



Developing and testing social objectives for fisheries management

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LIST OF ACRONYMS

ABARE	Australian Bureau of Agriculture and Resource Economics
ABS	Australian Bureau of Statistics
AHP	Analytical Hierarchical Process
BBN	Bayesian Belief Network
BRS	Bureau of Rural Sciences
CPUE	Catch per unit effort
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DEWHA	Commonwealth Department of Environment, Water and Heritage and the Arts (became SEWPAC and now DotE)
DEEDI	Queensland Department of Employment, Economic Development and Innovation
DAFF	Australian Department of Agriculture, Fisheries and Forestry (now the Department of Agriculture – DOA)
DOTE	Commonwealth Department of the Environment
ESD	Ecologically Sustainable Development
FAO	Food and Agriculture Organization of the United Nations
FRDC	Fisheries Research and Development Corporation
GBRMPA	Great Barrier Reef Marine Park Authority
GVP	Gross Value of Production
PIRSA	Primary Industries and Regions, South Australia
SEWPAC	Commonwealth Department of Sustainability, Environment, Water, Population and Communities (now DotE)
TACC	Total Allowable Commercial Catch

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OBJECTIVES:

1. Identify social objectives and indicators of relevance at the national level
2. Test and verify applicability of social objectives and indicators using the Queensland trawl fishery and three fishing communities in South Australia as case studies
3. Review social objectives and indicators for applicability to national fisheries management

NON-TECHNICAL SUMMARY:

OUTCOMES ACHIEVED TO DATE

The importance of including social objectives in fisheries management is recognised in many policies and programs that are intended to guide sustainable fisheries management. This includes the principle of Ecologically Sustainable Development (ESD) that underpins Australian fisheries management and is commonly agreed as the way forward in fisheries and marine ecosystem management, the Marine Stewardship Council certification process and the UNESCO Food and Agricultural Organisation (FAO)'s Code of Conduct.

Yet, little is known about the social dimensions of sustainable fisheries management. In particular, there is little guidance available for fisheries managers to assist them in identifying the social objectives they are managing for, or in collecting information that helps them more successfully manage for these objectives. To address this, this project developed a two-part guide, titled 'Managing the Social Dimensions of Fishing' ('the Guide'). This Guide takes fisheries managers and other key stakeholders through the steps of implementing social objectives, in an ESD context, by helping them identify, document and manage social objectives relevant to their fishery. The Guide also helps fisheries managers identify what aspects of the social dimensions of fisheries they can influence and what factors remain outside their direct influence. This will help fisheries managers better target the identification and management of social objectives to those issues that they can address. Fisheries managers and other key stakeholder will now be able to monitor the performance of a fishery from a social perspective and make decisions regarding future management. This is essential to enable progress to be made on the implementation of triple-bottom-line assessments for Australia's fisheries.

The Guide will also assist the Australian Fisheries Management Forum (AFMF) to promote a consistent national management approach across all fisheries jurisdictions for developing social objectives. The adoption of a consistent national approach will lead to improved fisheries management outcomes through increased certainty for all stakeholders.

The development of social objectives and associated indicators for Australian fisheries that can be used to assess performance, in line with ecological and economic objectives, was achieved through three phases.

First, based on a review of the literature on social dimensions of fishing, existing requirements of all Australian jurisdictions in relation to fisheries legislation and policy, and of existing national and international frameworks that consider social dimensions of fishing, a set of draft social objectives and associated indicators was developed. These draft social objectives and indicators were then revised at a workshop held with fisheries managers and policy makers from across Australia, which also included representatives from commercial, recreational and Indigenous fisheries from all states and territories. The workshop also considered how fisheries managers might best be able to engage with the proposed project outputs.

Second, case studies of the Queensland East Coast Trawl Fishery, the South Australian communities of Ceduna, Port Lincoln and Wallaroo (in which a diversity of fisheries operate) and the Indigenous community of Narunnga from South Australia were used to test the draft social objectives and indicators, identify how best to select and apply them to the circumstances of specific fisheries and to identify low-cost approaches that can be used by fishery managers to enable them to more explicitly incorporate social objectives in their management.

The results of the case studies were used to revise and refine the objectives, and to develop indicators designed to inform each objective. The outcome was a set of recommended social objectives and associated indicators, as well as recommended processes for selecting, measuring, and analysing them in different contexts. Testing in multiple case studies ensured that the resulting social objectives and associated indicators included in the Guide are appropriate for fisheries management across different jurisdictions, at the State, Territory and Commonwealth level.

Third, the revised social objectives and indicators were workshopped with the fisheries managers that had participated in the first phase of the project. This provided the basis for developing the two-part Guide that is the final output of the study. The draft Guide was reviewed by fisheries managers from across Australia, and their comments and feedback incorporated into revisions of the Guide.

Throughout the project, the objectives and indicators were developed with future integration into potential fisheries status report frameworks, such as the National Fisheries Status Report, in mind. To that end, the social objectives and indicators included in the Guide are high-level and include options that enable individual fisheries management jurisdictions to select options for measuring social objectives that best fit their needs, resources and budgets.

It is envisaged that the framework developed in this project, and detailed in the Guide, will enable the integration of the social dimension of sustainable management of fisheries into fisheries management practices. These outputs facilitate the monitoring of performance of a fishery from a social perspective and provide robust benchmarks to assist in making decisions that incorporates social considerations, as well as ecological and economic objectives and imperatives.

The Guide is not intended to be a prescriptive text to be adopted without flexibility, but to be used as a common framework to be applied as appropriate to the management needs of individual fisheries. The authors of this work consider this to be the foundation stone of ongoing work to incorporate social objectives and indicators into fisheries management and support the National Harvest Strategy Guidelines framework and the development of reporting for a National Fisheries Status Report.

The high level of engagement of fisheries managers throughout the study is expected to result in high levels of uptake of the outputs, with the achievement of increased use of social objectives and reporting in fisheries management reviews and planning processes. However, further work is necessary to support the comprehensive implementation of the Guide, including:

- Extension of knowledge and uptake;
- Further work on the Indigenous component to explore the national applicability of the objectives and indicators;
- Further development of social objectives and indicators that examine how the broader community views and interacts with fishing activities, enabling this work to better contribute to the provision of a social license to operate for the fishing sector; and
- Integration of social objectives and indicators with harvest strategy and fisheries status report frameworks. This could be achieved in the first instance through the use of case studies to demonstrate best practice integration.

KEYWORDS: ESD, social objectives, social indicators, triple-bottom-line assessment, national guidelines, fisheries management.

1. BACKGROUND

The call for triple-bottom-line assessments of businesses and industry was initiated in 1987 with the Brundtland Report (World Commission on Environment and Development 1987). It has since been re-endorsed in a different format with the call for management of natural resources on the principles of ESD¹. Although considered one leg of the ‘three legged stool’ of ecological, economic and social dimensions of sustainable development, the social aspect of triple-bottom-line assessments and ESD has remained largely unaddressed. To date, there is only limited reporting against social objectives in a small number of industries, and none that have been specifically developed in the context of fisheries management.

Symes and Phillipson (2009) decried the lack of social objectives defined or used in fisheries policy throughout the developed world. They called for “government policy to instill confidence in the industry and set out explicit social objectives for attaining an equitable profitable and sustainable future”.

In 2005 and 2007, the Fisheries Research and Development Corporation (FRDC) funded reviews of the effects of the restructure of the South Australian Marine Scalefish Fishery (MSF) from an environmental, economic and social perspective (Schirmer and Pickworth 2005a; Hundloe et.al 2010). This was one of the first true attempts at a comprehensive triple-bottom-line assessment of a fishery. During these reviews, it became obvious that while the restructure had clear ecological objectives and some economic goals/objectives, no social objectives had been identified for its implementation (Brooks 2010). It was therefore impossible to holistically identify if restructure had been effective in regard to the long-term sustainability of the industry.

Other attempts at triple-bottom-line assessments in Australian fisheries have been limited and largely inadequate. In a national triple-bottom-line assessment that included fisheries, the only social indicators considered by Foran et al. (2005) were employment generation, income and government revenue. These indicators are, in fact, largely economic indicators (although certainly also relevant as social indicators), and were not developed based on consideration of the objectives that were relevant to different management situations.

In 2008, the FRDC funded the ‘Geelong revisited: from ESD to EBFM – future directions for fisheries management’ workshop (Millington and Fletcher 2008). This workshop identified that, while large advances had been made in the area of ecological assessment, there had been ‘minimal progress in the social and economic area’. The following actions were recommended to help redress these gaps and to better embed social, economic and ecological considerations in fisheries management:

- Define social, economic and ecological objectives for the different sectors;
- Develop tools to achieve these objectives;
- Develop tools to measure success;
- Better align marine planning processes (including the establishment of Marine Protected Areas) with fisheries management processes and arrangements; and
- Develop clear whole-of-government objectives and guidelines for regions that clearly articulate what impacts are, and are not, allowed on aquatic system health.

¹ The National Strategy for Ecologically Sustainable Development (1992) defines ESD as “Using, conserving and enhancing the community’s resources so that ecological processes, on which life depends, are maintained, and the total quantity of life, now and in the future, can be increased”.

A number of Australian projects have ‘nibbled’ at the edges of establishing social objectives in fisheries from an industry perspective (e.g. Brooks et al. 2010), but none have explicitly aimed to establish a set of generic social objectives for fisheries managers, applicable to the development of fisheries management systems (e.g. management plans and harvest strategies) and decision-making processes across different jurisdictions.

This project was initiated by the fisheries management agencies of South Australia and Queensland. While initially developed in response to local issues, such as the review of the Queensland East Coast Trawl Fishery Management Plan², it was supported by all states as a previously perceived ‘wicked problem’ for which solutions would be welcomed.

For example, in South Australia, three fishing sectors are recognised under the *Fisheries Management Act 2007* (commercial, recreational and traditional). A key objective of this Act is to manage these fishing sectors in a manner that is consistent with the principles of ESD. Section 7(5) of the *Fisheries Management Act 2007* defines ESD as being comprised of the ‘use, conservation, development and enhancement of the aquatic resources of the State in a way, and at a rate, that will enable people and communities to provide for their economic, social and physical well-being...’. This sentiment is reflected in the Fisheries Acts of all Australian States and Territories, as well as for the Commonwealth. Despite this requirement, prior to this study, the social wellbeing principle of ESD was not being sufficiently addressed in South Australia, because the social impacts associated with fishing and fishing industries were poorly understood, and fisheries managers lacked the information they needed to integrate social objectives and indicators into their fisheries management frameworks. Similar gaps can be identified across all Australian states and territories.

This lack of available information has resulted in social issues often being confused with economic issues, and economic indicators have often been presumed to be adequate proxies for social responsibility reporting. Such economic indicators, even if associated with a particular objective, do not address issues of stewardship, compliance, non-economic livelihoods, barriers to participation, community engagement with management initiatives, protection and access to iconic species for Indigenous community members or the many other social issues that have an important and legitimate role in the effective management of aquatic resources for long term sustainability.

Consequently, although ecological and some economic data have traditionally been collected at the fishery level, the social outcomes of fisheries management – whether at the scale of the fisher, their household, or the community they live in – have to date remained unaddressed.

² An associated FRDC-funded study was undertaken to address the specific needs of the trawl review, in which social objectives were considered along with economic, environmental and governance objectives (Pascoe et al 2013). The social objectives, and preliminary indicators, were case specific, but provided an input into this broader study.

2. NEED

Most legislation guiding Australian fisheries management now explicitly recognises the need to achieve ESD. To achieve ESD, there is a need to identify clear ecological, economic and social objectives. Until now, fisheries management has mostly been directed by ecological and economic objectives. With the introduction of the call for triple-bottom-line assessments of industry and performance, a need to identify social objectives has become apparent, but this has remained largely unaddressed in terms of integration into fisheries management systems and decision-making processes.

There was therefore a need to develop appropriate social objectives and associated indicators that could be used to monitor social performance and help in the decision-making processes for fisheries management. This required the development of clarity over the degree and boundaries of social responsibility fisheries management have in areas such as employment, skills, instilling of stewardship and industry/community education. In this context, it was also essential to ensure that any trade-offs that may have to be accepted between the social, ecological and economic objectives provide the optimal outcomes in the context of both fisheries and other external drivers.

Although it would have been possible to identify a set of social objectives and indicators for one or two Australian States, it was deemed necessary to identify a universal set of social objectives and trial these using relevant case studies. A universal set of social objectives can facilitate a consistent approach and application in selecting social objectives and indicators across fisheries management jurisdictions across Australia, and be applied to any future reporting requirements.

Australia requires guidelines to choose and implement social objectives and associated indicators, in order to:

- Improve fisheries management systems and decision-making processes;
- Facilitate a consistent approach and application across Australian jurisdictions, including common definitions and language;
- Provide the social component of guidance for fisheries managers and other key stakeholders for the development of fisheries management systems and decision making processes (e.g. harvest strategies), for individual fisheries and over-arching policies;
- Support the further development of a national harvest strategy framework; and
- Support the further development of a national fisheries status report.

To achieve this, the base output required is a guide that takes fisheries managers through the steps of identifying social objectives and implementing them with robust indicators for the measurement of progress on achieving those objectives. By assisting fisheries managers identify, document, and manage social objectives relevant to their fishery, they are enabled, along with other stakeholders, to make more comprehensive, transparent and credible decisions regarding future management. This is essential to enable progress to be made on the implementation of triple-bottom-line assessments for government management of ESD in Australia's fisheries.

3. OBJECTIVES

The over-arching objective of the project was to develop a guide that takes fisheries managers through the steps of identifying and implementing social objectives, in an ESD context, by helping them identify, document, and manage social objectives relevant to their fishery. The achievement of this enables fisheries managers and other key stakeholders to adopt appropriate social objectives and implement associated indicators that can be used to monitor social performance, and make decisions regarding future management.

The over-arching objective of this project was comprised of the following three sub-objectives:

Objective 1: Identify social objectives and indicators of relevance at the national level

Identifying social objectives and indicators of relevance at the national level ensured that reporting frameworks could be aggregated across not only fisheries and regions, but states and territories to both a bio-regional and national level. Consequently, it was imperative to gain national support for the project and ensure relevance of any objectives across all jurisdictions.

Objective 2: Test and verify applicability of social objectives and indicators using the Queensland Trawl Fishery and three fishing communities in South Australia as case studies

It was not only imperative to identify social objectives that had national applicability, but to identify a means to measure the performance of fisheries management systems and decision-making processes against these objectives. Hence, the second objective was to identify how best to assess fishery performance against selected social objectives. This required the identification of appropriate indicators for each objective, testing the indicators to ensure relevance to the associated objective and testing the ability of the objective to be applied realistically to a range of fisheries.

Objective 3: Review social objectives and indicators for applicability to national fisheries management

In the process of testing social objectives and indicators, it was identified that modifications may have to be made, and that in some cases indicator data may not be able to be procured to adequately inform the achievement of objectives and fisheries management decisions. As a result, a third project objective was included, being to review the outcomes of the objective and indicator testing to ensure national relevancy to all types of jurisdictions. The results of this review generated the final set of social objectives and indicators to be incorporated in the key output of this project, the guide to 'Managing the social dimensions of fishing for Australian fisheries'.

4. METHODOLOGY

In line with its objectives, this project involved three phases: (i) identify provisional objectives and indicators; (ii) test them using case studies; and (iii) refine and revise a recommended set of national objectives and indicators. In this section, the project governance is first described, followed by a description of the methods used in each phase.

4.1 PROJECT GOVERNANCE – STEERING COMMITTEE

To assist project development and ensure appropriate guidance and dissemination of results, a Steering Committee was established at the outset of the project. The Steering Committee was composed of members from all state and territory fisheries management agencies, as well as the following national agencies: Australian Fisheries Management Authority (AFMA), Australian Department of Agriculture, Fisheries and Forestry (DAFF), Great Barrier Reef Marine Park Authority (GBRMPA), FRDC, Department of Sustainability, Environment, Water, Population and Communities (SEWPaC) and Commonwealth Scientific and Industrial Research Organization (CSIRO). Such a broad composition of members ensured a national focus to the project. This Steering Committee met twice during the project, at a workshop held in Phase 1 and a final workshop in Phase 3. In both workshops, committee members contributed to the content of the project. Between workshops, the members were asked to review key materials and outputs of the project. Appendix 3 lists the Steering Committee members who attended the Phase 1 and Phase 3 workshops.

4.2 PHASE 1: IDENTIFY PROVISIONAL SOCIAL OBJECTIVES AND INDICATORS

In Phase 1, a provisional set of social objectives and indicators was identified, based on the following methods:

- **Review of legislation.** Legislation governing or affecting fisheries activity in Australia was reviewed to identify the requirements included in this legislation regarding managing fisheries for social outcomes. This was used to help identify social objectives relevant to Australian fisheries.
- **Review of literature.** Review of Australian and international literature examining social objectives and indicators. This review focused on work undertaken in fisheries, but was not limited to this, with inclusion of key references examining development of social objectives and indicators in natural resource management. The review was used to develop a set of proposed social objectives and indicators with potential applicability in Australian fisheries management³.
- **Steering Committee workshop #1.** The draft social objectives and indicators developed from the reviews of legislation and literature were presented to the Steering Committee at a workshop in Melbourne on 5 April 2011 (see Appendix 3 for a list of participants). Workshop participants reviewed and discussed the material, with the discussion used to: (i) refine existing social objectives and indicators; and (ii) include additional social objectives and indicators not previously identified. This workshop also provided data on the likely applicability of different social objectives to different fisheries management situations and jurisdictions.
- **Development of a full set of objectives and indicators for testing in Phase 2.** The results of the reviews and workshop were used to prepare a full list of social objectives and indicators to be tested in Phase 2.

³ The literature review was also used to inform the development of the social and other objectives for the Queensland East Coast Trawl Fishery management review undertaken as a separate FRDC funded tactical research project (FRDC 2009/100). Experiences gained in this project were also presented at the workshop.

A detailed description of the methods used in Phase 1 of the project, including key findings, is outlined in the Phase 1 Milestone Report (see Appendix 4).

4.3 PHASE 2: TESTING OBJECTIVE AND INDICATORS IN THE CASE STUDIES

Phase 2 involved testing the applicability of the provisional social objectives and indicators to individual case studies. This had multiple objectives: (i) identify the relevance and applicability of objectives and indicators in different situations, including which are most relevant across different contexts; (ii) identify how best to adapt objectives and indicators to local contexts; and (iii) identify indicator measurement methods that are low-cost and readily implemented by fisheries managers.

The case studies included in Phase 2 were the Queensland East Coast Trawl Fishery, the South Australian communities of Ceduna, Port Lincoln and Wallaroo (in which a diversity of fisheries operate) and the Indigenous community of Narungga from South Australia. The case studies provided two approaches to testing the realism and practicality of objectives and indicators; a fishery-based and region-based approach. In the South Australian case studies, both recreational and commercial fishing were examined. This type of testing allowed identification of how best to assess performance against the social objectives in a diversity of contexts.

In Queensland, data were collected for a single fishery (East Coast Trawl Fishery), while in South Australia, data were collected across multiple fisheries, and then analysed both by fishery and by case study region. The three regional communities examined in South Australia were the West Coast (Ceduna), Eyre Peninsula (Port Lincoln) and the Yorke Peninsula (Wallaroo). These three regions were chosen for assessment because they represented different proportions of the three different fishing sectors:

- (i) **West Coast (Ceduna):** Base for numerous participants in the Marine Scalefish and a small number of licence holders in Western Zone Abalone and the Northern Rock Lobster fisheries. Ceduna also has an aquaculture industry mainly based on oysters and a large Aboriginal population that has links to traditional fishing history.
- (ii) **Eyre Peninsula (Port Lincoln):** Main base for the Western Zone Abalone and Northern Zone Rock Lobster fisheries, which are both commercially valuable fisheries. Port Lincoln also has a large number of Marine Scalefish and recreational fishers and a burgeoning aquaculture industry. It also has a large Aboriginal population and links to traditional fishing history, particularly through the Nauo Bargarla community.
- (iii) **Yorke Peninsula (Wallaroo):** Recent infrastructure developments such as boat ramps and marinas, together with housing developments, have led to greater recreational fishing in the upper Spencer Gulf region adjacent to Wallaroo. Wallaroo also has some commercial fishing, particularly operators in the Marine Scalefish and the Spencer Gulf Prawn fisheries. Yorke Peninsula also has links to traditional fishing history, mainly through the Narungga community, which is based at Point Pearce (~60 km south of Wallaroo).

At the start of Phase 2, a series of workshops were held with relevant stakeholders in South Australia (i.e. commercial and recreational fishers, fisheries managers and community members) to critically review and discuss the draft social objectives and indicators identified in Phase 1 of the project. Based on these discussions, a revised set of social objectives were proposed and a final suite of specific indicators were developed for the South Australian case studies. Details of these workshops and who attended are provided in Appendix 5. This set of social objectives and indicators were also applied in the case study of the Queensland East Coast Trawl Fishery, as it was considered more appropriate to test a common set of objectives and indicators across South Australia and Queensland to test the project objective of developing a nationally relevant set of objectives and indicators, to facilitate cross-fishery and jurisdictional comparisons.

A range of methods were used to collect data for different indicators. Some indicators required data that was held by fisheries managers, while other indicators required data collected directly from commercial fishers or Indigenous communities. For Phase 2, data were collected from the following sources:

- Surveys of fisheries managers in South Australia and Queensland. These surveys gathered data for indicators that required information held by fisheries managers and the fisheries management agencies they worked for;
- Surveys of commercial fishers, including one commercial fishery in Queensland (East Coast Trawl Fishery) and six commercial fisheries in South Australia (Marine Scalefish Fishery, Southern Zone Rock Lobster Fishery, Northern Zone Rock Lobster Fishery, Southern Zone Abalone Fishery, Central Zone Abalone Fishery and Western Zone Abalone Fishery). Questions for each fishery were iteratively developed. Learning from each survey was applied to the next one, enabling ongoing improvement in quality and relevance of questions used to measure indicators. While the majority of questions remained the same across surveys, this enabled variations of the questions to identify the optimal formats to suit the variation between fisheries.
- A survey of recreational fishers in South Australia;
- Consultation with Indigenous representatives in South Australia; and
- Analysis of data from the Australian Bureau of Statistics (ABS).

Copies of some of the survey instruments used in this project are provided in Appendices 6-10. The Guide summarises final recommendations on which survey questions to use to gather data for different indicators and thus can be used to identify how questions relate (via the indicators they measure) to specific social objectives. Wherever possible, the collection of social indicator data from fishers was undertaken as part of data collection processes that were already in place (e.g. by adding questions to existing economic surveys of commercial fishers in South Australia by EconSearch), in an effort to not only gather data in the most cost efficient way, but also to minimise survey fatigue for fishers. Table 1 summarises the methods used for each survey and responses received. The sections below then briefly describe the methods used to collect data for each method listed above, and summarise key findings regarding the cost and effectiveness of measuring indicators using each technique.

At the conclusion of Phase 2, work was undertaken to further analyse, prioritise and rank the social objectives and indicators. This is described in more detail below.

Table 1 Summary of the survey methods trialled to collect data for the different case studies in Phase 2.

Survey ^a	Survey methods trialled	Number of surveys completed	Response rate	Recommended as a feasible method for collecting data in future?
South Australian and Queensland fisheries managers	Internet	4	100%	Yes
South Australian Marine Scalefish Fishery	Face-to-face Mail	106	32%	Face-to-face – yes Mail – yes
Queensland East Coast Trawl Fishery	Internet Face-to-face	63	21%	Internet - no Face-to-face – yes
South Australian Southern Zone Rock Lobster Fishery	Face-to-face Mail	45	25%	Face-to-face – yes Mail – yes
South Australian Northern Zone Rock Lobster Fishery	Face-to-face Mail	22	33%	Face-to-face – yes Mail – yes
Southern, Central and Western Zone Abalone fisheries of South Australia	Face-to-face Mail	18	51%	Face-to-face – yes Mail – yes
South Australian Recreational Fishery	Internet Mail	951 357	N/A	Internet – yes Mail – maybe (higher cost/ lower response)

^a In some cases the same survey questions were used for more than one fishery; in these cases both fisheries are listed as being part of the same survey

4.3.1 Fisheries managers

Internet surveys of fisheries managers were undertaken in South Australia and Queensland (Appendix 6). This survey asked questions designed to measure indicators that draw on the knowledge and data held by fisheries managers and the fisheries management agencies they work for. The survey questions were drafted with the assistance of several fisheries managers; social objectives and indicators were described to these fisheries managers during phone interviews, and they were asked to help design specific survey questions that could be used to measure these. The survey questions were then hosted on the online survey platform 'SurveyMonkey'. The fisheries managers were sent an email with the survey link, asking them to complete the survey.

The choice of an internet survey was made based on cost and access; 100% of fisheries managers in Australia have ready internet access and can therefore easily complete an online survey. Internet surveys are low cost and using platforms like SurveyMonkey enables results to be downloaded in a readily analysable format. Other survey methods were not trialled as fisheries managers indicated internet surveys are the simplest, lowest cost options for them to use.

After the responses of the fisheries managers were analysed, the survey questions were revised to incorporate learnings from the process. Examples from the survey results are given throughout the Guide and form the primary presentation of results from the survey of fisheries managers.

4.3.2 South Australian Marine Scalefish Fishery

The first collection of data from fishers occurred via a pilot survey of commercial fishers from the South Australian Marine Scalefish Fishery. This pilot survey (attached in Appendix 7) was undertaken in 2011 and tested an initial set of questions intended to measure those indicators that required data from commercial fishers. The survey questions were added to an existing economic survey of fishers in the South Australian Marine Scalefish Fishery scheduled to occur at that time, which was conducted by EconSearch. The survey methods are described in detail in Schirmer (2013) (see Appendix 11).

In total, 32% of the 328 licence holders in the South Australian Marine Scalefish Fishery responded to the survey (Table 1). The survey was delivered using two methods: face-to-face interviews with fishers, and surveys mailed to those fishers who indicated a preference for completing the survey by mail. Both methods were successful in achieving a response.

Once the survey was completed, the survey questions were assessed by analysing the responses received to the questions and through formal feedback from EconSearch, who had delivered the surveys on the researcher's behalf. This assessment identified some questions that were ambiguous or were considered sensitive by fishers. These questions were revised, with new or changed versions trialled in the subsequent surveys of commercial fishers.

4.3.3 Queensland East Coast Trawl Fishery

The survey questions were next applied in the Queensland East Coast Trawl Fishery, where a response was achieved from 21% of the licence holders in the fishery. Some of the survey questions for the Queensland East Coast Trawl Fishery were amended based on testing the question in field trips to key communities (Moreton Bay, Tin Can/Hervey Bay and Cairns; see

Appendix 8 for the survey instrument). Additionally, the survey instrument was modified in consultation with Vikki Schaeffer (University of the Sunshine Coast), who was running a Cooperative Research Centre (CRC) funded project looking at building social capital in prawn fisheries and using the Queensland East Coast Trawl Fishery as a case study. Where there was overlap in some indicators in both surveys, these were removed on the basis that the CRC project could provide the appropriate data, rather than attempt to duplicate data collection⁴.

An on-line and face-to-face survey of the Queensland East Coast Trawl Fishery was undertaken between April and August 2012. In total, 63 usable responses were obtained from around 300 active trawlers (Table 1). The sample consisted of 51 owner-operators, nine employed skippers and three company fleet managers responsible for several vessels each. Another 6 partially completed survey responses were obtained, but they were not used. The survey responses were fairly equally distributed between the three regions in the fishery, Northern (north of Mackay), Central (Tin Can Bay to Mackay) and Southern (south of Tin Can Bay). The Northern region is based on larger vessels mostly fishing in deeper water for tiger and endeavour prawns, whereas the Central region consists of both smaller vessels fishing mostly inshore and larger vessels fishing offshore, fishing for eastern king prawns, Moreton bay bugs and scallops. The Southern region consists of mostly inshore vessels fishing primarily for eastern king prawns and Moreton Bay bugs. Only 4 responses were received from the on-line survey, despite repeated requests and reminders. This suggests that on-line surveys – while cost effective – may not be a practical approach to data collection in this fishery. The consensus of fisheries managers was that internet use is not high enough by fishers to warrant widespread use of internet-based surveys for commercial fishers, and the low use of the internet option in the Queensland East Coast Trawl Fishery confirms this perception.

The face-to-face surveys were conducted on an opportunistic basis. Most of the interviews in the Northern region were undertaken while fishers were offloading and/or refuelling from a mother-ship that serviced the region. In the other two regions, the fishers were approached and interviewed during a series of meetings organised by the fisheries management agency to discuss future management options in the fishery. Port visits in the Southern region were also undertaken, and fishers approached who were in port at the time. Hence, the sample is potentially biased as it is limited to only those fishers who attended these meetings, or those boats operating in the Northern and Southern regions during the time of the survey. On average, around one half of the fishers at each meeting, and a slightly higher proportion of those approached in the ports or mother-ship, participated in the survey. Reasons for non-participation or non-attendance at the meetings were not explored.

In the face-to-face surveys, a relatively high proportion of fishers consenting to participate in an interview (~10%) could not read or write. This low level of literacy may have also contributed to the low on-line response rate. Low response rates in this fishery may also have resulted from a separate social survey being simultaneously conducted in the fishery by the University of the Sunshine Coast. Relatively few of the survey respondents to our survey had also participated in the University of the Sunshine Coast survey, suggesting that those

⁴ In the end, the information collected in the CRC survey was not made available. Removal of overlap was at the request of industry members at the earlier meetings who did not want to be asked the same questions in two surveys. The actual overlap in completed surveys was relatively small (20%).

who had participated in the other survey were less responsive to participating in our survey. Previous surveys have also achieved low response rates, suggesting that low response rates to surveys are endemic to Queensland fisheries. The lack of engagement of the industry with fisheries management is a recognised problem and the separate University of the Sunshine Coast project aimed to examine and identify mechanisms to redress this problem.

4.3.4 South Australian Rock Lobster and Abalone Fisheries

An amended survey was used to collect social data from licence holders in the Northern Zone Rock Lobster Fishery and Southern Zone Rock Lobster Fishery of South Australia from late May to July 2012 (see Appendix 9). This survey was also used in the Southern Zone Abalone Fishery, Central Zone Abalone Fishery and Western Zone Abalone Fishery of South Australia in September 2012. For each of these surveys, small adjustments were made to suit the individual circumstances of the fishery, based on consultation with fishery representatives. These surveys were all approved by fisher representatives before being distributed. Of all six commercial fisheries surveyed in South Australia, the Southern Zone Rock Lobster Fishery had the lowest response rate (Table 1). Feedback from EconSearch indicated that the low response from this fishery related not to the inclusion of social questions on the survey, but to the inclusion of questions related to a separate research project, which were considered overly intrusive by fishers.

The results of the surveys for rock lobster and abalone fisheries of South Australia were evaluated, using the same process as for the South Australian Marine Scalefish Fishery, to further refine the questions used to collect data for different indicators.

4.3.5 South Australian recreational fishers

A survey of recreational fishers from South Australia was developed and revised twice based on: (i) feedback from the recreational fishery manager in South Australia; and (ii) results of a pilot test with six recreational fishers in Adelaide (see Appendix 10 for the survey instrument). When considering how to monitor performance against social objectives for recreational fishers, a key goal was to identify whether survey methods could be identified that were cost less than the traditional methods of face-to-face or phone surveys. Although surveys of commercial fishers are costly, they are not as costly as obtaining a representative sample of recreational fishers because there are typically small numbers of commercial fishers compared to recreational fishers, and their contact details are known.

To evaluate the best survey options, multiple methods were tested, and their results compared to identify which were most successful in achieving a response from recreational fishers that could be readily weighted to be representative of the recreational fisher population.

To enable this comparison, the survey of recreational fishers from South Australia was delivered and promoted in the following ways:

- **Delivery methods:**
 - Internet survey: survey hosted online and promoted using multiple methods (see below);
 - Hard copy surveys: 3,000 surveys handed out at key fishing spots in the three South Australian fishing regions in January and February 2012; and also sent to participants in a previous recreational fishing survey who had indicated a willingness to be involved in future research on the recreational fishery; and

- Face-to-face surveys: numerous face-to-face surveys undertaken at recreational fishing spots in the three case study regions in January and February 2012.
- **Promotion methods:**
 - Notices were posted on popular recreational fishing websites such as FishSA and Strike & Hook;
 - Emails were sent to recreational fishing associations (encouraging them to pass the emails on to others);
 - Emails were sent to social networks across South Australia, with encouragement to forward the email to friends and family;
 - A media release and several associated media interviews and articles on radio and in newspapers discussed the survey;
 - The survey was posted to fishers who had participated in a previous South Australia recreational fishing survey (in 2007/08) and indicated willingness to participate in more surveys (see Jones 2009);
 - Flyers were distributed in tackle shops, caravan parks, PIRSA offices, visitor information centres and on parked car windscreens at popular fishing spots in each of the three case study regions.
 - A prize draw was offered to encourage participation (see Appendix 12 for a copy of the flyer and details of the prizes offered).

The recreational survey was completed by a total of 1308 people (357 completed as hard copy surveys and 951 surveys completed online). As South Australia does not have a recreational licence system it is not possible to determine the percentage of fishers represented by this response rate. Instead, representativeness was assessed by comparing characteristics of the fishers who responded to known data on South Australian recreational fishers from the 2007/08 recreational fishing survey (Jones 2009) (Figure 1).

In the survey response, there was an under-representation of younger age groups and an over-representation of older age groups. When the hard copy survey response was compared to the online survey response, the online survey responses were more representative of the age distribution of recreational fishers than the hard copy responses (Figure 1). This suggests that online surveys will be more effective in achieving a representative sample than hard copy surveys.

An analysis of results suggested that most respondents were relatively enthusiastic fishers. Thus, the survey is likely to be biased to more avid recreational fishers, although the extent to which it is could not be formally assessed due to lack of recent surveys of recreational fishing in South Australia.

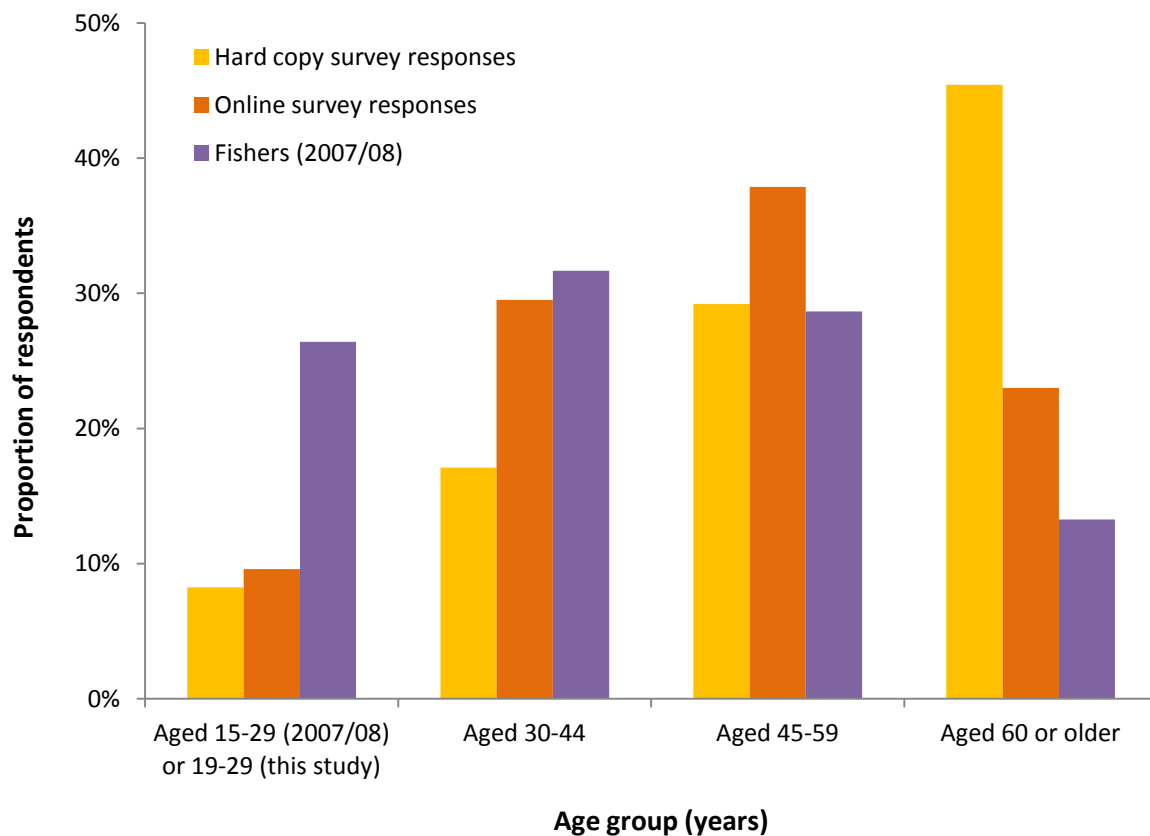


Figure 1 A comparison of the age distribution of recreational fishing survey respondents for surveys undertaken in 2007/08 by Jones (2009) and in 2012 for this project.

The online surveys were substantially cheaper to conduct than the hard copy surveys. The operational cost of achieving the 951 surveys online was approximately one quarter of the costs of printing, distributing and entering data from returned hard copy surveys. Moreover, the hard copy surveys generated far fewer responses than the online surveys. Per response, the online method was approximately one-tenth the cost per survey received compared to the hard copy survey.

The most successful promotional methods were also relatively low cost (Figure 2). Receiving an email or hearing about the survey via notices posted on popular fishing websites were the most common ways respondents heard about the survey, followed by hearing about it in the public media, or via a flyer picked up at a tackle shop. These methods are lower costs than other promotional methods such as handing out flyers, and were more successful.

Further information on the survey of recreational fishers from South Australia during 2012 can be found in the report '*Social aspects of recreational fishing by avid fishers in South Australia, 2012*' by Schirmer et al. (2014), which is provided in Appendix 13.

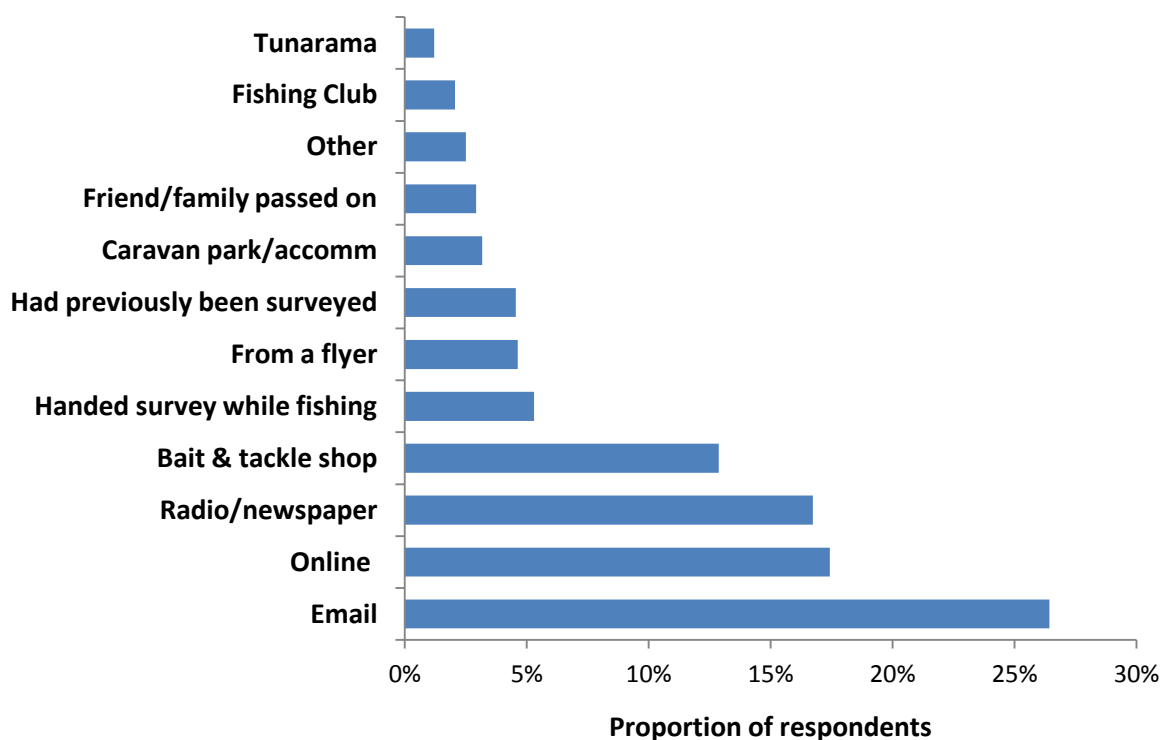


Figure 2 Proportion of recreational fishing survey respondents in South Australia during 2012 who reported hearing about the survey through different promotional methods.

4.3.6 Indigenous fishing sector

A draft set of social objectives and indicators was developed for the Indigenous fishing sector based on previous work that examined how best to monitor the effects of natural resource management on Indigenous communities in Australia and internationally. This draft set of objectives and indicators was then revised based on consultation with fisheries managers from the Northern Territory, the Australian Fisheries Management Authority in the Torres Strait, and one Indigenous community representative body, the Torres Strait Regional Authority (Appendix 14). Rural Solutions, SA was then subcontracted to further develop these objectives and indicators with the Narungga community of South Australia, which has strong and well established links to the marine resource in Point Pearce. Input by this community resulted in 7 Indigenous community objectives and 19 potential indicators being identified. A report on the engagement of the Narungga community is provided in Appendix 15. The resources available for this project allowed initial development of draft objectives and indicators relevant to Indigenous communities. Further work is needed to operationalise the indicators for each objective, and to identify appropriate processes that ensure objectives can be measured in culturally appropriate ways that are tailored to the unique needs and relationships different Indigenous communities have with fisheries resources.

4.3.7 Other data

Statistics from the ABS were also analysed, principally to measure the proportion of local employment generated by commercial fishing in the South Australian case study communities. These analyses largely became redundant when, in the final stages of Phase 2 and in Phase 3 of the project, the indicators measured by these data were considered of low relevance by fisheries managers. These indicators were subsequently removed from the Guide.

4.3.8 Analytic Hierarchy Process analysis to identify priorities

Phase 1 identified a large number of social objectives, but did not identify which ones were considered the highest priority by fisheries managers. A better understanding of the prioritisation given to each objective by fisheries managers was developed in Phase 2, using the Analytic Hierarchy Process (AHP). AHP is a multi-criteria decision analysis approach for determining objective preference weights by using a series of pair-wise comparisons of objectives to derive an overall strength of preference measure for each. This process has been applied to fisheries management objectives internationally (e.g. Leung et al. 1998; Soma 2003; Mardle et al. 2004; Nielsen and Mathiesen 2006; Himes 2007) and in Australia (Pascoe et al. 2009b). It was also applied in the associated study relating to the Queensland east coast trawl management review (Pascoe et al. 2013).

AHP is based upon the construction of a series of pair-wise comparison matrices which compare objectives to one another, and a hierarchical structure that group similar objectives into subgroups, and builds the hierarchy with progressive layers of groupings. The pair-wise comparison method makes the process of assigning weights much easier for participants because only two elements or objectives are being compared at any one time rather than all objectives having to be compared with each other simultaneously. Preferences are expressed on a nine point scale, with a 1 indicating equal preference, and a 9 indicating an extreme preference for one of the objectives. Preferences are assumed symmetrical, such that if A against B has a preference of $a_{AB} = 9$, then $a_{BA} = 1/a_{AB} = 1/9$. For each set of comparisons, a matrix of scores can be developed, given by:

$$A = \begin{bmatrix} a_{11} & a_{12} & \dots & a_{1n} \\ a_{21} & a_{22} & \dots & a_{2n} \\ \dots & \dots & \dots & \dots \\ a_{n1} & a_{n2} & \dots & a_{nn} \end{bmatrix} \quad (1)$$

The scores are normalised by dividing through each element of the matrix by the sum of the column j (i.e. summed over i , such that $\bar{a}_{ij} = a_{ij} / \sum_i a_{ij}$), and the weight associated with each objective can be estimated as the average of the normalised scores across the row i . That is, $w_i = \sum_j \bar{a}_{ij} / n$, where n is the number of objectives being compared.

The pair-wise comparisons and analyses are undertaken at the different levels of the hierarchy. That is, pair-wise comparison and analyses are made at different levels of aggregation, and the weight w_i^ℓ is estimated (the superscript ℓ indicating the level of the objective in the hierarchy). The analysis within each level of aggregation in the hierarchy is then undertaken, and the weights of the individual objectives are determined by the product of their initial weight estimate (i.e. when compared with the other objectives that they are grouped with) multiplied by the weight of the higher order aggregation (i.e. which is compared with other higher order aggregations). This reduces the number of direct comparisons that need to be made, as only objectives at the same level and within the same broader objective need to be compared. Preference weightings are highly subjective, and inconsistency is a common problem facing AHP, particularly when decision makers are confronted with many sets of comparisons. Respondents do not necessarily cross check their responses, and even if they do, ensuring a perfectly consistent set of responses when many objectives are compared is difficult. The discrete nature of the 1-9 scale can also contribute to inconsistency, as a perfectly consistent response may require a fractional preference score.

The degree of consistency in the results can be assessed using the consistency index (CI), given by

$$CI = \frac{\lambda_{\max} - n}{n - 1} \quad (2)$$

where λ_{\max} is the maximum eigenvalue of the matrix A, given by $\lambda_{\max} = \sum_i \sum_j a_{ij} w_i$ (Duke and Aull-Hyde 2002). This is compared to a randomly generated value for an n x n matrix (Random Indicator or RI) to derive a consistency ratio, CR, where CR=CI/RI. Values of CR≤0.1 are generally considered acceptable (Saaty 1980), although higher measures are often accepted in fisheries analyses (Himes 2007).

Objective weightings represent individual preferences, whereas policy development and fisheries management require a single set of weightings that reflect the views of the main stakeholders concerned. The level of group coherence indicates the degree to which members of a given stakeholder group have similar or dissimilar objective preferences. Zahir (1999a; b) developed a measure of group coherence for use in AHP studies, given by

$$\bar{\rho} = \langle v_i \bullet v_j \rangle \quad i \neq j \quad (3)$$

where v_i and v_j are vectors comprising the square root of the objective weights of individuals i and j ; \bullet indicates the dot product of the two vectors, and $\langle \rangle$ indicates the average of the set of dot products (Zahir 1999a). The coherence measure, $\bar{\rho}$, represents the average angle between the individual vectors ($\cos \theta = \rho_{i,j} = v_i \bullet v_j$ for a pair of individuals), such that $\cos 0^\circ = 1$ implies identical preferences and $\cos 90^\circ = 0$ implies orthogonal preferences. The closer the value is to 1, the greater the average agreement in opinion of the individuals. While this has the appearance of a statistical measure, there is no generally accepted critical value.⁵ Instead, Zahir (1999b) suggests the consideration of the proportion of 'extreme cases'. Given Saaty's (1980) nine point scale (i.e. 1-9), extreme cases are those that have individual coherence measures $\rho_{ij} < (n + 4)/(n + 8)$, where n is the number of objectives being examined. These effectively indicate substantial differences of opinion between individuals within a group. Hence, the proportion of comparisons between individuals that are considered extreme is another indicator of group coherence.

Face-to-face interviews were used to survey fishery managers from South Australia and Queensland on these pair-wise comparisons. To survey fisheries managers from other jurisdictions across Australia, participants who attended the Phase 1 workshop were sent an electronic copy of the AHP survey, with instructions to ask them to pass on the AHP survey to all relevant fisheries managers and policy officers known to them once they had completed it. A summary of the number of responses for this survey from each fisheries jurisdiction is provided in Figure 3. In all states but NSW, individuals provided separate responses. NSW, however, provided a single 'corporate' response, developed after they held an internal workshop involving 10 fisheries managers/policy makers who identified a single consensus response. This process enabled the final Guide to include an assessment of which objectives are typically considered a higher priority by fisheries managers and which are considered a lower priority from across Australia.

⁵ Some authors have adopted 99%, 95% and 90% as critical measures (Mardle *et al.* 2004), while others have developed other definitions of strong and weak coherence with wider intervals (Himes 2007).

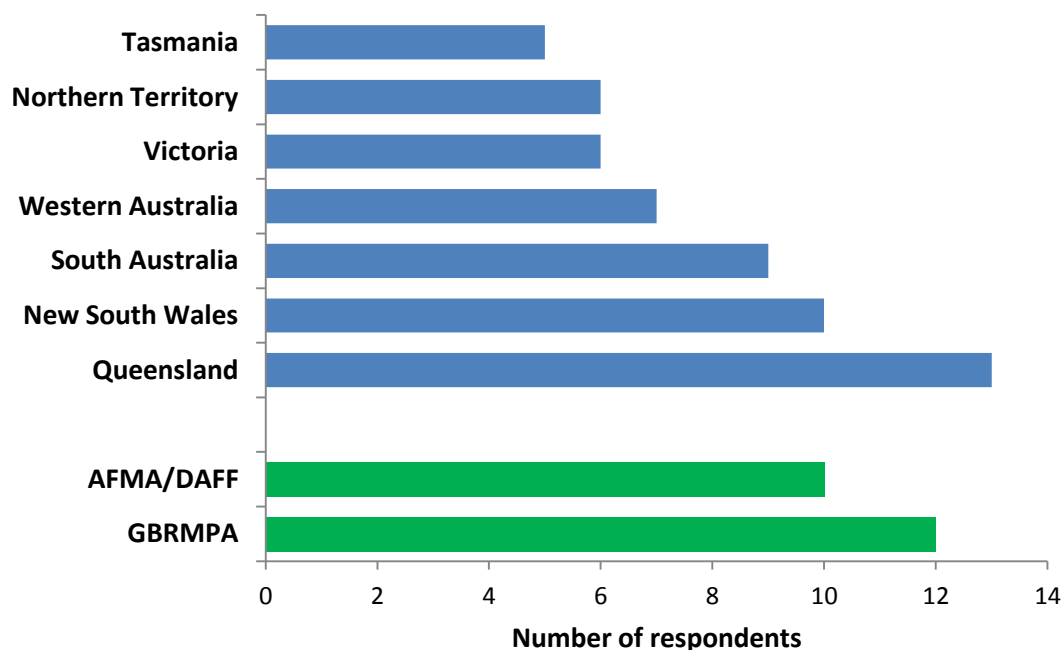


Figure 3 Number of responses received from the AHP survey from each State and Territory (blue bars), and Commonwealth (green bars) fisheries management jurisdictions. AFMA = Australian Fisheries Management Authority; DAFF = Department of Agriculture, Fisheries and Forestry; GBRMPA = Great Barrier Reef Marine Park Authority.

4.3.9 Assessing relevance of indicators for informing each objectives

Two processes were undertaken to consider how the indicators can inform the level of achievement against each objective, and in turn how these can be used to assess the performance of fisheries management. The first approach, mentioned in the previous section, involved the development of a Bayesian Belief Network (BBN), developed in NETICA. The BBN combines qualitative and quantitative information into a single framework for assessing the performance of the indicator against individual social objectives. It also measures the overall performance of across all social objectives. This approach has been used for fisheries modeling, where social drivers have had an impact on outcomes but an explicit quantitative relationship is difficult to establish (Little et al. 2004). The BBN was developed using recognised best practice principles and included Marcot et al. (2006) and Chen and Pollino (2012):

- Where possible limiting each node to no more than three parent nodes;
- Minimising the number of states of each node to as few as reasonable (ideally no more than three);
- Developing and validating the network with experts; and
- Undertake sensitivity analysis as part of the model evaluation

The BBN was developed during a three day workshop involving fisheries managers, economists and social scientists from the project team. The relationship between the indicator values and objective outcomes were also developed as part of the workshop. Each relationship was discussed and a range of alternative specifications were tested. The final relationship used in each case was based on a consensus of the group.

The relationship between the objectives and the overall performance measure was derived through the weights identified by fisheries managers, and elicited using the AHP. The state-specific (rather than national) weights were used to assess the performance of management in each State's fisheries. The weights allowed the individual objectives to be aggregated to the community level as well as provide an overall 'score' relating to the social performance of management.

The overall network developed in the workshop is illustrated in Figure 4, and the probabilities assigned to the relationship between indicator values and objective outcomes presented in Appendix 16. There are three main components representing the Industry (commercial, recreational and charter fisheries) community (blue), the Indigenous community (orange) and the Regional community (green).

The second approach involved a more qualitative assessment of the relationship between the indicators and objectives, and provided a traffic light system based on objectives achieving particular levels. These critical values of the indicators for each objective were derived by the project team and are presented in the Guide.

4.3.10 Assessing relevance of indicators for informing each objectives

In most cases, multiple indicators were identified that could potentially measure each objective. With a key goal of the project to provide a set of recommended indicators, two processes were used to assess the relevance of different indicators in informing the objective they were intended to measure.

The first process involved the quantitative estimation of the impact of each indicator on the objective using the BBN. The relative influence of each indicator on the objective outcome was tested using the sensitivity analysis feature within NETICA. Sensitivity analysis can be used to measure the degree to which findings at any node (e.g. the indicator measure) can influence the outcomes (or beliefs) at another node (e.g. the objective value), given the set of findings currently entered. For the purposes of this study, it can indicate which indicators will be the most informative in determining the objective scores. The results are indicative only, as the sensitivity analysis considers only individual sensitivities – evidence in combination may have a larger impact than the 'sum' of the individual impacts (Jensen and Nielsen 2007).

'Evidence' in BBNs is often uncertain in itself, and the cost of increasing the precision may be high. Sensitivity analysis can also be viewed as a means of determining which variables (indicators) require the most attention to get accurate data (or at least more precise assessments) as these will be the ones that the outcomes are most sensitive to (Jensen and Nielsen 2007).

Sensitivity analysis can also be used as part of the model evaluation. The sensitivity measures can be compared with a priori expectations about importance of particular nodes (indicators) to ensure that the model is behaving as expected (Chen and Pollino 2012). If the plotted sensitivity function does not behave as expected, this may indicate errors in the network structure or the conditional probability tables (CPTs) (Pollino et al. 2007).

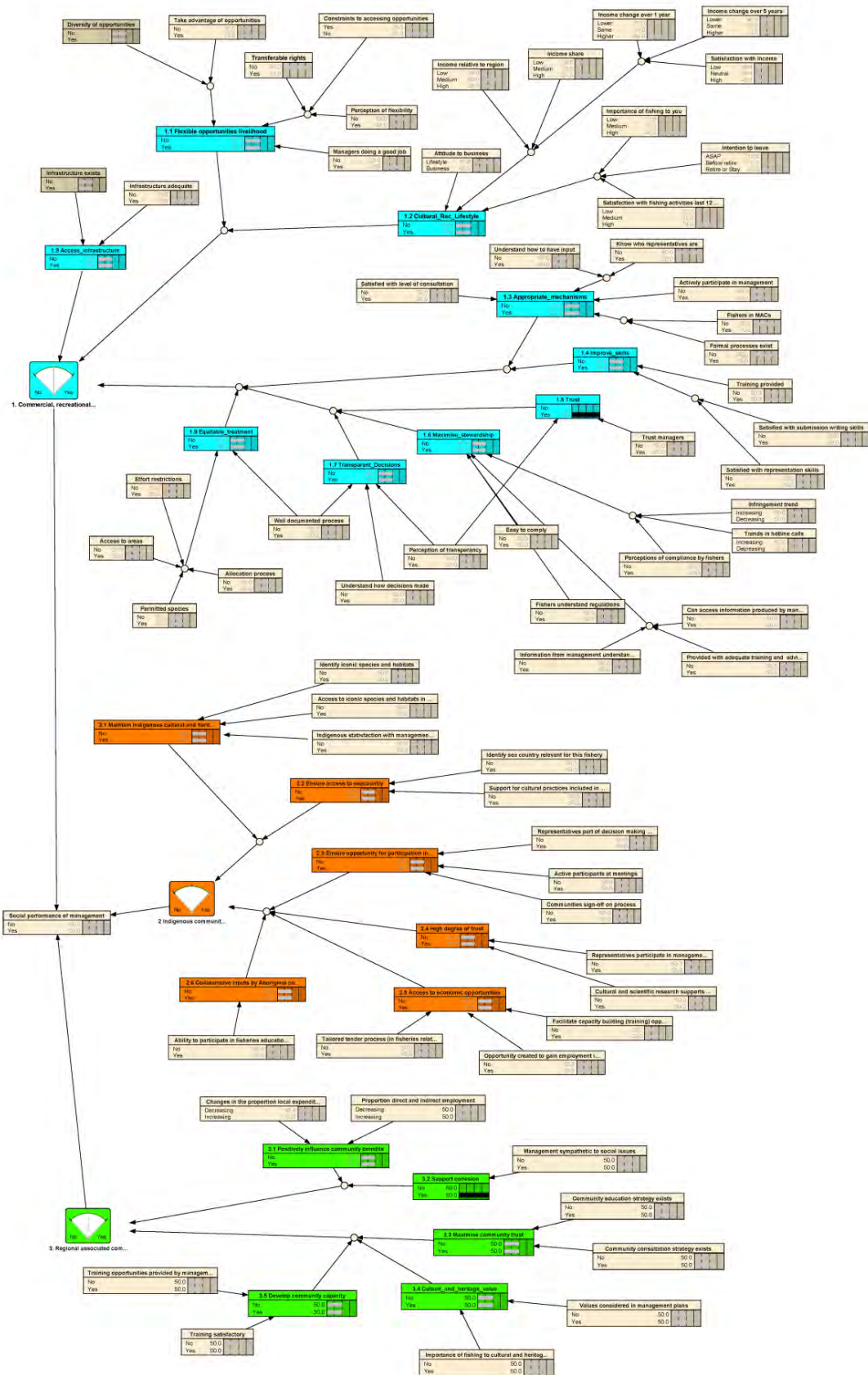


Figure 4 Structure of the Bayesian Belief Network, developed in NETICA for this project. Blue = Industry community. Orange = Indigenous community. Green = Regional community.

Two forms of sensitivity analysis are available in NETICA, both relating to sensitivity to findings: mutual information (entropy reduction); and the expected reduction of real variance. Other approaches have also been proposed (Bednarski et al. 2004), but these are not automated within NETICA.

Entropy relates to the uncertainty of a variable (Q) characterised by a probability distribution, $P(q)$ (Korb and Nicholson 2003; Pollino et al. 2007). Entropy reduction reports the expected degree to which the joint probability of Q and F diverges from what it would be if Q were independent of F . That is, it is a measure of the mutual information shared between the two nodes. If $I(Q,F)$ is equal to zero, Q and F are mutually independent (Pollino et al. 2007)

In NETICA, the mutual information (I) between Q and F is measured in 'bits'. The expected reduction in entropy of Q (measured in bits) due to a finding at F ⁶.

$$I = \sum_q \sum_f \log_2 \left[\frac{P(q)}{P(q)P(f)} \right] \quad (1)$$

where q is a state of the query variable (i.e. the objective) and f is a state of the varying variable (the indicator). The measure is logged with a base of 2, which is traditional for entropy and mutual information so that the units of the results will be "bits".

Variance Reduction refers to the expected reduction in variance of the expected real value of Q due to a finding at F .

$$Vr = \sum_q P(q) \left[X_q - \sum_q P(q)X_q \right]^2 - \sum_q P(q|f) \left[X_q - \sum_q P(q|f)X_q \right]^2 \quad (2)$$

where X_q is the numeric "real" value corresponding to state q (i.e. the objective). In this case, "real" refers to the expected value of continuous nodes, or discrete nodes which have a real numeric value associated with each state. In our model, all nodes are continuous, with a value ranging from 0 (zero) to 1.

From the sensitivity analysis results, it is possible to classify the indicators as to the degree of their influence.

The second process involved undertaking a workshop with 14 fisheries managers from South Australia (held on 14 May 2012) to review the consistency and quality of responses to survey questions for both the Marine Scalefish and Recreational fisheries of South Australia. During this workshop, fisheries managers were presented with analysed results for each indicator, and asked to formally evaluate the utility of the indicator in providing useful information regarding each social objective.

The results of these evaluations were then used to refine the design of indicators and select which were most relevant to include in the final Guide. The fisheries managers also provided comments on the relevancy of different objectives, and this information was further used to review and revise which the objectives to recommend for final inclusion. The result of these two processes was a recommended set of only the best performing indicators and another means to review the objectives themselves.

⁶ http://www.norsys.com/WebHelp/NETICA/X_Sensitivity_Equations.htm

4.4 PHASE 3: UPDATE NATIONAL OBJECTIVE AND INDICATORS:

Based on the Phase 2 results, the social objectives and indicators were revised and refined in Phase 3 to produce a recommended framework of objectives and associated indicators that were designed to assess performance against these objectives in different contexts, but with consistency of approach to enable national reporting. This framework was produced in the form of the Guide. Recommendations were also made on how to best move forward.

Phase 3 was divided into three main steps:

- 1. Steering Committee workshop #2:** The results from Phase 2 were presented at a Steering Committee workshop in Melbourne on 31 October 2012. Workshop participants took part in a series of discussions that were used to revise and refine the objectives and indicators. The outcome was a final set of social objectives and associated indicators that: (i) addressed issues identified as being of high priority in many jurisdictions and contexts; (ii) could be measured using robust and low-cost techniques; and (iii) could inform fisheries management decision-making processes. In addition, a draft format for the Guide was presented and feedback sought from participants.
- 2. Development of 'Managing the Social Dimensions of Fishing' Guide:** A Guide was produced for fisheries managers, aimed at providing a manual for identifying and monitoring social objectives and indicators in Australian fisheries management. The Guide includes explanations and examples of each objective and associated indicators, and suggested performance measures. This guide was distributed for comment by the Steering Committee in January 2013. Comments were received from fisheries management agencies from South Australia, Northern Territory, Victoria and Tasmania, as well as the Australian Fisheries Management Authority and incorporated into the final version of the Guide, where appropriate. Based on feedback from these agencies, the final Guide was separated into two parts (Part 1: Introduction to Social Objectives and Indicators in Fisheries Management; and Part 2: Implementing Social Objectives and Indicators in Fisheries Management).
- 3. Testing of the Guide:** A workshop with the Lakes and Coorong Consultative Committee on 26 June 2013 trialed the processes recommended in Part 1 of the Guide, intended to help fisheries managers and other key stakeholders select appropriate social objectives and indicators, by applying them to the South Australian Lakes and Coorong Fishery. This fishery had not formed part of any of the previous case studies undertaken for the project, and thus provided a useful test of the resulting product.

5. RESULTS/DISCUSSION

5.1 PHASE 1: IDENTIFY PROVISIONAL SOCIAL OBJECTIVES AND INDICATORS:

5.1.1 Identification of provision social objectives and indicators

The results of Phase 1 of the project were a set of provisional social objectives and indicators that could be tested in Phase 2. The process of developing this set of provisional social objectives and indicators generated useful insights. This process, and the insights gained and decisions made during this phase, are documented here to provide context to the ultimate set of objectives and indicators that were then tested. Detailed documentation of Phase 1 and its results is provided in the Phase 1 Milestone Report (Appendix 4).

In developing the set of provisional social objectives and indicators, the first decision that needed to be made was what scope was relevant for this project. In initial project discussions, the following two critical decisions were taken, which informed subsequent development throughout the project. First, it was decided that the project should identify objectives and indicators of most relevance to fisheries managers. Because of this, the first phase included an explicit review of relevant legislation to which fisheries managers are subject, including legislation in each state and territory of Australia, the Commonwealth, and other relevant national legislation (in particular, the *Environment Protection and Biodiversity Act 1999* and the *Great Barrier Reef Marine Park Act 1975*). The legislation reviewed for each jurisdiction was the overarching legislation, governing all fisheries management activity, rather than individual regulations, management systems or policies for each fishery. This was on the basis that the latter fall out of a jurisdiction's overarching *Fisheries Act*. Compared to the overarching legislation, the regulations, management systems or policies for each state and territory's fishery will often have greater detail regarding social obligations or objectives. However, for this project, we were specifically interested in identifying the legislated requirements.

The legislative review found that legislation in each state and territory included some statements regarding the obligations of fisheries managers to manage for social objectives. These social objectives varied substantially, sometimes focusing on social objectives relating to fishers, sometimes to communities directly involved or affected by fisheries activities and sometimes to the Australian community as a whole. They were generally phrased very broadly, using terms such as 'maximise benefit for the community' without giving specific guidance on how a fisheries manager could evaluate whether maximum benefit had, in fact, been achieved.

The second decision was to situate and organise objectives and indicators using the ESD tree framework initially identified by Fletcher et al (2002), and later adopted by both the Australian Department of Agriculture Forestry and Fisheries and the FAO. The ESD framework specifies that fishing activities can have impacts on the wellbeing of three types of 'communities': the 'industry community' (including commercial, recreational and charter fishers); 'local/regional community' (including the general public irrespective of whether they are directly or indirectly involved in fishing); and 'Indigenous community' (including all Indigenous people, not just those involved in fishing). The ESD tree conceptualises each of these communities as experiencing particular wellbeing effects as a result of fishing. This framework was used as a pre-existing set of social objectives that have been accepted as relevant and important in much of Australia's fisheries, and in many cases legislated via references in relevant legislative instruments to the concept of meeting ESD.

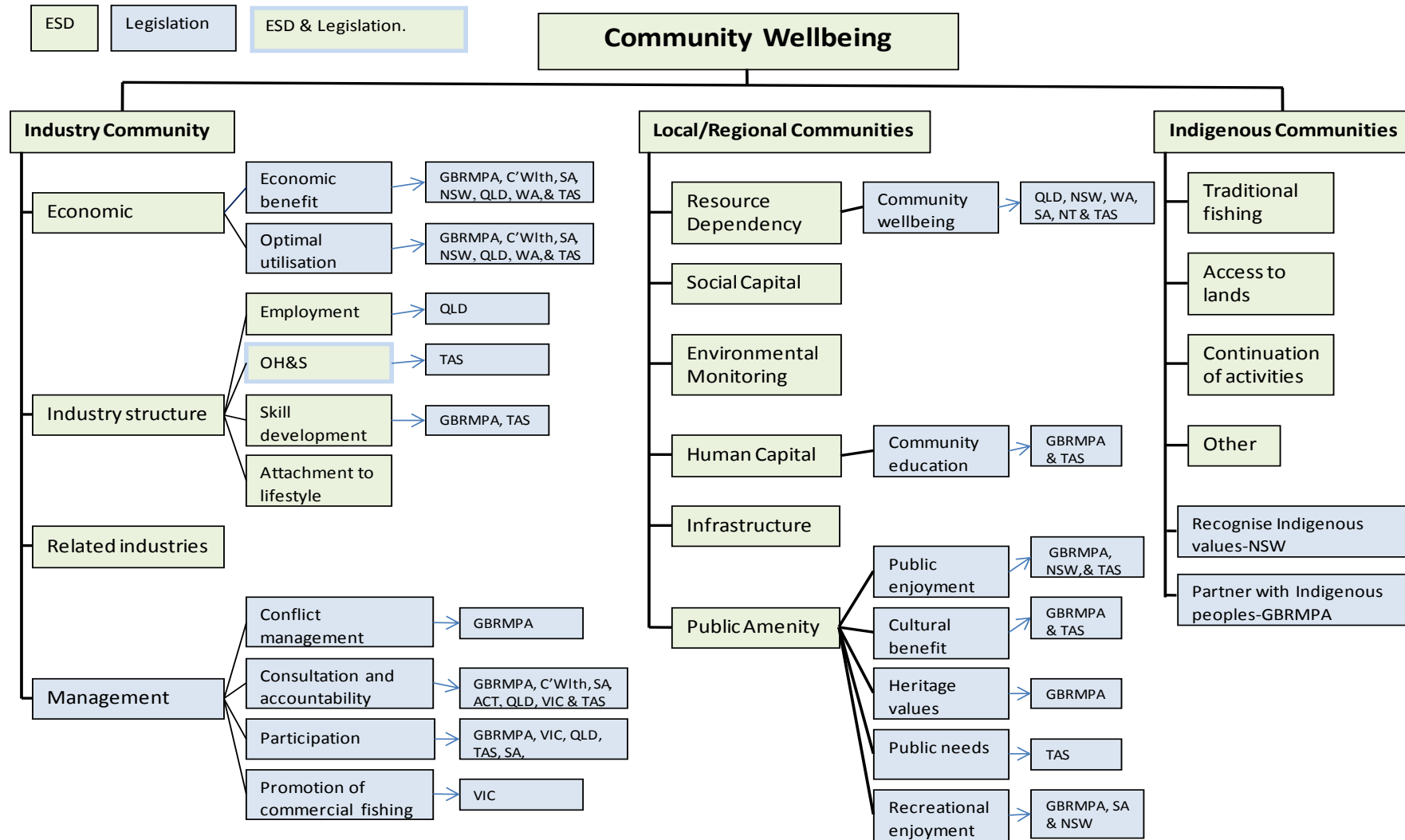
Figure 5 shows how the legislative requirements identified in the first part of Phase 1 fell into the different ESD communities, and the specific wellbeing components within each of these communities. In Phase 1, the original ESD tree was used, which placed Indigenous communities 'third' in the three branches of the tree. Consultations with Indigenous reference groups and individuals during Phase 2 identified strong objection to the placement of Indigenous concerns as third in the ESD table of stakeholder groups and objectives. Consequently from Phase 2 onwards, Indigenous communities were identified as the second group in the ESD framework. Figure 5 represents Indigenous communities third only to ensure it reflects the development of the framework at the end of Phase 1.

Having reviewed the legislation, and decided to base the structure of social objectives on the ESD tree, the next step was identified an initial set of social objectives and indicators that could be tested in Phase 2. The review of legislation identified that, while legislation typically required some consideration of social issues as part of fisheries management, it provided little to no specific guidance on how to meet generalised social objectives such as '*maximising benefit*' of fisheries resources for the general public. More specific social objectives, therefore, had to be developed for the project, based on a review of existing literature on social dimensions of fishing, focusing in particular on previous assessments and attempts to monitor and evaluate social outcomes of fishing. The relevance of these for Australian fisheries management was then identified using the Phase 1 Steering Committee workshop (see section 5.1.2).

The literature reviewed included that examining social indicators for the fisheries sector, using both fisheries specific literature such as Schirmer and Casey (2005), Vieira et al. (2009), Schirmer and Pickworth (2005a; b), Hundloe et.al (2010) and Brooks et al. (2010), as well as the literature on the concept and measurement of social wellbeing, quality of life, and adaptive capacity in natural resource management. The general literature accessed for the latter included, but was not restricted to, a range of Australian and international literature (Accadia and Spagnolo 2006; Ada and Blore 2000; Adger et al. 2004; Allen Consulting Group 2002; Allison and Ellis 2001; Astles 2008; Cannon et al. 2000; Chesson et al. 1999; Cheung and Sumaila 2008; Douthwaite et al. 2004; FAO 1995; FAO 2009a; FAO 2009b; FAO Fisheries Department 2003; Fenton 2004; Fletcher et al. 2002; Fletcher et al. 2004; Garcia et al. 2003; Garcia and Cochrane 2005; Gasalla et al. 2010; Gómez-Limón and Riesgo 2009; Grieve et al. 2010; Hilborn 2007; Pascoe et al. 2009a; Pascoe et al. 2009b; Schirmer and Casey 2005; Symes and Hoefnagel 2010; Symes and Phillipson 2009; Taylor 2008). When identifying indicators, emphasis was given to identifying those that could be monitored at relatively low cost, and which were at least on par with, if not building upon, existing international standards and indicators. All potential qualitative and quantitative indicators were included in the review, with none initially excluded. The full review can be found in the Phase 1 Milestone Report (Appendix 4).

The social objectives and indicators identified in the literature review were then organised to identify how they aligned with legislative requirements and the ESD framework. Most objectives identified in the literature could be organised using the ESD framework, but there were a small number that did not fit neatly into the ESD framework, or covered areas not required in legislation. To ensure that issues that may be of relevance to fisheries managers were not excluded at too early a stage of the project, all objectives and any associated indicators were included in the review.

Figure 5 Mapping of objectives determined in the workshop with those under the ESD framework.



5.1.2 Steering Committee Workshop #1

As described in section 4.2, the provisional social objectives and indicators were revised based on a workshop held with the Steering Committee. This workshop focused in particular on identifying which objectives were of relevance to fisheries managers; the representation of all states and territories ensured that relevance across jurisdictions could be identified. In Phase 1, it was considered critical to source input on this topic from fisheries managers and policy decision makers. Workshop attendees were specifically asked to discuss the relevance of the objectives identified as a result of the literature review, to identify if any of these were irrelevant and to identify any further objectives relevant to Australian fisheries management not covered by the review of legislation, ESD and relevant literature.

The workshop discussion highlighted a range of often varying views about the importance of different social objectives. In particular, it identified that some social objectives not currently embedded in legislation were considered important and relevant by many fisheries managers. It also suggested a need to test a wide range of objectives and indicators, to ensure relevance across the wide range of fisheries contexts occurring in Australia (see Appendix 4). As a consequence, the decision was made to 'road test' a reasonably large number of objectives in Phase 2.

5.1.3 Objectives identified in Phase 1 for subsequent testing in Phase 2

The key outcome of Phase 1 was a set of 24 social objectives, each of which were demonstrably relevant to Australian fisheries managers (although not necessarily in all jurisdictions or fisheries). A number of indicators were identified against each of these objectives, which either measured different aspects of the objective, or which used differing approaches to measure the same aspect of the objective.

Ten of the 24 objectives fell into the ESD category of 'industry community' (referred to as 'industry' from this point). Some of these applied only to particular types of fishing (e.g. commercial fishing or recreational fishing), while others applied across commercial, recreational and charter fishing activities. The objectives varied widely in terms of topics, from: maintenance of livelihoods, skills and participation; consultation and inclusion in, and transparency of, decision-making; minimisation of non compliance and creation of awareness of social responsibility; management flexibility; and equity of resource access.

A further 10 social objectives fell into 'local/regional communities', again covering topics as varied as: the benefits of fishing activities to the greater community; ensuring flexibility in management; ensuring trustworthy management and environmental performance; making data appropriately publicly available; supporting industry and local/regional community social capital; enhancing community capacity to develop resource stewardship; ensuring access to infrastructure necessary to fishing activities, and public benefit from fishing related infrastructure; and maintenance of cultural and heritage values.

The remaining four objectives related to Indigenous communities, and comprised: surety of access for traditional activities; appropriate consultation; positive contribution to traditional livelihoods; and access to income earning opportunities related to fisheries and marine water resources.

Table 2 summarises the 24 objectives as they were defined at the conclusion of Phase 1.

Table 2 Provisional social objectives identified at conclusion of Phase 1 of this project and modified in subsequent phases of the project.

ESD community	Social objective
Industry	<ol style="list-style-type: none"> 1. Maintain or enhance livelihoods of fishing families. 2. Improve the management skills of industry participants in co-management arrangements. 3. Maximise cultural, recreational and lifestyle benefits (including health benefits) of fishing for those who participate in fishing activities. 4. Undertake consultation with industry and ensure accountability for management decisions. 5. Ensure industry participation in management decision-making 6. Positive promotion of commercial fishing to ensure a positive perception by the community at large. 7. Minimise the risk of non-compliance and increase public awareness about social responsibility. 8. Ensure transparency of decision-making. 9. Ensuring that the management framework allows operators to make best decisions 10. Ensure equitable treatment and access.
Local/ regional	<ol style="list-style-type: none"> 1. Positively influence fisheries related benefits for regional communities. 2. Ensure flexible fishery management arrangements to facilitate and support the capacity of regional communities to adapt to change. 3. To maximise community trust in fisheries agencies to manage fisheries. 4. To facilitate and support the cohesion and connectedness of [fishers with their] regional communities through fisheries management. 5. That local and regional community have an awareness of and confidence in, fisheries agency monitoring and reporting of environmental performance under fisheries management obligations. 6. To make fisheries collected data available in a timely and publicly accessible manner. 7. To facilitate capacity building (through skills and knowledge development) for industry and community members to enhance [stewardship of fishing activity]. 8. Ensure adequate access to infrastructure needed for successful operation of fishing activities. 9. Ensure public benefit from use of fishing related infrastructure where this does not interfere with meeting other objectives of environmental sustainability or health and safety. 10. Ensure maintenance of cultural and heritage values related to fishing activities.

ESD community	Social objective
Indigenous	<ol style="list-style-type: none"> 1. Ensure provision of access to land, sea and water resources to enable continuation of traditional activities and subsistence use, and respect rights of Indigenous peoples to these resources. 2. Ensure Indigenous people are appropriately consulted regarding fisheries management. NOTE: Objective may need rewording to be specific to type of consultation/participatory management approach in different situations. 3. Ensure fisheries management contributes positively to Indigenous community livelihoods, culture and activities. 4. Ensure Indigenous communities are able to access income-earning opportunities related to fisheries, marine and water resources.

A number of ESD objectives were not included in the objectives identified as being of relevance by Phase 1 workshop participants. Some objectives were considered not relevant in a social objective context (e.g. number of jobs generated was argued to be more an economic indicator by some participants), while many of the ‘industry’ objectives identified in the ESD framework were considered either beyond the ability of managers to control (e.g. employment, especially in related industries) or subject to regulation by other jurisdictions (e.g. OH&S objectives).

While economic objectives were considered to be more appropriately considered separately (under an ‘economics’ component of a triple-bottom-line framework), the exclusion of employment as an objective was unexpected. Maintaining or increasing employment was the most common social objective in many previous multi-objective analyses of fisheries and other natural resource management systems (see the review in Appendix 4), and was the only social objective considered in a previous triple-bottom-line analysis of all Australian industries.

The two previous studies of fisheries management objectives in Australia at the state and Commonwealth levels (e.g. Schirmer and Pickworth 2005a) both identified employment as a key social objective. The objectives in these previous studies were developed through discussions with fisheries managers and other key stakeholders in their relevant jurisdictions.

The main arguments raised by Phase 1 workshop participants for excluding employment as a social objective included that: (i) maintaining employment was not their responsibility; (ii) they could not influence regional employment, as they had no direct influence over how many people fishers employed, where processors were located, or how many people they employed; and (iii) in some cases, an objection to the concept that ‘more employment’ is necessarily better. Some also considered that employment was more relevant as an economic consideration rather than a social consideration.

While not considered an objective in its own right, employment levels was considered to be an indicator for assessing fisheries related benefits for regional communities, and thus did form a key measure that informed other objectives.

5.1.4 Indicators identified in Phase 1 for subsequent testing in Phase 2

Initial concepts for indicators were developed for each objective based on the literature review, and on the Phase 1 workshop (see Table 3 for an example showing how feedback on indicators was sought in the Phase 1 workshop). These were then developed into more concrete, measurable indicators at the beginning of Phase 2, through the construction of measurement instruments such as surveys, and via consultation with stakeholders in the South Australian case studies.

The full list of indicators considered at various stages is not provided here, as it varied at different stages as it was refined during Phases 1 and 2.

In most cases, more than one indicator was suggested for an objective. This approach was adopted to ensure that in Phase 2 of the project all possible avenues were explored to achieve the best possible results, and to maximize potential options for fisheries management agencies to select from. It was also done because, in many cases, multiple dimensions of a single objective may need to be measured, given the breadth of topic included in any single objective. For example, consider the objective *'Maximise cultural, recreational and lifestyle benefits (including health benefits) of fishing for those who participate in fishing activities.'* This clearly may have multiple distinct indicators, particularly if it is considered important to measure different types of benefits as separate indicators, thus enabling identification of whether the objective is being fulfilled with regard to some benefits and not others.

Table 3 An example of securing fisheries manager feedback on data sourcing for each social indicator.

Objective	Proposed indicators	Does measuring this indicator require information from/about?			
		Commercial fishers	Recreational fishers	Indigenous fishers	Broader community
Maintain or enhance livelihoods of fishing families	(a) Household income in fishing families relative to average household income in area; (b) Extent to which fishers are satisfied with level of income achieved from fishing-related activities (measured via survey of fishers); (c) Quality of life index (survey?); (d) Attachment to occupation (from survey)	Yes	No	Yes	Yes-but it is likely that census data is sufficient
Ensure flexible fishery management arrangements to facilitate and support the capacity of regional communities to adapt to change	Level of flexibility in fisheries management plans.	Yes	Yes	Yes	Yes
To maximise community trust in fisheries agencies to manage fisheries	Level of regional community and industry consultation in the development of management plans	Yes	Yes	Yes	Yes
To facilitate and support the cohesion and connectedness of fishers with their regional communities through fisheries management	Evidence of recognition in management plans of community sensitivities, holidays, festivals etc. In regard to open and closing times of fishing access.	Yes	Yes	Yes	Yes
Ensure public benefit from use of fishing related infrastructure where this does not interfere with meeting other objectives of environmental sustainability or health and safety	Requires monitoring the public amenity achieved from use of fisheries related infrastructure. This can occur via direct survey of community, with the survey needing to identify two aspects: (a) public amenity values held by the public, which will change over time, and (b) extent to which infrastructure is meeting/fulfilling these values	No	Yes, where amenity values relate specifically to rec fishers	No	Yes
Ensure maintenance of cultural and heritage values related to fishing activities	Can only be measured via direct survey of people who take part in or benefit from fishing activities. Surveys need to measure (a)the importance of different cultural and heritage values, and how importance changes over time, and (b) the extent to which fishing activities provide these values	Yes	Yes	Yes	Yes

5.2 PHASE 2: OBJECTIVE AND INDICATOR TESTING WITH CASE STUDIES:

Phase 2 had three interrelated components, each aiming to further develop and refine the social objectives and indicators to be recommended for this project. These were to:

1. Identify the relative priority of different objectives, and how this varied depending on the fishery context. This enabled recommendations to be made regarding which social objectives should be considered part of 'nationally relevant' objectives, versus those which may only apply in a limited number of jurisdictions or fisheries.
2. Identify which indicators collect independent, reliable data to inform assessment of performance against objectives in a cost effective manner. This was achieved through testing social objectives and indicators in multiple case studies, and critically evaluating their effectiveness in terms of: (i) being able to collect data for each indicator in a cost-effective manner; and (ii) validity of the indicator.
3. Evaluate the outcomes of testing, to: (i) decide on which indicators were most relevant to informing objectives; (ii) further refine objectives; and (iii) specifically translate all objectives and indicators deemed important into a more systematic reporting approach that can be readily used by fisheries managers.

In this section of the results, these three processes are described, as well as key findings *other* than the ultimate objectives and indicators detailed. The final set of objectives and indicators developed via Phase 2 are reported in Part 2 of the Guide (Appendix 18), and represent the largest part of the results of Phase 2.

5.2.1 Prioritising objectives: Analytic Hierarchy Process

To identify if particular objectives were considered high priority by fisheries managers across different jurisdictions, an AHP was used (see Pascoe 2009a). In the AHP, fisheries managers and other relevant stakeholders were presented with a series of sets of pair-wise comparisons of different objectives, or groups relating to these objectives. They were then asked to provide their opinion as to which was more important and by how much. This was done utilising a Microsoft Excel program which allowed the respondent to adjust a 'slider' in the direction they thought was most appropriate to reflect the relative importance of the pair of objectives they were being asked to compare. They had the option of identifying that one was much more important than the other, or of identifying that both were equally important. When they had completed all the comparisons, they were then asked to 'check the consistency' of their responses. This involved running an algorithm which assessed whether an objective had been consistently rated as more or less important relative to others across all the pair-wise comparisons undertaken. The results were provided as graphical feedback to users. Where the inconsistency score was greater than 10%, participants were asked to reconsider the choices they had made, as this suggested that an objective was being inconsistently rated in terms of its importance.

The AHP results showed reasonable variability in the relative importance of different objectives, both within each of the three ESD communities (industry, Indigenous and local/regional), and across the three communities (Figures 6 & 7). All objectives were considered of high priority by at least some fishery managers, with none consistently rated as being of low priority. This finding contributed to the subsequent decision to retain all social objectives in the final Guide, after relevant refinements were made to ensure objectives, better and more specifically, focused on issues within the control of fisheries management. The AHP results were also used as critical input to the BBN analysis conducted subsequently in Phase 2.

Figure 6 Variability in importance of individual objectives as ranked by fisheries managers from different parts of Australia in 2012 using an Analytic Hierarchy Process.

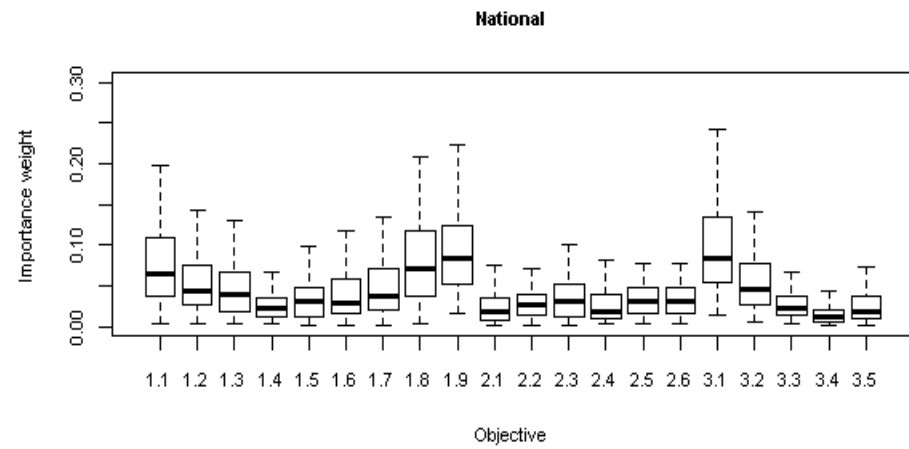
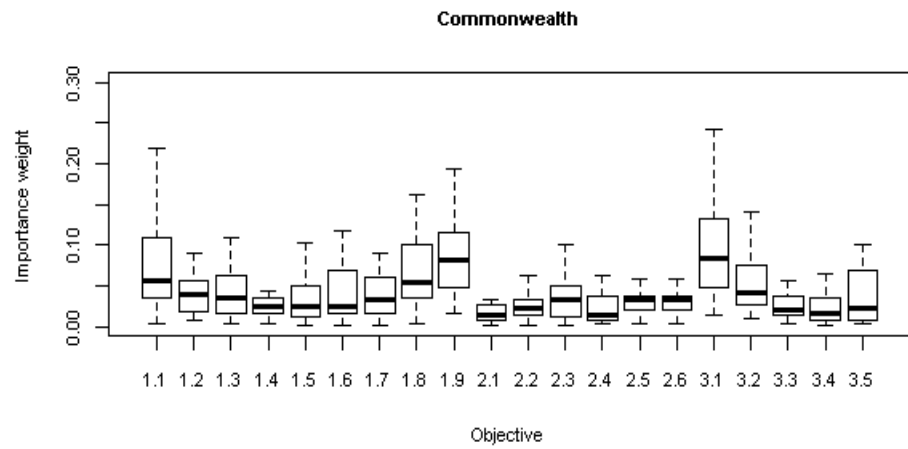
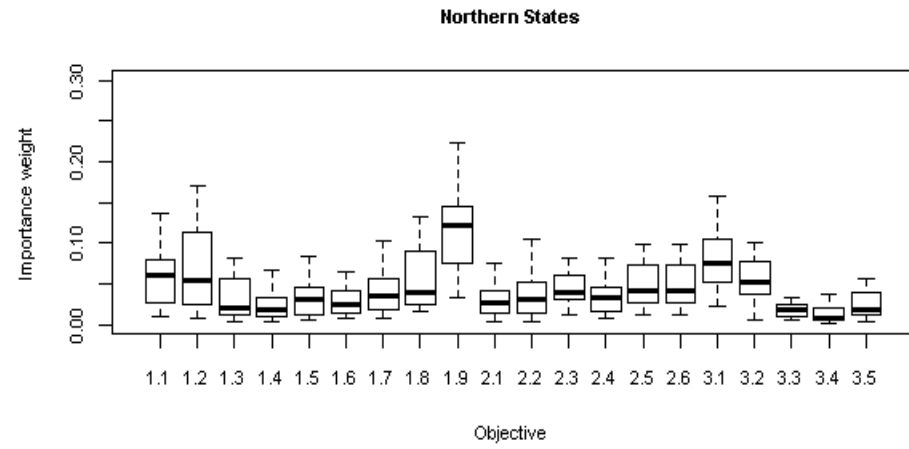
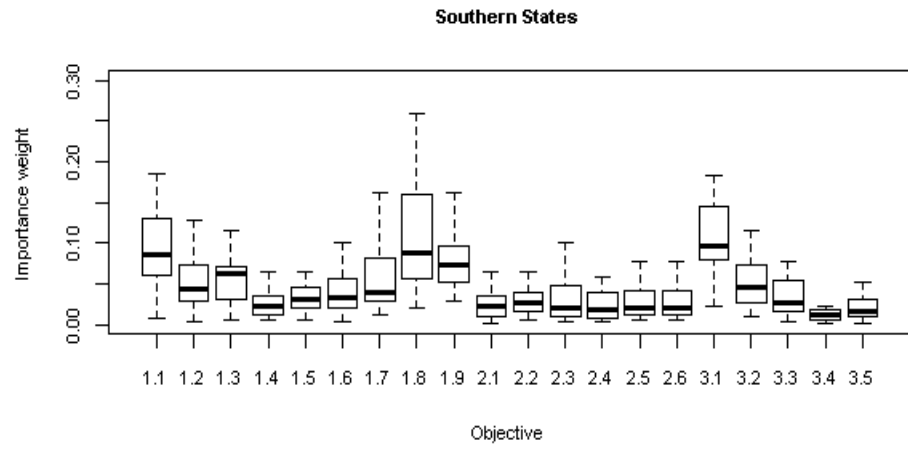
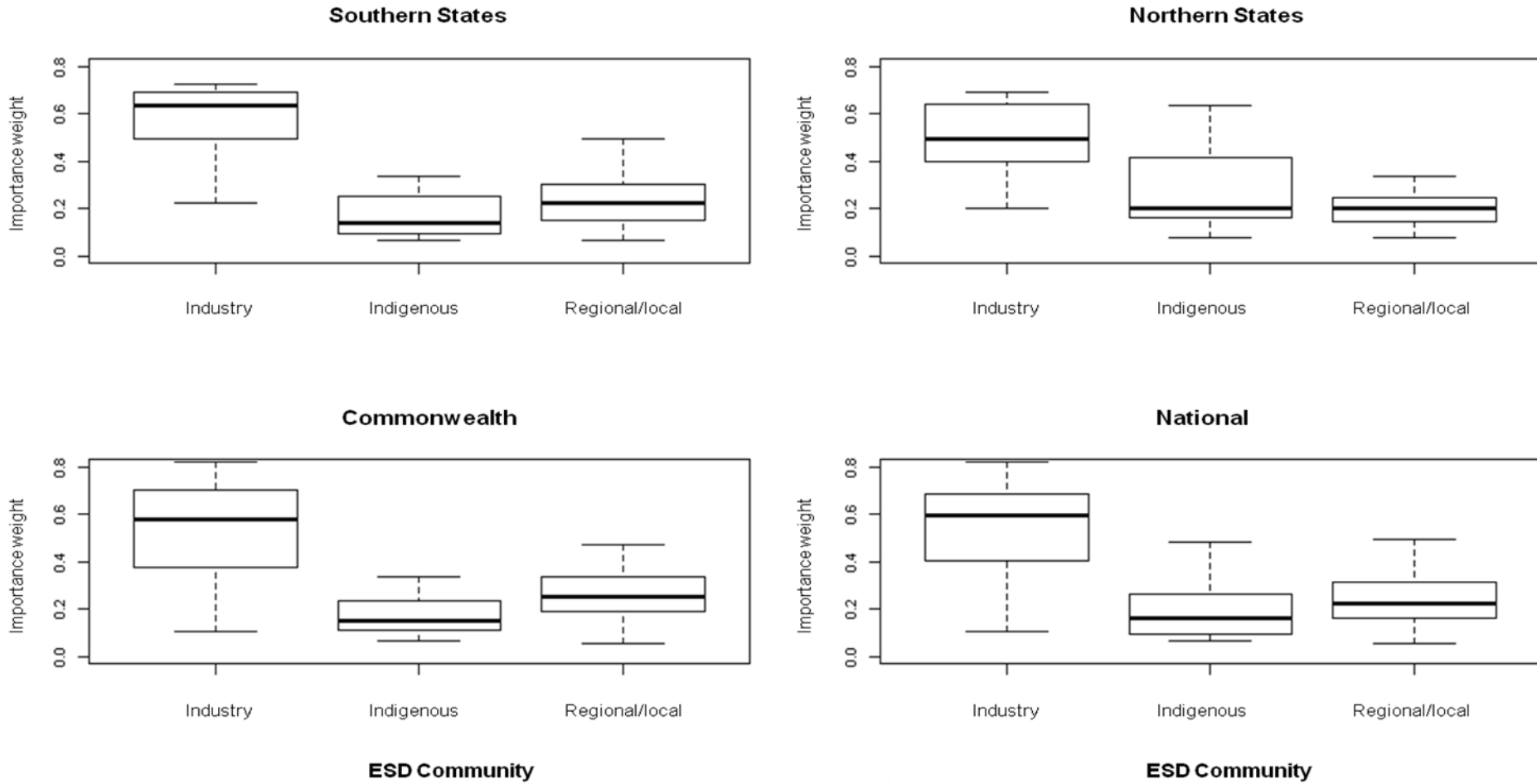


Figure 7 Variability in importance of community level as ranked by fisheries managers from different parts of Australia in 2012 using an Analytic Hierarchy Process.



5.2.2 Collecting and evaluating data in case studies

The process of data collection itself formed part of the results of the study. Specifically, the following were evaluated in Phase 2 based on the process of data collection: (i) whether data could be successfully collected to inform each indicator; (ii) the cost effectiveness and ease of different methods of data collection; and (iii) whether the data collected were sufficiently independent and robust to provide meaningful measures.

Could data be successfully collected for each indicator? Data could theoretically be collected to inform all the identified indicators in ways that ensured independence and reliability of the data. Methods were also identified that would enable each indicator to be measured in highly robust ways. The key barrier to measuring many indicators was found not to be a lack of methods, but the cost and complexity of the data collection.

Could data be cost-effectively and easily collected for each indicator? It was not possible to collect fully reliable and independent data for all indicators in a cost-effective manner. The cost and complexity issues varied for each of the ESD communities.

(a) INDUSTRY: Existing data sources do not provide measures that meaningfully assess the majority of the objectives identified in Phase 1, and hence many indicators proposed for objectives in the 'Industry' ESD community can only be measured via a direct survey of fishers. The ABS measures some limited data on commercial fishing employment, but this cannot be broken down by individual fishery. While expert ABS-developed tools exist that enable data on fishers to be analysed based on characteristics such as their income, age, and gender, these measures were not particularly helpful for measuring the proposed indicators, which did not require these types of information. Instead, performance against many social objectives can only be assessed by understanding the subjective experiences of fishers (e.g. their perceptions regarding the trustworthiness of fisheries management, or whether fishers are achieving the benefits they desire from fishing).

As surveys can be expensive, Phase 2 efforts to collect data for Industry community indicators focused on testing different approaches to surveying fishers to identify which are the lowest cost and most effective. There were two key findings from this process. The first finding was that adding questions to existing surveys of commercial fishers is lower cost, and often more effective in achieving a successful response rate, than generating an entirely new survey. This is evident from the response rates documented in the methods section of this report. In South Australia, 'social' questions were added to existing well accepted economic surveys sent to commercial fishers, and achieved a higher response rate at lower cost than was achieved in Queensland, where an entirely new survey was developed and sent to fishers (who did not have an existing survey on which social questions could be 'piggybacked').

Online surveys were also trialled in Queensland, but they were not successful with commercial fishers, who appear to have lower than average familiarity with and use of the internet. This means more expensive survey methods are needed to successfully collect data from commercial fishers that measure social indicators, with a combination of face-to-face, phone or mail successful in South Australia.

Although face-to-face and phone surveys are the most expensive survey methods, they enable the most robust data to be collected, as they overcome the difficulty presented by low literacy rates amongst some commercial fishers. Mail surveys can achieve a reasonable

response and are cheaper than phone or face-to-face surveys, but will be biased towards those with higher literacy. Online surveys are the cheapest, but cannot currently achieve adequate response to provide reliable and useable data in many commercial fisheries. This will likely change in coming years as internet use expands, and thus should be re-evaluated over time.

A very different finding emerged in the recreational fishing sector. Multiple survey methods were trialled to survey recreational fishers in South Australia, focusing on face-to-face, mail and online surveying methods. The success and cost of each method was then compared. The use of online surveys - promoted through popular fishing websites, email and through flyers at tackle shops and popular fishing spots – was found to achieve a large number of survey responses at a low cost (three-quarters of survey responses were received online). For a given number of survey responses, online methods incurred one tenth the cost of mail or phone survey alternatives. The sample achieved online was as representative as the samples achieved using the more traditional, and much more costly, mail and phone survey methods. By ‘representative’, we mean that, while all survey responses have some degree of bias, the online responses had no greater bias than other methods. Thus, the second key finding from this process is that it is currently feasible, and recommended, to use online survey methods in order to survey recreational fishers about social dimensions of fishing.

Where possible, methods other than direct survey of commercial fishers were identified and tested to collect data for indicators. In the case of industry indicators, these alternative methods principally involved utilising data collected as part of fisheries licensing information for commercial fishers, or otherwise asking fisheries managers their views regarding particular outcomes. There is an obvious risk in asking fisheries managers to answer questions intended to assess their own performance as a fisheries manager. To reduce the risk of bias, indicators that were to be based on data provided by fisheries managers or fisheries management agencies were designed to be based on data that: (i) was already collected by fisheries managers for other purposes; (ii) could be independently verified at any time; and/or (iii) was publicly available. This increased the reliability of these indicators.

To simplify the process of gathering data for indicators that were based on data provided by fisheries managers, a survey was developed that asked fisheries managers all the questions requiring their input. This should not be mistaken for an opinion survey, as the questions asked in the fisheries managers’ survey typically requires them to provide answers based on documentary evidence such as licensing records and management plans. Although indicators that can be measured by fisheries managers using existing data cost less than indicators requiring direct survey of fishers, not all indicators can be meaningfully measured using a ‘fisheries manager’ derived method. As such, some survey-based work is necessary to measure several of the social objectives.

(b) INDIGENOUS: For Indigenous communities, data collection for all indicators is likely to be relatively high cost, as it is essential to have community input and consultation as part of data collection. As described in the methods, indicators were not fully developed or tested for this community as project funds were not sufficient to enable this. Further work is needed to further develop the indicators that were developed as part of this project, as well as ways of ensuring that indicators can be appropriately adjusted to be meaningful across multiple distinct communities.

(c) LOCAL/REGIONAL: Similar to indicators for industry-related objectives, many of the indicators initially proposed for local/regional community objectives required direct data collection from the communities themselves. This is a costly exercise, with surveys of the general public usually incurring significantly higher costs than surveys of fishers. It was considered inappropriate to require objectives be only assessed through surveys of the general public, as this would most likely prevent fisheries managers being able to realistically assess their performance on local/regional community objectives. Instead, alternative indicators were developed that could be measured based on data from existing records of the fisheries manager. In most cases, this required a shift from an 'outcome' indicator requiring survey of the general public, to 'process' indicators, which show whether processes are in place that are intended to build the desired outcome.

To give an example, consider the objective of *'Making fisheries collected data available in a timely and publicly accessible manner'*. Using a community survey, it is possible to measure whether members of the public feel able to access information in a timely fashion – an outcome indicator. When gathering data from fisheries managers, the indicator must be designed to measure the process by which information is made available (e.g. by documenting the typical length of time required to release data on particular issues, and whether reports are made available in ways that are likely to facilitate access by the public).

While process indicators are not always ideal, and not as robust as outcome indicators, this approach ensured cost-effective and measurable indicators were developed for all local/regional community objectives. It was possible to design these alternative indicators for all but the objective of *'Positively influencing fisheries related socio-economic benefits for regional communities'*. The process of indicator testing identified another cost issue; some indicators required expert analysis to produce robust data, and thus are more expensive than others. An example of this is producing estimates of the indirect benefits of fishing for a local /regional community (i.e. Indicator 3.1.2). Accurately measuring this indicator requires professional economic modelling in order to produce robust estimates. The Guide clearly identifies where indicators involve high cost or a need for expert analysis, to help guide users regarding the potential cost/effort involved in assessing performance using each indicator.

Were the data collected sufficiently independent and robust to provide meaningful measures? As part of Phase 2, the relevance of each indicator was assessed when data were collected. Relevance here refers to whether the indicator measured something meaningful about the objective it is meant to inform, and was sufficiently independent and robust. This was assessed through review by the project team, and review of indicators in workshops with fisheries managers from South Australia. The review resulted in removal of the indicator *'Change in the number of calls to fisheries hotlines'*, which was intended to measure aspects of the industry objective *'Minimise the risk of non-compliance and increase awareness about social responsibility'*. This was because analysis of results identified that it is unclear what an increase or decrease in calls to fisheries hotlines actually means – an increase in calls could, for example, indicate increased incidence of people breaching regulations, and hence a decline in compliance. However, it could equally indicate an increase in reporting of existing breaches, with the increase in the rate of reporting driven by an increase in sense of stewardship. This meant the indicator could not be meaningfully interpreted to inform the objective, and so was removed. Further supporting its removal was the very low ranking both the BBN analysis and fisheries managers gave this indicator in regard to its effectiveness.

5.2.3 Evaluating the effectiveness of different indicators in informing the objective

Two methods were used to further analyse how effective each indicator was in informing the objective it was intended to assess. The first method relied on the BBN process to analyse the extent to which each of the indicators informed the objective it was intended to assess. While these detailed results are important in and of themselves, the key result they provided for the broader project was an assessment of which indicators had 'low' or 'very low' significance in assessing overall performance against an objective. In all cases, the indicator informed the objective to some degree, although some were considered to be of low significance to overall assessment of how well fisheries management was performing against the objective under consideration.

For the second method, fisheries managers from South Australia were asked to rate the usefulness of each indicator in informing the objective it was intended to assess, as well as to review the objectives themselves at a separate workshop on 14 May 2012. This workshop was particularly relevant as it asked end-users to evaluate data that had been produced for the fisheries they managed, and thus represented a 'real world' assessment of the practical relevance of the indicators to the day-to-day management of fisheries in South Australia.

The results of the BBN sensitivity analysis depended strongly on network parameters and on the current states of all observable nodes (Bednarski *et al.* 2004). In our analysis, we assumed no prior information on the states of the nodes, with each state having an equal probability. The analysis hence assessed the effect on the objective node from moving from no information to full information (i.e. moving to either a 0 or 100 per cent likelihood of a state), given that no information (uninformed priors) exist in the other nodes not be adjusted. The analysis was also run at two different levels; the sensitivity of each of the objectives to each of the (parent) indicators, as well as the sensitivity to the 'higher' level objective to the individual indicators. The results of the sensitivity analysis for each community are presented in Tables 4-6. Detailed information on the indicator descriptions are provided in Appendix 16.

The absolute values of the mutual influence and variance reduction scores have little individual meaning, but are used to rank the indicators from most to least important in terms of impacts on the node of interest. The value of the sensitivity analysis scores declined exponentially, with most of the information affecting the overall (higher level) objectives contained in the first third of the indicators (Figure 8). For ease of interpretation, the scores are re-classified into very high (> average), high (>0.5 average), medium (>0.25 average), low (>0.1 average) and very low (<0.1 average).

From the tables, it was possible for an indicator to have a low score in terms of its impact on the broader (higher level) objective, but a high score relative to a particular objective. For example, from Table 4, CRC_1_4_2 had a low importance relative to the broader fishing industry focused objective, but high importance to the specific objective (1.4 Improve skills). This difference reflected the combination of the conditional probability tables linking the indicators to the objective, and the AHP weights that link the specific objectives to the broader objectives.

Table 4 Sensitivity analysis of the Industry community.

Indicator	Higher order objective		Individual objective		Higher order objective		Individual objective	
	Mutual Info	Variance of Beliefs	Mutual Info	Variance of Beliefs	Mutual Info	Variance of Beliefs	Mutual Info	Variance of Beliefs
CRC_1_1_1	0.00013	4.42E-05	0.00656	0.002256	Low	Low	Low	Low
CRC_1_1_2	0.00016	0.000054	0.00801	0.002756	Low	Low	Low	Low
CRC_1_1_3	0.00081	0.000282	0.04221	0.0144	High	High	High	High
CRC_1_1_4	0.00081	0.000282	0.04221	0.0144	High	High	High	High
CRC_1_1_5	0.0002	7.06E-05	0.01047	0.0036	Low	Low	Low	Low
CRC_1_1_6	0.00057	0.000196	0.02922	0.01	High	High	Medium	High
CRC_1_2_1	0	0	0	0	Very Low	Very Low	Very Low	Very Low
CRC_1_2_2	0.00013	4.49E-05	0.01075	0.003713	Low	Low	Low	Low
CRC_1_2_3	0.00006	0.00002	0.00477	0.00165	Very Low	Very Low	Very Low	Very Low
CRC_1_2_4	0.00001	2.8E-06	0.00067	0.000232	Very Low	Very Low	Very Low	Very Low
CRC_1_2_5	0.00002	7.8E-06	0.00186	0.000645	Very Low	Very Low	Very Low	Very Low
CRC_1_2_6	0.00013	4.49E-05	0.01075	0.003713	Low	Low	Low	Low
CRC_1_2_7	0.00009	3.12E-05	0.00746	0.002578	Very Low	Very Low	Low	Low
CRC_1_2_8	0.00006	0.00002	0.00477	0.00165	Very Low	Very Low	Very Low	Very Low
CRC_1_2_9	0.00044	0.000151	0.03647	0.012478	Medium	Medium	High	High
CRC_1_3_1	0.00012	4.15E-05	0.01639	0.005625	Low	Low	Medium	Medium
CRC_1_3_2	0.00012	4.15E-05	0.01639	0.005625	Low	Low	Medium	Medium
CRC_1_3_3	0.00012	4.15E-05	0.01639	0.005625	Low	Low	Medium	Medium
CRC_1_3_4	0.00012	4.15E-05	0.01639	0.005625	Low	Low	Medium	Medium
CRC_1_3_5	0.00003	1.18E-05	0.00465	0.0016	Very Low	Very Low	Very Low	Very Low
CRC_1_3_6	0.00055	0.000189	0.07565	0.0256	High	High	Very high	Very high
CRC_1_4_1	0.00008	2.94E-05	0.04448	0.015006	Very Low	Very Low	High	High
CRC_1_4_2	0.0002	6.89E-05	0.10584	0.035156	Low	Low	Very high	Very high
CRC_1_4_3	0.0002	6.89E-05	0.10584	0.035156	Low	Low	Very high	Very high
CRC_1_5_1	0.00042	0.000146	0.04569	0.015625	Medium	Medium	High	High
CRC_1_5_2	0.01054	0.003645	0.18872	0.0625	Very high	Very high	Very high	Very high
CRC_1_6_1	0.00004	1.34E-05	0.01041	0.0036	Very Low	Very Low	Low	Low
CRC_1_6_2	0.00002	0.000006	0.00462	0.0016	Very Low	Very Low	Very Low	Very Low
CRC_1_6_3	0.00011	3.72E-05	0.02905	0.01	Low	Low	Medium	High
CRC_1_6_4	0	8E-07	0.00065	0.000225	Very Low	Very Low	Very Low	Very Low
CRC_1_6_5	0	1E-07	0.00007	0.000025	Very Low	Very Low	Very Low	Very Low
CRC_1_6_6	0.00001	3.3E-06	0.0026	0.0009	Very Low	Very Low	Very Low	Very Low
CRC_1_6_7	0.00011	3.72E-05	0.02905	0.01	Low	Low	Medium	High
CRC_1_6_8	0.00024	8.37E-05	0.06593	0.0225	Medium	Medium	Very high	Very high
CRC_1_7_1	0.00061	0.00021	0.06593	0.0225	High	High	Very high	Very high
CRC_1_7_2	0.00319	0.001104	0.02905	0.01	Very high	Very high	Medium	High
CRC_1_8_1	0.0041	0.001421	0.45878	0.140625	Very high	Very high	Very high	Very high
CRC_1_8_2	0.00103	0.000355	0.01855	0.0064	Very high	Very high	Medium	Medium
CRC_1_8_3	0.00103	0.000355	0.01855	0.0064	Very high	Very high	Medium	Medium
CRC_1_8_4	0.00103	0.000355	0.01855	0.0064	Very high	Very high	Medium	Medium
CRC_1_9_1	0	0	0	0	Very Low	Very Low	Very Low	Very Low
CRC_1_9_2	0.01223	0.004225	1	0.25	Very high	Very high	Very high	Very high

Table 5 Sensitivity analysis of the Indigenous community.

Indicator	Higher order objective		Individual objective		Higher order objective		Individual objective	
	Mutual Info	Variance of Beliefs	Mutual Info	Variance of Beliefs	Mutual Info	Variance of Beliefs	Mutual Info	Variance of Beliefs
Ind_2_1_1	0.00051	0.000177	0.02905	0.01	Low	Low	Low	Low
Ind_2_1_2	0.00205	0.00071	0.11871	0.04	Medium	Medium	High	High
Ind_2_1_3	0.00205	0.00071	0.11871	0.04	Medium	Medium	High	High
Ind_2_2_1	0.00932	0.003215	0.18872	0.0625	Very high	Very high	Very high	Very high
Ind_2_2_2	0.00932	0.003215	0.18872	0.0625	Very high	Very high	Very high	Very high
Ind_2_3_1	0.0011	0.000381	0.11871	0.04	Low	Low	High	High
Ind_2_3_2	0.0011	0.000381	0.11871	0.04	Low	Low	High	High
Ind_2_3_3	0.00028	9.53E-05	0.02905	0.01	Very Low	Very Low	Low	Low
Ind_2_4_1	0.00042	0.000144	0.03485	0.01	Very Low	Very Low	Low	Low
Ind_2_4_2	0.00167	0.000576	0.14679	0.04	Medium	Medium	High	High
Ind_2_5_1	0.01954	0.006724	0.18872	0.0625	Very high	Very high	Very high	Very high
Ind_2_5_2	0.00487	0.001681	0.04557	0.015625	Very high	Very high	Medium	Medium
Ind_2_5_3	0.00487	0.001681	0.04557	0.015625	Very high	Very high	Medium	Medium
Ind_2_6_1	0.0069	0.002381	1	0.25	Very high	Very high	Very high	Very high

Table 6 Sensitivity analysis of local/regional associated community.

Indicator	Higher order objective		Individual objective		Higher order objective		Individual objective	
	Mutual Info	Variance of Beliefs	Mutual Info	Variance of Beliefs	Mutual Info	Variance of Beliefs	Mutual Info	Variance of Beliefs
RAC_3_1_1	0.02221	0.007504	0.06593	0.0225	Very high	Very high	Low	Medium
RAC_3_1_2	0.12416	0.040855	0.39016	0.1225	Very high	Very high	Very high	Very high
RAC_3_2_1	0	0	1	0.25	Very Low	Very Low	Very high	Very high
RAC_3_3_1	0.00243	0.000827	0.18872	0.0625	Low	Low	High	High
RAC_3_3_2	0.00243	0.000827	0.18872	0.0625	Low	Low	High	High
RAC_3_4_1	0.00065	0.000221	0.39016	0.1225	Very Low	Very Low	Very high	Very high
RAC_3_4_2	0.00012	4.06E-05	0.06593	0.0225	Very Low	Very Low	Low	Medium
RAC_3_5_2	0.00077	0.000262	0.10482	0.030625	Very Low	Very Low	Medium	Medium

Relatively few indicators had a very low impact across both the specific and broader objectives, and all occurred in the commercial, recreational and charter objectives. These have been highlighted in red in Table 1. However, as noted previously, the combined effects of indicators can have a greater impact than the sum of the individual impacts. Further, increasing the number of nodes between the input and output nodes can dilute the sensitivity of the output to the inputs (Chen and Pollino 2012). Those indicators that are aggregated into intermediate nodes in order to make the development of the BBN practical may suffer in terms of lower sensitivity scores (Jensen and Nielsen 2007). As a result, removing indicators may have a greater impact on the results than the sensitivity analysis suggests. To test this, the model needs to be developed excluding the indicator and the results re-assessed.

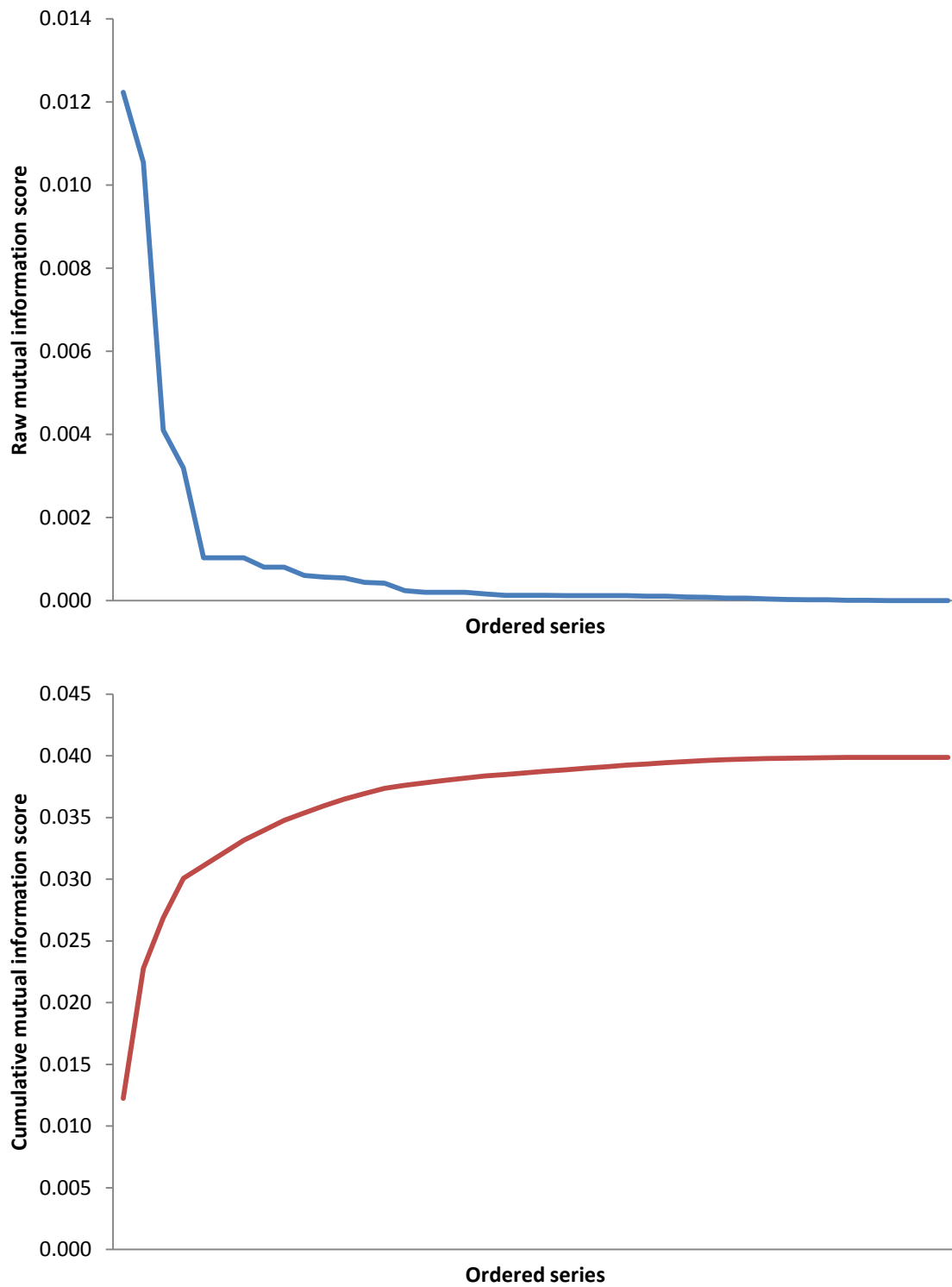


Figure 8 Individual and cumulative mutual information (entropy reduction) scores for the Industry community.

The outcomes of the BBN analysis are compared with the ratings of the South Australian fisheries managers in Table 7. It is clear from this table that in many cases outcomes of the BBN analysis were contradictory to those from the fisheries manager workshop. An example of this was the indicator *'Perception of flexibility: Fisher belief that fishing management processes are flexible enough to allow them to adapt to changing conditions'*. This indicator was ranked 'very highly' by the fisheries managers in relation to achieving the objective of *'ensuring fishers can maintain their livelihood'*, but 'low' in the BBN analysis.

These results highlight that indicators are of varying importance in different contexts: the fisheries managers' workshop reflects their importance in a quite specific context, whereas the BBN analysis reflects overall importance as rated by representatives with varying experience in differing fisheries jurisdictions. Both are equally meaningful.

As a consequence of this analysis, as well as similar outcomes from the workshop held in Phase 3, in which members of the Steering Committee were similarly asked to prioritise indicators, it was decided not to delete any indicator based on the BBN ranking, but to instead use this information as part of the Guide, in which indicators could be ranked based on:

- Significance to the objective;
- Relevance to fisheries managers; and
- Method and cost to implement.

Providing this type of information in the Guide was considered the best means to ensure fisheries managers have the option of selecting the indicators that are of greatest relevance to their own circumstances and available resources.

Table 7 Comparison of the outcomes of the Bayesian Belief Network (BBN) analysis with the ratings of South Australian fisheries managers⁷ in terms of ranking the significance of each indicator.

Objective number and name	Indicator number and name	BBN	Fisheries managers
1.1-Provide flexible opportunities to ensure fishers can maintain or enhance their livelihood, within the constraints of ecological sustainability	1.1.1-Provision of livelihood opportunity: How is the ability of fishers to access livelihood changing?	Low	Med
	1.1.2-Proportion of fishers accessing livelihood opportunities: what proportion of the livelihood opportunities (e.g. quota) are being taken up in the fishery?	Low	Med
	1.1.3-Transferable property or use rights exist for accessing marine and aquatic resources.	High	High
	1.1.4- Are there constraints to accessing livelihood opportunities that are the result of fisheries management decisions?	High	High
	1.1.5-Perception of flexibility: fishers belief that fishing management processes are flexible enough to allow them to adapt to changing conditions	Low	Med
	1.1.6-Fishers perceive managers as doing a good job of fisheries management?	High	High
1.2-Maximise cultural, recreational and lifestyle benefits (including health benefits) of fishing for those who participate in fishing activities, within the constraints of ecological sustainability	1.2.1-How important is fishing as a lifestyle versus as a business?	Very Low	High
	1.2.2-How does the average fisher's income compare to the average worker in the region?	Low	Low
	1.2.3-Dependence on fishing - what proportion of household income is derived from fishing?	Very Low	Low
	1.2.4-How has fishing-derived income changed over the last year?	Very Low	Not measured
	1.2.5-How has fishing-derived income changed over the last five years?	Very Low	Not measured
	1.2.6-How satisfied are fishers with their fishing derived income?	Low	High
	1.2.7-Fisher perceptions of importance of fishing activities to their life.	Low	High
	1.2.8- Fisher's plans to leave fishing.	Very Low	Not measured
	1.2.9- Fisher's overall satisfaction with their fishing activities over the last 12 months.	High	Medium
1.3-Ensure appropriate mechanisms exist for fisher involvement in development of management advice	1.3.1-How satisfied are fishers with the level of consultation undertaken by fisheries managers?	Medium	High
	1.3.2-Do fishers know how to contact the people who represent their interests in fisheries management/advisory processes?	Medium	High

⁷ Note that the list of objectives differs to that at end of Phase 1, and the final set produced in Phase 3, as an interim set of revised objectives was produced in Phase 2 based on early results of data collection and evaluation.

Objective number and name	Indicator number and name	BBN	Fisheries managers
	1.3.3 -Are fishers aware of the methods by which they can have input into fisheries management processes?	Medium	High
	1.3.4 -What proportion of fishers actively participate in fisheries management?	Medium	High
	1.3.5 -Do fishers have opportunity to be represented on fisheries management advisory groups?	Very Low	High
	1.3.6 - Does the fisheries agencies have a formal, documented process for providing feedback to stakeholders about management decisions, and how stakeholder input was used in those decisions?	Very high	Med
1.4 -Improve the skills of fishers participating in management advisory processes	1.4.1 -Are stakeholders involved in fisheries management supported to effectively take part?	High	Medium
	1.4.2 -Are fisher representatives satisfied with their submission writing skills?	Very high	Medium
	1.4.3 -Are fisher representatives satisfied with their overall representation skills?	Very high	Medium
1.5 -Industry stakeholders have a high level of trust in the management of fisheries	1.5.1 -To what extent do fishers trust the management agency to make the right decisions for managing the fishery?	High	High
	1.5.2 -To what extent do fishers feel the process of decision-making about fisheries management is transparent	Very high	High
1.6 -Maximise stewardship of fisheries resources	1.6.1 -How is the number of fisheries infringements changing over time?	Low	Low
	1.6.2 -How is the number of calls to fisheries hotlines changing over time?	Very Low	Med
	1.6.3 -Proportion of fishers who believe that, overall, most fishers comply with fishing rules and regulations.	High	High
	1.6.4 -Fisher's perceptions about ease of obtaining information about fisheries management, rules & regulations.	Very Low	High
	1.6.5 -Do fishers feel adequate training and advice about good fishing practices is available to them?	Very Low	Not measured
	1.6.6 -Do fishers find information produced by the fisheries agency easy to understand?	Very Low	High
	1.6.7 -To what extent do fishers accurately understand regulations?	High	High
	1.6.8 -Do fishers find it easy to comply with fishing rules and regulations?	Very high	High
1.7 -Ensure transparent decision-making process by fisheries agencies	1.7.1 -Do fishers understand how decisions relating to fisheries management are made?	Very high	High
	1.7.2 -Is the process of fisheries decision-making	High	Not

Objective number and name	Indicator number and name	BBN	Fisheries managers
	well documented?		measured
1.8 -Ensure equitable treatment and access for fishers	1.8.1 -How equitable/fair do fishers feel the processes used to make decisions about fisheries management are?	Very high	High
	1.8.2 - How equitable/fair do fishers feel the allocation of species/catch between sectors is?	Medium	High
	1.8.3 -How equitable/fair do fishers feel access to fishing areas is across sectors?	Medium	High
	1.8.4 -How equitable/fair do fishers feel effort/gear restrictions are across fishing sectors?	Medium	High
1.9 -Ensure adequate access to infrastructure needed for successful operation of fishing activities, within constraints of ecological sustainability	1.9.1 -Are there any gaps in availability of fishing infrastructure needed by fishers?	Very Low	Low
	1.9.2 -How satisfied are fishers with their level of access to different types of fishing infrastructure	Very high	Low
3.1 -Positively influence fisheries related socioeconomic benefits for regional communities, within the constraints of ecological sustainability	3.1.1 -Contribution of fisheries to local economic activity.	Medium	High
	3.1.2 -Proportion of direct and indirect employment in a region dependent on fishing.	Very high	Medium
3.2 -Facilitate and support the cohesion and connectedness of fishers with their regional communities through fisheries management, within the constraints of ecological sustainability	3.2.1 -Recognition of key social and community needs in fisheries management processes (e.g. need of fishers be with family for holiday times)	Very high	Low
3.3 -Maximise community trust in fisheries agencies to manage fisheries	3.3.1 -Management agency involvement in community education activities.	High	Low
	3.3.2 -Management agencies engage in community consultation activities.	High	Not measured
3.4 -Ensure fisheries management contributes to the maintenance of cultural and heritage values related to fishing activities	3.4.1 -Cultural and heritage values associated with fishing are identified and managed as part of fisheries management.	Very high	Low
	3.4.2 -Assessment of the importance of fishing to the culture and heritage of a community/region.	Medium	Low
3.5 -Facilitate capacity building (through skills and knowledge development) for community members to enhance stewardship of fisheries resources	3.5.1 -Management agency provides training and educational opportunities to the general public.		Low
	3.5.2 -Satisfaction of community members with their participation in training and educational opportunities.	Medium	Low

5.2.4 Designing metrics for use in assessing performance against objectives

Having identified which indicators could be measured based on the results of data collection, the final part of Phase 2 involved translating these indicators into readily interpretable and reportable metrics that can be easily used by fisheries managers. Both the outcomes of the BBN analysis and the South Australian fishery manager's workshops highlighted that fisheries managers wanted detailed guidance on how to interpret the results of each indicator and easily track their performance over time. To achieve this, a decision was made to develop a system in which results of each indicator could be interpreted using a 'traffic light system' in which:

- **Green** means the indicator is being met and no further management action is needed;
- **Orange** means the indicator is 'borderline' and management action is needed to improve performance; and
- **Red** means the indicator is not being met, and urgent management action is needed to address the issue.

The analysis was undertaken in two stages. First, the BBN was run using the survey information and the relative scores for each objective were converted to 'traffic' lights to indicate overall management performance. While the BBN provides a useful quantitative approach to assessing the quantitative and qualitative data, a simpler approach was required that could be employed by each fisheries management jurisdiction. The second stage established a series of thresholds in the 'traffic light' system for all indicators. This was based on: data collected in the case studies; discussions with fisheries managers in both South Australia and Queensland; discussion of indicators with a South Australian Indigenous community; the BBN modelling process; and the discussions had at the World Recreational Fishing Conference in August 2012. These inputs were used by researchers to set clear guidance on how to interpret the outcomes of each indicator and where management action may be needed, and this guidance was then set out in Part 2 of the Guide (Appendix 18).

Example results from the BBN analysis are presented below, where the results of the various surveys undertaken for the project were used to estimate the social performance of management of two fisheries from South Australia and one from Queensland. The model results are estimates of the probability that the objectives have been achieved. These can be aggregated into probabilities that higher order objectives are achieved based on the individual objective weights under each higher order objective, and the probability that social objectives are achieved at a satisfactory level taking into account the weights of all the objectives (Table 8).

The results of the three case studies are illustrative only, as the results relating to Indigenous indicators are not included. Consequently, the overall social performance value is misleading, as it is based on naive assumptions about the Indigenous indicators. However, it does provide an indication of the potential outcomes from the BBN approach.

As noted above, a traffic light-style report card may be more appropriate, particularly as the BBN results imply a precision (in terms of score) that is most likely inappropriate given the subjective nature of the development of the probabilities and also the variability in the input data. Further, fisheries managers will not have ready access to capability in running such a BBN, so a simpler approach is required.

Table 8 Bayesian Belief Network measures of social performance of fisheries management for Rock Lobster and Marine Scalefish fisheries of South Australia and the East Coast Trawl Fishery of Queensland.

Objective	SA Rock Lobster Fishery			SA Marine Scalefish Fishery			Qld East Coast Trawl fishery				
	All	Southern Zone	Northern zone	All	West Coast	Port Lincoln	Wallaroo	All	North	Central	South
Lower level objectives											
Commercial, recreational and charter											
• 1.1_Flexible_opportunities	52%	55%	47%	51%	49%	48%	53%	65%	61%	67%	66%
• 1.2 Cultural_Rec_Lifestyle	79%	80%	76%	68%	64%	69%	67%	66%	66%	67%	65%
• 1.3 Appropriate_mechanisms	81%	82%	80%	80%	80%	75%	75%	49%	47%	51%	52%
• 1.4 Improve_skills	64%	64%	64%	64%	64%	64%	64%	56%	56%	56%	56%
• 1.5 Trust	70%	71%	68%	49%	33%	33%	54%	41%	44%	42%	36%
• 1.6 Maximise_stewardship	94%	95%	92%	93%	92%	92%	93%	74%	80%	69%	73%
• 1.7 Transparent_Decisions	85%	84%	87%	62%	45%	45%	68%	55%	60%	57%	47%
• 1.8 Equitable_treatment	84%	86%	81%	44%	48%	35%	52%	77%	72%	75%	84%
• 1.9 Access_infrastructure	82%	83%	80%	85%	77%	91%	81%	60%	61%	51%	51%
Regional and associated communities											
• 3.1 Positively influence community benefits	50%	50%	50%	50%	50%	50%	50%	0%	0%	0%	0%
• 3.2 Support cohesion	100%	100%	100%	100%	100%	100%	100%	0%	0%	0%	0%
• 3.3 Maximise community trust	13%	13%	13%	13%	13%	13%	13%	63%	63%	63%	63%
• 3.4 Culture and heritage value	100%	100%	100%	100%	100%	100%	100%	69%	69%	69%	69%
• 3.5 Develop community capacity	65%	65%	65%	65%	65%	65%	65%	16%	16%	16%	16%
Higher level objectives											
1. Commercial, recreational and charter communities	78%	78%	75%	62%	58%	57%	64%	62%	62%	60%	60%
2 Indigenous communities	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
3. Regional associated communities	58%	58%	58%	58%	58%	58%	58%	11%	11%	11%	11%
Overall performance											
Social performance of management	68%	69%	67%	59%	57%	56%	60%	47%	47%	46%	46%

Rather than repeat the content of the Guide, below we demonstrate this simpler approach through three examples.

Example 1: The first example is Indicator 1.1.3 *‘Existence of transferable property or use rights that allow access to marine and aquatic resources’*. This indicator is measured using data from the fisheries management agency and identifies the extent to which property and use rights are clear and flexible, based on the following questions:

- *‘Are use rights in the fishery readily transferable between fishers (e.g. quotas and licences can be transferred from one user to another easily)?’*
- *‘If use rights are transferable, are there established markets enabling transfer (e.g. has anyone used that right of transfer in recent times)?’*
- *‘If use rights are transferable, is there a clear market price for the transferable rights?’* This would be evidenced by, for example, recent transactions that have set a price. If few transactions occur, there may not be a clear price for the rights.

All three questions are important, as in some cases transferable rights are traded so rarely that there is in effect no market for them, thus reducing the ability of fishers to enact the flexibility of use rights (e.g. South Australian Southern Zone Abalone Fishery).

This indicator is simple to analyse and interpret. Answering ‘yes’ to all three questions indicates a positive outcome, while a ‘no’ indicates an area of potential concern for fisheries managers. Thus the traffic light guidance is similarly simple:

This indicator is being met if: use rights are transferable, there is an established market and an established price.	There is need to consider further management action if: use rights are transferable, but there is not an established market or price.	There is an urgent need for management action if: use rights are not readily transferable.
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Table 9 gives a worked example of the steps of collecting and analysing the data for Indicator 1.1.3, and identifying whether the indicator is green, orange or red for the East Coast Trawl Fishery of Queensland and the Marine Scalefish, Rock Lobster and Abalone fisheries of South Australia.

Table 9 Step by step guide to measuring Indicator 1.1.3, using data from the East Coast Trawl Fishery of Queensland and the Marine Scalefish, Rock Lobster and Abalone fisheries of South Australia.

<p>Ask these questions of fisheries managers:</p>	<p>Q. 'Are the use rights readily transferable between fishers (e.g. quotas and licences can be transferred from one user to another easily)?' <input type="checkbox"/>Yes <input type="checkbox"/>No</p> <p>Q. 'If use rights are readily transferable, is there an established market enabling transfer (e.g. has anyone used that right of transfer in recent times)?' <input type="checkbox"/>Yes <input type="checkbox"/>No <input type="checkbox"/>Unsure</p> <p>Q. 'If use rights are readily transferable, is there a market price for transferable rights (e.g. recent transactions have a set price)?' <input type="checkbox"/>Yes <input type="checkbox"/>No <input type="checkbox"/>Unsure</p> <p>Notes: Transferable rights are only truly transferable if a market exists for them. This is why the two follow-up questions regarding market transactions are included as part of the indicator.</p>			
<p>Analyse the basic data:</p>	<p>Fishery</p> <p>Marine Scalefish (SA)</p> <p>East Coast Trawl (QLD)</p> <p>Rock Lobster (SA)</p> <p>Abalone (SA)</p>	<p>Are use rights readily transferable?</p> <p>Yes</p> <p>Yes</p> <p>Yes</p> <p>Yes</p>	<p>If rights are transferable, is there an established market?</p> <p>Yes</p> <p>Yes</p> <p>Yes</p> <p>Yes</p>	<p>If rights are transferable, is there a clear market price?</p> <p>Yes</p> <p>Yes</p> <p>Yes</p> <p>Yes</p>
<p>Identify if indicator is green, orange or red</p>	<p>SA Abalone Fishery SA Marine Scalefish Fishery QLD East Coast Trawl Fishery SA Rock Lobster Fishery</p>		<p>None</p>	<p>None</p>

Example 2: The second example is Indicator 1.1.2 'Perception of flexibility: fisher belief that fisheries management processes are flexible enough to allow them to adapt to changing conditions'. This indicator is measured through a survey of fishers, in which they are asked whether they agree or disagree with the statement 'Fisheries management is flexible enough to allow fishers to adapt to changing conditions'.

This indicator is assessed using the following criteria:

<p>This indicator is being met if: the proportion of fishers who think fisheries management is flexible is 50% or greater and this has remained stable or is increasing over time.</p>	<p>There is need to consider further management action if: the proportion of fishers who think fisheries management is flexible is <50% but is increasing over time. This means the indicator is moving positively, but further monitoring or management action is required by management.</p>	<p>There is an urgent need for management action if: the proportion of fishers who think fisheries management is flexible enough is decreasing over time, or is <50% and stable or decreasing. This means the indicator is not being met and management action is urgently required.</p>
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Table 10 gives a worked example of the steps of collecting and analysing the data for Indicator 1.1.2, and identifying whether the indicator is green, orange or red for the Marine Scalefish, Rock Lobster and Abalone fisheries of South Australia.

Table 10 Step by step guide to measuring Indicator 1.1.2, using data collected from fishers involved in the Marine Scalefish, Rock Lobster and Abalone fisheries of South Australia.

<p>Include these questions in a survey of fishers:</p>	<p>Q. 'To what extent do you agree or disagree with the following statements "Fisheries management is flexible enough to allow fishers to adapt to changing conditions"?'</p> <p><input type="checkbox"/> Strongly disagree <input type="checkbox"/> Disagree <input type="checkbox"/> Neither agree nor disagree <input type="checkbox"/> Agree <input type="checkbox"/> Strongly agree <input type="checkbox"/> Unsure</p> <p>Notes: When conducting the survey, include both this and a number of other statements from the attached sample on the survey. To analyse the responses, sum 'strongly disagree' and 'disagree'; and 'strongly agree' and 'agree'. However it is still useful to have the disaggregated and more detailed data—as it may be applicable to explore for example if there is sign of a positive trend with a growing number of people indicating they 'disagree' rather than 'strongly disagree'.</p>																			
<p>Analyse the basic data:</p>	<table border="1"> <thead> <tr> <th>Fishery</th> <th>Disagree (strongly disagree and disagree)</th> <th>Neither disagree nor agree</th> <th>Agree (strongly agree & agree)</th> </tr> </thead> <tbody> <tr> <td>Marine Scalefish (SA)</td> <td>54.2 %</td> <td>21.0%</td> <td>24.8%</td> </tr> <tr> <td>Rock Lobster (SA)</td> <td>50.8%</td> <td>25.4%</td> <td>23.7%</td> </tr> <tr> <td>Abalone (SA)</td> <td>23.5%</td> <td>17.6%</td> <td>58.8%</td> </tr> </tbody> </table>	Fishery	Disagree (strongly disagree and disagree)	Neither disagree nor agree	Agree (strongly agree & agree)	Marine Scalefish (SA)	54.2 %	21.0%	24.8%	Rock Lobster (SA)	50.8%	25.4%	23.7%	Abalone (SA)	23.5%	17.6%	58.8%			
Fishery	Disagree (strongly disagree and disagree)	Neither disagree nor agree	Agree (strongly agree & agree)																	
Marine Scalefish (SA)	54.2 %	21.0%	24.8%																	
Rock Lobster (SA)	50.8%	25.4%	23.7%																	
Abalone (SA)	23.5%	17.6%	58.8%																	
<p>Identify if indicator is green, orange or red</p>	<p>SA Abalone Fishery</p>	<p>SA Marine Scalefish Fishery SA Rock Lobster Fishery (as a trend is not yet know, these fisheries have been ranked as orange until the % of fishers who feel management is inflexible is growing or declining)</p>		<p>None are red as this indicator has not yet been measured at two points in time to establish a trend</p>																

Example 3

The third example is Indicator 3.2.1 'Level of recognition of key social and community needs in fisheries management processes'. To assess this indicator, fisheries managers are asked to answer the following questions:

- 'Can key community issues be identified that need to be addressed in management activities to ensure contribution by the fishery to local community wellbeing?'
- If yes, fisheries managers are asked to briefly document the cultural considerations.
- For each issue, 'do fisheries managers have established and documented guidelines on how to address it in their management processes (e.g. ensure requests for meetings with fishers do not clash with particular community events)?'
- 'Have the parties concerned with the issues agreed on the management arrangements required to meet community needs, and signed off on the documented management arrangements put in place?'

If the first measurement identifies no issues connected with the fishery, or for issues identified the following two measures are met and then also signed off by the parties concerned, then the indicator would be seen as being met (**Green**). If any of the first 3 measurements are being met, but no sign-off has been achieved, then the management activities would be considered to be positively moving toward being met, but that further management action is required. (**Orange**). If none of these aspects have been undertaken or the concerned parties have withdrawn their sign-off, then the indicator is regarded as not being met, and management action is urgently required (**Red**).

This indicator is being met if: issues are being actively identified, addressed in management processes, and signed off by concerned parties.	There is need to consider further management action if: no issues are being identified, or some issues are identified but not addressed in management processes	There is an urgent need for management action if: No issues known or unknown are being identified or addressed.
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Table 11 outlines the steps of collecting and analysing the data for Indicator 3.2.1, and identifying whether the indicator is green, orange or red for the East Coast Trawl Fishery of Queensland and the Marine Scalefish, Rock Lobster and Abalone fisheries of South Australia.

Table 11 Step by step guide to measuring Indicator 3.2.1, using data from the East Coast Trawl Fishery of Queensland and the Marine Scalefish, Rock Lobster and Abalone fisheries of South Australia.

Ask these questions of fisheries managers:	<p>Q. ‘Can you identify any key community issues that need to be addressed in your management activities to ensure you contribute to local community wellbeing?’</p> <p>For example, this might include identifying dates when fishers need to be able to participate in community activities, or when fishing may be considered culturally inappropriate (yes/no/unsure).</p> <ul style="list-style-type: none"> If yes, please describe briefly the cultural considerations For each issue, do you have guidance on how to address this issue in your management processes (e.g. requirement to close fishery). (yes/no/unsure) For each issue, have other relevant stakeholders signed off that they are satisfied with the processes put in place to ensure key community needs are addressed? 			
Analyse the basic data:	Fishery	Issues identified	Description	Addressed in management processes?
	Marine Scalefish (SA)	Yes	Use of hauling nets in coastal waters during certain holiday periods	Yes
	East Coast Trawl (QLD)	No		
	Rock Lobster (SA)	Yes		Unsure
	Abalone (SA)	Yes		Unsure
Identify if the indicator is green, orange or red:	SA Marine Scalefish Fishery	SA Rock Lobster Fishery SA Abalone Fishery		QLD East Coast Trawl Fishery

5.2.5 Production of the draft Guide

Based on the results of Phase 2, a draft Guide was produced. This Guide and its contents reflected the amendments made to both objectives and indicators in Phase 2 as a consequence of the data collection and evaluation undertaken in the case study regions and fisheries. In particular, it was informed by the ongoing assessment of objectives and indicators throughout the phase, in which these were modified, and in some cases entirely removed or changed. This was done for indicators based on assessing whether data could be reliably and objectively collected, whether affordable data collection was possible and whether indicators measured something useful about the objective they were intended to inform. Objectives were revised based on the discussions held when evaluating the data collected, which often shed new light on how objectives should be phrased. This resulted in some significant rephrasing of objectives and, in a small number of cases, shifting objectives between communities, or applying an objective to all three ESD communities that had previously only been applied to one (such as the provision of information in a timely and accessible manner).

The Guide was also informed by the other key findings of Phase 2. In particular, discussions held with fisheries managers identified that it is critical to provide not only detailed instructions on the measurement and interpretation of indicators, but also detailed guidance on the process of selecting objectives and indicators, something workshop discussions identified as a key barrier to considering social dimensions of fishing as part of fisheries management. Thus, the Guide included details on appropriate processes in Part 1 (Appendix 17), as well as guidance through the measurement and assessment of social objectives and indicators in Part 2 (Appendix 18).

The result of collating all this knowledge and information was a very extensive but detailed Guide, which was designed for any fisheries manager to be able to identify the social objectives of relevance to their fishery, the indicators that provided the most robust assessment of performance for their fishery within the resources available to them and to assess performance against the selected objectives utilising a standard traffic light system.

The Guide also contained detailed guidance on survey questions to be asked, data collection and analysis methods, to minimise the need for fisheries managers to employ external consultants to assess performance against social objectives.

5.3 PHASE 3: UPDATE NATIONAL OBJECTIVE AND INDICATORS:

The final phase of the project involved refining and finalising the Guide. This was achieved through engaging the Steering Committee to participate in a workshop to help further design the Guide, and then to review the full Guide after it was completely drafted. The Guide development workshop was undertaken on 31 October 2012 and was well attended by every state, and the Commonwealth, as well as representatives from the FRDC Indigenous Reference Group, Recfishing Research and the Commercial Fisheries Association (see Appendix 3 for full list of attendees). The only jurisdiction not to have representation on the day was the Northern Territory, who later provided off-line input.

The feedback facilitated both at the workshop and subsequent to it on the draft Guide, fell into a number of categories which generally related to:

- Clarification of social objectives (provided in Table 12) and indicators to be recommended for applicability to national fisheries management;
- Clarification of tables and instructional component of the Guide; and
- The length of the Guide, resulting in it being split into two Parts.

Subsequent to the workshop, comments were received in writing from five workshop participants and one combined response was received from the Northern Territory representative (a fisheries manager/researcher and Indigenous fisheries manager) who were unable to attend the workshop. The States and Territories represented in the feedback received included:

- Victoria, fisheries manager;
- New South Wales, economist;
- Western Australia, fisheries and ESD expert;
- FRDC, Indigenous Reference Group;
- Tasmania, fisheries manager; and
- Northern Territory, fisheries manager/researcher and Indigenous Fisheries Manager.

The comments received on the Guide were amalgamated and reviewed by two members of the project team in March 2013 and were either addressed through edits to the Guide or reasons for the comments not being acted upon were identified and noted. The full details of modifications made are documented in the 'Notes to review comments on draft final guide to social objectives and indicators, March 2013' in Appendix 19.

Generally the Guide was endorsed and there was enthusiasm for the output of the project, though a level of trepidation remained as to how fisheries managers would resource the time to actually employ the final product in their management systems (such as management plans and harvest strategies) and decision making processes.

It was also felt that the size of the Guide in the first instance at some 250 pages was daunting and would benefit from being broken into two parts: Part 1 would focus on the how, what and why of social objectives in fisheries management and Part 2 would provide the detailed implementation guide. This was adopted in the final Guide.

Table 12 Social objectives to be recommended for applicability to national fisheries management.

ESD community	Social objective
Industry	<ol style="list-style-type: none"> 1. Provide flexible opportunities to ensure fishers can maintain or enhance their livelihood, within the constraints of ecological sustainability. 2. Maximise cultural, recreational and lifestyle benefits (including health benefits) of fishing for those who participate in fishing activities, within the constraints of ecological sustainability. 3. Ensure appropriate mechanisms exist for fisher involvement in development of fisheries management advice Improve the management skills of industry participants in co-management arrangements. 4. Improve the ability of fishers to participate effectively in fisheries management advisory processes. 5. Industry stakeholders have a high level of trust in the management of fisheries. 6. Maximise stewardship of fisheries resources. 7. Ensure transparent decision-making process by fisheries agencies. 8. Ensure equitable treatment and access for fishers. 9. Ensure adequate access to infrastructure needed for successful operation of fishing activities, within the constraints of ecological sustainability. 10. Ensure fisheries information is available in a timely and publicly accessible manner.
Indigenous	<ol style="list-style-type: none"> 1. Fisheries management actions support the maintenance of cultural and heritage values related to fishing activities in Aboriginal and Torres Strait Islander communities. 2. Ensure access to 'Country' to enable continuation of cultural fishing activities, respecting the rights of Aboriginal and Torres Strait Islander peoples to these resources 3. Provide opportunities for Aboriginal and Torres Strait Islander communities to participate in fisheries management decision making processes. 4. Optimise access to income earning opportunities for Aboriginal and Torres Strait Islander community members related to the management of fisheries. 5. Make fisheries collected data available in a timely and publicly accessible manner. 6. Aboriginal and Torres Strait Islander communities associated with 'Country' aquatic resources have a high level of trust in the management of fisheries. 7. Ensure collaborative inputs by Aboriginal and Torres Strait Islander communities, regional and industry sectors on the benefits each sector offers to fisheries management.

ESD community	Social objective
Local/ regional	<ol style="list-style-type: none"> 1. Positively influence fisheries related socio-economic benefits for regional communities, within the constraints of ecological sustainability. 2. Facilitate and support the cohesion and connectedness of fishers with their regional communities through fisheries management. 3. Maximise community trust in fisheries agencies to manage fisheries. 4. Ensure fisheries management contributes to the maintenance of cultural and heritage values related to fishing activities. 5. To facilitate capacity building (through skills and knowledge development) for community members to enhance stewardship of fisheries resources. 6. Ensure fisheries information is available in a timely and publicly accessible manner.

Further verbal comment was also received from a number of Australian fisheries managers. Comments received included:

“Wow! Very comprehensive, easy to follow, easy to understand, and practical” (DPIWE fisheries management)

“The ones you have presented will definitely be useful as a starting point because without previous experience it is often hard to start but it must not be seen as a restrictive list.” (WA fisheries research)

“I can see a substantial amount of work has gone into it, providing very useful guidance to managers. [...] With regard to the way to make the guide useful to managers and others, I think a web based tool may be more useful guiding them through each objective without having to plough through a large report.” (Economic consultant – NSW)

The above comments were received on the first draft of the Guide, which have along with many others been taken into account in the Guide. The suggestion regarding the development of a web-based tool to increase uptake of the Guide was not budgeted for in this project. It is however, a suggestion the project team would strongly endorse for further investigation to make ensure maximum benefit is gained from this research investment.

Part 1 of the Guide was not fully tested in Phase 2, as the need for it emerged at the conclusion of Phase 2. Therefore the utility of the process recommended in Part 1 of the Guide was tested by trialling the five-step process in a workshop with the Lakes and Coorong Consultative Committee, held on 26 June 2013 at Murray Bridge. The process was used to guide the discussion and selection of relevant social objectives for the South Australian Lakes and Coorong Fishery. The process worked successfully, and the discussion held at this workshop was used to inform further revision of Part 1 of the Guide.

The scope of the work and the resultant Guide is very large, and has consequently resulted in a large document. While every effort has been made to remove unnecessary discussion from the Guide, some length was necessary given the lack of familiarity that fisheries management agencies and fisheries managers in general have with the material. Minimising the information provided further risked removing information needed in order to interpret the Guide and implement it meaningfully. The final two-part Guide is summarised below.

Part 1: Introduction to Social Objectives and Indicators in Fisheries Management:

- *Target audiences:* fisheries managers, directors and those who require an overarching understanding of the place of social objectives and indicators in the ESD and management process.
- *Provides:* A five-step process for identifying, evaluating and interpreting performance against social objectives. The process is designed to be integrated with existing management processes, ensuring integration of social, ecological and economic considerations.
- *When it should be used:* To provide guidance on how to embed management of social objectives into fishery management processes, and on the process of selecting, evaluating and interpreting social objectives.

Part 2: Implementing Social Objectives and Indicators in Fisheries Management:

- *Target audiences:* Any stakeholders wanting to measure and evaluate performance against social objectives. This will include those with a responsibility to develop or implement fisheries management plan and arrangements; fishers; Indigenous community groups; and members of communities associated with fishing activities (commercial/ recreational/ charter or traditional Indigenous).
- *Provides:*
 - Detailed information required to support selection of objectives, including specification of the data required to inform them, complexity of analysis and costs of collection and collation;
 - Indicators associated with each objective, ranked by their relevance to informing the objective (i.e. 1.1.1 = most significant to 1.1.6 = least significant) to assist selection of most appropriate indicators;
 - Detailed information supporting data collection and interpretation of the outcomes of each indicator. This includes a simple traffic light system that supports ready interpretation of the indicator, and recommended management actions that should be considered if the traffic light is red, orange or green;
 - Worked examples based on data collected in test case studies;
 - Information on data collection techniques and considerations, including survey questions that can be used to collect data for indicators.
- *When it should be used:* This should be used by any person who is identifying social objectives, or measuring performance against them. This may, for example, include: those responsible for developing or reviewing fisheries management plans or other management actions; industry members interested in engaging with triple-bottom-line reporting of their industry or business activity; or community members who are interested in engaging with the activities of the fishery and the effects of its activity within their community.

The Guide is not intended to be a prescriptive text to be adopted without flexibility, but to be used as a common framework that can be applied as appropriate to the fisheries management needs of different jurisdictions and different types of fisheries. The process has taken into account and incorporated work undertaken at Commonwealth and FAO level to ensure consistency with international frameworks and standards that have been developed in this area. Ideally, it will, subject to further funding, be provided in an online format that can be easily accessed in part or whole as required by the persons utilising it.

6. BENEFITS AND ADOPTION

One key output of the study is a set of social objectives and indicators that can be utilised in fisheries management systems and decision-making processes. This set of social objectives and indicators is relevant to all Australian fisheries, with extensive consultation with fisheries managers from management jurisdictions across Australia and in different fishing sectors. A second key output of the study is a practical Guide, which takes fisheries managers through the steps of implementing social objectives in an ESD context, by helping them identify, document, and manage social objectives relevant to their fishery. It also helps them identify which of the social dimensions of fishing they can influence, and what factors remain outside their direct influence, helping better target management of social objectives to those issues that managers can address.

This Guide provides the tools for fisheries managers to engage with the social dimension of fisheries management as part of their management – moving beyond theory to practice. The tools and methodology this project has developed for identifying and implementing social objectives and indicators in the management of Australian fisheries are designed to have relevance to fisheries nationally, and are in line with international obligations and standards.

The final output from this project was recommendations made to relevant national bodies, including the AFMF, for a framework of possible national social objectives and their indicators. This means that as well as having relevance to individual fisheries, the information produced by this project can be integrated into both the national harvest strategy framework and the further development of the national fisheries status reporting process, as well as into relevant international reporting processes.

To ensure this type of integration can occur as appropriate in future as part of these processes, all survey data collected during this project will be stored on a secure server in PIRSA Fisheries & Aquaculture and Queensland DEEDI Fisheries, with a daily backup routine. Access to these data will be restricted to the staff involved with this project. The fisheries managers working on this project, Dr Lianos Triantafillos and Mr Eddie Jebreen will be responsible for the management of these data.

An outcome of the study is already an improved understanding by fisheries managers of social objectives and indicators, and the implications of applying these social objectives to fisheries and communities. A large number of fisheries managers were involved throughout the project, ensuring that the project acted to build their familiarity with, and skills for, integrating social objectives into their fisheries management. This provides a starting point for further building awareness and skills of fisheries managers more broadly to use social objectives. Further to this, during the time that this report has been finalised the Manager of the South Australian Lakes and Coorong Fishery has, subsequent to their workshop referenced previously, utilised the Guide to develop a full set of social objectives, indicators and assessment metrics to be incorporated into the new management plan for this fishery.

The purpose of this project was not to achieve widespread adoption of the tools and methodology developed. Despite the initial localised take up in South Australia, for the Guide to be fully utilised, further investment is needed to support adoption of its use, discussed in the next section.

7. FURTHER DEVELOPMENT

This project has developed tools to assist integrating social objectives into fisheries management. The findings of this project will be published in international peer-reviewed journals and have already been presented at national and international conferences. They will also be communicated via direct consultation with Australian fisheries research and management agencies, as well as the Australian Fisheries Management Forum. Further development is needed to build fisheries managers' skills in using the guide, and to achieve uptake/adoption of the guide and, ultimately, integration of social objectives so they become part of 'business as usual' approaches to fisheries management. To achieve this, the key further development needs are: (i) demonstration of the tools in use in everyday fisheries management contexts, including integration of social considerations into existing processes such as the harvest strategy framework; (ii) improved access to, and training for, fisheries managers to use the guide; and (iii) further development of objectives and indicators for Indigenous communities.

To achieve high levels of uptake, the tools developed in this project should be integrated into a number of demonstration implementation cases of the harvest strategy framework, also finalised in 2014. Additionally, at the time of writing ABARES was working on the next version of the fisheries (stock) status report, providing an ideal opportunity to integrate the tools generated by this guide into an assessment to deliver a truly triple-bottom-line assessment of at least a number of fisheries that will be reviewed and can be reported on at the national level. This will require additional funding to fisheries management agencies to encourage them to participate in these 'watershed projects'. Fisheries managers consulted during this process requested the Guide be developed as an online tool, to improve the accessibility and ease of using what is a substantial information resource. This was supported by one of the independent reviewers of this report, who commented "that the size of the reports may result in them becoming 'dust collectors'" and suggested an online version would make them more user-friendly and would result in them utilised. Hosting the Guide online was not costed in the original project budget, and therefore, this could not be achieved as part of the project. Developing the Guide into an online tool would substantially enhance adoption. This requires identifying a hosting organisation/location, and should ideally be undertaken in collaboration with a working group of AFMF to ensure appropriate implementation and adoption by the various jurisdictions.

The funding available for this project did not enable full development of objectives and indicators for Indigenous communities, and this aspect of the Guide requires significant further work to clarify objectives and identify what indicators might reliably assess these objectives across multiple and varied contexts. This can be achieved through conducting further case studies to add to the single case study undertaken as part of this project, or alternatively, through a project that works with the multiple jurisdictions to test and further develop the objectives and indicators proposed in this project. This may be particularly feasible in States in which managers are reviewing fisheries management plans. In summary, the outputs and the outcomes of this project provide ideal and fertile ground in enabling fisheries managers to develop truly triple-bottom-line ESD reporting data in both individual jurisdictions, and at the national level. However, without further work to provide extensive and comprehensive examples, integrated with harvest strategy and national reporting frameworks of management, full advantage will not be taken of this work.

8. PLANNED OUTCOMES

This project has assisted Australia's fisheries agencies to engage with the idea of actively managing for specific social objectives as part of fisheries management. This was a key planned outcome of the project, and this outcome will continue to be extended as fisheries managers access and use the Guide.

A second outcome of the study will be an understanding of the implications of incorporating social considerations in the decision making process of fisheries management – in other words, what are the consequences of applying these objectives to actual fisheries and communities? In particular, the implications of including social objectives explicitly in fisheries management decision making processes will be evident through resulting changes in fisheries management that are made due to the consideration of social objectives and their integration with ecological and economic objectives.

A third, and most important, outcome is that fisheries managers now have information and tools that facilitate an understanding of how social objectives can be incorporated into management systems such as management plans and harvest strategies.

It is expected that the utility of incorporating social objectives will grow over time as fisheries managers further develop their understanding of social objectives, feel increased 'ownership' of social issues and confidence to address these, and build effective ways of responding to and managing them as part of their management processes.

Some of the social objectives and indicators developed in this project were considered and adopted in the commercial South Australian Marine Scalefish Fishery management plan. This management plan came into effect in 2013 and will be in place for 10 years. These social objectives and indicators are also currently being considered for adoption and application in Lakes and Coorong, Sardine and Spencer Gulf Prawn fisheries of South Australia.

With other fisheries agencies requesting the release of the report and the Guide, these social objectives and indicators will be considered for adoption and application in other fisheries management jurisdictions.

The development and use of the Guide by Australian fisheries managers places Australia at the forefront of international activity in this area. Consideration of the social dimension in fisheries and ecosystem management planning is a process that has international relevance to the activities of FAO, National Oceanic and Atmospheric Administration and other jurisdictions investigating the social dimension of fisheries and marine ecosystems management.

9. CONCLUSIONS

It has long been contended that the social element of ESD, while ostensibly recognised as necessary, is too difficult to quantify or measure as part of ESD assessments. This project was premised on the idea that such difficulties primarily arise due to: (i) a lack of clear specification of social objectives, which means social dimensions remain vague; and (ii) a lack of guidance on ways to appropriately measure and track progress against any identified clear objectives.

Consequently, the primary aim of the project was to identify social objectives and associated indicators that could be applied across a range of fisheries, and that could be compared across fisheries, enabling analysis at the national level. This involved identifying the social responsibilities of fisheries managers, as well as clarifying the areas in which fisheries managers and decision makers can influence social dimensions of ESD through their management decisions and actions.

As a result of this project, a set of social objectives was presented to the Steering Committee of fisheries management agencies representing all five States and the Northern Territory as well as the Commonwealth management agencies of DAFF, AFMA and SEWPAC (now DotE), for review and general agreement as to which were applicable across all their jurisdictions. These social objectives are by their nature values-based and therefore should be revised over time as social values and expectations shift.

A further aim of this project was to test and verify the applicability of the identified social objectives and indicators using the Queensland East Coast Trawl Fishery and three fishing communities in South Australia as case studies. This was undertaken very successfully for the commercial and recreational fishing sectors (part of the ESD 'Industry Community'). Although it was not possible to test every single one of the objectives and indicators identified as part of 'Local/Regional Community' due to budget constraints, most of the objectives and indicators for this part of the ESD tree were tested successfully.

The same level of certainty was not achieved for the second key ESD stakeholder group, 'Indigenous Community', again due to budget constraints. The development of objectives and indicators for Indigenous communities should therefore be considered preliminary only, with further work required to build confidence in the wider applicability and relevance of these objectives and indicators. The set of social objectives and possible associated indicators developed in this project in collaboration with the South Australian Indigenous community of Narungga provides a sound platform from which to progress this work further.

The third and last aim of the project was to review the tested social objectives and indicators with fisheries managers and policy makers, to make final recommendations regarding which are applicable across jurisdictions, and about which to include in a comprehensive Guide that can be used by fisheries managers to incorporate consideration of social dimensions in their decision-making processes. This review process highlighted the importance both of having objectives and indicators that can be customised for each individual fisheries management context; and also of having a 'core' set of objectives and indicators that can be measured across different situations, facilitating comparison of performance and national reporting. The Guide incorporates both these dimensions in its recommendations.

The final Guide provides a comprehensive tool that can be used by fisheries managers. Its utility can be increased by further developing it into an online tool; and through its application in a wider range of case studies.

This work has been undertaken at the same time the FAO, NOAA, UNESCO and Canada have been further developing their approaches and methods for integrating the social dimension into fisheries and ecosystem management. This project incorporated learnings from these other international processes, ensuring that both best practice knowledge was drawn upon, and that this project aligns with international approaches. This ensures that this work can support Australia's participation in global environmental and resource management reporting.

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APPENDICES

Appendix 1 Intellectual Property and/or valuable information arising from the research.
N/A

Appendix 2 List of all the staff that have been engaged on the project.

Principle Investigator:

Dr Lianos Triantafillos – Primary Industries and Regions, South Australia (PIRSA)

Co-Investigators:

Dr Jacki Schirmer – Australian National University/ University of Canberra

Dr Kate Brooks – KAL Analysis Pty Ltd

Dr Sean Pascoe – Commonwealth Scientific and Industrial Research Organisation

Mr Eddie Jebreen - Fisheries Queensland, Department of Agriculture, Fisheries and Forestry

Dr Cathy Dichmont – Commonwealth Scientific and Industrial Research Organisation

Ms Toni Carnard – Commonwealth Scientific and Industrial Research Organisation

Dr Olivier Thebaud – Commonwealth Scientific and Industrial Research Organisation

Appendix 3 Attendance of Steering Committee members at Phase 1 and 3 workshops

Name	Organization	Project role	Workshop	
			Phase 1	Phase 3
Lianos Triantafillos	Primary Industries and Regions South Australia, Fisheries and Aquaculture	Principal Investigator	Yes	Yes
Kate Brooks	KAL Analysis P/L & Fisheries Research and Development Corporation	Project team	Yes	Yes
Jacki Schirmer	ANU Enterprise and University of Canberra	Project team	Yes	Yes
Cathy Dichmont	CSIRO Marine and Atmospheric Research	Project team	Yes	Yes
Sean Pascoe	CSIRO Marine and Atmospheric Research	Project team	Yes	Yes
Eddie Jebreen	Queensland Department of Employment, Economic Development and Innovation	Steering Committee	Yes	Yes
Carmel Anderson	Australian National University Enterprise	Project team	No	Yes
Doug Ferrell	New South Wales Department of Primary Industries-Fishing and Aquaculture	Steering Committee	Yes	Yes
Alice Fistr	Primary Industries and Regions South Australia, Fisheries and Aquaculture	Steering Committee	Yes	No
Andrew Hodges	Victorian Department of Primary Industries-Fisheries	Steering Committee	Yes	Yes
James Bennett	Primary Industries and Regions South Australia, Fisheries and Aquaculture	Steering Committee	Yes	No
Hilary Revill	Tasmanian Department of Primary Industries, Parks, Water and Environment	Steering Committee	Yes	No
Anna Battese	Victorian Department of Primary Industries-Fisheries	Steering Committee	Yes	Yes
Chris Calogeras	C-AID Consultants, Northern Territory	Steering Committee	Yes	Yes
Dallas D'Silva	Victorian Department of Primary Industries-Fisheries	Steering Committee	Yes	No
Ross McGowan	National Seafood Industry Alliance (Commercial Fishing)	Steering Committee	Yes	No
Lindsay Joll	Department of Fisheries, Western Australia	Steering Committee	Yes	Yes
Roslyn Volcano	Northern Territory Department of Resources-Fisheries	Steering Committee	Yes	No
Ian Yaroll	Queensland Department of Employment, Economic	Steering Committee	Yes	No

Name	Organization	Project role	Workshop	
			Phase 1	Phase 3
	Development and Innovation			
Lorraine Hitch	Australian Department of Agriculture, Fisheries and Forestry	Steering Committee	Yes	No
Paul Garrett	Department of Sustainability, Environment, Water, Populations and Communities	Steering Committee	Yes	No
David Galeano	Australian Fisheries Management Authority	Steering Committee	Yes	No
Rachel Pears	Great Barrier Reef Marine Park Authority	Steering Committee	Yes	No
Terry Korodaj	Murray Darling Basin Authority	Steering Committee	Yes	No
Margaret Gooch	Great Barrier Reef Marine Park Authority	Steering Committee	Yes	No
Bill Sawynok	Recreational Fishing Research	Steering Committee	Yes	No
Matt Barwick	Recreational Fishing Research	Steering Committee	No	Yes
Gavin Begg	Australian Department of Agriculture, Fisheries and Forestry	Steering Committee	Yes	No
Lisa Rippin	EconSearch	Steering Committee	Yes	No
Rob Kancans	Australian Bureau of Agricultural and Resource Economics and Sciences	Steering Committee	No	Yes
Brian Jeffriess	Australian Southern Bluefin Tuna Industry Association (representing the Commercial Fishing Association)	Steering Committee	No	Yes
Grant Pullen	Tasmanian Department of Primary Industries, Parks, Water and Environment	Steering Committee	No	Yes
Michelle Wenner	Victorian Department of Primary Industries-Fisheries	Steering Committee	No	Yes
Rick Fletcher	Department of Fisheries, Western Australia	Steering Committee	No	Yes
Steve Bolton	Australian Fisheries Management Authority	Steering Committee	No	Yes

Appendix 4

Developing and Testing Social Objectives and Indicators for Fisheries Management

FRDC Project 2010/040

Phase 1 Report, June 2011

Authors:

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1.0 Background

1.1 Overview of project

In recent years, most legislation guiding fisheries management has incorporated recognition of the need to achieve ecologically sustainable development (ESD). In association with this, considerable work has gone into developing appropriate indicators of the ecological and economic sustainability of fisheries that can be used by fisheries managers and other stakeholders to monitor performance, and make decisions regarding future management. Significantly less work has examined social dimensions of sustainable management. There is a need for specific social objectives and associated relevant indicators for fisheries management to use in the development of management plans and the assessment of them. This requires clarity over the degree and boundaries of social responsibility fisheries management have in areas such as employment, skills and education.

The aims of the project are to identify social objectives relevant to different fisheries contexts, and develop and trial cost-effective indicators for their monitoring. The project is endeavouring to produce outputs that enable fisheries managers and other stakeholders to select and apply the indicators most appropriate to their situation, based on social objectives Fisheries managers nationally, agreed to aim to achieve and the particular fisheries context. This is essential to enable progress to be made on the implementation of triple bottom line assessments for government management of ESD in Australia's fisheries.

The project is funded by the Fisheries Research and Development Corporation, together with Primary Industries Resources South Australia (PIRSA) Fisheries and the CSIRO Wealth from Oceans Flagship. It is led by Primary Industries Resources South Australia (PIRSA) Fisheries. Research partners are KAL Analysis, CSIRO and the Australian National University, who will undertake various aspects of the research.

The overall approach to this project involves three phases: developing a draft national framework of social objectives for fisheries, followed by testing the proposed framework and using results of the fieldwork to refine and revise the recommended framework.

In the second phase these objectives will be tested in relevant case studies, undertaken during 2011 and 2012. It is essential to 'road test' measurement of the objectives in order to test the realism and practicality of these national objectives and indicators. The case studies will be:

- The Queensland trawl fishery, which operates across a wide geographic region covering multiple communities; and
- The South Australian communities of Ceduna, Port Lincoln and Wallaroo, each of which experiences social impacts from multiple fisheries (including commercial, recreational and Indigenous).

The two case studies will provide two approaches to testing the applicability and efficacy of the social objectives developed in the first part of the project: testing via a fishery-based and region-based approach will allow identification of how best to assess performance against the social objectives in a diversity of contexts.

In the third phase of the project, to be completed in late 2012, the results of the case studies will be used to revise and refine the objectives and approaches to monitoring them, and to produce a set of recommended objectives and associated approaches to assessing performance against these objectives in different contexts.

This report summarises the project to the end of the first phase of the research.

1.2 Phase One Project initiation workshop and Objective development

The culmination of the first stage of the project involved a workshop with industry management stakeholders to review the results of a literature review and potential social objectives and indicators that were to be considered by management stakeholders. The task was to provide feedback on the applicability of the objectives and indicators to their jurisdictions, and where appropriate provide any other suggestions on what data is available and how it may be collected. The workshop was attended by fisheries managers from all jurisdictions, as well as legislative stakeholders in marine and freshwater fisheries management including the Murray Darling Basin Authority, Great Barrier Reef Marine Park Authority, the Department of Sustainability, Environment, Water, Population and Communities, and the commercial and recreational fishing industries. The project team sought to identify a representative for Indigenous fisheries; however this was not possible, however it was agreed that Indigenous objectives would be provided to the newly formed FRDC Indigenous Reference Group for comment and input.

The objective of the workshop was ultimately to identify a set of objectives and if possible, associated indicators, for the project to trial in the field with case study commercial, recreational and Indigenous fishing communities in South Australia and Queensland.

The outcome from this first phase is a comprehensive understanding by not only the project team, but also the stakeholders, of:

- The relevance of different social objectives to existing legislative and ESD requirements in fisheries management nationally;
- The work to date on social objectives and indicator identification and testing; and
- Agreed industry, local/regional community and Indigenous social objectives that will have indicators tested in the identified case study communities.

The workshop was very well attended and received positive feedback for the information presented and the opportunity to discuss and explore this particular dimension of ESD and fisheries management responsibilities.

2.0 Phase One - Project methods

The methods employed for this first phase of the project included literature reviews and an industry workshop, which was held in Melbourne on April 5th, 2011 at the Holiday Inn Melbourne Airport.

2.1 Literature Review:

The literature review had two parts, consisting of a review of the legislation governing or affecting fisheries activity in Australia, and the second part related to previous work on social objectives and indicators.

2.1.1. Legislation Literature Review

The first to be undertaken was the review of all fisheries legislation covering each State and Territory of Australia, including the Environment Protection and Biodiversity Act 1999, and the Great Barrier Reef Marine Park Act 1975. The legislation reviewed for each jurisdiction was the overarching legislation, governing all fisheries management activity and plans, rather than individual legislated plans for each fishery. This was on the basis that the legislation for each specific fishery falls out of a jurisdiction's overarching Fisheries' Act, and therefore the absolute minimum that is required in each would be captured. It is recognised that in each State and Territory the individual management plans and legislation for each fishery may have greater detail of social obligations or objectives noted that have been deemed appropriate or necessary in that instance. However it may not be an explicit requirement according to the overarching legislation, dependent upon the jurisdiction.

The results of that review identified the following summary features:

- With the exception of the Commonwealth and Australian Capital Territory, the legislation of all jurisdictions encompassed Commercial, Recreation and Indigenous activity. Commonwealth legislation only refers to commercial fishing activity and ACT's legislation only relates to commercial and recreational fishing activities.
- That the EPBC Act dictates that all Commonwealth organisations are required to report on their environmental performance and how they accord with and advance the principles of ecologically sustainable development (ESD)¹ and further to this, the EPBC Act identified that the principles of ESD encompass that:
 - decision-making processes should effectively integrate both long-term and short-term economic, environmental, social and equitable considerations²;
 - that it is mandatory in deciding whether or not to approve the taking of an action, and what conditions to attach to an approval, that the Minister must consider [...]economic and social matters³.
- The principles of ESD have been enshrined in the majority of fisheries legislation in Australia's States and Territories
- The most commonly cited social objectives of fisheries legislation across Australia were that marine and fisheries resources should be managed to:
 - achieve economic return/benefit;
 - ensure management occurs in a consultative manner;
 - optimise utilisation;
 - ensure equity;
 - seek to achieve co-management; and
 - achieve community benefit.

¹ Section 516A of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) Accessed 1/4/11 http://http://www.comlaw.gov.au/Details/C2011C00014/Html/Volume_1#param1

² EPBC Act (1999), Chapter 1, Part 1, Section 3A

³ EPBC Act (1999), Subdivision B - 136 General considerations:

The full review of legislation along with a summary table of the key features included in each jurisdiction's legislation is provided in Appendix 1, with explicit references to social issues or considerations highlighted in yellow.

2.1.2 Literature Review of previous work on social indicators.

Due to commonality of ESD as a requirement for all jurisdictions, the project team agreed to utilise the ESD Framework previously developed by Fletcher et.al [1] as the basis upon which to frame this current work and therefore the review of previous literature on social objectives and indicators. The hierarchical tree framework that that work identified provided components that, combined with the elements identified as essential from the legislative review, were used to focus the review of past work on social and economic objectives and indicators. (The component tree developed for this work is provided in Appendix 2: Workshop documentation, Figure 2).

The focus of the review was to identify objectives and indicators that can be used to monitor compliance with the principles of ESD, to the benefit of the future of the industry and its sustainability. While the ESD Reporting Framework requires indicators that cover regional and national concerns, local considerations also may need to be taken into account. In particular, impacts of fisheries management decisions on local communities intimately associated with the industry should be taken into account. Consideration of the resilience of these communities to management changes is consequently also an important component of developing social objectives. Consequently the review sought to identify objectives and data collection questions that will inform management decisions for fisheries departments and associated management agencies.

The literature review focused on identifying objectives and association indicators for the following components identified in (i) the ESD component tree developed by Fletcher et al. and (ii) legislation governing fisheries management:

1. Economic
 - a. Economic benefit
 - b. Optimal utilisation
2. Industry Structure
 - a. Employment
 - b. OH&S (Work related injuries)
 - c. Skill Development (use of technical knowledge)
 - d. Attachment to lifestyle
3. Management
 - a. Conflict management
 - b. Consultation and accountability
 - c. Participation
 - d. Promotion of commercial fishing
4. Resource Dependency
 - a. Community wellbeing/benefit
5. Social Capital
6. Environmental monitoring

7. Human Capital
 - a. Community education
8. Infrastructure
9. Public Amenity
 - a. Public Enjoyment
 - b. Cultural benefit
 - c. Heritage values
 - d. Public needs/values
 - e. Recreational enjoyment
10. Indigenous Communities
 - a. Traditional fishing
 - b. Access to land
 - c. Continuation of activities
 - d. Recognition of indigenous values
 - e. Partnering with Indigenous peoples.

A particular focus of the review was identifying indicators that could be monitored at relatively low cost, and which are at least on par with, if not building upon, existing international standards and indicators. The review was also cognisant of identifying indicators and data collection questions that incorporated an element of qualitative evaluation, alongside the more easily digestible quantitative assessment options or documentation provision, as indicators of the circumstance of the industry. The full review is attached in Appendix 3.

2.2 Industry Workshop:

The Industry workshop was undertaken on April 5, 2011, and brought industry management representatives from across Australia together to establish a common platform of understanding:

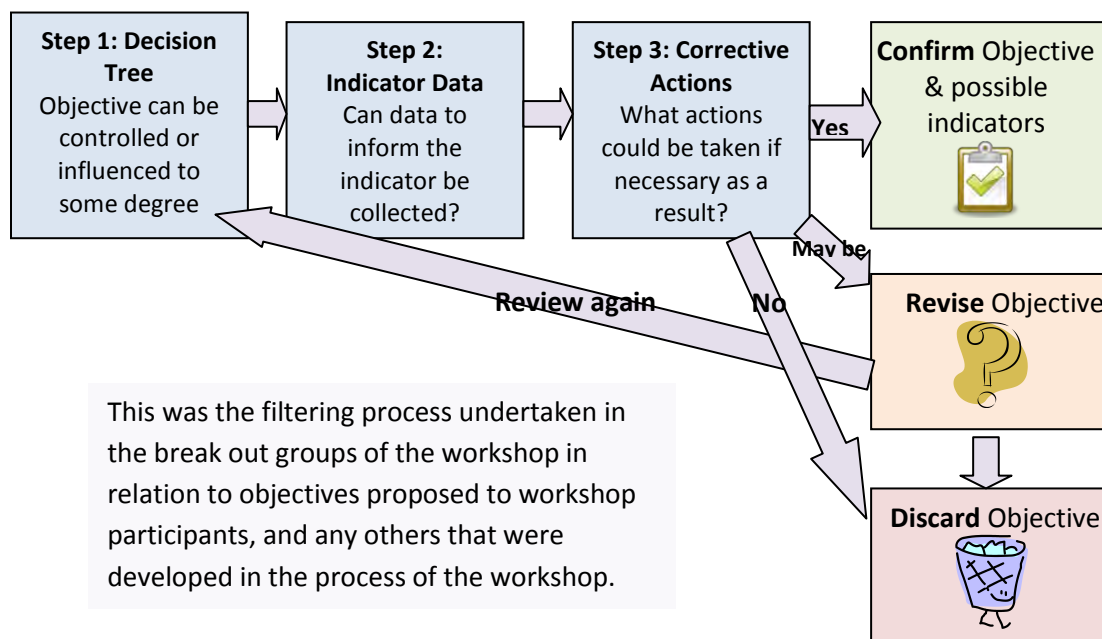
- of the requirements to include a social component in fisheries management;
- of what work had been done in this area before on the basis of the ESD Framework of objectives and indicators;
- to generate discussion around the range of possible objectives and identify the possible essential objectives, compared to those which are considered to 'nice to have' and unnecessary objectives;
- to identify potential indicators or information sources to inform the essential objectives associated with the components of the ESD tree.

The workshop was attended by twenty industry managers and representatives (See Appendix 4). The first session of the day was focussed on bringing all participants up to speed with the project, its objectives and relevancy to them as industry managers and to also inform them of the outcomes to date on a similar but smaller project being undertaken by DEEDI for the East Coast Trawl Fishery in Queensland.

The project team then also ran through the potential objectives that had been identified as a result of the literature review (contained in Appendix 2) which also contained as guidance, a ‘decision tree’ that workshop participants were asked to use to assess the relevancy of potential objectives (Figure 1; also in Appendix 2 Figure 3). Using the decision tree, the participants were asked to consider to what extent they had the ability as managers to influence each objective, and therefore the relevancy of monitoring it. This allowed for acknowledgement that while in some cases fisheries managers may not have any direct ability to influence a particular objective they may have indirect ability to do so, or a need may exist to monitor a particular circumstance for its effects, as they may be under fisheries management control.

The second filter that was then placed over the objective was consideration of whether it is possible to identify measurable indicators to monitor progress toward or achievement of the objective (**Error! Reference source not found.**). Finally, participants needed to consider whether an alternative (revised) objective was needed based on (i) and (ii). If the answer to all of these were ‘no’ then the objective was discarded. This resulted in some being discarded out of hand, however in other cases it resulted in the objective being reviewed to focus specifically on those elements that fisheries agencies do have control or influence over.

Figure 1: Objective filtering process



The workshop then broke out into three groups to review the sets of indicators in groups of A) Industry economics, structure and management; B) Local/regional community resource dependency, Social and human capital, and Environmental management; and C) Local/regional community infrastructure and public amenity; and Indigenous communities. By the end of the day the three groups were each able to review their group’s objectives, but time did not permit each group to review other objectives.

The final session of the day brought all three groups together to run through what was achieved in each group. The group with the most changes to the 'tree' proposed at the outset of the workshop (as per Appendix 2) was that reviewing the industry economics, infrastructure and management. The general perception of the group was that many of the proposed economic objectives were more appropriately considered as "Economic" rather than "Social" objectives. They also felt that many of the proposed economic objectives were out of their control (e.g. the objective of ensuring equity, where it was considered that some individual fishers may earn poor profits due to poor business decisions unrelated to management while others capitalised on management through good decision making).

Similarly, many industry structure objectives were out of the control of managers (e.g. the objective of maximising onshore employment – fisheries managers have no control over where processors locate or how many people they employ). There was considerable interest by the group in the management objectives, especially those involved in enhancing co-management and ensuring industry participation and transparency, and several alternative objectives were proposed by the group.

The second group agreed with the majority of objectives proposed to them on the basis of the literature review; however they did agree that a small number were largely duplicating other objectives and could either be deleted or should be re crafted to alter the focus to encompass further perspectives or being more specific to provide differentiation.

The third group amalgamated several of the initially proposed objectives and reworded others, while focusing on identifying examples of when and why different indicators would be of high or low priority. This group firstly examined objectives relating to infrastructure and public amenity. Proposed objectives were amalgamated and reworded to ensure they were objectives better able to be influenced by fisheries managers, and situations identified where these objective may be useful for monitoring. Indigenous indicators were discussed, with some amalgamation of objectives proposed, and agreement to undertake some further work to develop these objectives in consultation with the Indigenous Working Group.

2.2.1 Nationally relevant Community Wellbeing objectives and indicators

The outcomes of workshop discussions were identification of 24 objectives across the three components of industry, local/regional community and Indigenous communities. These objectives are described in the following section, together with suggested indicators. The indicators identified alongside these objectives are those either previously identified and endorsed by the relevant workshop group, or alternative indicators suggested by the groups as being more relevant, and/or available for regular analysis.

3.0 Proposed Set of Objectives for testing

Of the 24 objectives, ten related to the commercial and recreational fishing industries, covering the areas of maintenance of livelihoods, skills and participation; consultation and inclusion in, and transparency of, decision making; minimisation of non compliance and creation of awareness of social responsibility; management flexibility; and equity of resource access. The second component of local/regional communities comprised a further ten objectives, covering: benefits of fishing activities to the greater community; flexibility in management; trustworthy management and environmental performance; making data appropriately publicly available; supporting industry and local/regional community social capital; enhancing community capacity to develop resource stewardship; access to infrastructure necessary to fishing activities; ensuring public benefit from fishing related infrastructure; and maintenance of cultural and heritage values. The component of Indigenous communities had four objectives, which comprised surety of access for traditional activities; appropriate consultation; positive contribution to traditional livelihoods; and surety of access to income earning opportunities related to fisheries and marine water resources.

3.1 Objectives

The 24 social objectives identified in the workshop and their relevance to the different stakeholder groups are summarised below, with a summary of workshop discussions regarding the importance and relevance of each objectives:

3.1.1 Commercial and recreational fishing industry objectives

1. Maintain or enhance livelihoods of fishing families:
 - This was seen by workshop participants as very context specific ranging from HIGH priority to not applicable. It was seen to be very much related to resource dependency, with its importance increasing as the resource dependency increases (e.g. rural coastal communities with little alternative employment opportunities). It was also seen to be potentially applicable to Indigenous fisheries (where there may be a high resource dependency).
2. Improve the management skills of industry participants in co-management arrangements
 - This was seen to be applicable to commercial, recreational and other (non-fishing) stakeholders involved in fisheries co-management. This was considered a HIGH priority for developing co-management skills. There was general agreement in the group that there were substantial social as well as economic benefits of co-management, but these could only be achieved if the stakeholders were well placed to participate in the decision making process.
3. Maximise cultural, recreational and lifestyle benefits (including health benefits) of fishing for those who participate in fishing activities.
 - This was seen as a HIGH priority. It was seen as applicable mostly to recreational fisheries, although commercial and indigenous fisheries may also have some potential (e.g. lifestyle fisheries).
4. Undertake consultation with industry and ensure accountability for management decisions.

- This was considered a HIGH priority. It was considered primarily applicable to the commercial fisher.
5. Ensure industry participation in management decision making
 - The group considered this in the context of the commercial fishing industry primarily, but it could also apply to recreational sector. This was considered a HIGH priority. It relates to co-management, but is more extensive as it aims to have all individuals contributing either directly or indirectly (i.e. through discussions with industry representatives)
 6. Positive promotion of commercial fishing to ensure a positive perception by the community at large
 - Aimed at the commercial sector primarily where there is a belief that the industry has a poor public image. This was considered a HIGH priority. This relates to a social licence to operate.
 7. Minimise the risk of non-compliance and increase public awareness about social responsibility.
 - This was considered to be a HIGH priority and applicable to commercial, recreational and indigenous fisheries.
 8. Ensure transparency of decision making.
 - The revised objective was considered to be a HIGH priority and applicable to commercial, recreational and indigenous fisheries.
 9. Ensuring that the management framework allows operators to make best decisions
 - Aimed at the commercial sector primarily. This was considered a HIGH priority.
 10. Ensure equitable treatment and access.
 - Applicable to commercial, recreational and indigenous fisheries. This was considered a HIGH priority.

3.1.2 Local/regional community objectives

11. Positively influence fisheries related benefits for regional communities.
 - It was understood that what is regarded as the 'benefit' to regional communities will vary from situation to situation. What is regarded as a positive influence in one community may be regarded as a negative benefit in another. However this high level objective was regarded as being able to cover all situations.
12. Ensure flexible fishery management arrangements to facilitate and support the capacity of regional communities to adapt to change.
 - This related to the ability to adapt and change management arrangements as impacts of change (climate and other) might become evident, in ways that allowed maximum flexibility for fisher related communities (as well as fishers) to adapt to change and accommodate
13. To maximise community trust in fisheries agencies to manage fisheries.
 - It relates to the processes of management and in particular transparency and accountability for actions and decisions.

14. To facilitate and support the cohesion and connectedness of [fishers with their] regional communities through fisheries management.
 - It was noted that this is also related to conflict management objectives. The scope of the objective related to management policy and plans that impacted the capacity of fishers to contribute to and participate in broader community activities and therefore regional social capital.
15. That local and regional community have an awareness of and confidence in, fisheries agency monitoring and reporting of environmental performance under fisheries management obligations.
 - It relates to the communication of the processes of management and in particular the provision of easily accessible information and public notification of that information. NOTE: This is closely aligned with Social Objective 13, which if that is undertaken and performed well against, would have the effect of achieving that social capital objective.
16. To make fisheries collected data available in a timely and publicly accessible manner.
 - This related to all data that could be publicly released in each State.
17. To facilitate capacity building (through skills and knowledge development) for industry and community members to enhance [stewardship of fishing activity].
 - This related to State fisheries programs to educate the general community about recreational fishing or the industry about new developments, both being to enhance stewardship of the environment.
18. Ensure adequate access to infrastructure needed for successful operation of fishing activities
 - Applicable to commercial, recreational and potential Indigenous fishing activities .It is important to ensure that the infrastructure needed by fishers is available to them. Fisheries managers in many cases have only indirect influence over this, but can play a role through actions such as ensuring lobbying of relevant government agencies, and in some cases directly ensuring infrastructure is available. Infrastructure varies in scope and nature, from fish cleaning tables to roads
19. Ensure public benefit from use of fishing related infrastructure where this does not interfere with meeting other objectives of environmental sustainability or health and safety
 - Applicable to all sectors. It is important to ensure that fisheries related infrastructure provides public benefit where possible, usually through enabling the public to use this infrastructure, or to enjoy its presence in other ways (such as enjoying the visual amenity of the infrastructure). However, sometimes it is not possible to provide public access to some types of infrastructure.
20. Ensure maintenance of cultural and heritage values related to fishing activities.
 - Applicable to all sectors. Fisheries managers have a range of mechanisms available to them by which they can ensure they maintain cultural and heritage values (see examples). However, they do not have influence in all situations. This was perceived as a HIGH priority for Indigenous and recreational fishing and marine parks. Participants varied on its priority for commercial fishing, from low to medium/high, depending on the type of fishery.

3.1.3 Indigenous community objectives

21. Ensure provision of access to land, sea and water resources to enable continuation of traditional activities and subsistence use, and respect rights of Indigenous peoples to these resources.
 - This was rated as HIGH priority by participants for situations where traditional/subsistence use occurs. It is a high priority in SA, NSW, Torres fishery, emerging issue for MDBA, but priority for QLD only in situations where you might exclude access to some users to enable others to achieve traditional/subsistence needs
22. Ensure Indigenous people are appropriately consulted regarding fisheries management. NOTE: Objective may need rewording to be specific to type of consultation/participatory management approach in different situations.
 - Relevant to all sectors, although often use different approaches when consulting Indigenous community due to unique needs and issues (e.g. if one objective for all sectors, indicators would need to vary by sector to reflect this). Fisheries managers have control but not necessarily adequate skills and resources in this area
23. Ensure fisheries management contributes positively to Indigenous community livelihoods, culture and activities.
 - Fisheries managers have high control over this in some areas and it is a HIGH priority in these e.g. Torres fisheries where fishery contributes significantly to ability of community to sustain itself and continue to exist. In other situations, low priority.
24. Ensure Indigenous communities are able to access income-earning opportunities related to fisheries, marine and water resources.
 - Applicable to all sectors. Fisheries managers have a range of opportunities to ensure fish stocks and fisheries are managed in way that ensure Indigenous community are able to access income-earning opportunities.

The objectives match relatively closely with the original ESD objective component tree (Figure 2), where the number in brackets represents the objective number above. In some cases, several objectives identified in the workshop as important relate to a single ESD objective. In two instances, new objectives were proposed that did not match directly to those in the ESD framework, with these being classified into a general livelihoods objective and a broad objective relating to effective and efficient management (to which several workshop identified objectives related). Also in several instances (for example, objective 7, 13, 19 and 20 in particular), the objectives identified in the workshop related to several of the ESD objectives, rather than just one.

A number of ESD objectives were also not covered by the objectives determined by the workshop group. As noted previously, the economic objectives were largely considered not relevant in a social objective context, while many of the industry structure objectives (both the fishing industry and related industries) were considered either beyond the ability of managers to control (e.g. employment, especially in related industries) or subject to regulation by other jurisdictions (e.g. OH&S objectives).

While economic objectives were considered to be more appropriately considered separately (under an “Economics” component of a triple bottom line framework), the exclusion of employment as an objective was unexpected. Maintaining or increasing employment was the most common social objective in many previous multi-objective analyses of fisheries and other natural resource management systems (see the review in Appendix 3), and was the only social objective considered in a triple bottom line analysis of all Australian industries [2].

The two previous studies of fisheries management objectives in Australia at the State [3] and Commonwealth levels [4] both identified employment as a key social objective. The objectives in these previous studies were developed through discussions with managers and other stakeholders in their relevant jurisdictions. The main arguments raised by workshop participants for excluding employment as a social objective included that maintaining employment was not seen as their responsibility; and that they could not influence regional employment as they had no direct influence over how many people fishers employed and where processor located and how many people they employed. Some also considered that it was more relevant as an economic consideration rather than a social consideration. While not considered an objective in its own right, however, employment levels was considered to be an indicator for assessing fisheries related benefits for regional communities (objective 11, Table 1).

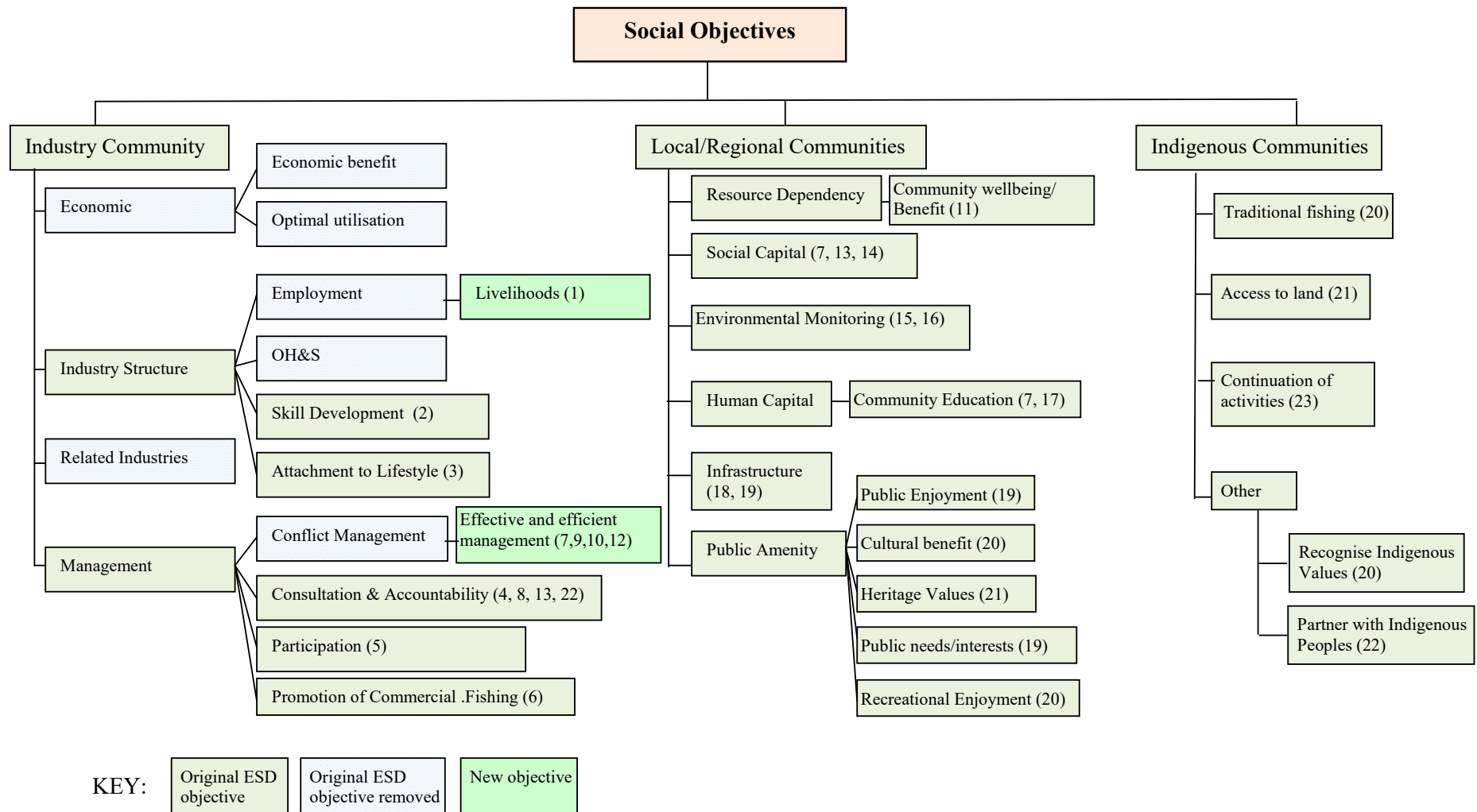


Figure 2: Mapping of objectives determined in the workshop with those under the ESD framework (see Appendix 2).

3.2 Indicators

The groups also considered potential indicators for the final objectives. These were further supplemented with indicators identified in the literature review. A summary of the proposed indicators, how it is envisaged that that data will be collected, or where it will be sourced from, is given in Table 1.

In a number of cases more than one indicator was suggested for an objective. This approach was adopted to ensure that in the second phase of the project, which relates to testing the indicators and therefore objectives, all possible avenues were explored to achieve the best possible results, and the most potential options for fisheries agencies to select from. It is envisaged that, while a single set of objectives for all agencies across Australia be identified, where possible a selection of indicators be provided to inform those objectives, so that agencies can select the indicator most appropriate to the regional circumstances.

Table 1. Potential indicators relating to the identified fisheries objectives

Objective	Proposed indicators	Does measuring this indicator require information from/about			
		Commercial fishers?	Recreational fishers?	Indigenous fishers?	Broader community?
1. Maintain or enhance livelihoods of fishing families	1. Household income in fishing families relative to average household income in area; 2. Extent to which fishers are satisfied with level of income achieved from fishing-related activities (measured via survey of fishers); 3. Quality of life index (survey?); 4. Attachment to occupation (from survey)	yes	no	yes	yes - but probably census data is probably sufficient
2. Improve the management skills of industry participants in co-management arrangements	If a member of a local MAC, have the appropriate skills; number of training opportunities provided	yes - if member of a local MAC	yes - if member of a local MAC	maybe	no
3. Maximise cultural, recreational and lifestyle benefits (including health benefits) of fishing for those who participate in fishing activities	1. Participation rate (assuming more is better?); 2. Identify importance/value placed on cultural, recreational and lifestyle benefits of fishing activities (via survey of fishers); 3. Identify extent to which desired cultural, recreational and lifestyle benefits are being achieved (via survey of fishers)	yes - attitudinal survey - but may be more relevant to recreational fishers	yes - attitudinal survey	yes - cultural values	no

Objective	Proposed indicators	Does measuring this indicator require information from/about			
		Commercial fishers?	Recreational fishers?	Indigenous fishers?	Broader community?
4. Undertake consultation with industry and ensure accountability for management decisions.	1. Industry feels accountable for decision making (survey of fishers - level of satisfaction reported by industry participants with consultation (measured via survey of industry participants); 2. number of meetings held with industry; 3 Inclusion of stakeholders in management advisory groups; 4. Formal process of industry consultation that includes feedback to industry on decisions made; 5. is there an identified management contact	Yes - 1,	yes - 1	potentially	yes if considering other stakeholder groups e.g. conservation groups
5. Ensure industry participation in management decision making	Percentage of industry members and other stakeholders actively involved in or attending a). management advisory groups; and b) meetings/industry forums	no	no	no	no
6. Positive promotion of commercial fishing to ensure a positive perception by the community at large	1. proportion of community who have a positive view towards commercial fishing	no	no	no	yes - attitudinal survey
7. Minimise the risk of non-compliance and increase public awareness about social responsibility	1. Number of reported infringements (not considered a good indicator); 2. Proportion of management cost spent on public awareness; 3. Degree of public awareness of regulations?	no	potentially in relation to degree of public awareness	no	potentially in relation to degree of public awareness
8. Ensure transparency of decision making	1. Perceptions of transparency (survey); 2. Degree to which fishers think that fishers' concerns are taken into consideration	yes	yes	maybe	no

Objective	Proposed indicators	Does measuring this indicator require information from/about			
		Commercial fishers?	Recreational fishers?	Indigenous fishers?	Broader community?
9. Ensuring that the management framework allows operators to make best decisions	1. Existence of some form of transferable property/use right; 2. Any other controls developed in collaboration with industry; 3. Proportion of fishers who are satisfied with level of income achieved from fishing-related activities (measured via survey of fishers); 4. Identified constraints to best decision making (survey of fishers)	yes - 3 and 4	no	no	no
10. Ensure equitable treatment and access	1. Proportion of fishers who believe they are treated fairly relative to other users (other commercial and rec fishers) (survey); 2. If any preferential treatment of one sector over another exists, is this based on robust research of economic or social values ? (from managers); 3. relative share of catch allocated to different sectors	Yes - 1,	yes -1	yes - 1	
11. Positively influence fisheries related benefits for regional communities.	Level of local and region employment and unemployment	This could be collected directly from fishers OR the ABS	Yes - from associated businesses . Some information might be available from business registers and ABS data.	Yes - indigenous fisheries activities Need to define focus on indigenous commercial or customary fishing.	Yes in regards to down stream employment (input output models)
	Growth of a) wild catch levels; b) aquaculture	Yes	No	Potentially	No
	Contribution of fisheries activities to changes in local and regional employment	No	No	No	No
	Community perception of the importance of fishing.	No	No	No	Yes

Objective	Proposed indicators	Does measuring this indicator require information from/about			
		Commercial fishers?	Recreational fishers?	Indigenous fishers?	Broader community?
12. Ensure flexible fishery management arrangements to facilitate and support the capacity of regional communities to adapt to change.	Level of flexibility in fisheries management plans.	Yes	Yes	Yes	Yes
13. To maximise community trust in fisheries agencies to manage fisheries.	Level of regional community and industry consultation in the development of management plans	Yes	Yes	Yes	Yes
14. To facilitate and support the cohesion and connectedness of [fishers with their] regional communities through fisheries management	Evidence of recognition in management plans of community sensitivities, holidays, festivals etc. In regard to open and closing times of fishing access.	Yes	Yes	Yes	Yes
15. That local and regional community have an awareness of and confidence in, fisheries agency monitoring and reporting of environmental performance under fisheries management obligations.	Number of media releases issues to regional and urban communities about data collected and published, that are taken up by the media.	No	No	No	No
16. To make fisheries collected data available in a timely and publicly accessible manner.	Number of information releases	No	No	No	No
	Recency of data that is released	No	No	No	No

Objective	Proposed indicators	Does measuring this indicator require information from/about			
		Commercial fishers?	Recreational fishers?	Indigenous fishers?	Broader community?
17. To facilitate capacity building (through skills and knowledge development) for industry and community members to enhance [stewardship of fishing activity]	Provision of number of training and educational opportunities for Commercial fishers	Yes	No	No	No
	Provision of number of training and educational opportunities for Recreational fishers	No	Yes	No	No
	Provision of number of training and educational opportunities for Indigenous/customary fishers	No	No	Yes	No
	Provision of number of training and educational opportunities for the general community in regard to fishing activities	No	No	No	Yes
18. Ensure adequate access to infrastructure needed for successful operation of fishing activities	1. Fishers self rated level of access to infrastructure (infrastructure to be defined for the individual context). Measured via survey of fishers	Yes, if applied to commercial sector	Yes, if applied to rec sector	Yes, if applied to Indig sector	No
	2. Fisheries managers report on whether access is available to infrastructure identified as necessary for successful operation of fishing activities	No	No	No	No
	3. Independent documentation utilised to identify whether access is available to infrastructure	No	No	No	No

Objective	Proposed indicators	Does measuring this indicator require information from/about			
		Commercial fishers?	Recreational fishers?	Indigenous fishers?	Broader community?
19. Ensure public benefit from use of fishing related infrastructure where this does not interfere with meeting other objectives of environmental sustainability or health and safety	Requires monitoring the public amenity achieved from use of fisheries related infrastructure. This can occur via direct survey of community, with the survey needing to identify two aspects: (a) public amenity values held by the public, which will change over time, and (b) extent to which infrastructure is meeting/fulfilling these values	No	Yes, where amenity values relate specifically to rec fishers	No	Yes
20. Ensure maintenance of cultural and heritage values related to fishing activities	Can only be measured via direct survey of people who take part in or benefit from fishing activities. Surveys need to measure (a) the importance of different cultural and heritage values, and how importance changes over time, and (b) the extent to which fishing activities provide these values	Yes	Yes	Yes	Yes
21. Ensure provision of access to land, sea and water resources to enable continuation of traditional activities and subsistence use, and respect rights of Indigenous peoples to these resources	Identification by Indigenous people of level of access needed, together with identification of satisfaction of Indigenous people with level of access for such activities (via survey of Indigenous people - may be face to face consultation or other form of survey)	No, except where commercial fishery involves Indigenous fishers undertaking traditional activities	No	Yes	No

Objective	Proposed indicators	Does measuring this indicator require information from/about			
		Commercial fishers?	Recreational fishers?	Indigenous fishers?	Broader community?
22. Ensure Indigenous people are appropriately consulted regarding fisheries management.	1. Identify level of consultation fisheries managers are aiming to achieve. 2. Identify if this has been achieved through documentation of participation in consultation process and whether it has achieved the set goals (eg information provision, dialogue, shared decision making, participation of all relevant stakeholders). Can be monitored in two ways: ideally through monitoring satisfaction of BOTH Indigenous people and fisheries managers, or alternatively by identifying satisfaction of only one of these groups with the consultation process. Multiple evaluation points are possible, but particularly (a) whether all relevant stakeholders were given an opportunity to participate, (b) if goals of process were met	No	No	Yes	No
23. Ensure fisheries management contributes positively to Indigenous community livelihoods, culture and activities	Requires identifying (a) the ways fisheries management can contribute and (b) performance against these contributions. A set of potential contributions must be developed before measurement options can be identified				
24. Ensure Indigenous communities are able to access income-earning opportunities related to fisheries, marine and water resources	Identification of measures put in place to support Indigenous income earning opportunities (including capacity building measures, training programs, funding and others) by fisheries managers	Yes, where Indigenous fishers participate in commercial fishing	No	No (info is about Indig fishers but obtained from fisheries managers)	No

Objective	Proposed indicators	Does measuring this indicator require information from/about			
		Commercial fishers?	Recreational fishers?	Indigenous fishers?	Broader community?
	Monitor success of strategies for improving access through surveys of Indigenous people who take part in activities supported by these strategies (eg surveys of those who participate in training that evaluate success)	Yes, where Indigenous fishers participate in commercial fishing	No	Yes	No

4.0 Phase Two - Next Steps

The next step for the project is to move onto Phase Two which involves testing the objectives by collecting data on the indicators identified in selected case studies to confirm if:

- Data are available and able to be collected to inform the indicators;
- Do they effectively provide information in relation to achieving the objective identified; and
- A benchmark can be established from the case study work for national reference.

The second phase will be conducted as case studies undertaken with fishing and local/regional communities in both South Australia and Queensland. In both cases as each area of study is confirmed, the Steering Committee members will be notified to ensure they are informed of the progress of the project.

4.1 South Australian Case Studies

The case studies in South Australia will cover commercial fishing communities, local/regional general communities and indigenous groups. These are currently planned to be undertaken as follows.

A workshop will be held in South Australia with stakeholders from all groups covered by the proposed objectives, to prioritise locally relevant objectives (i.e. where necessary a few more objectives may be added in addition to the national objectives, to 'localise' broader national objectives where relevant) as well as to verify or identify alternative potential indicators. This will then followed by finalising design of questions for surveys most particularly for the recreational sector, local/regional communities and Indigenous communities.

4.1.1 Commercial Fishing Industry & Associated Communities.

A survey is being developed for both fishers and managers of the following fisheries to be implemented in the time frames noted next to each.

Commercial Fishing by Fisheries	Survey and data collection period
Marine Scale Fishery	June 2011
Spencer Gulf Prawn fishery	October 2011
Abalone	November 2011
SA Rock lobster	November 2011

Monitoring of objectives related to commercial fishing activities will largely be undertaken via a survey of fishers and fisheries managers across four fisheries. This involves adding questions to existing survey questions already regularly monitored, ensuring survey fatigue of fishers and their managers is minimised, and also mimicking as closely as possible how data would be collected on a regular basis in the future for reporting on the social dimension of ESD management of our fisheries. Data from fishers will be collected for both their activities in their port of landing as well as their home ports.

Data needed to monitor community benefits arising from commercial fishing activities will be accessed via information provided by commercial fisheries managers and publicly available data.

4.1.2 Recreational and Indigenous Fishing and Associated communities

In relation to assessing the management of recreational fishing on recreational fishers and those communities associated with recreational fishing, it is expected that onsite (boat ramp) surveys will be conducted with recreational fishers. Additionally, if appropriate key representative community members in the local/regional communities, will also be surveyed/interviewed to ensure a reliable data set to inform the indicators.

Similarly with assessing the community wellbeing aspects of fisheries management on Indigenous communities, key representatives of the selected communities will be identified through community elders. Most importantly this aspect of the work will be undertaken in close collaboration and with advice from the FRDC's newly formed Indigenous Reference Group. The draft objectives and indicators are to be sent to the reference group for comment, input and confirmation prior to any field work testing.

Recreational & Indigenous Fishing by location	Survey and data collection periods
Port Lincoln, Wallaroo and Ceduna <ul style="list-style-type: none"> • Locals and SA resident visitors • Interstate visitors 	October 2011 September 2011 March 2012
Indigenous Communities <ul style="list-style-type: none"> • Ceduna 	To be determined

4.2 Queensland Case Studies

The Queensland case study will focus on the East Coast trawl fishery, building on the analysis undertaken in the Tactical Research Fund project (FRDC 2009/100) associated with this project..

A targeted face-to-face survey of commercial fishers and fisheries managers will be undertaken during the period September-December using the same questions developed for the South Australian case study. No regular survey is undertaken of the fishery (unlike in South Australia), and the survey will focus only on the social indicators (rather than a full economic survey). As it is commercial fisheries focused, the indigenous and recreational objectives will not be covered unless they overlap (or are affected by) the objectives relevant to the commercial sector.

A web based survey instrument will also be developed for capturing views in regard to the indicators identified in Table 1 as requiring input of the broader community. This will be publicised through local media to encourage participation in the survey. Recreational fishers will not be surveyed directly, but their views will be captured through the broader community survey and an indicator about recreational fishing activity will be included to see if these views differ from non recreational fishers.

4.3 Linking indicators to objectives

As noted previously, many objectives have several indicators. As these indicators may be affected by factors other than fisheries management, some means of linking changes in these objectives to management effectiveness needs to be developed. A workshop will be held in Brisbane in early 2012 (after the surveys of the fisheries have been completed and the range in indicator values has been assessed) to develop a Bayesian Belief Network (BBN) model that will link both quantitatively and qualitatively the indicator values to the probability of success of the objective. This may also be modelled using a discrete choice model which will also feed into the BBN. The discrete choice model will assess managers' and other stakeholders' perceptions of success in achieving a given objective based on the range of outcomes of the indicators. This will enable a probability of success to be quantitatively assessed, accounting also for differences in opinions of the different stakeholders. As a direct follow up from Phase 1, the relative importance of the objectives will also be assessed using the Analytic Hierarchy Process (AHP) using the participants of the first workshop. These weights will also be incorporated into the BBN to provide an overall indication as to whether the broad (overarching) social objective has been improved given the set of indicators relating to the individual objectives. The AHP analysis will be undertaken in July/August once feedback from the workshop participants on the objective and indicator

5.0 Phase Three - Post Case Studies

Subsequent to the finalisation of all case studies the results for both South Australia and Queensland will be written up and then also amalgamated to identify commonly beneficial objectives and indicators for the three groups identified in the community wellbeing ESD Framework: Industry; local/regional communities; and Indigenous communities.

At that point a summary document will be distributed to the working/steering committee for review and a further meeting convened for all State and Territory representatives of fisheries and associated resource management agencies and industry representative groups. At that meeting it is envisaged that the following information will be presented for review and discussion:

- A summary of the results of the case studies;
- The final recommended objectives and indicators;
- A suggested national framework of social objectives (with an associated guide to indicators) to assess community wellbeing in ESD fisheries management will be proposed for national adoption at each agencies discretion.

The final report of the project will present this data to the FRDC and Australia's fishery management agencies for consideration.

Appendix 1: Legislative Literature Review

Legislation governing Fisheries & Fisheries Management

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1. Commonwealth:

Commonwealth Fisheries Management Act 1991

FISHERIES MANAGEMENT ACT 1991 - SECT 3

Objectives

- (1) The following objectives must be pursued by the Minister in the administration of this Act and by [AFMA](#) in the performance of its functions:
- (a) implementing efficient and cost-effective [fisheries](#) management on behalf of the Commonwealth; and
 - (b) ensuring that the exploitation of [fisheries](#) resources and the carrying on of any related activities are conducted in a manner consistent with the [principles of ecologically sustainable development](#) (which include the exercise of the [precautionary principle](#)⁴), in particular the need to have regard to the impact of [fishing](#) activities on non-target species and the long term sustainability of the marine environment; and
 - (c) maximising the net economic returns to the Australian community from the management of Australian [fisheries](#); and
 - (d) ensuring accountability to the [fishing](#) industry and to the Australian community in [AFMA](#)'s management of [fisheries](#) resources; and
 - (e) achieving government targets in relation to the recovery of the costs of [AFMA](#).

⁴ NATIONAL ENVIRONMENT PROTECTION COUNCIL ACT 1994 - SCHEDULE—Intergovernmental Agreement on the Environment (http://www.austlii.edu.au/au/legis/cth/consol_act/nepca1994432/sch1.html)

3.5.1 precautionary principle —

Where there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. In the application of the precautionary principle, public and private decisions should be guided by:

- (i) careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment; and
- (ii) an assessment of the risk-weighted consequences of various options.

3.5.2 intergenerational equity —

the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations.

(2) In addition to the objectives mentioned in subsection (1), or in [section 78](#) of this Act, the Minister, [AFMA](#) and Joint Authorities are to have regard to the objectives of:

(a) ensuring, through proper conservation and management measures, that the living resources of the AFZ are not endangered by over-exploitation; and

(b) achieving the optimum utilisation of the living resources of the AFZ; and

(c) ensuring that conservation and management measures in the AFZ and the [high seas](#) implement Australia's obligations under international agreements that deal with [fish](#) stocks; and

(d) to the extent that Australia has obligations:

(i) under international law; or

(ii) under the [Compliance Agreement](#) or any other international agreement;

in relation to [fishing](#) activities by Australian flagged [boats](#) on the [high seas](#) that are additional to the obligations referred to in paragraph (c)-ensuring that Australia implements those first mentioned obligations;

but must ensure, as far as practicable, that measures adopted in pursuit of those objectives must not be inconsistent with the preservation, conservation and protection of all species of whales.

SECT 3A - Principles of ecologically sustainable development

The following principles are [*principles of ecologically sustainable development*](#) :

(a) decision-making processes should effectively integrate both long-term and short-term economic, environmental, **social** and equity considerations;

(b) if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation;

(c) the principle of inter-generational equity--that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations;

(d) the conservation of biological diversity and ecological integrity should be a fundamental consideration in decision-making;

(e) improved valuation, pricing and incentive mechanisms should be promoted.

SECT 10 - Operation of certain State and Territory laws

- (1) Except as provided by subsections (2) and (3), this Act is not intended to exclude or limit the concurrent operation of any law of a State or Territory.
- (2) Subject to subsection (3), the Parliament intends that this Act is to apply to the exclusion of any law of a State or Territory relating to [fish](#) or [fishing](#) so far as that law would, but for this Act, apply to:
 - (a) activities in the AFZ; or
 - (b) activities in the [coastal waters](#) of a State or Territory in respect of which a [fishery](#) to which an arrangement mentioned in section 12K of the *Fisheries Act 1952* , or section 76 of this Act, relates; or
 - (c) the landing in the State or Territory of [fish taken](#) under a [statutory fishing right](#) or [fishing permit](#) by prohibiting such landing or by requiring such landing to be done under a licence, permit or similar instrument or upon payment of a fee or charge.
- (3) This Act **does not apply to**:
 - (a) recreational [fishing](#) (whether from a [charter boat](#) or otherwise) that is carried on in the AFZ or outside the AFZ by the use of an [Australian boat](#), other than recreational [fishing](#) that is prohibited or regulated by a [plan of management](#) or [temporary order](#); or
 - (b) recreational [fishing](#) (whether from a [charter boat](#) or otherwise) that is carried on by the use of an [Australian boat](#) in the [coastal waters](#) of a State or Territory, being [coastal waters](#) in respect of which an arrangement mentioned in section 12K of the *Fisheries Act 1952* , or section 76 of this Act, relates, other than recreational [fishing](#) that is prohibited or regulated by a [plan of management](#) or [temporary order](#); or
 - (c) activities in the AFZ to which, because of section 77, this Act does not apply.
- (4) The reference in paragraph 10(2)(c) to prohibiting the landing in a State or Territory of [fish taken](#) under a [statutory fishing right](#) or [fishing permit](#) includes a reference to:
 - (a) directly prohibiting the landing of such [fish](#) in the State or Territory; or
 - (b) directly prohibiting or regulating the possession or [processing](#) of, or other [dealing](#) with, such [fish](#) in the State or Territory in any respect that

would be likely to substantially discourage the landing of such [fish](#) in the State or Territory.

- (5) For the avoidance of doubt, the reference in subsection (2) to a law of a State or Territory relating to [fish](#) or [fishing](#) does not include such a law that is for the protection of public health, for ensuring safety or for any similar objective.

SECT 5 - Coastal waters

- (1) For the purposes of this Act, the [coastal waters](#) of a State or internal Territory are:
- (a) the part or parts of the [territorial sea](#) of Australia that are:
- (i) within 3 nautical miles of the baseline by reference to which the territorial limits of Australia are defined for the purposes of international law; and
 - (ii) adjacent to that State or Territory; and
- (b) any marine or tidal waters that are on the landward side of that baseline and are adjacent to that State or Territory but are not within the limits of a State or Territory.
- (2) Any part of the [territorial sea](#) of Australia that is adjacent to the Jervis Bay Territory is, for the purposes of subsection (1), [taken](#) to be adjacent to New South Wales.

2. Victoria:

Fisheries Act 1995 (Vic)

Category: Coastal and marine

Year: 1995

Jurisdiction: Victoria

Websource: http://www.austlii.edu.au/au/legis/cth/consol_act/fa1995110/

The Act creates a framework for regulation, management, development and conservation of Victorian fisheries, aquatic habitats and ecosystems, aquaculture industries and associated aquatic biological resources. This framework applies to defined 'Victorian waters,' aquariums and hatcheries.

The Act aims to protect and conserve fisheries resources, habitats and ecosystems, and promote sustainable commercial fishing. The means in which the Act achieves these aims include;

- management plans may be created for declared fisheries. 'Fisheries' includes a species of fish or fishing bait, an area of land or waters, a method of fishing, a type of fishing equipment, a class of boats or a class of licences or permits;
- The Act creates various offences regarding fisheries;
 - creates offences in relation to aquatic biota;
 - creates offences for certain acts without a permit;
- Permits can be issued to allow take, injure, destroy, or hatch biota and species;

* Species may be declared to be a noxious aquatic species;

- Provides that any community of aquatic flora or fauna may be declared to be protected aquatic biota (excludes protected wildlife under [Wildlife Act 1975 \(Vic\)](#) and protected flora under [Flora and Fauna Guarantee Act 1988 \(Vic\)](#)) while any community of fish listed under [Flora and Fauna Guarantee Act 1988 \(Vic\)](#) are deemed to be protected aquatic biota;
- provides that any waters not protected under the [National Parks Act 1975 \(Vic\)](#) may be declared a fisheries reserve;

1. establishes Fisheries Co-Management Council;

- licences are regulated by the Commercial Fisheries Licensing Panel;

The Act operates in conjunction with the [Fisheries Management Act 1991 \(Cth\)](#).

Fisheries Act 1995 - SECT 3

(http://www.austlii.edu.au/au/legis/vic/consol_act/fa1995110/s3.html)

Objectives of Act

3. Objectives of Act

The objectives of [this Act](#) are-

- (a) to provide for the management, development and use of Victoria's fisheries, aquaculture industries and associated aquatic biological resources in an efficient, effective and ecologically sustainable manner;
- (b) to protect and conserve fisheries resources, habitats and ecosystems including the maintenance of aquatic ecological processes and genetic diversity;
- (c) to promote sustainable commercial fishing and viable aquaculture industries and quality recreational fishing opportunities for the benefit of present and future generations;
- (d) to facilitate access to fisheries resources for commercial, recreational, traditional and non-consumptive uses;
- (e) to promote the commercial fishing industry and to facilitate the rationalisation and restructuring of the industry;
- (f) to encourage the participation of resource users and the community in fisheries management.

Consultation principles

3A. Consultation principles

- (1) To the extent that it is practicable, the following consultation principles apply to decisions made by the Minister or Secretary [under this Act](#), which affect the use and conservation of Victoria's fisheries resources-
 - (a) the purpose of consultation and any consultation process should be clear, open, timely and transparent;
 - (b) the level of consultation should reflect the likely impact of decisions on persons and fisheries resources;

- (c) the consultation process should be adequately resourced;
 - (d) the consultation process should be flexible and designed to take into account the number and type of persons to be consulted and their ability to contribute to the process;
 - (e) the consultation process should involve consideration of representative advice which represents the views and values of the persons represented;
 - (f) representative advice in relation to the following persons or groups should be considered during any consultation process-
 - (i) recreational fishers;
 - (ii) commercial fishers;
 - (iii) aquaculture operators;
 - (iv) conservation groups;
 - (v) indigenous groups;
 - (g) the consultation process should consider expert advice, which should be obtained from the most appropriate provider;
 - (h) any expert advice obtained during the consultation process should be made available to persons participating in the consultation process.
- (2) Without limiting the generality of subsection (1), for the purposes of that subsection, the following decisions are taken to affect the use and conservation of Victoria's fisheries resources-
- (a) a decision by the Minister to declare or amend a management plan under [Part 3](#);
 - (b) a decision by the Secretary to vary a class of fishery licence under section 54(1)(c);
 - (c) a decision under section 54(1)(d) by the Secretary to vary or revoke a condition imposed by the Secretary, or to impose a new condition, on a class of fishery licence;
 - (d) a decision by the Minister to give, revoke or amend a direction on matters relating to the management of fisheries or zones in a fishery under section 61;
 - (e) a decision by the Minister to make, revoke or amend a quota order in relation to a fishery under section 64, 64A, 66C or 66D;

- (f) a decision by the Minister to make, revoke or amend an order declaring sub-zones in a quota fishery under section 64AB or 66E;
 - (g) a decision by the Minister to appoint a person as a member of the Commercial Fisheries Licensing Panel under section 132(2)(c) or 132(2)(d);
 - (h) a decision by the Minister to nominate a person to be appointed as a member of the Licensing Appeals Tribunal under section 135(2);
 - (i) decisions relating to the making and content of regulations in respect of royalties and levies imposed in accordance with sections 150 and 151;
 - (j) decisions by the Minister relating to priorities for the disbursement of funds that may be paid out of the Recreational Fishing Licence Trust Account under section 151B;
 - (k) a decision by the Minister to make a fisheries notice under section 152(1).
- (3) This section does not apply in relation to the following decisions-
- (a) decisions which are specific to an individual licence or permit, the holder of a licence or permit or a person acting on behalf of a holder of a licence or permit;
 - (b) reviewable decisions within the meaning of section 137.
- (4) In this section person includes an association or body.

FISHERIES (FEES, ROYALTIES AND LEVIES) REGULATIONS 2008 (SR NO 4 OF 2008) - REG 1

Objectives

The objectives of these Regulations are to prescribe the fees, royalties and levies payable in respect of [commercial fishery](#) licences, individual quota units, recreational fishery licences, permits and [boat](#) registrations under the [Fisheries Act 1995](#) and other provisions relating to those fees, royalties and levies.

3. New South Wales

Fisheries Management Act 1994

Act 38 of 1994 - As at 3 September 2010

3 Objects of Act

(1) The objects of this Act are to conserve, develop and share the [fishery](#) resources of the State for the benefit of present and future generations.

(2) In particular, the objects of this Act include:

(a) to conserve [fish](#) stocks and key [fish habitats](#), and

(b) to conserve [threatened species](#), [populations](#) and ecological communities of [fish](#) and [marine vegetation](#), and

(c) to promote [ecologically sustainable development](#), including the conservation of [biological diversity](#),

and, consistently with those objects:

(d) to promote **viable** commercial [fishing](#) and [aquaculture](#) industries, and

(e) to promote quality recreational [fishing](#) opportunities, and

(f) to appropriately share [fisheries](#) resources between the users of those resources, and

(g) to provide social and economic benefits for the wider community of New South Wales, and

(h) to recognise the spiritual, social and customary significance to [Aboriginal persons](#) of [fisheries](#) resources and to protect, and promote the continuation of, [Aboriginal cultural fishing](#).

7D Purpose of [fishery](#) management strategy

(1) A [fishery](#) management strategy is the strategy for achieving the objectives of this Act with respect to the [designated fishing activity](#) for which it is prepared. The draft strategy is the basis for environmental assessment under Division 5 of Part 5 of the EPA Act of that activity.

(2) A draft strategy is to be prepared (in accordance with guidelines agreed between the Minister administering this Act and the Minister administering the EPA Act) so as to enable:

(a) an environmental assessment consistent with the principles on which assessments of activities are undertaken under Part 5 of the EPA Act, and

(b) the cumulative environmental impact of [fisheries](#) approvals under this Act to be assessed.

7E Content of [fishery](#) management strategy

A [fishery](#) management strategy is to:

- (a) describe the [designated fishing activity](#) for which it is prepared, and
- (b) incorporate any [management plan](#) or draft [management plan](#) for the [fishery](#) concerned, and
- (c) outline the [fishing regulatory controls](#) or proposed [fishing regulatory controls](#) applicable to the [designated fishing activity](#), and
- (d) outline the likely interaction of the [designated fishing activity](#) with other [fishing](#) activities, and
- (e) include performance indicators to monitor whether the objectives of the strategy (and the [management plan](#)) and [ecologically sustainable development](#) are being attained, and
- (f) describe how the [designated fishing activity](#) is to be monitored, and
- (g) specify at what point a review of the strategy is required when a performance indicator is not being satisfied

4. Queensland

Fisheries Act 1994

- Reprinted as in force on 1 July 2010

Division 2 Objectives 3 Particular purposes of Act

(1) **The main purpose of this Act** is to provide for the use, conservation and enhancement of the community's fisheries resources and fish habitats in a way that seeks to—

- (a) apply and balance the principles of ecologically sustainable development;
- and
- (b) promote ecologically sustainable development.

(2) In balancing the principles, each principle is to be given the relative emphasis appropriate in the circumstances.

(3) Despite the main purpose of this Act, a further purpose of this Act is to reduce the possibility of shark attacks on humans in coastal waters of the State adjacent to coastal beaches used for bathing.

(4) Subsections (1) and (3) do not limit the purposes of this Act.

(5) In this section ***ecologically sustainable development*** means using, conserving and enhancing the community's fisheries resources and fish habitats so that—

- (a) the ecological processes on which life depends are maintained; and
- (b) the total quality of life, both now and in the future, can be improved.

precautionary principle means the principle that, if there is a threat of serious or irreversible environmental damage, lack of scientific certainty should not be used as a reason to postpone measures to prevent environment degradation, or possible environmental degradation, because of the threat.

principles of ecologically sustainable development means the following principles—

- (a) enhancing individual and community wellbeing through economic development that safeguards the wellbeing of future generations;
- (b) providing fairness within and between generations;
- (c) protecting biological diversity, ecological processes and life-support systems;
- (d) in making decisions, effectively integrating fairness and short and long-term economic, environmental and social considerations;
- (e) considering the global dimension of environmental impacts of actions and policies;
- (f) considering the need to maintain and enhance competition, in an environmentally sound way;

- (g) considering the need to develop a strong, growing and diversified economy that can enhance the capacity for environmental protection;
- (h) that decisions and actions should provide for broad community involvement on issues affecting them;
- (i) the precautionary principle.

3A How particular purposes are to be primarily achieved

- (1) The main purpose of this Act is to be primarily achieved by—
 - (a) giving the chief executive appropriate powers to perform the chief executive's functions under this Act; and
 - (b) providing for the following—
 - (i) the management and protection of fish habitats;
 - (ii) the management of commercial, recreational and indigenous fishing;
 - (iii) the prevention, control and eradication of disease in fish;
 - (iv) the management of aquaculture.
- (2) The further purpose of this Act under section 3(3) is to be primarily achieved by the chief executive establishing and managing a program for particular coastal waters of the State adjacent to coastal beaches used for bathing.
- (3) The program is the ***shark control program***.

Part 5 - 35 What management plan must deal with

A management plan must state its objectives and how they are to be achieved.

Part 5 - 36 What management plan may deal with

The management plan may make provision about anything prescribed under a regulation for this section or the chief executive considers appropriate to deal with in the plan.

Examples of what the chief executive may consider appropriate to deal

with—

- 1 Fishing capacity of a fishery and its measurement.
- 2 The way a fishery is to be managed, which may include, for example, the regulation of the following—
 - (a) fishing methods;
 - (b) taking of a species, type or quantity of fisheries resources;
 - (c) the use of a type, size or quantity of fishing apparatus;
 - (d) use of a type or number of boats;
 - (e) a period of fishing.
- 3 Management of a fishery by a system of authorities and for any of the following in relation to the authorities—
 - (a) their issue;

- (b) their conditions;
 - (c) whether they can or cannot be amended, renewed or transferred;
 - (d) if they can be amended, renewed or transferred—conditions for the amendment, renewal or transfer;
 - (e) for their cancellation or suspension or for how the chief executive may cancel or suspend them.
- 4 Procedures to be followed to select persons to whom authorities are to be issued.
 - 5 Obligations of holders of authorities which may include, for example, a requirement to install, maintain and use VMS equipment.
 - 6 Regulation of recreational activities in a fishery.
 - 7 Regulation of fishing for research purposes in a fishery.
 - 8 Formulation and funding of restructuring or adjustment schemes.
 - 9 Formulation and funding of fisheries restocking or enhancement programs.
 - 10 Research, education and environmental issues.
 - 11 Enforcement.
 - 12 Boundaries of, and buffer zones for, a fish habitat or declared fish habitat area.
 - 13 Regulation of development in a fish habitat or declared fish habitat area.
 - 14 How a fish way must be operated.
 - 15 How a fish habitat, declared fish habitat area or fisheries resources are to be managed or restored.
 - 16 Fish migration.

5. Australian Capital Territory

Fisheries Act 2000

Section 3: Objects

The objects of this Act are—

- (a) to conserve native fish species and their habitats; and
- (b) to manage sustainably the fisheries of the ACT by applying the principles of ecologically sustainable development mentioned in the [Environment Protection Act 1997](#), section 2 (2); and
- (c) to provide high quality and viable recreational fishing; and
- (d) to cooperate with other Australian jurisdictions in sustaining fisheries and protecting native fish species.

SECT 5 - Content of fisheries management plan

A fisheries management plan must include—

- (a) a description of fish species and their habitats in the ACT; and
- (b) a description of current and potential threats to fish species and their habitats; and
- (c) measures to be taken to achieve the objects of this Act, including performance indicators and monitoring methods; and
- (d) guidelines to which the conservator must have regard in exercising functions under this Act.

SECT 6 - Preparation of fisheries management plan

The conservator must prepare a draft management plan for management of fish species and their habitats in the ACT.

SECT 7 - Consultation on draft plan

- (1) If the conservator prepares a draft fisheries management plan, the conservator must prepare a written notice—
 - (a) containing a brief description of the draft plan; and
 - (b) stating where copies of the draft plan may be obtained; and
 - (c) inviting written suggestions or comments about the draft plan to be given to the conservator, at the place stated in the notice, within 60 working days after the day the notice is notified under the [Legislation Act](#) (the *consultation period*).

SECT 8 - Consideration of suggestions etc and revision of draft plan

- (1) The conservator must consider the suggestions and comments given to the conservator during the consultation period about the draft plan.
- (2) The conservator may, in writing, revise the draft plan in accordance with any of the suggestions or comments.

6. Great Barrier Reef Marine Park Authority (GBRMPA)

Great Barrier Reef Marine Park Act 1975

(<http://www.frli.gov.au/ComLaw/Legislation/ActCompilation1.nsf/0/124C6B80CDDABEECA2576E2007B0A1F?OpenDocument>)

The Great Barrier Reef Marine Park Act 1975 is the primary Act in respect of the Great Barrier Reef Marine Park. It includes provisions which:

- Establish the Great Barrier Reef Marine Park (the Marine Park)
- Establish the Great Barrier Reef Marine Park Authority (GBRMPA), a Commonwealth authority responsible for the management of the Marine Park
- Provide a framework for planning and management of the Marine Park, including through zoning plans, plans of management and a system of permissions
- Prohibit mining operations (which includes prospecting or exploration for, as well as recovery of, minerals) in the Great Barrier Reef Region (unless authorised to carry out the operations by a permission granted under the Regulations, for the purpose of research or investigations relevant to the conservation of the Marine Park)
- Require compulsory pilotage for certain ships in prescribed areas of the Great Barrier Reef Region
- Provide for regulations, collection of Environmental Management Charge, enforcement etc.

Great Barrier Reef Marine Park Act 1975, Act No. 85 of 1975 as amended.

This compilation was prepared on 5 March 2010 taking into account amendments up to Act No. 8 of 2010

Part I—Preliminary

2A Objects of this Act

- (1) The main object of this Act is to provide for the long term protection and conservation of the environment, biodiversity and heritage values of the Great Barrier Reef Region.
- (2) The other objects of this Act are to do the following, so far as is consistent with the main object:
 - (a) allow ecologically sustainable use of the Great Barrier Reef Region for purposes including the following:
 - (i) public enjoyment and appreciation;
 - (ii) public education about and understanding of the Region;
 - (iii) recreational, economic and cultural activities;
 - (iv) research in relation to the natural, social, economic and cultural systems and value of the Great Barrier Reef Region;

- (b) encourage engagement in the protection and management of the Great Barrier Reef Region by interested persons and groups, including Queensland and local governments, communities, Indigenous persons, business and industry;
- (3) In order to achieve its objects, this Act:
- (a) provides for the establishment, control, care and development of the Great Barrier Reef Marine Park; and
 - (b) establishes the Great Barrier Reef Marine Park Authority; and
 - (c) provides for zoning plans and plans of management; and
 - (d) regulates, including by a system of permissions, use of the Great Barrier Reef Marine Park in ways consistent with ecosystem-based management and the principles of ecologically sustainable use; and
 - (e) facilitates partnership with traditional owners in management of marine resources; and
 - (f) facilitates a collaborative approach to management of the Great Barrier Reef World Heritage area with the Queensland government

Part VB—Plans of management

39V Interpretation

A reference in this Act to a community group having a special interest in an area of the Marine Park includes a reference to the people in the group who have some form of native title to the area or its resources or have some other special identification with the area or its resources.

39W Preparation of plans of management

- (1) The Authority may, in writing, prepare plans of management for the Marine Park in accordance with this Part.
- (2) This Part does not prevent the Authority from preparing and implementing a plan of management for an area of the Marine Park under a provision of this Act other than this Part or under a provision of a zoning plan and this Part does not apply in relation to such a plan of management.
- (3) Plans of management prepared in accordance with this Part may set out:
 - (a) policies and strategies in relation to management of the matters referred to in section 39X; and
 - (b) enforcement provisions (see subsection 39ZD(5)).

39X Types of plans of management

The Authority may prepare plans of management for the following:

- (a) one or more areas of the Marine Park;
- (b) one or more species within the Marine Park or within an area or areas of the Marine Park;
- (c) one or more ecological communities within the Marine Park or within an area or areas of the Marine Park.

39Y Objects of plans of management

The objects of plans of management are as follows:

- (a) to ensure, for particular areas of the Marine Park in which the Authority considers that nature conservation values, cultural and heritage values, or scientific values, are, or may be, threatened, that appropriate proposals are developed to reduce or eliminate the threats;
- (b) to ensure management for the recovery and continued protection and conservation of species and ecological communities that are, or may become:
 - (i) extinct; or
 - (ii) extinct in the wild; or
 - (iii) critically endangered; or
 - (iv) endangered; or
 - (v) vulnerable; or
 - (vi) conservation dependent;
- (c) to ensure that activities within areas of the Marine Park are managed on the basis of ecologically sustainable use;
- (d) to provide a basis for managing the uses of a particular area of the Marine Park that may conflict with other uses of the area or with the values of the area;
- (e) to provide for the management of areas of the Marine Park in conjunction with community groups in circumstances where those groups have a special interest in the areas concerned;
- (f) to enable people using the Marine Park to participate in a range of recreational activities.

39ZA Arrangements with community groups that have special interests in areas of the Marine Park

- (1) The Authority may enter into an agreement or arrangement for the purposes of this Part with a group of people who are representative of a community group that has a special interest in an area of the Marine Park.
- (2) The agreement or arrangement may relate to the development and/or the implementation of a plan of management for, or for a species or ecological community within, the area concerned and may, if the Authority considers it

appropriate, provide that, if such a plan of management is prepared, the community group is to manage the area, or the species or ecological community within the area, jointly with the Authority in accordance with the plan.

39ZB Notice of proposal to prepare plan of management

(1) Before preparing a plan of management, the Authority must, by public notice:

- (a) state that it proposes to prepare the plan; and
- (b) set out the area, species or ecological community to which the plan is to relate; and
- (c) invite the public to make comments in relation to matters to be included in the plan by the date specified in the notice (which must be at least 1 month after the date the notice is published in the *Gazette*); and
- (d) specify the address to which comments must be sent.

(2) The Authority must take into account any comments made in accordance with the notice.

[sic – lack of (3)]

(4) After the publication of the notice, the Authority may decide that the proposed plan of management is to cover an area, species or ecological community not mentioned in the notice but, if it does so, it is not required to give a further public notice in relation to the proposed plan.

39ZE Notice of preparation of plan of management

(1) When the Authority has prepared a plan of management, the Authority must cause public notice to be given:

- (a) stating the plan has been prepared; and
- (b) setting out the area, species or ecological community to which the plan relates; and
- (c) invite the public to make comments in connection with the plan by the date specified in the notice (which must be at least 1 month after the date the notice is published in the *Gazette*); and
- (d) stating:
 - (i) an address from which copies of the plan may be obtained; and
 - (ii) an address to which comments must be sent.

[sic – lack of (2)]

(3) The Authority must take into account any comments made in accordance with the notice and:

- (a) if it thinks fit, alter the plan of management accordingly; or
- (b) otherwise, confirm the plan of management.

- (4) The Authority must cause public notice to be given:
- (a) if it has altered the plan of management as mentioned in paragraph (3)(a):
 - (i) stating that the plan of management has been altered; and
 - (ii) stating an address at which copies of the plan of management as altered may be inspected or from which copies of the plan of management as altered may be obtained; or
 - (b) otherwise, stating that the plan of management has been confirmed.
 - (c) assist in meeting Australia's international responsibilities in relation to the environment and protection of world heritage (especially Australia's responsibilities under the World Heritage Convention).

7. Primary Industry and Resources Standing Committee

House of Representatives Standing and Sessional Orders

As at 1 December 2008

Chapter 16. Standing, select and joint committees

The chapter also provides for the operation of committees.

Standing committees

214 Appointment of standing committees

Standing committees shall be appointed at the beginning of each Parliament.

215 General purpose standing committees

- a. The following general purpose standing committees shall be appointed:
 - i. Standing Committee on Aboriginal and Torres Strait Islander Affairs;
 - ii. Standing Committee on Climate Change, Water, Environment and the Arts;
 - iii. Standing Committee on Communications;
 - iv. Standing Committee on Economics;
 - v. Standing Committee on Education and Training;
 - vi. Standing Committee on Employment and Workplace Relations;
 - vii. Standing Committee on Family, Community, Housing and Youth;
 - viii. Standing Committee on Health and Ageing;
 - ix. Standing Committee on Industry, Science and Innovation;
 - x. Standing Committee on Infrastructure, Transport, Regional Development and Local Government;
 - xi. Standing Committee on Legal and Constitutional Affairs; and
 - xii. Standing Committee on Primary Industries and Resources.
- b. A committee appointed under paragraph (a) may inquire into and report on any matter referred to it by either the House or a Minister, including any pre-legislation proposal, bill, motion, petition, vote or expenditure, other financial matter, report or document.
- c. A committee may make any inquiry it wishes to make into annual reports of government departments and authorities and reports of the Auditor-General presented to the House. The following qualifications shall apply to these inquiries:
 - i. Reports shall stand referred to committees under a schedule presented by the Speaker to record the areas of responsibility of each committee.
 - ii. The Speaker shall determine any question about responsibility for a report or part of a report.
 - iii. The period during which an inquiry into an annual report may be started by a committee shall end on the day the next annual report of the department or authority is presented to the House.
 - iv. If a committee intends to inquire into all or part of a report of the Auditor-General, the committee must notify the Joint Committee of Public Accounts and Audit of its intention, in writing.

- d. Each committee appointed under paragraph (a) shall consist of 10 members: six government and four non-government Members. Each committee may supplement its membership by up to two members for a particular inquiry, with a maximum of one extra government and one extra non-government Member.

216 Committee of Privileges and Members' Interests

- a. A Committee of Privileges and Members' Interests shall be appointed to:
 - i. inquire into and report on complaints of breach of privilege or contempt which may be referred to it by the House under *standing order 51* or by the Speaker under *standing order 52*, or any other related matter referred to it by or in accordance with a resolution of the House;
 - ii. inquire into and report on the arrangements made for the compilation, maintenance and accessibility of a Register of Members' Interests;
 - iii. consider proposals by Members and others on the form and content of the Register of Members' Interests;
 - iv. consider specific complaints about registering or declaring interests;
 - v. consider possible changes to any code of conduct adopted by the House; and
 - vi. consider whether specified persons (other than Members) ought to be required to register and declare their interests.
- b. The committee shall consist of 11 members: the Leader of the House or his or her nominee, the Deputy Leader of the Opposition or his or her nominee and nine other members, five government and four non-government Members. When the Opposition is composed of two parties, the non-government Members shall consist of at least one member of the smaller opposition party.
- c. The committee may call for witnesses and documents, but when considering a matter concerning the registration or declaration of Members' interests it must not exercise that power or undertake an investigation of a person's private interests unless the action is approved by at least 6 members of the committee other than the Chair.
- d. The committee may report when it sees fit, and must report to the House on its operations in connection with the registration and declaration of Members' interests during the year as soon as possible after 31 December each year.

8. Western Australia:

Western Australia Fish Resources Management Act 1994

An Act relating to the management of fish resources, to repeal and amend certain Acts, and for related purposes.

Part 1 — Preliminary

1. Short title

This Act may be cited as the *Fish Resources Management Act 1994* ¹.

2. Commencement

This Act comes into operation on such day as is fixed by proclamation ¹.

3. Objects

(1) The objects of this Act are to conserve, develop and share the fish resources of the State for the benefit of present and future generations.

(2) In particular, this Act has the following objects —

(a) to conserve fish and to protect their environment;

(b) to ensure that the exploitation of fish resources is carried out in a sustainable manner;

(c) to enable the management of fishing, aquaculture and associated industries, aquatic eco-tourism and other tourism reliant on fishing;

(d) to foster the development of commercial and recreational fishing and aquaculture including the establishment and management of aquaculture facilities for community or commercial purposes;

(e) to achieve the optimum economic, social and other benefits from the use of fish resources;

(f) to enable the allocation of fish resources between users of those resources;

(g) to provide for the control of foreign interests in fishing, aquaculture and associated industries;

(h) to enable the management of fish habitat protection areas and the Abrolhos Islands reserve.

4. ...

5. ...

6. Application of Act to Aboriginal persons

An Aboriginal person is not required to hold a recreational fishing licence to the extent that the person takes fish from any waters in accordance with continuing Aboriginal tradition if the fish are taken for the purposes of the person or his or her family and not for a commercial purpose.

7. Exemptions ...

8. Crown bound ...

Part 3 — Commonwealth-State management of fisheries

Division 3 — Arrangements for management of particular fisheries

22. ...

24. Functions of Joint Authority

(1) If, in respect of a fishery, an arrangement is in force under which a Joint Authority has the management of the fishery and the fishery is to be managed in accordance with the law of the State, the Joint Authority has the functions of —

- (a) keeping constantly under consideration the condition of the fishery;
- (b) formulating policies and plans for the **good management of the fishery**; and
- (c) for the purposes of the management of the fishery —
 - (i) exercising the powers conferred on it by this Act; and
 - (ii) co-operating and consulting with other authorities (including other Joint Authorities within the meaning of the Commonwealth Act) in matters of common concern.

(2) A Joint Authority is to pursue the following objectives in the performance of its functions under subsection (1) —

- (a) ensuring, through proper conservation, preservation and fisheries management measures, that fish resources are not endangered by over-exploitation; and
- (b) achieving the **optimum utilization** of those resources.

25. Joint Authority to exercise certain powers instead of Minister etc.

Part 4 — Advisory Committees

Division 1 — Rock Lobster Industry Advisory Committee

29. Rock Lobster Industry Advisory Committee

30. Functions of Advisory Committee

(1) The functions of the Advisory Committee are —

- (a) **to identify issues that affect rock lobster fishing;**
- (b) to advise the Minister on matters relating to the management, protection and development of rock lobster fisheries; and
- (c) **to advise the Minister on matters relating to rock lobster fisheries on which the advice of the Advisory Committee is sought by the Minister.**

(2) The Advisory Committee may do all things necessary or convenient to be done for or in connection with the performance of its functions.

Division 2 — Recreational Fishing Advisory Committee

33. Recreational Fishing Advisory Committee

34. Functions of Advisory Committee

(1) The functions of the Advisory Committee are —

- (a) to identify issues that affect recreational fishing;
 - (b) to advise the Minister on issues relating to recreational fishing and the management of recreational fishing;
 - (c) to advise the Minister on recreational fishing funding priorities; and
 - (d) to advise the Minister on any matter related to recreational fishing on which the advice of the Advisory Committee is sought by the Minister.
- (2) The Advisory Committee may do all things necessary or convenient to be done for or in connection with the performance of its functions.

Division 3 — Aquaculture Development Council

37. Aquaculture Development Council

- (1) An Advisory Committee to be known as the Aquaculture Development Council (in this Division referred to as the “**Council**”) is to be established.

38. Functions of Council

- (1) The functions of the Council are —
- (a) to identify issues that affect aquaculture;
 - (b) to advise the Minister on issues relating to aquaculture and the management of aquaculture; and
 - (c) to advise the Minister on any matter related to aquaculture on which the advice of the Council is sought by the Minister.
- (2) The Council may do all things necessary or convenient to be done for or in connection with the performance of its functions.

Division 4 — Fishery Management Advisory Committees

41. Fishery Management Advisory Committees

- (2) The function of an advisory committee is to provide information and advice to the Minister on matters related to the protection and management of the fishery.
- (3) The instrument establishing an advisory committee —
- (a) must identify the fishery for which the committee is established and the members of the committee;
 - (b) may provide for any other matter that, in the Minister’s opinion, is necessary for the operation of the committee.
- (4) The Minister may, by further instrument in writing, amend or revoke an instrument made under this section.
- (5) An advisory committee may be established under this section for a fishery whether or not a management plan is in force in respect of that fishery.

Division 5 — Other Committees

42. Other committees

- (1) The Minister may, by instrument in writing, establish other advisory committees, consisting of such person's as the Minister thinks fit, to provide information and advice to the Minister on matters related to the administration of this Act.
- (2) The instrument establishing an advisory committee —
 - (a) must specify the functions, and identify the members, of the committee;
 - (b) may provide for any other matter that, in the Minister's opinion, is necessary for the operation of the committee.
- (3) The Minister may, by further instrument in writing, amend or revoke an instrument made under this section.

Part 5 — General regulation of fishing

Part 6 — Management of fisheries

Division 1 — Interpretation

53. Meaning of “authorisation” in this Part

In this Part, “authorisation” means —

- (a) in relation to a managed fishery, a managed fishery licence; or
- (b) in relation to an interim managed fishery, an interim managed fishery permit.

Division 2 — Management plans

54. Determination of management plan

- (1) The Minister may, by instrument in writing published in the *Gazette*, determine a management plan for a fishery.

...

56. General contents

- (1) A management plan must —
 - (a) identify the fishery to which it relates; and
 - (b) declare the fishery to be either —
 - (i) a managed fishery; or
 - (ii) an interim managed fishery.
- (2) A management plan declaring a fishery to be an interim managed fishery may further classify the fishery as a developmental fishery.
- (3) A management plan may include any provision that, in the Minister's opinion, is necessary for the protection or management of the fishery or any part of the fishery.

57. Expiry date

- (1) A management plan for an interim managed fishery may provide that the plan only has effect for a specified period.
- (2) Subsection (1) does not limit the Minister's power to revoke a management plan.

58. Management plan — authorisations

- (1) Without limiting section 56(3), a management plan may prohibit a person from engaging in fishing or any fishing activity of a specified class in the fishery or any part of the fishery otherwise than in accordance with an authorisation.
- (2) The management plan may —
 - (a) provide for different classes of authorisations;
 - (b) restrict the number of authorisations that can be granted or provide that no further authorisations can be granted;
 - (c) specify criteria to be satisfied before the Executive Director can grant an authorisation;
 - (d) specify a procedure for determining which persons are to be granted authorisations if the number of eligible persons seeking an authorisation exceeds the number of authorisations that can be granted;
 - (e) provide for the submission and consideration of objections to the grant of authorisations;
 - (f) provide for specified things to be endorsed on authorisations;
 - (g) specify conditions to which authorisations are subject;
 - (h) specify grounds on which the Executive Director may cancel, suspend or refuse to renew an authorisation (in addition to those already specified in section 143(1)(a) to (g));
 - (i) specify a period for which an authorisation remains in force after it has been granted or renewed;
 - (j) specify criteria to be satisfied before the Executive Director can vary an authorisation on the application of the holder of the authorisation;
 - (k) specify grounds on which the Executive Director may refuse to transfer an authorisation or any part of an entitlement under an authorisation;
 - (l) prescribe fees payable in respect of applications for —
 - (i) the grant, renewal and variation of authorisations; or
 - (ii) the transfer of authorisations or entitlements under authorisations;
 - (m) prescribe fees payable for the issue of authorisations.

59. Management plan — capacity of fishery

- (1) Without limiting section 56(3), a management plan may specify the capacity of the fishery or any part of the fishery.
- (2) The capacity may be specified by reference to —
 - (a) a quantity of fish that may be taken;
 - (b) a quantity of fishing gear that may be used;
 - (c) a number of boats that may be used;

(d) a number of persons who may engage in fishing; or

(e) any other thing.

(3) The capacity is to be determined in accordance with the method specified in the management plan or prescribed in the regulations.

60. Management plan — entitlements

(1) Without limiting section 56(3), a management plan may provide for a scheme relating to the extent of the entitlements conferred by authorisations in respect of the fishery or any part of the fishery.

65. Procedure before amending management plan

(1) A management plan must specify an advisory committee or advisory committees or a person or persons who are to be consulted before the plan is amended or revoked.

(2) Before amending or revoking a management plan the Minister must consult with the advisory committee or advisory committees or the person or persons specified for that purpose in the plan.

(3) Despite subsection (2), the Minister may amend a management plan without consulting in accordance with that subsection if, in the Minister's opinion, the amendment is —

(a) required urgently; or

(b) of a minor nature.

(4) If —

(a) the Minister amends a management plan; and

(b) the amendment is made without consultation because it is, in the Minister's opinion, required urgently, the Minister must consult with the advisory committee or advisory committees or the person or persons specified for that purpose in the plan as soon as practicable after the plan has been amended.

...

71. Prior fishing confers no right to authorisation

(1) The fact that a person engaged in fishing, or used any boat for fishing, in a fishery before a management plan was determined for the fishery is not to be taken as conferring upon that person any right to the grant of an authorisation if a management plan is determined for that fishery.

(2) Despite subsection (1), the Executive Director **is to take into account a person's past history of fishing in a fishery when** determining whether or not to grant the person an authorisation.

72. Grant of authorisation confers no right to subsequent authorisation

(1) The grant of an authorisation to any person is not to be taken as conferring on that person any right to the grant of another authorisation if a subsequent management plan is determined for the fishery.

(2) Despite subsection (1), the Executive Director is to take into account the fact that a person held an authorisation when determining whether or not to grant the person another authorisation.

Part 7 — Fish processing

...

80. Grant of permit

(1) If a person applies to the Executive Director for a permit and the Executive Director is satisfied that —

- (a) the person is a fit and proper person to hold such a permit;
- (b) the person intends to process fish for a commercial purpose in or on the place;
- (c) the person appears likely to satisfy the criteria for the grant of a fish processor's licence;
- (d) it is in the better interests of the fishing industry to grant the permit having regard to —
 - (i) the number of establishments in respect of which permits or fish processor's licences have already been granted or sought;
 - (ii) the size and nature of those establishments; and
 - (iii) such other matters as the Executive Director thinks fit;

and

- (e) the construction or modification (as the case may be) and the use of the place has been approved by other relevant authorities,

...

Part 10 — Designated fishing zones

109. Area may be prescribed to be designated fishing zone

(1) An area of waters or an area of the seashore up to high water mark and any waters adjacent to that area may be prescribed to be a designated fishing zone for the purposes of this Act if in the opinion of the Governor —

- (a) the area contains a fishery of particular social or economic importance; and
- (b) the fishery is particularly susceptible to disturbance by human activity.

(2) An area may be prescribed to be a designated fishing zone under subsection (1) at all times or only during any specified period or periods.

...

238. Fisheries Research and Development Fund

(1) The "Fisheries Research and Development Fund" ("the Fund") previously established under the repealed Act is continued in existence.

(2) The Fund is to continue to be kept at the Treasury as part of the Trust Fund constituted under section 9 of the *Financial Administration and Audit Act 1985*.

...

- (5) The Fund may be applied by the Minister for all or any of the following purposes —
- (a) the purposes set out in sections 37(3), 41 and 55(4) and (5) of the *Pearling Act 1990*;
 - (b) scientific, technological or economic research;
 - (c) the exploration and development of commercial fisheries;
 - (d) to defray the costs of the administration and management of commercial fisheries;
 - (e) to purchase any authorisation, entitlement, boat or fishing gear for the benefit of the fishing industry, the fish processing industry or the aquaculture industry;
 - (ea) to provide payment in consideration for the surrender of an aquaculture lease;
 - (f) the purposes set out in section 115(2) for which an area may be set aside as a fish habitat protection area;
 - (fa) the care, control and management of the Abrolhos Islands reserve;
 - (g) the development of aquaculture;
 - (h) to conduct programmes and provide extension services relating to fisheries, fish processing or aquaculture, including publicity programmes;
 - (i) to conduct enforcement, operations and compliance programmes;
 - (j) to purchase capital assets required for the management or administration of fisheries, fish processing or aquaculture;
 - (k) to the credit of the Fisheries Adjustment Schemes Trust Account under the *Fisheries Adjustment Schemes Act 1987* for the benefit of the fishing industry or the aquaculture industry;
 - (ka) in payment of compensation under section 12 of the *Fishing and Related Industries Compensation (Marine Reserves) Act 1997* and of the costs of administering that Act;
 - (l) to assist the fishing industry or any body (whether incorporated or not) whose objects include the provision of assistance to, or the promotion of, the fishing industry;
 - (m) in payment of any administrative costs under Part 14;
 - (ma) to defray any costs, incurred in the management of a marine park or marine management area under the *Conservation and Land Management Act 1984*, which are attributable to the authorisation under this Act or the *Pearling Act 1990* of aquaculture or pearling activity in the park or management area;
 - (n) in payment of the costs of administering the Fund;
 - (o) any other purpose for which moneys may be lawfully paid from the Fund.
- (6) In subsection (5), “**fisheries**” and “**fishing industry**” include, respectively, pearl oyster fisheries and the pearl oyster fishing industry.

...

256. Regulations — general power

- (1) The Governor may make regulations prescribing all matters that are required or permitted by this Act to be prescribed, or are necessary or convenient to be prescribed for giving effect to the purposes of this Act.
- (2) The regulations may create offences and may provide for a penalty not exceeding \$10 000 and a daily penalty not exceeding \$100.

257. Regulations — other licences

- (1) The regulations may provide for the licensing of —
 - (a) persons engaged in commercial fishing;
 - (b) persons engaged in specified activities by way of recreational fishing;
 - (c) fishing boats;
 - (d) boats used for transporting or trans-shipping fish for a commercial purpose;
 - (e) boats used in connection with aquaculture;
 - (f) charter boats used for recreational fishing;
 - (g) persons engaged in aquatic eco-tourism or the provision of fishing tours for a commercial purpose; and
 - (h) persons engaged in selling specified classes of fish that have been produced by means of aquaculture.
- (2) For the purpose of giving effect to subsection (1), the regulations may —
 - (a) prohibit a person from operating or using a boat, or engaging in an activity, referred to in subsection (1) unless the person is authorised to do so by a specified licence;
 - (b) authorise the Executive Director to grant licences authorising persons to operate or use boats, or to engage in activities, referred to in subsection (1);
 - (c) specify the criteria to be applied by the Executive Director in determining whether or not to grant such licences;
 - (d) provide, subject to sections 136A and 143, for the renewal of such licences;
 - (e) authorise conditions to be specified on licences by the Executive Director or prescribed by the regulations and provide for conditions specified on a licence to be deleted, varied or added to;
 - (f) prohibit a person from contravening a condition of a licence; and
 - (g) specify the duration of licences and any other matter relating to the licences.

9. Tasmania:

Living Marine Resources Management Act 1995 (primary legislation for management of the State's sea fisheries) ***AND Fishing Registration Act 2001*** (Licence and Interest)

Fisheries Licensing and Ministerial Guidelines

These are administrative policy guidelines approved by the Minister under section 75 of the Living Marine Resources Management Act 1995

7. Purpose and objectives

(1) The purpose of this Act is to achieve sustainable development of living marine resources having regard to the need to –

- (a) increase the community's understanding of the integrity of the ecosystem upon which fisheries depend; and
- (b) provide and maintain sustainability of living marine resources; and
- (ba) take account of a corresponding law; and
- (c) take account of the community's needs in respect of living marine resources; and
- (d) take account of the community's interests in living marine resources.'

...

29. Matters included in a draft code of practice

(1) A draft code of practice may provide for any or all of the following:

- (a) the preservation of good order amongst fishers;
- (b) the conduct of persons engaged in commercial or recreational fishing, marine farming activities and handling fish;
- (c) the efficient utilisation of fishing resources catching strategies;
- (d) the use of fishing equipment in a safe manner and in particular circumstances or locations;
- (e) the handling, storage, processing, transport, marketing and presentation of fish for sale;
- (f) the equipment on fishing boats for the handling and storage of fish;
- (g) the storage or holding of fish for human consumption;
- (h) the manner of preparing fish for marketing or sale;
- (i) the restoration or rehabilitation of fish habitat;
- (j) the common names of fish to be used in the marketing and sale of fish;
- (k) any other prescribed matter.

...

PART 3 - Fisheries Management

Division 1 - Rules relating to fisheries

32. Management plan

A management plan consists of rules relating to a specified fishery.

33. Rules

(1) The Minister may make rules in respect of –

- (a) a management plan; or
- (b) a fishery in respect of which there is no management plan; or
- (c) any other matter under this Act.

(2) Rules in respect of a management plan take effect on a date specified in the rules that is a date after the provisions of Division 2 of this Part have been complied with.

(3) The Minister must –

(a) consult with the relevant fishing body before making any rules under subsection (1)(b) or (c); and

(b) notify any proposed rules by public notice.

...

(2) The Minister must approve a draft management plan if satisfied that –

- (a) the plan promotes and develops commercial or recreational fishing without detriment to the fish habitat and environment; and
- (b) the Secretary has taken appropriate action in relation to any representation made in respect of the plan.

(3) If the Minister is not satisfied under subsection (2), the Minister must –

- (a) advise the relevant fishing body accordingly; and
- (b) refer the draft management plan to the Secretary; and
- (c) specify any matter which requires action before the Minister may be satisfied under subsection (2).

...

58. Revocation of management plan

(1) The Minister, after receiving advice from the Secretary, by order, may revoke a management plan if satisfied that it is necessary or desirable to do so because biological, economic or other factors make it impossible, difficult or unsafe for fishing to be conducted in the fishery to which the management plan relates.

(2) Before revoking a management plan, the Minister is to consult with the relevant fishing body.

...

96. Allocation of total allowable catch

A management plan that incorporates a total allowable catch for a species or class of fish may provide for that catch to be allocated among any or any combination of the following:

- (a) persons holding a licence to take fish of that species or class;
- (b) persons holding another kind of licence;
- (c) persons engaging in recreational fishing;
- (d) Aborigines engaging in Aboriginal activities.

97. Appeals against allocations of total allowable catch

(1) The holder of a fishing licence may appeal to the Appeal Tribunal against a decision to allocate part of a total allowable catch to a person under a management plan only on –

- (a) the facts of the case; or
- (b) the grounds of natural justice.

(2) An appeal is to be instituted within 60 days after the decision is made.

(3) For the purpose of an appeal, the Appeal Tribunal is to be constituted by more than one member, one of whom must possess expertise in fishing or the fishing industry.

97A. Confirmation of total allowable catches for giant crab and rock lobster

Notwithstanding any other provision of this Division or anything done or caused to be done under such a provision, Schedule 4 has effect with regard to the total allowable catches for the giant crab and rock lobster fisheries.

...

105. Marine resources protected area

(1) The Minister may establish a marine resources protected area for any or all of the following purposes:

- (a) the protection of representative samples of marine and estuarine habitats and ecosystems;
- (b) the maintenance of fish species and genetic diversity;
- (c) the protection of sites of ecological significance or fragility;
- (d) the protection of the biological productivity of fish species through enhanced egg production and settlement within, and propagation from, the area;
- (e) the protection of vulnerable fish species and their habitats;

(f) the establishment of scientific reference areas;

(g) public education in the resources, protection and use of the marine environment

...

110. Approval of draft marine resources protected area management plan

(1) The Secretary must submit to the Minister –

(a) the draft marine resources protected area management plan with any amendment made under section 109; and

(b) the report prepared under that section.

(2) The Minister must approve a draft marine resources protected area management plan if satisfied that –

(a) the plan promotes the conservation of the marine environment; and

(b) the plan prevents the introduction of, or removes, introduced fish and noxious fish; and

(c) the plan assists in the enjoyment of, and access to, the living marine resources by the community; and

(d) the Secretary has taken appropriate action in relation to any representation made in respect of the plan.

...

117. Powers of managing authority

The managing authority of a marine resources protected area may –

(a) erect or construct, or cause to be erected or constructed, any building or other works; and

(b) purchase or acquire anything required to carry out its functions; and

(c) provide and maintain facilities and conveniences for the use or benefit of any persons entering the marine resources protected area; and

(d) charge for the use of those facilities and conveniences; and

(e) sell, let on hire or otherwise provide for the use by those persons any goods and articles; and

(f) obtain and use any produce of, or materials in, the area; and

(g) make arrangements with any other person to do anything referred to in this section; and

(h) do anything necessary or convenient to perform its functions.

...

150. Functions of scientific observer

A scientific observer, if requested by the Secretary, is to report to the Secretary on –

(a) the species, number, size, sex, age and condition of fish taken; and

(b) the methods by which, the areas in which and the depths at which those fish are taken; and

(c) the effects on fish of the methods used to take them; and

(d) the operations of the fishing vessel; and

(e) any other matter that may assist the Secretary to obtain, analyse or verify information for research purposes.

...

153. General functions and powers of Joint Authority

(1) A Joint Authority has any function relating to the management of the fishery for which an arrangement is in force.

(2) In managing a fishery, the Joint Authority is to –

(a) consider the condition of the fishery; and

(b) formulate policies and plans for the good management of the fishery; and

(c) exercise the powers conferred on it by this Act; and

(d) co-operate and consult with other authorities, including other Joint Authorities within the meaning of the Commonwealth Act, in matters of common concern.

(3) A Joint Authority is to –

(a) ensure, through proper conservation, preservation and fisheries management measures, that fish resources are not endangered by over-exploitation; and

(b) achieve efficient use of those resources.

(4) A Joint Authority is to perform its functions and exercise its powers in accordance with the Commonwealth Act.

(5) A Joint Authority may exercise the powers of the Minister and any other person under this Act.

(6) Any rules made by a Joint Authority in the exercise of a power under subsection (5) may provide that any rules made under Part 3 apply to a fishery managed by the Joint Authority.

...

SCHEDULE 1 - Objectives of the Resource Management and Planning System of Tasmania

Section 3

1. The objectives of the resource management and planning system of Tasmania are –

(a) to promote the sustainable development of natural and physical resources and the maintenance of ecological processes and genetic diversity; and

(b) to provide for **the fair, orderly** and sustainable use and development of air, land and water; and

(c) **to encourage public involvement in resource management and planning**; and

(d) **to facilitate economic development** in accordance with the objectives set out in paragraphs (a), (b) and (c); and

(e) to promote the sharing of responsibility for resource management and planning between the different spheres of Government, the community and industry in the State.

2. In clause 1(a), "**sustainable development**" means managing the use, development and protection of natural and physical resources in a way, or at a rate, **which enables people and communities to provide for their social, economic and cultural well-being and for their health and safety while –**

(a) sustaining the potential of natural and physical resources to meet the reasonably foreseeable needs of future generations; and

(b) safeguarding the life-supporting capacity of air, water, soil and ecosystems; and

(c) avoiding, remedying or mitigating any adverse effects of activities on the environment.

10. South Australia

South Australia Fisheries Management Act 2007

Version: 8.3.2009

Part 2—Objects of Act

7—Objects of Act

- (1) An object of this Act is to protect, manage, use and develop the aquatic resources of the State in a manner that is consistent with ecologically sustainable development and, to that end, the following principles apply:
- (a) proper conservation and management measures are to be implemented to protect the aquatic resources of the State from over-exploitation and ensure that those resources are not endangered;
 - (b) access to the aquatic resources of the State is to be allocated between users of the resources in a manner that achieves optimum utilisation and equitable distribution of those resources to the benefit of the community;
 - (c) aquatic habitats are to be protected and conserved, and aquatic ecosystems and genetic diversity are to be maintained and enhanced;
 - (d) recreational fishing and commercial fishing activities are to be fostered for the benefit of the whole community;
 - (e) the participation of users of the aquatic resources of the State, and of the community more generally, in the management of fisheries is to be encouraged.
- (2) The principle set out in subsection (1)(a) has priority over the other principles.
- (3) A further object of this Act is that the aquatic resources of the State are to be managed in an efficient and cost effective manner and targets set for the recovery of management costs.
- (4) The Minister, the Director, the Council, the ERD Court and other persons or bodies involved in the administration of this Act, and any other person or body required to consider the operation or application of this Act (whether acting under this Act or another Act), must—
- (a) act consistently with, and seek to further the objects of, this Act; and
 - (b) insofar as this Act applies to the Adelaide Dolphin Sanctuary, seek to further the objects and objectives of the *Adelaide Dolphin Sanctuary Act 2005*; and
 - (c) insofar as this Act applies to the River Murray, seek to further the objects of the *River Murray Act 2003* and the *Objectives for a Healthy River Murray* under that Act; and
 - (d) insofar as this Act applies to areas within a marine park, seek to further the objects of the *Marine Parks Act 2007*.
- (5) For the purposes of subsection (1), **ecologically sustainable development** comprises the use, conservation, development and enhancement of the aquatic resources of the State in a way, and at a rate, that will enable people and communities to provide for their economic, social and physical well-being while—

- (a) sustaining the potential of aquatic resources of the State to meet the reasonably foreseeable needs of future generations; and
- (b) safeguarding the life-supporting capacity of the aquatic resources of the State; and
- (c) avoiding, remedying or mitigating adverse effects of activities on the aquatic resources of the State, (taking into account the principle that if there are threats of serious or irreversible damage to the aquatic resources of the State, lack of full scientific certainty should not be used as a reason for postponing measures to prevent such damage).

Division 2—Fisheries Council of South Australia

11—Establishment of Council

- (1) The Fisheries Council of South Australia is established.
- (2) Subject to subsection (3), the Council consists of—
 - (a) the Director (*ex officio*); and
 - (b) at least 9 other members appointed by the Governor on the nomination of the Minister, being persons chosen from a list of persons submitted by a selection committee (the **Ministerial Selection Committee**).
- (3) A member of the Ministerial Selection Committee cannot be chosen or nominated as a member of the Council.
- (4) Each member of the Council must have expertise in fisheries management and at least 1 must be a person with knowledge and experience of aboriginal traditional fishing.
- (5) The membership of the Council must include persons who together have, in the Minister's opinion, expertise in the following areas:
 - (a) commercial fishing and the processing of aquatic resources;
 - (b) recreational fishing;
 - (c) research and development relevant to the use of aquatic resources;
 - (d) conservation of aquatic resources;
 - (e) socio-economics;
 - (f) business;
 - (g) law.
- (6) Before nominating a person or persons for appointment to the Council, the Minister must, by notice published in a newspaper circulating generally throughout the State, invite expressions of interest for appointment to the Council within a period specified in the notice and must submit any expressions of interest received in response to the notice to the Ministerial Selection Committee for its consideration.
- (7) The Ministerial Selection Committee consists of 7 members appointed by the Minister of whom—
 - (a) 1 must be a person selected from a panel of 3 persons nominated by a body that, in the Minister's opinion, represents the interests of the seafood industry; and
 - (b) 1 must be a person selected from a panel of 3 persons nominated by a body that, in the Minister's opinion, represents the interests of the commercial fishing sector; and

(c) 1 must be a person selected from a panel of 3 persons nominated by a body that, in the Minister's opinion, represents the interests of the recreational fishing sector; and

(d) 1 must be a person selected from a panel of 3 persons nominated by a body that, in the Minister's opinion, represents the community interest in the conservation of aquatic resources, aquatic habitats and aquatic ecosystems.

(8) The Ministerial Selection Committee must submit to the Minister a list of persons considered by the Committee to be suitable candidates for appointment as members of the Council.

(9) The Ministerial Selection Committee must, in preparing the list—

(a) consider any expressions of interest for appointment to the Council submitted by the Minister under subsection (6); and

(b) have regard to the qualification requirements of subsections (4) and (5).

(10) Members of the Ministerial Selection Committee will hold office on terms and conditions determined by the Minister.

...

Division 3—Advisory committees

20—Establishment of committees

(1) The Minister, or the Council with the approval of the Minister, may establish committees to provide advice to the Minister or the Council on any matter related to the administration of this Act.

(2) The members of a committee established by the Minister will be appointed by the Minister and hold office for a term and on conditions determined by the Minister.

(3) The members of a committee established by the Council will be appointed by the Council with the approval of the Minister and hold office for a term and on conditions determined by the Council with the approval of the Minister.

(4) The membership of a committee must include persons who, in the opinion of the Minister, have expertise in fields relevant to those matters on which the committee is established to provide advice about and, in particular—

(a) a committee established to provide advice on the management of a fishery must include at least 1 person with expertise in fisheries management and at least 1 person with expertise in fisheries research;

(b) a committee established to provide advice on the allocation of the aquatic resources of a fishery must include persons who have expertise in issues related to that matter and who are cognisant of the interests of the various stakeholders in the fishery.

...

43—General nature and content of management plans

(1) A management plan must—

(a) be consistent with the objects of this Act; and

(b) be consistent with any relevant aboriginal traditional fishing management plan; and

(c) set out the management objectives of the plan and strategies for achieving those objectives; and

- (d) identify research needs and priorities; and
 - (e) set out the resources required to implement the plan; and
 - (f) take into account—
 - (i) the advice of any committee of the Council established for that purpose by the Council; and
 - (ii) the provisions of the Planning Strategy and any relevant Development Plan under the *Development Act 1993*; and
 - (iii) the provisions of any document prescribed for the purposes of this paragraph (insofar as is relevant to the operation of this Act and reasonably practicable).
- (2) A management plan for a fishery must—
- (a) identify the fishery to which the plan relates; and
 - (b) describe the biological, economic and social characteristics of the fishery; and
 - (c) identify the impacts or potential impacts of the fishery on its associated ecosystem or ecosystems, including impacts on non-target species of fish or other aquatic resources; and
 - (d) identify any ecological factors that could have an impact on the performance of the fishery; and
 - (e) assess the risks (if any) identified under paragraphs (c) and (d) to determine the most serious risks; and
 - (f) set out strategies for addressing those risks; and
 - (g) set out methods for monitoring the performance of the fishery and the effectiveness of the plan, including performance indicators, trigger points for review or action and progress reporting; and
 - (h) specify the share of aquatic resources to be allocated to each fishing sector under the plan; and
 - (i) prescribe a method, or establish an open and transparent process for determining the method, for adjusting allocations of aquatic resources between the different fishing sectors during the term of the plan; and
 - (j) provide that compensation will be paid to persons whose licences or licence entitlements are compulsorily acquired in order to reduce the share of aquatic resources allocated to the commercial fishing sector and increase the share allocated to another sector.
- (3) In determining the share of aquatic resources to be allocated to a particular fishing sector under the first management plan for an existing fishery, the share of aquatic resources to which that fishing sector had access at the time the Minister requested the Council to prepare the plan (based on the most recent information available to the Minister) must be taken into account.

...

44—Procedure for preparing management plans

- (1) The Council must, in relation to a proposal to prepare a management plan—
 - (a) by notice published in a newspaper circulating generally within the State, give notice of the intention to prepare the management plan with a description of the general purpose of the proposed management plan; and
 - (b) prepare a draft of the management plan; and
 - (c) seek the views of a representative of all signatories to any indigenous land use agreement that is in force in relation to any of the area to which the plan relates in relation to the draft.
- (2) The Council must, after preparing a draft management plan, prepare a report containing—
 - (a) an explanation of the purpose and effect of the draft management plan; and
 - (b) a summary of the background and issues relevant to the draft management plan and of the analysis and reasoning applied in formulating the plan.
- (3) The Council must, after preparing the draft management plan and related report—
 - (a) refer the plan and report to—
 - (i) the Minister; and
 - (ii) the representative of all signatories to any indigenous land use agreement that is in force in relation to any area to which the plan relates; and
 - (iii) any advisory committee whose area of responsibility is affected by the plan; and
 - (iv) any public authority whose area of responsibility is, in the opinion of the Council, particularly affected by the plan; and
 - (b) cause an advertisement to be published in a newspaper circulating generally in the State—
 - (i) giving notice of places at which the draft management plan and report (or copies of the draft management plan and report) are to be available for inspection and, if copies are to be available for purchase, places at which copies may be purchased; and
 - (ii) inviting interested persons to make written submissions in relation to the draft management plan within a period specified in the advertisement (being not less than 2 months from the date of publication of the advertisement); and
 - (iii) stating that the submissions will be available for inspection as provided by subsection (5); and
 - (iv) appointing a place and time at which a public hearing will be commenced by the Council in which interested persons may appear to be heard in relation to the draft management plan and the submissions.
- (4) However, the Council may, in relation to a particular draft management plan, with the approval of the Minister, dispense with the requirement for the holding of a public hearing if satisfied that it is not warranted in the circumstances.
- (5) If written submissions are made in response to an advertisement published under subsection (3)(b), a copy of those submissions must be made available for inspection by interested persons during ordinary business hours at the principal office of the Council from the end of

the period specified for the making of submissions until the Council reports to the Minister on the draft management plan under this section.

- (6) At the time and place appointed for a public hearing, interested persons may appear and make submissions to the Council that are relevant to the draft management plan or the written submissions relating to the draft management plan.
- (7) The Council must consult with and consider the advice of the persons and bodies referred to in subsection (3)(a) on—
 - (a) the provisions of the draft management plan; and
 - (b) all matters raised as a result of public consultation under this section; and
 - (c) any alterations that the Council proposes should be made to the draft management plan.
- (8) The Council must then report to the Minister and the Minister may, after taking into account the report and recommendations of the Council on the matter—
 - (a) adopt the draft management plan; or
 - (b) alter the draft management plan and adopt the draft management plan as altered; or
 - (c) decline to adopt the draft management plan.
- (9) A management plan has no force or effect until adopted by the Minister.
- (10) On adopting a draft management plan, the Minister must cause notice of that fact to be published in the Gazette.
- (11) The Minister must, in the Gazette notice adopting a management plan, fix a date on which the plan will take effect.
- (12) A failure of the Council or the Minister to comply with a requirement of this section does not affect the validity of a management plan.

...

Division 2—Aboriginal traditional fishing

60—Management of aboriginal traditional fishing

- (1) The Minister and a native title group that is party to an indigenous land use agreement may make an aboriginal traditional fishing management plan under the agreement for the management of specified aboriginal traditional fishing activities in a specified area of waters.
- (2) An aboriginal traditional fishing management plan under an indigenous land use agreement must—
 - (a) be consistent with—
 - (i) the agreement; and
 - (ii) the objects of this Act; and
 - (iii) any management plan under Part 5 that relates to the area of waters to which the plan applies; and
 - (b) include the management objectives of the plan; and
 - (c) specify the management tools and other measures to be used to achieve the management objectives; and

- (d) identify the area of waters to which the plan applies; and
 - (e) identify any fisheries constituted in relation to those waters; and
 - (f) specify the classes of aboriginal traditional fishing activities that are authorised by the plan; and
 - (g) identify, or provide a mechanism for identifying, the classes of persons who are authorised to engage in aboriginal traditional fishing activities under the plan; and
 - (h) provide a method for determining how aboriginal traditional fishing activities may be distinguished from other kinds of fishing activities; and
 - (i) provide for any other matter relating to aboriginal traditional cultural fishing as required by the agreement.
- (3) The Minister must cause notice of an aboriginal traditional fishing management plan made under an indigenous land use agreement to be published in the Gazette fixing the date on which the plan will take effect.

61—Availability and evidence of aboriginal traditional fishing management plans

- (1) Copies of each aboriginal traditional fishing management plan must be kept available for inspection and purchase by the public during ordinary office hours at a place or places determined by the Minister.
- (2) In legal proceedings, evidence of the contents of an aboriginal traditional fishing management plan may be given by production of a document certified by the Minister as a true copy of the plan.
- (3) An apparently genuine document purporting to be a certificate of the Minister will be accepted as such in the absence of proof to the contrary.

...

11. Northern Territory

Northern Territory Of Australia Fisheries Act

As in force at 16 September 2009

...

2A Objects

The objects of this Act are:

- (a) to manage the aquatic resources of the Territory in accordance with the principles of ecologically sustainable development, whether managing a single fish species or an ecosystem, to ensure the promotion of appropriate protection of fish and fish habitats;
- (b) to maintain a stewardship of aquatic resources that **promotes fairness, equity and access to aquatic resources by all stakeholder groups**, including:
 - (i) indigenous people;
 - (ii) commercial operators and aquaculture farmers;
 - (iii) amateur fishers; and
 - (iv) others with an interest in the aquatic resources of the Territory; and Part I Preliminary *Fisheries Act 2*
- (c) **by means of a flexible approach to the management of aquatic resources and their habitats, to promote the optimum utilisation of aquatic resources to the benefit of the community.**

...

ecologically sustainable development means using, conserving and enhancing the community's resources so that ecological processes, on which life depends, are maintained and the **total quality of life**, now and in the future, can be increased.

...

Part III Fisheries management plans

21 Purposes of Part

- (1) The purpose of this Part is to conserve, enhance, protect, utilize, and manage the fish and aquatic life resources of the Territory to:
 - (a) promote, develop and maintain commercial and amateur fishing;
 - (b) provide for optimum yields from a fishery and maintain the quality of the yield;
 - (c) ensure that the fisheries of the Territory are not endangered or overexploited;
 - (ca) **encourage tourist and scientific interest** in fish and aquatic life; and/or
 - (d) ensure that the habitats of fish or aquatic life and the general environment is not detrimentally affected.

- (2) For the avoidance of doubt, **manage** in subsection (1) includes, and shall be taken always to have included, a total prohibition against the taking of fish or aquatic life in all or part of a fishery management area or in a fishery.

...

24 Fisheries management advisory committees

- (1) For the purposes of assisting the Director in preparing proposed plans and giving advice in relation to operative plans, the Minister may, as the Minister thinks fit, from time to time establish and, after having due regard to the users of an area or fishery, appoint members to an advisory committee for each management area or managed fishery.
- (2) Each such committee shall be chaired by a person nominated by the Minister and may include members representing commercial, processing, wholesaling, retailing, recreational, consumer, or other interests in the area relating to fishing, fish, or aquatic life.

25 Procedure in relation to plans

- (1) A proposed plan being prepared under section 23 shall contain a description of the management area or managed fishery and make provision in relation to the managed area or the managed fishery with respect to such of the matters specified in Schedule 2 as the Director considers applicable.
- (2) Every proposed plan prepared under section 23 shall be submitted to the Minister, and, if the Minister agrees in principle with the proposed plan, the Minister may give notice in the Gazette and such newspapers circulating in the Territory as is thought appropriate of the proposed plan and of the place or places where a copy of it may be inspected.
- (2A) There may be included with each proposed plan prepared under section 23, but so as not to form part of the plan:
- (a) an outline of the history and status of the fishery;
 - (b) the policy and objectives of the plan; and
 - (c) such other information relating to the fishery, as the Director thinks fit.
- (3) Not less than one month after the date of notification in the *Gazette* under subsection (2), the Minister, after considering any submissions made in respect of the proposed plan, may make such amendments to the plan as the Minister thinks fit, and, after advising any relevant advisory committee of any amendments and the reasons for them, may then approve it.

...

Schedule 2 Matters that may be provided for in a fishery management plan

section 25(1)

2. A fishery management plan may:
- (a) designate areas, within the fishery management area where, and the periods when, fishing for certain species of fish or aquatic life shall be prohibited or restricted, or permitted only by specified types of vessels or by specified methods or persons, or

- with specified types or quantities of fishing gear, or subject to such other conditions as may be specified;
- (aa) specify the methods or practices to be used by a class of persons in the supervision of operations conducted for the purposes of a licence or permit;
 - (ba) specify the species of fish that may or shall not be taken and/or the restrictions (if any) that apply in relation to the taking of any species of fish;
 - (bb) specify the number of licences that may be issued in relation to an area or a fishery, as the case requires, and prohibit or regulate the transfer of licences in respect of a fishery;
- (b) specify ports or places or circumstances where fish or aquatic life may be landed or trans-shipped at sea;
 - (c) determine a quota or allowable catch for the fishery or for any designated areas within the fishery for all fish or aquatic life within the fishery or such areas, or for any designated species or type of fish or aquatic life;
 - (d) authorize the Minister, by notice in the *Gazette*, to allocate a quota or allowable catch to the person or persons the Minister specifies, and to specify the method (if any) by which a quota or allowable catch may be allocated;
 - (e) set limits as to size, number, weight, sex, or other factor, on a catch of fish or aquatic life, or any species or class of fish or aquatic life, from any specified area which are considered necessary or desirable for the conservation and management of the fishery; (f) establish a system for limiting access to the fishery to persons who can satisfy the Director of their eligibility having regard to, but not limited to, the following criteria or such criteria as may be specified in the plan:
 - (i) present participation in the fishery;
 - (ii) historical fishing patterns and dependence on the fishery; or
 - (iii) the capability of fishing vessels being used, or intended to be used, in the fishery, to operate in other fisheries;
 - (g) provide for offences in respect of contravention of or non-compliance with a provision of the plan or a notice, requirement or direction given under the plan and provide for penalties as follows:
 - (i) a penalty not exceeding \$20 000 for an offence;
 - (ii) a penalty not exceeding \$50 for each fish or item of aquatic life in excess of a specified limit;
 - (iii) a penalty not exceeding \$500 for each item of gear by which a specified limit in respect of the gear is exceeded;
 - (h) contain any other measures considered necessary or desirable for the conservation, management or control of the fishery; or
 - (j) provide for the establishment and administration of a scheme for the rationalisation of the fishery and for those purposes may provide for:

- (i) a limitation or reduction in an equitable manner of the number of fishing units licensed to operate in a fishery;
 - (ii) the surrender and purchase of licences relating to that fishery on payment of agreed compensation;
 - (iii) the establishment by the Accountable Officer of a fund within the Agency Operating Account within the meaning of the *Financial Management Act*;
 - (iv) the imposition of levies or other payments for the purposes of funding any compensation to be paid; and Schedule 2 Matters that may be provided for in a fishery management plan
 - (v) the repayment of surplus amounts, after payment of any outstanding amounts due, to persons who, on conclusion of a scheme, are holders of licences in respect of fishing units to which the scheme relates.
3. A fishery management plan may prescribe different penalties for different classes of offender for an offence against the plan.
 4. Subject to clause 5, a fishery management plan may provide for the Director to do either or both of the following:
 - (a) revoke an approval for a person to engage in a fishery in a capacity that the Director must approve;
 - (b) refuse, for a specified period not exceeding 5 years, to approve a person to engage in a fishery in a capacity that the Director must approve.
 5. A provision of a fishery management plan made under clause 4 may authorise the Director to act under the provision only if:
 - (a) the person has been found guilty:
 - (i) on more than one occasion of a prescribed offence under the plan (whether the same type of offence or not); or
 - (ii) of a prescribed offence under the plan and has also been found guilty of a prescribed offence under another fishery management plan; and
 - (b) the later offence was committed after the commencement of that clause.

12. EPBC Act

Environment Protection and Biodiversity Conservation Act 1999

Act No. 91 of 1999 as amended

Volume 1 includes: Table of Contents
Sections 1 – 266A

This compilation was prepared on 16 May 2005, incorporating amendments up to Act No. 38 of 2005

...

3A Principles of ecologically sustainable development

The following principles are *principles of ecologically sustainable development*:

- (a) decision-making processes should effectively integrate both long-term and short-term economic, environmental, social and equitable considerations;
- (b) if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation;
- (c) the principle of inter-generational equity—that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations;
- (d) the conservation of biological diversity and ecological integrity should be a fundamental consideration in decision-making;
- (e) improved valuation, pricing and incentive mechanisms should be promoted.

...

131 Inviting comments from other Ministers before decision

- (1) Before the Minister (the *Environment Minister*) decides whether or not to approve the taking of an action, and what conditions (if any) to attach to an approval, he or she must:
 - (a) inform any other Minister whom the Environment Minister believes has administrative responsibilities relating to the action of the decision the Environment Minister proposes to make; and
 - (b) invite the other Minister to give the Environment Minister comments on the proposed decision within 10 business days.
- (2) A Minister invited to comment may make comments that:
 - (a) relate to economic and social matters relating to the action; and
 - (b) may be considered by the Environment Minister consistently with the principles of ecologically sustainable development.

This does not limit the comments such a Minister may give.

...

Subdivision B—Considerations for approvals and conditions

136 General considerations

Mandatory considerations

(1) In deciding whether or not to approve the taking of an action, and what conditions to attach to an approval, the Minister must consider the following, so far as they are not inconsistent with any other requirement of this Subdivision:

(a) matters relevant to any matter protected by a provision of Part 3 that the Minister has decided is a controlling provision for the action;

(b) economic and social matters.

Factors to be taken into account

(2) In considering those matters, the Minister must take into account:

(a) the principles of ecologically sustainable development; and

(b) the assessment report relating to the action; and

(c) if the action was assessed under Division 5 or 6 of Part 8 (which deal with public environment reports and environmental impact statements)—the report or statement about the action finalised by the designated proponent; and

(d) if an inquiry was conducted under Division 7 of Part 8 in relation to the action—the report of the commissioners; and

(e) any other information the Minister has on the relevant impacts of the action (including information in a report on the impacts of actions taken under a policy, plan or program under which the action is to be taken that was given to the Minister under an agreement under Part 10 (about strategic assessments)); and

(f) any relevant comments given to the Minister by another Minister in accordance with an invitation under section 131.

Appendix 2: Workshop Background for Participants

Developing and Testing Social Objectives and Indicators for Fisheries Management (FRDC Project 2010/040), Project Initiation Workshop, April 5th 2011, 10am-3.30pm

Workshop overview

This document provides information for the April 5th project initiation workshop being held for the FRDC-funded project 'Developing and testing social objectives and indicators for fisheries management'. Background on the project is provided in the 'Project information sheet' sent with the workshop invitation to workshop participants.

Workshop objectives:

The goal of the workshop is to review social objectives and associated indicators for fisheries management, and identify those of greatest use/relevance for different fisheries contexts. Those identified as of highest priority will then be explored in case studies in Queensland and South Australia in the second part of this project.

Workshop agenda:

9.30am	Tea, coffee
10.00am	Welcome and introduction (Cathy Dichmont)
10.05am	Overview of project & workshop (Lianos Triantafillos)
10.15am	Identifying social objectives and implementing them in fisheries management: Queensland's experience (Eddie Jebreen)
10.30am	Social objectives: current legislative requirements in different Australian jurisdictions; EBFM and ESD (Kate Brooks, Sean Pascoe and Jacki Schirmer)
11.30am	Break-out groups: Prioritise social objectives of highest importance/usefulness in different contexts (facilitated by Kate Brooks, Sean Pascoe, Jacki Schirmer)
12.30pm	Lunch
1.30pm	Break-out groups: Identifying appropriate indicators for high priority social objectives (facilitated by Kate Brooks, Sean Pascoe, Jacki Schirmer)
2.30pm	Group feedback (facilitated by Cathy Dichmont)
3.10pm	Next steps (Cathy Dichmont)
3.30pm	Workshop close

What will participants be asked to do?

In the first part of the workshop, an overview of the project will be provided, focusing on understanding the social obligations currently embedded in fisheries management legislation, and in ESD requirements that many fisheries management agencies have committed to. We will review the ESD 'social component tree' which suggests different areas that may be considered when monitoring the social outcomes of fisheries management (see page 4 for the social component tree).

There are many possible social objectives for fisheries management. Workshop participants will be asked to work in break out groups to review potential objectives identified from those used to monitor social dimensions of fisheries management in Australia and internationally in the past, and from a broader review of social issues fisheries managers may be asked to manage. These potential objectives are provided at the end of this document (page 6 onwards).

In the first workshop break-out session, participants will be asked to review objectives and identify:

- Whether the objective is one that your organisation or other fisheries managers have some influence over (the decision tree provided on page 5 will be used to help assess this)
- If an objective is one your organisation or others may have influence over, in what fisheries management situations would this objective be relevant? (eg commercial/ recreational/ customary fishing, particular locations or management situations)
- For each situation identified, what priority would you give this objective (low, medium or high)?
- Whether further social objectives need to be added to the list

At the end of this session your group should have:

- ✓ A clear understanding of which objectives are relevant in different fisheries management situations, and why

In the second workshop break-out session, participants will be asked to discuss how best to measure performance against the objectives identified as being of highest priority in the first session. You will

- Identify if the indicators already listed against these objectives would be practical and:
 - if your jurisdiction currently has processes in place to collect data needed for these indicators
 - the frequency of monitoring required
 - the sector they are applicable to (commercial /recreational/ customary); and
 - if they could be employed for the majority of fisheries in your jurisdiction.
- Identify alternative indicators that your jurisdiction would be able to use to inform the objective

At the end of this session your group should have:

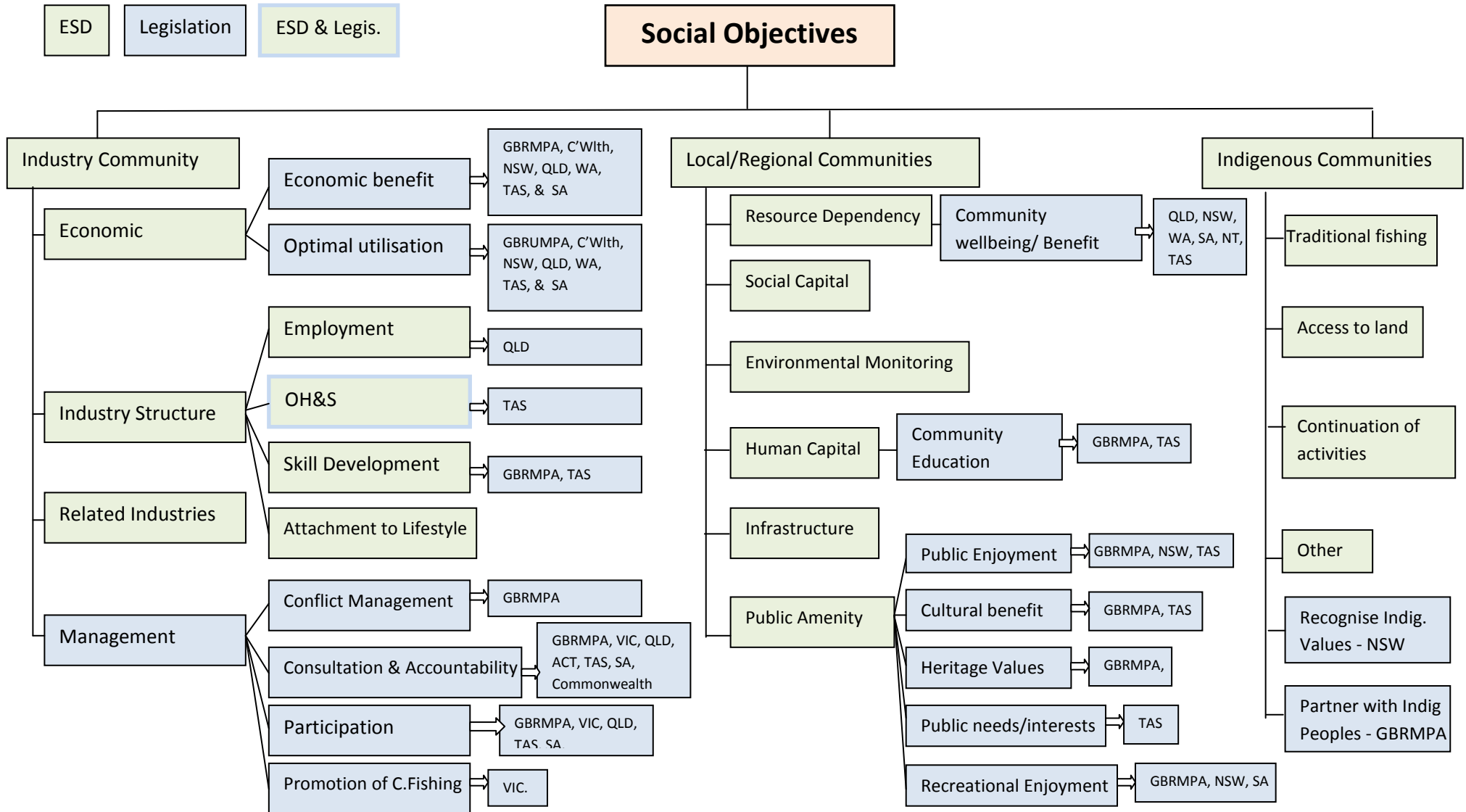
- ✓ Indicators identified for each objective along with details of existing collection methods for the jurisdictions covered by your group, and which sectors these could be applied to.

At the end of the workshop, the project team will provide an overview of

- (i) The next stage of the project, which is the field work to test these objectives and indicators that you will have identified,
- (ii) How you will be updated on the project as it progresses, and input you may be asked for, and
- (iii) The last stage of the project when you will be asked to participate in another workshop to review the outcomes of the field work and to agree on a set of objectives under the ESD/EBFM framework.

Figure 2: ESD Social Component Tree

This diagram summarises social objectives included in (a) the ESD framework and (b) current legislation.

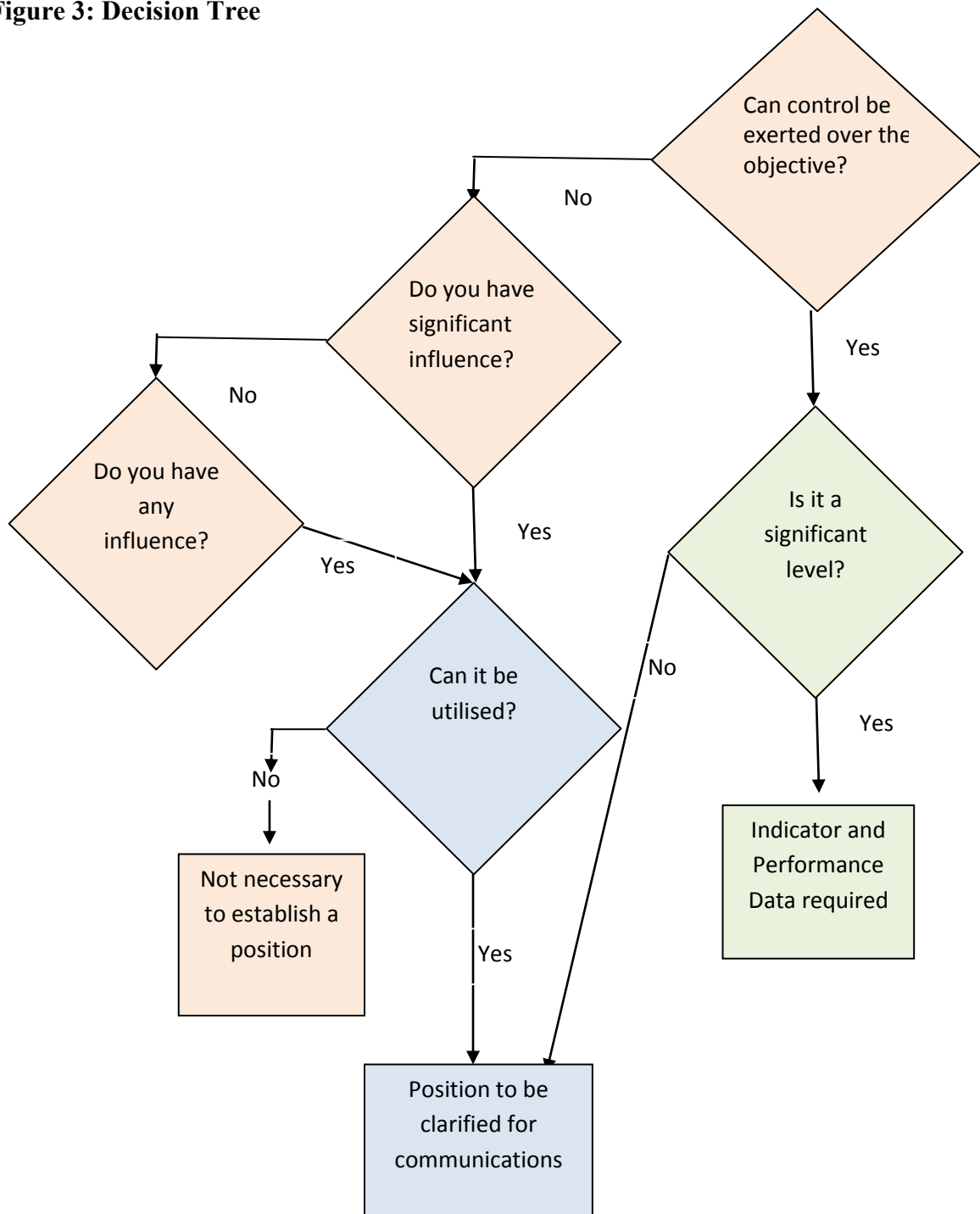


Decision Tree for Social Objectives in Fisheries Management

(Adapted from 2000-2006 GRI Sustainability Reporting Guidelines)

Workshop participants will be asked to use this decision tree to help identify which social objectives are relevant to the fisheries management situations they are involved in, as part of the first workshop break-out session (held at 11.30).

Figure 3: Decision Tree



Social objectives and indicators to be discussed in the workshop

The following pages list social objectives and indicators that have been used in the past by fisheries managers, or suggested in the literature. These are intended to form a starting point for workshop discussions, with participants asked to critically review whether and when each might be useful, and suggest new or different objectives.

The objectives have been split into the following categories, using the ESD component tree on page 5 as a guide:

- Industry – Economic
- Industry – Industry structure
- Industry – Industry management
- Local/regional communities – Resource dependency
- Local/regional communities – Social capital
- Local/regional communities – Environmental monitoring
- Local/regional communities – Human capital
- Local/regional communities - Infrastructure
- Local/regional communities – Public amenity
- Indigenous communities.

Industry - Economic

Some consideration of economic conditions in the fishery is commonly included in most fisheries legislation and/or policies both within Australia and overseas. In some cases, such as in the Commonwealth and Queensland policies, strong economic objectives including 'achieving maximum economic yield' in fisheries are identified. In other States, the need to consider economic implications is either explicit or implicit in policy and legislation.

Potential objectives and indicators related to economic performance are identified in the table below; it should be noted that all indicators require economic information that can only be obtained from an economic survey of the fisheries.

Objective	Potential indicators	Notes
Maximise fishing industry economic profits	<p>Level of profits relative to those at maximum economic yield</p> <p>Level of economic profits as a proportion of total revenue</p> <p>Changes in quota/unit/licence values</p>	<p>Requires detailed estimates of MEY for a particular fishery using bio-economic models</p> <p>Many studies have suggested that economic profits at MEY may be between 20 and 40% of the total revenue (in some cases higher).</p> <p>A proxy measure assuming that increases in unit/quota/licence prices reflect changes in economic profits. This identifies a potential improvement but not necessarily that MEY has been achieved.</p>
Maximise value added from fishing (the sum of economic profits and skipper and crew incomes)	Level of economic profits and incomes generated as a proportion of total revenue	There has been no established benchmark for this, but an increasing proportion of value added over time suggests that the objective is being achieved.
Ensure equitable distributions of income within the fishery	<p>Proportion of the fleet making an economic loss</p> <p>Income distribution measures (e.g. Gini coefficient)</p>	<p>This is not a true indicator of an equitable distribution, but a low (or zero) proportion making economic losses is better than a high proportion</p> <p>This is a formal measure of income distribution</p>

Industry – Industry structure

Maximising economic benefits in the fishing industry is often associated with fewer vessels and a reduction in fishing employment. However, there are often concerns over regional employment, particularly in fishing communities with a high resource dependency. While economic efficiency and employment objectives may conflict, identifying and prioritising these objectives enables best compromise solutions to be achieved.

Potential objectives and indicators related to industry structure are identified in the table below.

Objective	Potential indicators	Notes
Maximise employment in the catching sector	Number of crew Number of fishing vessels Proportion full time crew	A very crude proxy measure for employment Some fisheries may be highly seasonal so a total number may be misleading if there is a large increase in seasonal labour at certain times of the year
Maximise associated onshore employment in the fishing communities	Number of people employed in processing or auxiliary industries Proportion of regional employment engaged in fishing or onshore associated industries	This puts changes in the number of people involved in the sector (onshore or offshore) into regional context
Maintain or enhance livelihoods of fishing families	Proportion of family income derived from fishing Security of fishing rights	Changes in the proportion of family income derived from fishing may indicate the longer term viability of the industry
Maintain relative size structure (i.e. mix of small and large boats)	Proportion of small/large boats in the fleet	This was identified in recent work undertaken in Queensland as “respect customary fishing” which was interpreted as ensuring that small family run boats were able to continue to exist in the fishery. It is closely related to the above objective on maintaining livelihoods of fishing families
Improve the skill mix in the fishery	Proportion of skilled/unskilled labour Average educational attainment	This is a proxy measure for the level of skill in the fishery
Ensure health and safety of fishers	Number of reported accidents/work related injuries and illnesses Number of reported fatalities	The objective would be to minimise the values of the indicators
Maximise health benefits of	Estimated consumption	Health benefits are well

fishing activities	<p>benefit of seafood produce caught by fishers</p> <p>Monitoring fishers self-reported level of wellbeing generated by fishing activities (via survey of fishers)</p>	acknowledged but can be difficult to monitor
Maximise cultural, recreational and lifestyle benefits of fishing for those who participate in fishing activities	<p>Identify importance/value placed on cultural, recreational and lifestyle benefits of fishing activities (via survey of fishers)</p> <p>Identify extent to which desired cultural, recreational and lifestyle benefits are being achieved (via survey of fishers)</p>	Most commonly considered in recreational and customary fishing sectors, but can also apply to commercial fishing. Often stated as a goal of maximising subject to constraints of ecological sustainability.
Support positive social capital within industry	<p>Level of support fishers feel they receive from industry organisations</p> <p>Level of trust fishers have in industry organisations to represent their interests</p> <p>Extent to which fishers feel they have support from others within the industry</p>	This indicator can measure effectiveness of strategies such as providing funding to industry organisations to improve their ability to represent industry's interest in fisheries management forums
Maximise skill level of fishers including literacy, numeracy, business management and fishing related skills	<p>Monitor formal skills attainment level of fishers (ABS data)</p> <p>Monitor attainment of fishing-relevant skills via informal and formal processes (eg certificates, level of self-reported skills)</p>	Human capital is generally considered to be higher when individuals have the skills needed to perform their job well, and to shift to undertaking and learning new tasks as necessary when fishing activities and conditions change
To maximise the social networks (social capital) and subsequent support within the industry to continue its activities.	<p>Number of second or greater generation of fishers.</p> <p>Number of regional fisheries related community groups</p> <p>Frequency of interaction with other fishers</p>	Maximisation of social capital can only involve ensuring the environment exists to facilitate networking, engagement and the development of trust.

	<p>Physical distance from family and friends</p> <p>Proportion of family and friends who are also members of same industry</p> <p>Membership of fishing organisations</p> <p>Level and nature of participation in those organisations</p>	
<p>Ensure fishers have sustainable financial return from fishing sufficient to support livelihood needs</p>	<p>Extent to which fishers are satisfied with level of income achieved from fishing-related activities (measured via survey of fishers)</p> <p>Comparison of average fisher income with average income of individuals in non-fishing activities, and with poverty level (using ABS data)</p>	<p>Human capital is enhanced when a person has financial sustainability</p>
<p>Ensure fishers psychological wellbeing is maximised</p>	<p>Monitor self-reported satisfaction of fishers with work and life</p>	<p>Human capital is enhanced if an individual has positive mental health enabling them to cope positively with ongoing change in the industry</p>

Industry –Management

The process of management development also has social implications, and the potential benefits of industry participation in developing management plans have been widely recognised. Management plans can also be developed with the specific aim of minimising conflict between competing users of the resource, as well as conflicts with industry themselves.

Potential objectives and indicators related to management development are identified in the table below.

Objective	Potential indicators	Notes
Minimise conflict with industry	Number of formal objections to the management plan/complains by industry	A crude measure of satisfaction or dissatisfaction by industry
Minimise conflicts between industry and other users	Number of complaints by other stakeholders Number of reported incidents between industry and other users	As above, a crude measure of satisfaction. The usefulness of this as an indicator can only be seen over time as it increases or decreases in these incidents that indicate how well the objective is being achieved.
Undertake consultation with industry and ensure accountability for management decisions.	Inclusion of stakeholders in management advisory groups Formal process of industry consultation that includes feedback to industry on decisions made Identified management contact Level of satisfaction reported by industry participants with consultation (measured via survey of industry participants)	These may be yes/no answers Industry has an identified contact person to raise concerns
Ensure industry participation in management decision making	Percentage of industry members actively involved in or attending <ul style="list-style-type: none"> • management advisory groups • meetings/industry forums 	This is best expressed as a percentage rather than an absolute value as it is a better indicator of the degree of engagement with the management process
Positive promotion of commercial fishing to ensure a positive perception by the community at large	Number of adverse media reports about the fishery	These influence the social perception about the industry and affect the social licence to operate

Development of cost effective management plans	<p>Cost of management relative to the value of the fishery</p> <p>Cost of management relative to the economic profits generated</p> <p>Net (industry wide) economic profits after management costs have been deducted</p>	<p>This is a crude indicator of the cost effectiveness as it presumes success</p> <p>These are better indicators of cost effectiveness as it relates the costs of management to the economic benefits generated</p>
Ensure industry compliance with fisheries management plans	Number of reported violations of regulations/policy	Non-compliance is an indicator that fishers do not accept the validity of the management plan

Local/regional communities – Resource dependency

The *National ESD Reporting Framework for Australian Fisheries* identifies that “‘Resource dependency’ means, as the term suggests, how dependent a community is on the fishery resource. The dependency of a community on a resource, in this case a fishery, can be assessed in the traditional way of looking at the income and employment it generates”⁵. The Framework notes that in summary the dependency of a community on a fishery resource could be assessed looking at:

- direct employment and income as a proportion of the total;
- indirect employment and income generated by expenditure made by those involved in the fishery; and
- the role the fishery plays in qualifying a community for a government service and in attracting and retaining commercial services.

As direct income from the industry is covered in ‘Industry – Economic’, the focus here is on maximising the related income and employment benefits that may be generated by fishery activities in communities. However this objective does have to be mediated by the ecological imperatives to maintain sustainability of stocks and avoid over exploitation of the resource in the name of employment. Consequently the objective may be to minimise any negative impacts on community employment and income by fisheries management decisions.

Potential objectives and indicators related to resource dependency are identified in the table below.

Objective	Potential indicators	Notes
Maximise the positive impacts of the fishery on regional community employment and income.	<p>Level of local & regional unemployment and employment.</p> <p>Growth of aquaculture/wildcatch production</p> <p>Contribution of fisheries activities to change in local and regional employment and unemployment.</p> <p>Community perception of fishery importance. (established via regular survey of community attitudes)</p>	<p>Maximisation of employment may compete with other objectives but must be considered and decisions justified against this objective.</p> <p>This is a proxy for the asserted connection between any increase in industry activity and the expected associated community benefits.</p> <p>A key challenge of this indicator is in identifying what influence fishing related activities have on (un)employment.</p>
Maximise positive and minimise negative impacts of fishing activities on employment, income and socio-demographic characteristics of fishery-dependent communities.	<p>Monitor contribution of fishery to change in fishery-dependent communities using ABS data; this may include the impact of fishing activities on:</p> <ul style="list-style-type: none"> • Population change • Net migration • Age (average & median) 	<p>With demographic indicators, there is the requirement to contextualise the trends identified to identify the extent to which they are influenced by fishing activities versus other factors. For example, an increase in net migration into a community could</p>

⁵ Fletcher, W.J., Chesson, J., Fisher M., Sainsbury, K.J., Hundloe, T., Smith, A.D.M. and B. Whitworth (2002) *National ESD Reporting Framework for Australian Fisheries: The 'How To' Guide for Wild Capture Fisheries*. FRDC Project 2000/145, Canberra, Australia.p.45

	<ul style="list-style-type: none"> • Gender ratios • Dependency ratios • Income • Level of Education • Unemployment • Labour force participation • Employment by industry sector <p>In addition, data may be collected via surveys of fishers on:</p> <ul style="list-style-type: none"> • Longevity in industry • Length of residence • Social networks • Household expenditure <p>Proportion of regional employment derived from the sector (measured using ABS data; a reliable percentage indicator that can be monitored over time)</p>	<p>only reasonably be attributed to fisheries activities when there is a notable concurrent increase in wild catch, aquaculture or other fishing activity.</p> <p>Specifically collected data has the opportunity to be specifically contextualised and therefore more directly attributable to fisheries activities</p>
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Local/regional communities – Social capital

The *National ESD Reporting Framework for Australian Fisheries* identifies that “communities with high levels of social capital are better able to respond to and deal with adverse change. For example, if there is a significant reduction in access to a fishery resource, the community with good social capital is likely to be able to pull together to find ways to rebuild. However, the community with low social capital may not be able to find ways to overcome the reduced employment and income resulting from a fishery closure.”⁶

The Framework notes that in summary elements of social capital in a community are demonstrated through such things as:

- high levels of trust amongst community members;
- good networks within the community;
- good networks from the community to outside;
- reciprocity - or a preparedness to help each other;
- high numbers of voluntary organisations;
- high levels of participation in voluntary organisations;
- these voluntary organisations are effective and ‘get things done’; and
- effective government institutions that help rather than hinder community

The focus of this element of the component tree is, through management activities and regime, to maximise the social capital of a fishery related community, and not to erode the social capital of a community in the way in fisheries management is applied. It applies to ensuring that the communities in which fishers operate perceive a benefit from fishing activities and feel positively connected to, and therefore supportive of, the industry. It is NOT about fishers themselves, but rather *non* fishers in fishing related communities.

Potential objectives and indicators related to resource dependency are identified in the table below.

Objective	Potential indicators	Notes
To maximise community trust in government agencies to manage the fishery	Quantitative survey data on trust of community in government decision making	This will relate to the level of transparency of management actions and behaviour that can engender trust in government agencies.
To maximise the contribution of social capital by the industry to its regional community	<p>Availability of institutional networks and processes to utilise the industry to develop community skills (TAFEs, Schools, colleges etc).</p> <p>Fishing member involvement in non fishing civic activities and groups.</p> <p>Level of attachment of general community members to the region in which they live due to the fishing activity in it.</p>	<p>Industry management cannot bring about engagement of regional communities with the industry. However it can facilitate network development through encouragement of skills development and training</p> <p>This is a proxy measure that would be indicated of the perceived importance of the industry to community lifestyle, and therefore support of the industry.</p>

⁶ Fletcher W.J., et.al., (2002) p. 47

	<p>What social networks exist/ changes have occurred, at community level as a result of the fishery?</p> <p>Perceptions of relations between fishing communities and the general community, and how these are changing over time.</p>	<p>This is a proxy for the contribution that the fishery makes to the broader community. For example where the TAFE or high school implemented seafood training, or supermarket a seafood cooking course as a result of industry management that encourages or facilitates such activities.</p> <p>This a proxy measure of acceptance of fishing as a desired and legitimate community activity.</p>
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Local/regional communities – Environmental monitoring

The *National ESD Reporting Framework for Australian Fisheries* does not discuss the interpretation of Environmental Monitoring under Local/Regional community wellbeing. However this sub component would commonly be interpreted to refer to the opportunities that fisheries management might provide to general and fisheries associated communities to both provide environmental monitoring and transparently receive information on environmental conditions and trends related to fisheries activities.

The focus of this element of the component tree is suggested to be the benefit to the community of confidence in the environmental management of our fisheries. Potential objectives and indicators related to resource dependency are identified in the table below.

Objective	Potential indicators	Notes
To ensure management plans engender trust in the monitoring and enforcement of environmental laws.	Provision of advertised and easily accessible environmental fisheries data to the public. Survey of public perceptions of effective environmental monitoring of fisheries activities. Survey of public perceptions of perceived levels of environmental protection enforcement in fisheries activities.	This will relate to the level of transparency of management actions and behaviour that can engender trust in government fisheries agencies.

Local/regional communities – Human capital

The *National ESD Reporting Framework for Australian Fisheries* does not discuss the interpretation of human capital in the context of local/regional community wellbeing. However this sub component would commonly be interpreted to refer to the opportunities that the management of our fisheries might provide to general and fisheries associated communities in regard to the development of skills in the general community.

The focus of this element of the component tree is suggested to be the benefit to the community of skills and educational opportunities that may be contributed to by our fisheries management. Potential objectives and indicators related to resource dependency are identified in the table below.

Objective	Potential indicators	Notes
To improve community knowledge of fisheries management and options.	<p>The number of community seafood and industry education forums/training opportunities provided.</p> <p>Assessment of perceived value of community education activities.</p> <p>Assessment of participation and awareness of community education activities.</p>	<p>This would relate to information/training/field days initiated by management or in conjunction with industry.</p> <p>It could be assessed by exit survey's for participants in training and in annual reviews of management activities.</p>
To enhance the capacity of industry and community to adapt to management changes.	<p>What skills development and enhancement has taken place in the general community as a result of management plans?</p> <p>Has the [method of management] imparted particular skills/knowledge of benefit to particular individuals or groups in the community?</p> <p>What new groups/partnerships have been formed as a result of fisheries management?</p>	As above

Local/regional communities - Infrastructure

The *National ESD Reporting Framework for Australian Fisheries* identifies that “Fishery-related infrastructure [can be] a component of the contribution of a fishery to community well-being. For example, a harbour and associated infrastructure that exists primarily to service commercial fishing provides benefits to other users.”

This raises the question of the extent to which fisheries-related infrastructure should be managed to provide broader benefits for the community. Further, it must be considered if this should be a social objective of fisheries management, and if so, under what circumstances.

Potential objectives and indicators related to infrastructure are identified in the table below.

Objective	Potential indicators	Notes
Ensure public access to publicly provided/maintained fisheries infrastructure where appropriate, to maximise public amenity benefits from this infrastructure	<p>% of infrastructure to which public access is available (may be specified by type of access e.g. access for pedestrian traffic; boats)</p> <p>Level of public satisfaction with level of access to relevant infrastructure (established via regular survey of community attitudes)</p>	Responsibility for fisheries infrastructure maintenance may lie with agencies other than fisheries managers; level of influence of managers on outcomes of this objective therefore needs to be determined.
Maximise ancillary public benefits of presence of fisheries infrastructure, such as visual amenity provided by such infrastructure	Level of public satisfaction with contribution of fisheries infrastructure to visual amenity of local area	As above

Local/regional communities – Public amenity

The provision of public amenity refers to providing facilities or conditions that contribute to a pleasant, agreeable or enjoyable environment. It also sometimes refers to improving ease of access to and comfort of facilities.

The *National ESD Reporting Framework for Australian Fisheries* and the wording of current fisheries legislation in different jurisdictions suggest that the following areas may be examined as social components of ESD related to public amenity: maximising public enjoyment of fisheries and marine resources (eg fisheries legislation in NSW, Tasmania and GBRMPA), maximising recreational enjoyment (GBRMPA, NSW, SA), maximising cultural benefit (GBRMPA, Tasmania) or heritage values (GBRMPA), and meeting public needs and interests (Tasmania).

Potential objectives and indicators related to infrastructure are identified in the table below. Note that the ‘infrastructure’ indicators include some objectives and indicators relevant to public amenity.

Objective	Potential indicators	Notes
Maximise public enjoyment derived from fisheries infrastructure such as harbours, jetties, docks, through activities such as recreational fishing	Identify and monitor (i) social importance attached to this infrastructure, (ii) how enjoyment is derived e.g. through recreational fishing, and (iii) measure extent to which public is satisfied with level of enjoyment achieved – via regular survey of public attitudes	As the social importance of different types of infrastructure changes over time, it is essential to measure both how important different facilities are (so managers can prioritise which to maximise enjoyment from), and the level of satisfaction with the ability to derive enjoyment from the facility.
Ensure maintenance of cultural and heritage values of fisheries and marine infrastructure and related culture	Identify cultural and heritage values of importance (for example, through heritage registers, or via consultation/submission process) and type of access/activities required to ensure public can access and enjoy these values. Monitor whether this access/activity is being achieved	As above

Indigenous communities

The *National ESD Reporting Framework for Australian Fisheries* suggests that the following areas may be examined as social components of ESD related to Indigenous communities: traditional fishing, access to land, continuation of activities, and 'other'. In addition, some fisheries management legislation specifies that fisheries managers should recognise Indigenous values for fisheries related resources (eg NSW), or explicitly partner with Indigenous people (GBRMPA).

As with other social components of ESD, identifying clear objectives related to Indigenous communities which can be monitored using appropriate indicators can be challenging. In particular, it is essential to ensure that locally meaningful objectives and indicators can be set, as different Indigenous communities have very different cultural and traditional relationships with fisheries and marine resources, and therefore different needs in terms of fisheries management.

Potential objectives and indicators related to Indigenous communities are identified in the table below. These have been drawn from literature related to Indigenous communities and fishing, as well as broader work on indicators related to Indigenous wellbeing which have been modified to suggest objectives aiming to ensure fisheries management contributes positively to Indigenous wellbeing.

Objective	Potential indicators	Notes
Ensure access to land and sea resources for traditional activities and subsistence use	<p>Extent to which local Indigenous groups report they have adequate access (requires having good knowledge of access needs)</p> <p>Monitoring level of Indigenous catch/use and long-term sustainability of this (environmental sustainability of catch essential to ensuring long-term access to resources)</p> <p>Evaluation of adequacy of available catch/resources to meet Indigenous needs (for example, are Indigenous people allocated adequate catch to meet cultural and subsistence needs)</p>	<p>It is essential to have locally meaningful input on traditional activities and subsistence needs, and how these may change over time. This requires ongoing consultation with Indigenous communities.</p> <p>Indicators should involve two steps: (i) identifying level of access required (which may change over time), and (ii) assessing extent to which this is being achieved</p>
Ensure long term Indigenous use rights to land and sea are respected and enabled	<p>Extent of disputes over land and sea rights (noting that absence of disputes does not necessarily indicate absence of problems)</p> <p>Extent to which local Indigenous groups report having adequate acknowledgment of land and sea rights</p>	Requires having understanding of Indigenous rights. Specific measures may include
Ensure fisheries management enables continuation of	Extent to which local Indigenous groups report they are able to successfully maintain traditional	Indicators should involve two steps: (i) identifying nature of activities, and (ii) assessing extent to which

Indigenous activities dependent on fish and marine resources	activities relevant to fisheries management	ongoing ability to undertake these activities is successfully enabled via fisheries management (for those activities where fisheries management has an influence)
Ensure Indigenous people are appropriately consulted regarding fisheries management	<p>Fisheries managers can demonstrate ongoing consultation with all relevant Indigenous communities (identification of Indigenous stakeholders; documentation of consultation process, participation, and outcomes)</p> <p>Extent to which Indigenous communities report being satisfied with level of consultation achieved</p>	A key challenge with this objective is ensuring that there is assessment of whether consultation is reaching all relevant Indigenous communities (instead of only some), and whether Indigenous people are being consulted using methods that are culturally appropriate and effective for achieving Indigenous input. Indicators therefore need to measure quality of consultation as well as quantity.
Ensure fisheries management contributes to maintenance of Indigenous communities	<p>Identification of ways fisheries management may contribute to the maintenance of Indigenous communities</p> <p>Assessment of effectiveness of fisheries management in contributing to maintaining Indigenous communities</p>	This objective was developed largely with reference to subsistence-based Indigenous communities who depend directly on fisheries resources for day to day needs. It may need modification to be applicable to Indigenous communities for whom access to fisheries and marine resources is principally for cultural, rather than subsistence, needs.
Ensure Indigenous communities are able to access income-earning opportunities related to fisheries and marine resources	<p>Consideration given in management plans to providing Indigenous access to aquatic resources for income earning opportunities</p> <p>Participation of Indigenous people in income earning opportunities relating to fishing (measured as change over time in Indigenous participation in employment and business management)</p>	

Appendix 3: Literature Review - Social and Economic Objectives

INDUSTRY

1. Economic

a. Economic benefit

b. Optimal utilisation

Some consideration of economic conditions in the fishery is commonly included in most fisheries legislation and/or policies both within Australia and overseas. In some cases, such as in the Commonwealth [5] and Queensland [6] policies, strong economic objectives including 'achieving maximum economic yield' in fisheries are identified. In other States, the need to consider economic implications is either explicit or implicit in policy and legislation.

Distinguishing between economic benefits and optimal utilisation, as in the ESD framework, is less straightforward as the two are intrinsically linked. From an economic perspective, maximising economic benefits is the optimal utilisation of the resource. Maximising economic profits from the fishery is the most common economic related objective cited [4, 7-14], although in some instances different preferences are given to particular sectors of the fishery [15]. Ensuring economic viability at the fleet level has also been proposed as an economic objective [16], and has been operationalised in the definition of MEY for Australia's Northern Prawn Fishery (where a constraint is imposed in setting MEY that vessel profitability cannot fall below zero at any point in time) [17].

In the context of a social objective, key economic objectives may also include maximising the performance of the associated sectors [15], maximising value added (the combined profit and crew income) [12] or equity considerations [12, 18, 19]. Maximising vessel profitability is also seen to have social benefits in terms of strengthening local communities through increased resilience of the industry [8, 19]. As well as ensuring a resilient fishing industry, maximising profits has been found to have a positive flow-on effects to the local communities in terms of enhanced incomes in other sectors [20].

2. Industry Structure

Maximising economic benefits in the fishing industry is often associated with fewer vessels and a reduction in fishing employment. However, there are often concerns over regional employment, particularly in fishing communities with a high resource dependency. While economic efficiency and employment objectives may conflict, identifying and prioritising these objectives enables best compromise solutions to be achieved.

a. Employment

Employment is an often cited objective of natural resource management [21] and has been considered a key element in agriculture [22, 23], mining [24], fisheries in particular [7-9, 12, 13, 25]. While maximising or maintaining employment is usually considered a social objective, it has also been considered an economic objective [15]. In some instances, employment is represented as the only social objective considered [2].

In fisheries, a distinction is often made between maintaining or increasing employment in the fishing sector and regional employment, with both being considered as separate objectives [3, 4, 9, 12, 26].

Indirectly related to the employment objective is the structure of the fishing fleet. A large fleet of smaller boats may have very different employment consequences than a small fleet of larger boats.

Maintaining relative fleet structure has not been a common objective in the literature, although has been imposed in some studies where equity in changes in fleet structure was considered important [26]. To a large extent, limiting changes in fleet size and structure are a means to achieving a broader employment objective, so are not generally seen as an objective in their own right. However, ensuring that one sector is not given preferential treatment over another is a common management objective as will be discussed below.

b. OH&S (Work related injuries)

Ensuring health and safety has been included as an objective of management in several fisheries [9, 10] and aquaculture [27] studies. However, this was not identified as an objective in the previous Australian studies [3, 4].

c. Skill Development (use of technical knowledge)

Enhancing the technical ability of fishers to catch fish has been an objective in a limited number of European fisheries [28], with improved productivity identified as a related objective in other instances fisheries [16]. The relatively low number of instances of such objectives may relate to their implicit inclusion in other economic objectives (such as improved vessel profitability) or environmental objectives, in particular the reduction of bycatch [4, 7, 10, 12, 15, 25] and habitat damage in Fisheries [4, 12, 14, 25]. Consequently, they may be seen as a means to an end rather than an end in their own right.

d. Attachment to lifestyle

Fishers gain many non-monetary benefits from fishing. For recreational fisheries, these non-monetary benefits dominate as (technically) no financial returns are achieved. The attachment to lifestyle for these fishers has a substantial impact on their behaviour [29]. For indigenous fisheries, the cultural significance of the activity may also be significant. For commercial fishers, there is often considerable attachment to lifestyle which can be affected by fisheries management [15, 19, 25, 30, 31]. Similarly, in areas of limited alternative employment opportunity, there may be substantial resource dependency by the commercial sector for economic as well as social reasons [18]. In the Queensland fisheries study, respecting customary fishing was considered a key social objective, where customary fishing in this case reflected largely the small scale “mum and dad” fishing business that generally supplied the local markets [3]. Consequently, maintaining or enhancing these cultural, recreational and lifestyle benefits of fishing for those who participate in fishing activities may be seen as an important social objective.

3. Management

The process of management development also has social implications, and the potential benefits of industry participation in developing management plans have been widely recognised. Management plans can also be developed with the specific aim of minimising conflict between competing users of the resource, as well as conflicts with industry themselves.

a. Conflict management

Minimise conflicts between alternative users of the resource (e.g. gear conflicts, Interacting fisheries and Recreational and commercial fisheries) is often included as a key social objective in fisheries [4, 9, 12, 15]. This has also been the case for Australian fisheries for which management objectives have been assessed [3, 4].

b. Consultation, accountability and participation

These are identified as two separate components of the ESD objective hierarchy, although there is substantial overlap in the fisheries context. Encouraging participation interacts with the consultation and accountability objective to increase trust in the management system and achieve better overall

results [32]. Community participation in management decision making is seen as a key factor in natural resource management relevant to maintaining communities. A number of case studies have been presented in forestry [33] as well as fisheries [18, 19] where enhancing these components have improved management outcomes. In the context of fisheries, there is growing awareness that the benefits of moving to a co-management system with participation by industry and other stakeholders are potentially substantial [34-36]. Fisheries management has long been characterised by strong user-group involvement, created to enhance the legitimacy and proficiency of decisions [37]. Enhancing opportunities to develop co-management arrangements was seen as a key management objective in the Queensland study [3].

c. Promotion of commercial fishing

Social concerns and the associated conflicts that they can generate constitute a rapidly expanding aspect of risk [38]. The concept of a social licence to operate, representing community acceptance of the resource based industry, is an important consideration in the minerals and energy sector [38, 39], and is becoming increasingly important in fisheries, particularly in the context of increased development of marine protected areas for marine biodiversity conservation and adverse community reactions to issues such as bycatch of threatened, endangered or protected species. A key public perception of fisheries is that they are characterised by overexploitation and environmental damage [40]. In Australia, public perceptions regarding fisheries have generally been negative since the early 1980s [41], and persist today despite substantial improvements in management performance and the ecological and economic sustainability of the industry.

A poor perception of the industry has longer term implications for its survival as an industry. The cost of entering the industry is high – both in terms of gaining access (i.e. buying a licence and vessel) and the opportunity cost of labour (given the level of incomes in fisheries relative to other sectors). A negative social perception regarding the industry further reduces the likelihood that new people will enter the fishery. Australian fisheries are characterised by relatively few new entrants and an aging labour force. To reverse this trend, fisheries need to be both economically and socially attractive.

ASSOCIATED COMMUNITIES

4. Resource Dependency

a. Community wellbeing/benefit

The objective of maintaining or supporting communities associated with fishing activities, relates to the recognised need and/or preference for fishers to live in communities that are provided with services and infrastructure, in the form of schools, support industries, retail and transport services. The contribution or influence that the industry can have in this regard is its contribution to the regional community economy, which in turn provides an element of ‘resilience’⁷ in that community. This also has a further associated benefit of contributing to the maintenance of the industry’s social licence to operate⁸. A number of projects and reports have discussed this objective identifying a range of indicators which focus on different elements of regional community contributions [4, 8, 9, 12, 14, 18, 19, 33, 44-49]. These indicators suggested include:

- the proportion of income or regional employment in the regional community derived from the fishing sector;
- degree of community involvement in the management of the industry;

⁷ “A resilient community is one that is able to maintain the same or an improved functionality in the face of changed circumstances.” [67342]

⁸ “A social licence to operate is an overall measure of socio-political sentiment towards a project, company or industry” [43]

- level of indirect economic impacts from the fishery on the regional economy;
- the level of infrastructure provided as a result of the industry's existence in the community;
- degree of integration of fishing activity into local economic development plans;
- the number of small vessels in the regional community (contribution to the culture of the community);
- profitability of the sector (proxy for contribution to the regional economy and thereby community)
- and number, or profitability of, associated support industries, such as fish processing/chandlers/net makers/transporters.

Many of these are only useful if the data is either collected regularly (which is not commonly the case) or the resources are available to specifically collect data for each assessment in each community considered. This is commonly not feasible on a whole of country basis, except where the data may be collected by agencies such as the Australian Bureau of Statistics or ABARE as part of either annual or other regularly collected census data. Consequently the indicators that might be considered for this objective in this context of being nationally consistent are problematic, but may include,

- the degree of community involvement in management decisions; or if data is available,
- the proportion of community income or employment derived from the sector.

A further aspect of community wellbeing already raised, is that of community resilience. Although the majority of contributions by the industry to community resilience will be commonly derived from the income generated by the industry, the dependence of regional communities on fishing activities through secondary or support industries and services accessed by fishers must be considered as a regional or associated community benefit [46]. The indicator of this most commonly suggested is that of economic multipliers, however difficulties have been experienced in attempting to collect this data previously [47], despite our reasonably data rich environment. The data for this is difficult to collate without resorting to primary data collection. In relation to the contribution to overall community resilience Marshall [46] identified four key factors that contributed to resilience: the perception of risk; ability to cope; ability to plan and learn; and level of interest in adaptation. However, while these concepts could be extended to general community resilience, more work would be required to clarify the nexus between a specific industry or industry sector (fishery) and a general community's level of resilience [50].

5. Social Capital

Social capital is seen as a key element in reducing conflict and transaction costs generally in the operation of industries generally, a concept which is equally applicable to fisheries management in the context of being situated in diverse regional communities with often conflicting aspirations for resources [10, 18, 23, 33, 42, 51-54]. The means to assess social capital is often confounded however, by the diversity of opinion as to what type⁹ of social capital is being assessed and for what purpose. Despite this, the common types of indicators of social capital that appear in the literature

⁹ Social capital is broken down into three different types: bonding (homogenous supportive networks); bridging (heterogeneous diversifying networks); and linking (networks that facilitate access to power and decision making)[55]

related to regional communities associated with the fishing industry, include; the level and/or intensity of social networks between members of the industry and associated community; a comparison of the number of bonding, bridging and linking networks between the industry and regional community; and education levels which contribute to bridging social capital through exposure to diverse sources of knowledge and problem solving approaches. Many of the easily collected proxies for social capital such as membership numbers of general community associations [56, 57] have been proven to be unreliable in regard to the conclusions that can be drawn from them. That is, that membership cannot in reality be equated to participation and therefore access to resources that might otherwise be generated by membership of that network. However, DeFilippis [53] argues that when linked to economic capital, such as the existence and use of microenterprise lending circles, which can act as focal points for social networks to come together, social capital can be relatively easily assessed. In this context it has both economic relevance and also to developing and developed countries equally, however it is relevant to situations where small microfinance situations exist, rather than the Australian context of large national financial institutions making finance available, sometimes entirely remotely. In the Australian, developed nation, circumstance unfortunately this perspective while has credibility for its perspective, has little relevance. Consequently to assess social capital in the Australian governance situation is constrained by the ability to collect primary data in the form of participation levels, perceptions or network analysis.

6. Environmental monitoring

The interpretation of Environmental Monitoring under Local/Regional community wellbeing in the ESD Component Tree Framework is not discussed, however this sub component was interpreted as it is commonly referred to, which is the opportunities that fisheries management might provide to general and fisheries associated communities to both provide environmental monitoring and transparently receive information on environmental conditions and trends related to fisheries activities. It was suggested that the focus of this component be the benefit to the community of confidence in the environmental management of our fisheries. In the literature overarching objective emerges as commonly being to identify community concerns and knowledge as the community is an essential component of the ecosystem [58, 59]. However, while there are many reports as to the success of community based monitoring and efforts to engage communities in environmental monitoring and increased environmental stewardship; or frameworks to employ in the process of achieving community participation in environmental monitoring, no literature was able to be identified that discussed specific management objectives and indicators of success of community engagement in this activity. Previous work in the aquaculture sector did identify a number of indicators in relation to the objective of assessing industry participation in environmental monitoring, but not from the perspective of procuring information for management's around community participation or knowledge [60].

7. Human Capital

a. Community education

Human capital refers to the ability to the resources that people have through the knowledge and skills they possess and is generally assessed through the level of education or skills of an individual or group [61-66]. While there is a large amount of literature on social capital, again there is little in the context of the role of management in generating human capital and assessing the effectiveness of that role. Generally the work that has been undertaken and reported in on how human capital can be utilised, accessed or enhanced with social capital. It is also often reported and discussed from the

perspective of communities or organisations and how they can build or further develop human capital. Consequently, these perspectives are not able to be directly utilised in this context of management contribution to a communities' human capital. Adaptation is, however, a further aspect of human capital which is discussed by a number of authors in relation to environmental management [44, 67-71]. This is in the context of the role of management to assist communities directly and indirectly associated with the resource to adapt to changes in its management. This work is potentially much more relevant to fisheries management than traditional human capital literature. The perspectives raised by both these bodies of literature that are of use in being adapted to the context of ESD Fisheries Management are considered to include: levels of training; opportunities for knowledge of training/education development; and facilitation of adaptation.

8. Infrastructure

The *National ESD Reporting Framework for Australian Fisheries* [1] identifies that “Fishery-related infrastructure [can be] a component of the contribution of a fishery to community well-being. For example, a harbour and associated infrastructure that exists primarily to service commercial fishing provides benefits to other users.” This raises the question of the extent to which fisheries-related infrastructure should be managed to provide broader benefits for the community. Further, it must be considered if this should be a social objective of fisheries management, and if so, under what circumstances.

Previous work identifying indicators related to fishing have not typically identified specific objectives regarding infrastructure. While providing adequate infrastructure and ensuring it is accessible by various stakeholders is typically acknowledged as an important objective (see for example [72]), more specific detail is rarely provided. Therefore, the preliminary work in the National ESD Reporting Framework [1] was used to develop suggested objectives, with associated indicators developed based on reviewing the types of infrastructure typically referred to in the fisheries literature, and workshop discussions. Infrastructure was identified as including facilities for mooring, utilities and boat servicing (fuel, workshops), fish handling infrastructure (processing facilities etc) and marketing infrastructure [73], as well as ‘fish friendly’ infrastructure designed to provide places for fishing such as jetties, fishing platforms and artificial reefs [74].

In general, the objectives developed were focused on, firstly, ensuring the public has opportunity to access and utilise publicly provided or maintained fisheries related infrastructure, with the overall objective being to maximise public amenity benefits from this infrastructure where feasible (for examples of these types of objectives embedded in fisheries infrastructure management plans, see [75, 76]). Access and use of infrastructure can provide significant public amenity, for example where access is provided to jetties for the general public, who can enjoy coastal resources through utilising jetties on walks and sightseeing. Another example is that of providing access to artificial reefs for fishing purposes. In addition to access, fisheries infrastructure can provide significant amenity benefits – for example, the presence of a fishing jetty or dock, or even of fishing boats, can be part of the visual appeal of a town that contributes to public enjoyment of it, and may result in both intangible benefits (public enjoyment) and tangible benefits (increased tourism revenue). Therefore, as well as maximising access for direct utilisation, it may be important to maximise ancillary benefits of infrastructure, such as their visual appeal as part of a coastal town setting.

9. Public Amenity

The provision of public amenity refers to providing facilities or conditions that contribute to a pleasant, agreeable or enjoyable environment. It also sometimes refers to improving ease of access to and comfort of facilities [77].

The *National ESD Reporting Framework for Australian Fisheries* [1] and the wording of current fisheries legislation in different jurisdictions suggest that the following areas may be examined as social components of ESD related to public amenity: maximising public enjoyment of fisheries and marine resources (e.g. fisheries legislation in NSW, Tasmania and GBRMPA), maximising recreational enjoyment (GBRMPA, NSW, SA), maximising cultural benefit (GBRMPA, Tasmania) or heritage values (GBRMPA), and meeting public needs and interests (Tasmania).

However, in identifying objectives, considerable overlap was identified between these areas. Objectives and indicators developed as part of other processes often combine concepts such as 'public enjoyment' and 'recreational enjoyment', with no clear distinction or definition made between both; similarly, the terms 'cultural' and 'heritage' values are often defined and used in similar ways. The concept of public needs or values cuts across all the other suggested areas (public enjoyment, cultural benefit, heritage values and recreational enjoyment).

Therefore, based on review of the concepts embedded in the idea of public amenity, two broad objectives were proposed: an objective of maximising public enjoyment derived from fisheries related activities, and ensuring maintenance of cultural and heritage values. The concept of public enjoyment (including that derived from recreation) is conceptually different to maintaining cultural and heritage values, as the latter specifically involves maintaining historically undertaken activities or activities, or the meaning embedded in them, whereas the former involves identifying what maximises enjoyment irrespective of historical activity.

10. Indigenous communities

The *National ESD Reporting Framework for Australian Fisheries* [1] suggests that the following areas may be examined as social components of ESD related to Indigenous communities: traditional fishing, access to land, continuation of activities, and 'other'. In addition, some fisheries management legislation specifies that fisheries managers should recognise Indigenous values for fisheries related resources (eg NSW), or explicitly partner with Indigenous people (GBRMPA). These five areas – providing for traditional fishing, Indigenous access to land, continuation of Indigenous activities, recognising Indigenous values, and partnering with Indigenous peoples – are highly inter-related concepts that are not easily separable and often overlap. Previous work developing objectives and indicators related to Indigenous people in the fisheries sector often use these different terms to refer to similar concepts or objectives (see for example [78, 79] for different wordings).

A recent UN workshop examining how best to develop objectives and indicators regarding Indigenous people's wellbeing concluded that ultimately, there is a 'need for rights-based indicators that take into account issues of access to territories (land and waters) and to resources, participation in decision-making, as well as issues of discrimination or exclusion in the areas of economic, social and cultural rights' [80]. This suggests that objectives should be set that focus on ensuring maintenance of Indigenous people's rights, in terms of property and resource access, access to

decision making, and access to economic and social systems enabling and supporting their desired livelihoods.

When reviewing programs within the fisheries sector with an Indigenous focus, a further objective related to those above is apparent: as identified by Tedesco and Szakiel [81], 'Currently there is a range of indigenous economic strategies and programs across Australia that are administered by state and territory governments. All of these initiatives have similar objectives and generally focus on the improvement of economic aspects related to indigenous communities either through a broad economic development strategy, better employment opportunities, or growth in indigenous businesses' ([81] p. 26). This suggests that to achieve the rights-based objectives identified above, it may be important to have objectives that involve building capacity within the Indigenous sector to utilise these rights to achieve livelihood outcomes. A review of the effectiveness of encouraging Indigenous fishing activities in the Torres Strait found that it was essential to match the delivery of rights with capacity building initiatives enabling Indigenous people to effectively utilise those rights for their livelihood needs [78].

As with other social components of ESD, identifying clear objectives related to Indigenous communities which can be monitored using appropriate indicators can be challenging. In particular, when developing indicators related to Indigenous wellbeing it is essential to ensure that locally meaningful objectives and indicators can be set [80], as different Indigenous communities have very different cultural and traditional relationships with fisheries and marine resources, and therefore different needs in terms of fisheries management [82]. Taylor [82] highlighted that there is often conflict between formal processes of objective setting and indicator measurement and how Indigenous people perceive and understand their own well-being. It is essential that this project explore this potential conflict in the South Australian case studies and identify to what extent it is resolvable; the objectives identified in Stage 1 are expected to be modified as needed in consultation with Indigenous people in the case study regions, together with having dialogue regarding the extent to which government-focused objective and indicator based processes can meaningfully identify Indigenous wellbeing issues related to fishing. The approach used in case studies will follow methods used by previous authors working in various primary resources industries, such as Karjala et al. [83] in the forestry sector, with a participatory approach to identifying locally meaningful Indigenous indicators used.

Recognising these principles, objectives related to Indigenous communities and fishing activities focused on (a) ensuring access rights (to land and water resources) are provided and enabled; (b) ensuring that continuation of Indigenous use of fisheries resources is enabled (for example through ensuring access to adequate fish stocks [84], in addition to access to water or land needed to access those stocks); (c) ensuring Indigenous people have access and input into decision making processes, ensuring their voices are heard and acted upon; (d) ensuring the maintenance of Indigenous communities is contributed to as appropriate by fisheries management, and (e) ensuring Indigenous people have the capacity to access and develop livelihood opportunities related to fishing activities.

Appendix 4: Workshop Participants

Invitees/Participants for the AFMF management/
Social Objectives Workshop – FRDC Project: 2010/040

Name	Organisation	Email	Phone Number	Attendee
Anthony Hurst	ED - Victoria Dept of Primary Industries - Fisheries	Anthony.hurst@dpi.vic.gov.au	(03) 96584360	Dallas D'Silva Anna Battese, Andrew Hodges,
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Ian Curnow	ED – Northern Territory Dept of Resources – Fisheries	ian.curnow@nt.gov.au	(08) 89992027	Roslyn Volcano roslyn.vulcano@nt.gov.au
Jim Groves	MD – Fisheries Queensland	Jim.groves@deedi.qld.gov.au	(07) 32242268	Ian Yarroll Ian.yarroll@deedi.qld.gov.au
Simon Veitch	DAFF	Simon.veitch@daff.gov.au	(02) 6272 5863	Lorraine Hitch Lorraine.Hitch@daff.gov.au Gavin Begg Gavin.Begg@abares.gov.au
James Findlay	AFMA	James.findlay@afma.gov.au	(02) 62255301	David Galeano David.galeano@afma.gov.au
Rick Fletcher	AFMF EBFM Subcommittee representative	Rick.Fletcher@fish.wa.gov.au	(08) 9203 0114 M:0418 884 236	(Lindsay Joll nominated to act in this capacity as well)
Nigel Routh	Assistant Secretary, Marine Biodiversity Policy Branch- SEWPaC	Nigel.routh@environment.gov.au	(02) 6274 1111	Paul Garrett Paul.garrett@environment.gov.au Director, Marine

				Bioregional Planning Strategy, Tropical Marine Conservation Branch
Patrick Hone	FRDC	Patrick.hone@frdc.com.au	(02)62850401	Not attending – Kate B FRDC representative
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Chris Calogeras	Indigenous	calogeras@inet.net.au	(04) 0169-2601	No representative attending
Bill Sawynok	Recreational Fishing	Bill@info-fish.net	0417 075277	Bill Sawynok Bill@info-fish.net
Lisa Rippin	EconSearch Pty Ltd	www.econsearch.com.au	(08) 84315533	Lisa Rippin lmrippin@econsearch.com.au
Martin Exel	Chairman - Commonwealth Fishing Association	MExel@australfisheries.com.au ceo@comfish.com.au		(Ross McGowan also acting on behalf of CFA)
Workshop Convenors				
Lianos Triantafillos	Principal Investigator - Fisheries Manager - PIRSA	lianos.triantafillos@sa.gov.au	(08) 82262961	Yes
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Cathy Dichmont	CSIRO	Cathy.dichmont@csiro.au	(07) 38335925	Yes
Jacki Schirmer	Research Fellow - ANU	jacki.schirmer@anu.edu.au	(02) 61252737	Yes
Kate Brooks	Social Scientist – KAL Analysis P/L	kate@kalanalysis.com.au	(03) 99172665	Yes

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Appendix 5 Details of workshops held in South Australia as Phase 2 inception

A series of workshops were held with relevant stakeholders in South Australia to critically review and discuss the draft objectives and indicators identified in Phase 1 of the project. Based on these discussions, a final suit of specific Objectives and Indicators were developed. Listed below are the details of these workshops and who attended.

Workshop	Date	Attendees (affiliation)
Ceduna community	20/9/2011	Reg Davis (Recreational fisher) Mick Maher (Recreational fisher) Phillip Towbridge (Recreational fisher) Ian Carwood (Recreational fisher) Mark Mozel (Recreational fisher) Perry Willis (Recreational fisher) Kim Woods (Recreational fisher) Alan Suter (Mayor/ MSF licence holder) Gus Oestmann (MSF licence holder) Kimberley Griffin (Compliance officer) Trevor Puckeridge (Compliance officer) Kate Brooks (Project team)
Fisheries managers	20/9/2011	Mark Ayliffe (Project officer, PIRSA) Alice Fistr (Manager of fisheries policy, PIRSA) Keith Rowling (Recreational liaison & Blue Crab fishery manager, PIRSA) James Bennett (Charter boat fishery manager, PIRSA) Craig Noell (Prawn fisheries manager, PIRSA) Jonathan McPhail (Inland fisheries manager, PIRSA) Shirley Sorokin (Policy officer, PIRSA) Michelle Besley (Marine scalefish fishery manager, PIRSA) Keith Jones (Silago Research Pty Ltd) Jacki Schirmer (Project team) Carmel Anderson (Project team) Lianos Triantafillos (Project team; rock lobster & abalone fisheries manager)
Commercial sector	22/9/2011	Damon Edmunds (Abalone Industry Association of SA, Western Zone Abalone Fishery) Samara Miller (Executive officer-Abalone Industry Association of SA) Mike Tokley (Executive officer-Central Zone Abalone Fishery) Simon Clark (Executive officer-Spencer Gulf & West Coast Prawn Fishermen's Association) Justin Philips (Executive officer-SA Rock Lobster Advisory Council, SA Blue Crab Pot Fishers Association, GSV Prawn Fishery) Roger Rowe (Northern Zone Rock Lobster Fishery licence holder) Jacki Schirmer (Project team) Carmel Anderson (Project team) Lianos Triantafillos (Project team)

Workshop	Date	Attendees (affiliation)
Recreational sector	23/9/2011	Keith Jones (Silago Research Pty Ltd) Knut Gassmanis (South Australian Recreational Fishing Advisory Council) Keith Rowling (Recreational liaison officer, PIRSA) Kym Woolford (South Australian Recreational Fishing Advisory Council) Gary Flack (Executive officer- South Australian Recreational Fishing Advisory Council) Norm Pope (Eyre Peninsula Recreational Fishing Committee) Gary Denton (GT Fishing Charters-Coffin Bay) Damien Smart-The Smart Catch and Eyre Peninsula Recreational Fishing Committee) Ron Sheriff (South Australian Recreational Fishing Advisory Council, Fisheries Council of South Australia and Yorke Peninsula Recreational Fishing Committee) Jacki Schirmer (Project team) Carmel Anderson (Project team) Lianos Triantafillos (Project team)

Fisheries manager survey

*** 1. This survey is designed to be answered for a specific fishery, by fisheries managers. To begin, we ask for your name and the name of the fishery for which the survey is being completed.**

Your name:

Name of the fishery you manage:

2. . If you manage a single fishery for multiple purposes, please select as many as apply.

- Commercial
- Recreational
- Indigenous
- Other

Fisheries manager survey

Objective 1 - Opportunity for livelihood

A key social objective of commercial fisheries management is to provide livelihood opportunities for fishers, within the constraints of ecological sustainability. The questions in this section ask questions that evaluate the opportunity provided for livelihood in the fishery you manage.

The questions in this section should be completed only for commercial fisheries. If you manage a non-commercial fishery, please go to the next page.

3. Think about how fishers gain entry to the fishery (eg by purchasing a licence, or quota). How have costs of entering the fishery changed in the last three years?

- Entry costs have increased
- Entry costs have stayed about the same
- Entry costs have decreased
- Unsure/don't know

If you wish, please provide more detail here

4. Think about how fishers are able to gain entry to the fishery (eg through purchasing a licence, or quota, or both). How have the costs of entry changed over the last 3 years relative to returns?

- Costs of entry have increased more than average returns to fishers from the fishery
- Costs of entry have not increased more than average returns
- Costs of entry and returns have both increased at about the same rate
- Unsure/don't know

Please provide more detail if needed

Fisheries manager survey

5. What proportion of opportunities to enter the fishery are being accessed at the moment (eg is 100% of quota being utilised, or 100% of available licences)?

- 100%
- 90-99%
- 80-89%
- 70-79%
- 60-69%
- 50-59%
- 40-49%
- 30-39%
- 20-29%
- 10-19%
- 0-10%
- Not applicable as open access fishery
- Unsure/don't know

Provide further comment below if you wish

6. Now, please think about the methods by which fishers maintain access to the fishery (eg through an annual fee). How have costs of maintaining access, ie fees paid on a regular basis to management agencies, changed over time?

- Fees have increased
- Fees have stayed about the same
- Fees have decreased
- Unsure/don't know

7. Still thinking about costs of maintaining access to the fishery: How have these costs changed over the last 3 years relative to returns?

- Costs of maintaining access have increased more than average returns to fishers from the fishery
- Costs of maintaining access have not increased more than average returns
- Costs of maintaining access and returns have both increased at about the same rate
- Unsure/don't know

Please provide more detail if needed

Fisheries manager survey

8. Are use rights in the fishery readily transferable between fishers (eg quotas and licences can be transferred from one user to another easily)?

- Yes
- No
- Unsure/don't know

9. If use rights are transferable, is there an established markets enabling transfer (eg has anyone used that right of transfer in recent times)?

- Yes
- No
- Unsure

10. If use rights are transferable, is there a clear market price for the transferable rights (this would be evidenced by, for example, recent transactions that have set a price. If few transactions occur, there may not be a clear price for the rights)

- Yes
- No
- Unsure

11. In your opinion, does fisheries management constrain access of fishers to livelihood opportunities in ways other than constraints imposed in order to ensure ecological sustainability? (for example, through high entry costs or other restrictions)?

- Yes
- No
- Unsure

Fisheries manager survey

Objective 3 - Ensure fisher involvement in management

Another important social objective for fisheries management is to ensure fishers are able to be involved in management. The questions on this page apply to all fisheries.

12. Which of the following opportunities do fishers in your fishery have to provide input into fisheries management? (select all that apply)

- Contact with fisheries manager (fishers can call, email or otherwise talk directly to you)
- Contact via a representative organisation (an organisation exists that represents the interests of fishers to fisheries managers)
- Fishers are represented on a management committee
- Fishers are notified directly when there is a planned change to the fishery, and asked to provide feedback
- Other

If you specified other, please describe below

13. When fishers are asked to provide feedback to fisheries management, which of the following formats are they usually able to provide feedback in? (select all that apply)

- Face to face meeting
- Phone discussion
- Written input on paper or by email
- Online feedback
- Other

If you indicated other, please specify

14. Approximately what proportion of the fishers in your fishery have you communicated with in each of the following ways in the last 12 months?

	Face to face meeting with individual fishers	Phone conversation	Sending letter or email communication	Meeting with groups of fishers	Meeting with individuals appointed to represent a larger group of fishers
Answer	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Fisheries manager survey

15. Approximately what proportion of fishers and other stakeholders you aim to engage with have actively participated in fisheries management in the last 12 months, through any of the methods listed in the previous questions? If fishers don't talk directly to you, but instead talk to their representative organisation in order to give you feedback, you may need to consult that organisation prior to answering this question.

- Less than 20%
- 20-39%
- 40-59%
- 60-79%
- More than 80%

16. Do you specifically identify and document what individuals and groups are materially affected by management of this fishery?

- Yes
- No
- Unsure/don't know

17. Do you specifically identify and document what individuals and groups have an interest in the management of this fishery even if they are not materially affected by management decisions?

- Yes
- No
- Unsure/don't know

18. Do all stakeholders who are materially affected by fisheries management have an opportunity to be represented on management advisory groups?

- Yes
- No
- Unsure

19. Do all stakeholders who have an interest in, but are not materially affected by, fisheries management have an opportunity to be represented on management advisory groups?

- Yes
- No
- Unsure

Fisheries manager survey

20. Within your organisation, are there clearly designated contact people whose responsibility is to liaise with specific stakeholders in your fishery?

- Yes
- No
- Unsure

21. How do you ensure stakeholders know who to contact if they wish to discuss management of this fishery? (select all that apply)

- Contact names and numbers are listed on our website
- Stakeholders are sent a list of contacts by email or email
- Other (please specify below)

Other (please specify)

22. How often do you provide feedback to stakeholders about how their input to management processes was used?

- Never
- Occasionally, but only for big changes in fishery management
- Regularly as part of updates about management
- Other (please describe below)

Other (please specify)

23. When you provide feedback to stakeholders, how do you provide it? (select all that apply)

- Informally through conversations in person or on the phone
- Formally through conversations or by phone (you keep records of who you contacted and when)
- In writing through letters or emails sent to each fisher individually
- In writing through newsletters or notices sent to all fishers
- By placing a notice on the website
- Other (please describe below)

Other (please specify)

Fisheries manager survey

24. Is there a formal process of feedback to stakeholders that will be continued by other staff if a new person takes over management of the fishery?

- Yes
- No
- Unsure

Objective 4

Sometimes stakeholders asked to be involved in fisheries management processes need support to participate effectively. This page asks questions about the support needs for your fishery, and the types of capacity building activities you conduct with stakeholders. Managers of all fisheries should answer these questions.

25. Which of the following opportunities did you provide to stakeholders involved in fisheries management in the last 12 months (all are methods of building skills and capacity to participate)? (select all that apply)

- Expert presentations discussing scientific data on the fishery
- Training courses for members of advisory committees or other stakeholders involved in management
- Resources to facilitate participation, such as reimbursement of travel costs to attend meetings
- Other (please describe below)

Other (please specify)

26. Have you noticed any significant constraints or issues that prevent some stakeholders from participating effectively in fisheries management (eg through providing comments in submissions, or participating on advisory committees)?

- Yes
- No
- Unsure

27. If you answered yes to the previous question, what are these constraints (eg low literacy, lack of ability to travel to meetings, difficulty understanding science of the fishery, or others)?

Fisheries manager survey

Objective 6 - Stewardship of fisheries resources

This section asks you questions intended to identify whether fishers have a strong sense of stewardship in the fishery, and how this impacts on fisheries management. Managers of all fisheries should answer these questions.

28. How have the number of fisheries infringements/warnings/prosecutions changed over the last year?

	Recorded infringements	Warnings given to fishers	Prosecutions of fishers
Select one option from the drop down box	<input type="text"/>	<input type="text"/>	<input type="text"/>

Please add comments if you wish to

29. What was the total number of infringements recorded in the fishery in the last 12 months, and your total spend on compliance activities and education activities?

Number of infringements:	<input type="text"/>
\$ spent on compliance effort (excluding education initiatives):	<input type="text"/>
\$ spent on education initiatives:	<input type="text"/>

30. If you have a phone number people can call to report poor fishing behaviour, please answer this question. How has the number of calls to fisheries hotlines reporting concerns about fishing in your fishery changed over the last 12 months?

- Increased
- Stayed about the same
- Decreased
- Don't know/unsure

Please add a comment if you wish to

Objective 8 - Equitable treatment and access for fishers

Equitable treatment of fishers is an important social objective for fisheries management. The following questions should be answered by managers of all types of fisheries.

31. Are the mechanisms/methods by which fish stocks are allocated & reallocated to different groups of fishers documented and made publicly available?

- Yes
- No
- Unsure/don't know
- Not applicable

32. Are mechanisms/rules used to guide allocation & reallocation for this fishery stable (ie consistent over time)?

- Yes
- No
- Unsure/don't know
- Not applicable

33. Are mechanisms/rules used to guide allocation & reallocation for this fishery easy to understand?

- Yes
- No
- Unsure/don't know
- Not applicable

34. How do you ensure that the resource allocation process for your fishery is (i) transparent (in other words, readily understandable and clear) and (ii) equitable to all users of the fishery?

Fisheries manager survey

Objective 9 - Access to infrastructure

Fisheries managers do not always have direct power to influence fishing infrastructure. However, in some cases they do, and on this page we ask questions about the infrastructure you may have management power for. In addition, sometimes fisheries managers may seek to influence infrastructure that is managed by other people, and we ask you questions about that infrastructure as well. Managers of all types of fisheries should answer the questions on this page.

35. What fishing infrastructure do you directly manage or have influence over in your fishery (eg artificial reefs; fish benches provided at jetties, unloading facilities, other)?

36. How adequate is the infrastructure you have direct influence over?

- Very inadequate
- Inadequate
- Neither adequate/inadequate
- Adequate
- Very adequate

Please add comments if you wish

37. What fishing infrastructure do you NOT have directly influence over currently, but affects your ability to successfully manage your fishery? (eg artificial reefs; fish benches provided at jetties, unloading facilities, access of fishers to fuel in different parts of the fishery, other)

38. How adequate is the infrastructure you have do not directly manage, but would like to have some influence over?

- Very inadequate
- Inadequate
- Neither adequate/inadequate
- Adequate
- Very adequate

Please add comments if you wish

Fisheries manager survey

Objective 10 - Provision of information

The provision of information about the fishery to stakeholders is an important part of fisheries management. This page asks questions about the types of information you collect and release to stakeholders and the general public. Managers of all types of fisheries should answer these questions.

39. Please identify the types of information collected about your fishery

	Catch data	Stock estimates	Economic data on the fishery	Social data on the fishery
Is this type of information collected for this fishery?	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Is this information released to fishers in the fishery?	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Is this information released to stakeholders other than fishers?	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Is this information released to the general public?	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Is this information collected or verified independently of fishers?	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Is this information released to stakeholders within 12 months of data collection?	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Is this information collected at least once a year?	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Is this information collected at least once every five years?	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Community objectives - Maximise community trust in fisheries management

Fisheries managers are managing fisheries on behalf of the broader public and their interest, and legislative requirements often require managers to ensure they are ensuring community benefit from the fishery. This page asks several questions about how you manage for the general community (whereas previous sections asked about management more for fishers and stakeholders with a specific interest in the fishery). Managers of all fisheries should answer these questions.

40. Do you have specific strategies in place to build and maintain the public's trust in fisheries management?

- Yes
- No
- Unsure/don't know

If yes, what are these strategies (briefly describe)?

41. If you answered yes to the previous question, are these strategies documented in your fisheries management planning documents?

- Yes
- No
- Unsure/don't know

If yes, what are these strategies (briefly describe)?

42. Sometimes managers need to consider local cultural and social needs when planning their fisheries management. Can you identify any key community issues that need to be addressed in your management activities to ensure you contribute to local community wellbeing? For example, this might include identifying dates when fishers need to be able to participate in community activities, or when fishing (or conversely, placing restrictions on fishing) may be considered culturally inappropriate.

- Yes
- No
- Unsure/don't know

If yes, please describe briefly the cultural considerations

Fisheries manager survey

43. If you answered yes to the previous question, are these issues and your plans for managing them documented in your fisheries management planning documentation?

- Yes
- No
- Unsure/don't know

Please add a comment if you wish

44. Which of the following methods do you use to identify the cultural and heritage values that arise from your fishery for communities in which the fishery operates? (select all that apply)

- Your own knowledge about the community
- Consultation with local experts eg tourism office, heritage office
- Consultation with Indigenous groups
- Consultation with other stakeholder groups eg local council
- Consultation with fishers
- Community survey
- I don't identify cultural and heritage values at all
- Other (please describe below)

Please describe methods if you selected 'other'

45. Do you or others in your organisation provide training and education opportunities for the non-fishing public?

- Yes
- No
- Unsure/don't know

If yes, please describe the types of activities

Fisheries manager survey

46. Do you or others in your organisation contribute to training and education opportunities provided by other groups (eg you might give a talk at a school or a public event)?

- Yes
- No
- Unsure/don't know

If yes, please describe the types of activities

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Marine Scalefish Fishery Economic Indicators Study 2009/10

Please read this first:

- Please only include the amounts that can be attributed to your Marine Scalefish fishing business for the 2009/10 financial year
- If exact figures are not available, please provide careful estimates.

PART A GENERAL INFORMATION

1. How many years have you worked in commercial fishing? _____

2. How long have you owned a licence in the Marine Scale fishery? _____

3. How many generations of your family have worked in commercial fishing? _____

4. Please indicate (circle) your age bracket:

Under 25	26–30	31–35	36–40	41–45
46–50	51–55	56–60	61–65	Over 65

5. In which of the following fishing regions did you fish during 2009/10?

- | | |
|--|---|
| <input type="checkbox"/> West Coast | <input type="checkbox"/> Spencer Gulf / Coffin Bay |
| <input type="checkbox"/> Gulf St Vincent / Kangaroo Island | <input type="checkbox"/> Victor Harbor / South East |
| <input type="checkbox"/> Other (specify) | |

6. How did you learn the skills you use in your work in the Marine Scalefish fishery?

- | | |
|--|--|
| <input type="checkbox"/> Self taught | <input type="checkbox"/> Taught by family member |
| <input type="checkbox"/> Worked in a fishing business (not family) | <input type="checkbox"/> Learned from other fishers (not family) |
| <input type="checkbox"/> Formal training through a training course | <input type="checkbox"/> Other (please specify) |

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PART B CONTRIBUTION TO THE COMMUNITY

1. Please indicate the time spent on community-related activities during times when you and others employed on your licence are not fishing.

Community Activity	Hours per month (average)
Participating in conservation activities (e.g. bird counts, water watch)	
Participating in marine rescue and recovery	
Attending meetings, seminars, workshops that are fishing industry related	
Participation in fishing-related research (does not include the provision of catch and effort data)	
Provision of technical advice to committees, panels etc on matters related to the fishing industry	
Volunteering for community services (e.g. CFS, SES, Ambulance, schools)	
Other (please specify):	

2. In addition to the above, are there other ways in which you as a licence holder or the Marine Scalefish Fishery as a whole contribute to the social, environmental and heritage values of the local community?

3. In your opinion, has the operation of the Marine Scalefish Fishery (and the employment the fishery generates and the households it maintains) contributed to the provision, maintenance, and/or expansion of any local or regional services or businesses?

Service	Location(s)	Fishery Contribution

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4. How many children in your family and those of others you employ in your fishing business are under 18 years of age?

Your family _____

Employees' families' _____

5. How many children in your family and those of others you employ in your fishing business currently attend local schools?

Your family _____

Employees' families (if known) _____

6. Which school(s) do they currently attend? (i.e. local, Adelaide, elsewhere)

7. Involvement with and views about fisheries management

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
I am satisfied with the level of consultation undertaken with fishers on management decisions about the MSF	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I actively participate in providing comments and/or feedback to managers about draft management plans (either through my representative or directly)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Current decision making is transparent (i.e. the reasons behind the decisions are made clear to industry)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fishers' concerns and preferences regarding management options are fully taken into consideration in the management decision making	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Commercial fishing management plans are flexible enough to allow fishers to adapt to changing market and environmental conditions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
The management plan for the MSF allows me to fish in a way that gives me a good work/life balance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PIRSA distributes adequate information to the public about management of the Marine Scalefish fishery	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PIRSA provides Marine Scalefish fishers adequate training and advice about good fishing practices (e.g. bycatch reduction, using new technologies)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

8. Do you know who are the members of the Marine Fishers Association, who PIRSA recognises as the peak representative body for the Marine Scalefish Fishery?

YES / NO

9. Do you believe the commercial sector is treated equitably and fairly by fisheries managers compared to other users of fisheries resources?

YES / NO

Why or why not?

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PART C CAPITAL

1. In the following table, please include a list of all fishing gear and equipment that you use for fishing in the Marine Scalefish Fishery, including electronic equipment, sheds, trailers and motor vehicles (please give values *exclusive* of GST).

Item	Age (yrs)	Current value \$	Replacement cost \$
Boat 1 engine			
Boat 1 (without engine)			
Boat 2 engine			
Boat 2 (without engine)			
Electronic Equipment			
Fishing Gear (specify)			
Sheds/buildings			
Motor vehicles			
Trailers			
Other equipment (specify)			

2. If this capital is not solely used for the Marine Scalefish Fishery, what is the percentage of the your capital used for the Marine Scalefish fishery? _____%

3. If your capital has other uses, what are these uses?
- _____
- _____
- _____

4. What is your estimate of the current market value of your Marine Scalefish Fishery license?
- \$ _____

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5. How satisfied are you with the **level of access** you have to the following infrastructure as part of your Marine Scalefish activities?

	Very dissatisfied	Somewhat dissatisfied	Neither satisfied or dissatisfied	Somewhat satisfied	Very satisfied
Mooring facilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fuel and repair facilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ice	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cold storage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Seafood sorting facilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Processing facilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Road infrastructure needed to transport your catch to market	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Marketing infrastructure	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (please describe)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

PART D FISHING REVENUE AND HOUSEHOLD INCOME

1. What was your total revenue from fishing in 2009/10?
- a) from MSF \$ _____
- b) from other fisheries \$ _____

2. What was your total household income in 2009/10? (Please tick the appropriate box)

<\$20,000	\$20,001- \$40,000	\$40,001- \$60,000	\$60,001- \$80,000	\$80,001- \$100,000	\$100,001- \$120,000	\$120,001- \$140,000	\$140,001- \$160,000	>\$160,000
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3. What proportion of your household income in 2009/10 was derived from fishing? _____%
4. If you could move to a land-based job today with the same income, would you? (Assuming you could also sell your fishing assets for their appropriate value) **YES / NO**
5. How much more income would you need to earn onshore to consider leaving fishing as an occupation?
- \$ _____

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PART E EXPENDITURE

1. Please provide estimates of your direct costs and administrative costs associated with fishing in the Marine Scalefish Fishery for the whole of the 2009/10 financial year. For your administrative costs, only include the amount that can be attributed to Marine Scalefish fishing (please provide values *exclusive* of GST).

Direct Fishing Costs (2009/10)	\$ (excl. GST)
Boat Fuel & Lubricants	
Ice, Bait	
Fishing Tackle	
Skipper Fees	
Crew Wages	
Provisions	
Fishing licence fees	
Repairs and maintenance to boat and equipment	
Slipping/mooring/boat survey	
Protective Clothing	
Freight and Marketing	
Other fishing costs (provide details)	
Administrative Costs (2009/10)	
Insurances – vessels	
Insurances – other	
Legal & Accounting	
Communication –telephone, fax, email	
Power	
Repairs and maintenance to Buildings/Plant	
Repairs and maintenance to Motor Vehicles	
Rates and Rents	
Interest and borrowing costs	
Travel, accommodation	
Membership, association expenses	
Other expenses (specify)	

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PART F EMPLOYMENT

1. How many people are employed in your Marine Scalefish fishing activity (average for financial year 2009/10, including yourself, paid employees and unpaid family helpers involved in running the fishing business, whether they are involved in actual fishing time, maintenance of fishing equipment, or the management (eg bookkeeping, negotiating with processors, attending meetings) of the fishing operations?)

Year	Full-Time		Part Time		
	Male	Female	No of Persons		Full Time Equivalent
			Male	Female	
Actual 2009/10					
Estimated 2010/11					

2. Please estimate the number of days in 2009/10 that were spent on these activities by people who were not paid a wage (assuming an average of 8 hours per business day).

	Fishing (boat time) (days)	Repairs & Maintenance (days)	Management & Administration (days)
You (licence holder)			
Family (unpaid)			
Other unpaid labour			

3. How many children in your family and those of others you employ in your fishing business assist (either paid or unpaid) with fishing-related activities? _____

PART G BUSINESS OPERATIONS

1. What is the name of your hometown? _____
2. What is the name of your homeport? _____
3. Number of fishing days in the Marine Scalefish fishery for 2009/10 _____
4. Do you own a net endorsement? Yes / No

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5. Which of the following gear types did you primarily use in 2009/10 (please tick four main types)?

<input type="checkbox"/> Large Mesh (Shark) Nets	<input type="checkbox"/> Gill Nets	<input type="checkbox"/> Bait Nets	<input type="checkbox"/> Handlines	<input type="checkbox"/> Troll Lines
<input type="checkbox"/> Jigging	<input type="checkbox"/> Haul Nets	<input type="checkbox"/> Salmon Nets	<input type="checkbox"/> Purse Seine Nets	<input type="checkbox"/> Crab (hoop) net
<input type="checkbox"/> Crab Pot	<input type="checkbox"/> Drop Line	<input type="checkbox"/> Dab Net	<input type="checkbox"/> Mussel Dredge	<input type="checkbox"/> Fish Trap
<input type="checkbox"/> Long Line	<input type="checkbox"/> Octopus Trap	<input type="checkbox"/> Fishing Pole	<input type="checkbox"/> Rakes	<input type="checkbox"/> Fork
<input type="checkbox"/> Drop Net	<input type="checkbox"/> Spade	<input type="checkbox"/> Hand	<input type="checkbox"/> Other (specify)	

6. Estimate the quantity and net value of the fish that you caught and sold during **2009/10**. Net value is the income you received from fish sales **excluding** marketing costs (commission, freight, packing etc) were deducted. Please also provide an indication of the market destination of fish that you caught and sold (e.g. local sales, Adelaide, Melbourne, Sydney etc.)

Species	Catch (tonnes)	Value		Market Destination (e.g. Adelaide, Melbourne)
		Total Sales (\$)	Price (\$/kg)	

7. To what extent do you process or value-add your catch?

Species	Nature of Processing/ Value-Adding Activity (e.g. freezing, filleting)	Proportion of total catch processed (%)

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8 What opportunities do you see for value-adding product from the Marine Scalefish Fishery (from the point of view of both your business and the fishery as a whole)?

.....

.....

.....

.....

.....

PART H YOUR WELLBEING AND HOW FISHING CONTRIBUTES TO IT

1. How satisfied are you with the following aspects of your life and work?
(Tick one box only for each statement)

	Very dissatisfied	Somewhat dissatisfied	Neither satisfied or dissatisfied	Somewhat satisfied	Very satisfied
Life in general	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Your present financial situation in general	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Your own health	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The health of members of your family	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The income you receive from fishing and fishing-related activities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2. How does the level of satisfaction you gain from fishing compare to the satisfaction you felt...

	Much lower	Lower	About the same	Higher	Much higher
Three years ago					
Five years ago					
Ten years ago					

3. How do you believe most people in the general community perceive commercial fishers?

Very negatively	Negatively	Neither/ Neutral	Positively	Very positively
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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PART I FURTHER COMMENTS

Please provide any additional comments that could assist in preparing the economic indicators report.

Thank you for completing this survey



Developing and Testing Social Objectives and Indicators for Fisheries Management (FRDC Project 2010/040)

Queensland East Coast Trawl Fishery Social indicators survey

Survey ID: _____

Interviewer: _____

Date _____

Are you the Skipper or owner-operator

Note: if skipper then skip Section 6

Have you been surveyed by Vikki Schaffer in the CRC social capital project Yes No

Email address: _____

(optional – in case we need to clarify a response. Email addresses will not be stored with the survey responses to protect anonymity)

1. Your views about fishing and its importance to you

1a. How important are your fishing activities to you?

Commercial fishing is often more than ‘just a job’ to some fishers, and because of this, this question asks you how important your fishing activities are relative to all aspects of your life. Please indicate on the scale of 1 to 10 below. 1 means that, while you enjoy fishing, it is not of much importance to your life, and 10 means it is the most important part of your life.

1 (Not very important)	2	3	4	5	6	7	8	9	10 (Very important)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

1b. Which statement most describes your attitude towards fishing?

(tick one response only)

The lifestyle of commercial fishing is as important to me as the business aspects	I view fishing principally as a business, which I participate in to earn income					
1	2	3	4	5	6	7
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

1c. Last financial year (2010-11), approximately what % of your total household income was earned from commercial fishing?

10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

1d. How does the level of income you gained from your fishing activities in 2010-11 compare to the income you gained...

	Much lower	Lower	About the same	Higher	Much higher
...one year ago	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...three years ago	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...five years ago	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

If your income has changed, what are the main reasons for the change?

1e. On average, how satisfied have you been with your commercial fishing activities over the last 12 months?

1 (Not at all satisfied)	2	3	4	5	6	7	8	9	10 (Very satisfied)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

1f. How satisfied are you with the following aspects of your current fishing activities?

(Tick one box only for each statement)

	Very unsatisfied	Neither				Very satisfied	N/A
Continuing a family tradition of fishing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Being a part of the fishing industry	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The enjoyment/challenge of fishing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The money made from my fishing business	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

1g. How does the level of satisfaction you gain from your fishing activities compare to the satisfaction you felt...

	Much lower	About the same				Much higher
...one year ago	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
...three years ago	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
...five years ago	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

If you indicated your level of satisfaction has changed, please describe why it has changed:

1h. How long do you intend to continue fishing commercially?

We ask this question because each fisher is at a different stage of their working life, and we want to understand if the stage of your working life you are in influences some of your other views about fishing.

	I plan to leave as soon as possible	I plan to leave before I retire	I plan to leave when I retire	I plan to keep fishing beyond retirement age
How long do you intend to continue participating in the commercial fishing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

1i. Your views about public perceptions of fishers

(Tick one box only for each statement)

	Very negatively	Neutral			Very positively
How do you believe most people in the general community perceive commercial fishers?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How do you believe most people in the general community perceive recreational fishers?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2. Information and knowledge of fisheries rules, regulation and management

The Department of Employment, Economic Development and Innovation (DEEDI) are the government agency responsible for managing commercial fishing in Queensland. The following questions relate to your views on the effectiveness of various aspects of fisheries management by DEEDI.

To what extent do you agree or disagree with the following statements?

(tick one response only)

	Strongly disagree	Neither			Strongly agree	Don't know
I can easily access information about the management of commercial fishing in Queensland	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The information DEEDI produces about commercial fishing is easy to understand	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Most commercial fishers comply with fishing rules and regulations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Most commercial fishers are responsible in how they fish	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I have a good understanding of fishing rules and regulations that apply to my fishing activities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
It is easy to comply with fishing rules and regulations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If I see other people doing the wrong thing while fishing, I report it to authorities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If I see someone doing the wrong thing when fishing, I know who to report it to	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3. Your views on fisheries management

3a. To what extent do you agree or disagree with the following statements?

(tick one response only)

	Strongly disagree	Neither			Strongly agree	Don't know
DEEDI fisheries managers are doing a good job of managing commercial fishing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I trust DEEDI to make the right decisions for managing commercial fishing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I understand how decisions about fisheries management are made	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Commercial fishing management plans are flexible enough to allow fishers to adapt to changing conditions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3b. How fairly do you feel you are treated by fisheries managers compared to other users of fisheries resources in terms of ...

Please answer for each of the areas listed.

	Very unfair	Unfair	Neither fair nor unfair	Fair	Very fair
Effort restrictions (e.g. limit on days, types of fishing gear, Hull units etc)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Access to fishing areas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Permitted species	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The processes used to make allocation decisions about fisheries resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

4. Your participation in fisheries management

4a. To what extent do you agree or disagree with the following statements?

(tick one response only)

	Strongly disagree	Neither			Strongly agree
I am satisfied with the level of consultation DEEDI undertakes with fishers on management decisions about my fishery	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I have a good understanding of how I can have input into the development of management plans for my fishery	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I actively participate in providing comments and/or feedback to DEEDI fisheries managers about draft fisheries management plans (either through my representative or directly)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

4b. How much time do you spend on fisheries management-related activities?

Fisheries management related activity	Hours per month (average)
Attending meetings, seminars, workshops that are fishing industry related	_____ hours
Participation in fishing-related research (does not include the provision of catch and effort data)	_____ hours
Provision of technical advice to committees, panels etc on matters related to the fishing industry	_____ hours
Other (please specify):	_____ hours

4c. Are you a member of any fishing association/industry organisation?

YES NO

If yes, please list the groups you are a member of: _____

4d. Do you know how to contact the people who represent your interests on fisheries management/advisory committees

YES NO

4e. If you want to have a say in how your fishery is managed, which of the following methods do you prefer to use?

(tick one answer for each option)

	Not at all interested	A little interested	Interested	Very interested	Don't know/ unsure
Provide your views in written submissions (e.g. by email or post)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Attend public meetings about fisheries management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Attend meetings between commercial fishers and DEEDI only	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Be a member of a committee that makes recommendations about fisheries management (but not final decisions)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Be a member of a committee that makes decisions about fisheries management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Contact DEEDI via social media networks (e.g. Facebook, Twitter)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Access or submit information or comment online via the DEEDI website	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Use a smartphone application (eg iPhone/ android app)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

5. Access to fishing infrastructure

How satisfied are you with the level of access you have to the following infrastructure as part of your fishing activities?

	Very dissatisfied	Somewhat dissatisfied	Neither satisfied or dissatisfied	Somewhat satisfied	Very satisfied
Mooring facilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fuel and repair facilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ice	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cold storage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Roads to access facilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Offloading facilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Seafood sorting facilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other processing facilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (please describe) _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

6. Community contributions

Complete if owner-operator only; skip if skipper

6a. Approximately how much did you spend on fishing activities in 2010-11 (excluding crew payments?)

Include spending on fuel, boat maintenance and repair, purchase of gear and supplies, fisheries management fees, and any accommodation/food costs incurred as part of your fishing work. Do not include new boat purchases if any.

- less than \$50,000
 \$50,000-99,999
 \$100,000-199,999
 \$200,000-299,999
 \$300,000-399,999
 more than \$400,000

6b. What proportion of this was spent in your local community?

10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

6c. Approximately how much did you pay your crew in 2010-11?

Include any onshore labour if paid as part of your fishing business

- less than \$50,000
 \$50,000-99,999
 \$100,000-199,999
 \$200,000-299,999
 \$300,000-399,999
 more than \$400,000

6d. Please estimate the number of days in 2010-11 that were spent on these activities by people who were not paid a wage
(assuming an average of 8 hours per business day).

	Fishing (boat time)	Repairs & Maintenance	Management & Administration
You (business manager)			
Family (unpaid)			
Other unpaid labour			

7. Your fishing activities

To better understand how changes in your fishing activities impact you, we need to know some detail about your fishing activities. We understand some of the following questions ask for sensitive information, and would appreciate you returning the survey even if you choose to leave some of the questions unanswered.

7a. Thinking about your fishing over the last 12 months (including in other fisheries), have you fished less, more or about the same amount as in the previous 12 months?

(please tick one) Less More Same Don't know/unsure

7b. If you indicated that you fished more or less, what are the main reasons for this change

(tick all that apply)

Availability of fish stocks	<input type="checkbox"/>	Business costs (e.g. fuel costs)	<input type="checkbox"/>
Price received for catch	<input type="checkbox"/>	Environmental reasons (please specify) _____	<input type="checkbox"/>
Personal life (e.g. arrival of new baby, family commitments)	<input type="checkbox"/>	Access to resource (e.g. new marine reserve)	<input type="checkbox"/>
Weather conditions	<input type="checkbox"/>	No reason/unsure	<input type="checkbox"/>
Technology (e.g. new equipment)	<input type="checkbox"/>	Other (please specify) _____	<input type="checkbox"/>

8. Information about you

To better understand the social dynamics in the fishery, we also need to collect some information about you, your history in the fishery and the community in which you live. We understand some of the following questions ask for sensitive information, and would appreciate you returning the survey even if you choose to leave some of the questions unanswered.

8a. What is the name of your homeport? _____

8b. In what town do you live?

(please name the town, or nearest town if you live on a rural property; and provide the postcode)

Town: _____ **Postcode:** _____

8c. Did you choose to live in this location because of your fishing activities?

(e.g. so you could fish from a place close to where you live) YES NO

8g. Roughly how many hours do you work per week?

(please provide the average over the last 12 months) _____ hours

8h. Roughly what was your total household income before tax in 2011-12?

This includes the income earned by all working people in your household. (Tick one box).

<\$20,000	\$20,001-\$40,000	\$40,001-\$60,000	\$60,001-\$80,000	\$80,001-\$100,000	\$100,001-\$120,000	\$120,001-\$140,000	\$140,001-\$160,000	>\$160,000
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

9. Other key local issues

9a. What do you see as the key local issues affecting your fishing business that have not already been addressed?

THANK YOU FOR YOUR TIME

We really appreciate the time you have spent answering these questions.

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EconSearch Pty Ltd
 214 Kensington Road
 Marryatville SA 5068
 Tel: 08 8431 5533
 Fax: 08 8431 2210
 Contact: Stacey Paterson or
 Lisa Rippin

Northern Zone Rock Lobster Economic Indicators Study 2010/11

Please read this first:

- Please only include the amounts that can be attributed to your Northern Zone Rock Lobster fishing business for the 2010/11 financial year
- If exact figures are not available, please provide careful estimates.

PART A CAPITAL

1. What is the length of your boat? _____
2. What is the engine capacity of your boat? _____
3. In the following table, please include a list of all fishing gear and equipment that you use for fishing in the Northern Zone Rock Lobster fishery, including electronic equipment, sheds, trailers and motor vehicles (please give values *exclusive* of GST).

Item	Age (yrs)	Current value \$	Replacement cost \$
Boat engine			
Boat (without engine)			
Electronic Equipment			
Fishing Gear (specify)			
Sheds/buildings			
Motor vehicles			
Trailers			
Other equipment (specify)			

4. If this capital is not solely used for the Northern Zone Rock Lobster fishery, what is the percentage of your capital used for the Northern Zone Rock Lobster fishery? _____%
5. If your capital has other uses, what are these uses?

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6. How many pots did you own during the 2010/11 financial year? _____

Leasing to...

7. How many pots did you **lease to** other licence holders during the 2010/11 financial year?

8. If you did lease pots to other licence holders during 2010/11, how much did you receive per pot?

9. How many kilograms of quota did you **lease to** other licence holders during the 2010/11 financial year?

10. If you did lease quota to other licence holders during 2010/11, how much did you receive per kilogram of quota?

Leasing from...

11. How many pots did you **lease from** other licence holders during the 2010/11 financial year?

12. If you did lease pots from other licence holders during 2010/11, how much did you pay per pot?

13. How many kilograms of quota did you **lease from** other licence holders during the 2010/11 financial year?

14. If you did lease quota from other licence holders during 2010/11, how much did you pay per kilogram of quota?

Licence value...

15. What is your estimation of the current market value of your fishing licence (meaning what is the value of the pots you own)?

\$ _____ /pot or \$ _____ total value of fishing licence

PART B EXPENDITURE

1. Are skipper wages charged as a percentage share of landed value? **Yes / No**

2. If so, what's the skippers percentage share of landed value in 2010/11? _____

3. How many crew (deckies) do you normally have? _____

4. Are crew wages charged as a percentage share of landed value? **Yes / No**

5. If so, what's the crew percentage share of landed value in 2010/11? _____

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6. Please provide estimates of your direct costs and administrative costs associated with fishing in the Northern Zone Rock Lobster fishery for the whole of the 2010/11 financial year. For your administrative costs, only include the amount that can be attributed to Rock Lobster fishing (please provide values *exclusive* of GST).

Direct Fishing Costs (2010/11)	\$ (excl. GST)
Boat Fuel & Lubricants	
Ice, Bait	
Skipper Fees	
Crew Wages	
Provisions	
Fishing licence fees	
Repairs and maintenance to boat and equipment	
Slipping/mooring/boat survey	
Protective Clothing	
Freight and Marketing	
Other fishing costs (provide details)	
Administrative Costs (2010/11)	
Insurances – vessels	
Insurances – other	
Legal & Accounting	
Communication –telephone, fax, email	
Power	
Repairs and maintenance to Buildings/Plant	
Repairs and maintenance to Motor Vehicles	
Rates and Rents	
Leasing Charges and Fees	
Interest and borrowing costs	
Travel, accommodation	
Membership, association expenses	
Other expenses (specify)	

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PART C EMPLOYMENT

1. How many people are employed in your Northern Zone Rock Lobster fishing activity (including yourself, paid employees and unpaid family helpers involved in running the fishing business, whether they are involved in actual fishing time, maintenance of fishing equipment, or the management (eg bookkeeping, negotiating with processors, attending meetings) of the fishing operations)?

Year	Full-Time	Part Time	
		No of Persons	Full Time Equivalent
Actual 2010/11			
Estimated 2011/12			

2. Please estimate the number of days in 2010/11 that were spent on these activities by people who were not paid a wage (assuming an average of 8 hours per day).

	Fishing (boat time) (days)	Repairs & Maintenance (days)	Management & Administration (days)
You (licence holder)			
Family (unpaid)			
Other unpaid labour			

PART D SALES

1. Estimate the net value of the fish that you caught and sold during **2010/11**, that is, the income you received from fish sales **after** marketing costs (commission, freight, packing etc) were deducted.

Species	Sales (\$)	Weight (tonnes)

2. Number of fishing days for 2010/11 _____
3. Average number of shots per day for 2010/11 _____

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PART E Your views about fishing and its importance to you

1. How important are your fishing activities to you?

Commercial fishing is often more than 'just a job' to fishers, and because of this, this question asks you how important your fishing activities are as a part of your life. Please indicate on the scale of 1 to 10 below. 1 means that, while you enjoy fishing, it is not of much importance to your life, and 10 means it is the most important part of your life.

1	2	3	4	5	6	7	8	9	10
Not very important				Somewhat important					Very important
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2. On average, how satisfied have you been with your commercial fishing activities over the last 12 months?

1	2	3	4	5	6	7	8	9	10
Not at all satisfied				Somewhat satisfied					Very satisfied
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3. How satisfied are you with the following aspects of your current fishing activities?

Tick one box for each statement. If it doesn't apply to you (e.g. many fishers don't work with family), tick 'N/A'

	Very unsatisfied	Somewhat unsatisfied	Neither	Somewhat satisfied	Very satisfied	N/A
Relaxation/unwinding	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Spending time in the outdoors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Spending time with family	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Spending time with friends	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Continuing a family tradition of fishing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Being on my own/getting away from it all	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Being a part of the fishing industry	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The enjoyment or sport of catching fish, crabs etc	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The money made from my fishing business	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Passing on knowledge about fishing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

4. Tick the point on the scale below that best represents how you view your commercial fishing activities (tick one response only)

←The lifestyle of commercial fishing is as important to me as the business aspects				I view fishing principally as a business, which I participate in to earn income→		
1	2	3	4	5	6	7
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

5. How long do you intend to continue fishing commercially? (tick one response only)

We ask this question because each fisherman is at a different stage of their working life, and we want to understand if the stage you are at influences some of your other views about fishing.

	I plan to leave as soon as possible	Less than 5 years	5 to 10 years	10 to 20 years	Until I retire	I plan to keep fishing beyond retirement age
How long do you intend to continue participating in the commercial fishing industry?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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6. On average, how satisfied have you been with the following aspects of your life and work over the past month? (Tick one box only for each statement)

	Very dissatisfied	Somewhat dissatisfied	Neither satisfied or dissatisfied	Somewhat satisfied	Very satisfied
Life in general (not necessarily related to fishing)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Your present financial situation (not necessarily related to fishing)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Your own health (not necessarily related to fishing)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The income you receive from fishing and fishing-related activities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The work/life balance you achieve with your fishing work	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

7. Your views about public perceptions of fishers (tick one box only for each statement)

	Very negatively	Negatively	Neither/Neutral	Positively	Very Positively
How do you believe most people in the general community perceive commercial fishers?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How do you believe most people in the general community perceive recreational fishers?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

PART F Information and knowledge of fisheries rules, regulation and management

1. To what extent do you agree or disagree with the following statements? (tick one box only for each statement)

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	Don't know
PIRSA do a good job of managing commercial fishing in SA	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I trust PIRSA to make the right decisions for managing commercial fishing in SA	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I understand how decisions about fisheries management are made	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I am satisfied with the level of consultation PIRSA undertakes with fishers on management decisions about the Northern Zone Rock Lobster Fishery	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If I want to have a say in commercial fishing management, I know how to	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Commercial fishing management plans are flexible enough to allow fishers to adapt to changing conditions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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2. How fairly do you feel commercial fishers are treated by fisheries managers compared to other users of fisheries resources? (tick one box only for each statement)

How fair is the treatment of commercial fishers in terms of:	Very unfair	Unfair	Neither fair or unfair	Fair	Very fair
Gear restrictions (e.g. types of fishing gear you can use)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Access to fishing areas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Allocation of catch	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The processes used to make decisions about fisheries management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3. To what extent do you agree or disagree with the following statements? (tick one response only)

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	Don't know
I can easily access information about commercial fishing management in SA	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The commercial fishing information PIRSA produces is easy to understand	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Most recreational fishers comply with fishing rules and regulations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I have a good understanding of fishing rules and regulations that apply to my fishing activities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Most commercial fishers fish responsibly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
It is easy to comply with fishing rules and regulations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If I see a fisher doing the wrong thing, I know who to report it to	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fishers are provided with adequate training and advice about good fishing practices (e.g. bycatch reduction)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If I see other people doing the wrong thing while fishing, I report it to authorities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Most commercial fishers comply with fishing rules and regulations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Most recreational fishers fish responsible	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

PART G Your participation in fisheries management

1. Are you a member of any fishing association/industry organisation? YES NO

If yes, please list the groups you are a member of:

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2. Do you know how to contact the people who represent your interests on fisheries management/advisory committees? (please circle one) YES NO

3. Please indicate the time spent on the following fisheries management-related activities during times when you are not fishing

Fisheries management related activity	Hours per month (average)
Attending meetings, seminars, workshops that are fishing industry related	
Participation in fishing-related research (does not include the provision of catch and effort data)	
Provision of technical advice to committees, panels etc. on matters related to the fishing industry	
Other (please specify):	

4. If you want to have a say in how commercial fishing is managed, which of the following methods do you prefer? (tick one answer for each option)

How interested are you to...	Not at all interested in using this	A little interested	Interested	Very interested	Don't know/unsure
...receive information from PIRSA (e.g. by email or post)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...provide your views in written submissions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...attend public meetings about fisheries management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...attend meetings between commercial fishers and PIRSA (members of the public not invited)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...be a member of a committee that makes recommendations about fisheries management, but not final decisions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...be a member of a committee that makes decisions about fisheries management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...contact PIRSA via social media networks (e.g. Facebook, Twitter)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...access or submit information or comment online via the PIRSA website	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...use a smartphone application (e.g. iPhone/android app)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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5. Where did your spending on fishing activities occur in the last 12 months?

(please list the top five towns/local government areas where spending occurred, and estimate what % of spending occurred in each. If a lot of your spending occurred online, please write 'internet')

Location (town, local government area, or internet)	Types of spending (e.g. fuel, boat repair)	Approximate % of spending on fishing activities spent here

6. Please indicate the time spent on community-related activities

Community Activity	Hours per month (average)
Participating in conservation activities (e.g. bird counts, water watch)	
Participating in marine rescue and recovery	
Volunteering for community services (e.g. CFS, SES, ambulance, schools)	
Participating in local sporting groups	
Participating in local civic groups (e.g. Rotary, Lions)	
Other (please specify):	

7. In addition to the above, are there other ways in which you as a member of the Northern Zone Rock Lobster fishery contribute to the social, environmental and heritage values of the local community?

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PART H Access to fishing infrastructure

1. How satisfied are you with the level of access you have to the following infrastructure as part of your fishing activities?

	Very dissatisfied	Somewhat dissatisfied	Neither satisfied or dissatisfied	Somewhat satisfied	Very satisfied	N/A
Marines/mooring facilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Fuel and repair facilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Ice	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Cold storage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Roads accessing fishing areas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Fishing ramps/jetties/ wharves	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Bait and other supplies (other than ice)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Offloading facilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Seafood sorting facilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Other processing facilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Other (please describe) _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

PART I Your fishing activities

1. Thinking about the fishing that you've done in 2010/11 (including in other states), have you fished less, more or about the same amount compared with the 12 months prior to that? (please tick one)

Less More Same Don't know/unsure

If you indicated that you fished more or less, what are the main reasons for this change (please describe below)

2. In financial year 2010/11, approximately what % of your household income was earned from commercial fishing (or from a specific commercial fishery)? _____%

3. How does the level of income you gained from your fishing activities in 2010/11 compare to the income you gained...

	Much lower	Lower	About the same	Higher	Much higher
...one year ago	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...three years ago	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...five years ago	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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4. If you indicated your income has changed, what are the main reasons for the change?

5. What is the name of your homeport? _____

6. How did you learn your fishing skills? (tick all that apply)

<input type="checkbox"/> Self-taught e.g. through experience and accessing information online, in magazines	<input type="checkbox"/> Taught by family member
<input type="checkbox"/> Worked in a fishing business (not family)	<input type="checkbox"/> Learned from other fishers (not family)

PART J Information about you

How old are you?	_____ years
What is your gender?	<input type="checkbox"/> Male <input type="checkbox"/> Female
How many children do you have? (If none, please write '0')	No. of children: _____
How many years have you worked in commercial fishing?	_____ years
How long have you owned a licence in SZRL fishery?	_____ years
How many generations of your family have worked in commercial fishing?	_____ generations
Where do you live?	_____ town (nearest town if in rural area) _____ postcode
Did you choose to live in this location because of your fishing activities? (e.g. so you could live in a place close to where you fish)	<input type="checkbox"/> YES <input type="checkbox"/> NO

1. Please tick the highest formal education level you have achieved: (Tick one box)

<input type="checkbox"/> Primary school	<input type="checkbox"/> TAFE diploma (post high-school)
<input type="checkbox"/> Fourth year of high school	<input type="checkbox"/> University degree
<input type="checkbox"/> High school certificate	<input type="checkbox"/> Postgraduate degree

2. If you work outside the fishing industry in addition to your work in fishing, what type of job do you have outside fishing?

3. How many hours do you work per week? (include the total hours from all jobs you do) (please provide the average over the last 12 months) _____ hours

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The following question, like others, is voluntary. We are asking it to get a better understanding of the economic wellbeing of fishing families. We ask that you still participate in the rest of the survey even if you choose not to provide information about household income.

4. In financial year 2010/11, what was your total household income before tax? This includes the income earned by all working people in your household. (Tick one box).

<\$20,000	\$20,001- \$40,000	\$40,001- \$60,000	\$60,001- \$80,000	\$80,001- \$100,000	\$100,001- \$120,000	\$120,001- \$140,000	\$140,001- \$160,000	>\$160,000
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

PART K FURTHER COMMENTS

Please provide any additional comments that could assist in preparing the report.

Thank you for completing this survey

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EconSearch Pty Ltd
 214 Kensington Road
 Marryatville SA 5068
 Tel: 08 8431 5533
 Fax: 08 8431 2210
 Contact: Stacey Paterson or
 Lisa Rippin

Northern Zone Rock Lobster Economic Indicators Study 2010/11

Please read this first:

- Please only include the amounts that can be attributed to your Northern Zone Rock Lobster fishing business for the 2010/11 financial year
- If exact figures are not available, please provide careful estimates.

PART A CAPITAL

1. What is the length of your boat? _____
2. What is the engine capacity of your boat? _____
3. In the following table, please include a list of all fishing gear and equipment that you use for fishing in the Northern Zone Rock Lobster fishery, including electronic equipment, sheds, trailers and motor vehicles (please give values *exclusive* of GST).

Item	Age (yrs)	Current value \$	Replacement cost \$
Boat engine			
Boat (without engine)			
Electronic Equipment			
Fishing Gear (specify)			
Sheds/buildings			
Motor vehicles			
Trailers			
Other equipment (specify)			

4. If this capital is not solely used for the Northern Zone Rock Lobster fishery, what is the percentage of your capital used for the Northern Zone Rock Lobster fishery? _____%
5. If your capital has other uses, what are these uses?

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6. How many pots did you own during the 2010/11 financial year? _____

Leasing to...

7. How many pots did you **lease to** other licence holders during the 2010/11 financial year?

8. If you did lease pots to other licence holders during 2010/11, how much did you receive per pot?

9. How many kilograms of quota did you **lease to** other licence holders during the 2010/11 financial year?

10. If you did lease quota to other licence holders during 2010/11, how much did you receive per kilogram of quota?

Leasing from...

11. How many pots did you **lease from** other licence holders during the 2010/11 financial year?

12. If you did lease pots from other licence holders during 2010/11, how much did you pay per pot?

13. How many kilograms of quota did you **lease from** other licence holders during the 2010/11 financial year?

14. If you did lease quota from other licence holders during 2010/11, how much did you pay per kilogram of quota?

Licence value...

15. What is your estimation of the current market value of your fishing licence (meaning what is the value of the pots you own)?

\$ _____ /pot or \$ _____ total value of fishing licence

PART B EXPENDITURE

1. Are skipper wages charged as a percentage share of landed value? **Yes / No**

2. If so, what's the skippers percentage share of landed value in 2010/11? _____

3. How many crew (deckies) do you normally have? _____

4. Are crew wages charged as a percentage share of landed value? **Yes / No**

5. If so, what's the crew percentage share of landed value in 2010/11? _____

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6. Please provide estimates of your direct costs and administrative costs associated with fishing in the Northern Zone Rock Lobster fishery for the whole of the 2010/11 financial year. For your administrative costs, only include the amount that can be attributed to Rock Lobster fishing (please provide values *exclusive* of GST).

Direct Fishing Costs (2010/11)	\$ (excl. GST)
Boat Fuel & Lubricants	
Ice, Bait	
Skipper Fees	
Crew Wages	
Provisions	
Fishing licence fees	
Repairs and maintenance to boat and equipment	
Slipping/mooring/boat survey	
Protective Clothing	
Freight and Marketing	
Other fishing costs (provide details)	
Administrative Costs (2010/11)	
Insurances – vessels	
Insurances – other	
Legal & Accounting	
Communication –telephone, fax, email	
Power	
Repairs and maintenance to Buildings/Plant	
Repairs and maintenance to Motor Vehicles	
Rates and Rents	
Leasing Charges and Fees	
Interest and borrowing costs	
Travel, accommodation	
Membership, association expenses	
Other expenses (specify)	

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PART C EMPLOYMENT

1. How many people are employed in your Northern Zone Rock Lobster fishing activity (including yourself, paid employees and unpaid family helpers involved in running the fishing business, whether they are involved in actual fishing time, maintenance of fishing equipment, or the management (eg bookkeeping, negotiating with processors, attending meetings) of the fishing operations)?

Year	Full-Time	Part Time	
		No of Persons	Full Time Equivalent
Actual 2010/11			
Estimated 2011/12			

2. Please estimate the number of days in 2010/11 that were spent on these activities by people who were not paid a wage (assuming an average of 8 hours per day).

	Fishing (boat time) (days)	Repairs & Maintenance (days)	Management & Administration (days)
You (licence holder)			
Family (unpaid)			
Other unpaid labour			

PART D SALES

1. Estimate the net value of the fish that you caught and sold during **2010/11**, that is, the income you received from fish sales **after** marketing costs (commission, freight, packing etc) were deducted.

Species	Sales (\$)	Weight (tonnes)

2. Number of fishing days for 2010/11 _____
3. Average number of shots per day for 2010/11 _____

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PART E Your views about fishing and its importance to you

1. How important are your fishing activities to you?

Commercial fishing is often more than 'just a job' to fishers, and because of this, this question asks you how important your fishing activities are as a part of your life. Please indicate on the scale of 1 to 10 below. 1 means that, while you enjoy fishing, it is not of much importance to your life, and 10 means it is the most important part of your life.

1	2	3	4	5	6	7	8	9	10
Not very important				Somewhat important					Very important
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2. On average, how satisfied have you been with your commercial fishing activities over the last 12 months?

1	2	3	4	5	6	7	8	9	10
Not at all satisfied				Somewhat satisfied					Very satisfied
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3. How satisfied are you with the following aspects of your current fishing activities?

Tick one box for each statement. If it doesn't apply to you (e.g. many fishers don't work with family), tick 'N/A'

	Very unsatisfied	Somewhat unsatisfied	Neither	Somewhat satisfied	Very satisfied	N/A
Relaxation/unwinding	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Spending time in the outdoors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Spending time with family	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Spending time with friends	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Continuing a family tradition of fishing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Being on my own/getting away from it all	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Being a part of the fishing industry	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The enjoyment or sport of catching fish, crabs etc	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The money made from my fishing business	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Passing on knowledge about fishing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

4. Tick the point on the scale below that best represents how you view your commercial fishing activities (tick one response only)

←The lifestyle of commercial fishing is as important to me as the business aspects				I view fishing principally as a business, which I participate in to earn income→		
1	2	3	4	5	6	7
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

5. How long do you intend to continue fishing commercially? (tick one response only)

We ask this question because each fisherman is at a different stage of their working life, and we want to understand if the stage you are at influences some of your other views about fishing.

	I plan to leave as soon as possible	Less than 5 years	5 to 10 years	10 to 20 years	Until I retire	I plan to keep fishing beyond retirement age
How long do you intend to continue participating in the commercial fishing industry?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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6. On average, how satisfied have you been with the following aspects of your life and work over the past month? (Tick one box only for each statement)

	Very dissatisfied	Somewhat dissatisfied	Neither satisfied or dissatisfied	Somewhat satisfied	Very satisfied
Life in general (not necessarily related to fishing)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Your present financial situation (not necessarily related to fishing)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Your own health (not necessarily related to fishing)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The income you receive from fishing and fishing-related activities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The work/life balance you achieve with your fishing work	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

7. Your views about public perceptions of fishers (tick one box only for each statement)

	Very negatively	Negatively	Neither/Neutral	Positively	Very Positively
How do you believe most people in the general community perceive commercial fishers?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How do you believe most people in the general community perceive recreational fishers?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

PART F Information and knowledge of fisheries rules, regulation and management

1. To what extent do you agree or disagree with the following statements? (tick one box only for each statement)

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	Don't know
PIRSA do a good job of managing commercial fishing in SA	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I trust PIRSA to make the right decisions for managing commercial fishing in SA	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I understand how decisions about fisheries management are made	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I am satisfied with the level of consultation PIRSA undertakes with fishers on management decisions about the Northern Zone Rock Lobster Fishery	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If I want to have a say in commercial fishing management, I know how to	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Commercial fishing management plans are flexible enough to allow fishers to adapt to changing conditions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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2. How fairly do you feel commercial fishers are treated by fisheries managers compared to other users of fisheries resources? (tick one box only for each statement)

How fair is the treatment of commercial fishers in terms of:	Very unfair	Unfair	Neither fair or unfair	Fair	Very fair
Gear restrictions (e.g. types of fishing gear you can use)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Access to fishing areas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Allocation of catch	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The processes used to make decisions about fisheries management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3. To what extent do you agree or disagree with the following statements? (tick one response only)

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	Don't know
I can easily access information about commercial fishing management in SA	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The commercial fishing information PIRSA produces is easy to understand	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Most recreational fishers comply with fishing rules and regulations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I have a good understanding of fishing rules and regulations that apply to my fishing activities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Most commercial fishers fish responsibly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
It is easy to comply with fishing rules and regulations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If I see a fisher doing the wrong thing, I know who to report it to	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fishers are provided with adequate training and advice about good fishing practices (e.g. bycatch reduction)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If I see other people doing the wrong thing while fishing, I report it to authorities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Most commercial fishers comply with fishing rules and regulations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Most recreational fishers fish responsible	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

PART G Your participation in fisheries management

1. Are you a member of any fishing association/industry organisation? YES NO

If yes, please list the groups you are a member of:

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2. Do you know how to contact the people who represent your interests on fisheries management/advisory committees? (please circle one) YES NO

3. Please indicate the time spent on the following fisheries management-related activities during times when you are not fishing

Fisheries management related activity	Hours per month (average)
Attending meetings, seminars, workshops that are fishing industry related	
Participation in fishing-related research (does not include the provision of catch and effort data)	
Provision of technical advice to committees, panels etc. on matters related to the fishing industry	
Other (please specify):	

4. If you want to have a say in how commercial fishing is managed, which of the following methods do you prefer? (tick one answer for each option)

How interested are you to...	Not at all interested in using this	A little interested	Interested	Very interested	Don't know/unsure
...receive information from PIRSA (e.g. by email or post)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...provide your views in written submissions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...attend public meetings about fisheries management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...attend meetings between commercial fishers and PIRSA (members of the public not invited)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...be a member of a committee that makes recommendations about fisheries management, but not final decisions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...be a member of a committee that makes decisions about fisheries management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...contact PIRSA via social media networks (e.g. Facebook, Twitter)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...access or submit information or comment online via the PIRSA website	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...use a smartphone application (e.g. iPhone/android app)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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5. Where did your spending on fishing activities occur in the last 12 months?

(please list the top five towns/local government areas where spending occurred, and estimate what % of spending occurred in each. If a lot of your spending occurred online, please write 'internet')

Location (town, local government area, or internet)	Types of spending (e.g. fuel, boat repair)	Approximate % of spending on fishing activities spent here

6. Please indicate the time spent on community-related activities

Community Activity	Hours per month (average)
Participating in conservation activities (e.g. bird counts, water watch)	
Participating in marine rescue and recovery	
Volunteering for community services (e.g. CFS, SES, ambulance, schools)	
Participating in local sporting groups	
Participating in local civic groups (e.g. Rotary, Lions)	
Other (please specify):	

7. In addition to the above, are there other ways in which you as a member of the Northern Zone Rock Lobster fishery contribute to the social, environmental and heritage values of the local community?

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PART H Access to fishing infrastructure

1. How satisfied are you with the level of access you have to the following infrastructure as part of your fishing activities?

	Very dissatisfied	Somewhat dissatisfied	Neither satisfied or dissatisfied	Somewhat satisfied	Very satisfied	N/A
Marines/mooring facilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Fuel and repair facilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Ice	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Cold storage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Roads accessing fishing areas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Fishing ramps/jetties/ wharves	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Bait and other supplies (other than ice)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Offloading facilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Seafood sorting facilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Other processing facilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Other (please describe) _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

PART I Your fishing activities

1. Thinking about the fishing that you've done in 2010/11 (including in other states), have you fished less, more or about the same amount compared with the 12 months prior to that? (please tick one)

Less More Same Don't know/unsure

If you indicated that you fished more or less, what are the main reasons for this change (please describe below)

2. In financial year 2010/11, approximately what % of your household income was earned from commercial fishing (or from a specific commercial fishery)? _____%

3. How does the level of income you gained from your fishing activities in 2010/11 compare to the income you gained...

	Much lower	Lower	About the same	Higher	Much higher
...one year ago	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...three years ago	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...five years ago	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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4. If you indicated your income has changed, what are the main reasons for the change?

5. What is the name of your homeport? _____

6. How did you learn your fishing skills? (tick all that apply)

<input type="checkbox"/> Self-taught e.g. through experience and accessing information online, in magazines	<input type="checkbox"/> Taught by family member
<input type="checkbox"/> Worked in a fishing business (not family)	<input type="checkbox"/> Learned from other fishers (not family)

PART J Information about you

How old are you?	_____ years
What is your gender?	<input type="checkbox"/> Male <input type="checkbox"/> Female
How many children do you have? (If none, please write '0')	No. of children: _____
How many years have you worked in commercial fishing?	_____ years
How long have you owned a licence in SZRL fishery?	_____ years
How many generations of your family have worked in commercial fishing?	_____ generations
Where do you live?	_____ town (nearest town if in rural area) _____ postcode
Did you choose to live in this location because of your fishing activities? (e.g. so you could live in a place close to where you fish)	<input type="checkbox"/> YES <input type="checkbox"/> NO

1. Please tick the highest formal education level you have achieved: (Tick one box)

<input type="checkbox"/> Primary school	<input type="checkbox"/> TAFE diploma (post high-school)
<input type="checkbox"/> Fourth year of high school	<input type="checkbox"/> University degree
<input type="checkbox"/> High school certificate	<input type="checkbox"/> Postgraduate degree

2. If you work outside the fishing industry in addition to your work in fishing, what type of job do you have outside fishing?

3. How many hours do you work per week? (include the total hours from all jobs you do) (please provide the average over the last 12 months) _____ hours

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The following question, like others, is voluntary. We are asking it to get a better understanding of the economic wellbeing of fishing families. We ask that you still participate in the rest of the survey even if you choose not to provide information about household income.

4. In financial year 2010/11, what was your total household income before tax? This includes the income earned by all working people in your household. (Tick one box).

<\$20,000	\$20,001- \$40,000	\$40,001- \$60,000	\$60,001- \$80,000	\$80,001- \$100,000	\$100,001- \$120,000	\$120,001- \$140,000	\$140,001- \$160,000	>\$160,000
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

PART K FURTHER COMMENTS

Please provide any additional comments that could assist in preparing the report.

Thank you for completing this survey



Government
of South Australia

Primary Industries
and Regions SA

Survey of the Social Aspects of Recreational Fishing in South Australia, 2012



Australian Government

Fisheries Research and
Development Corporation

QUESTION AND ANSWER BOOKLET

Please record your responses in this booklet and return it in the reply paid envelope provided

Part A: Your participation in recreational fishing

Recreational fishing includes line fishing, crabbing, cockling, dabbling and spearfishing, and any other catch of fish or other marine species for recreation.

Yes No

Have you participated in recreational fishing in the last 12 months in South Australia? (please tick one)

→ If you ticked YES, please go to Part B (you do not need to complete the question below)

→ If you ticked NO, please indicate why you have not fished recreationally in the last 12 months (tick all that apply)

I have never fished recreationally in SA

I used to fish recreationally in SA but haven't recently, for the following reasons:

(please describe why you haven't fished recently, eg changes in fishing conditions, or in your life)

If you ticked 'no' to Part A, please return the survey – you do not need to answer further questions

Part B: Your views about fishing and its importance to you

B1. How **important** are your recreational fishing activities to you?

(please tick one box below. A rating of 1 means that, while you enjoy fishing, it is not important to your life, and 10 means it is the most important part of your life)

Not at all important					Somewhat important					Very important
1	2	3	4	5	6	7	8	9	10	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

B2. How does the level of satisfaction you gain from your fishing activities now compare to the satisfaction you felt... (please tick one box for each statement; if you did not fish one year, three years or five years ago, please tick 'N/A')

	Much lower	Lower	About the same	Higher	Much higher	N/A
...one year ago	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...three years ago	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...five years ago	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

B3. If you indicated your level of satisfaction has changed, please describe why it has changed (eg change in your personal life, changed fishing conditions, or other reasons).

If your level of satisfaction has not changed, please go to Question B4.

B4. On average, how satisfied have you been with your recreational fishing activities over the last 12 months? (please tick one box on the scale of 1 to 10 below)

Not at all satisfied									Somewhat satisfied			Very satisfied
1	2	3	4	5	6	7	8	9	10			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

B5. On average, how satisfied have you been with your life in general in the past month (not necessarily related to fishing)? (please tick one box only)

	Very dissatisfied	Somewhat dissatisfied	Neither satisfied or dissatisfied	Somewhat satisfied	Very satisfied	Don't know
Your satisfaction with your life in general in the last month	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

B6. How important is each of the following aspects of your fishing activities to you? (please tick one box only for each statement)

	Not important	A little important	Important	Very important	N/A
Relaxation/unwinding	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Spending time in the outdoors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Spending time with family	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Spending time with friends	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Continuing a family tradition of fishing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Being on my own/getting away from people	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Participating in fishing competitions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The enjoyment or sport of fishing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Eating the fish, crabs etc that I catch	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Passing on knowledge about fishing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (please describe)					
_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Part C. Your fishing activities

C1. Approximately what percentage of your recreational fishing took place in South Australia in the last 12 months?	<input type="text"/> %
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C2. Approximately how many years have you been recreational fishing in South Australia?

(please tick one box only)

<input type="checkbox"/> 0-5 years	<input type="checkbox"/> 6-10 years	<input type="checkbox"/> 11-15 years	<input type="checkbox"/> 16-20 years	<input type="checkbox"/> 20-29 years	<input type="checkbox"/> >30 years
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C3. Where you fish

Please list the three locations in South Australia where you have fished most often in the last 12 months, by listing the nearest town, launching point or other location you used

Beach/launching point name (if known)	Nearest town
1. Beach/ launch point name: <input type="text"/>	Nearest town: <input type="text"/>
2. Beach/ launch point name: <input type="text"/>	Nearest town: <input type="text"/>
3. Beach/ launch point name: <input type="text"/>	Nearest town: <input type="text"/>

C4. Which of the following types of fishing do you do? (please tick all that apply)

Land based fishing (eg from beach/jetty/raking for crabs)	<input type="checkbox"/>
Boat based fishing (non-charter)	<input type="checkbox"/>
Boat based fishing (charter)	<input type="checkbox"/>
Inshore fishing (fishing within 5 kilometres of land)	<input type="checkbox"/>
Offshore fishing (fishing more than 5 kilometres from land)	<input type="checkbox"/>
Freshwater fishing (eg in rivers, dams)	<input type="checkbox"/>
Other (please describe) _____	<input type="checkbox"/>

C5. What are the main species you targeted when fishing in the last 12 months? (please tick all that apply)	<input type="checkbox"/> King George Whiting	<input type="checkbox"/> Snapper	<input type="checkbox"/> Squid (calamari)
	<input type="checkbox"/> Other (please specify) _____		
C6. What are the main species you caught over the last 12 months? (please tick all that apply)	<input type="checkbox"/> King George Whiting	<input type="checkbox"/> Snapper	<input type="checkbox"/> Squid (calamari)
	<input type="checkbox"/> Other (please specify) _____		

C7. Thinking about the fishing that you've done in the last 12 months (including in other states), have you fished LESS, MORE or ABOUT THE SAME amount compared with the previous 12 months? (please tick one box only)

<input type="checkbox"/> Less	<input type="checkbox"/> More	<input type="checkbox"/> Same	<input type="checkbox"/> Don't know/ unsure
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C8. If you indicated that you fished MORE or LESS, what are the main reasons for this change (please tick all that apply) If you indicated you fished about the same amount, please go to C9.

Work/business related (e.g. more/less busy, shift work)	<input type="checkbox"/>
Personal health/fitness	<input type="checkbox"/>
Personal preference (e.g. you have a new business, sport, hobby)	<input type="checkbox"/>
Home/family related (e.g. you are renovating, have a new baby)	<input type="checkbox"/>
Social (e.g. your friends fish more or less often)	<input type="checkbox"/>
Weather conditions	<input type="checkbox"/>
Changes in bag/possession limits	<input type="checkbox"/>
Change in technology (eg GPS, boat with different motor)	<input type="checkbox"/>
Location related (e.g. you have shifted house)	<input type="checkbox"/>
Other 'access' related (e.g. you bought/sold a boat or holiday house, or have had nearby jetty closures)	<input type="checkbox"/>
Fuel costs (boat, car etc)	<input type="checkbox"/>
Other costs (please specify) _____	<input type="checkbox"/>
Fishing quality/catch rates (e.g. better/worse)	<input type="checkbox"/>
You are undertaking different kinds of fishing/targeting of catch	<input type="checkbox"/>
Environmental reasons (e.g. water quality or water levels) (please specify) _____	<input type="checkbox"/>
No reason/unsure	<input type="checkbox"/>
Other (please specify) _____	<input type="checkbox"/>

C9. Thinking about the main species you catch, what do you do with your legal catch? (your legal catch means the fish you catch that are above the legal size limit– don't include juvenile fish that you returned)

Catch use	Approx. % catch you do this with (eg 20%)
Catch and release (of legal size fish – don't include juveniles)	<input type="text"/> %
Eaten by your household	<input type="text"/> %
Given to others	<input type="text"/> %
Used as bait by your household	<input type="text"/> %
Disposed of	<input type="text"/> %
Other (please describe) _____	<input type="text"/> %

C10. Do you or any other member of your household own a boat (or multiple boats) that you use for recreational fishing? Yes No
 (include part-ownership, canoes, kayaks and motorised boats; do not include paddle skis or windsurfers)

→ If you ticked YES, what is your homeport (or where you store your boat) Port:

→ If you ticked YES, does your boat have an echo sounder (sonar, fishfinder)? Yes No

→ If you ticked YES, does your boat have a GPS (global positioning system, including hand held)? Yes No

C11. How did you learn your fishing skills? (please tick all that apply)

Self taught eg through experience and accessing information online, in magazines Taught by family member

Worked in a fishing business (not family) Learned from other fishers (not family)

Formal training through a training course Other

Part D. Access to fishing infrastructure

D1. How satisfied are you with the level of access you have to the following infrastructure for recreational fishing? (please tick one box only for each statement)

	Very dissatisfied	Somewhat dissatisfied	Neither satisfied or dissatisfied	Somewhat satisfied	Very satisfied	N/A
Marinas/mooring facilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fuel and repair facilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Reservoirs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Roads accessing fishing areas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fishing ramps/jetties/wharves	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bait and other supplies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fish cleaning benches & offal disposal facilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fish attraction devices/artificial reefs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Toilets	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Accommodation near fishing areas (eg caravan parks)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (please describe)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Part E: Your knowledge of fisheries rules, regulation and management

This part of the survey asks for your views on the effectiveness of various aspects of fisheries management by the Department of Primary Industries and Regions SA (PIRSA), the government agency responsible for managing recreational fishing in South Australia.

E1. To what extent do you agree or disagree with the following statements?

(please tick one box only for each statement)

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	Don't know
I can easily access information about recreational fishing management in SA	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The recreational fishing information PIRSA provides is easy to understand	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I use information produced by PIRSA about recreational fishing in SA	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fishers are provided with adequate training and advice about good fishing practices (e.g. handling of released fish)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I have a good understanding of recreational fishing rules/regulations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
It is easy to comply with fishing rules and regulations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If I see a fisher doing the wrong thing, I know who to report it to	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Most recreational fishers comply with fishing rules and regulations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Most recreational fishers fish responsibly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Most commercial fishers fish responsibly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If I see other people doing the wrong thing while fishing, I report it to authorities eg FISHWATCH	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I have a good knowledge of bag and size limits	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

E2. Do you use the following methods to find information on recreational fishing?

(tick one box for each statement)

	<u>I don't get any information from this source</u>	<u>I get information on fishing rules and regulations from this source</u>	<u>I get other fishing information from this source (eg on fishing conditions, methods)</u>
Notices/signs posted at boat launching ramps, on jetties or at beaches	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fisheries officers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Internet (eg PIRSA website)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other fishers (not friends or family)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Newspapers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Radio	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fishing association (e.g SARFAC)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Magazines	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pamphlets/brochures	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Information provided at fishing related businesses (eg bait/tackle suppliers)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Friends	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Family	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fishcare volunteers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SMS Fish	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Charter fishing businesses	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Information provided at caravan parks/tourist accommodation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TV programs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Recreational fishing guide by PIRSA	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fishnet Australia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fishers for Conservation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
FishSA	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Spooled	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Recfish Australia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Strike and Hook	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Australian Maritime Safety Authority	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (please describe)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Part F. Your views on fisheries management

F1. To what extent do you agree or disagree with the following statements?

(tick one box for each statement)

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	Don't know
PIRSA do a good job of managing recreational fishing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I trust PIRSA to make the right decisions for managing recreational fishing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I understand how decisions about fisheries management are made	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I am satisfied with the level of consultation PIRSA undertakes with fishers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If I want to have a say in recreational fishing management, I know how to	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

F2. How fairly do you feel recreational fishers are treated by fisheries managers compared to other users of fisheries resources? (please tick one box for each of the statements)

How fair is the treatment of recreational fishers in terms of:	Very unfair	Unfair	Neither fair or unfair	Fair	Very fair	Don't know
Gear restrictions (eg types of fishing gear you can use)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Access to fishing areas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Allocation of catch	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The processes used to make decisions about fisheries management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

F3. Your views about public perceptions of fishers (please tick one box for each statement)

	Very negatively	Negatively	Neither	Positively	Very positively	Don't know
How do you believe most people in the general community perceive commercial fishers?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How do you believe most people in the general community perceive recreational fishers?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

F4. Your knowledge of groups who represent recreational fishers

Are you a member of any recreational fishing association/club/ organisation? (please tick one)	<input type="checkbox"/> Yes	<input type="checkbox"/> No
→ If you ticked YES, please list the groups you are a member of	Name/s of groups: _____	
Do you know how to contact the people who represent your interests on fisheries advisory committees? (please tick one)	<input type="checkbox"/> Yes	<input type="checkbox"/> No

F5. Your involvement in recreational fishing management

Have you had any involvement in recreational fishing management? (eg through attending public meetings to discuss proposed management changes, making a submission to PIRSA, or joining an advisory committee)	<input type="checkbox"/> Yes	<input type="checkbox"/> No
→ If you ticked YES, please describe the types of involvement you have had (eg attending public meetings, making a submission)	_____ _____	

F6. If you wanted to know more about a recreational fishing management issue (such as bag or size limits for particular species), or to have your views heard about it, which of the following methods would you be interested in using? (please tick one box for each option)

How interested would you be to...	Not at all interested	A little interested	Interested	Very interested	Don't know/unsure
...receive information by PIRSA (eg by email or post)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...providing your views in written submissions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...attend public meetings about fisheries management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...be a member of a committee that makes recommendations about fisheries management (but does not make final decisions)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...be a member of a co-management committee that makes decisions regarding fisheries management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...contact PIRSA via social media networks (eg. Facebook, Twitter)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...access or submit information or comment online via the PIRSA website	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...access a smartphone application (eg. iPhone or android app)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Part G. Your contributions to the communities in which you fish

G1. Approximately how much did you spend on fishing activities in the last 12 months? (please tick one box only).

Include spending on fuel, accommodation, boat maintenance and repair, purchase of fishing gear and supplies such as bait, ice etc, and food when travelling for fishing trips.

If you went on a holiday where only part of your time was spent fishing, estimate costs based on the proportion of time spent fishing (eg if one day of a five day holiday was spent fishing, include 20% of your petrol, accommodation and food costs).

<input type="checkbox"/> \$0-499	<input type="checkbox"/> \$500-999	<input type="checkbox"/> \$1,000-4,999	<input type="checkbox"/> \$5,000-9,999	<input type="checkbox"/> \$10,000-19,999
<input type="checkbox"/> \$20,000-49,999	<input type="checkbox"/> \$50,000-99,999	<input type="checkbox"/> > \$100,000		

G2. Do you own a holiday home that you purchased partly so you could go fishing in the local area? Yes No

G3. Where did your spending on fishing activities occur in the last 12 months?

(please list the top five towns/local government areas where spending occurred, and estimate what % of spending occurred in each. If a lot of your spending occurred online, please write 'internet').

We understand you may not be able to do this easily, and have given two examples to assist. You only need to make a rough estimate of your proportion of spending (please do not spend time going through your records)

Location (town, local government area, or internet)	Types of spending (eg fuel, boat repair, food, accommodation, hiring charter boat)	Approximate % of expenditure on fishing spent here
<i>Example 1: Internet</i>	<i>Rod and reel package, echo sounder, fishing magazine subscription</i>	20%
<i>Example 2: Ceduna</i>	<i>Fuel, food, motel</i>	50%
1.		<input type="text"/> %
2.		<input type="text"/> %
3.		<input type="text"/> %
4.		<input type="text"/> %
5.		<input type="text"/> %

Part H. Information about you

The last section of the survey asks for some information about you. We ask these questions because we want to find out if people in different situations – for example, in different age groups – fish in different ways. This will help fisheries managers identify the needs of different recreational fishers.

H1. Personal details

How old are you?	<input type="text"/> years
What is your gender?	<input type="checkbox"/> Male <input type="checkbox"/> Female
How many children do you have? (If none, please write '0')	<input type="text"/>
Which of the following best describes your marital status at present? (please tick one box only)	<input type="checkbox"/> Currently married or de facto <input type="checkbox"/> Never married or de facto <input type="checkbox"/> Separated/ divorced <input type="checkbox"/> Widowed
What is your occupation? (if retired, please write 'retired')	<input type="text"/>
How many hours do you work per week? (include unpaid work such as volunteering or domestic duties; provide the average over the last 12 months)	<input type="text"/> hours
Where do you live? (please name the town, or nearest town if you live on a rural property; and provide the postcode)	Town: <input type="text"/> Postcode: <input type="text"/>
Did you choose to live in this location because of your fishing activities? (eg so you could fish from a place close to where you live)	<input type="checkbox"/> Yes <input type="checkbox"/> No
What is your ancestry? (eg Australian, Chinese, English, German, Irish, Greek, Scottish, Vietnamese)	<input type="text"/>

H2. What is the highest formal education level you have achieved? (please tick one box only)

<input type="checkbox"/> Primary school	<input type="checkbox"/> TAFE diploma (post high-school)
<input type="checkbox"/> Up to fourth year of high school	<input type="checkbox"/> University degree
<input type="checkbox"/> High school certificate	<input type="checkbox"/> Postgraduate degree

H3. In financial year 2010-11, what was your total household income before tax? This includes the income earned by all working people in your household. (please tick one box only). *Please note: if you choose not to answer this question, we would appreciate you still returning the survey with this question uncompleted.*

<\$20,000	\$20,001- \$40,000	\$40,001- \$60,000	\$60,001- \$80,000	\$80,001- \$100,000	\$100,001- \$120,000	\$120,001- \$140,000	\$140,001- \$160,000	>\$160,000
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Part I. Your participation in this survey

11. How did you find out about this survey? (please tick one box only)

I was emailed the link to the survey by a friend or colleague	<input type="checkbox"/>
I heard about the survey on the radio or by reading a newspaper or magazine	<input type="checkbox"/>
I was handed the survey while fishing	<input type="checkbox"/>
I was handed the survey while at a bait and tackle shop	<input type="checkbox"/>
I was handed the survey while at a caravan park or other accommodation	<input type="checkbox"/>
I was sent the survey because I had participated in a previous fishing survey	<input type="checkbox"/>
From a notice promoting the survey	<input type="checkbox"/>
Other (please describe)	<input type="checkbox"/>
<hr/>	

If you would like to enter the draw to win a charter boat fishing trip or vouchers for fishing gear, please provide your email address, phone number and postal address below. Please note, completed surveys must be received by 29 February 2012, to be eligible for the prize draw. Winners will be drawn on 12 March 2012 and notified by 16 March 2012. Please also indicate if you would like to be sent a summary of the results of the project. Your contact details will not be used for purposes other than sending you information about this survey, and entering you in the prize draw.

Name: _____
Email: _____
Phone number: _____
Postal address: _____
<input type="checkbox"/> I would like to be sent a summary of survey results and would prefer to receive it by <input type="checkbox"/> email <input type="checkbox"/> mail
I am willing to participate in future surveys like this one <input type="checkbox"/> Yes <input type="checkbox"/> No

If you have any further comments or feedback, please provide it below (please attach a separate sheet of paper if the space below is not enough):

Thank you for completing the survey.

**SOCIAL ASPECTS OF COMMERCIAL FISHING IN SOUTH AUSTRALIA, 2011-2012:
Findings from surveys of the South Australian marine scalefish, rock lobster and abalone
fisheries.**

J. Schirmer

March 2013

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1. INTRODUCTION

This report describes the results of three surveys of commercial fishers undertaken in South Australia in 2011 and 2012. Fishers in the Marine Scalefish Fishery (MSF), Southern and Northern Zone Rock Lobster Fisheries (SZRLF and NZRLF) and Abalone Fishery were surveyed to gather information about social dimensions of commercial fishing in South Australia. The purpose of the survey was to collect data to test social indicators developed as part of the 'Developing and testing social objectives for fisheries management' study. The 'Social objectives' study is identifying how to monitor social dimensions of fishing as part of fisheries management.

The survey's purpose was different to that of most previous surveys of commercial fishers in South Australia (and elsewhere in Australia). Most commercial fishing surveys aim to gather information to help evaluate changes in stock and/or to assist fisheries management. This survey, however, aimed to improve understanding of the social dimensions of commercial fishing.

Understanding social dimensions of commercial fishing is important for a number of reasons. Firstly, fisheries managers are often asked to manage fisheries to maximise the benefits of the resource to the community. As members of the broader community, it is important to understand how participating in fishing influences commercial fishers. Second, the decisions commercial fishers make – for example, about their level of fishing effort and when to retire from fishing – are not driven solely by economic considerations. Commercial fishers are often highly attached to fishing for cultural, historical and social reasons, rather than being driven by economic motivation. Understanding these social motivations is critical to understanding how fishers cope with change in fisheries management, markets and other factors. Additionally,

This study examined these important issues. This report examines the overall results of the survey. Other reports forming part of the 'Social objectives' study more specifically examine the usefulness of the data collected for measuring performance against the social objectives of fisheries management. In this report, we describe and evaluate the methods used in the study briefly. We then present results of the surveys regarding various social dimensions of commercial fishing. Finally, we discuss key implications of the study's findings, and identify gaps in knowledge that need further exploration.

2. METHODS

This report provides results from three surveys of commercial fishers undertaken in South Australia during 2011 and 2012. This section summarises the methods used to design the survey questionnaire, and distribute the survey.

2.1 Designing the questionnaire

The survey questionnaire was designed in several stages. The topics to be included were determined based on (i) prior work in the 'Social objectives' study, which had identified social objectives that are often relevant in fisheries management and designed indicators to measure performance against these objectives (these processes are detailed in other reports produced during the study). Survey questions were designed to measure these indicators, and to gather data that could help fisheries managers understand social trends in recreational fishing. These initial topics were tested in the first survey of commercial fishers: the MSF survey, in July 2011, included several questions on social dimensions of fishing. While it would have been preferable to further test questions before surveying fishers, the MSF fishery was scheduled to be surveyed by EconSearch at this time, and this was the only viable opportunity to include questions on social dimensions of fishing within the timeframe of this project. The survey questions were reviewed by a number of South Australian fisheries stakeholders at a workshop held in Adelaide in September 2011. Participants included representatives of RecFish SA and the PIRSA recreational fisheries manager, as well as representatives of the commercial fisheries sector who were reviewing similar questions asked in surveys of commercial fishers.

Based on feedback from these stakeholders, the survey was revised. It was then revised further after reviewing response rates and results of the MSF survey. The revised questionnaire was then reviewed by representatives of the RLF and Abalone fishery, who advised on whether any questions needed modification in order to be applicable in the context of their fishery, or should be removed. These questions were then revised to ensure the survey could be easily completed, and the questionnaire finalised.

The three surveys asked questions on the following topics:

- The importance of fishing, and relative importance of lifestyle versus business aspects of commercial fishing
- Attachment to and involvement in fishing, including number of years spent fishing, proportion of income derived from fishing, work outside the industry, and family history of involvement in commercial fishing
- Satisfaction with fishing and different aspects of it
- Future intentions regarding fishing
- Overall wellbeing of the fisher
- Stewardship, including perceptions about fishing rules and regulations and obligations to fish responsibly, and how the public view fishers
- The quality and fairness of fisheries management
- Involvement in fishing management and decision making, including membership of fishing organisations and preferences for involvement in fisheries management processes

- Satisfaction with fishing infrastructure
- Change in fishing activity over time, and the reasons for any increase or decrease over time
- Change in fishing income over time, and the reasons for any increase or decrease over time
- How fishing skills are learned
- Socio-demographic characteristics (age, gender, number of children, residential location, education and household income)

In addition, a number of questions were asked about economic aspects of the fishing business (the primary purpose of the survey onto which these social questions were added). These are not detailed here as they were analysed by EconSearch as part of their regular reporting, and reported in the relevant reports (EconSearch 2012a,b,c; EconSearch 2013).

2.2 Regions surveyed

One of the goals of the ‘Social objectives’ project was to test whether the social indicators developed as part of the project could be used to compare different case study regions. For this reason, three specific case study regions within South Australia were selected, and specific effort given to achieving survey responses from people fishing in those regions:

- NW Yorke Peninsula region: This case study region, centred on the townships of Wallaroo, Kadina and Moonta, included the north-west of the Yorke Peninsula from just south of Tickera to Port Victoria.
- Southern Eyre Peninsula region: This case study region included the southern Eyre Peninsula from Point Drummond to Port Neill, including Port Lincoln.
- Far West region: The region from Fowlers Bay to Baird’s Bay was included in this case study region.

These three case study regions were selected as each is a focus for recreational and commercial fishing (a separate survey was undertaken of recreational fishers, with the results presented in a separate report to this one), but each also has different characteristics. The survey of the three commercial fisheries was open to any fisher with a licence to operate in those fisheries, irrespective of the region in which they fished or lived. Once survey results were received, analysis was undertaken to identify how many respondents lived in one of the case study regions¹.

In total:

- 12.6% (24 fishers) lived in the NW Yorke Peninsula region, of which 22 were in the MSF and two in the rock lobster fishery
- 18.3% (35 fishers) lived in the Southern Eyre Peninsula region, of which 16 were MSF fishers, 7 were abalone fishers and 11 were NZRLF fishers
- 11.5% (22 fishers) lived in the Far West region, of which two were abalone fishers and the remainder MSF fishers.

¹ Most fishers lived and fished in the same region, although a small number fished in a different region to that in which they lived. As much of their spending occurred near their residential location, including fishing business spending, we defined whether they were in a particular case study region based on where they lived

- 57.6% (110 fishers) lived in areas outside the three case study regions, primarily in the south east (Robe, Kingston SE), Kangaroo Island, Adelaide, and other parts of the Yorke and Eyre Peninsulas.

The relatively small numbers of fishers who lived in each case study region reduced the potential to compare characteristics of fishers by region. In the MSF fishery there were adequate numbers in each region to compare whether their views differed depending on the region in which they lived. In the other two fisheries, there were not. Therefore in the results presented in this report, only responses from the MSF fishery are compared by region, and this only for some analyses where response rates to the question were adequate to enable a meaningful comparison.

2.3 Survey distribution methods

Questions on the social dimensions of fishing were asked as part of a broader survey examining economic performance of each fishery. These surveys are undertaken regularly in each fishery by EconSearch, with approx. 14 previous surveys undertaken. The methods used by EconSearch to survey each fishery are detailed in reports of the results of the overall survey (see EconSearch 2012a,b,c; EconSearch 2013). In brief, they were:

- EconSearch sent fishers a letter advising them of the survey
- This was followed by a phone call, and organisation of either a face to face meeting to complete the survey or, if the fisher preferred, mailing of the survey.
- The majority of surveys were completed face to face.

The MSF survey was undertaken in July 2011; the NZRLF and SZRLF surveys in April 2012; and the abalone fishery survey in October 2012.

2.4 Survey sample achieved

The survey response rates were as follows:

- MSF: 36% response rate (106 usable survey responses from 328 licence holders)
- SZRLF: 27% (45 responses from 164 active licence holders)
- NZRLF: 46% (22 responses from 48 active licence holders)
- Abalone fishery: 51% (18 responses from 35 active licence holders)

It was not possible to analyse how representative the sample achieved in each fishery was of the whole fishery. This would require having access to independent information about key characteristics of all fishers in each fishery, something that wasn't possible within the resource constraints of this study.

2.5 Data analysis

The survey data were entered into an excel spreadsheet. Data analysis was undertaken using the software package IBM SPSS Statistics 19. The analyses included in this report are:

- Descriptive statistics
- Cross-tabulations (eg comparisons of recreational fishing behaviour of particular groups)
- Simple bivariate statistical analyses to identify whether the differences in observed opinions or behaviour of different types of recreational fishers are statistically significant. The statistical tests used are reported when statistics are presented.

3. RESULTS

The results of the commercial fisheries surveys are presented in several sections, each covering a topic area related to the social dimensions of commercial fishing:

- **Dependence on and attachment to fishing:** This section examines the extent to which fishers feel a strong attachment to fishing, and their dependence on it as a livelihood
- **Satisfaction with fishing:** This examines how satisfied fishers are with their commercial fishing activities overall, and with different aspects of them
- **Fisher wellbeing:** This examines how satisfied fishers are with different aspects of their life that typically predict a person's overall wellbeing, including their finances, their work in fishing, and non-fishing related issues such as their relationships and the community they live in
- **Stewardship:** This section examines the sense of stewardship fishers feel about their fishing activities, and how their sense of being stewards of fishing resources is impacted by other's perceptions of them
- **Fisheries management and decision making:** This section examines fishers' views about the adequacy of fisheries management and decision making processes
- **Fishing infrastructure:** The satisfaction of fishers with their access to infrastructure needed for fishing is examined
- **Changes in fishing over time:** This section identifies how the level of fishing activity engaged in over time has changed, and why
- **Socio-demographic characteristics:** This section describes the characteristics of the fishers who responded, including aspects such as gender, age, formal educational attainment, and household income.

3.1 Dependence on and attachment to fishing

When examining the social dimensions of fishing, a critical part is to understand the social aspects of the choice of commercial fishing as an occupation.

People choose to work in commercial fishing for a range of reasons, including a preference for the lifestyle of fishing, and a desire to earn money from fishing. When examining social dimensions of fishing, it is helpful to know to what extent fishers are choosing to fish for lifestyle versus commercial reasons, as well as their personal connections to the fishing industry. A person whose reasons for fishing are strongly lifestyle or cultural – for example, they are continuing a family tradition of fishing – will likely make different decisions about when they might exit fishing or switch to a different occupation than someone whose reasons for fishing are purely commercial.

Fishers' attachment to and involvement in fishing was examined by (i) examining how dependent fishers are on their work in commercial fishing, (ii) identifying how attached they are to fishing, and (iii) identifying the reasons for their attachment to fishing (eg lifestyle versus income).

3.2 Dependence on commercial fishing

The extent to which fishers are dependent on working in commercial fishing will affect how easily they are able to find work in other industries, and their vulnerability to changes affecting their work in the industry. ‘Dependence’ here can mean more than one thing: a person can depend on an industry psychologically to support their sense of wellbeing and achievement, financially for income, culturally to fulfil a family or community history of fishing, and socially to provide networks of friendships and social contact. It was not possible to measure all these types of dependence in the surveys. Dependence was measured based on:

- Years the fisher had spent working in commercial fishing (Figure 1). This identifies the extent to which a fisher has had experience of working in other occupations, with longer years spent fishing an indicator that the fisher is likely to find it difficult to look for work in other industries if they chose to or had to
- Generations of the fisher’s family who had worked in commercial fishing (Figure 2). This helps identify the extent of cultural attachment to fishing, with more generations of history in fishing indicating higher cultural dependence on fishing
- Proportion of household income earned from fishing (Figure 3). This identifies current financial dependence on fishing, and whether the fisher has alternative sources of income to draw on during any downturns in fishing. In addition, two of the surveys (the RLF and Abalone surveys) asked fishers who indicated they had a job outside commercial fishing to describe the nature of their work outside fishing.

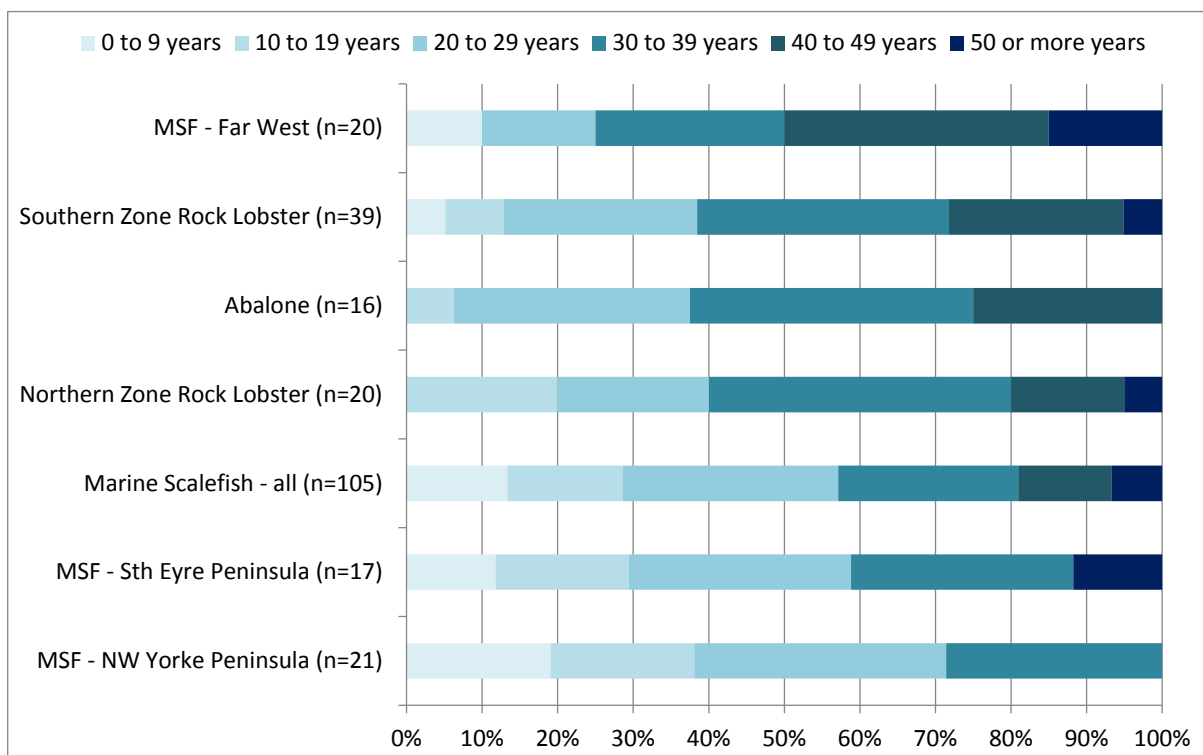


Figure 1 Number of years fishers had worked in commercial fishing

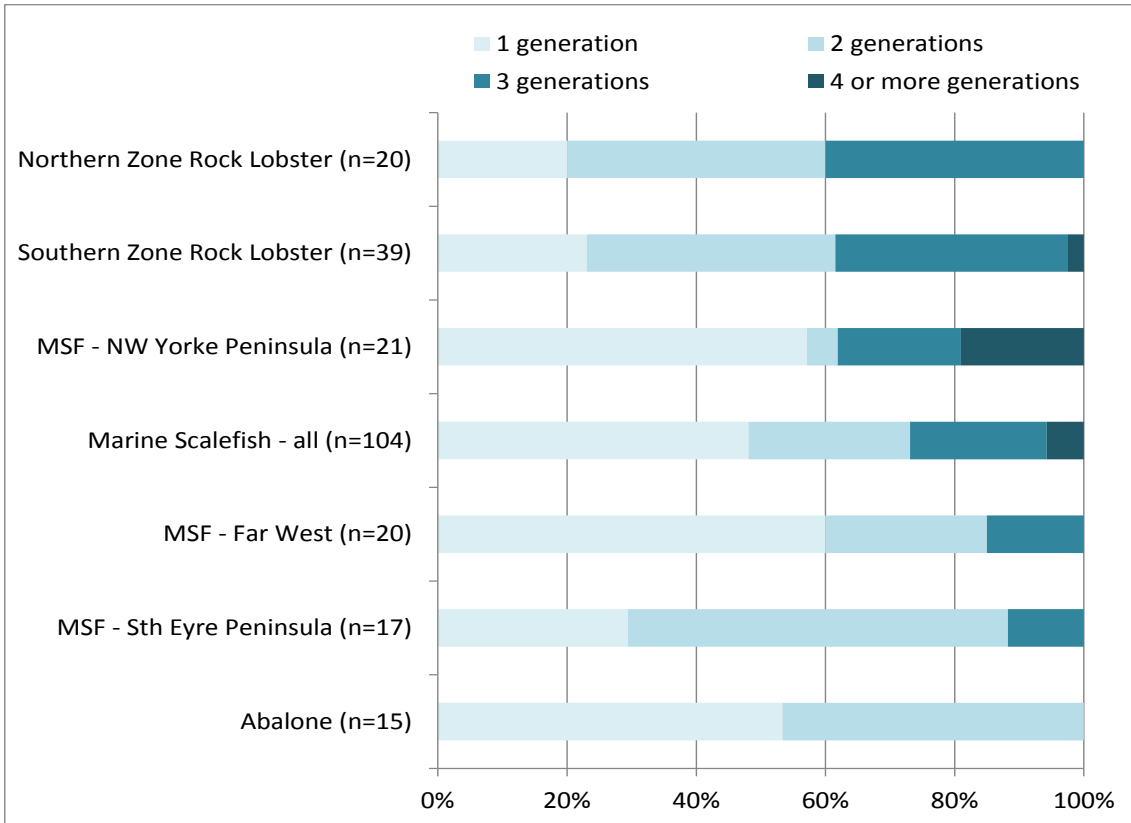


Figure 2 Generations of the fishers family who have worked in commercial fishing

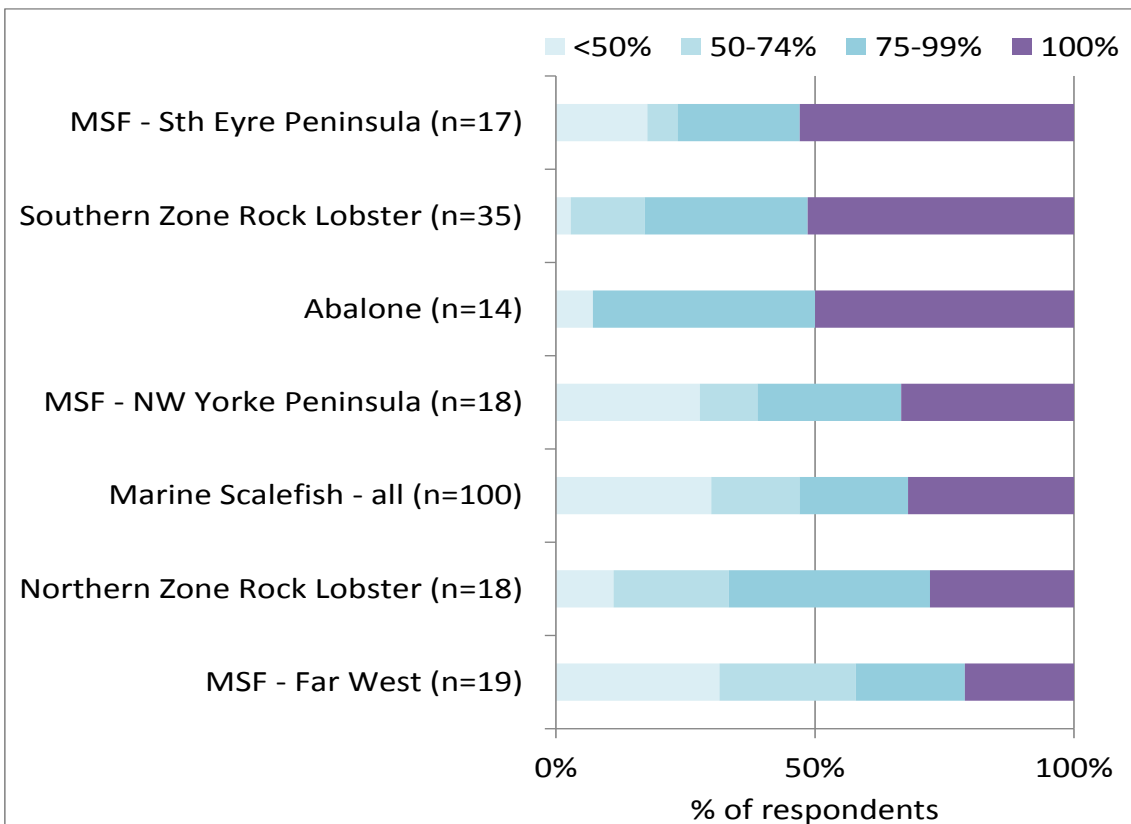


Figure 3 Proportion of household income earned from commercial fishing

The RLF and Abalone surveys asked respondents who had indicated they had a job outside of fishing to describe the nature of their work. This question was not included on the MSF survey.

Of the 41 respondents who answered this question (from 77 respondents in total to these two surveys):

- 32% worked in agriculture, typically describing their work as 'farming'
- 27% worked as a tradesperson, most commonly in construction, mechanic or as an electrician
- 20% worked in marine related jobs such as in a seafood processing factor, in marine shipping, or aquaculture
- 10% worked in a retail shop or hotel
- 7% worked in forestry
- 5% worked in air transport.

Dependence on commercial fishing varied considerably across the different fisheries, as well as by region, and by type of dependence measured.

Rock lobster fishers were generally highly dependent on fishing, with a majority having worked more than 30 years in fishing, having more than one generation of involvement in fishing, and in the case of the Southern Zone, having a high proportion of household income from fishing (with just over half earning all their income from fishing).

Abalone fishers were likely to have worked a long time in fishing and to earn a higher proportion of income from fishing, but didn't typically have multi-generational involvement in fishing.

The MSF fishery varied substantially by region – MSF fishers in regions other than the Far West had worked the fewest years in fishing, had varying family histories of fishing, and in Southern Eyre Peninsula were likely to earn most of their household income from fishing, while in the Far West were least likely of all the fishers surveyed to earn a high proportion of their household income from fishing.

3.3 Attachment to fishing and reasons for attachment

Questions about how attached fishers are to working in commercial fishing were asked in different ways on the three surveys. First, in the MSF survey, fishers were asked to identify whether, if offered the same income they currently earn from fishing, they would move to a land-based job (assuming they could sell their fishing assets for an appropriate value). Of the 97 respondents to the question, 26.8% replied 'yes' and 73.2% replied 'no'.

MSF fishers were then asked how much more income they would need to earn onshore to consider leaving fishing as an occupation, as a measure of how strongly attached they are to fishing. This question achieved a low response rate, with fishers often indicating that they either (i) could not quantify the income needed to leave fishing as the decision would depend on too many other factors, such as the type of onshore job they went to; or that (ii) no amount of additional income would make them considering leaving fishing.

Of the 73 MSF fishers who did attempt to answer the question (representing 69% of respondents, some of whom also indicated difficulty answering it):

- 19.2% indicated they would need no additional income to leave fishing
- 23.3% indicated they would need between \$5,000 and \$40,000 to leave fishing
- 20.5% indicated they would need between \$40,000 and \$60,000
- 11.0% indicated they would need between \$60,001 and \$99,999
- 26.0% indicated they would need \$100,000 or more.

Given that a large proportion of fishers indicated difficulty answering these questions, and some found it confronting to be asked what amount of money would be needed to make them leave an occupation they are highly attached to, in subsequent surveys different questions were asked.

Fishers were asked to rate the relative importance of the lifestyle aspects of commercial fishing versus the business aspects, on a scale of one to seven in which one indicated that lifestyle aspects of commercial fishing were as important to the fisher as business aspects, while seven indicated that they viewed fishing principally as a business, in which they participated to earn income.

Second, they were asked how long they intend to continue participating in the commercial fishing industry, as a measure of how strongly attached they feel to fishing. Finally, they were asked how important fishing is to their lives, on a scale of 1 (not very important) to 10 (very important). Figures 4 to 6 show the results.

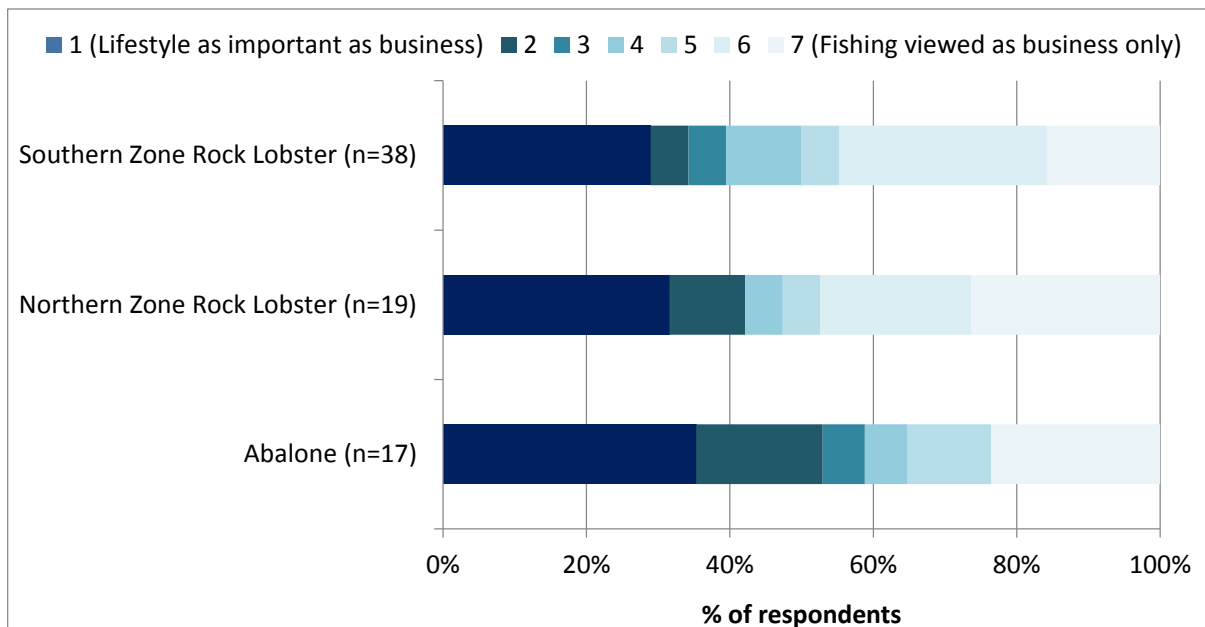


Figure 4 Fishers attachment to commercial fishing as a lifestyle versus a commercial business

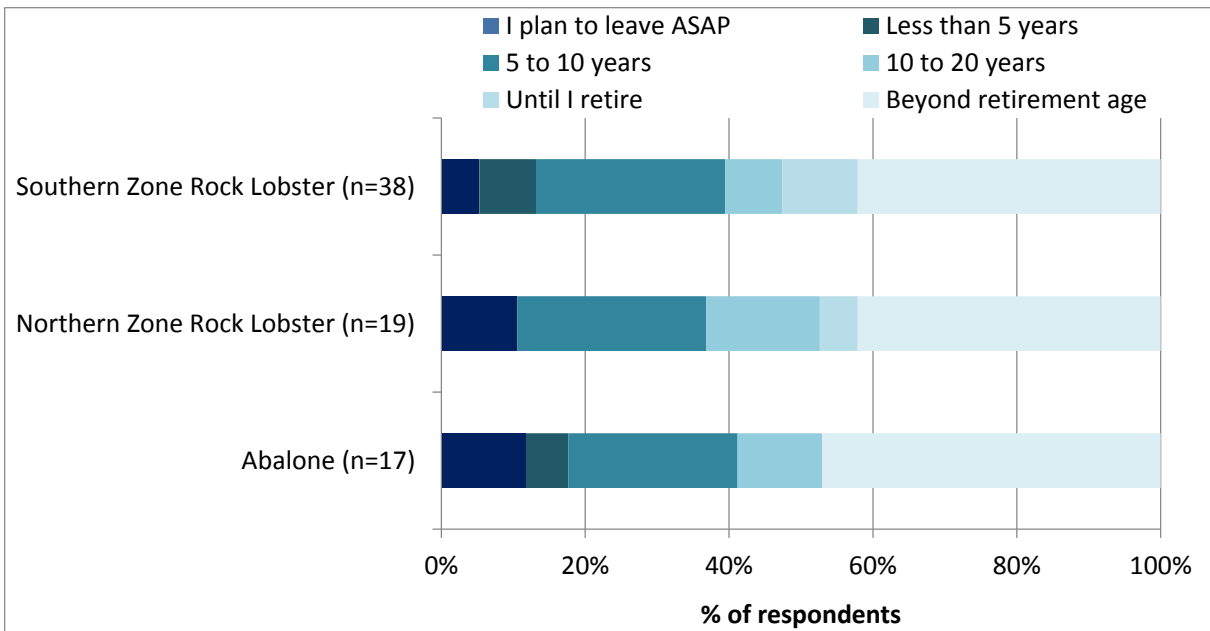


Figure 5 Length of time fishers intend to continue fishing commercially

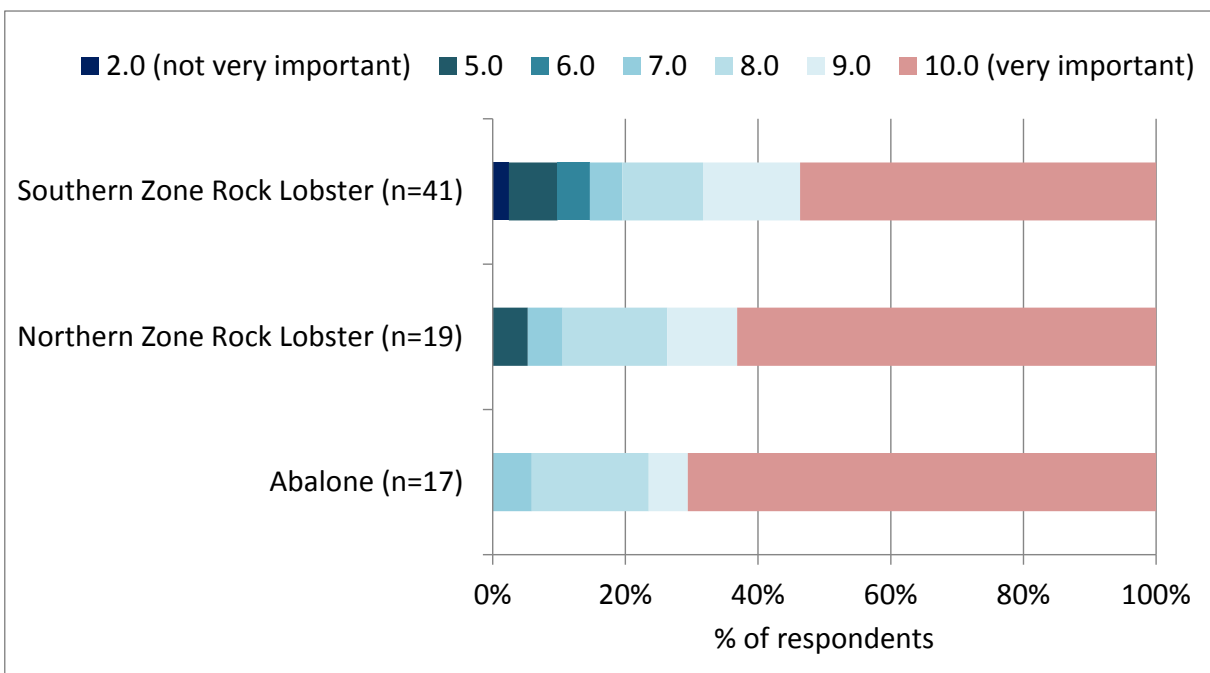


Figure 6 Fisher rating of how important their fishing activities are as a part of their life, from 1 (not very important) to 10 (very important)²

Overall, the large majority of commercial fishers have high attachment to commercial fishing as a livelihood. In the MSF fishery the results are somewhat difficult to interpret due to high numbers of non-respondent; in the other fisheries the results provide a better measure of attachment.

² Note that no fishers answered 1, 3 or 4 on the scale, and so these numbers are not represented on the legend for Figure 6.

In addition, less than 10% of fishers want to leave fishing as soon as possible, while a much larger proportion – 40% to 50% depending on the fishery – plan to keep fishing beyond retirement age. Fishers were more likely to value fishing for its lifestyle benefits than its business benefits, although there was a lot of variation in response to this question. The overwhelming majority of fishers rate fishing activities as being very important to their lives.

While fishers in the abalone and rock lobster fisheries were fairly similar on most attachment measures, as a whole southern zone rock lobster fishers were slightly less attached to fishing, being more likely to view fishing primarily as a business rather than a lifestyle, slightly less likely to plan to fish beyond retirement, and somewhat more likely to rate fishing as being of lower overall importance to their life. However, these differences were relatively small.

3.4 Satisfaction with fishing

Economic analyses of fishing typically assume that if a fisher is earning higher income from fishing, they will be happier with their fishing experience. However, it is well established that earning income, while important to a person's wellbeing, is not the only thing that influences wellbeing, and that the benefits of income decrease as a person's wealth increases (Cummins 2000). This means that fishers who earn less income may not be less satisfied with their fishing experience; while those who earn higher income are not necessarily more satisfied with their work in commercial fishing.

In the MSF survey, fishers were asked whether their level of satisfaction from fishing had increased or decreased over time during the last three, five and ten years (Figure 7). Around 40% of fishers indicated they were less satisfied with their fishing now than they had been either three, five or ten years ago. On the other end of the scale, almost 40% believed they were more satisfied with fishing now than 10 years ago, but only 20% more satisfied now than 3 years ago. These results are difficult to interpret, and some fishers raised concern that the question could be misread and answered incorrectly as a result. Despite this, the results suggest that satisfaction with fishing varies for different fishers, and this warrants further investigation to understand what factors influence satisfaction with fishing.

Responses to this question indicated a need to further develop questions in this area, and in the subsequent surveys of the RLF and Abalone fisheries, the following questions were asked:

- How satisfied have you been with your commercial fishing activities over the last 12 months? Fishers answered on a scale of 1 to 10, where one indicated they were not at all satisfied, and 10 that they were very satisfied (Figure 8)
- How satisfied are you with the following aspects of your current fishing activities: relaxation/unwinding, spending time in the outdoors, spending time with friends, continuing a family tradition of fishing, being on my own/getting away from it all, being a part of the fishing industry, the enjoyment or sport of catching fish/crabs etc, the money made from my fishing business, and passing on knowledge about fishing. This question was only asked on the RLF survey, as it was considered too lengthy to include on the Abalone survey.

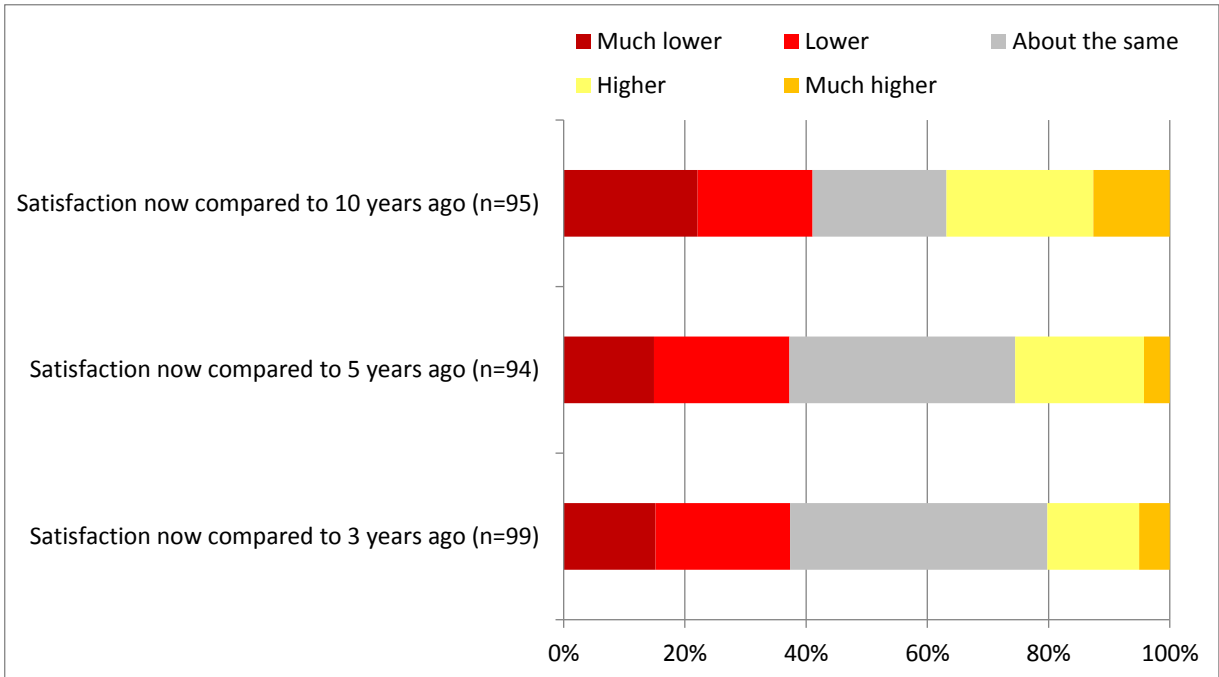


Figure 7 Change in satisfaction with fishing over time reported by MSF fishers

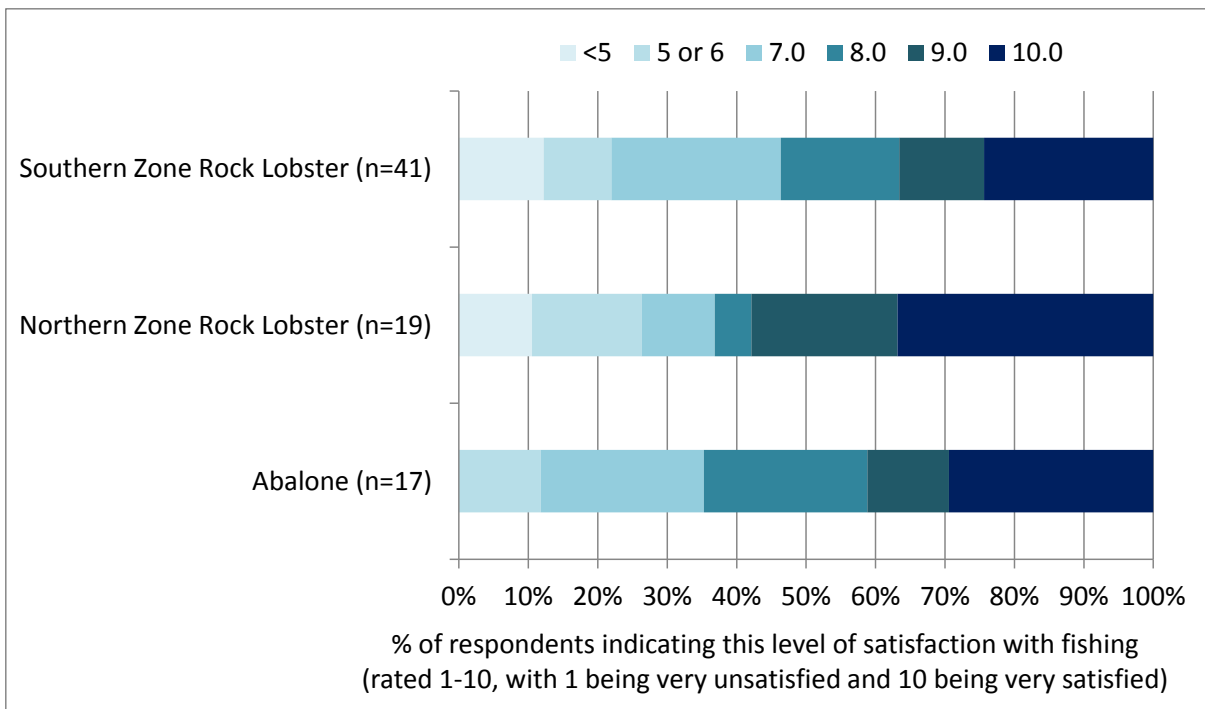


Figure 8 Fishers' average level of satisfaction with their commercial fishing activities over the 12 months prior to the survey

Figure 9 shows the proportion of fishers reporting being satisfied with these aspects, and Figure 10 the proportion reporting being dissatisfied.

When asked to rate their level of satisfaction with their commercial fishing activities on a scale of 1 to 10, all but 10% of fishers rated their satisfaction as 5 or higher, and between 40% and 50% as being 9 or 10 (Figure 8). There was some variation between fisheries – Northern Zone rock lobster fishers reported higher levels of satisfaction than abalone fishers, and Southern Zone rock lobster fishers slightly lower levels of satisfaction than either Northern Zone rock lobster or abalone fishers.

The large majority of fishers reported being satisfied with the different dimensions of fishing, although Southern Zone rock lobster fishers were more likely to report being satisfied than Northern Zone fishers on most measures (Figure 9).

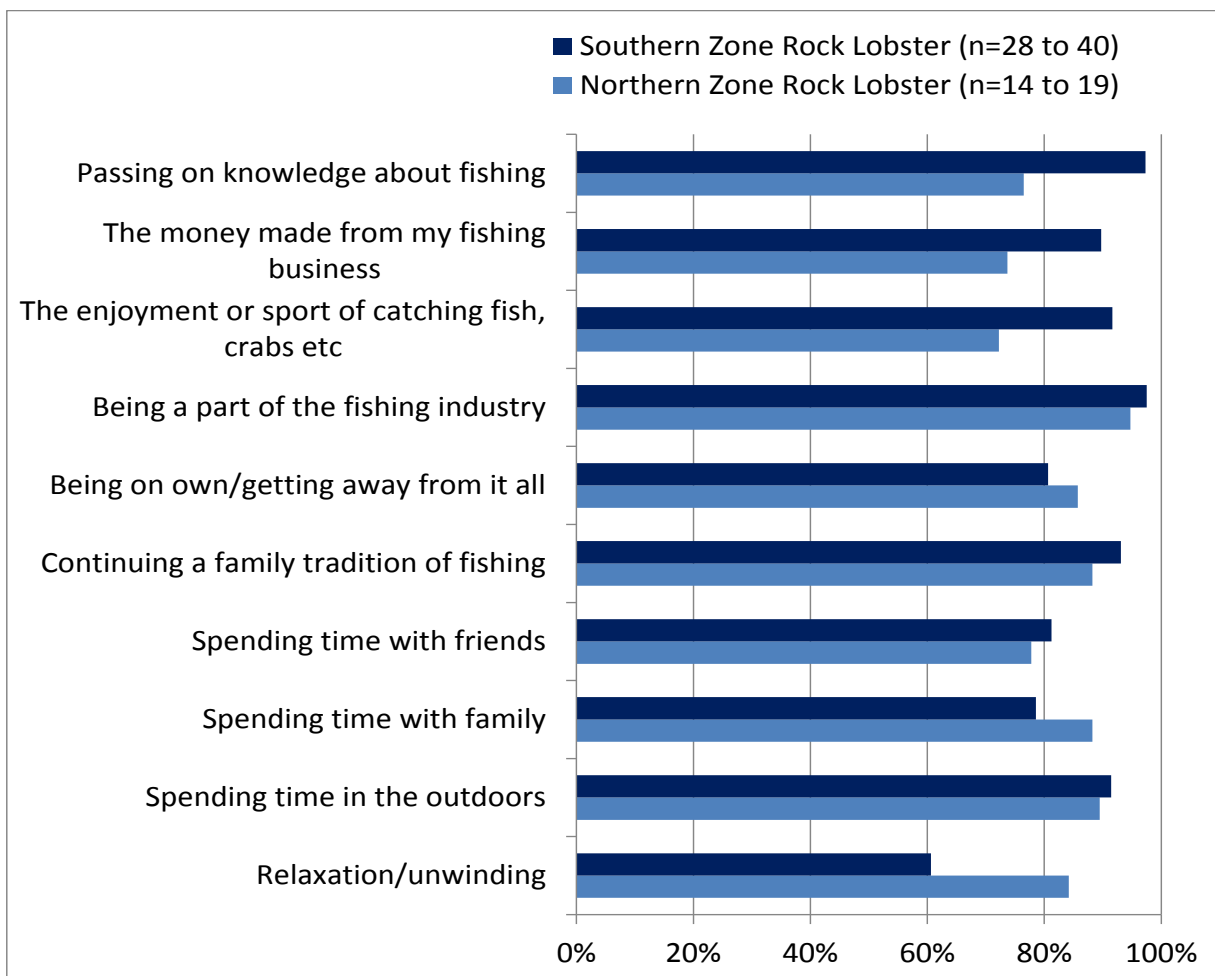


Figure 9 Proportion of rock lobster fishers reported they were 'satisfied' or 'very satisfied' with different aspects of their fishing

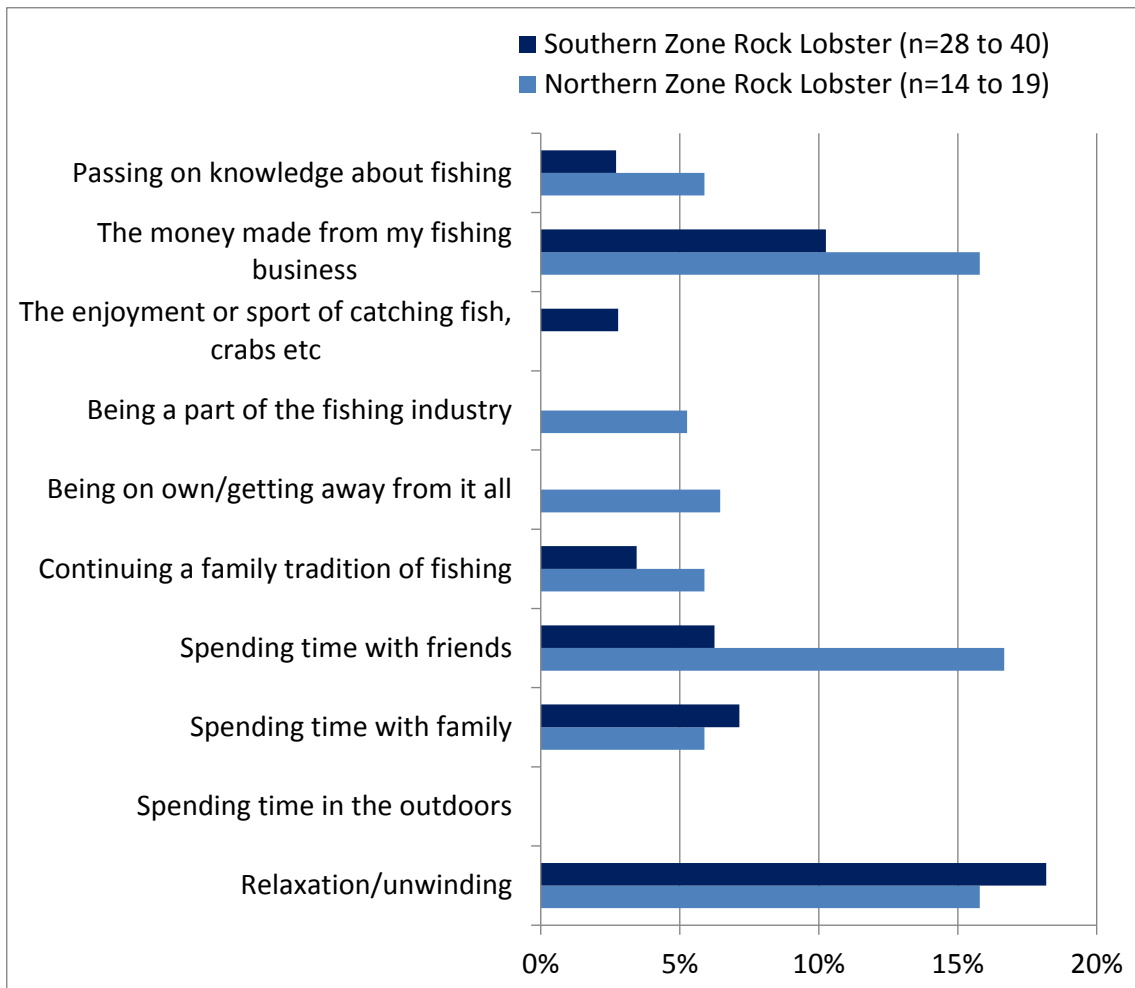


Figure 10 Proportion of rock lobster fishers reported they were 'unsatisfied' or 'very unsatisfied' with different aspects of their fishing

While only a small proportion of fishers reported being dissatisfied with any aspect of their fishing (Figure 10), the areas most commonly associated with dissatisfaction were relaxation/unwinding, spending time with friends, and the money made from the fishing business. It should be noted, however, that only 10% (Southern Zone) and 15% (Northern Zone) of fishers reported dissatisfaction with their fishing-derived income.

When analysing results, we analysed whether fisher income and satisfaction with finances was significantly related to their satisfaction with fishing, using the Spearman's rho correlation test:

- Household income and satisfaction with fishing were not significantly related, suggesting that satisfaction with fishing is not strongly dependent upon the specific income being earned from fishing ($p=0.75$, $r_s=0.048$, $n=47$)
- Satisfaction with fishing was strongly correlated to satisfaction with fishing income ($p<0.000$, $r_s=0.47$, $n=72$) and fishers' satisfaction with their overall finances ($p=0.001$, $r_s=0.37$, $n=72$). While satisfaction with fishing income was significantly correlated with household income, it was not significant at the 0.01 level, suggesting a weaker relationship.

Overall, this means that a person who is satisfied with their fishing income tends to be more satisfied with their fishing – but that earning a higher income doesn't always translate into higher satisfaction

3.5 Fisher wellbeing

When considering the social dimensions of fishing, a critical question is how much fisher's overall wellbeing is affected by their participation in commercial fishing. In other words, if their fishing is going poorly, how strongly does this influence the overall wellbeing of the fisher (and vice versa – when fishing is good, does it lead to substantially improved wellbeing)?

The overall 'wellbeing' of fishers was measured by asking them how satisfied they are with their life overall, and with various areas of their life that are known to be strongly linked to overall wellbeing, specifically their present financial situation, health, income received from fishing, and work/life balance. Fishers were specifically asked to answer these questions (with the exception of the two that relate to their work in fishing) based on their life overall rather than just their fishing activities. A person's self-rated satisfaction with their life overall has been demonstrated in numerous studies, both in Australia and elsewhere, to be strongly correlated with various independent measures of their mental and physical health (Cummins 2000). It measures the outcomes of all the factors that influence the quality of life a person has, and is an important, and commonly used, measure of wellbeing.

Figure 11 shows how fishers self-assessed their satisfaction with their life overall during the month prior to the survey. The large majority – over 70% in all instances – reported being somewhat or very satisfied with their life overall. Abalone fishers and MSF fishers in the Southern Eyre Peninsula region were least likely to report satisfaction (70.6% and 75.0% respectively), and MSF fishers in the Far West region and across the whole fishery the most (95.0% and 85.6% respectively). These high levels of satisfaction are typical of the more general population: with Australians as a whole typically score between 74-76% out of a possible 100% on measures of overall life satisfaction (where 0% indicates very low satisfaction and 100% very high satisfaction), and measures that bring together multiple domains of life satisfaction (Cummins 2003). While the results suggest the possibility of higher than average life satisfaction for some fishers, the small samples involved mean it is not possible to conclusively demonstrate this based on the survey results.

Fishers' satisfaction with life in general was significantly correlated with:

- their satisfaction with their fishing activities, although at the 5% rather than 1% level ($p=0.014$, $r_s=0.29$, $n=72$).
- satisfaction with overall finances ($p<0.000$, $r_s=0.49$, $n=176$).
- satisfaction with income received from fishing ($p<0.000$, $r_s=0.28$, $n=176$).

Fisher's overall satisfaction with their life was not, meanwhile, significantly correlated with the level of household income they reported ($p=0.779$, $r_s=0.02$, $n=142$). This suggests that their work in commercial fishing has a strong impact on a fisher's overall wellbeing.

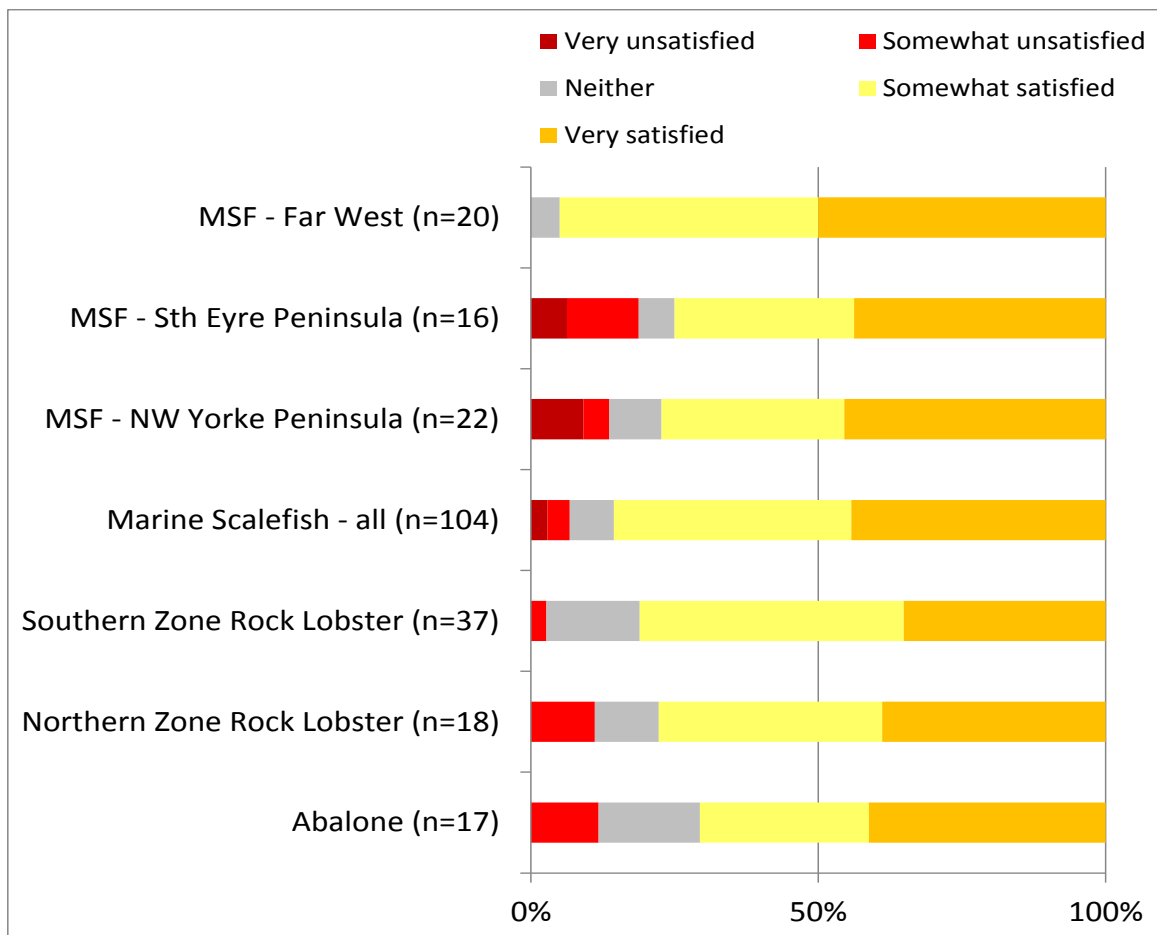


Figure 11 Fisher's level of self-assessed satisfaction with their life in general in the month prior to completing the survey

Fishers were asked how satisfied they were with various 'domains' of wellbeing: specifically, their overall finances, their health, their fishing income and their work-life balance (Figure 12). Responses varied by both domain and fishery:

- Abalone fishers were less satisfied with their overall finances and fishing income, and to a lesser extent their work-life balance, than other fishers (excepting MSF fishers based in MW Yorke Peninsula), although they were very satisfied with their health.
- Northern Zone rock lobster fishers were most satisfied with their health and work-life balance, followed by Southern Zone rock lobster fishers. However, Southern Zone rock lobster fishers were more satisfied with their fishing income and overall finances than Northern Zone fishers.
- MSF fishers were least satisfied with their fishing income compared to all other fishers, but often still reasonably satisfied with their overall finances and health, with the exception of fishers in the NW Yorke Peninsula region who rates their finances, health and fishing income less satisfactory than all other fishers.

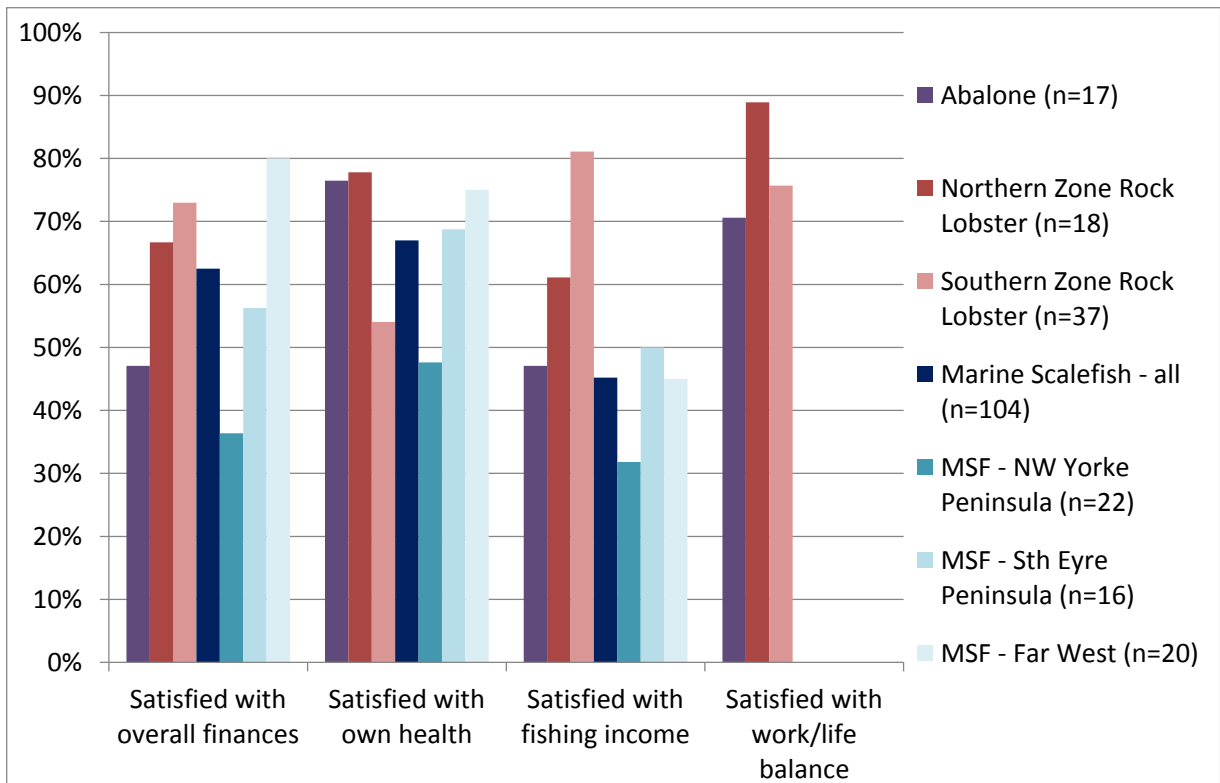


Figure 12 Proportion of fishers indicating they were somewhat or very satisfied with different domains of wellbeing³

3.6 Stewardship and fishing

Stewardship is the sense of responsibility fishers feel to take care of marine resources. It is an important social dimension of fishing: fishers with strong stewardship are highly motivated to care for the resources they depend on for a livelihood, and through this contribute to sustainability of fisheries management. Stewardship is also likely to contribute to the wellbeing of fishers: studies of farmers and other managers of natural resources suggest that if they feel they are able to care appropriately for the natural resources their livelihood depends on, and that others recognise their role in doing this, they are likely to feel more satisfied with their life (see for example Schirmer et al. forthcoming).

We examined several dimensions of stewardship, particularly (i) whether fishers feel they have access to the information and training needed to be effective stewards of fisheries resources; (ii) if they feel they and others comply with fishing rules and regulations and participate in reporting those who do not, factors indicative of strong reinforcing stewardship behaviour; and (iii) how they believe the general community perceives fishers.

³ Note that MSF fishers were not asked how satisfied they were with their work-life balance.

3.7 Information and training

To understand whether fishers feel confident they have the information and skills they need to be effective stewards of fisheries resources, rock lobster and abalone fishers were asked the extent to which they agreed or disagreed with the following statements:

- I can easily access information about commercial fishing management in SA (Figure 13)
- The commercial fishing information PIRSA produces is easy to understand (Figure 14)
- Fishers are provided with adequate training and advice about good fishing practices (eg bycatch reduction) (Figure 15).

These questions were developed after testing an earlier question in the MSF survey, 'PIRSA provides fishers with adequate training and advice about good fishing practices' (Figure 16). The results indicated that fishers felt PIRSA was not the organisation that should be responsible for training and advice, and the question was rephrased to be more generic. In addition, PIRSA's role was identified as important in terms of needing to provide accessible and easily understood information about fishing management.

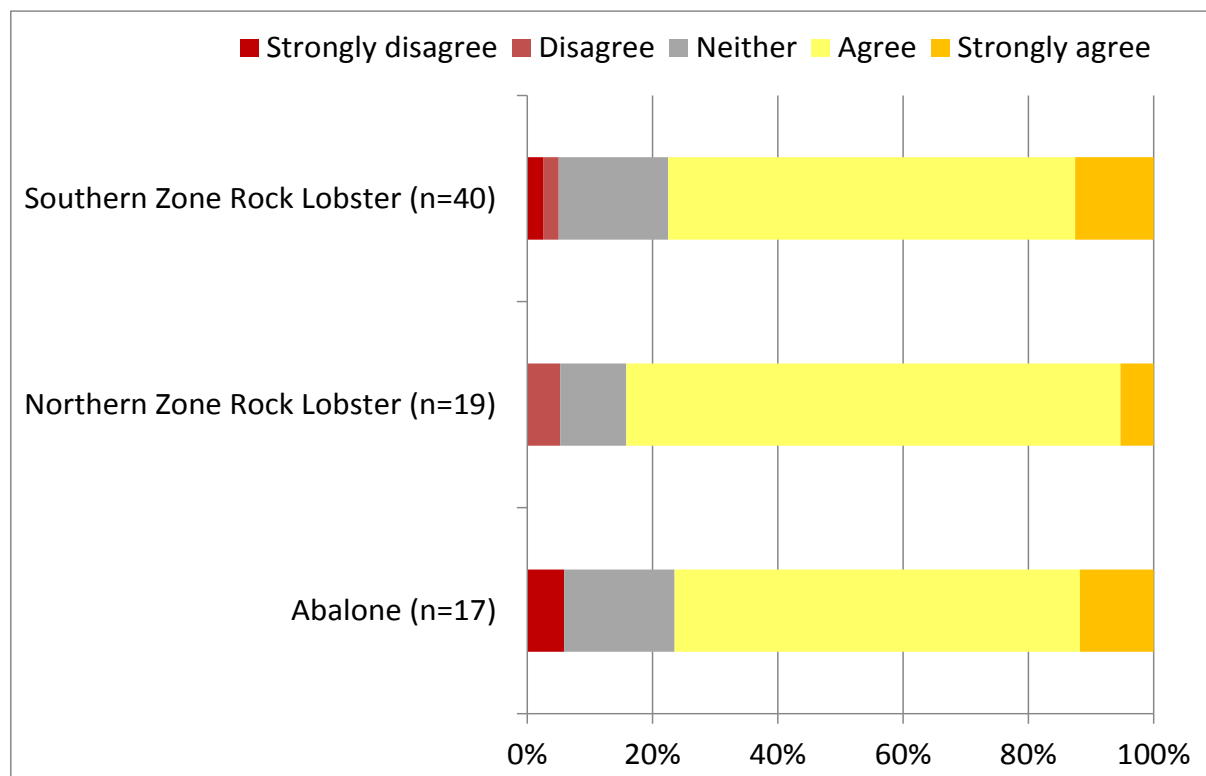


Figure 13 Fishers' level of agreement with the statement 'I can easily access information about commercial fishing management in SA'

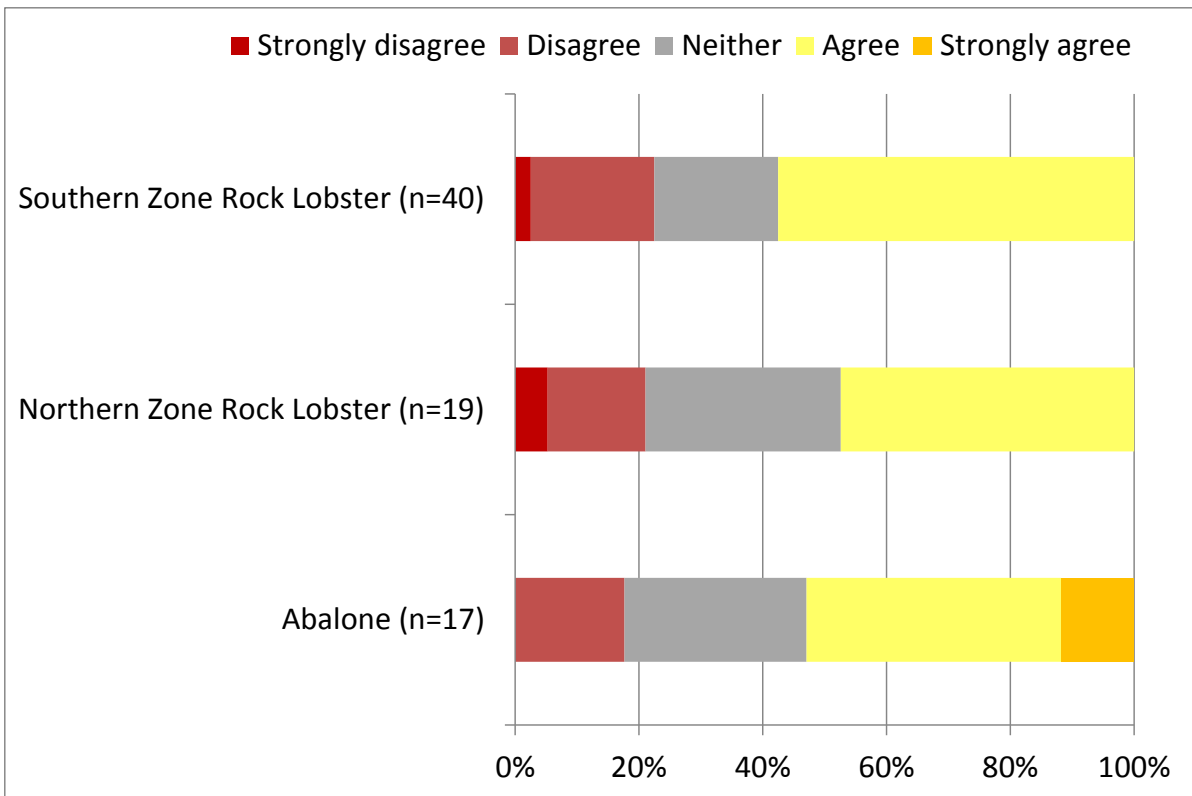


Figure 14 Fishers' level of agreement with the statement 'The commercial fishing information PIRSA produces is easy to understand'

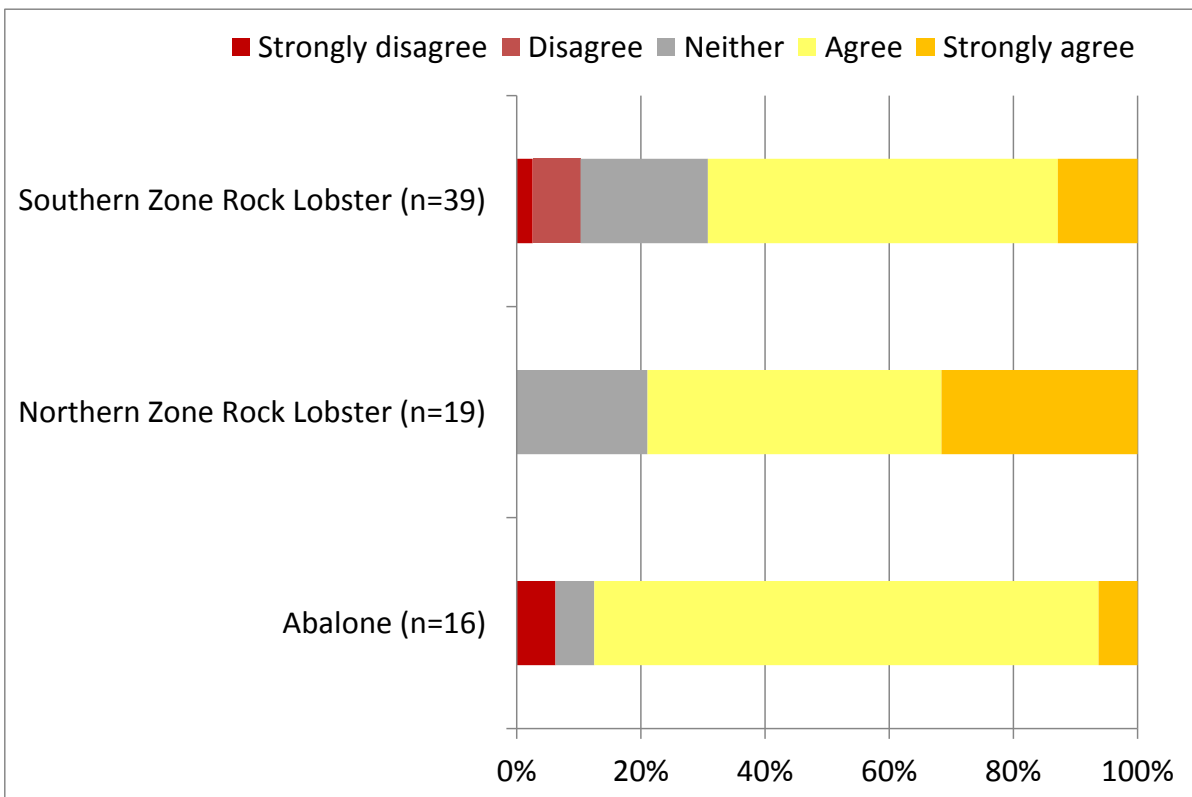


Figure 15 Fishers' level of agreement with the statement 'Fishers are provided with adequate training and advice about good fishing practices'

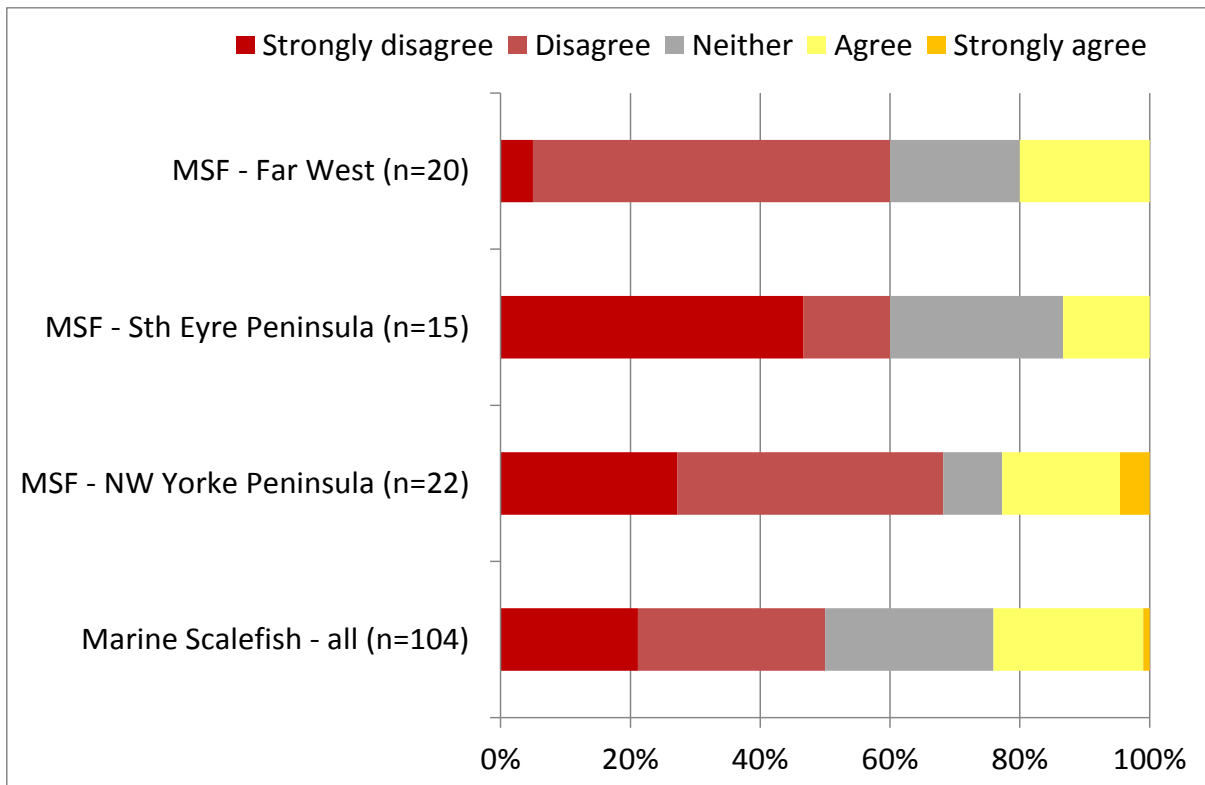


Figure 16 MSF fishers' level of agreement with the statement 'PIRSA provides marine scalefish fishers adequate training and advice about good fishing practices'

The large majority of abalone and rock lobster fishers – almost 85% - were able to readily access information on fishing (Figure 13), with little variation across the two fisheries. However, somewhat fewer found this information easy to understand, with between 50% and 60% reporting the information they access on fishing was easy to understand, and around 20% that it was difficult to understand (Figure 14).

The majority of abalone and rock lobster fishers believed that in general, fishers have access to adequate training and advice (Figure 15), with between 70% and 85% agreeing with this statement. In the MSF fishery the slightly different statement asking if PIRSA provided adequate training and advice had a much more negative response, with half of the MSF fishers indicating they did not feel PIRSA provided adequate training (Figure 16).

It was not possible to tell if the difference in the results for Figure 15 and Figure 16 are a result of the different wording of the statement – in the former, training and advice were asked about in general, while the latter asked specifically about training and advice provided by PIRSA – or of a difference in views across the different fisheries.

Fishers were also asked how they had learned their fishing skills, as the process of learning skills is a key mechanism by which fishers learn the principles of being good stewards of fisheries resources (Figure 17).

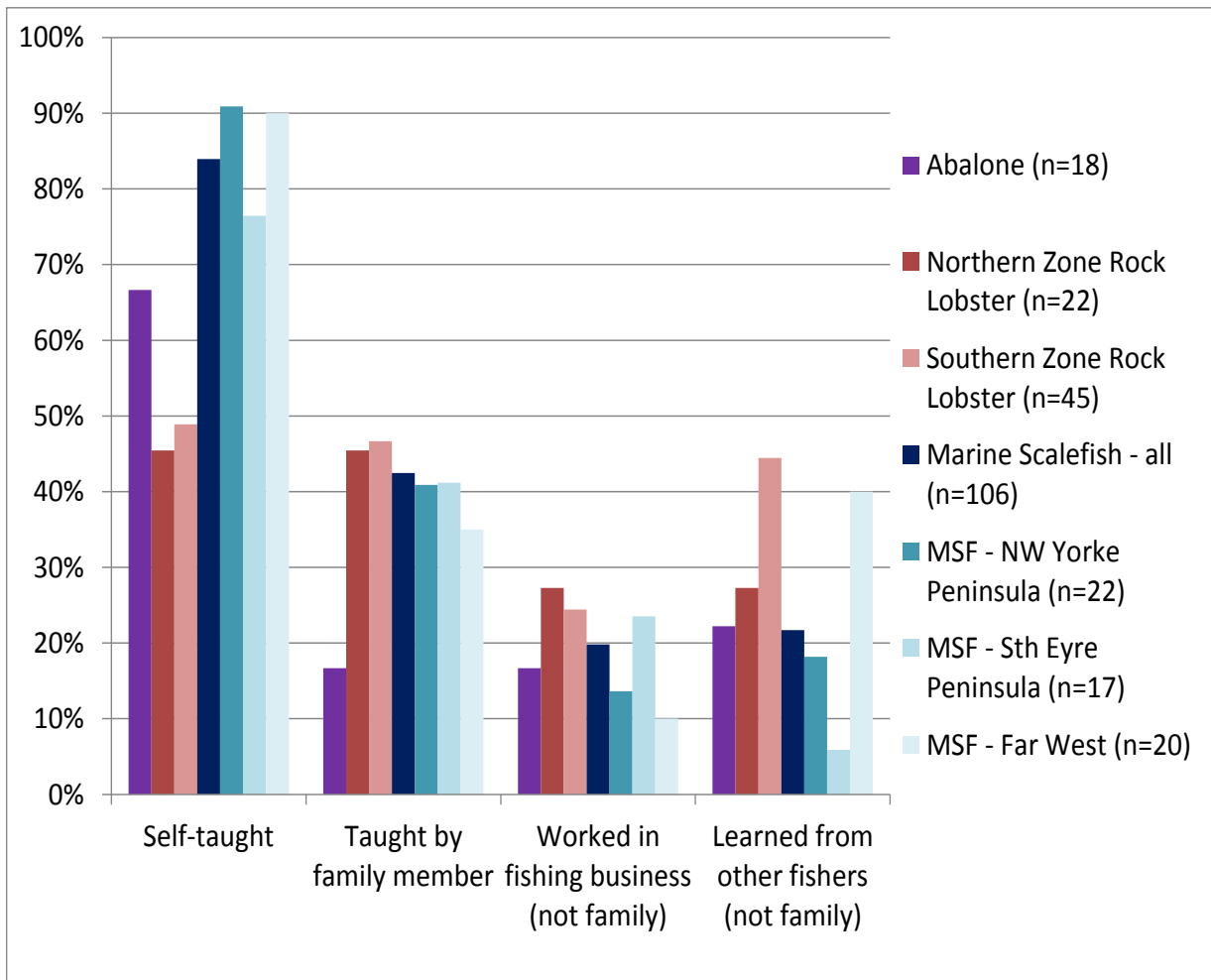


Figure 17 Methods by which fishers have learned their commercial fishing skills

The large majority of fishers reported being self-taught, and this was by far the most common method of attaining fishing skills in the MSF and abalone fisheries. In the rock lobster fisheries, a somewhat lower proportion reported being self-taught, and it was almost as common for a fisher to learn from family members and from other fishers who weren't in their family, perhaps partly reflecting the stronger generational attachment to fishing in this fishery.

3.8 Compliance with fishing rules and regulations

To understand whether fishers feel a strong sense of stewardship, and whether they felt fishers in other sectors are responsible, we asked the extent to which they agreed or disagreed with a number of statements related to caring for marine resources and complying with rules and regulations. These questions were only asked in the rock lobster and abalone surveys, as they were developed after review of the results of the MSF survey; only a limited number were asked in the abalone survey, in order to reduce the length of the survey:

- Most commercial fishers fish responsibly (not asked in abalone survey)
- I have a good understanding of fishing rules and regulations that apply to my fishing activities
- It is easy to comply with fishing rules and regulations
- If I see a fisher doing the wrong thing, I know who to report it to
- If I see other people doing the wrong thing while fishing, I report it to authorities (not asked in abalone survey)
- Most commercial fishers comply with fishing rules and regulations
- Most recreational fishers comply with fishing rules and regulations
- Most recreational fishers fish responsibly (not asked in abalone survey)

Figure 18 identifies the proportion of fishers who agreed or strongly agreed with each statement. The large majority of fishers (between 90% and 100%) agreed with statements about the importance of fishing responsibly, and indicated they had a good understanding of fishing rules and regulations and were willing to report fishers who do the wrong thing to authorities. This indicates a strong belief in the importance of stewardship.

Fewer fishers believed it is easy to comply with fishing rules and regulations (although still a majority in all fisheries). Commercial fishers have a more negative view of recreational fishers, with around 40% of rock lobster fishers and 60% of abalone fishers believing that recreational fishers fish responsibly.

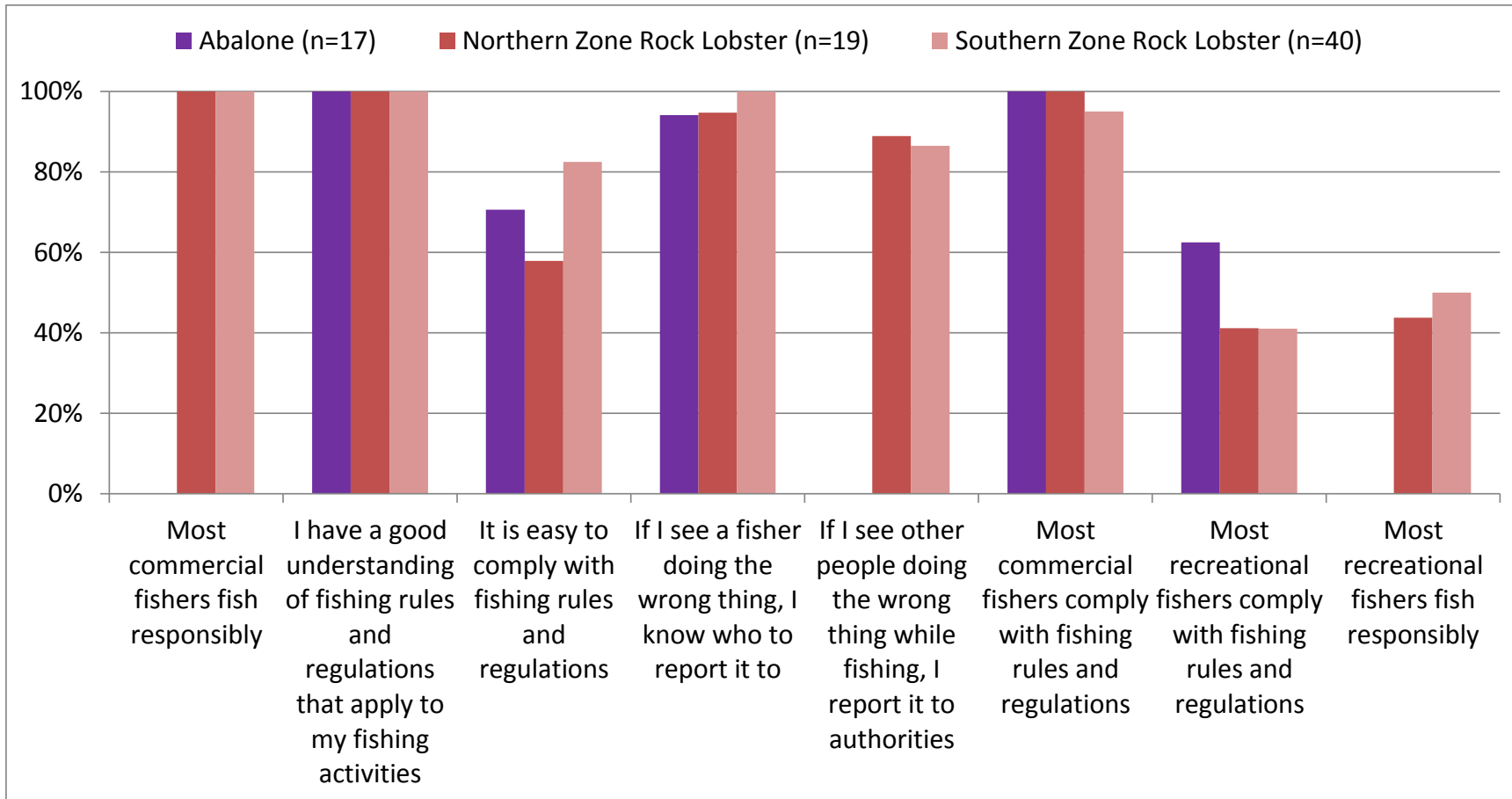


Figure 18 Proportion of fishers who agreed/strongly agreed with statements about stewardship of fisheries resources

3.9 Perceived views of the general community

Fishers were asked how they believe most people in the general community perceive commercial fishers (Figure 19). Rock lobster fishers were also asked how they feel recreational fishers are perceived by the broader community. This question was asked as, if fishers feel that they are perceived negatively by the broader community, this may impact negatively on their overall wellbeing.

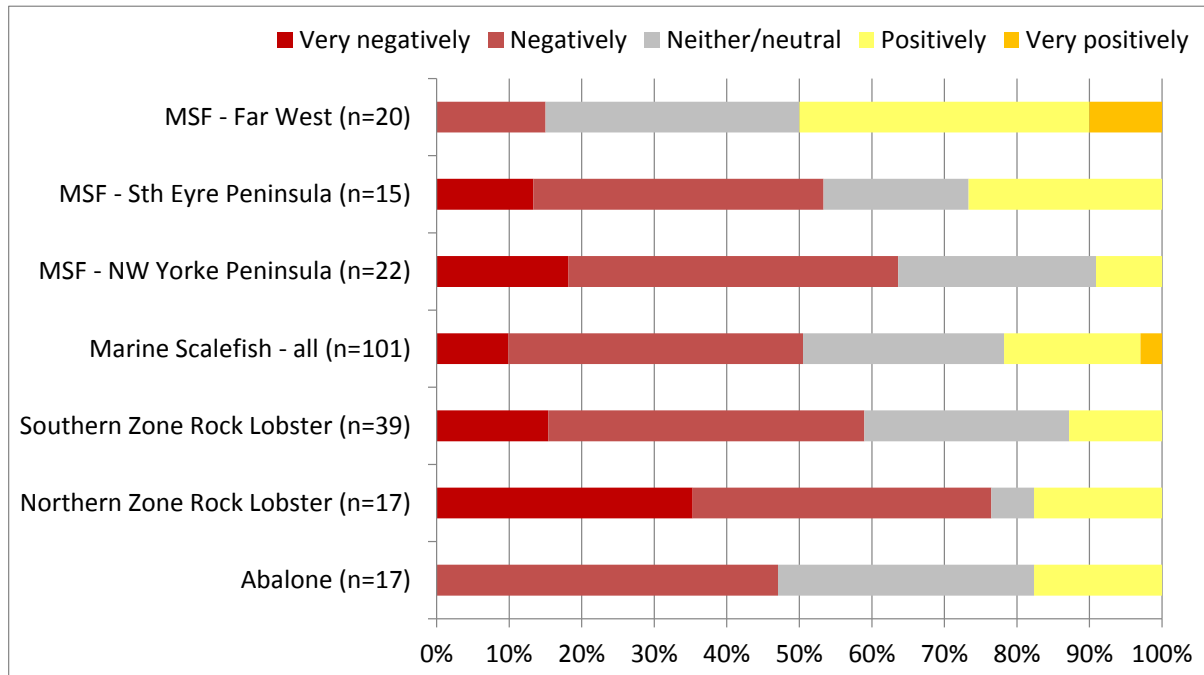


Figure 19 Fishers' responses to the question 'how do you believe most people in the general community perceive commercial fishers?'

Figure 19 shows how commercial fishers believe they are perceived by the broader community. Rock lobster fishers – particularly in the Northern Zone – and MSF fishers in the NW Yorke Peninsula were most likely to report that they were perceived negatively by the broader community. MSF fishers in the Far West, and abalone fishers, were much less likely to believe they were perceived negatively by the broader community.

Figure 20 shows how commercial fishers believe recreational fishers are perceived by the broader community. This question was not asked of MSF fishers. Overall, commercial fishers appear to believe that the general community has a more positive view of recreational fishers than commercial fishers.

The correlation between a fisher's overall wellbeing, and their beliefs about how they are perceived by the broader community, was identified using Spearman's rho. The two were significantly related at the 5% level ($p=0.031$, $r_s=0.166$, $n=170$), with fishers who felt they were perceived more positively more likely to report a high level of satisfaction with their life in general.

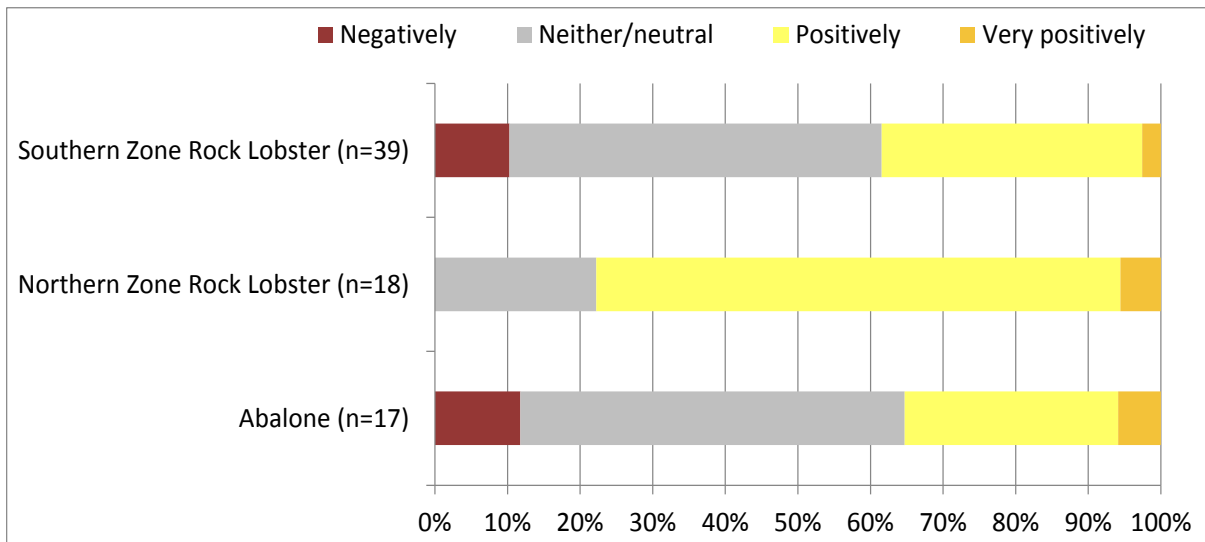


Figure 20 Fishers' responses to the question 'how do you believe most people in the general community perceive recreational fishers?'

3.10 Fisheries management and decision making

Fishers were asked how fair and equitable they feel fisheries decision making processes are, as well as a number of questions about the management of the fishery and how it affects them.

3.11 PIRSA's management of the fishery

Fishers were asked the extent to which they agreed or disagreed with the following statements (as not all questions were asked in each survey, the brackets after each statement indicate in which fishery surveys the question was asked):

- PIRSA do a good job of managing commercial fishing in SA (RLF, AB) (Figure 21)
- I trust PIRSA to make the right decisions for managing commercial fishing in SA (RLF, AB) (Figure 22)
- I understand how decisions about fisheries management are made (MSF⁴, RLF, AB) (Figure 23)
- I am satisfied with the level of consultation PIRSA undertakes with fishers on management decisions about the [name of fishery] (MSF, RLF, AB) (Figure 24)
- Commercial fishing management plans are flexible enough to allow fishers to adapt to changing conditions (MSF, RLF, AB) (Figure 25)
- Fishers' concerns and preferences regarding management options are fully taken into consideration in the management decision making (MSF only; not repeated as the phrasing was poor and the question difficult to answer as a result. Instead, questions on fairness of treatment, discussed in the following section, were asked in more depth in subsequent surveys) (Figure 26).

⁴ This question was asked using different phrasing in the MSF survey: 'Current decision making is transparent (ie the reasons behind the decisions are clear to industry)'. Feedback indicated that fishers were unsure what was meant by the term 'transparent', and as a result the phrasing is changed for subsequent surveys. It is possible some of the differences observed between the MSF and other fisheries is a result of the different phrasing of the question, rather than of actual differences in views of fishers.

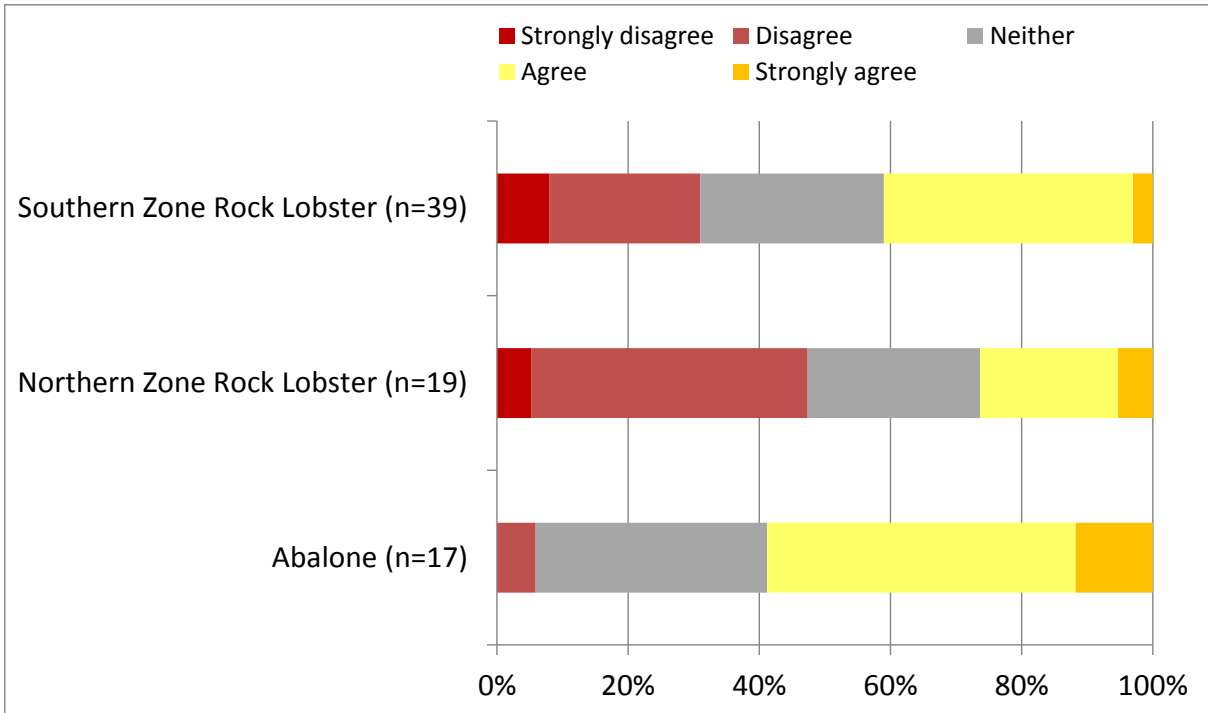


Figure 21 Fisher's level of agreement with the statement 'PIRSA do a good job of managing commercial fishing in SA'

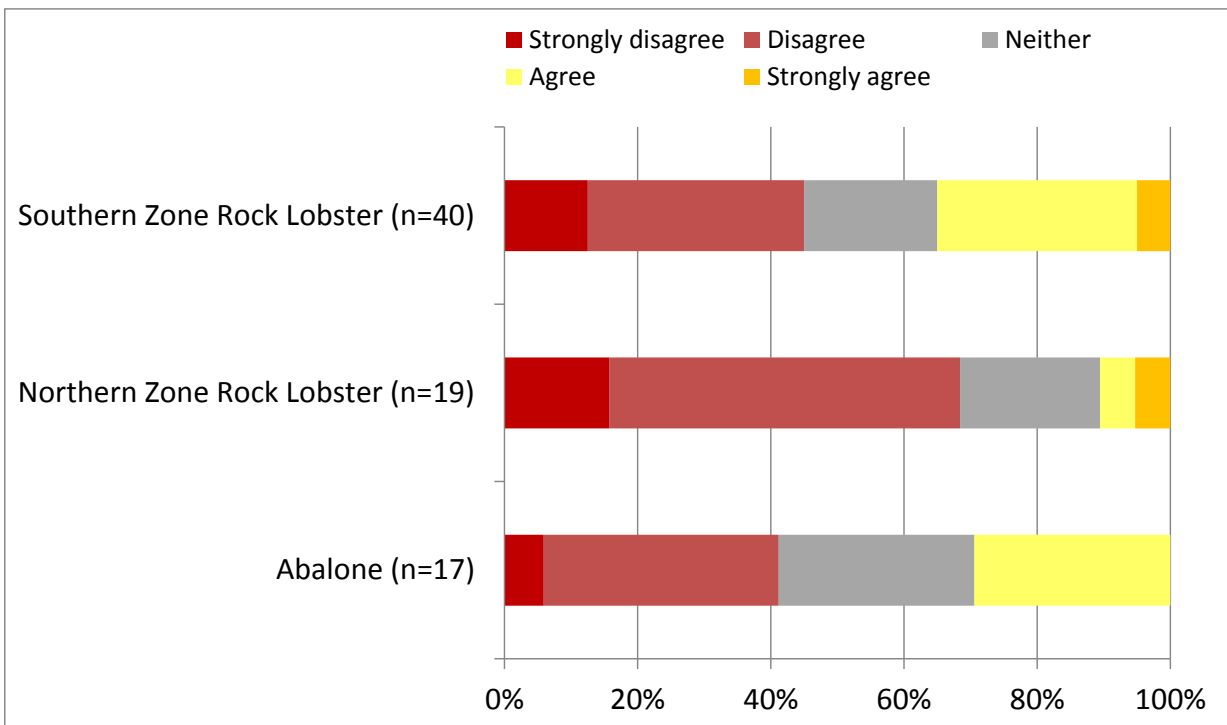


Figure 22 Fisher's level of agreement with the statement 'I trust PIRSA to make the right decisions for managing commercial fishing in SA'

When Figure 21 and 22 are compared, a difference can be seen in the proportion of fishers who felt PIRSA was doing a good job, versus those who trusted PIRSA to make the right decisions for managing commercial fishing. In general, fishers were more likely to believe PIRSA was doing a good job than to trust PIRSA to make the right decisions. Abalone fishers were more positive than others, with almost 60% believing PIRSA are doing a good job, and less than 10% feeling they weren't; and only 40% distrusting PIRSA compared to almost 70% of Northern Zone rock lobster fishers. Northern Zone rock lobster fishers were least likely to feel PIRSA was doing a good job or to trust PIRSA.

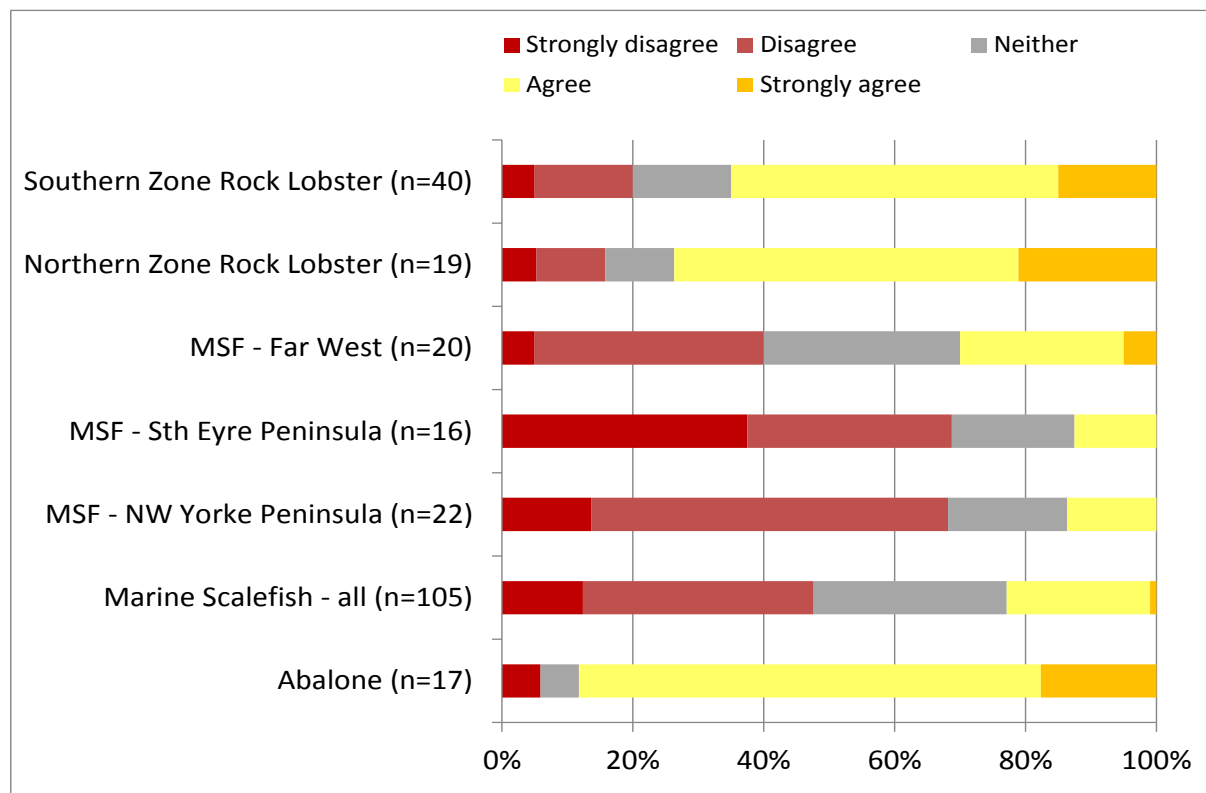


Figure 23 Fisher's level of agreement with the statement 'I understand how decisions about fisheries management are made' (RLF and Abalone) and 'Fisheries decision making is transparent' (MSF)

MSF fishers were far less likely than others to report that they understood fisheries management decisions; this may be a result of the different phrasing of the question when asked in the MSF survey compared to the other two surveys (Figure 23). Between 25% and 65% of fishers were satisfied with the level of consultation undertaken by PIRSA (Figure 24). Abalone and Southern Zone rock lobster fishers were more likely to feel satisfied with the level of consultation, and Northern Zone rock lobster fishers and MSF fishers located in the Southern Eyre Peninsula and Far West the least likely to report being satisfied with consultation.

Views about whether commercial fishing management plans are flexible enough to enable fishers to adapt to changing conditions varied by fishery and region (Figure 25). Abalone fishers were most likely to believe plans are adequately flexible, and Northern Zone rock lobster fishers and MSF fishers located in the Southern Eyre Peninsula the least likely to hold this view.

In the MSF fishery, just over 60% of fishers didn't feel fishers' concerns and preferences were fully taken into consideration in fisheries decision making, and this proportion was higher for MSF fishers based in the three case study regions.

This negative response may partly result from the phrasing of the question, which only allowed a positive response if fishers preference were 'fully' taken into consideration and may have encouraged a negative response as a result (for this reason, this question was changed in the subsequent two surveys).

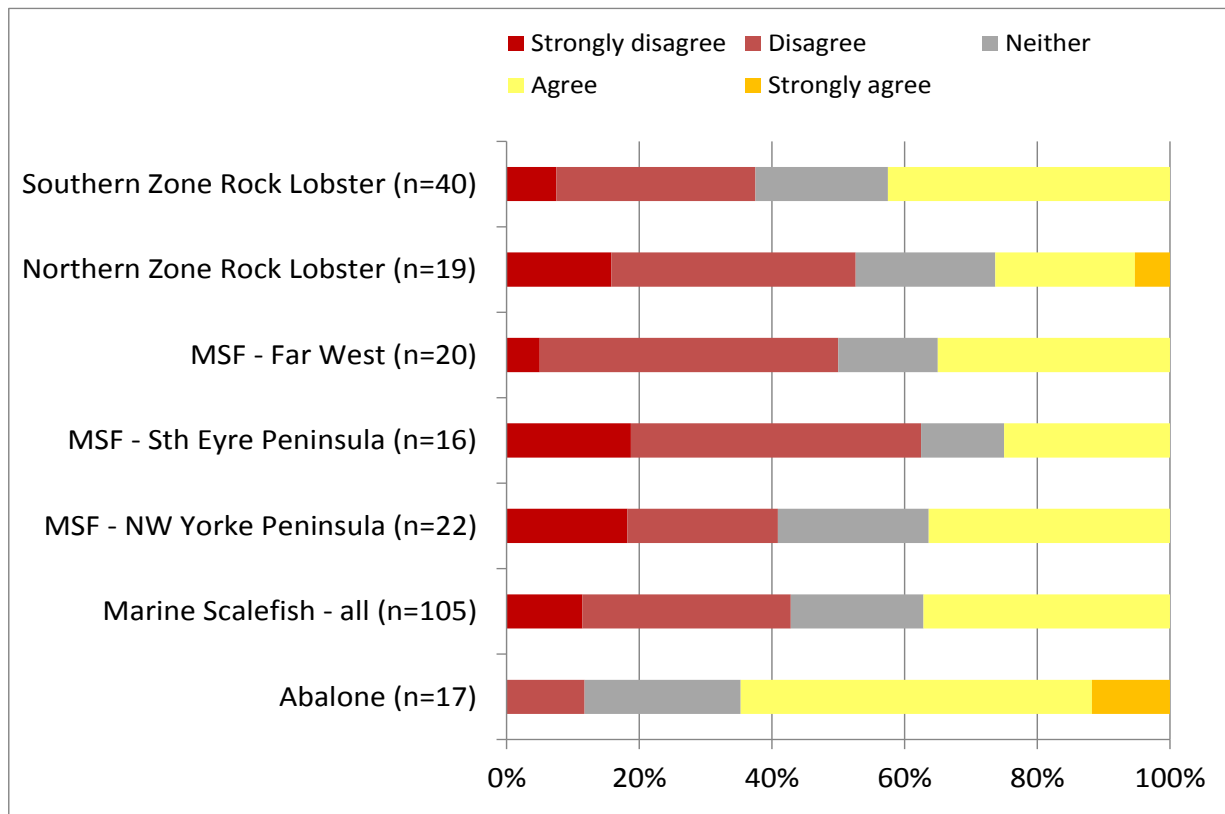


Figure 24 Fisher's level of agreement with the statement 'I am satisfied with the level of consultation PIRSA undertakes with fishers on management decisions about the [name of fishery]'

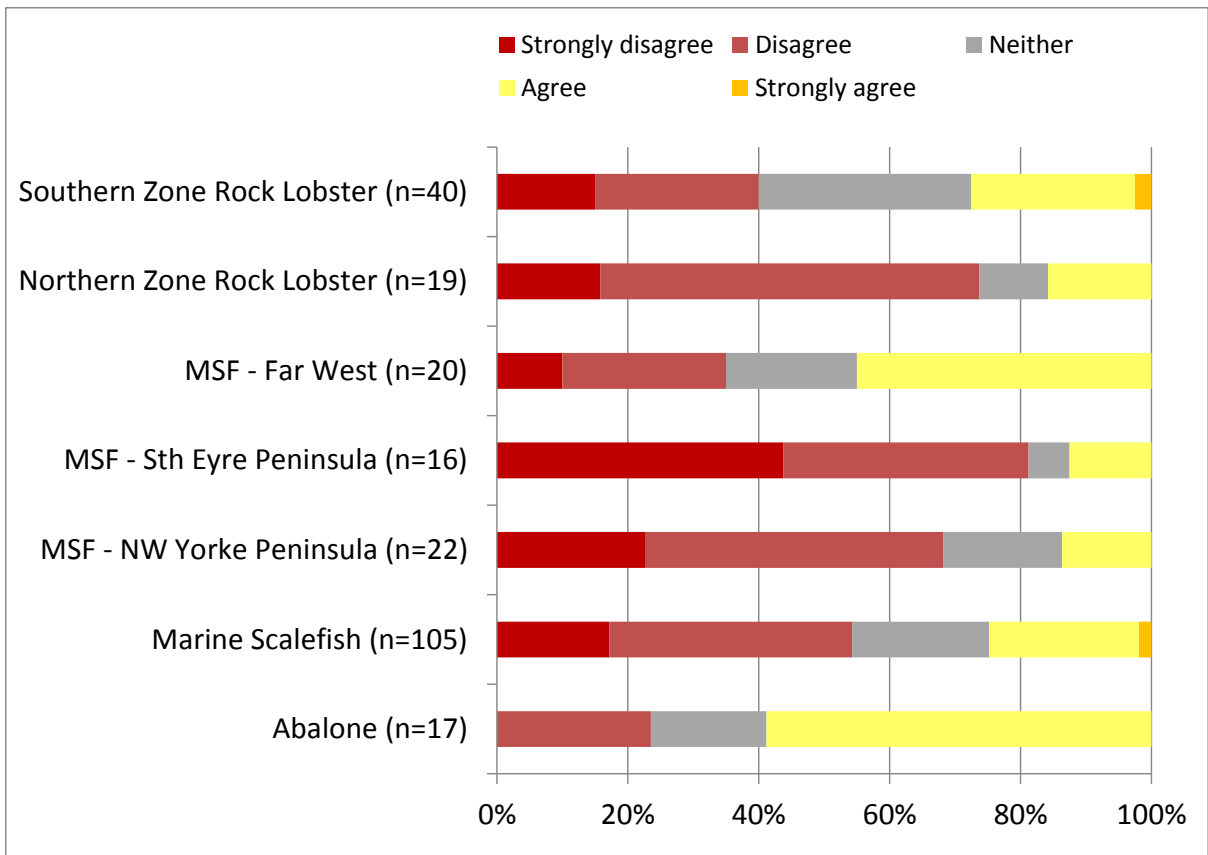


Figure 25 Fisher's level of agreement with the statement 'Commercial fishing management plans are flexible enough to allow fishers to adapt to changing conditions'

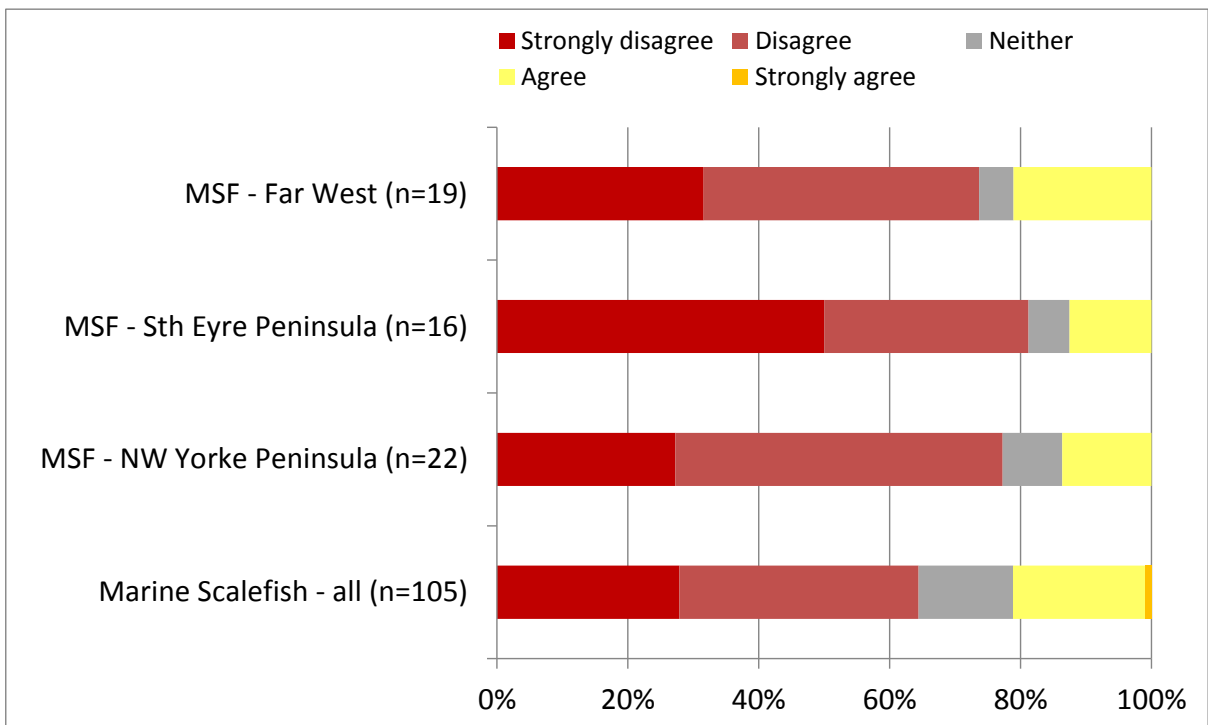


Figure 26 MSF fisher's level of agreement with the statement 'Fishers' concerns and preferences regarding management options are fully taken into consideration in the management decision making'

3.12 Fairness of treatment

In the MSF survey, fishers were asked to answer 'yes' or 'no' to the statement 'do you believe the commercial sector is treated equitably and fairly by fisheries managers compared to other users of fisheries resources'. In total, 69.4% answered 'no' and 30.6% 'yes' (n=98). Fishers were then asked to explain why or why not. In analysis of the answers, issues of fairness were largely related to four categories: gear restrictions, access to fishing areas, allocation of catch, and decision making processes.

When reviewing this question in September 2011, fisheries stakeholders pointed out that it was likely fishers evaluated the fairness of different aspects of fisheries management in different ways. For example, they may evaluate only one of the domains of gear restrictions, access to fishing areas, allocation of catch, or the processes used to make decisions about fisheries management, as unfair, and others as fair. It was also considered likely that fishers have differing levels of judgment about 'fairness' and that asking for a simple 'yes' or 'no' missed this nuance.

Fishers in the RLF and Abalone fisheries were therefore asked the questions 'how fairly do you feel commercial fishers are treated by fisheries managers compared to other users of fisheries resources' in terms of (i) gear restrictions, (ii) access to fishing areas, (iii) allocation of catch and (iv) the processes used to make decisions about fisheries management. They were able to answer that each was either very unfair, unfair, neither fair nor unfair, fair, or very fair.

Perceptions of fairness of treatment did vary substantially depending on the 'dain' being asked about (gear restrictions, access to areas, allocation of catch, and decision making processes). Abalone and Southern Zone rock lobster fishers predominantly felt they were fairly treated with regard to gear restrictions, with 10% of Southern Zone and no abalone fishers reporting they felt unfairly treated, while almost 50% of Northern Zone rock lobster fishers felt unfairly treated (Figure 27). While 20% or fewer fishers felt that they had unfairly low access to fishing areas compared to other fishers (Figure 28), less than 50% of Northern Zone rock lobster fishers felt their access was fair, compared to 70% or more of fishers in the other two fisheries, being more likely to be 'neutral' in their evaluation of access to fishing areas than other fishers.

Allocation of catch was viewed as either fair, or neither fair or unfair, by all abalone fishers, while rock lobster fishers were more likely to view it as unfair, with around 25% reporting catch allocation as unfair and a similar proportion reporting it as 'neither fair or unfair' (Figure 29). Fisheries decision making processes were more likely to be viewed as unfair, with less than 50% of fishers in any of the three fisheries reporting these processes were fair (Figure 30). The Northern Zone rock lobster fishers were most likely to report feeling decision making processes were unfair, with just over 50% reporting them as unfair, compared to just under 20% of abalone fishers and just under 30% of Southern Zone rock lobster fishers.

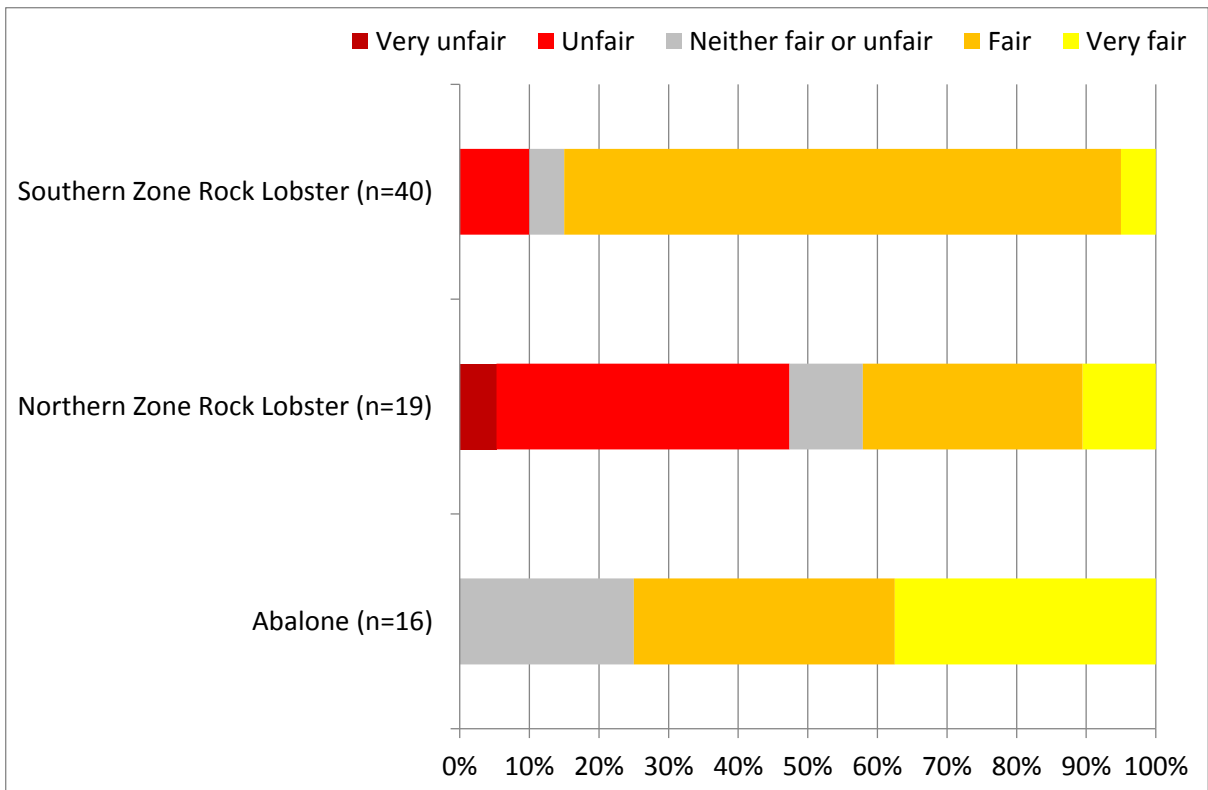


Figure 27 Perceived fairness of gear restrictions faced by commercial fishers compared to other users of fisheries resources

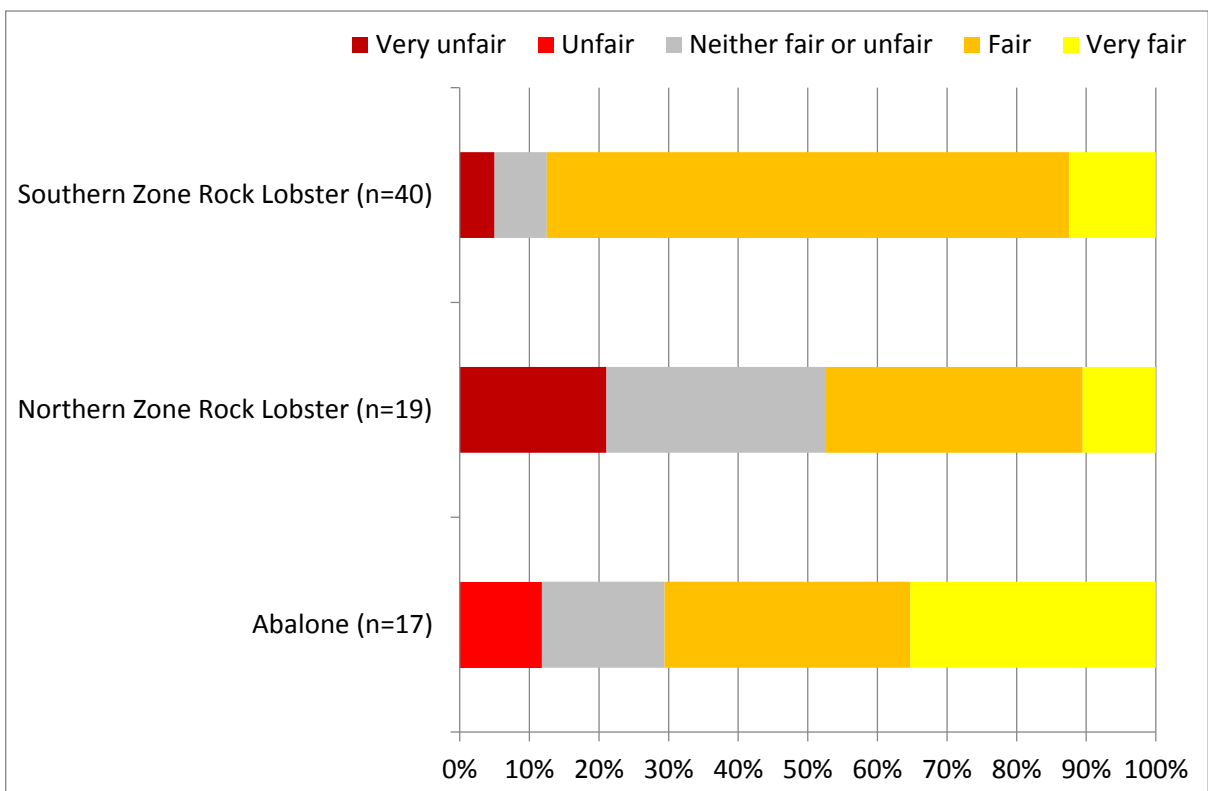


Figure 28 Perceived fairness of access to fishing areas of commercial fishers compared to other users of fisheries resources

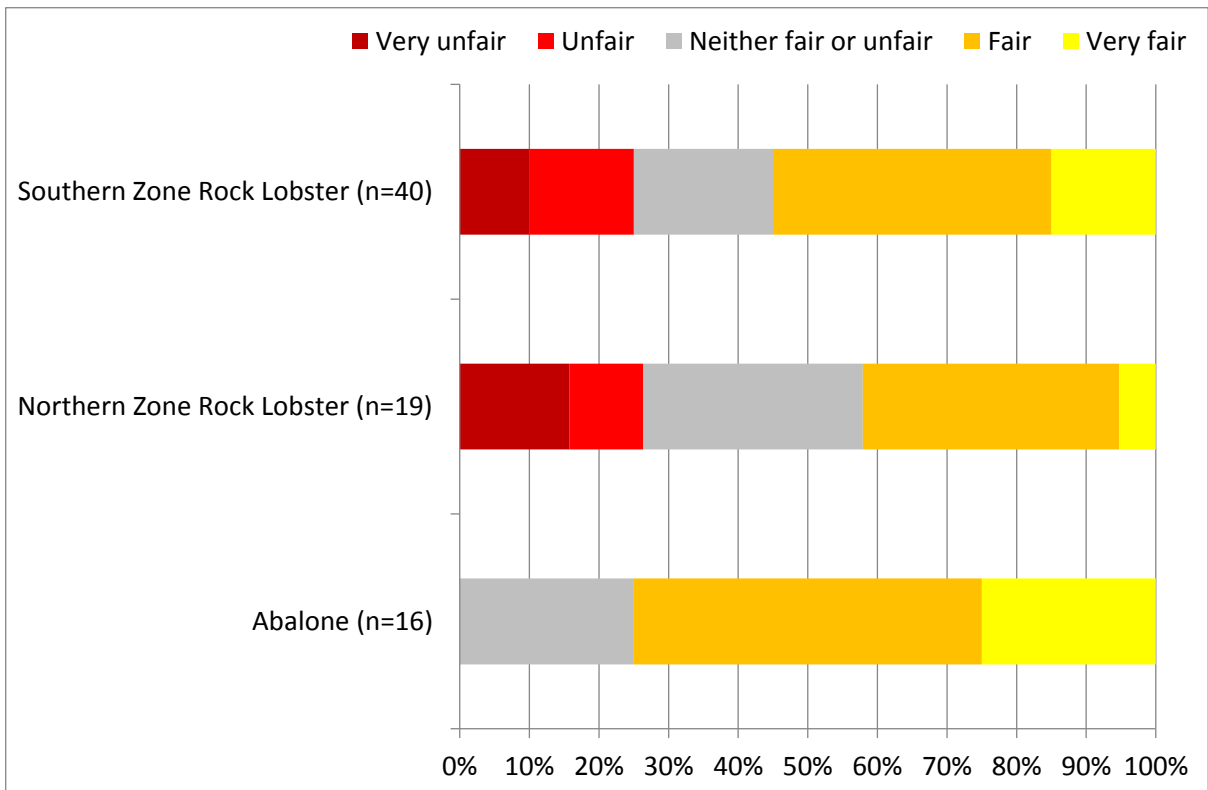


Figure 29 Perceived fairness of allocation of catch to commercial fishers compared to other users of fisheries resources

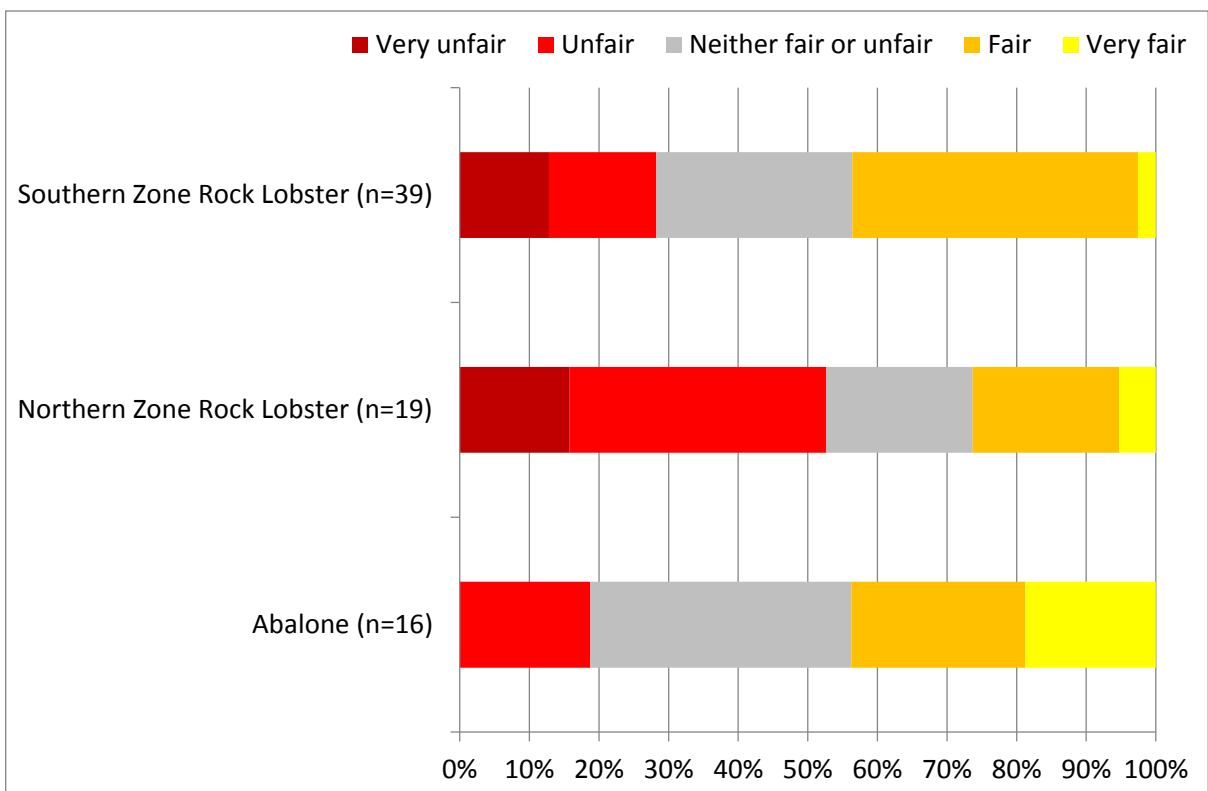


Figure 30 Perceived fairness of the processes used to make decisions about fisheries management

3.13 Involvement in fisheries management and decision making processes

Fishers were asked a number of questions about their level of involvement in fisheries management and decision making processes. These included asking them whether they were satisfied with consultation undertaken by PIRSA (as previously reported), as well as the extent to which they agreed or disagreed with the following statements:

- I actively participate in providing comments and/or feedback to managers about draft management plans (either through my representative or directly) (asked in MSF survey only) (Figure 31)
- If I want to have a say in commercial fishing management, I know how to (RLF, AB) (Figure 32)

The first statement was revised after the MSF survey, as the results from the MSF survey suggested that it was more important to understand if fishers knew how to make comment rather than whether they chose to take action. It is critical that fishers know how to have their voice heard if they wish to; however, they may in many situations choose not to engage (for example, if a fisher is happy with fishing management they may not feel the need to engage with fisheries managers). Around 60% of MSF fishers reported being actively involved in providing comments or feedback. Between 80 and 95% of rock lobster and abalone fishers reported that they knew how to have a say on commercial fishing management if they wanted to.

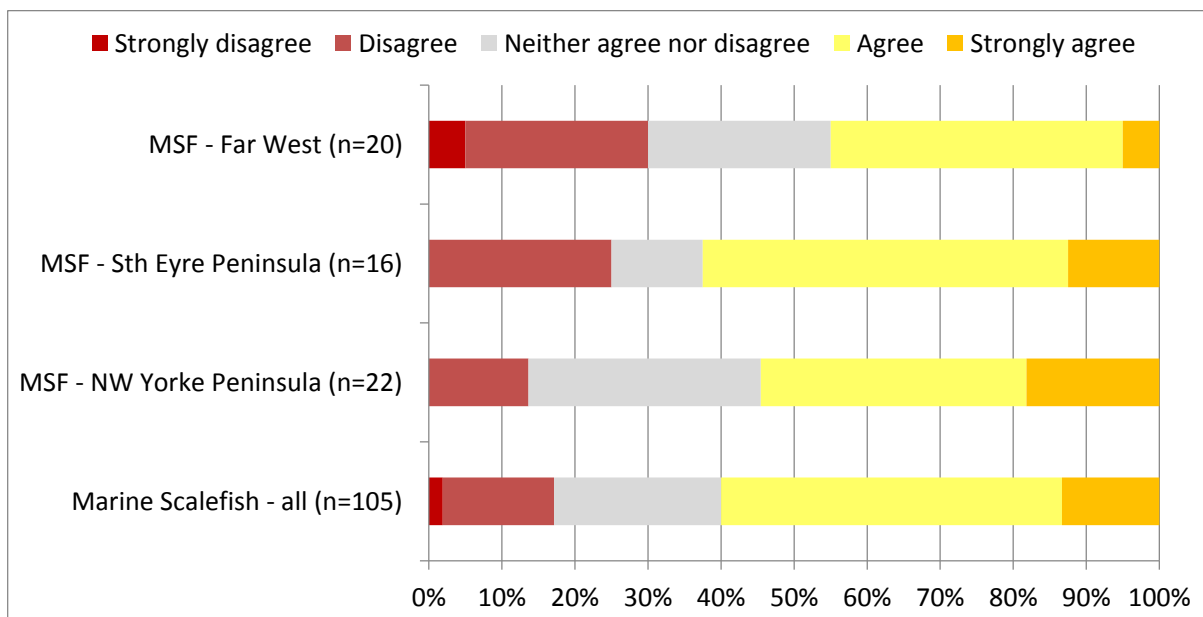


Figure 31 MSF fishers' level of agreement with the statement 'I actively participate in providing comments and/or feedback to managers about draft management plans'

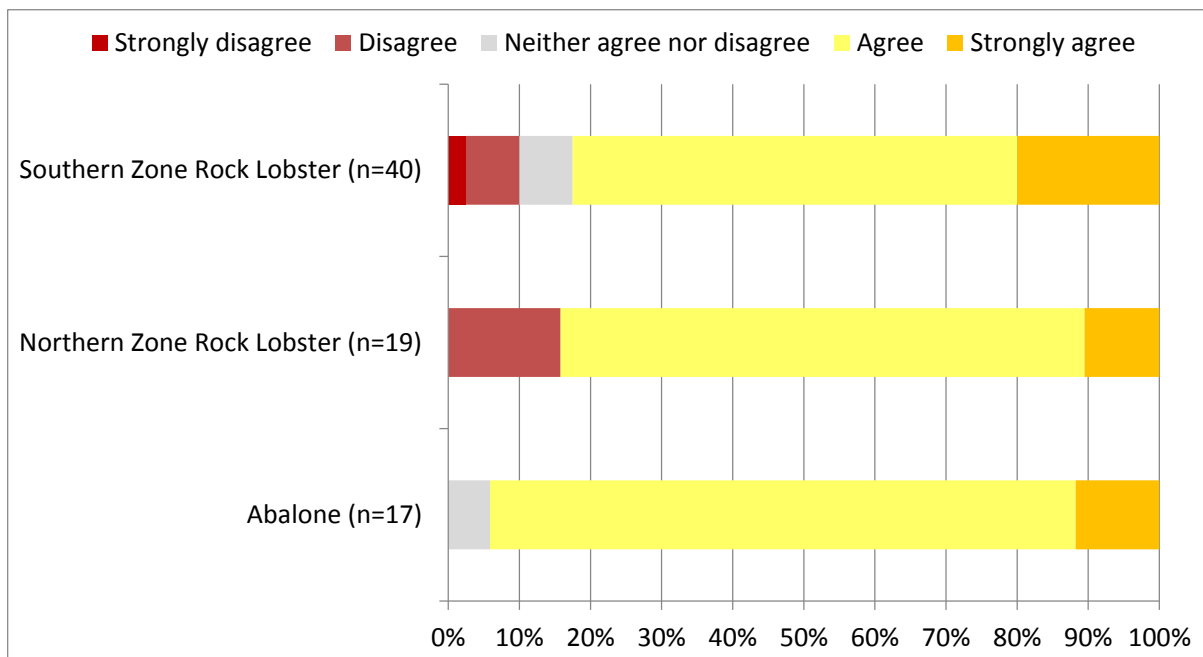


Figure 32 RLF and abalone fishers' level of agreement with the statement 'If I want to have a say in commercial fishing management, I know how to'

Fishers were also asked the following questions to find out more about the extent to which they feel able to have their voice heard in fisheries management, and how they prefer to be involvement in fisheries management:

- Are you a member of any fishing association/industry organisation? (Figure 33)
- Do you know how to contact the people who represent your interests on fisheries management/advisory committees? (Figure 33)
- Time spent attending meetings, seminars, workshops that are fishing industry related (Figure 34)

The large majority of rock lobster and abalone fishers reported both being a member of a fishing association and knowing how to contact the people who represented their interests. MSF fishers were less likely to report knowing who the members of the Marine Fishers Association were (Figure 33).

Northern Zone rock lobster fishers reporting spending the highest number of hours per month in fishing-related meetings (Figure 34), followed by abalone fishers, with MSF fishers reporting the lowest average number of hours. This likely reflects the lower number of rock lobster and abalone fishers: in small fisheries, a larger proportion of fishers are likely to be spending time in meetings.

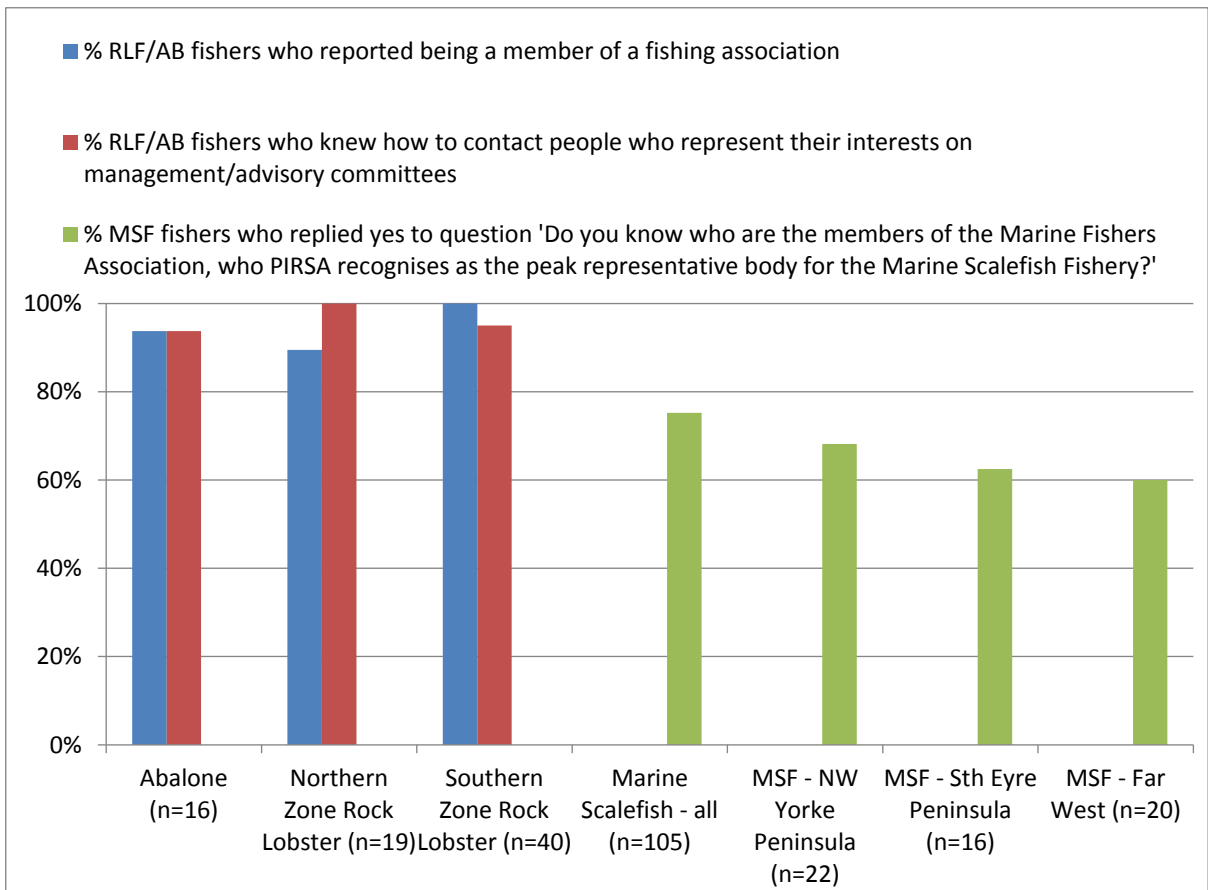


Figure 33 Membership of fishing associations and awareness of how to contact representatives

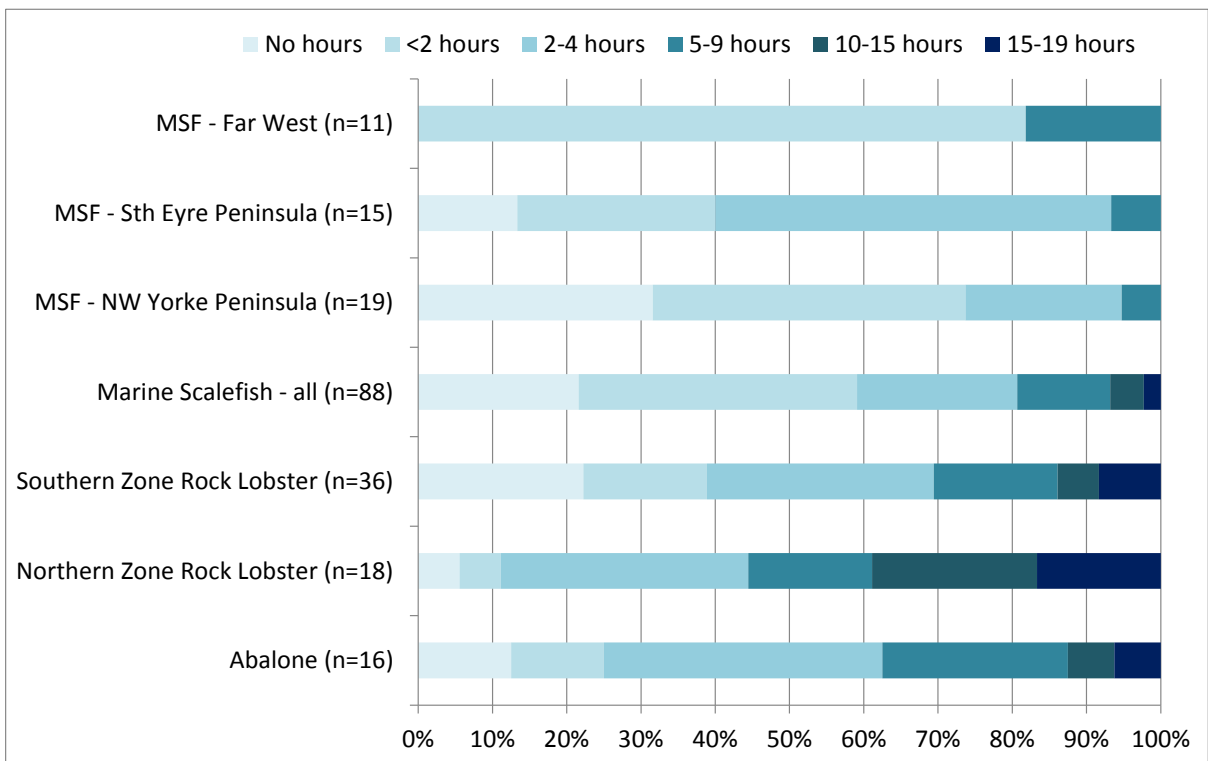


Figure 34 Average hours spent per month attending fishing-related meetings, seminars and workshops

Finally, fishers were asked how interested they were in participating in fisheries management through receiving information from PIRSA, providing views in written submissions, attending different types of meetings, participating in management committees, and using online and social media (RLF and Abalone only) (Figure 35). The most preferred method of participation was through direct communication in private meetings, followed by receiving information by post or email. Public meetings were preferred by a high proportion of rock lobster fishers, but less popular with abalone fishers. While social media were the least preferred method overall, 35% of abalone fishers indicated it would be a method they would use to communicate with PIRSA.

3.14 Fishing infrastructure

Fishers were asked how satisfied they were with their access to various types of fishing infrastructure.

Figure 36 shows the proportion of fishers who indicated they were satisfied or very satisfied with different types of infrastructure by fishery, while Figure 37 shows this by region. Figures 38 and 39 show the proportion of fishers who were dissatisfied by fishery and region.

Overall, fishers were most satisfied with their access to roads, ice, cold storage, bait and seafood sorting facilities, and least satisfied with marinas and mooring facilities, fishing ramps, offloading facilities and - in the rock lobster fishery - fuel and repair facilities. Fishers on Kangaroo Island were least likely to report being satisfied and more likely to report being dissatisfied with several types of infrastructure; fishers in the Southern Eyre Peninsula were overall more satisfied with infrastructure than fishers located in other regions. In other regions, satisfaction and dissatisfaction varied by the type of infrastructure being examined.

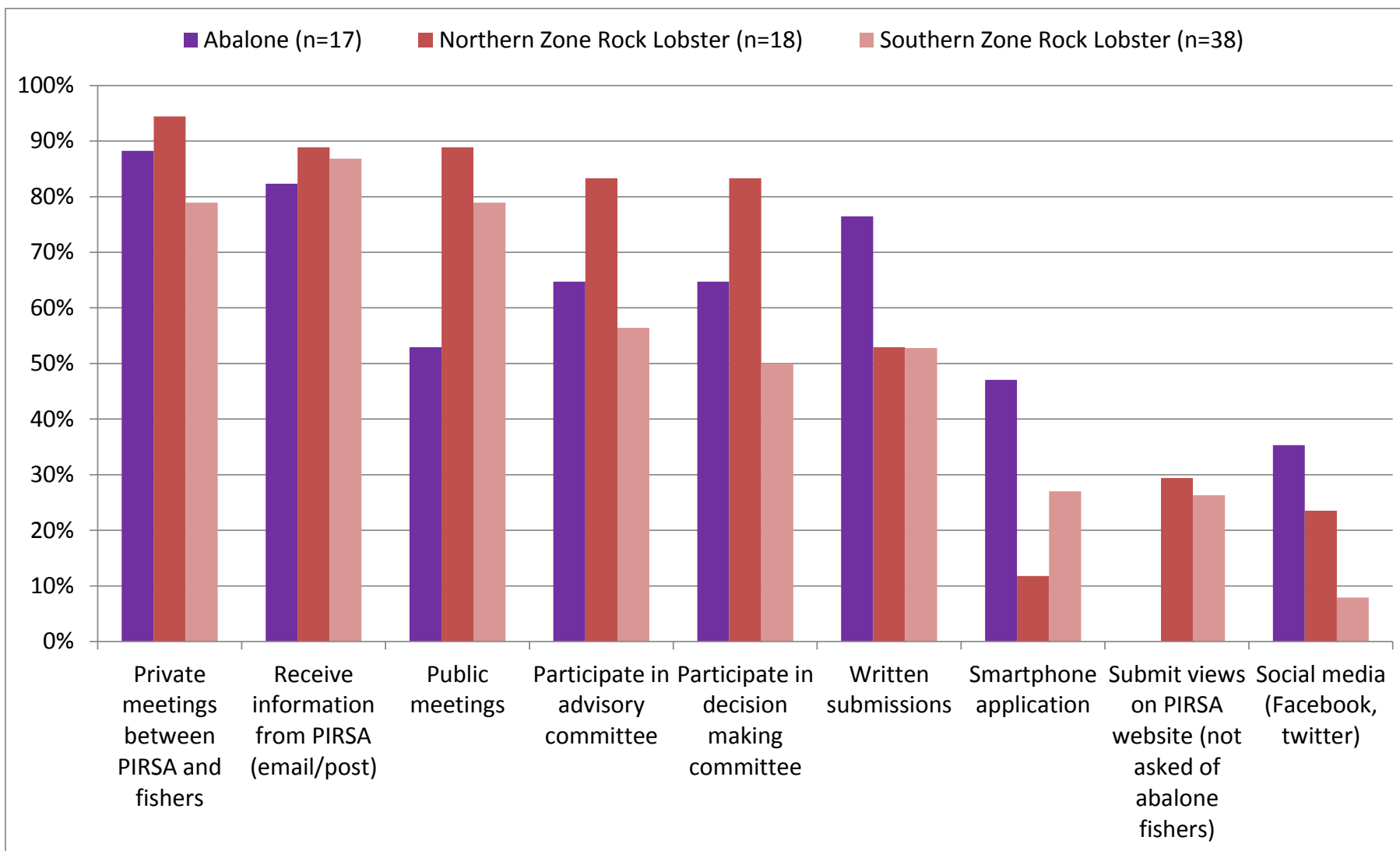


Figure 35 Fishers' preferred methods for having a say in how commercial fishing is managed

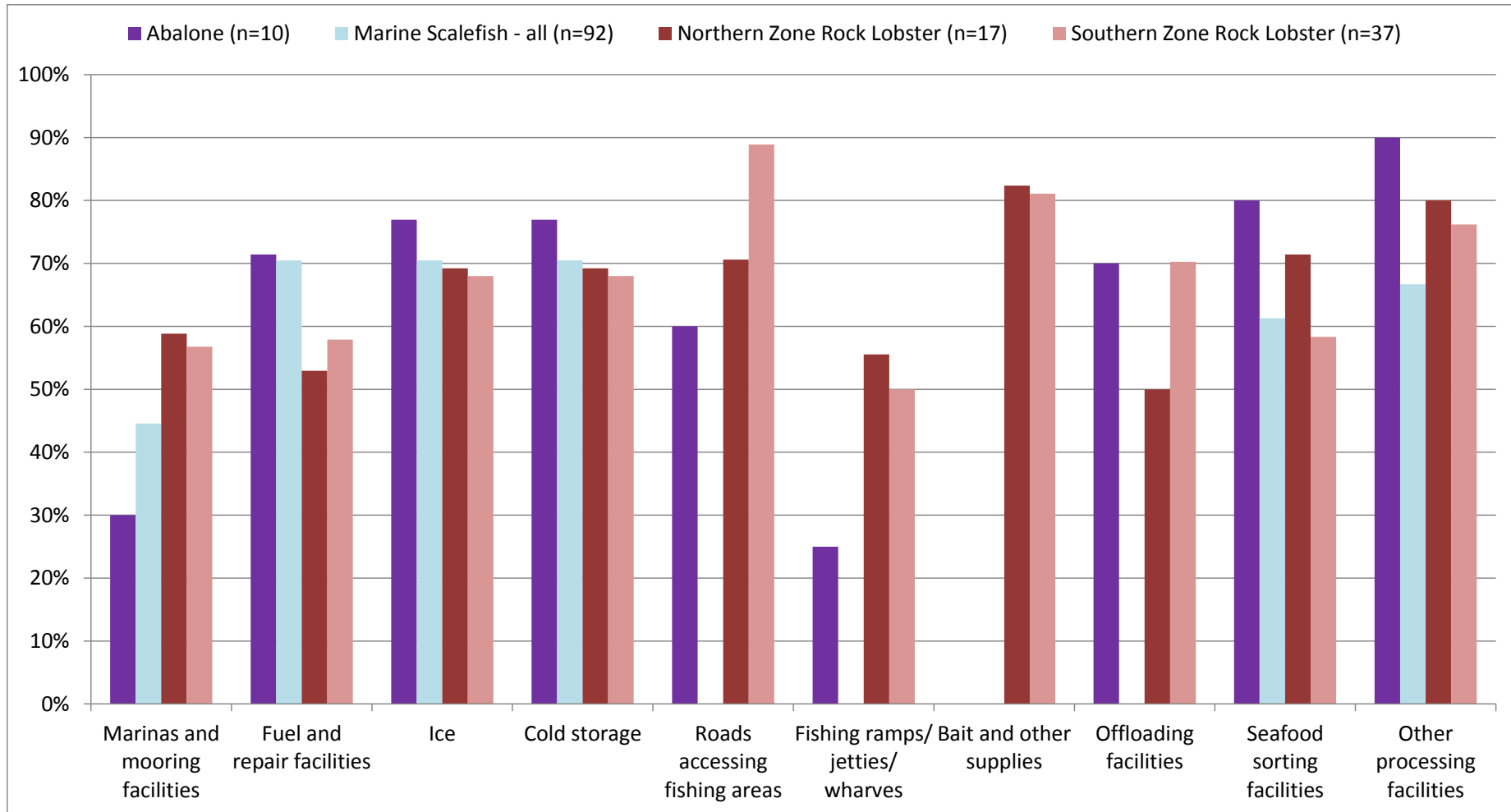


Figure 36 Proportion of fishers who were satisfied or very satisfied with their access to different types of infrastructure, by fishery (where no data are shown, it is because fishers in that particular fishery were not asked about that type of infrastructure)

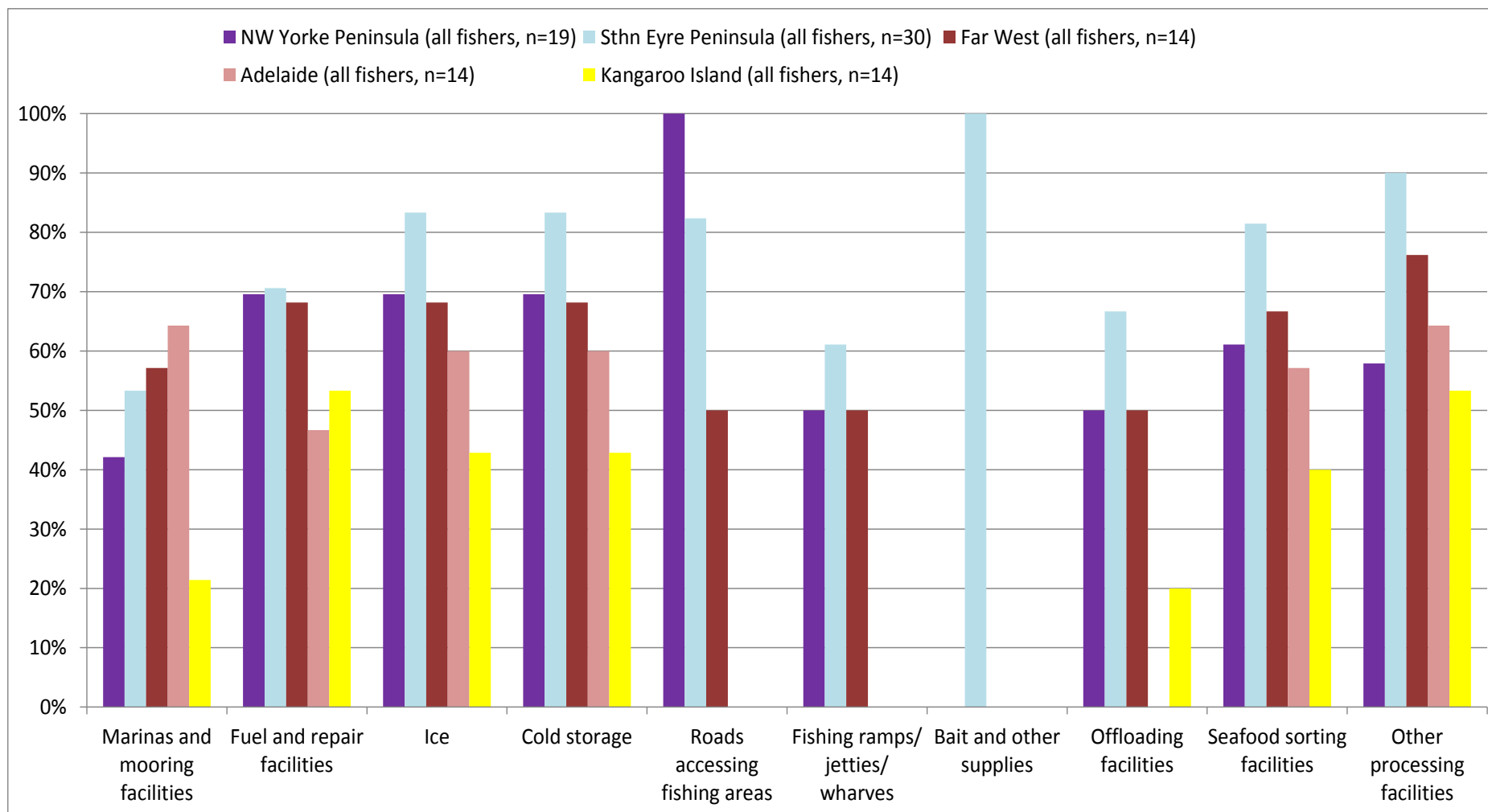


Figure 37 Proportion of fishers who were satisfied or very satisfied with their access to different types of infrastructure, by region (where no data are shown, it is because fishers in that particular fishery were not asked about that type of infrastructure)

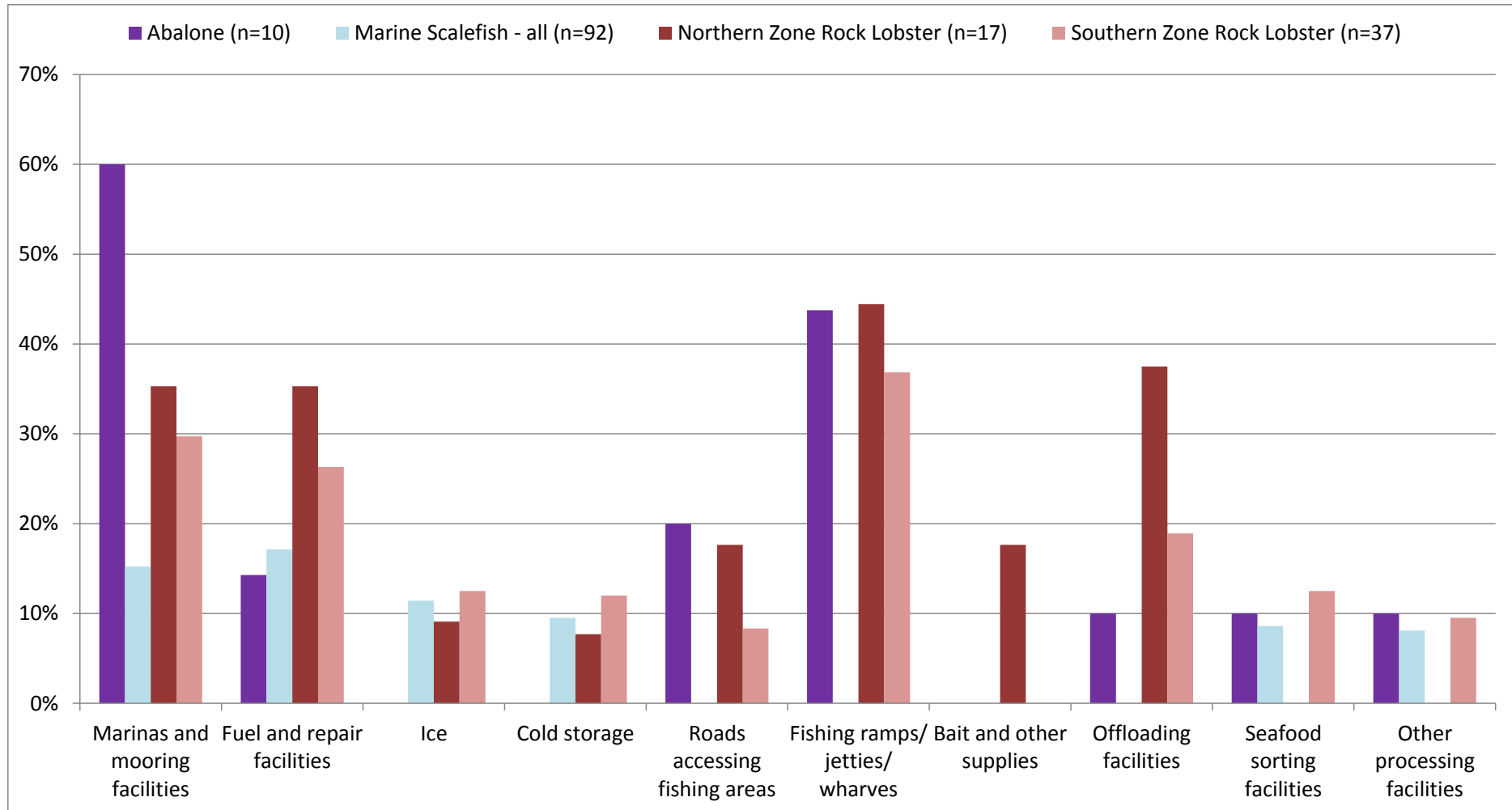


Figure 38 Proportion of fishers who were unsatisfied or very unsatisfied with their access to different types of infrastructure, by fishery (where no data are shown, it is because fishers in that particular fishery were not asked about that type of infrastructure)

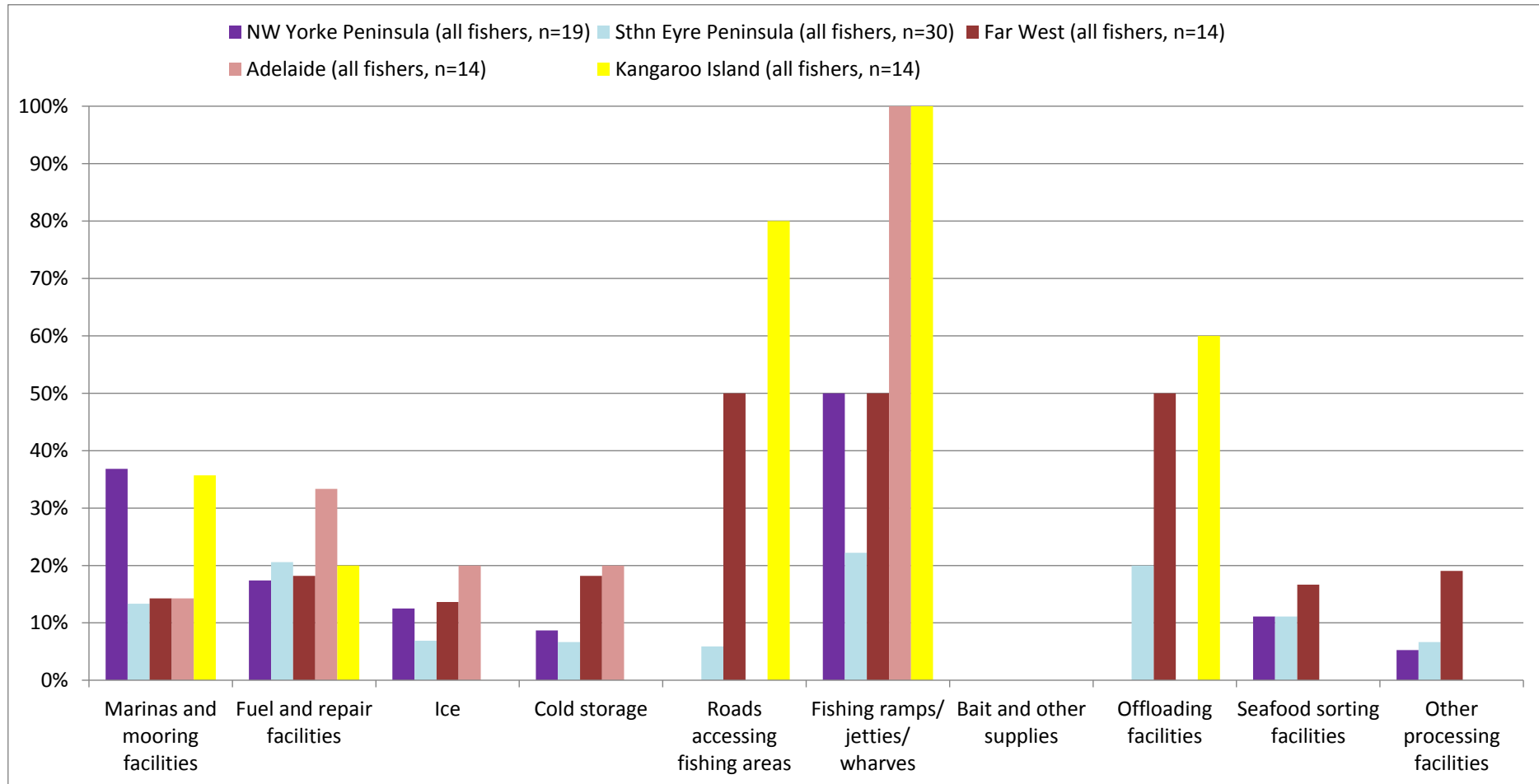


Figure 39 Proportion of fishers who were unsatisfied or very unsatisfied with their access to different types of infrastructure, by region (where no data are shown, it is because fishers in that particular fishery were not asked about that type of infrastructure)

3.15 Changes in fishing over time

RLF and abalone fishers were asked if, in the last year, they had fished less, more or about the same amount compared with the previous 12 months (Figure 40). They were then asked how the level of income gained from their fishing incomes compared to that one year ago, three years ago and five years ago (Figures 41 to 43). These questions were not asked in the MSF survey, as they were developed based on a review of how well the MSF survey did in covering key fishing-related factors affecting fishers' wellbeing.

Abalone fishers were most likely to report having increased fishing in the last 12 months, and Southern Zone rock lobster fishers the most likely to report having decreased their fishing. These differences may reflect the quota allocation for the particular year being examined (2010-11 compared to 2011-12).

Abalone fishers were more likely to have reported experiencing a decline in income over time (whether comparing to one, three or five years previously), and Northern Zone rock lobster fishers the most likely to report experiencing an increase. However, there was substantial variation in the changes in income reported by fishers within each fishery, indicating a range of outcomes for different fishers that will depend on many factors.

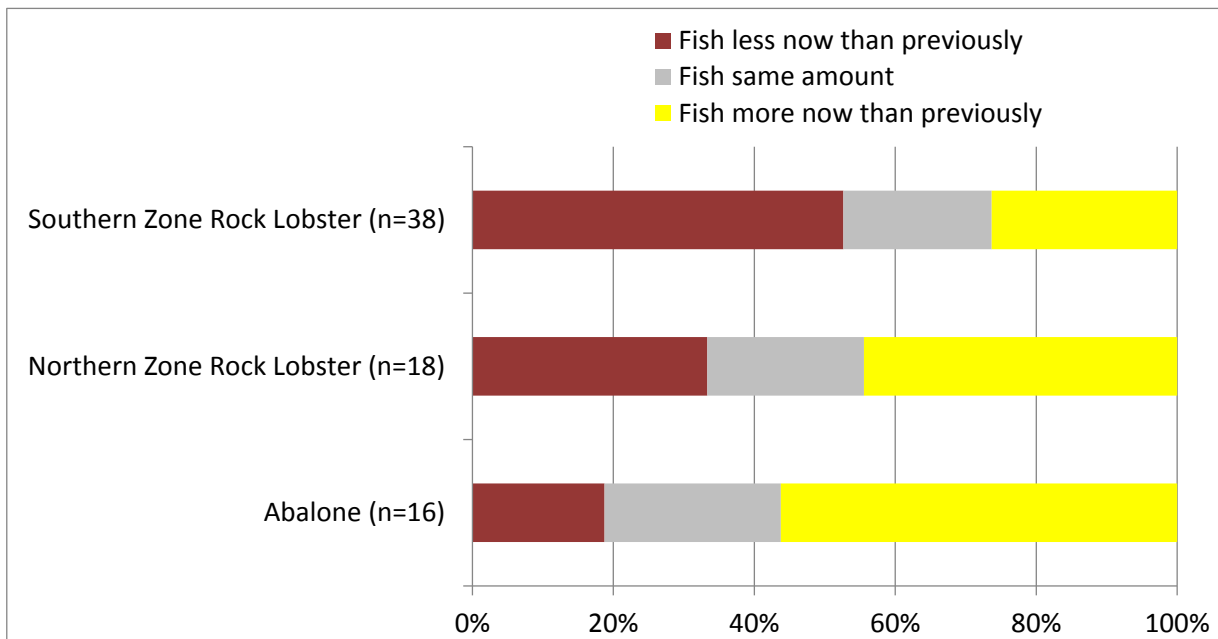


Figure 40 Fisher's assessment of how their fishing effort in 2010-11 compared to the previous 12 months

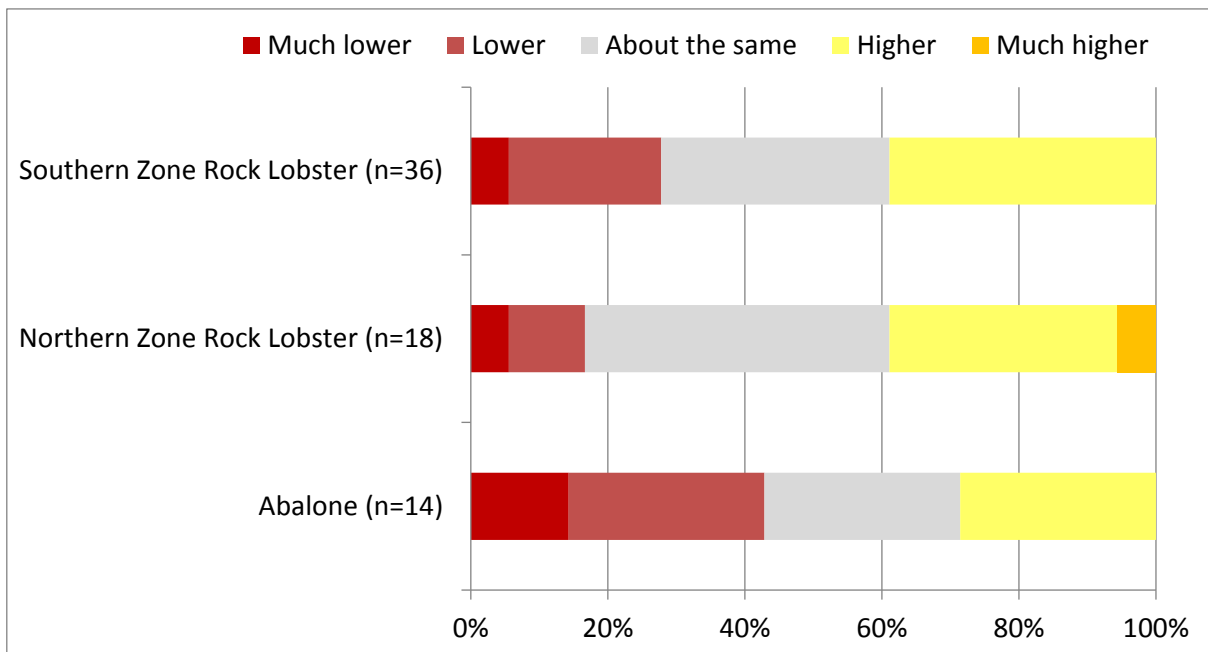


Figure 41 Fisher's assessment of whether their income at the time of completing the survey was lower or higher than one year previously

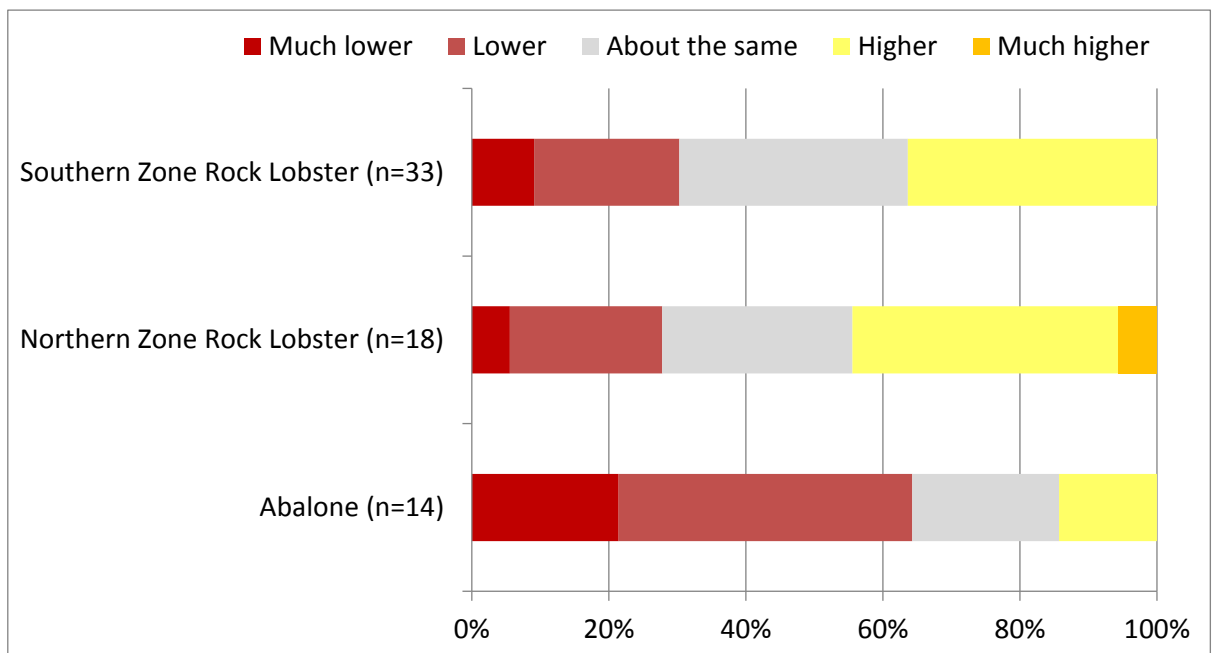


Figure 42 Fisher's assessment of whether their income at the time of completing the survey was lower or higher than three years previously

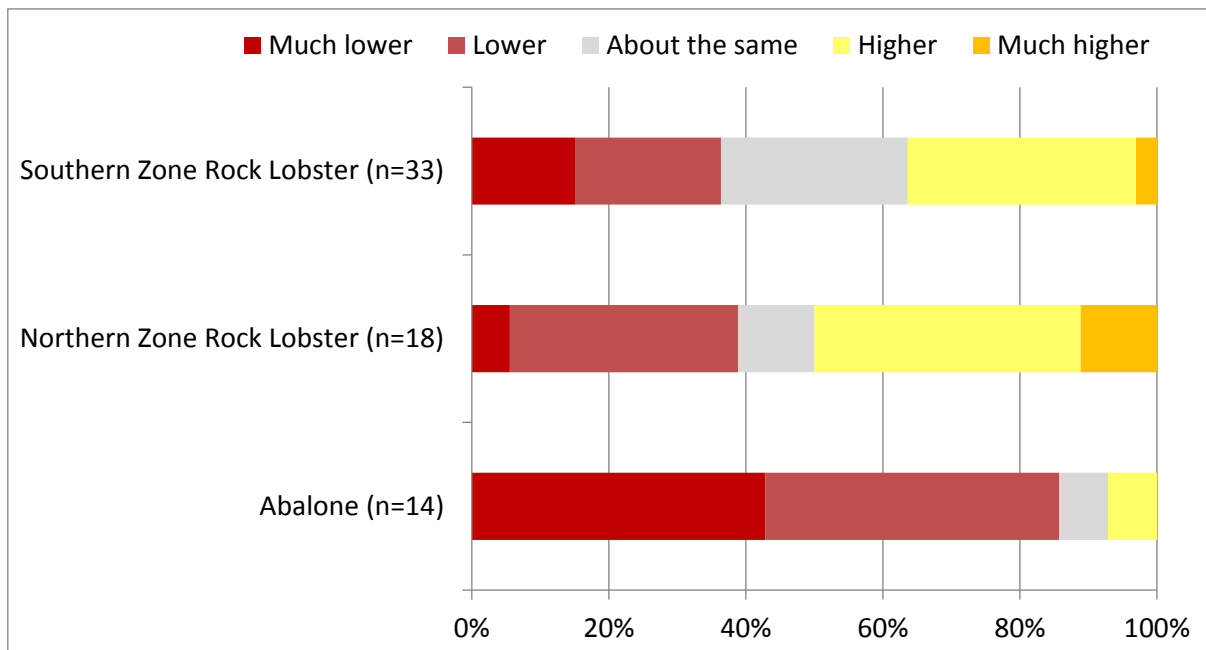


Figure 43 Fisher’s assessment of whether their income at the time of completing the survey was lower or higher than five years previously

3.16 Socio-demographic characteristics

Socio-demographic characteristics of fishers were examined as part of the survey. In this section, the age, gender, residential location, and formal educational attainment of fishers is examined. Other socio-demographic characteristics were discussed elsewhere in the report, including generations of family involved in fishing, the number of years the fisher had spent in fishing and any work they were engaged in outside the fishing industry.

Age

Across the different fisheries, abalone and MSF fishers were typically older, and Northern Zone rock lobster fishers younger (Figure 44). In all but the Northern Zone rock lobster fishery the majority of fishers (60-70%) were aged 50 or older, suggestive of an ageing fishing workforce. Almost no fishers were aged under 30 in these three fisheries, while less than 20% of Northern Zone rock lobster fishers were aged under 30. The overall age profile is suggestive of unsustainable levels of recruitment of young fishers into the industry, although further surveys would be needed over time to confirm this.

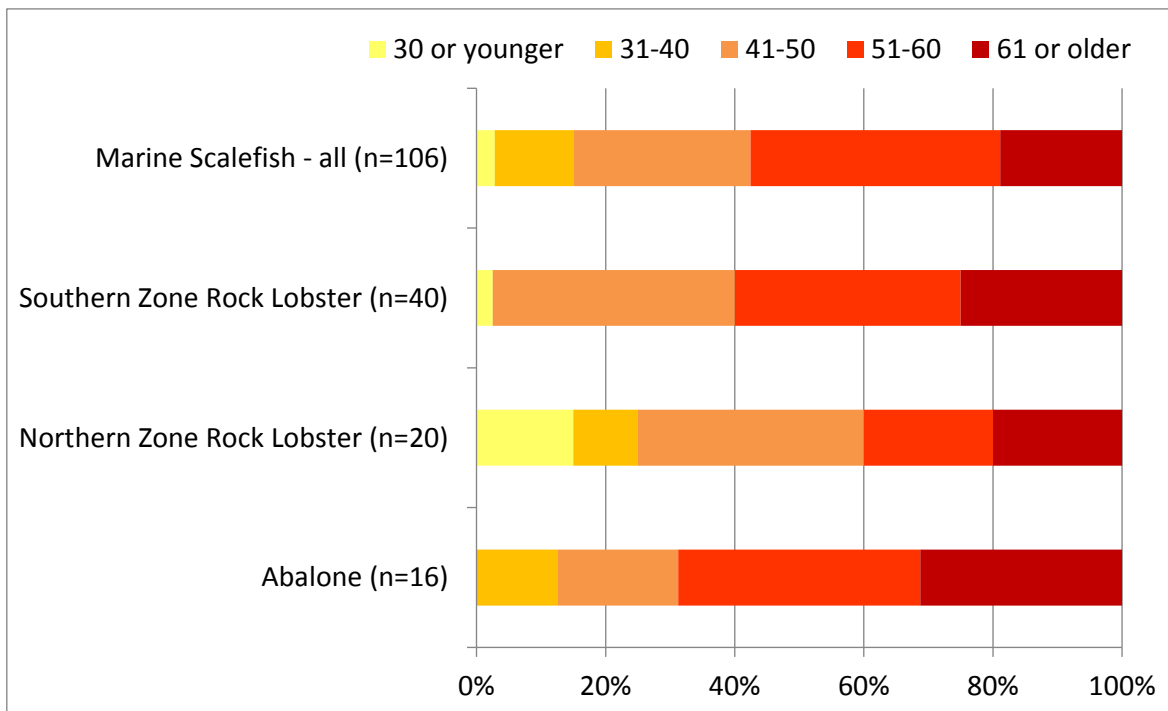


Figure 44 Age of fishers

Gender

Fishers in the RLF and abalone fisheries were asked their gender (this question was not included in the MSF survey). All but one fisher was male, with one fisher who responded to the Southern Zone Rock Lobster Fishery survey being female.

Formal educational attainment

Fishers were asked to indicate the highest level of formal education they had completed (Figure 45). The large majority of fishers – over 70% in all fisheries and 100% in the abalone fishery – had not finished high school, and very few had completed any post-school qualifications. This suggests a very low level of formal education, something that can reduce ability of fishers to gain employment in other industries if they do leave fishing.

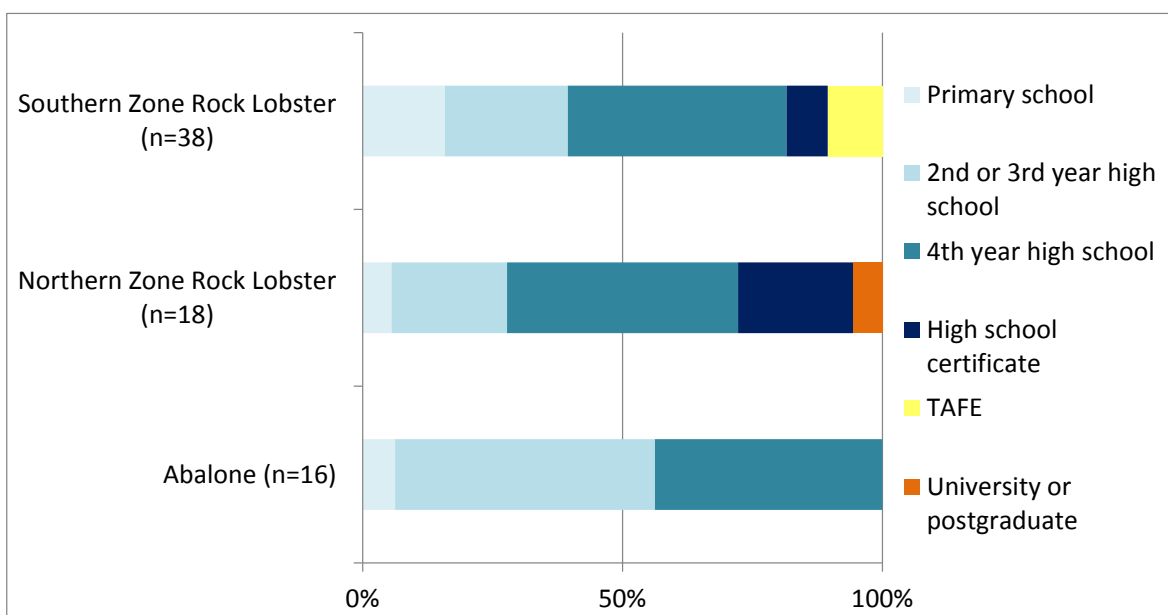


Figure 45 Highest level of formal education fishers had attained

3.17 Household income

Fishers were asked to indicate what income bracket their household income fell into. While some fishers chose not to answer this sensitive question, the large majority did, as can be seen in Figure 46. The overall highest incomes were reported by abalone fishers, with all reporting a household income of \$80,000 or more (although a larger proportion of Southern Zone rock lobster fishers reported earning the highest income bracket compared to abalone fishers). MSF fishers earned lower household incomes than other fishers, with almost 50% earning less than \$80,000 compared to less than 20% in any other fishery (and none in the abalone fishery).

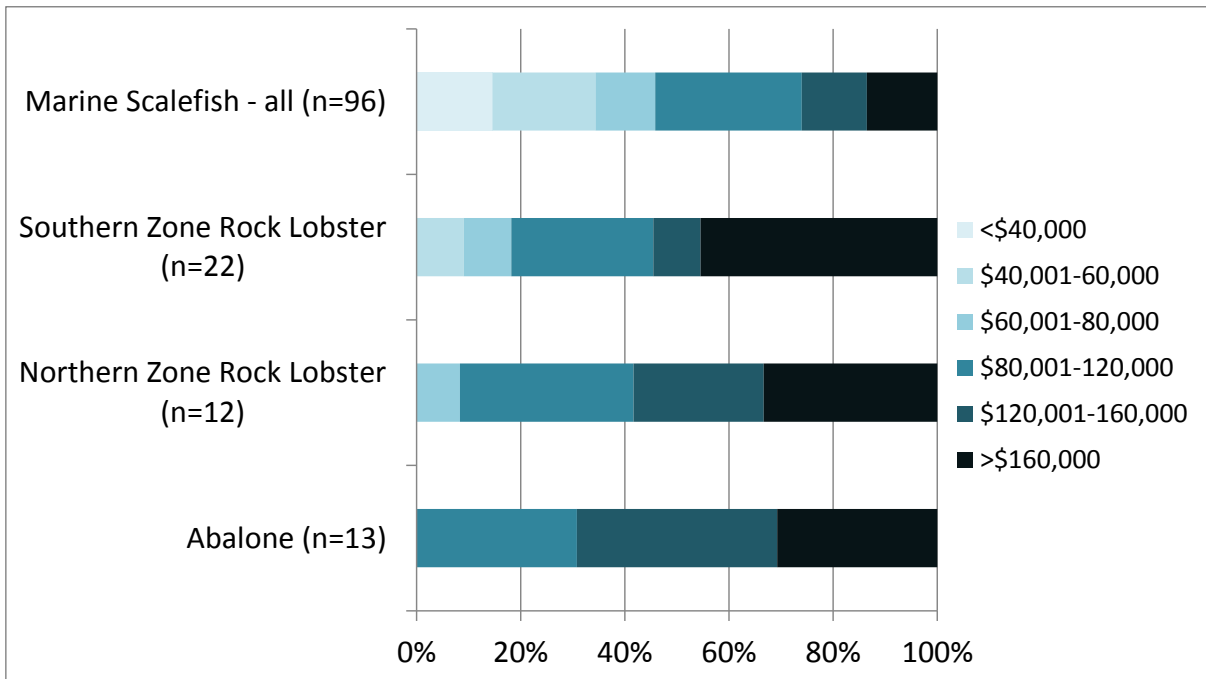


Figure 46 Household income reported by fishers for financial year prior to completing the survey

4. CONCLUSIONS

This report provides an initial examination of social characteristics of fishers in the South Australian MSF, rock lobster and abalone fisheries. This presents a picture of fishers who are often highly attached to and dependent on fishing, who strongly believe in their role as stewards of fisheries resources, and who have often strong levels of involvement in fisheries management decision making processes. There are important differences between the fisheries in terms of how fairly they feel they are treated, their income, and their attachment to fishing, amongst other factors.

The results presented here were limited by the fact that they include the presentation of 'works in progress' – in particular, the MSF survey was a pilot survey, and questions asked in the subsequent two surveys were revised based on analysis of the responses to the MSF survey. This limited comparability of responses to the surveys across fisheries.

The other key limitation of the surveys is that they provide information for a single point in time. Repetition of surveys regularly over time will provide a greater understanding of how social dimensions of fishing are changing, and enable assessment of the effects resulting from changes in fisheries management.

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Survey of the Social Aspects of Recreational Fishing in South Australia, 2012

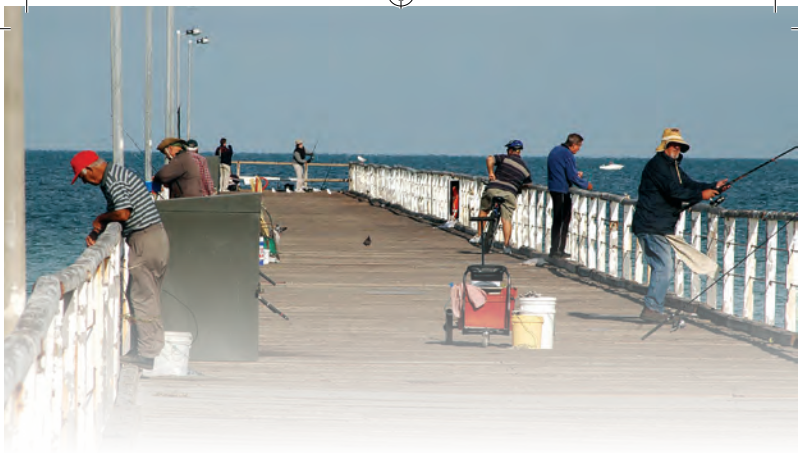
WIN a Charter Boat Trip for three
or a \$500 Fishing Voucher*

Complete the survey to go into the draw

PIRSA Fisheries and Aquaculture and the Fisheries Research and Development Corporation are conducting a survey of recreational fishers in South Australia. The survey will build a better understanding of the things that matter to recreational fishers, and will be used to inform recreational fishing management.

If you fish, your views are needed;
we will use the results of the survey
to help improve your fishing experience

To enter the prize draw, complete the survey form online at:
www.pir.sa.gov.au/recfishingsurvey



Everyone who completes the survey online or via hard copy, will go into a random draw to win one of the following prizes:

- **First prize** – Choose from a one day charter boat fishing trip with two friends (maximum value \$1000) or a \$500 voucher for fishing gear redeemable at your local fishing outlet.
- **Runner up prizes** – Nine people will win \$100 vouchers for fishing gear, redeemable at their local fishing outlet.



To be eligible for the draw, completed surveys must be received by 29 February 2012. Winners will be drawn on 12 March 2012 and notified by 16 March 2012.



For assistance with the survey or to obtain a hard copy call 1800 981 499 or email the Principal Investigator of the project, Dr Lianos Triantafillos lianos.triantafillos@sa.gov.au

*Conditions: All completed surveys will go into the prize draw. Entries open 23 January 2012 and close 29 February 2012. Prize draw takes place 12 March 2012. Winner to be notified by 16 March 2012. Prize details: First prize is a charter boat fishing trip for the winner and two friends up to a maximum value of \$1000 OR a \$500 voucher for fishing gear at the fishing outlet of the winner's choice. Nine runners up will receive a \$100 voucher for fishing gear from the fishing outlet of their choice. Prizes cannot be exchanged or redeemed for cash.



Australian Government
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**Government
of South Australia**
Primary Industries
and Regions SA



Social aspects of recreational fishing by avid fishers in South Australia, 2012

Jacki Schirmer, Lianos Triantafillos, Keith Jones

Draft Report, January 2014



**Government
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DEVELOPMENT CORPORATION

Project No. 2010/040

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INTRODUCTION

This report describes the results of a survey of recreational fishers in South Australia, undertaken between January 23rd and February 29th 2012. The survey examined social dimensions of recreational fishing, and had three objectives:

- To collect data to test the social indicators developed for the ‘Developing and testing social objectives for fisheries management’ study (FRDC Project No. 2010/040). The ‘Social objectives’ study examined how to monitor social dimensions of fishing as part of fisheries management,
- To test different approaches to delivering surveys to recreational fishers, and
- To examine social dimensions of recreational fishing in South Australia more broadly.

The survey’s purpose was different to that of most previous surveys of recreational fishers in South Australia (and elsewhere in Australia). Most recreational fishing surveys aim to quantify the amount and type of catch by recreational fishers, and to understand the fishing methods and platforms used, with this information used to help evaluate changes in stock and to assist fisheries management. This survey did not aim to quantify catch; rather, its goal was to improve understanding of the social dimensions of recreational fishing.

The importance of understanding social aspects of recreational fishing cannot be underestimated. The benefits to individuals of recreational fishing are often social – to enjoy the sport of fishing, to enjoy time outdoors, to spend time with friends and family, for example. Recent studies have emphasised that recreational fishing may have important benefits for fisher health and wellbeing (McManus et al. 2011). Despite widespread recognition that recreational fishers are motivated by social, rather than economic, factors, few studies have examined questions such as: what aspects of fishing are more valued by recreational fishers? How is their satisfaction with their fishing experience changing over time? How is this affected by factors such as availability of fishing infrastructure and the processes used to manage recreational fishing? Do they want to have a say in recreational fishery management, and how?

This survey examined some of these important questions. Other reports forming part of the ‘Social objectives’ study more specifically examine the usefulness of the data collected for measuring performance against the social objectives of fisheries management. In this report, we describe and evaluate the methods used in the survey. We then present results of the survey regarding various social dimensions of recreational fishing. Finally, we discuss key implications of the study’s findings, and identify gaps in knowledge that need further exploration.

This report is titled ‘social aspects of recreational fishing by avid fishers’, as the large majority of survey respondents fished more frequently than the average fisher. When reading the report, it is important to recognise that the results are more representative of frequent fishers than of infrequent fishers.

This report first describes the methods used to survey recreational fishers in South Australia in 2012. The results of the survey are then presented in two parts. First, the survey response is analysed, including its representativeness and the success of different survey platforms and distribution methods. Second, responses to each survey question are presented. Key results are briefly discussed as they are presented. The conclusions then examine the implications of the findings for (i) conducting future surveys of recreational fishers, and (ii) managing the social dimensions of recreational fishing in South Australia.

SURVEY METHODS

A key objective of the survey was to test different approaches to delivering surveys to recreational fishers, and evaluate the effectiveness of these approaches in terms of (i) cost and (ii) ensuring an appropriate sample of fishers is achieved.

Multiple survey platforms and distribution methods can be used when surveying recreational fishers. The term *survey platform* refers to the mechanism by which a person completes a survey. Commonly used survey platforms include computer-assisted telephone interview (CATI) surveys, postal surveys, or online surveys. Face-to-face surveys can also be used, but are not discussed here as their cost is typically too high to use them for large-scale recreational fisher surveys, although they are often used for smaller scale surveys of fishers, and are an important method in many circumstances. The term *distribution method* refers to the methods used to recruit people to undertake a survey. These include media releases and promotion of surveys in the public media; direct mailing flyers or surveys to intended recipients asking them to complete the survey; sending emails; and posting on websites, amongst other methods. The distribution method is a key determinant of the sample achieved.

Previous surveys of recreational fishers in South Australia and elsewhere have often relied on CATI surveys, or on surveys that combine telephone and diary methods (in which the survey participant maintains a diary of fishing activities between phone surveys) (Henry and Lyle 2003, Jones 2009, Lyle et al. 2010). These methods have proved effective in achieving accurate estimates of recreational fish catch (see for example Pollock 2010).

However, there is evidence that the success of surveys conducted by phone in achieving a representative sample is decreasing, a consequence of factors including a reduction in the proportion of younger people who have a landline telephone, difficulty reaching people at home for phone surveys, and reduced willingness to answer a phone survey (Bambrick et al. 2009). Additionally, phone surveys are substantially more expensive than alternative methods such as mail and internet surveys (Bambrick et al. 2009). This high cost, previously justified because of the ability to achieve a representative sample, means surveys are typically conducted infrequently due to the high cost involved.

At the same time, the potential of online (internet-hosted) surveys has increased rapidly as larger proportions of the population gain access to high speed internet. In South Australia in 2011, 75.6% of households had access to an internet connection (compared to 79.4% nationally)¹. Meanwhile, in 2007-08 it was estimated that 88% of Australian households had fixed-line phones, and that the proportion of households with fixed lines was falling, suggesting that the proportion of households with fixed line home phones is not much above those with an internet connection. Importantly, in 2007-08 only 75% of 18-24 year olds and 80% of 25-34 year olds had access to fixed-line home phones; this proportion fell

¹ Data sourced from the 2011 Australian Bureau of Statistics *Census of Population and Housing*, using the ABS TableBuilder product.

further (to 60% for 18-24 year olds) when young people living in share houses instead of with their parents were examined (ACMA 2009). This means that CATI surveys are increasingly unlikely to reach people aged under 35, while internet surveys are increasingly likely to reach this group.

In this rapidly changing environment, it is important to re-evaluate the best approach to surveying fishers. To do this, we trialled non-traditional survey methods in order to test whether approaches other than CATI surveys can achieve an adequate sample, and provide a lower-cost approach to surveying that can be used more regularly than CATI surveys.

Multiple methods of survey distribution were tested, to identify which methods enabled the lowest cost, most efficient approach to data collection. Specifically, we compared how successful different methods of distributing surveys were, using both 'hard copy' (printed) survey booklets, and online surveys.

The sections below describe the design of the questionnaire and the methods used to distribute the survey and analyse results. The first section of the results then examines the sample achieved, followed by presentation of results from the survey itself.

Designing the questionnaire

The survey questionnaire was designed in several stages. First, the topics to be included were identified. This occurred as part of the broader 'Social objectives' project, which identified social objectives and indicators relevant to fisheries management (see Triantafillos et al. 2014 for further information on this part of the project).

Second, the survey questionnaire was drafted, with a goal of ensuring it would gather data that assisted the monitoring of social trends in recreational fishing, and assessment of the performance of recreational fishing management against social objectives (Triantafillos et al. 2014).

The draft survey questions were reviewed by a number of South Australian fisheries stakeholders at a workshop held in Adelaide in September 2011. Participants included representatives of RecFish SA and the PIRSA recreational fisheries manager, as well as representatives of the commercial fisheries sector who were reviewing similar questions asked in surveys of commercial fishers (see Triantafillos et al. 2014 for further detail).

Based on feedback from these stakeholders, the survey was revised. The revised questionnaire was then pilot tested with four recreational fishers, who completed the survey, and were asked to identify any parts that were confusing or difficult to complete. The questionnaire was finalised after incorporating feedback from this pilot testing process.

The final questionnaire asked questions on the following topics:

- Fishing activities including: years of fishing experience, the top locations fished in, fishing platforms, species targeted and caught, and how catch is used
- How fishing skills are learned
- Fishing gear used (asking only about boats, sonar and GPS)

- Change in fishing activity over time, and the reasons for any increase or decrease over time
- Importance of recreational fishing activities, and of different aspects of fishing
- Satisfaction with fishing, how this has changed over time, and why it has changed
- Overall wellbeing of the fisher
- Satisfaction with fishing infrastructure
- Stewardship, including perceptions about fishing rules and regulations and obligations to fish responsibly, and how the public view fishers
- Accessing information on recreational fishing
- The quality and fairness of fisheries management
- Involvement in fishing management and decision making, including membership of recreational fishing clubs and involvement in fisheries management processes
- Fishing expenditure (amount and location)
- Socio-demographic characteristics (age, gender, number of children, marital status, occupation, hours worked, residential location, ancestry, education and household income)
- How the person heard about the survey.

Regions surveyed

The survey was open to anyone involved in recreational fishing in South Australia, including fishers who live in South Australia, and fishers who live in other states but travel to South Australia to fish. Several survey recruitment methods were designed to capture responses from recreational fishers who were fishing in South Australia, irrespective of where they lived, including a media release, email distribution and posts on popular websites accessed by people fishing in South Australia.

One of the goals of the 'Social objectives' project was to test whether the social indicators developed in the project could be used to compare different case study regions. For this reason, specific effort was given to achieving survey responses from people fishing in three regions within South Australia:

- NW Yorke Peninsula region: This case study region, centred on the townships of Wallaroo, Kadina and Moonta, included the north-west of the Yorke Peninsula from just south of Tickera to Port Victoria.
- Southern Eyre Peninsula region: This case study region included the southern Eyre Peninsula from Point Drummond to Port Neill, including Port Lincoln.
- Far West region: The region from Fowlers Bay to Baird's Bay was included in this case study region.

These three case study regions were selected as each is a highly used, popular recreational fishing destination, but with different characteristics considered likely to attract different types of recreational fisher. For example, the NW Yorke Peninsula region attracts many fishers on weekend fishing trips from Adelaide. The Far West is typically described as a

destination for recreational fishers from interstate, as well as South Australian residents on longer holidays, compared to the weekend trips more common in the NW Yorke Peninsula.

Survey distribution methods

As described earlier, we trialled use of different *survey platforms* and *survey distribution* methods. Table 1 summarises the platforms and distribution methods used in the survey.

Two survey platforms were tested: a paper survey, and an online survey. This was done to identify what proportion of fishers were comfortable completing a survey online, compared to the more traditional (and higher cost) method of a paper survey.

Fishers were encouraged to complete the survey via a wide variety of survey distribution methods, including media articles, tackle shops, caravan parks, websites, and email lists. Some survey distribution methods were only used in the three case study regions, in particular handing out surveys and flyers at fishing sites; distribution via tackle shops, caravan parks and other accommodation; and distribution via charter fishing businesses.

Irrespective of the distribution method by which a fisher heard about the survey, they always had the option of completing the survey either in hard copy or online. While some distribution methods were tailored more to hard copy or online surveys, it was important to ensure fishers were able to choose how they preferred to complete the survey. Therefore hard copy surveys prominently displayed information informing recipients that they could complete the survey online if they wished to; while the flyer used to promote the survey (shown in Figure 1) included both the online survey URL and instructions on how to request a hard copy of the survey.

Assistance with completing the survey was provided via a freecall phone number that survey respondents could call to request assistance with the survey. Relatively low numbers of calls were received, with 38 calls recorded in total during the entire period during which the survey was open.

A media release was used to promote public awareness of the survey. Multiple media articles – including two radio interviews, and four newspaper articles – were published in South Australia discussing the survey.

Survey prizes were offered as an incentive to complete the survey. The prizes totalled approximately \$1900, with the first prize winner given a choice of either a one day charter boat trip with two friends to a maximum value of \$1000, or a \$500 voucher for fishing gear redeemable at the fishing outlet of the winner's choice; and nine runner-up prizes of \$100 fishing gear vouchers redeemable at local fishing outlets.

The survey was distributed from 23 January 2012, with final survey responses received on March 8 2012. To ensure we could evaluate which survey distribution methods and platforms were most effective, we included questions that asked how survey respondents had heard about the survey.

Table 1 Summary of survey platform and distribution methods used

Survey platform	Description	Distribution methods used
Hard copy	A printed survey booklet provided to survey respondent together with stamped addressed envelope for survey return, an information sheet about the survey, and a flyer explaining they could complete the survey either online or in hard copy. 3000 surveys printed and distributed.	<ul style="list-style-type: none"> ▪ Media release & media articles ▪ Tackle shops¹ ▪ Caravan parks¹ ▪ Fishing charter businesses¹ ▪ Fishing sites¹ ▪ PIRSA offices ▪ Directly posted to people who had completed a previous fishing survey & indicated willingness to complete further surveys <p>In addition, people targeted using 'online' methods could ring the Freecall 1800 number provided to request a hard copy of the survey if they did not wish to complete it online.</p>
Online	An online survey hosted using SurveyMonkey, a commonly used online survey tool. The start of the online survey included an information page about the survey, which included information on how to access the survey in hard copy if preferred.	<ul style="list-style-type: none"> ▪ Media release & media articles ▪ Tackle shops (flyer with URL distributed)¹ ▪ Caravan parks (flyer with URL distributed)¹ ▪ Fishing sites (flyer with URL distributed)¹ ▪ PIRSA (flyer with URL distributed) ▪ Notices posted on recreational fishing websites (FishSA, Strike & Hook, PIRSA website) ▪ Email invitation to complete survey, sent to recreational fishing organisations who were asked to forward the invitation through their networks <p>In addition, people targeted using 'hard copy' methods were provided the URL of the online survey as part of the information given to them with the survey form, and encouraged to complete the survey online if they wished.</p>

¹These methods were only used in three case study regions targeted as part of the survey: the regions around NW Yorke Peninsula, Far West and Southern Eyre Peninsula.

Data analysis

The survey data were entered into a Microsoft Excel spreadsheet. Online survey data were downloaded directly as spreadsheet files, while data from hard copy surveys were entered manually and subsequently checked for data entry errors.

Data analysis was undertaken using the software package IBM SPSS Statistics 21. The analyses included in this report are:

- Descriptive statistics
- Cross-tabulations (e.g. comparisons of recreational fishing behaviour of particular groups)
- Simple bivariate statistical analyses to identify whether the differences in observed opinions or behaviour of different types of recreational fishers are statistically significant. The principal tests used were Spearman's correlation (r_s), and the Mann-Whitney U test (Z).

RESULTS

Survey response, by survey platform and distribution method

The survey was completed in part or full by a total of 1310 people. In total, 357 hard copy surveys were completed (out of a total approx. 3,000 distributed), and 953 surveys were completed online. Some respondents did not complete all questions on the survey. The 'valid sample' – surveys in which enough questions were completed to enable meaningful analysis of that survey response, with a minimum of 10 questions completed – totalled 1268 surveys.

The online survey was the more successful survey platform, attracting a high number of responses at significantly lower cost than the distribution of paper surveys. The effort expended in achieving online responses cost approximately 1/3 that used to achieve hard copy responses, and yet achieved almost three times the number of responses.

Survey respondents were asked how they had heard about the survey, enabling examination of which survey distribution methods were most effective. Figure 2 shows the results. Email and online methods were the most common methods reported, with just over 45% of respondents having heard about the survey via (i) a post on a popular fishing website, or (ii) being sent an email (either by a recreational fishing newsletter, or acquaintances). A further 17% heard about the survey via radio and newspaper items. Distribution of flyers in bait and tackle shops was also effective. Smaller numbers of people heard about the survey through being handed a survey while fishing, being handed a flyer, having been emailed based on their participation in a previous survey, or receiving information at tourist accommodation, a festival (Tunarama) or from their fishing club.

Figure 3 shows the number of surveys received, organised by the date on which (i) online surveys were completed, and (ii) paper surveys were postmarked. It also shows dates on which high levels of media coverage of the survey occurred in South Australia. In general, media coverage was associated with an increase in survey completion, occurring within one to two days for online surveys, and within approximately four to eight days for paper surveys due to the time lag involved in the survey being posted, completed and returned. The effect of media coverage on survey responses appears stronger for online surveys. It is possible that media coverage is more successful in recruiting online survey participants than paper survey participants, due to the greater effort involved in a recreational fisher calling to request a copy of the paper survey be posted to them, comparing to going to the online survey after hearing or seeing the URL in a media article.

Figure 1 Distribution method by which survey respondents heard of the survey (n=1164)

Figure 2 Survey response rate over time, and media coverage

Survey response by region

All survey respondents were asked where they lived. Table 2 summarises responses, showing the local government areas (LGAs) within South Australia, or state outside South Australia, in which people lived, and the broader region each LGA falls within. In several analyses in this report, these broader regions are used rather than LGA-scale data, due to the small number of responses from some LGAs.

The responses included only 32 people who live outside South Australia. This suggests the methods used were not highly successful in recruiting participation from the large numbers of people who travel from other states to fish in South Australia. This was unexpected, as it appears that even where intensive attempts were made to survey people in the three case study regions, including handing surveys out at fishing spots, there was relatively low success in recruiting 'out of state' fishers. Further work is needed to identify how better to recruit people from this group.

Unsurprisingly, the survey responses are predominantly from people residing in Adelaide, in which a large proportion of South Australian residents live, and from those living in or near the three case study regions.

Survey respondents were also asked to name the three fishing locations in South Australia in which they most commonly fished (they could name one or two if they did not fish in three separate locations). The responses were coded by fishing region, including the three case study regions. Table 3 summarises the proportion of respondents who reported fishing in different regions. The total adds to more than 100% because respondents could specify that they fished in more than one region.

The survey was reasonably successful in obtaining responses from fishers in most regions. This means that, if data were available on the proportion of fishers located in each region, it would be possible to weight the data to be representative of recreational fishers in South Australia, as long as other biases in the responses (discussed in the next section) could also be addressed.

Table 2 Number of responses received, by place of residence of survey respondent

Region	Local government area	Number of respondents
Adelaide and surrounds	Adelaide (all councils within city boundaries)	593
	Gawler (T)	10
Barossa and Lower North	Barossa (DC)	15
	Clare and Gilbert Valleys (DC)	5
	Goyder (DC)	1
	Light (RegC)	6
	Mallala (DC)	5
	Wakefield (DC)	4
Port Lincoln	City of Port Lincoln	88
Fleurieu and Kangaroo Island	Alexandrina (DC)	7
	Kangaroo Island (DC)	8
	Victor Harbor (C)	4
	Yankalilla (DC)	11
Lincoln	Cleve (DC)	2
	Elliston (DC)	5
	Franklin Harbour (DC)	3
	Lower Eyre Peninsula (DC)	18
	Tumby Bay (DC)	18
	Wudinna (DC)	2
Mt Lofty Ranges	Adelaide Hills (DC)	21
	Mount Barker (DC)	11
Murray Mallee & Riverland	Berri & Barmera (DC)	6
	Loxton Waikerie (DC)	5
	Murray Bridge (RC)	8
	Renmark Paringa (DC)	1
	Southern Mallee (DC)	2
No fixed address	No fixed address	2
Northern	Coober Pedy (DC)	3
	Northern Areas (DC)	2
	Peterborough (DC)	4
	Port Augusta (C)	10
	Port Pirie City and Districts	17
	Unincorporated SA	2
	Whyalla (C)	13
South East	Grant (DC)	1
	Kingston (DC)	20
	Mount Gambier (C)	9
	Naracoorte and Lucindale (DC)	4
	Robe (DC)	2
	Tatiara (DC)	3
	Wattle Range (DC)	7
Yorke	Barunga West (DC)	8
	Copper Coast (DC)	57
	Yorke Peninsula (DC)	40
West Coast	Ceduna (DC) and West Coast (DC)	57
	Streaky Bay (DC)	7
Outside SA	ACT	3
	NSW	7
	NT	3
	QLD	7
	VIC	9
	WA	3

Total	1150			
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Table 3 Number of respondents who fished in different South Australian fishing regions

Fishing region label	Fishing region name	Fishing region description	Number of responses	% respondents who reported one or more of their top 3 fishing spots was in this region
IA	Inner Adelaide	Inner Adelaide metropolitan	433	36.4%
OA	Outer Adelaide	Outer Adelaide, incl. Fleurieu, KI, Barossa, Adelaide Hills	210	17.6%
ML	Murray and Mallee	Murray & Mallee (previously called Murray Lands)	151	12.7%
YLN	Yorke and Lower North	Yorke & Lower North excluding 'WAL'	397	33.3%
<i>WAL¹</i>	<i>Walleroo</i>	<i>Walleroo, Kadina, Moonta, and all north-west region of Yorke</i>	<i>367</i>	<i>30.8%</i>
<i>CED¹</i>	<i>Ceduna</i>	<i>Ceduna and surrounds</i>	<i>172</i>	<i>14.4%</i>
<i>PL¹</i>	<i>Port Lincoln</i>	<i>Port Lincoln Case Study area</i>	<i>219</i>	<i>18.4%</i>
EY	Eyre Peninsula	Eyre Peninsula to Ceduna, excluding Port Lincoln	124	10.4%
NSA	Northern SA	Northern SA (Outback SA)	43	3.6%
LC	Limestone Coast	Limestone Coast	84	7.1%
Total			1191	184.7%

¹Case study region

Representativeness of sample

We assessed the representativeness of the sample achieved as far as is possible.

Representativeness refers to how well the sample represented the population it was intended to, in this case recreational fishers who fish in South Australia.

A key challenge in assessing representativeness is a lack of available information on South Australian recreational fishers. The most recent information available is from the 2007-08 survey of recreational fishers reported in Jones (2009).

Representativeness was first assessed by comparing the distribution of ages of respondents against (i) the broader South Australian population, and (ii) the estimated age distribution of South Australian fishers in 2007. Figure 4 shows the proportion of survey respondents who were in age groups from 19-24, through to 80 and older. It separates respondents based on the survey platform used (hard copy surveys versus online surveys). It also shows the proportion of the South Australian population in each age group, based on 2011 Census of Population and Housing data. It is important to note here that the survey respondents would not be expected to match the South Australian age distribution, as not all South Australians fish. It does, however, provide a useful benchmark when comparing the responses received by hard copy versus online.

Figure 3 Proportion of 2012 recreational fishing survey respondents in different age groups, compared to South Australian population in 2011

Overall, the online survey achieved greater response than the hard copy survey from those aged 25-29 through to 50-54 years. The hard copy survey achieved greater response from older age groups, with older people much more likely to choose to use this survey platform than younger people. Interestingly, the online survey responses also included reasonably high representation of older age groups: in the age brackets from 30-34 through to 65-69, the proportion of fishers falling into each age group was higher than the average for the population. This suggests that older fishers are often willing to complete online surveys, despite some having a preference for completing a paper survey. Given the relatively small number of paper surveys completed overall compared to online, a reasonable sample was achieved of all age groups in the online survey, certainly large enough to enable weighting of responses using appropriate information about the recreational fisher population.

The most recent data available on the age of recreational fishers comes from Jones (2009), and was gathered in 2007-08. It is likely that since this time, the age distribution of recreational fishers has changed; Jones (2009) identified a large decline over time in the participation of younger age groups in fishing, while participation of older age groups remained more stable. If this trend has continued since 2007-08, it would be expected that a smaller proportion of South Australian fishers would be aged under 44, and a greater proportion aged 45 or older, compared to the 2007-08 data shown in Figure 5.

Figure 5 compares the proportion of respondents to the 2012 recreational fisher survey who fell in different age groups, to the proportion of South Australian fishers estimated by Jones (2009) to fall into these age groups. This comparison suggests the 2012 survey achieved a low response from those aged under 30, although this is likely to be partly a result of (i) the trend to lower participation in fishing by younger age groups described above, and (ii) the fact the 2012 survey did not target those aged under 19, where Jones (2009) estimates include those aged 15-18 in their estimate. In the 30-44 age group, the online survey achieved a more representative sample compared to the hard copy survey, while it appears to have achieved a higher proportion of 45-59 year olds. The survey overrepresented those aged 60 or more, with the online survey closer to the actual proportion of fishers than the hard copy survey.

Figure 4 Proportion of survey respondents in different age groups, compared to 2007-08 estimates for the South Australian recreational fisher population

This analysis suggests that an online survey can achieve an adequate response from older age groups, and is preferred for achieving responses from younger age groups, compared to a paper survey. However, achieving responses from fishers aged under 30 is difficult irrespective of the survey platform used.

While age distribution was reasonable, other survey results suggest the survey method used resulted in substantial bias towards avid fishers. A sample of online fishers were asked how

many days they had fished in the last 12 months². Figure 6 shows responses. These figures suggest the survey is substantially skewed towards avid fishers: Jones (2009) found that 46% of fishers in South Australia fished 3 or fewer days in a 12 month period, while only 3% fished for 20 or more days. In this survey, only 7.2% of fishers reported fishing 5 days or less in the last year, while 59.2% reported fishing greater than 20 days. The results of the survey can therefore only be considered representative of fishers who fish frequently, and not of those who fish only occasionally.

Figure 5 Number of days spent fishing in last 12 months (n=348)

Overall, the survey methods were highly successful in obtaining a large number of responses from avid fishers. In future, the methods should be modified to better recruit participation from (i) fishers who do not reside in South Australia, and (ii) infrequent fishers. This will require some change in the survey methods used. In particular, it is likely to require changing the survey distribution methods, as advertising through websites and at fishing and tackle shops is clearly likely to obtain responses from avid fishers, and not as successful in reaching less avid fishers. One option that would help recruit less avid fishers is to post flyers about the survey to a sample of letterboxes. The flyers would include the survey URL, and encourage anyone who fishes, even if occasionally, to complete the survey online, or to ring a phone number to be sent a paper copy of the survey. Using this approach would reduce survey costs compared to mailing the full survey, as online survey completion substantially reduces postage, data entry and data cleaning expenses. It may also be preferable to offer survey prizes that are not fishing-related, as fishing-related prizes may not be of interest to less avid fishers. A more generic prize such as a gift card may be more effective. Out of state fishers may be able to be targeted through more focus on advertising the survey on national recreational fishing websites, rather than just South Australian websites.

The survey methods were not designed to be used to estimate how many people participate in recreational fishing. They do, however, suggest that when designing surveys aimed at identifying recreational fishing participation and effort, consideration should be given to using online survey platforms instead of the traditional phone and diary surveys. While initial recruitment to this type of survey may need to occur via phone or mail, ongoing diary surveys could easily be hosted online and this may reduce survey costs substantially.

² This question was not asked of all fishers, due to an error in the online survey software that prevented the question being seen by some respondents.

FISHING ACTIVITIES

Survey respondents were asked a series of questions about their fishing activities, including where they fish, how long they have been fishing, their fishing platforms, species targeted and caught, and what they do with their catch. As a reminder, these results mostly represent the activities of avid fishers.

Fishing location

Respondents were asked what percentage of their recreational fishing took place in South Australia in the previous 12 months. As can be seen in Figure 7, the majority of respondents fished solely in South Australia. This reflects the predominance of South Australian residents in the sample, with few people who resided in other states completing the survey.

Figure 6 Proportion of recreational fishing activities in last 12 months that took place in South Australia (n=1146)

The top three fishing spots listed by survey respondents were classified by fishing region. Table 4 shows the percentage of respondents who reported fishing in different fishing regions, and highlights the most common fishing locations reported by fishers living in different regions. The majority of respondents reported they most commonly fish in the same region they live in - for example, 62.6% of fishers who lived in Adelaide and surrounds

reported fishing in the inner Adelaide fishing region, and 94.3% of fishers living in Port Lincoln reported they fish in the Port Lincoln fishing region. However, many fishers also fish in more distant regions. For example, fishers who live in Adelaide, in addition to fishing in Adelaide and surrounds, also commonly reported fishing in Yorke and Lower North and Wallaroo; those living in the Barossa and Lower North commonly fished in Yorke and Lower North, Wallaroo, and Inner Adelaide. The exceptions to this were fishers living in more remote areas: those who lived in the South East, Lincoln (referring to the Eyre Peninsula outside Port Lincoln), Port Lincoln and the West Coast almost exclusively fished in their local region.

Table 4 Most common fishing locations reported by fishers, by their region of residence

Fisher's region of residence ↓	Percent of fishers who reported fishing in this location →									
	IA	PL	NSA	ML	CED	OA	LC	YLN	EY	WAL
Adelaide and surrounds (n=593)	62.6%	9.6%	1.7%	14.2%	7.9%	25.5%	4.6%	40.0%	7.1%	35.4%
Barossa and Lower North (n=36)	30.6%	0.0%	2.8%	16.7%	8.3%	13.9%	0.0%	47.2%	5.6%	52.8%
City of Port Lincoln (n=88)	0.0%	94.3%	0.0%	1.1%	4.5%	1.1%	0.0%	2.3%	15.9%	1.1%
Fleurieu and Kangaroo Island (n=30)	6.7%	3.3%	0.0%	30.0%	16.7%	80.0%	6.7%	10.0%	0.0%	16.7%
Lincoln (n=48)	0.0%	70.8%	0.0%	0.0%	12.5%	0.0%	0.0%	6.3%	43.8%	0.0%
Mt Lofty Ranges (n=32)	21.9%	3.1%	0.0%	31.3%	9.4%	40.6%	3.1%	53.1%	6.3%	37.5%
Murray Mallee & Riverland (n=22)	4.5%	9.1%	4.5%	68.2%	18.2%	13.6%	9.1%	31.8%	13.6%	22.7%
Northern (n=51)	2.0%	27.5%	51.0%	3.9%	19.6%	3.9%	0.0%	21.6%	54.9%	13.7%
Outside SA (n=32)	6.3%	25.0%	6.3%	0.0%	34.4%	0.0%	9.4%	25.0%	9.4%	15.6%
South East (n=46)	0.0%	2.2%	0.0%	15.2%	0.0%	0.0%	91.3%	6.5%	4.3%	0.0%
West Coast (n=64)	1.6%	3.1%	0.0%	0.0%	90.6%	1.6%	0.0%	0.0%	4.7%	0.0%
Yorke (n=105)	1.9%	4.8%	1.0%	3.8%	6.7%	1.9%	1.0%	58.1%	0.0%	75.2%
All fishers (n=1147)	34.7%	18.1%	3.6%	12.0%	13.8%	17.6%	6.8%	32.2%	10.5%	29.9%

Interpreting data: This table shows the % of fishers living in each 'region of residence' who reported fishing in the locations indicated by column headings. For example, 62.6% of fishers who lived in the 'Adelaide and surrounds' region reported that they fished in the IA (Inner Adelaide) fishing region.

Personal history of fishing in South Australia

Respondents were asked how many years they had spent recreational fishing in South Australia. The large majority – 61.2% – had fished in South Australia for 30 or more years, while less than 5% had fished in South Australia for 5 years or less (Figure 8). As younger people by definition will have spent fewer years fishing, the years a person had spent fishing in South Australia was also analysed by age group, shown in Figure 9. The results suggest that the majority of fishers learn to fish during their childhood, with more than 80% of those aged under 50 giving responses that, based on their age, mean they began fishing below the age of 15. Between 10-20% of respondents gave responses that indicate they learned to fish at an older age. This reinforces that a majority of people are recruited into recreational fishing at a relatively young age: it appears to be uncommon for people to begin fishing as a new hobby after childhood. This is concerning given that Jones (2009) identified a rapid decline in the participation of younger age groups in fishing; it suggests that the decline in participation by young people is unlikely to be addressed through people choosing to take up recreational fishing later in life.

Figure 7 Number of years respondents had been recreational fishing in South Australia (n=1210)

Figure 8 Years spent fishing in South Australia, by age group (n=1167) EDIT HORIZONTAL AXIS LABEL

Fishing platforms and types

Fishers were asked what fishing platforms they used (land-based or boat-based), and whether they participated in inshore, offshore, and/or freshwater fishing. Figure 10 summarises responses. The most common platform reported was non-charter boat fishing (78.9% of respondents), followed by land-based fishing (70.6%), with 18.4% reporting they did charter fishing. Of respondents, 66.7% reported participating in inshore fishing (defined as within five kilometres of shore), 45.2% in offshore fishing (greater than 5 kilometres from shore), and 31.9% in freshwater fishing.

Figure 9 Fishing platforms and types undertaken by respondents (n=1250)

The type of fishing done varied somewhat depending on the age of the fisher (Figure 11). Younger fishers were most likely to report they did freshwater fishing, charter fishing, and land-based fishing, while older fishers were most likely to report they did non-charter boat fishing and inshore fishing.

Figure 10 Fishing platform and location by age of fisher (n=1135)

Species targeted

Respondents were asked whether they targeted King George Whiting (KGW), snapper, squid, or other species when fishing. Figure 12 shows the percentage of respondents who reported targeting each of these. Squid and KGW were most commonly targeted, and snapper least commonly targeted.

Figure 11 Species targeted by survey respondents (n=1250)

When analysed by respondent age, there was little difference in the species targeted by fishers of differing ages, with the exception of snapper, which was more likely to be targeted by younger fishers, particularly those aged 30-39 (Figure 13).

Figure 12 Species targeted by age of fisher (n=1123)

Utilisation of catch

Respondents were asked what they do with their legal catch. They were asked to estimate what percentage of their catch was used for catch and release, used for household consumption, given to others, used as bait, or disposed of. As shown in Figure 14, the most common use across all respondents is for catch to be eaten. However, when broken down by age importance differences in catch utilisation are readily observable. As can be seen in Figure 15, younger fishers report eating a much smaller proportion of their catch compared to older age groups, and are much more likely to report that they engage in catch and release fishing, and use some of their catch as bait compared to older fishers. The proportion of catch given to others, meanwhile, varies relatively little across age groups.

Figure 13 Average proportion of catch used for different purposes (n=1210)

Figure 14 Average proportion of catch used for different purposes, by age group (n=1152)

Change in fishing activity over time

Almost half of survey respondents (49.5%) reported that, in the last 12 months, they had fished about the same amount they did the previous 12 months, while 24.5% reported they had fished less, and 25.1% that they had fished more (Figure 16).

Fishers were then asked to indicate whether they had fished more or less for one or more of a number of reasons. They could tick multiple options, and many reported more than one reason for fishing more or less often. Figures 17 and 18 summarise the results. The most common reasons for fishing *more* often in the last 12 months were a change in social or work conditions, a shift to different types of fishing, or simply a personal preference e.g. they decided to fish in preference to other activities. The most common reasons for fishing *less* often in the last 12 months were changes in working conditions and weather conditions,

while other reasons such as increases in fuel costs, changes in fishing quality, and home/family related changes, were less common.

Figure 15 Proportion of fishers who indicated they had fished less, the same, or more in the last 12 months compared to the preceding 12 months (n=1223)

Figure 16 Reasons fishers had fished more often in last year compared to the year before (n=307)

Figure 17 Reasons fishers had fished less often in last year compared to the year before (n=307)

Fishing skills and gear

Fishers were asked if they owned a boat and, if they did, whether their boat had an echo sounder and GPS. Of respondents, 66.3% reported owning a boat (Figure 19). This is a reflection of the sample, which as noted previously is biased towards avid fishers. The large majority who had boats reported having an echo sounder (80.8%) and GPS (78.9%).

Fishers were asked how they had learned their fishing skills, with results shown in Figure 20. The most common methods of learning fishing skills were through self-teaching, from family members, and from other fishers. Formal training is very uncommon.

Figure 18 Boat and boat related fishing equipment owned by fishers

Figure 19 Methods by which survey respondents had learned fishing skills (n=1207)

IMPORTANCE OF RECREATIONAL FISHING ACTIVITIES

Fishers were asked to answer the question 'how important are your recreational fishing activities to you', on a scale from 1 (not at all important) to 10 (very important). Figure 21 shows the results across all respondents.

Figure 20 Importance of recreational fishing activities to survey respondents (n=1250)

The majority of respondents indicated fishing was moderately or highly important to their life overall. Respondents were significantly more likely to rate fishing as highly important to their life if they also:

- Fished a large number of days, with more avid fishers more likely to consider fishing as very important to their life ($p < 0.000$, $r_s = 0.359$, $n = 348$)³
- Were more satisfied with their fishing activities overall ($p < 0.000$, $r_s = 0.408$, $n = 348$)⁴
- Spent larger amounts on recreational fishing ($p < 0.000$, $r_s = 0.325$, $n = 1159$)
- Had lower household income, although the relationship was not as strong as for other factors ($p = 0.044$, $r_s = -0.065$, $n = 972$)
- Had lower levels of formal education ($p = 0.032$, $r_s = -0.064$, $n = 1140$)

³ Note: questions about days fished were asked only of some survey respondents, and hence there is a smaller number of respondents than for other questions

⁴ Note: questions a person's satisfaction with fishing were asked only of some survey respondents, and hence there is a smaller number of respondents than for other questions

- Were an active member of a recreational fishing organisation ($p < 0.000$, $r_s = -0.148$, $n = 1159$)

The importance of fishing was not significantly correlated with a person's age, or their overall satisfaction with their life.

To better understand what aspects of fishing tend to be more or less important for recreational fishers, respondents were asked to indicate whether a number of characteristics often associated with recreational fishing were important to them, shown in Figure 22. The following aspects of fishing were rated as important or very important by more than 80% of respondents: relaxation/unwinding, spending time in the outdoors, the enjoyment/sport of fishing, eating catch, and spending time with family and friends. Getting away from people, and participating in fishing competitions, were least likely to be rated as important aspects of a person's recreational fishing experience.

Figure 21 Proportion of respondents who reported that different aspects of recreational fishing were important to them

The aspects of fishing considered important varied depending on the demographic characteristics of the fisher, as can be seen in Figure 23. The importance of fishing for solitude was greater for people in age groups from 18 to 44, and lower for older age groups. Meanwhile, eating catch was more commonly of importance to older respondents than younger fishers, while the importance of fishing to spend time with family was greatest for those aged between 30 and 50 years, and fishing with friends was of similar importance across most age groups except those aged 65 and above.

The importance of fishing to people's lives varied somewhat by the region they lived in (Figure 24). Those living in the West Coast and in Port Lincoln, and those residing outside SA, were less likely to consider fishing highly important to their life, compared to those living in the South East, Fleurieu, Kangaroo Island, and Adelaide. However, differences were often relatively small between regions, and may partly reflect the different methods used to recruit survey participants in different areas – it is possible that in the three case study regions, where more effort was made to recruit participation, a larger number of fishers who are less avid were recruited to complete the survey.

Figure 22 Proportion of respondents who rated different aspects of fishing as important, by age group

Figure 23 Respondent rating of the importance of recreational fishing to their life, by region in which the fisher lives

SATISFACTION WITH FISHING

Fishers were asked how satisfied they were overall with their fishing activities (Figure 25). This question was asked only on some surveys, due to an error in the online survey form, and hence has a lower response rate than some other questions. Almost all fishers rated their satisfaction as 5 or higher on a scale of 1 to 10, from not at all satisfied to very satisfied. Almost equal proportions rated themselves as 5, 6, 7 or 8 on the scale, while a higher proportion (21.6%) rated their satisfaction at 10.

Satisfaction with fishing was, as reported earlier and shown in Figure 26, strongly correlated with the importance of fishing. While the causation of this relationship is unknown, it is clear that those who rated fishing less important to their life were also less likely to reported being highly satisfied with their fishing activities.

Figure 24 Satisfaction with fishing activities (n=408)

Figure 25 Satisfaction with recreational fishing reported by fishers who had differing ratings of the importance of fishing to their life (n=404)

In addition to asking how satisfied they were with their fishing activities, survey respondents were asked how satisfied they were with their life in general. This question is a measure of a person’s subjective wellbeing, and has been shown to have strong correlations with objective measures of a person’s wellbeing (Oswald and Wu 2010). While a person’s life satisfaction was not significantly correlated with their rating of the overall importance of fishing to their life ($p=0.637$, $r_s=-0.014$, $n=1216$), life satisfaction and fishing satisfaction were significantly and positively correlated ($p<0.000$, $r_s=0.210$, $n=404$). This suggests an important relationship between the social benefits of recreational fishing, and a person’s overall wellbeing, that requires further exploration.

Satisfaction with fishing did not vary substantially between fishers who used different fishing platforms or targeted different species. Table 5 compares the mean (i) satisfaction with recreational fishing and (ii) importance of recreational fishing reported by fishers who use different fishing platforms and types. There is very little differentiation in reported satisfaction or importance by fishing platform and type, although those who participate in charter fishing and offshore fishing rate recreational fishing somewhat more important than other respondents, and also recorded slightly higher satisfaction with their fishing activities.

Table 5 Satisfaction with fishing, importance of fishing, and satisfaction with life overall, by fishing platform and type

Fishing platform/type	Recreational fishing satisfaction (mean score out of 10, from 1 = not at all satisfied to 10 = very satisfied)	Recreational fishing importance (mean score out of 10, from 1 = not at all important to 10 = very important)	Overall satisfaction with life (mean score out of 10, from 1 = not at all satisfied to 10 = very satisfied)
Land based fishing	7.3	8.3	8.4
Boat based fishing (non-charter)	7.2	8.3	8.6
Boat based fishing (charter)	7.5	8.7	8.6
Inshore fishing	7.4	8.4	8.5
Offshore fishing	7.5	8.7	8.6
Freshwater fishing	7.3	8.5	8.4

Table 6 compares the mean (i) satisfaction with recreational fishing and (ii) importance of recreational fishing reported by fishers who target different species. There is very little differentiation, with the exception that snapper fishers reported slightly higher recreational fishing satisfaction and importance compared to others.

Table 6 Satisfaction with fishing, importance of fishing, and satisfaction with life overall, by species targeted

Fishing platform/type	Recreational fishing satisfaction (mean score out of 10, from 1 = not at all satisfied to 10 = very satisfied)	Recreational fishing importance (mean score out of 10, from 1 = not at all important to 10 = very important)	Overall satisfaction with life (mean score out of 10, from 1 = not at all satisfied to 10 = very satisfied)
King George Whiting	7.4	8.3	8.5
Snapper	7.5	8.6	8.5
Squid	7.3	8.4	8.5
Other species	7.4	8.3	8.5

SATISFACTION WITH FISHING

All respondents were also asked how their level of satisfaction with their fishing activities had changed in recent years (Figure 27). Overall, fishers were more likely to be experiencing stable or growing satisfaction with their recreational fishing, than declining satisfaction. The most common response was that fishing satisfaction had remained about the same over time, with 57.8% of respondents reporting their satisfaction was about the same as it was a year ago, 48.3% that it was the same as three years ago, and 41.0% that it was the same as five years previously. Satisfaction with fishing had fallen for 11.2% of fishers in the last year, and or 19.6% over the last five years. Satisfaction with fishing had increased for 30.1% of fishers in the last year, and 37.6% of fishers in the last five years.

Figure 26 Reported satisfaction with fishing activities at time of doing the survey, compared to 1, 3 and 5 years previously

Those who reported that their recreational fishing satisfaction had changed over time were asked to describe why it had changed, in an open-ended question. Their responses were categorised. Figure 28 shows the reasons reported for growing fishing satisfaction, in order of their frequency, while Figure 29 shows the reasons reported for declining satisfaction with fishing activities. Fishing satisfaction was most commonly reported to have *grown* as a consequence of having better fishing equipment, more time to fish, or improvement in fishing skills, and less commonly for other reasons such as spending time with grandchildren. Fishing satisfaction most commonly *declined* as a consequence of lower catch success (which may occur for a number of reasons, often unspecified in the person's response to the survey question), and factors that lead to greater difficulty fishing such as access restrictions or lack of time in which to fish.

Figure 27 Most common reasons given by survey respondents for an increase in fishing satisfaction over time

Figure 28 Most common reasons given by survey respondents for a decrease in fishing satisfaction over time

FISHING INFRASTRUCTURE

The majority of survey respondents reported they were somewhat or very satisfied with their access to bait and other supplies, ramp jetties and wharves, roads, and accommodation (Figure 30). More than 40% of fishers were somewhat or very dissatisfied with their access to fish cleaning benches and offal disposal facilities, and fish attraction devices, while 35.3% were dissatisfied with their access to toilets, and 28.9% with their access to reservoirs.

Figure 29 Satisfaction of recreational fishers with access to different types of fishing-related infrastructure

Satisfaction with fishing infrastructure as a whole was highest in Port Lincoln and Ceduna, followed closely by the Eyre Peninsula, and lowest in Murray and Mallee and Inner Adelaide (Figure 31).

Figure 30 Average satisfaction with fishing infrastructure, by region in which respondents fished (n=1206)

As shown visually in Figure 32, fishers who were less satisfied with their fishing infrastructure were significantly more likely to rate fishing as being highly important to their life ($p < 0.000$, $r_s = -1.27$, $n = 1202$), and significantly less likely to be satisfied with their fishing overall ($p = 0.005$, $r_s = 0.140$, $n = 396$). Infrastructure condition therefore appears to matter more to people who consider fishing a key part of their life, and poor infrastructure is linked to lower satisfaction with fishing. However, it should be noted that the causation of these linkages is not known – for example, a person who is less satisfied with their fishing may be more likely to rate infrastructure as being inadequate, and it is equally possible that a person who experiences infrastructure problems will be less satisfied with their fishing as a consequence.

Figure 31 Average satisfaction with fishing infrastructure reported by fishers, compared to their satisfaction with and importance of fishing (n=382)

RECREATIONAL FISHING RULES, REGULATION AND STEWARDSHIP

Survey respondents were asked whether they agreed or disagreed with a series of statements about fishing rules, regulation and stewardship. The statements were designed to identify the extent to which recreational fishers feel able to comply with rules and regulations, and to which they feel a sense of responsibility and stewardship for fisheries resources. The large majority of recreational fishers report they can readily comply with fishing rules and regulations, that most recreational fishers fish responsibly, and that they know who to report noncompliance to (Figure 33). Somewhat fewer, although still a large majority, believe most recreational fishers comply with regulations, or would report people they see doing the wrong thing to authorities. Trust in fishers extends only to other recreational fishers, with a minority of recreational fishers agreeing with the statement 'most commercial fishers fish responsibly'.

Figure 32 Fisher's level of agreement with statements about fishing rules, regulation and stewardship

These responses indicate a strong sense of stewardship amongst recreational fishers. They reflect views and values about what *should* be done, rather than necessarily actual behaviour, and should be interpreted as such. They also reflect the views largely of experienced, regular fishers who may invest more time and effort in understanding rules and regulations compared to less frequent fishers.

This was explored further by examining whether responses to the statements shown in Figure 33 varied depending on the number of days a person fished in the previous 12 months. A Spearman's correlation test was insignificant for all but three items; for those three those who fished fewer days were significantly less likely to:

- Agree that they have a good understanding of recreational fishing rules/regulations ($p < 0.000$, $r_s = 0.243$, $n = 328$)
- Disagree that most recreational fishers fish responsibly ($p = 0.019$, $r_s = -0.130$, $n = 327$)
- Agree that they have a good knowledge of bag and size limits ($p < 0.000$, $r_s = 0.212$, $n = 326$).

This suggests there may be important differences in stewardship for fishers depending on their level of fishing effort. Those who fish less regularly are less likely to feel confident in their ability to follow fishing rules and regulations, an issue of concern given that the large majority of recreational fishers do not fish regularly (Jones 2009).

Fishers were also asked how they believe others view recreational and commercial fishers, a question that can help identify how confident fishers feel that their stewardship of fisheries resources is recognised by others. The majority of survey respondents (58.8%) felt recreational fishers are perceived positively by others, while only 12.9% felt that recreational fishers were perceived negatively by the broader community (Figure 34). When asked how the public perceive commercial fishers, 57.9% of survey respondents felt commercial fishers are perceived negatively, and only 12.9% that they are perceived positively.

Figure 33 Beliefs about how people in the general community perceive recreational and commercial fishers

Respondents who rated recreational fishing as highly important to their life were significantly more likely to think the public perceive commercial fishers negatively ($p < 0.000$, $r_s = -0.110$, $n = 1173$).

Respondents were significantly more likely to think the general community perceives recreational fishers negatively if they:

- Had lower satisfaction with their recreational fishing ($p = 0.002$, $r_s = 0.160$, $n = 389$)
- Had lower satisfaction with their life overall ($p < 0.000$, $r_s = 0.124$, $n = 1148$)
- Were younger ($p < 0.000$, $r_s = 0.128$, $n = 1135$)
- Fished more days ($p = 0.013$, $r_s = -0.138$, $n = 324$).

Perceptions also varied depending on the region in which a person fished and in which they lived. Fishers who fished in Inner Adelaide, Murray and Mallee and Ceduna were more likely than others to consider recreational fishers are perceived negatively by the general public, and those fishing in Northern SA, the Eyre Peninsula and Port Lincoln least likely to (Figure 35). Those who lived outside SA, on the West Coast, and in Adelaide were most likely to believe recreational fishers were perceived negatively, and those living in the Yorke Peninsula and Northern areas least likely to (Figure 36).

Figure 34 Responses to the question 'how do you believe most people in the general community perceive recreational fishers', by region in which respondents fished

Figure 35 Responses to the question 'how do you believe most people in the general community perceive recreational fishers', by region in which respondents lived

ACCESSING INFORMATION ON RECREATIONAL FISHING

The large majority of fishers report that they can easily access and understand information about recreational fishing in South Australia, and that they use information produced by PIRSA about recreational fishing (Figure 37). When a Spearman's correlation was conducted, no significant differences in responses were found between fishers who fished fewer versus more days.

Figure 36 Access, use and ease of understanding information about recreational fishing in South Australia

There was relatively little difference across regions in the self-rated ability of fishers to access information about recreational fishing management (Figure 38), although those in the Murray Mallee and Riverland, South East, Adelaide, and Fleurieu and Kangaroo Island regions were slightly less likely to feel able to easily access information than those living in other regions.

Figure 37 Responses to statements ‘I can easily access information about recreational fishing management in SA’, by region in which respondent lived

Respondents were asked whether they had obtained information on (i) fishing rules and regulations, or (ii) other fishing-related information, from a number of sources. As shown in Figure 39, the most common sources of information on rules and regulations were the PIRSA recreational fishing guide, notices and signs at fishing spots, pamphlets/brochures, the internet, fishing businesses and friends, with over 50% of fishers using these methods to obtain information of this type. Other fishing information was most commonly sourced from fishing businesses, friends, family, magazines, television, newspapers, the internet and FishSA, with between 20% and 40% of fishers obtaining fishing information from each of these sources.

Figure 38 Methods by which fishers reported obtaining fishing related information (n=1164)

FISHERIES MANAGEMENT

Fishers had a wide range of views when asked whether they trust PIRSA to make the right decisions for recreational fishing, and whether PIRSA do a good job of managing recreational fishing (Figure 40). In total, 40.7% agreed with the statement 'PIRSA do a good job of managing recreational fishing in SA', while 23.5% disagreed and the remainder indicated a neutral view, or that they didn't know. Fewer – 33.6% - agreed that they 'trusted PIRSA to make the right decisions for managing recreational fishing', with 35.5% disagreeing with this statement, and 27.7% indicating they neither agreed or disagreed.

Figure 39 Perceptions of management of recreational fishing by PIRSA

Respondents who did *not* trust PIRSA or consider PIRSA to be doing a good job were significantly more likely than those who *did* trust PIRSA or consider them to be doing a good job to:

- Consider fishing a very important part of their life ($p=0.003$, $r_s=-0.088$, $n=1177$ and $p<0.000$, $r_s=-0.159$, $n=1176$ for 'good job' and 'trust' respectively). This suggests that if fishing is central to a person's life, they are more likely to question fisheries management
- Report lower satisfaction with their recreational fishing activities (only significant for 'good job', $p<0.000$, $r_s=-0.197$, $n=391$)
- Be older (only significant for 'trust', $p=0.007$, $r_s=-0.179$, $n=1138$)

The numbers of days a person fished was not significantly correlated with their level of trust in PIRSA or their rating of how well PIRSA manages recreational fishing.

Respondents who lived in Murray Mallee & Riverlands, the South East, and Lincoln (with Lincoln referring to the Eyre Peninsula excluding Port Lincoln) were most likely to disagree that PIRSA do a good job managing recreational fishing (Figure 41). Those who lived in the Fleurieu and Kangaroo Island, Port Lincoln, Yorke and West Coast regions were most likely to agree that PIRSA do a good job managing recreational fishing.

Figure 40 Responses to statement 'PIRSA do a good job of managing recreational fishing in SA', by region in which respondent lived

The majority of survey respondents reported feeling that recreational fishers were treated fairly or very fairly compared to other users of fisheries resources in terms of allocation of catch (61.9%), access to fishing areas (55.9%), and gear restrictions (70.3%). However, only 24.2% felt fairly treated in processes used to make decisions about fisheries management, while 36.2% felt unfairly treated, and the remainder either indicated a neutral position or that they didn't know how fairly they were treated in these processes (Figure 42).

Figure 41 Perceptions of the fairness of treatment of recreational fishers compared to other users of fisheries resources

Fishers were significantly more likely to consider they were fairly treated with regard to decision making processes if they:

- Did not consider fishing highly important to their life, suggesting that avid fishers are less likely to feel equitably treated compared to occasional fishers ($p < 0.000$, $r_s = -0.209$, $n = 1171$)
- Believed PIRSA did a good job of managing fisheries ($p < 0.000$, $r_s = 0.440$, $n = 1173$)
- Trusted PIRSA to manage fisheries well ($p < 0.000$, $r_s = 0.528$, $n = 1170$)
- Had not had any previous involvement in fisheries management (Mann-Whitney U test, $p < 0.000$, $Z = -6.715$, $n = 1166$).

Fishers were significantly more likely to consider they were fairly treated with regard to allocation of catch if they:

- Did not consider fishing highly important to their life, suggesting that avid fishers are less likely to feel equitably treated compared to occasional fishers ($p < 0.000$, $r_s = -0.113$, $n = 1173$)
- Were satisfied or highly satisfied with their recreational fishing ($p < 0.000$, $r_s = 0.207$, $n = 391$)
- Believed PIRSA did a good job of managing fisheries ($p < 0.000$, $r_s = 0.291$, $n = 1172$)
- Trusted PIRSA to manage fisheries well ($p < 0.000$, $r_s = 0.315$, $n = 1171$)
- Had not had any previous involvement in fisheries management (Mann-Whitney U test, $p = 0.001$, $Z = -3.313$, $n = 1168$)

Fishers were significantly more likely to consider they were fairly treated with regard to access to fishing areas if they:

- Did not consider fishing highly important to their life, suggesting that avid fishers are less likely to feel equitably treated compared to occasional fishers ($p < 0.000$, $r_s = -0.134$, $n = 1175$)
- Were older ($p = 0.001$, $r_s = -0.103$, $n = 1138$)
- Believed PIRSA did a good job of managing fisheries ($p < 0.000$, $r_s = 0.288$, $n = 1175$)
- Trusted PIRSA to manage fisheries well ($p < 0.000$, $r_s = 0.309$, $n = 1173$)

Fishers were significantly more likely to consider they were fairly treated with regard to gear restrictions if they:

- Were satisfied or highly satisfied with their recreational fishing ($p = 0.001$, $r_s = 0.169$, $n = 391$)
- Believed PIRSA did a good job of managing fisheries ($p < 0.000$, $r_s = 0.302$, $n = 1176$)
- Trusted PIRSA to manage fisheries well ($p < 0.000$, $r_s = 0.283$, $n = 1174$)

When examined by the region in which a person lived (Figures 43 through 46):

- Residents of northern areas, Murray Mallee and Riverland and South East were most likely to feel unfairly treated with regard to *gear restrictions*, and those living in the Barossa and Lower North, West Coast, Lincoln and Yorke regions least likely to
- Residents of Adelaide and Murray Mallee and Riverland were most likely to feel unfairly treated with regard to *access to fishing areas*, and those living in the West Coast, Port Lincoln and South East least likely to
- Residents of northern areas, Adelaide, Barossa and Lower North and Murray Mallee and Riverland were most likely to feel unfairly treated with regard to *allocation of catch*, and those living in the West Coast, Fleurieu and Kangaroo Island, Yorke and Lincoln least likely to
- Residents of Adelaide, Murray Mallee and Riverland and Northern areas were most likely to feel unfairly treated with regard to *decision making processes*; and those living in the West Coast, living outside SA, Barossa and Lower North least likely to.

Figure 42 Response to question 'How fairly do you feel recreational fishers are treated ... in terms of gear restrictions' by region in which respondent lived

Figure 43 Response to question 'How fairly do you feel recreational fishers are treated ... in terms of access to fishing areas', by region in which respondent lived

Figure 44 Response to question 'How fairly do you feel recreational fishers are treated ... in terms of allocation of catch', by region in which respondent lived

Figure 45 Response to question 'How fairly do you feel recreational fishers are treated ... in terms of processes used to make decisions', by region in which respondent lived

INVOLVEMENT IN FISHING MANAGEMENT

To better identify how involved recreational fishers are in having a say about fisheries management, survey respondents were asked about their involvement in fisheries management and in fishing organisations. As can be seen in Figure 47, even within the sample of avid fishers obtained for this study, the large majority had not had any involvement in recreational fishing management, were not a member of a fishing club or association, and did not know how to contact people who represented their interests on fisheries advisory committees.

Figure 46 Involvement in recreational fishing management processes, and access to processes via representatives and fishing organisations

Those who reported they had been involved were significantly more likely than those who had not been involved in recreational fishing management to:

- Rate recreational fishing as highly important to their life ($p < 0.000$, $Z = -5.413$, $n = 1174$)
- Fisher a larger number of days ($p < 0.000$, $Z = -5.5159$, $n = 327$)
- Be in an older age group ($p < 0.000$, $Z = -4.454$, $n = 1142$)
- Disagree that they were satisfied with the level of consultation PIRSA undertakes with fishers ($p < 0.000$, $Z = -5.134$, $n = 1168$)

A person's level of satisfaction with fishing was not significantly associated with a higher or lower likelihood of becoming actively involved in fisheries management processes.

Membership of fishing clubs/organisations varied somewhat by age: those who were aged under 30, and 40-49, were least likely to be a member of a club (Figure 48).

Figure 47 Proportion of avid fishers who are members of fishing clubs/organisations, by age group (n=1162)

Almost half of respondents – 46.6% – indicated they were not satisfied with the level of consultation PIRSA undertakes with fishers (Figure 49), while 21.4% were satisfied (Figure 49). Respondents were divided on whether they knew how to have a say in recreational fishing (35.7% indicated they did not, and 34.2% that they did), or whether they understood how decisions about fisheries management are made (32.1% indicated they didn't and 30.3% that they did).

There were regional variations in fisher's confidence in being able to have a say in recreational fishing (Figure 50). In general, those who lived in or relatively close to Adelaide were least likely to feel they knew how to have their views heard in recreational fishing management. Those who lived in areas with a strong fishing culture – Port Lincoln and the surrounding Eyre Peninsula (labelled Lincoln in Figure 50), and the West Coast – were most confident. Those who lived in the Murray Mallee and Riverland, Mt Lofty Ranges, and South East were least likely to be satisfied with the consultation undertaken by PIRSA, and those in the West Coast, Northern regions, living outside SA, and in Port Lincoln, least likely to be dissatisfied with consultation levels (Figure 51).

Figure 48 Access to and satisfaction with recreational fishing management processes

Figure 49 Responses to the statement 'If I want to have a say in recreational fishing management, I know how to', by region in which respondent lived

Figure 50 Responses to the statement ‘I am satisfied with the level of consultation PIRSA undertakes with fishers’, by region in which respondent lived

When asked what methods they would be interested in using to find out more about recreational fishing management issues, or to have their say about it, survey respondents were most interested in receiving information from PIRSA, website interactions (defined as accessing or submitting information or comments via the PIRSA website), and attending public meetings (Figure 52). The least popular methods were social media, smartphone applications, and being a member of a co-management committee. This suggests a preference for simple methods that do not require ongoing commitment, and also a preference for traditional forms of consultation, with the exception of website interaction.

Figure 51 Preferred methods of expressing views about recreational fishing management issues

FISHING EXPENDITURE

The majority of fishers (61.4%) reported they had spent between \$1,000 and \$9,999 on recreational fishing in the previous year. Just over a quarter (25.2%) spent less than \$1,000 (Figure 53). Spending tended to increase as days of fishing increased, but only up to around 15 days of fishing a year; beyond this, increased days of fishing were not associated with consistently higher expenditure on fishing, with the exception of those who fished 100 or more days of the year (Figure 54). This suggests that, even for avid fishers, expenditure on fishing varies substantially.

Figure 52 Amount spent on recreational fishing in previous 12 months (n=1162)

Figure 53 Amount spent on recreational fishing, by days spent fishing (n=362)

Spending varied by age of fishers (Figure 55), with lowest amounts being spent by those aged under 25 and 70 or older. Those who spent higher amounts on fishing were typically more satisfied with their fishing activities (Figure 56), with the exception of those who spent more than \$50,000, who were much more likely to report being dissatisfied with their fishing than others.

Figure 54 Amount spent on recreational fishing, by age group of fisher (n=1143)

Figure 55 Reported satisfaction with fishing, by amount spent on recreational fishing in last 12 months (n=385)

People who spent more on recreational fishing were more likely than those who spent less to:

- Report being highly satisfied with their fishing ($p=0.016$, $r_s=0.123$, $n=385$); as can be seen in Figure 56, this result held for all spending up to \$49,999 but the small number of people who reported spending \$50,000 or more were more likely to report being dissatisfied with their fishing
- Have a higher household income ($p<0.000$, $r_s=0.159$, $n=969$)
- Own a boat ($p<0.000$, $r_s=-0.318$, $n=1146$)
- Report that the following aspects of fishing were important to them: relaxation/unwinding ($p<0.000$, $r_s=0.139$, $n=1137$); spending time in the outdoors ($p=0.006$, $r_s=0.082$, $n=1138$); continuing a family tradition ($p=0.005$, $r_s=0.083$, $n=1132$); participating in fishing competitions ($p<0.000$, $r_s=0.110$, $n=1128$); the enjoyment or sport of fishing ($p<0.000$, $r_s=0.226$, $n=1131$); passing on knowledge about fishing ($p<0.000$, $r_s=0.142$, $n=1128$)
- Report a lower level of satisfaction with fishing infrastructure ($p<0.000$, $r_s=-0.196$, $n=1155$)
- Report being unsatisfied with the level of consultation PIRSA undertakes with fishers ($p<0.000$, $r_s=-0.255$, $n=1146$)

The amount a person spent on fishing was not significantly correlated with their change in satisfaction with fishing over time, life satisfaction, or with the extent to which they rated eating their catch, spending time with family or friends, or getting away from people, as an important part of their fishing activities

When asked if they owned a holiday home purchased partly so they could fish in their local area, 22.2% of respondents responded 'yes', and 77.8% 'no'. This likely reflects the sample obtained, which included a large proportion of avid fishers.

Expenditure on fishing was analysed by (i) the region where fishers lived (Figure 57), and (ii) by the region in which they fished (Figure 58). There was greater variation when analysed by the location in which a fisher lived than fishing region, something which reflects that many fishers reported fishing in multiple locations. Fishers who lived in the West Coast, Barossa and Lower North, Port Lincoln, Lincoln (Eyre Peninsula), and outside SA were more likely to report spending less than \$1000 on fishing compared to those in other regions. The regions in which the greatest proportion of residents reported spending more than \$10,000 on recreational fishing were the South East, Northern, Port Lincoln, and Adelaide.

When analysed by the region in which a person fished, fishers who reported fishing in Port Lincoln, Ceduna, and outer Adelaide were most likely to spend under \$1000 a year on recreational fishing (Figure 58), and those who fished in Yorke and Lower North, the Eyre Peninsula, Limestone Coast, Port Lincoln and Inner Adelaide most likely to report spending \$10,000 or more on fishing.

Figure 56 Spending on recreational fishing in last 12 months, by region in which fisher lives NEED N

Figure 57 Spending on recreational fishing in last 12 months, by region in which respondent reported fishing

CONCLUSIONS

This survey examined the social dimensions of recreational fishing in South Australia. Principal conclusions from this examination relate to (i) the methods used to survey fishers, and (ii) social characteristics of avid fishers.

The survey clearly demonstrates that online surveys can be used to successfully survey recreational fishers in South Australia. This can significantly reduce the cost of conducting a survey of fishers compared to using CATI or mail-based methods. However, more specifically targeted survey distribution methods need to be used to obtain a more representative sample of fishers. Fishers should be recruited to do online surveys through methods that reach a more representative sample of fishers, specifically through phoning or mailing a random sample of residents, or recruiting fishers at fishing sites. Those who agree to be surveyed can then be sent the URL for the online survey via email. This would enable better selection of a more representative sample of fishers, but still enable use of the online survey platform, something that is useful for both 'one-off' and diary-based survey methods. As the most difficult group to recruit is fishers who fish only occasionally, any survey prizes offered should not be fishing-specific – instead, they should be designed to be attractive to fishers who fish only occasionally and may not be interested in prizes involving fishing equipment or experiences.

The results of the survey demonstrate that the social characteristics of recreational fishers do differ by region, but in quite complex ways. Those living on the West Coast and Eyre Peninsula had more positive views of many aspects of their fishing experiences, particularly fisheries management and consultation processes, compared to those who lived in or near Adelaide. Other characteristics, such as fisher expenditures, varied in complex ways depending on the region in which a person lived and the regions in which they fished. This highlights the importance of understanding how fisher experiences, preferences and behaviour vary in different regions and for different types of fishing, in order to best manage recreational fishing to maximise its benefits.

Fishers vary substantially depending on their age. Younger fishers are more likely than older fishers to engage in charter fishing and freshwater fishing, and less likely to go boat fishing. The reasons they fish are different to those of older fishers: younger fishers are more likely to fish for catch and release, and less likely to eat their catch, compared to older fishers. The importance of fishing for solitude also varies with age. Younger fishers are more likely to believe that recreational fishers are perceived negatively by the general public, something that has potential to reduce their enjoyment of recreational fishing.

Fishers tend to fall into clusters with quite different characteristics. Avid fishers tend to consider fishing as very important to their life, be highly satisfied with their fishing, spend larger amounts on fishing, and are more likely than less avid to be a member of a fishing organisation (although a majority are not members of these organisations). They fish a larger number of days, feel confident they can comply with fishing rules and regulations,

and have often been involved in fisheries consultation processes. They tend to be less satisfied with fishing infrastructure and with fisheries consultation processes, and have less trust in fisheries management, compared to less avid fishers. Occasional fishers tend to fish fewer days, spend less, not be involved in fisheries decision making processes, be less confident in their knowledge of fishing rules and regulations, but are highly satisfied with their fishing. They are also more satisfied with fishing infrastructure, fisheries consultation and management than the 'avid fisher' group.

The survey findings also highlight key issues that may affect participation in recreational fishing, and recruitment of new participants. This is an issue of interest given the rapid changes in fishing effort and participation identified by Jones (2009). The findings suggest that the main reasons people increase their fishing effort are either a lifestyle change (such as retirement), or investment in changing how they fish. Decline in fishing effort, however, is driven by weather and personal life. This suggests that recreational fishing organisations that seek to increase recreational fishing participation will not be successful unless they can overcome the influence of non-fishing factors that appear to drive changes in fishing effort. The survey results also suggest that the large majority of recreational fishers begin fishing during childhood, with few taking it up post childhood; and learn their skills informally, from other fishers or through teaching themselves. These factors all suggest that addressing the decline in the proportion of young people who fish, identified by Jones (2009), will be difficult unless effective strategies are developed to recruit people into fishing at an older age.

The survey results also support the hypothesis raised in previous studies that recreational fishing is associated with greater wellbeing for fishers (e.g. McManus et al. 2011). This wellbeing linkage is present if a person is satisfied with their recreational fishing, but higher wellbeing is not associated with the number of days fished, type of species targeted or fishing platform used. Assuming at least part of the correlation between a person's overall wellbeing and recreational fishing is caused by their fishing activities (something the data from this survey cannot establish), this suggests it is important to focus on increasing a person's satisfaction with recreational fishing in order to maximise the wellbeing benefits of fishing. The most common reasons respondents reported for an increase in their fishing satisfaction were investing in new fishing equipment, having more time or opportunities to fish, and improving their fishing skills. Of these, the latter is likely the easiest to influence and the simplest path to increasing the wellbeing benefits of recreational fishing. Decreasing satisfaction with fishing was associated with reduced quantity of catch, restrictions in access to fishing, and reduced time available to fish, and to a lesser extent to concerns about increased competition from other fishers. Some of these have potential to be addressed by fisheries management processes, suggesting potential pathways to increasing the wellbeing benefits associated with recreational fishing.

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Indigenous Social Objectives and Indicators

Summary of Activities:

Objective and Indicator Development:

The initial list of objectives and associated indicators resulted from a desktop literature research from a variety of sources. The first of these was of work relating to indigenous welfare indicators (including: The World Bank ; Trewin and Madden 2005; Stamatopoulou and Raj 2006; Taylor 2008; Department of Human Resources and Skills Development Canada 2011; Consultative Group on International Agricultural Research (CGIAR)), which is generally targeted at broad scale community health issues rather than specific resource use effects on community wellbeing.

This was then cross referenced with the various State agency documents on fisheries management objectives and any indicators they may have had for them; in the first case this was in relation to printed documentation and the second, through personal communication in light of issues of concern relating to fishing and water use activities in indigenous communities, which were gleaned from conversations in the Northern Territory and Queensland.¹ A set of draft objectives and indicators were then distributed for comment², where individuals were asked to review the draft document specifically with reference to;

- Initial responses to the proposed objectives; identifying strengths, weaknesses and opportunities to improve or modify them;

¹ Indigenous Fisheries Development Strategy 2012–2014
http://www.nt.gov.au/d/Fisheries/Content/File/indigenous/Indigenous_Fisheries_Development_Strategy.pdf
 : Accessed 15/2/12
 Indigenous Fisheries Development Strategy 2012–2014
http://www.nt.gov.au/d/Fisheries/Content/File/indigenous/Indigenous_Fisheries_Development_Strategy.pdf
 : Accessed 15/2/12
<http://www.fish.wa.gov.au/docs/pub/CustomaryFishing/Customary%20Fishing%20Policy.pdf> : Accessed 15/2/12
http://www.dpi.vic.gov.au/_data/assets/pdf_file/0006/43944/Aboriginal-Fishing-Strategy.pdf : Accessed 15/2/12
<http://www.dpi.nsw.gov.au/fisheries/aboriginal-fishing/strategy/nsw-ifs/nsw-ifs> : Accessed 15/2/12
http://www.dpi.qld.gov.au/documents/Fisheries_PolicyAndLegislation/Qld-Fisheries-Strategy-09to14.pdf : Accessed 15/2/12
<http://www.dpi.vic.gov.au/fisheries/aboriginal-fishing>: Accessed 10/2/12

² Pers Comm: Chris Calogeras (Program Manager), Indigenous Reference Group; by email 13/12/2011
 Pers Comm: Robert Carne (Indigenous Fisheries Manager), NT Fisheries; by email 14/3/12
 Pers Comm: Annabel Jones (Fisheries Manager, Torres Strait), AMFA; by email 30/3/12
 Pers Comm: Shane Fava (Regional Manager) & Damien Miley, Torres Strait Regional Authority; 22/3/12
 Pers Comm: Stan Lui, Senior NRM Officer (Sea); Land and Sea Management Unit, Torres Strait Regional Authority, QLD; 22/3/12

- The applicability and feasibility of the identified indicators; and
- Alternative indicators for the listed objectives and any new objectives identified by the groups that would be achievable within the resources of PIRSA and similar government departments.

Consequently, the initial set of objectives and indicators resulted from a variety of sources, but modified to for applicability to Australian indigenous circumstances and fisheries management resources; while being cognisant what data is likely to be readily available.

Feedback on the original Set

The variety of feedback was received in relation to the initial set of objectives and indicators (Appendix 1), prior to detailed consultation with one Aboriginal Community (the Narungga Nation, of which Point Pearce in South Australia is the epicentre). The generic feedback at the outset of the indigenous community consultation on the draft objectives and indicators effecting the continuation of cultural and traditional activities, were also recorded (Appendix 2).

Indigenous Community Case study

The objective of this part of the work was not to undertake exhaustive testing of objectives and indicators as has been undertaken for the industry and regional community objective/indicator sets. This was not envisaged as realistic given the large disparity in the amount of scoping work that has been undertaken in the industry and regional community sectors in relation to social objectives and indicators compared to indigenous communities here in Australia.

While the project envisaged identifying a draft set of objectives and indicators for indigenous communities, the key aim of the project was to scope the 'reasonableness' of these. The expectation is that these might then be taken forward to a national level of testing for applicability at a future date.

Consequently no data collection has been undertaken on the indicators identified, nor has any AHP or BBN analysis been undertaken for the results.

Outcomes

The case study has further refined the desktop developed objectives and indicators for Australia indigenous communities, with the results of:

- The case study confirmed the objectives and some indicators, but suggested the deletion and addition of other indicators;
- The case study confirmed a new objective, with an associated indicator.
- The case study resulted in identifying seven (7) objectives with nineteen (19) associated indicators (See Appendix 3).

The work has now progressed to a level whereby these objectives and indicators may now be:

- Put to a national forum of fisheries managers for acceptability to the various State and Territory Fisheries management frameworks;
- Undergo fisheries managers AHP analysis;
- Through selection of a diverse geographical range of fisheries and therefore associated Indigenous communities, undertake;
 - Scoping of the applicability of the objectives and indicators to these diverse communities, using the methodology identified by Rural Solutions;
 - Collection of data for the indicators at a level that may be considered representative of the diverse nature of Aboriginal and Torres Strait Island communities.

Conclusion:

At this time it would be preferable to have fisheries managers nationally assess the objectives utilising AHP, to provide a comparative perspective to the other objective sets.

It is suggested that this set of objectives and indicators are included in the final report of the project (FRDC 2010/040) as a preliminary set for further testing.

Appendix 1

Robert Carne – NT Fisheries (Email 14/3/12)

“I did find it a little difficult to read, esp (sic) some of the Objectives e.g. #1. I think you were right with your original statement but could have just added ‘...for relevant fisheries management decisions’. In regards to the table in Objective 1, Values are can be easily linked with ‘social’ values and from my experience, the best method to get this data is from ‘constant on-going consultation’ and making it part of Core Business (which is what I think you’re trying to achieve).

Objective 2, to me relates to the concept of ‘last man standing’, i.e. Commercial, then recreational, the Indigenous should be impacted in any management changes/decisions. And this should be regardless of Native Title claims. Local rangers are a good resource to engage in data collection and identifying individuals associated with ‘sea country’. Again, the table for this one should have on-going consultation process as core business. Perhaps have agency Polices reflect engagement protocols etc. In the orange Indicator 1 section, NT has allocated a proportion of stock in the Spanish mackerel fishery under a quota system.

Objective 3, really needs to show how it can recognise (and implement wherever possible) existing customary management (rules/protocols). Also how current contemporary management impacts on customary. An example here is that Indigenous managers continue to follow their traditional laws and try to effectively manage their resources, but have other factors impact on their activities, e.g. Recreational, Commercial fishers, habitat destruction due to developments, pollution etc.

Indicator 1 in this table can be measured again, with on-going consultation as core business. Obvious difficulties by trying to have one person from each mob represented at the MAC level, as the NT would be looking at a very minimum of eight reps. Need to be more innovative and allow agencies to be better resourced to engage Indigenous.

I hope I have provided you with something useful. Just as a matter of reference for you, I have attached the NT Indigenous Fishing Strategy 2012-14, as well as the NT Fisheries Marine Ranger Guideline. They are both very clear, short and specific in their objectives.

One of the problems with government agencies and non-Indigenous groups etc, is that we are always looking at Indigenous issues are being so different and complex, so we think we have to have complex solutions. Sometimes you just have to get on with it and do something, but use the KISS approach.”

Annabel Jones – AFMA Fisheries Manager, Thursday Island Torres Strait
(Email: 30/3/12)

1. “As I have read the document I have found myself thinking about what we can include in our Finfish Management Plan when we develop up the indicators etc in the near future. I think this demonstrates the success of your approach in developing the document, making managers think, and help them include social objectives and indicators in the management process.
2. I have struggled a little with the objectives and indicators, I think it is because I tend to be more comfortable with the detailed objectives, indicators and measures rather than broader ones, and I acknowledge that this document is not appropriate for detailed objectives. Hence, I think that my comments may not be that useful to you in the context of this document, but maybe more for consideration of what would be the next level of developing social indicators. What may help with others in this situation is an example of indicators included in the tables.
3. For the Torres Strait Island fisheries, I have also struggled with the fact that I feel that it is impossible to not consider the commercial fishing in the social objectives. There are such strong overlaps between the cultural and commercial fishing sectors that the commercial aspects have to be considered as these impact on the social values so much. This has been identified in a couple of research projects to date (Eva Plaganyi et al in their MSE of the lobster fishery that includes a range of social and economic indicators in the MSE, and Sara Busilacchi’s PhD project on subsistence fishing in eastern Torres Strait.). If you want more information on these I would be happy to send you some more information.
4. My feeling is then that the objectives don’t encapsulate subsistence, or customary fishing. For Torres Strait, the ability to fish for subsistence is as important as being able to fish for ceremonies etc. The two types of traditional fishing (Customary and cultural) are defined separately, they should both be referred to in the objectives. “

Appendix 2:

Narungga People, Point Pearce, South Australia (Case Study undertaken by Rural Solutions SA; Report "Testing the social framework with the Narungga community of South Australia"; July 2012; selected from comments received, pp.15-17.)

- There is a connection between cultural and customary rights and economic rights.
- Representatives suggested that the practice of cultural trade should be included as an appropriate use of marine species taken under the "Cultural Take" definition. An example was provided in a historical context that Edward Snell an early white settler, would barter/trade marine resources (fish, molluscs and crustaceans), which differs with Native Title rules on the commercialisation of animals.
- Aboriginal people have traditional knowledge on the local environment, fauna and flora. Recognising and incorporating this knowledge into contemporary science can have multiple benefits of improving stock assessments and providing economic opportunities for Aboriginal people.
- The group was concerned about the impact of seasonal closures in fisheries management plans on cultural and customary fishing practices (i.e. snapper closure).
- The State wide ban on the take of any creature in the rocky inter-tidal zone, including intertidal molluscs such as periwinkles and warreners is an example of how Government legislation is preventing Aboriginal cultural and customary practices.
- Actions of community members undertaking traditional practices (i.e. fishing and hunting) are driven by cultural needs. Changes in government regulations are required to allow for and protect the continuation of cultural and traditional practices.
- The group was unsure if or how an Indigenous Land Use Agreement negotiation for fisheries access would interact with the ESD process.
- Narungga and Aboriginal law still applies even today in modern times whereby Aboriginal people will not fish in other people's country without approval of the Traditional Owners.
- There are some Aboriginal cultural rules that are no longer enforced however some cultural rules (e.g. environmental protection and maintenance of culturally important resources) have been incorporated into the core values of the people. Aboriginal culture is constantly evolving and incorporating Aboriginal values and cultural and customary rights into fisheries management plans will assist Aboriginal people to continue to practice their culture and traditional practices.
- The group saw that the implementation of this process could assist Aboriginal communities strengthen their connection with the environment. This could result in an increase in the level of participation in environmental protection activities through heightened feelings of recognition of the rights and values of Aboriginal people.

- The representatives expressed a community frustration with repetitiveness of Aboriginal information collection by government agencies, especially information on fisheries and “Sea Country”. There was a concern that the process may be “reinventing the wheel”. The group expressed hope that the information gathered during this project would be utilised effectively by government and feed into future beneficial outcomes for Aboriginal communities.
- The group felt that information on fisheries was hard to access and should be more widely shared and easier to access.
- Education on fisheries rules and regulations is important and more needs to occur and should be provided by fisheries officers to kids and adults within the Point Pearce and broader Aboriginal community.
- The group would have liked to know the definition of a “Traditional ceremony” that will be used by State Governments. As this was unavailable at the time the representatives suggested that more work should be conducted in the future to define what constitutes a “Traditional ceremony”.
- The group was interested to know if the framework was applied to a fisheries management plan, what would be the timeframes to review the Aboriginal Objectives and Indicators. Representatives were concerned about the ability to negotiate or change management decisions outside of the fisheries management plan review cycle.

Appendix 3

<u>Objective 1:</u>		<u>Action</u>
Fisheries management actions support the maintenance of cultural and heritage values related to fishing activities in Aboriginal and Torres Strait Islander communities, within the constraints of ecological sustainability.		Supported by group.
<u>Group Suggested Indicators</u>	<u>Supplied Indicators</u>	<u>Actions</u>
Identify with the Aboriginal community the cultural and heritage values of the “Sea Country”	Values associated with Aboriginal and Torres Strait islander use of marine resources are identified for each community	These indicators were linked and it was decided that they should be merged to form a new indicator.
Ensure cultural and customary take is supported in fisheries management plans	Indigenous people access cultural and customary fisheries	The group supported the supplied indicator however they preferred their suggested indicator.
Recognition and protection of iconic species and habitat in fisheries management plans		New indicator.
Continued access of identified community iconic species through habitat protection and catch management		New indicator.
Determine the impacts of management activities on the maintenance of values and cultural activities over time.	Change in values over time	The supplied indicator was rejected and the group proposed their suggested indicator as a replacement. This indicator was suggested during a discussion on how fisheries management laws and gear restrictions have prevented the continuation of traditional netting of garfish. This was identified as preventing the continuation of cultural knowledge of fishing techniques and seasonal practices to the next generation.
Determine the impacts of management activities on the maintenance of values and cultural activities over time	Provisions in management plans do not inhibit cultural or customary fishing	The group supported the supplied indicator and thought it appropriate to link with their suggested indicator to monitor fisheries management plans effect on cultural and customary fishing practices.

<u>Objective 2:</u>		<u>Action</u>
Ensure access to 'Sea Country' to enable continuation of cultural fishing activities, respecting the rights of Aboriginal and Torres Strait Islander peoples to these resources, within the constraints of ecological sustainability.		Supported by group.
<u>Group Suggested Indicators</u>	<u>Supplied Indicators</u>	<u>Actions</u>
Identify and understand the Traditional Owners historical context of the Sea Country and their management processes		New indicator. This indicator was suggested by the group to ensure fisheries managers are aware of the worldview of the Aboriginal community they engage with. This is aimed to improve communication and collaboration on management plans by developing mutual understanding and respect of each other's needs.
Support annual and seasonal practices of cultural and customary take including the cultural values that underpin the take		New Indicator. This indicator is linked to suggested indicators in objective 1 to support and ensure the ability to continue cultural and customary practices.
	Identification of 'Sea Country' associated with fisheries management plan. Note that indicators may be included that specifies a minimum level of access to: (1) a geographic region (2) a quantity of stock and (3) a proportion of stock As a way of enabling continuation – need to define most appropriate way of ensuring activities can continue.	Supported by the group on the premise that the Aboriginal community participate in the assessment and decision making.

<u>Objective 3:</u>		<u>Actions</u>
Provide opportunities for Aboriginal and Torres Strait Islander communities to participate in fisheries management decision making processes.		Supported by group.
<u>Group Suggested Indicators</u>	<u>Supplied Indicators</u>	<u>Actions</u>
Representatives from the Aboriginal communities are active participants in fisheries management decision making	Identification of Indigenous community or Nation representative of 'Sea Country' associated with the fishery	The group discussed the supplied indicator and suggested a new indicator to represent active participation of Aboriginal community representatives in management processes and focusing Aboriginal engagement to groups associated with sea county and which interact with the specific fishery management plan.
Nominated representatives of Aboriginal communities associated with 'Sea Country' and a fishery are active participants in fisheries management decision making	Level of attendance at advisory committee meetings	The suggested indicator is a replacement indicator for the above suggested and supplied indicator and the level of attendance indicator. The suggested indicator incorporates the measures of the three replaced indicators.
Nominated representatives seek community signoff of fisheries management plans	Satisfaction with consultation process	The suggested indicator was developed through discussions on the supplied indicator. The group felt that having a community signoff process was a greater representation of satisfaction with the fisheries management plan development process than the supplied indicator.

<u>Objective 4:</u>		<u>Action</u>
Ensure access to income earning opportunities for Aboriginal and Torres Strait Islander community members related to the management of fisheries marine and water resources, including participation in data collection processes, within the constraints of ecological sustainability.		Supported by group.
<u>Group Suggested Indicators</u>	<u>Supplied Indicators</u>	<u>Actions</u>
	Aboriginal and Torres Strait Islander communities are able to access income-earning opportunities related to fisheries, marine and water resources	Supported by group.
Procurement process to allow for the select tendering of Aboriginal community members for the communities associated with 'Sea Country' in the fishery	Tendering process that is tailored to Aboriginal and Torres Strait Islander employment circumstances for the communities associated with the 'sea country' in the fishery	The group supported the supplied indicator. The suggested indicator strengthens the supplied indicator.
<p>Training and capacity building opportunities are identified and supported</p> <p>Group suggested measures:</p> <ul style="list-style-type: none"> • Aboriginal community members are involved in education and compliance of fisheries management plans • Training opportunities are accessed by Aboriginal communities members • Percentage of certification achieved through training opportunities 		This indicator was suggested by the group to promote additional opportunities for community members. It focused on identifying income generating opportunities by coupling work with potential accreditation programmes. The inclusion of Aboriginal community members in the education and compliance elements of fisheries management plans was suggested to provide assistance for Aboriginal communities and regulatory bodies to monitor management plans.

<u>Objective 5:</u>		<u>Action</u>
To make fisheries collected data available in a timely and publicly accessible manner		Supported by group.
<u>Group Suggested Indicators</u>	<u>Supplied indicators</u>	<u>Actions</u>
	The number of information releases; amount and type of data available on website	<p>The group supported this indicator and provided clarity on the type of information that could be provided by PIRSA fisheries.</p> <ul style="list-style-type: none"> • Provision of information on the process and science determining stock health and allocation amongst users. • Information on environmental health, ecosystems would be appreciated by the group.
	Proportion of information that is released publicly	Supported by group.
	Currency of information that is released	Supported by group.
	Quality, comprehensiveness and accessibility of data released	Supported by group.
Community nominees involved in fisheries management planning provide relevant and requested fisheries information back to the communities they represent. Within the constraints of confidentiality	Satisfaction of stakeholders with information provision	This indicator was suggested to be linked with the group suggested indicator that community nominees provide relevant information back to their communities. The suggested measure of this would be the community sign off of fisheries management plans.

<u>Objective 6</u>		<u>Actions</u>
Aboriginal and Torres Strait Islander communities associated with sea country have a high level of trust in the management of fisheries		Supported by group.
<u>Group Suggested Indicators</u>	<u>Supplied Indicators</u>	<u>Actions</u>
Community nominees participate in the evaluation process of fisheries management plans		The group supported the idea that community nominees are active participants throughout the entire fisheries management plan cycle.
Collaborative cultural and scientific research is supported to ensure fisheries management is consistent and supportive of cultural and customary take.	Level of trust in fisheries management	The supplied indicator was removed due to the difficulty of accurately measuring trust in the process of fisheries management. The group suggested the alternative to incorporate traditional knowledge into Western scientific research and build trust in the fisheries assessment process.

<u>Objective 7</u>	<u>Action</u>
Ensure collaborative inputs by Aboriginal communities, Regional and Industry sectors on the benefits each sector offers to fisheries management.	New Objective.
<u>Indicator</u>	<u>Action</u>
Aboriginal groups participate in the fisheries ESD education process to build capability and increase participation amongst sectors to strengthen fisheries management.	New Indicator.

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Ecological Sustainable Development Fisheries Management Social Objectives & Indicators

Testing the social framework with the Narungga community of South Australia

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Agribusiness

Environment

RURAL SOLUTIONS SA



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Community Approval

This document reflects conversations and input from participants of the Narungga nation from Point Pearce in May and June 2012. This information is provided in the spirit of building relationships and creating a greater understanding of the importance of Sea Country to the Narungga people. The participants maintain an inherent and cultural responsibility to ensure their Sea Country is managed appropriately for future generations. Ecological sustainable development objectives and indicators reflect an integrated approach to the future management of Sea Country and fisheries management zones. Approval is provided for this information to be used to advance Aboriginal participation in Sea Country management.

“The pleasing aspect for the Narungga people is the best practice approach to this process. We have appreciated being involved in every aspect; from the submission, input into workshop plans, active participation in the workshops and input into the report.”

George Walker, Chair of the Point Pearce Aboriginal Corporation

Signed

A handwritten signature in black ink that reads "George L Walker". The signature is written in a cursive style with a long horizontal flourish at the end.

George Walker

Date: 18/07/2012

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1 EXECUTIVE SUMMARY

Ecological Sustainable Development (ESD) has been incorporated into legislation guiding the management of most of Australia's fisheries. ESD aims to incorporate all users of a resource into three management considerations; economic, ecological and social. Economic and ecological objectives are often addressed in fisheries management plans however this is often not the case for social objectives. The incorporation of social, economic and ecological objectives into future management plans is necessary to achieve ESD.

The three recognised social components of fisheries ESD in Australia are commercial, recreational and traditional fishing. Engagement with Aboriginal communities in the ESD process has been difficult in the past due to the absence of an appropriate tool or engagement mechanism available to fisheries managers. This project aimed to overcome this problem by testing recently developed indicators with a South Australian Aboriginal community and developing engagement recommendations for future extension.

Aboriginal and Torres Strait Islander people have an extensive knowledge history and significant cultural connection to Sea Country. Traditional lore, values, spirituality, health and wellbeing are still considered as important today as they have been for hundreds of generations.

The contemporary challenges Aboriginal and Torres Strait Islander people face are exacerbated by Western interactions and approaches to mapping, researching, dividing and allocating the resources of fisheries. Historically, these interactions have not always been respectful of traditional values and more work is needed to understand this in moving forward.

The extensive Aboriginal knowledge that exists in coastal communities is an untapped and valuable resource which has the potential to be highly beneficial in fisheries management. There is a growing understanding and appreciation for Aboriginal cultural knowledge, in terms of providing a valuable educational component to current and future generations about the connection between the Sea Country, the land and the interconnectedness of people that interact with it.

The work conducted by Rural Solutions SA with the Narungga people of South Australia highlights their passionate commitment to Sea Country and their desire and willingness to participate. The Narungga community was the preferred group to trial the social objective and indicator framework based on their experience and knowledge in managing Sea Country. Despite having significant issues with regulators and fishing industry representatives in the past, the participants of this activity were focused on the future of their Sea Country, equity for all groups that interact and the ongoing use for future generations.

The commitment of individuals to work through the schedule has been positive. The Narungga people have been respectfully engaged in the entire process of this activity

including the design and approach. The deeply considered views of participants are provided in the spirit of generating discussion and validating the body of draft work provided as well as reinforcing the need to integrate and value Aboriginal knowledge and traditions into future fisheries management.

The objective and indicator discussions generated self reflection and deep thoughts on the importance of Sea Country amongst the group. The flexibility of the objective and indicator framework was effective in capturing the information presented by the group. Through the personalisation of objectives and indicators, a holistic view of the values of an Aboriginal group was achieved. The delivery approach and methodology assisted the community representatives to understand the concept of objectives and indicators and apply this knowledge to incorporate their values to form representative objectives and indicators.

Upon completion of the objective and indicator discussions the group commented that “the social objectives and indicators are about fisheries management and does not tell the story of individual, family and community wellbeing as a result of connections to Sea Country”. This comment crystallises the disconnect felt by the group between the operational function of objectives and indicators and the values they represent. The identification of measures is suggested to have complimented this process and may have provided a clearer representation and specification of individual, family and community wellbeing as a result of connections to Sea Country.

The following recommendations are based on the learning’s from this activity and the experience of those involved. These recommendations are in no specific order of importance and should be considered as critical success factors for use if further work is to be done in engaging and working with Aboriginal groups.

- Where possible, a community champion with knowledge, experience and networks within the selected community, should be identified and utilised within the scope of works to provide the necessary links, communication and behind the scenes discussion, critical to participation and interaction.
- It is beneficial to the process and the community to involve multiple generations during the definition of the Aboriginal communities fisheries objectives and indicators.
- Contextualising the definitions and use of objectives and indicators through locally relevant examples aids in generating participant understanding.
- Personalisation of social objectives and indicators by each Aboriginal community involved in a fishery is required to have contextual relevance.
- Understanding the history and background of the Aboriginal Nations of the selected community, its connection to Sea Country, the interactions with government and the broader fishing industry, will be of significant benefit.
- Allow for significant time and flexibility when conducting the engagement activities and ensure all represented groups have the opportunity to participate.
- The use of jargon, technical terms and acronyms can be a barrier to participation. Developing a glossary of terms and working collaboratively with participants to

develop a consensus and understanding of technical and colloquial terms are seen as tools to overcome this barrier.

- The use and understanding of the engagement continuum, (IAP2) is a worthwhile model when considering engagement and establishing relationships.
- It is important to understand that participants, whilst keen to be involved, will have competing interests, including, jobs, health issues, family and cultural obligations that may take precedence. Being respectful of these issues is important. Arranging and rearranging meeting times to facilitate participants and the delivery team to honour their commitments will build trust and respect.
- It is important for objectives and indicator discussions, that the delivery team possess sound knowledge of the application of objectives and indicators in the context of the ESD framework, and employs strong facilitation skills to assist group members to transform their values into objectives and indicators meaningful to the purpose for which they will be used.
- Further work should be conducted to define what constitutes a “Traditional ceremony” within the context of fisheries ESD.
- Future investigations of the suitability of objectives and indicators to represent Aboriginal value, should allow for the identification of measures to support indicators and assist in the representation of individual, family and social wellbeing as a result of connections to Sea Country.
- Application of the methodology and recommendations from this study to trial social objectives and indicators with Aboriginal groups in other jurisdictions. Further investigations will form a national perspective of the effectiveness of objectives and indicators as a tool to incorporate Aboriginal values into fisheries management plans.

2 BACKGROUND

Australia's National Strategy for Ecologically Sustainable Development (1992) defines ecologically sustainable development as: 'using, conserving and enhancing the community's resources so that ecological processes, on which life depends, are maintained, and the total quality of life, now and in the future, can be increased'¹.

Ecologically Sustainable Development (ESD) has been incorporated into the legislation guiding most of Australia's fisheries. ESD aims to incorporate all users of a resource into management considerations, these are categorised as economic, ecological and social. Until recently the majority of work on the development of ESD indicators has centred on ecological and economic sustainability.

Consideration of social components is now gathering interest. The three recognised social components of fisheries ESD in Australia are commercial, recreational and traditional fishing. Aligning Aboriginal cultural values into the process will require significant engagement and investment by jurisdictions. An appropriate tool and process for engagement is critical to ensure good participation, understanding and quality of the findings. This project aimed to establish a foundation by testing recently developed

¹ <http://www.environment.gov.au/about/esd/index.html>

objectives and indicators with a South Australian Aboriginal community and developing engagement recommendations for future application.

2.1 INCORPORATING ABORIGINAL CULTURAL VALUES

Incorporating Aboriginal cultural values into management plans will provide benefits to Aboriginal communities associated to Sea Country, State and Federal Government, fisheries managers, and recreational and commercial fishers. Building upon and strengthening collaborative relationships to manage fisheries following the ESD principles will achieve better fisheries management into the future.

The participation of Aboriginal people in the fisheries management process will ensure the collective knowledge and experience of cultural science and cultural values are incorporated into the policy, planning and management of fisheries.

2.2 CONSULTANCY BRIEF & CONTEXT

Rural Solutions SA (*„the service provider“*) was required, by the Principal Investigator (*„the client“*) of the FRDC project „Developing and testing social objectives for fisheries management“, to engage with a South Australian Aboriginal community to trial social objectives and indicators that were drafted to incorporate Aboriginal values into fisheries management plans. See Appendix 1 for the project brief and Appendix 2 for the project proposal.

2.3 INFORMATION ON NARUNGA NATION

Narungga lands cover the entire Yorke Peninsula and extend north and east to the border of the Kurna and Nukunu lands (Figure 1). Point Pearce is the epicentre for Narungga people Australia wide and Aboriginal culture on Yorke Peninsula. It is an important place for the Narungga people to access and conduct cultural and traditional fishing practices. Point Pearce was first established as Yorke Peninsula’s Aboriginal mission in 1868. The Aboriginal people of Point Pearce were given control of the land in 1972, when the management of 5,777 hectares was transferred to the Point Pearce Community Council under the *Aboriginal Lands Trust Act 1966*.



Figure 1: Map of Yorke Peninsula, South Australia, the traditional lands of the Narungga people. Note that in this map Narungga has been spelt incorrectly as Narangga. Adapted from Aboriginal Australia Wall Map, D R Horton, Aboriginal Studies Press, AIATSIS, 1996

The Narungga people are known as the butterfly people and have a strong lasting cultural connection to the coastal area and marine resources. The Narungga community have worked with the South Australian State Government to develop a Narungga fishing Indigenous Land Use Agreement (ILUA) and a Narungga cultural fishing management plan. Participation in these processes has shown that the Narungga community has knowledge in fisheries management and experience working collaboratively with the State Government. This experience and knowledge was the determining factor in the process of identifying an Aboriginal community in South Australia to trial the social objective and indicator framework.

3 METHODOLOGY

The planning process for the social objectives and indicators workshops began with the delivery team developing a project engagement and delivery plan. It was important for the delivery team to have a comprehensive understanding of the ESD framework and the context of which objectives and indicators were to be used to measure Aboriginal social values. Session plans were developed for all community engagement events to ensure a managed approach to introducing and explaining unfamiliar concepts to community representatives (see Appendix 3).

The project team applied the International Association for Public Participation Australasia (IAP2) framework for the engagement process. The Involve and Collaborate levels of the IAP2 framework (Appendix 4) were used as a guide to plan the workshops and to engage with the Narungga community. The methodology included the following steps:

1 Development of communication information

Background information critical to the communication of the project was developed in order to contextualise and reference discussion prior to and during the pilot.

An early discussion with the Principal Investigator identified the opportunity to utilise the skills, experiences and strong networks of Mr Klynton Wanganeen, (Narungga Leader), in this project. The net benefit of Mr Wanganeen's role was seen as critical to communicating the activities, obtaining community participation and interactions that can be difficult as an external agent. The extensive knowledge networks and experience provided a valuable context to participants and equally and respectfully challenged the discussions occurring during the workshops.

2 Engage with the Aboriginal community (Narungga)

A preliminary meeting and discussions occurred to seek endorsement and participation by the nation. The authors decided not to introduce the free and prior informed consent forms due to the wishes of members of the group to remain anonymous. The consent to use gathered information was decided to be provided through community sign off of this document. Project background information was provided and distributed to enable discussion, preferred meeting dates and a project schedule was discussed and agreed upon.

3 First formal meeting

This meeting was used to provide information on the scope of the project, identify the Ecological Sustainable Development framework and establish context for the discussions. The objectives and indicators process were identified and discussed to seek understanding and perspective.

4 Second formal meeting

A review of the previous meeting occurred to remind participants of the project context. Formal discussions revolved around the suitability of the suggested objectives and indicators or alternative indicators identified by the community. Information was collected

to inform and support the objectives and indicators and how they relate to the Narungga nation.

Initially it was planned for the two formal workshops to be separated by a two week period. Due to unforeseen events (e.g. funerals and logistical difficulties) the delivery plan had to be amended and the workshops were rescheduled to run on consecutive days. This resulted in a high retention of information by the community participants and is believed to have contributed to increased efficiency, participation and coverage of issues during the second formal workshop than what may have occurred if there was a delay between delivery dates.

5 Review data and write draft report

The data collected from the formal meetings was reviewed by Rural Solutions SA and a report written on the findings and recommendations for future applications. The draft was sent to Dr. Lianos Triantafillos and Dr. Kate Brooks for their input.

It should be noted that in a South Australian context the term Aboriginal is preferred as opposed to Indigenous. In the context of discussions with the community, Aboriginal and Torres Strait Islanders and Indigenous were replaced with the term Aboriginal. This is reflected in the objectives and indicators that are provided within this report.

6 Present draft report to Community

A formal meeting was held with the Narungga community to present and discuss the draft report. This provided an opportunity to incorporate their input and recommendations and ensure the report represented their responses to the objectives and indicators.

7 Edit of final report

Recommendations gathered from the community meeting were incorporated into the final report. Upon completion the document was sent to Dr. Lianos Triantafillos and the FRDC project team.

8 Present report to community and identify further opportunities

The final report was provided to the Narungga in a community meeting that involved discussions on further opportunities on the application of the social indicator project into a national context.

4 CONSULTATION

4.1 PROJECT INFORMATION SESSION

An initial meeting was held to provide information on the project to as many community members as possible, in recognition of the importance of their input and ensure there was a genuine interest from the community to participate. Additionally it was seen as critical to achieving credible outcomes that a relationship be established, to build trust, respect and capture information on the community's history, rich culture and their involvement and knowledge of fisheries management. The following information was captured and is provided to articulate the views and perspectives of those engaged on the day.

Community aspirations

- Community commercial fishing activities within their Sea Country.
- Protection of the following habitats are important considerations now and into the future;
 - the sand spit,
 - creeks in Port Victoria bay and other important habitats for juvenile marine species,
 - Galadry beach,
 - Warraulti beach to Barkers beach,
 - Point Turton,
 - Recognition of Cape Elizabeth as Narungga owned country.
- Coastal protection / access / ownership are all seen as matters relevant to the Narungga community.
- The ability to conduct traditional and cultural practices on Sea Country.
- Exclusive Narungga and Point Pearce community access rights to culturally significant coastal sites, are a critical issue for the Narungga community.

Positives for traditional fishing at Point Pearce

- Commercial netting has stopped. This has led to a reduction in environmental damage and increased fishing outcomes for the all Narungga people, and everyone who fishes in the region.

Ongoing assistance required

- Commercial netting needs to be restricted in certain locations (i.e Bird Island) for the community to successfully conduct shore based fishing activities.
- To ensure commercial fishing operators are respecting areas closed to fishing.
- To protect offshore cork weed habitat from commercial trawlers.
- To resolve conflicts between user groups – Cape Elizabeth (Moonta residents and Narungga & Point Pearce community), Balgowan (Maitland residents and Point Pearce community).
- To prevent people riding motorbikes in the Point Pearce sand dunes and disrespecting Sea Country.
- To improve relationships between the Minister responsible for Fisheries and Aquaculture and the Narungga community.
- To help the community reach its aspirations.
- Previous Government assisted Point Pearce community commercial enterprises were unable to reach economic self sustainability before Government assistance was ceased. If Government agencies assist in the development of future community commercial enterprises ongoing assistance is requested to reach economic self sustainability.

The following table represents information that was provided in discussions to demonstrate the value, relationships and interactions the Narungga community have with their Sea Country.

Table 1: Community provided list of important marine species to the Narungga people. The list includes iconic consumed and non-consumed species of fish, molluscs, crustaceans and marine mammals. This list is far from exhaustive and is limited by the time available to capture knowledge. Whilst not part of the brief it does demonstrate the cultural and customary links the Narungga people have with Sea Country. * = Iconic, culturally important species.

Important Marine Species	Consumed (Yes or No)
Fish	
Butterfish* – Dusky morwong (<i>Dactylophora nigricans</i>)	Yes
Whiting – King George (<i>Salliginodes punctata</i>), Silver (<i>Sillago bassensis</i>) and Yellowfin (<i>Sillago schomburgkii</i>)	Yes
Garfish (<i>Hyporhamphus melanochir</i>)	Yes
Tommies – Australian Herring (<i>Arripis georgianus</i>)	Yes
Snapper (<i>Pagrus auratus</i>)	Yes
Mullet (<i>Aldrichetta forsteri</i>)	Yes
Flathead (<i>Platycephalus</i> species)	Yes
White bait (<i>Hyperlophus vittatus</i>)	Yes
Magpie Perch (<i>Cheilodactylus nigripes</i>)	Yes
Foobala – Zebrafish (<i>Girella zebra</i>)	Yes
Goreta* – Sharks	No
Stingrays*	No
Dunimudla* - toadfish	No
Molluscs	
Abalone – Greenlip (<i>Haliotis laevis</i>), Blacklip (<i>Haliotis rubra</i>) and staircase abalone (<i>Haliotis scalaris</i>)	Yes
Warrener* (<i>Turbo undulata</i>)	Yes
Periwinkle* (<i>Nerita atramentosa</i>)	Yes
Cockles – small sand cockles found at Point Pearce	Yes
Scallops (Family <i>Pectinidae</i>)	Yes
Squid (<i>Sepioteuthis australis</i>)	Yes
Cuttlefish (<i>Sepia apama</i>)	Yes
Crustaceans	
Blue Swimmer Crab (<i>Portunus pelagicus</i>)	Yes
Southern Rocklobster (<i>Jasus edwardsi</i>)	Yes
Western King Prawn (<i>Melicertus latisulcatus</i>)	Yes
Mammals	
Whales*	No
Dolphins*	No
Seals*	No
Penguins*	No

4.2 WORKSHOP 1

4.2.1 Background

The current method of managing fisheries in South Australia was explained using visual representations of whiting, snapper and squid stocks. These three species were chosen as examples because of how their management plans differ based on the biology of the species and in their allocations amongst recreational and commercial users and the environment (remaining biomass to maintain a sustainable stock level). Management controls (input and output) were discussed with the group to remove misconceptions and increase their understanding of the fisheries management process. The context of this project within these indicative examples was discussed and explored with the group to assist in the applicability of the theoretical concepts required to provide input into the objective and indicator discussions.

Ecological Sustainable Development

The term “Ecological Sustainable Development” (ESD) is becoming increasingly used by government. The level of understanding of ESD varied between community group members. To ensure a common understanding amongst all participants the term Ecological Sustainable Development was broken down and discussed in a facilitated process to build a group consensus and understanding of the terminology. The following represents the group consensus of Ecological Sustainable Development.

- **Ecological**
 - Environmentally friendly
 - Looking after plants
 - Logical thinking about the environment
- **Sustainable**
 - Lasting forever
 - Enough to go around forever
 - Species to survive
- **Development**
 - Rules, what and how you can take or use species (animals and plants)
 - Restocking

The Ecological Sustainable Development framework was stepped out and discussed at every level to develop participant understanding of the structure and the context that each segment represents (Figure 2).

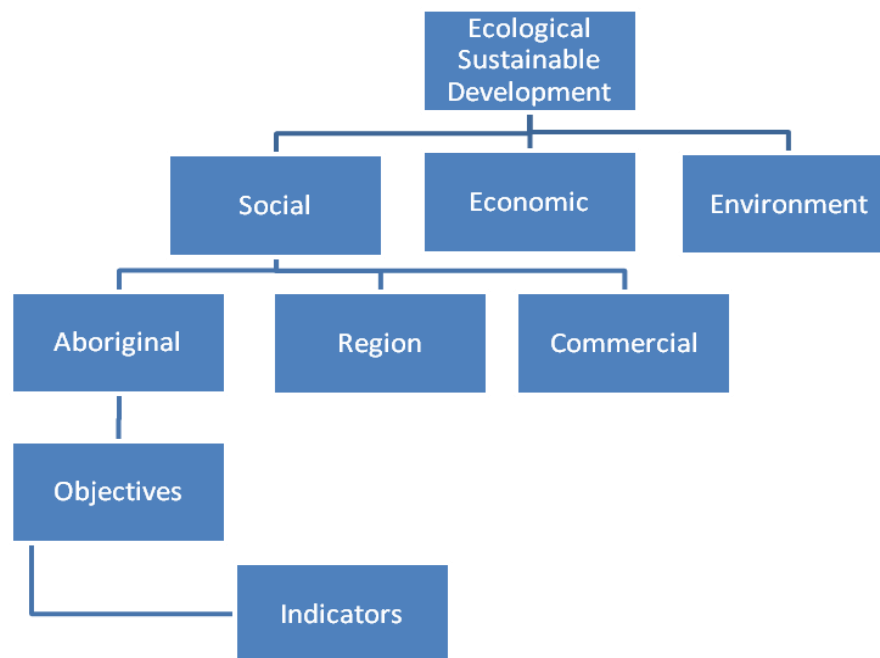


Figure 2: Hierarchical structure of the Ecological Sustainable Development framework discussed in with the Narungga community during the Social Indicators workshops.

The draft definitions of Cultural and Customary take were provided to the group and were the basis for a discussion on the appropriateness and representativeness of the terms.

Cultural Take: *„food for traditional ceremony purposes leaving enough for future generations’*

Customary Take: *„fishing for the purpose of satisfying personal, subsistence, educational or non-commercial communal purposes“*

“The Social and cultural practices relating to fishing and interaction with Sea Country contribute significantly to the social, health, wellbeing, physical, cultural and spiritual strength of the individuals and traditional owners”

Karen Brine and George Walker

The following represents key points of discussion from the group

- There is a connection between cultural and customary rights and economic rights.
- Representatives suggested that the practice of cultural trade should be included as an appropriate use of marine species taken under the “Cultural Take” definition. An example was provided in a historical context that Edward Snell an early white settler, would barter/trade marine resources (fish, molluscs and crustaceans), which differs with Native Title rules on the commercialisation of animals.
- Aboriginal people have traditional knowledge on the local environment, fauna and flora. Recognising and incorporating this knowledge into contemporary science can have multiple benefits of improving stock assessments and providing economic opportunities for Aboriginal people.

- The group was concerned about the impact of seasonal closures in fisheries management plans on cultural and customary fishing practices (i.e. snapper closure).
- The State wide ban on the take of any creature in the rocky inter-tidal zone, including intertidal molluscs such as periwinkles and warreners is an example of how Government legislation is preventing Aboriginal cultural and customary practices.
- Actions of community members undertaking traditional practices (i.e. fishing and hunting) are driven by cultural needs. Changes in government regulations are required to allow for and protect the continuation of cultural and traditional practices.
- The group was unsure if or how an Indigenous Land Use Agreement negotiation for fisheries access would interact with the ESD process.
- Narungga and Aboriginal law still applies even today in modern times whereby Aboriginal people will not fish in other peoples country without approval of the Traditional Owners.
- There are some Aboriginal cultural rules that are no longer enforced however some cultural rules (e.g. environmental protection and maintenance of culturally important resources) have been incorporated into the core values of the people. Aboriginal culture is constantly evolving and incorporating Aboriginal values and cultural and customary rights into fisheries management plans will assist Aboriginal people to continue to practice their culture and traditional practices.
- The groups saw that the implementation of this process could assist Aboriginal communities strengthen their connection with the environment. This could result in an increase in the level of participation in environmental protection activities through heightened feelings of recognition of the rights and values of Aboriginal people.
- There was a group perception that commercial fishers were intentionally providing misleading catch and location information to distort fisheries management decisions and therefore preventing Aboriginal commercial access.
- There is a perceived protection of current commercial fishing licence holders by the State Government, which is therefore preventing Aboriginal commercial access to fisheries.
- There are observed recreational breaches of commercial sales of marine products e.g. People have been observed selling fresh and processed crabs illegally at Wallaroo.
- Indigenous rights to fisheries in other countries/internationally should be researched and communicated to build knowledge and understanding.
- The representatives expressed a community frustration with repetitiveness of Aboriginal information collection by government agencies, especially information on fisheries and "Sea Country". There was a concern that the process may be "reinventing the wheel". The group expressed hope that the information gathered during this project would be utilised effectively by government and feed into future beneficial outcomes for Aboriginal communities.
- The group felt that information on fisheries was hard to access and should be more widely shared and easier to access.
- Education on fisheries rules and regulations is important and more needs to occur and should be provided by fisheries officers to kids and adults within the Point Pearce and broader Aboriginal community.

- The group would have liked to know the definition of a “Traditional ceremony” that will be used by State Governments. As this was unavailable at the time the representatives suggested that more work should be conducted in the future to define what constitutes a “Traditional ceremony”.
- The group was interested to know if the framework was applied to a fisheries management plan, what would be the timeframes to review the Aboriginal Objectives and Indicators. Representatives were concerned about the ability to negotiate or change management decisions outside of the fisheries management plan review cycle.
- The group discussed the existence of a historical fishing zone around Point Pearce put in place by the State Government for the exclusive access by the Narungga and Point Pearce Aboriginal community. This fishing zone was traded for B class marine scale fish licences that allowed the community to participate in commercial fishing activities. The representatives went on to explain that a condition of the B class license was that they could not be transferred or sold, meaning that once the owner died or could no longer fish families were required to find an alternative income.
- The representatives explained that during the implementation and promotion of the abalone fishery on the Yorke Peninsula holders of a fishing licence were offered to include abalone on their existing license however the Aboriginal families that held a B class license were not given the same opportunity. This is one of the reasons that the community feel that it would be appropriate to be provided with a commercial abalone license.

4.2.2 Examples of Objectives and Indicators

The concept of catching 10 feeds of snapper was used as an example of how the objective and indicator framework can be applied to a familiar situation. The group was asked to suggest possible indicators to achieve the objective. The indicators initially suggested were;

- having a working boat,
- possessing the required safety equipment,
- various fishing equipment and supplies,
- access to reefs that held snapper,
- the ability to be able to take snapper (in consideration of seasonal fisheries closures)

As the conversation continued the group discussed higher level management and planning decisions, for example, ensuring that the fish stock was healthy and present to support traditional fishing and the protection of the environment (reef systems, seagrass and kelp beds). This discussion was helpful to develop a group understanding of how objectives and indicators were to be used in the upcoming discussions. The process also introduced the high level planning and thinking that is required to develop objectives and indicators. To consolidate the group understanding of the concepts, the delivery team used a puzzle to symbolise the relationship between objectives and indicators. The completed picture represented the objective and the individual puzzle pieces represented indicators.

4.3 WORKSHOP 2 - COMMUNITY VIEWS ON PRESENTED OBJECTIVES AND INDICATORS

Participants were introduced to each suggested objective and participated in a facilitated discussion identifying indicators relative to the agreed objective. Once discussion had occurred the supplied draft indicators were provided for consideration. The following represents the outcomes of these discussions.

Table 2: The response, views, suggested indicators and actions from representatives of the Narungga community on the supplied objectives and indicators for the inclusion of Aboriginal cultural values into fisheries management plans. The action column describes the representatives preferences on the objectives and indicators they would like incorporated into future fisheries management plans.

<u>Objective 1:</u>		<u>Action</u>
Fisheries management actions support the maintenance of cultural and heritage values related to fishing activities in Aboriginal and Torres Strait Islander communities, within the constraints of ecological sustainability.		Supported by group.
<u>Group Suggested Indicators</u>	<u>Supplied Indicators</u>	<u>Actions</u>
Identify with the Aboriginal community the cultural and heritage values of the "Sea Country"	Values associated with Aboriginal and Torres Strait islander use of marine resources are identified for each community	These indicators were linked and it was decided that they should be merged to form a new indicator.
Ensure cultural and customary take is supported in fisheries management plans	Indigenous people access cultural and customary fisheries	The group supported the supplied indicator however they preferred their suggested indicator.
Recognition and protection of iconic species and habitat in fisheries management plans		New indicator.
Continued access of identified community iconic species through habitat protection and catch management		New indicator.
Determine the impacts of management activities on the maintenance of values and cultural activities over time.	Change in values over time	The supplied indicator was rejected and the group proposed their suggested indicator as a replacement. This indicator was suggested during a discussion on how fisheries management laws and gear restrictions have prevented the continuation of traditional netting of garfish. This was identified as preventing the continuation of cultural knowledge of fishing techniques and seasonal practices to the next generation.
Determine the impacts of management activities on the maintenance of values and cultural activities over time	Provisions in management plans do not inhibit cultural or customary fishing	The group supported the supplied indicator and thought it appropriate to link with their suggested indicator to monitor fisheries management plans effect on cultural and customary fishing practices.

The following represents key points of discussion from the group

- Educational activities should be conducted for children, the broader Narungga community and the local non-Aboriginal community on customary and cultural fishing activities and responsibilities throughout ESD fisheries management processes.
- Under cultural and customary take allocations in potential fisheries management plans there needs to be an understanding of how marine resources are allocated amongst the Narungga community. For example family networks living in other communities are provided with fish and marine resources on occasion, however this does not generally extend to unrelated individuals unless holding a special gathering with invited guests from other nations.
- Culturally important fish, animals and plants have been identified by the community and provisions need to be recognised in fisheries management plans to protect and ensure access into the future.

- Recognition of the relationship of iconic (culturally significant) species that are not taken for use or consumption by the community needs to be included into fisheries management plans to ensure adequate protection and their continual presence in the Sea Country.
- Protection of iconic species for community consumption by identified communities (e.g. Butterfish/Dusky morwong and warreners for Narungga) needs to be incorporated into fisheries management plans to ensure adequate protection, community access and continual presence in the Sea Country.
- Fisheries management plans should consider and provide for the protection of essential habitat for sustainability of fish stocks and continuation of community access and the presence of iconic species in the Sea Country.
- The use of jargon, technical terms and acronyms can be a barrier to participation in objective and indicator discussions. Developing a glossary of terms and working collaboratively with participants to develop a consensus and understanding of technical terms are seen as tools to overcome this barrier.

Table 3: The response, views, suggested indicators and actions from representatives of the Narungga community on the supplied objectives and indicators for the inclusion of Aboriginal cultural values into fisheries management plans. The action column describes the representatives preferences on the objectives and indicators they would like incorporated into future fisheries management plans.

<u>Objective 2:</u>		<u>Action</u>
Ensure access to „Sea Country“ to enable continuation of cultural fishing activities, respecting the rights of Aboriginal and Torres Strait Islander peoples to these resources, within the constraints of ecological sustainability.		Supported by group.
<u>Group Suggested Indicators</u>	<u>Supplied Indicators</u>	<u>Actions</u>
Identify and understand the Traditional Owners historical context of the Sea Country and their management processes		New indicator. This indicator was suggested by the group to ensure fisheries managers are aware of the worldview of the Aboriginal community they engage with. This is aimed to improve communication and collaboration on management plans by developing mutual understanding and respect of each other's needs.
Support annual and seasonal practices of cultural and customary take including the cultural values that underpin the take		New Indicator. This indicator is linked to suggested indicators in objective 1 to support and ensure the ability to continue cultural and customary practices.
	Identification of „Sea Country“ associated with fisheries management plan Note that indicators may be included that specifies a minimum level of access to: - A geographic region - A quantity of stock - A proportion of stock As a way of enabling continuation – need to define most appropriate way of ensuring activities can continue.	Supported by the group on the premise that the Aboriginal community participate in the assessment and decision making.
	Communication of sea country identification to State and / or Commonwealth Environmental bodies.	Supported by group.

The following represents key points of discussion from the group

- Inform fisheries managers/government on original lease agreements on Yorke Peninsula and the letters patent. A reflection of the lease agreements and letters patent should be incorporated into management plans.
- Annual and seasonal fishing cultural practices were identified as providing important education practices for generational transfer of information e.g. garfish netting and collecting warreners.

Table 4: The response, views, suggested indicators and actions from representatives of the Narungga community on the supplied objectives and indicators for the inclusion of Aboriginal cultural values into fisheries management plans. The action column describes the representatives preferences on the objectives and indicators they would like incorporated into future fisheries management plans.

<u>Objective 3:</u>		<u>Actions</u>
Provide opportunities for Aboriginal and Torres Strait Islander communities to participate in fisheries management decision making processes.		Supported by group.
<u>Group Suggested Indicators</u>	<u>Supplied Indicators</u>	<u>Actions</u>
Representatives from the Aboriginal communities are active participants in fisheries management decision making	Identification of Indigenous community or Nation representative of „Sea Country“ associated with the fishery	The group discussed the supplied indicator and suggested a new indicator to represent active participation of Aboriginal community representatives in management processes and focusing Aboriginal engagement to groups associated with sea county and which interact with the specific fishery management plan.
Nominated representatives of Aboriginal communities associated with „Sea Country“ and a fishery are active participants in fisheries management decision making	Level of attendance at advisory committee meetings	The suggested indicator is a replacement indicator for the above suggested and supplied indicator and the level of attendance indicator. The suggested indicator incorporates the measures of the three replaced indicators.
Nominated representatives seek community signoff of fisheries management plans	Satisfaction with consultation process	The suggested indicator was developed through discussions on the supplied indicator. The group felt that having a community signoff process was a greater representation of satisfaction with the fisheries management plan development process than the supplied indicator.

The following represents key points of discussion from the group

- Representatives discussed how “active participants” should be defined in the context of community participation in the decision making process of fisheries management plans. This level of detail would be defined during the identification of measures and could include the representation of Aboriginal community values in management plans and community signoff of management plans and decisions.

Table 5: The response, views, suggested indicators and actions from representatives of the Narungga community on the supplied objectives and indicators for the inclusion of Aboriginal cultural values into fisheries management plans. The action column describes the representatives preferences on the objectives and indicators they would like incorporated into future fisheries management plans.

<u>Objective 4:</u>		<u>Action</u>
Ensure access to income earning opportunities for Aboriginal and Torres Strait Islander community members related to the management of fisheries marine and water resources, including participation in data collection processes, within the constraints of ecological sustainability.		Supported by group.
<u>Group Suggested Indicators</u>	<u>Supplied Indicators</u>	<u>Actions</u>
	Aboriginal and Torres Strait Islander communities are able to access income-earning opportunities related to fisheries, marine and water resources	Supported by group.
Procurement process to allow for the select tendering of Aboriginal community members for the communities associated with „Sea Country” in the fishery	Tendering process that is tailored to Aboriginal and Torres Strait Islander employment circumstances for the communities associated with the „sea country” in the fishery	The group supported the supplied indicator. The suggested indicator strengthens the supplied indicator.
<p>Training and capacity building opportunities are identified and supported</p> <p>Group suggested measures:</p> <ul style="list-style-type: none"> • Aboriginal community members are involved in education and compliance of fisheries management plans • Training opportunities are accessed by Aboriginal communities members • Percentage of certification achieved through training opportunities 		This indicator was suggested by the group to promote additional opportunities for community members. It focused on identifying income generating opportunities by coupling work with potential accreditation programmes. The inclusion of Aboriginal community members in the education and compliance elements of fisheries management plans was suggested to provide assistance for Aboriginal communities and regulatory bodies to monitor management plans.

The following represents key points of discussion from the group

- Aboriginal communities engage with other Government departments and agencies (Department of Environment, Water and Natural Resources, CSIRO, Biosecurity SA) to benefit from income earning opportunities arising from work on Sea Country.

Table 6: The response, views, suggested indicators and actions from representatives of the Narungga community on the supplied objectives and indicators for the inclusion of Aboriginal cultural values into fisheries management plans. The action column describes the representatives preferences on the objectives and indicators they would like incorporated into future fisheries management plans.

<u>Objective 5:</u>		<u>Action</u>
To make fisheries collected data available in a timely and publicly accessible manner		Supported by group.
<u>Group Suggested Indicators</u>	<u>Supplied indicators</u>	<u>Actions</u>
	The number of information releases; amount and type of data available on website	<p>The group supported this indicator and provided clarity on the type of information that could be provided by PIRSA fisheries.</p> <ul style="list-style-type: none"> • Provision of information on the process and science determining stock health and allocation amongst users. • Information on environmental health, ecosystems would be appreciated by the group.
	Proportion of information that is released publicly	Supported by group.
	Currency of information that is released	Supported by group.
	Quality, comprehensiveness and accessibility of data released	Supported by group.
Community nominees involved in fisheries management planning provide relevant and requested fisheries information back to the communities they represent. Within the constraints of confidentiality	Satisfaction of stakeholders with information provision	This indicator was suggested to be linked with the group suggested indicator that community nominees provide relevant information back to their communities. The suggested measure of this would be the community sign off of fisheries management plans.

The following represents key points of discussion from the group

- The request for information on the process and science of stock assessment arose from a group conversation on the difference between traditional knowledge of fisheries resources and scientific stock assessments. There was a group view that the allocation of the central zone abalone stock was not representative of the stock and that unfished stocks existed that could support an Aboriginal commercial abalone licence.
- The current fisheries management practices and broken relationships has led to mistrust and a perceived corruption of commercial fishers actions and reporting of their catch.
- PIRSA should reflect on historical government management actions (i.e. Exclusive Fishing Zone around Point Pearce and B Class licenses) to contextualise and understand community views and aspirations.
- The *Fisheries Management Act 2007* is viewed as a form of protection for established licence holders and makes it difficult for Aboriginal groups to enter into the industry.

Table 7: The response, views, suggested indicators and actions from representatives of the Narungga community on the supplied objectives and indicators for the inclusion of Aboriginal cultural values into fisheries management plans. The action column describes the representatives preferences on the objectives and indicators they would like incorporated into future fisheries management plans.

<u>Objective 6</u>		<u>Actions</u>
Aboriginal and Torres Strait Islander communities associated with sea country have a high level of trust in the management of fisheries		Supported by group.
<u>Group Suggested Indicators</u>	<u>Supplied Indicators</u>	<u>Actions</u>
Community nominees participate in the evaluation process of fisheries management plans		The group supported the idea that community nominees are active participants throughout the entire fisheries management plan cycle.
Collaborative cultural and scientific research is supported to ensure fisheries management is consistent and supportive of cultural and customary take.	Level of trust in fisheries management	The supplied indicator was removed due to the difficulty of accurately measuring trust in the process of fisheries management. The group suggested the alternative to incorporate traditional knowledge into Western scientific research and build trust in the fisheries assessment process.

The following represents key points of discussion from the group

- Collaborative research needs to incorporate identifying and supporting cultural, social and spiritual aspects resulting from interactions with Sea Country.
- The inclusion of Aboriginal community representatives in the complete fisheries management cycle is believed to provide a greater trust in the system and foster a greater ownership and responsibility to abide by the collaboratively agreed management arrangements.
- Traditional knowledge can provide information to fisheries science that has not been captured through the scientific practices currently utilised.

Table 8: The Objective and Indicator suggested by representatives Narungga community for the inclusion of Aboriginal cultural values into fisheries management plans. The action column describes the representatives preferences on the objectives and indicators they would like incorporated into future fisheries management plans.

<u>Objective 7</u>	<u>Action</u>
Ensure collaborative inputs by Aboriginal communities, Regional and Industry sectors on the benefits each sector offers to fisheries management.	New Objective.
<u>Indicator</u>	<u>Action</u>
Aboriginal groups participate in the fisheries ESD education process to build capability and increase participation amongst sectors to strengthen fisheries management.	New Indicator.

The following represents key points of discussion from the group

- This objective and indicator was developed by the group to recognise the need to form collaborative relationships between the social sectors in the ESD framework. The interaction between sectors enables the opportunity to discuss the benefits they can provide. Forums or regular meetings were suggested to support the development and implementation of ESD fisheries management plans.

5 DISCUSSION & RECOMMENDATIONS

The objective and indicator discussions generated self reflection and deep thoughts on the importance of Sea Country amongst the group. The flexibility of the objective and indicator framework was effective in capturing the information presented by the group. Through the personalisation of objectives and indicators, a holistic view of the values of an Aboriginal group was achieved. The delivery approach and methodology assisted the community representatives to understand the concept of objectives and indicators and apply this knowledge to incorporate their values to form representative objectives and indicators.

The objectives were identified as functioning on three tiers of management; strategic (objectives 1 & 2), planning (objectives 3 & 4) and operational (objectives 5, 6 & 7). The multitier representation of Aboriginal values was supported by the community group as it ensured meaningful collaborations for Sea Country management. The supplied and suggested indicators were effective at linking objectives and management tiers and allowed for operational activities (i.e. Aboriginal community nominees involvement with management decisions) to support multiple indicators and objectives.

Upon completion of the objective and indicator discussions the group commented that “the social objectives and indicators are about fisheries management and does not tell the story of individual, family and community wellbeing as a result of connections to Sea Country”. This comment crystallises the disconnect felt by the group between the operational function of objectives and indicators and the values they represent. The identification of measures is suggested to have complimented this process and may have provided a clearer representation and specification of individual, family and community wellbeing as a result of connections to Sea Country.

The following recommendations are based on the learning’s from this activity and the experience of those involved. These recommendations are in no specific order of importance and should be considered as critical success factors for use if further work is to be done in engaging and working with Aboriginal groups.

- Where possible, a community champion with knowledge, experience and networks within the selected community, should be identified and utilised within the scope of works to provide the necessary links, communication and behind the scenes discussion, critical to participation and interaction.
- It is beneficial to the process and the community to involve multiple generations during the definition of the Aboriginal communities fisheries objectives and indicators.
- Contextualising the definitions and use of objectives and indicators through locally relevant examples aids in generating participant understanding.
- Personalisation of social objectives and indicators by each Aboriginal community involved in a fishery is required to have contextual relevance.
- Understanding the history and background of the Aboriginal Nations of the selected community, its connection to Sea Country, the interactions with government and the broader fishing industry, will be of significant benefit.

- Allow for significant time and flexibility when conducting the engagement activities and ensure all represented groups have the opportunity to participate.
- The use of jargon, technical terms and acronyms can be a barrier to participation. Developing a glossary of terms and working collaboratively with participants to develop a consensus and understanding of technical and colloquial terms are seen as tools to overcome this barrier.
- The use and understanding of the engagement continuum, (IAP2) is a worthwhile model when considering engagement and establishing relationships.
- It is important to understand that participants, whilst keen to be involved, will have competing interests, including, jobs, health issues, family and cultural obligations that may take precedence. Being respectful of these issues is important. Arranging and rearranging meeting times to facilitate participants and the delivery team to honour their commitments will build trust and respect.
- It is important for objectives and indicator discussions, that the delivery team possess sound knowledge of the application of objectives and indicators in the context of the ESD framework, and employs strong facilitation skills to assist group members to transform their values into objectives and indicators meaningful to the purpose for which they will be used.
- Further work should be conducted to define what constitutes a “Traditional ceremony” within the context of fisheries ESD.
- Future investigations of the suitability of objectives and indicators to represent Aboriginal value, should allow for the identification of measures to support indicators and assist in the representation of individual, family and social wellbeing as a result of connections to Sea Country.
- Application of the methodology and recommendations from this study to trial social objectives and indicators with Aboriginal groups in other jurisdictions. Further investigations will form a national perspective of the effectiveness of objectives and indicators as a tool to incorporate Aboriginal values into fisheries management plans.

APPENDIX 1 – PROJECT BRIEF

Social Indicators for Ecologically Sustainable Development in Fisheries. A South Australian Aboriginal Community perspective

BACKGROUND

Australian fisheries are managed using legislation and management plans to ensure that fish stocks stay healthy for present and future generations. However fisheries will not remain plentiful and healthy unless all the factors that impact them are taken into account. Currently the sustainability of a fishery is managed by setting size and catch limits to ensure that enough bigger, breeding-size fish remain. This allows the fishery to continue to reproduce itself successfully.

This type of management program is based on ecological measures such as the number of fish being caught, and the size of the fish that are caught. These ecological factors are important, but they do not take human factors such as social values or traditional practices into account. Federal and State Governments are moving towards fisheries management being more inclusive by considering *economics* and *social values* in fishery assessments. This process is called Ecologically Sustainable Development (ESD).

A great deal of work has gone into developing objectives and indicators for the ecological and economic sustainability of fisheries. The current focus is looking at objectives and indicators for Industry, Regional and Aboriginal aspects, which together make up the social sector. The Fisheries Research and Development Corporation (FRDC), in consultation with their National Indigenous Reference Group (NIRG) have developed a set of draft Aboriginal objectives and indicators to help fishery managers understand the importance of marine stocks to Aboriginal communities.

Your advice is being sought regarding how well these objectives and indicators might work for the Narungga sea country.

What is an objective?

An objective is a goal that this project would like to see achieved.

What is an Indicator?

An indicator is used to measure if the Objective has been achieved.

PROJECT AIM

The aim of this project is to use the draft Aboriginal community social objectives and indicators to record how important the marine environment is to the Narungga Nation. We are looking for your feedback on if the suggested objectives and indicators, and any alternatives which you believe may be more useful, can act as a starting point to represent Aboriginal values in modern ESD fisheries management.

OBJECTIVES & INDICATORS

Many different sections of the community are involved in fishing activities. Their different values interact with each other, and the fishery itself. ESD aims to help each sector achieve their needs and values, while also respecting and acknowledging the objectives of the other sectors involved. For example, a social objective such as „Ensure Aboriginal communities are able to access income earning opportunities in fisheries“. The indicator could be that „the job application process for fisheries management work on sea country fisheries is tailored for the employment of Aboriginal community members“.

The steps for testing the social objectives will be;

Step 1: Review Objectives:

Review the suggested objectives by looking at how the marine resource is valued by Aboriginal communities or propose new objectives

Step 2: Review Indicators:

Review the suggested indicators that go with the proposed objectives , and either accept them or propose new indicators

Step 3: Develop Terminology:

Develop terminology to show how data and information to measure those indicators might best be collected

OBJECTIVE AND INDICATOR DISCUSSIONS WITH THE NARUNGA NATION

The draft objectives and indicators for Aboriginal community wellbeing are suggestions for your consideration. They are open for discussion and are there to provide a way to look at how we can manage fisheries that Aboriginal people use in the future.

We would like to discuss the draft Aboriginal community objectives and indicators with the Narungga Nation at four community meetings to be held between March and May 2012. Your views will be recorded and written into a project report to help fisheries managers include Aboriginal values in future fisheries management plans nationally.

This report will contribute to the knowledge and development of ESD management frameworks in South Australian fisheries and will influence future discussions on the management of sea country. The indicators and objectives you help develop will also provide advice and recommendations on the refinement, development and extension of similar projects to other Aboriginal communities nationally.

For further information please contact Matthew Osborne 0408 677 521 matthew.osborne@sa.gov.au

APPENDIX 2 – RURAL SOLUTIONS SA PROPOSAL

PILOT TRIAL

Social Indicators for Ecologically Sustainable Development in Fisheries. A South Australian Aboriginal Community perspective of indicators

Background

Ecologically Sustainable Development (ESD) has been incorporated into the legislation guiding most of Australia's fisheries. ESD aims to incorporate all users of a resource into management considerations, these are categorised as economic, ecological and social. The majority of work on the development of ESD indicators has centred on ecological and economic sustainability. The three recognised social components of fisheries ESD in Australia are commercial, recreational and traditional fishing. Engagement with Aboriginal communities in the ESD process has been difficult in the past due to the absence of an appropriate tool or engagement mechanism available to fisheries managers. This project aims to overcome this problem by testing recently developed indicators with a South Australian Aboriginal community and developing engagement recommendations for future extension.

Consultation

Rural Solutions SA staff have discussed the project delivery requirements with the principal investigator, Lianos Triantafillos and in conjunction with Jason Downs developed a project delivery schedule. Discussions have also included Klynton Wanganeen, a representative of the Narungga region partnership authority and the project has received in principle support for community involvement.

It is understood that for the duration of this project Jason Downs will lead with the facilitation and provide support and advice to the project ensuring project continuity and expedience.

Need

The involvement and participation of Aboriginal communities and traditional fishing rights is a priority of current national and state government fisheries managers, policy and legislation. The objectives and indicators that have been developed under the FRDC funded project are yet to be field trialled. This project forms the extension and testing phase of the social indicators to determine their effectiveness, practicality and realism of representing the views and social aspects of a South Australian Aboriginal community.

Planned outcomes

This project will contribute to the knowledge and development of ESD in South Australian fisheries management by testing social objectives and indicators from the perspective of a representative South Australian Aboriginal community. The findings of this project will define the effectiveness of the developed objectives and indicators in a South Australian context and will provide advice and recommendations of refinement, replication and

extension of the tool to other Aboriginal communities nationally. These outcomes will benefit both state and Federal fisheries management authorities and increase constructive Indigenous involvement through the recognition of the importance of traditional and contemporary fishing rights and fostering a greater ownership and collaboration between government and Aboriginal communities.

Methods

Rural Solutions SA will work with input from the „Developing and testing social objectives and indicators for fisheries management“ project team to develop a communications paper for distribution to the Narungga community. Rural Solutions SA has established networks with the Narungga community and will organise and attend a meeting with representatives of the Narungga community to discuss the project’s background, scope, objectives, future timelines and participation requirements. The project delivery will run according to the timeline below and will consist of multiple visits to the Narungga Community at a location to be specified, likely to be on the Yorke Peninsula.

A formal meeting will be planned with Rural Solutions SA and Dr. Kate Brooks to ensure that the objectives and indicators are delivered to the group without bias and in such a way that maximises outputs. This will be used to inform process and guide the delivery of the sessions.

Project Methodology

Stage	Process
1	<p>Development of communication information</p> <p>Background information critical to the communication of the project and context will be developed in order to contextualise and reference discussion prior to and during the pilot.</p>
2	<p>Engage with the Aboriginal community (Narungga)</p> <p>A preliminary meeting and discussions will occur to seek endorsement and participation by the nation. The free and prior informed consent forms will be introduced to community representatives at an appropriate time at the discretion of Rural Solutions SA. Project information will be provided and distributed to enable discussion. At this stage preferred meeting dates and a schedule will be discussed and agreed upon.</p>
3	<p>First formal meeting</p> <p>This meeting will be used to provide context of the scope of the project, identify the objectives and establish context for the discussions. The indicators will be identified and discussed to seek understanding and perspective.</p>
4	<p>Second formal meeting</p> <p>A review of the previous meeting will occur to enable context and remind participants of the context. Formal discussions will revolve around the suitability</p>

	of the suggested indicators or alternative indicators identified by the community and gathering data to inform and support them and how they relate to the Narungga nation.
5	Review data and write draft report The data collected from the formal meetings will be reviewed by Rural Solutions SA consultants and a report written on the findings, effectiveness of the tool and recommendations for future extension. The draft will be sent to Dr. Lianos Triantafillos and Dr. Kate Brooks for their input.
6	Present draft report to Community A formal meeting will be held with the Narungga community to present and discuss the draft report. This will act to incorporate their input and recommendations and ensure the report represents their responses to the indicators.
7	Edit of final report Recommendations gathered from the community meeting will be incorporated into the final report. Upon completion the document will be sent to Dr. Lianos Triantafillos and the FRDC project team.
8	Present report to community and identify further opportunities The final report will be presented to the Narungga in a community meeting that will also involve discussions on further opportunities on the extension of the social indicator project into a national context.

Risk analysis

Risk	Likelihood (#/10)	Mitigation/Contingency
Topics outside of the scope of meetings will be interfere with the productivity and effectiveness of meetings	4	The project team will determine a terms of reference with the community prior to conducting the formal meetings. A parking bay board will be provided to capture other issues that may be relevant and for discussion at a later date
Conflicting time availability with Aboriginal community	3	Alternative dates to conduct meetings and changes in meeting structuring can be discussed or alternative community involvement sought. Schedule of meetings will be discussed and confirmed at the first meeting
Insufficient numbers of Aboriginal community members present at meetings to conduct representative	3	Rural Solutions SA will utilise established networks with members of the suggested Aboriginal community representative body to encourage community participation. As a

investigations		contingency, alternative modes of information distribution could be discussed and implemented if insufficient numbers effect data collation.
Over commitment of resources	1	Rural Solutions SA uses Planview project management software to monitor the allocations and utilisation of resources to prevent over commitment to projects and manage a project to budget.
Staff departure	1	Rural Solutions SA has an range of consultants skilled in engaging with Aboriginal communities and is able to provide alternative consultants if a project staff member departs

Performance Indicators

The identified performance indicators of project success will be:

- Testing of the developed social objectives and indicators
- Organisation and delivery of formal community meetings
- Aboriginal community participation and attendance at formal meetings
- The representative nature of important issues and characteristics of traditional fishing in the Aboriginal community in the final report
- Community agreement and sign off of the final report

APPENDIX 3 – WORKSHOP SESSION PLANS

Session Plan Workshop 1				
Aim:				
The aim of this workshop is to provide a forum for participants to understand fisheries management issues and how the ESD framework can incorporate Aboriginal cultural values <i>Italics identifies group activity and capturing information</i>				
Time	Session	Activity	Who	Duration
	Start		JD	10 mins
11.30	Introductions, name, interest, outcome you would like	<i>Capture outcomes on Butchers paper and display</i>		
	Refresh			
11.40	History - How Fisheries Management currently operates	Provide visual snapshot on how this currently work	MO	5
	Big Picture on Fisheries Management, National	Info for group on working specifically with Narrunga	MO	5
	Setting the context for the day regarding project	Info for group on National agenda for continuous improvement	JD	5
	Questions & discussion	<i>Clarify any points achieve consensus</i>		
	Context			
11.55	ESD definition	<i>Provide visual on ESD, ask group to provide definition on each E, S, D, reach consensus</i>	MO	15
	Cultural – Customary definitions	<i>Provide visual on each, discuss and achieve consensus</i>	JD	15
12.25	Lunch Break - Stretch and allow 20 mins			
12:45	Proposed ESD Framework	Display ESD categories provide information and clarity and explain why and how	JD	10
12:55	Definitions			
	Objective	Display definitions and provide example for discussion & understanding	MO	20
	Indicator			
	Measure			
1.15	Aboriginal Objectives	Provide all objectives on wall and discuss one at time, refer to definitions as needed and case study, have an example for each objective	JD & MO	50 Mins
2.00	Wrap up	Feedback from participants Confirm next meeting	JD	5 Mins

Session Plan Workshop 2

Aim:

The aim of this workshop is to provide a forum for participants to discuss how objectives and indicators could be used to represent Aboriginal values in fisheries management decision making processes.

Italics identifies group activity and capturing information

Time	Session	Activity	Who	Duration
11.30	Start Introductions and reflection exercise on previous days discussion	<i>Reflect on discussions and key points</i>	JD	10 mins
11.40	Refresh What is an objective and an indicator How objectives and indicators can be used	Group discussions and reflection on previous days work. Provide an example of how objectives and indicators can be used to represent Aboriginal values and goals <i>Clarify any points, achieve understanding</i>	MO	15 mins
11.55	Aboriginal Objectives & Indicators Objectives Indicators	Provide all objectives on wall and discuss one at time, refer to definitions as needed and case study, have an example for each objective Under each objective list the supplied indicators and discuss one at a time. Discuss the suitability of the objectives and indicators for representing the groups values and facilitate discussions of group suggested alternative objectives and Indicators	JD & MO	35 mins
12.25	Lunch Break - Stretch and allow 20 mins			
12:45	Continue with Objectives & Indicators	Provide all objectives on wall and discuss one at time, refer to definitions as needed and case study, have an example for each objective Under each objective list the supplied indicators and discuss one at a time. Discuss the suitability of the objectives and indicators for representing the groups values and facilitate discussions of group suggested alternative objectives and Indicators	JD & MO	75 mins
2.00	Wrap up	Feedback from participants Confirm next meeting Explain what will happen with information and seek comment	JD	5 Mins

APPENDIX 4 – IAP2 FRAMEWORK

Increasing level of public participation and influence in decision making



Levels of Engagement				
INFORM	CONSULT	INVOLVE	COLLABORATE	EMPOWER
Public Participation Goals. To:				
Provide the public with balanced and objective information to assist them in understanding the problems, alternatives, opportunities and/or solutions.	Obtain public feedback on analysis, alternatives and/or decisions.	Work directly with the public throughout the process to ensure that public concerns and aspirations are consistently understood and considered.	Partner with the public in each aspect of the decision including the development of alternatives and identification of the preferred solution.	Place final decision-making in the hands of the public.
The Promise to the Public. We will:				
Keep you informed.	Keep you informed, listen to and acknowledge concerns and provide feedback on how public input influenced the decision.	Work with you to ensure that your concerns and aspirations are directly reflected in the alternatives developed and provide feedback on how public input influenced the decision.	Look to you for direct advice and innovation in formulating solutions and incorporate your advice and recommendations into the decisions to the maximum extent possible.	Implement what you decide.
Example techniques to consider:				
<ul style="list-style-type: none"> • Fact Sheets • Web sites 	<ul style="list-style-type: none"> • Public comment • Focus groups • Surveys • Public meetings 	<ul style="list-style-type: none"> • Workshops • Deliberate polling 	<ul style="list-style-type: none"> • Citizen advisory committees • Consensus building • Participatory decision making 	<ul style="list-style-type: none"> • Citizen juries • Ballots • Delegated decision making

APPENDIX 5 – ABOUT RURAL SOLUTIONS SA

Consultants delivering solutions in agribusiness and environmental markets

Who is Rural Solutions SA?

Rural Solutions SA is a South Australian Government owned business that operates under the Department of Primary Industries and Regions of South Australia. The organisation has operated since 1998 and has a rich history in providing a broad range of consulting services across economic, environmental, political, and social dimensions to agribusiness and environmental clients in local, regional and international markets.

What does Rural Solutions SA do?

Rural Solutions SA provides professional consultancy services in two areas:

AGRIBUSINESS

- Sustainable agriculture and farming systems
- Agronomy
- Livestock systems
- Soils productivity
- Horticulture and irrigation
- Business and strategic planning
- Industry and policy development
- Market and value chain development

ENVIRONMENT

- Environmental planning, monitoring and evaluation
- Ecosystem restoration
- Revegetation and biodiversity
- Aquatic ecosystems
- Biosecurity and pest management
- Environmental management in mining
- Carbon and environmental offsetting
- Soil conservation

To complement the organisation's range of services, Rural Solutions SA is a leader in the engagement of diverse communities, providing services across the range of engagement methodologies, from basic information through to full community participation in decision making. Rural Solutions SA also offers a range of services to support and enhance client and community outcomes using leading edge methodologies, spatial technologies and techniques, and proven training approaches.

Why engage Rural Solutions SA?

Technical Expertise

Rural Solutions SA consultants are highly qualified, technical experts with practical skills, delivering client-first outcomes.

Regional Presence

Regional bases, industry networks, strong capabilities and regional insights enhance client outcomes by enabling the delivery of tailored, responsive solutions efficiently and effectively.

Procurement Advantage

Government organisations can directly engage Rural Solutions SA without a procurement process, generating savings and efficiencies through less duplication of effort, economies of scale and a reduction in transaction costs.

Government Affiliation

Government ownership provides decision makers with the security, confidence and comfort needed to meet their organisational needs and objectives.

Daniel Casement
Executive Director



Bayesian Belief Network model for assessing social performance of fisheries management

DRAFT 30 September 2012

Sean Pascoe, Toni Cannard, Olivier Thebaud, Cathy Dichmont (CSIRO)
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FRDC 2010/040
Developing and testing social objectives for fisheries management
DRAFT AND INCOMPLETE REPORT

[Insert ISBN or ISSN and cataloguing-in-publication (CiP) information if required]

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1 Introduction

Still to be done

Want a general description of need to including social objectives in fisheries management. Also, increasing interest in assessing fishery performance under a triple bottom line approach, which requires some quantitative measure of social, economic and environmental performance.

Difficulty is in measuring and assessing outcomes against these objectives. Numerous indicators of social performance exist, but these are largely qualitative in nature.

In this study, a Bayesian belief network (BBN) approach is undertaken to link social indicators to social objectives, and derive a numerical "score" of performance against each objective. BBNs have been used in a wide range of ecological (refs) and social (refs) studies where quantifying links between inputs (indicators) and outcomes is difficult using traditional modelling approaches. It has been used in fisheries in a wide range of contexts, but particularly in incorporating expectations of human behaviour into analyses in response to management changes (refs).

An advantage of the BBN approach is that it allows qualitative information to be combined with quantitative measures. It can also draw on expert opinion when quantitative links between indicators and outcomes cannot be derived, or the outcomes themselves are not readily measurable. In the case of this study, there are no objective quantifiable outcome measures that indicate performance against each objective, so there is no alternative means to determine the relationship between indicators and the degree to which objectives are achieved

Outline of the report ...

2 Development of the BBN

The BBN combines qualitative and quantitative information into a single framework for assessing the performance of management against individual social objectives as well as a measure of the overall performance of management across all social objectives. The indicators and objectives are based on those in the *Objectives and Indicators description (31 October 2011)* and *Indigenous Social Objectives and Indicators July 2012 Summary*.¹

The BBN was developed using recognised best practice principles. This included (Marcot *et al.*, 2006; Chen and Pollino, 2012):

- Where possible limiting each node to no more than three parent nodes;
- Minimising the number of states of each node to as few as reasonable (ideally no more than three);
- Developing and validating the network with experts; and
- Undertake sensitivity analysis as part of the model evaluation

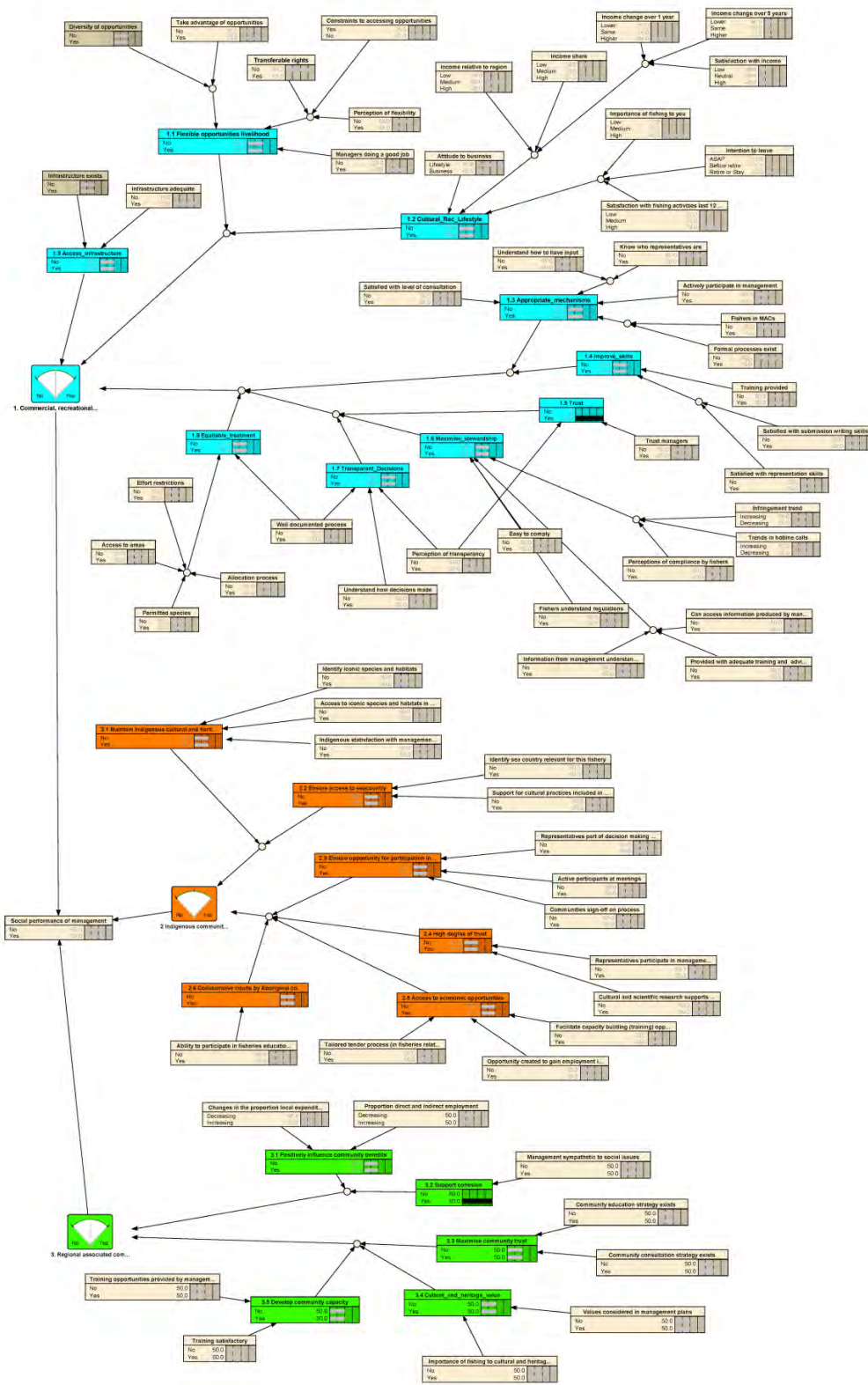
The belief network was developed during a three day workshop involving managers, economists and social scientists involved in the project team (see Annex A), based on an initial network derived from the above two sources. The relationship between the indicator values and objective outcomes were also developed as part of the workshop. Each relationship was discussed and a range of alternative specifications were tested. The final relationship used in each case was based on a consensus of the group.

The relationship between the objectives and the overall performance measure is derived through weights derived from managers, and elicited using the Analytic Hierarchy Process (AHP). These are State specific.

The overall network is illustrated in Figure 1. There are three main components representing the Commercial, Recreational and Charter community (blue), the Indigenous community (orange) and the Regional Associated communities (green).

¹ Will need to get better references for these

Figure 1: BBN structure



3 Sensitivity analysis

Sensitivity analysis can be used to measure the degree to which findings at any node (e.g. the indicator measure) can influence the outcomes (or beliefs) at another node (e.g. the objective value), given the set of findings currently entered. For the purposes of this study, it can indicate which indicators will be the most informative in determining the objective scores. The results are indicative only, as the sensitivity analysis considers only individual sensitivities – evidence in combination may have a larger impact than the “sum” of the individual impacts (Jensen and Nielsen, 2007).

“Evidence” in BBNs is often uncertain in itself, and the cost of increasing the precision may be high. Sensitivity analysis can also be viewed as a means of determining which variables (indicators) require the most attention to get accurate data (or at least more precise assessments) as these will be the ones that the outcomes are most sensitive to (Jensen and Nielsen, 2007).

Sensitivity analysis can also be used as part of the model evaluation. The sensitivity measures can be compared with a priori expectations about importance of particular nodes (indicators) to ensure that the model is behaving as expected (Chen and Pollino, 2012). If the plotted sensitivity function does not behave as expected, this may indicate errors in the network structure or the conditional probability tables (CPTs) (Pollino *et al.*, 2007).

Two forms of sensitivity analysis are available in NETICA, both relating to sensitivity to findings: mutual information (entropy reduction) and the expected reduction of real variance. Other approaches have also been proposed (Bednarski *et al.*, 2004), but these are not automated within NETICA.

Entropy relates to the uncertainty of a variable (Q) characterised by a probability distribution, $P(q)$ (Korb and Nicholson, 2003; Pollino *et al.*, 2007). Entropy reduction reports the expected degree to which the joint probability of Q and F diverges from what it would be if Q were independent of F . That is, it is a measure of the mutual information shared between the two nodes. If $I(Q,F)$ is equal to zero, Q and F are mutually independent (Pollino *et al.*, 2007)

In NETICA, the mutual information (I) between Q and F is measured in “bits”. The expected reduction in entropy of Q (measured in bits) due to a finding at F^2 .

$$I = \sum_q \sum_f \log_2 \left[\frac{P(q)}{P(q)P(f)} \right] \quad (1)$$

where q is a state of the query variable (i.e. the objective) and f is a state of the varying variable (the indicator). The measure is logged with a base of 2, which is traditional for entropy and mutual information so that the units of the results will be “bits”.

Variance Reduction refers to the expected reduction in variance of the expected real value of Q due to a finding at F .

$$Vr = \sum_q P(q) \left[X_q - \sum_q P(q) X_q \right]^2 - \sum_q P(q|f) \left[X_q - \sum_q P(q|f) X_q \right]^2 \quad (2)$$

where X_q is the numeric “real” value corresponding to state q (i.e. the objective). In this case, “real” refers to the expected value of continuous nodes, or discrete nodes which have a real numeric value associated with each state. In our model, all nodes are continuous, with a value ranging from 0 (zero) to 1.

The results of the sensitivity analysis depend strongly on network parameters and on the current states of all observable nodes (Bednarski *et al.*, 2004). In our analysis, we assumed no prior information on the states of the nodes, with each state having an equal probability. The analysis hence assesses the effect on the

² http://www.norsys.com/WebHelp/NETICA/X_Sensitivity_Equations.htm

objective node from moving from no information to full information (i.e. moving to either a zero or 100 per cent likelihood of a state), given that no information (uninformed priors) exist in the other nodes not be adjusted.

The analysis was also run at two different levels: the sensitivity of each of the objectives to each of the (parent) indicators, as well as the sensitivity to the “higher” level objective to the individual indicators. The results of the analysis are presented in Tables 1-3. Detailed descriptions of the indicators are given in Annex 2. The numbering system indicates the objective that the indicator relates to. The first number represents the higher order objective group (1=Commercial, recreational and charter; 2= Indigenous communities; 3= Regional and associated communities), the second number indicates the specific objective (e.g. 1_1 is objective 1.1), and the third number represents the indicator identifier that relates to that objective.

The absolute values of the mutual influence and variance reduction scores have little individual meaning, but are used to rank the indicators from most to least important in terms of impacts on the node of interest. The value of the sensitivity analysis scores decline exponentially, with most of the information affecting the overall (higher level) objectives contained in the first third of the indicators (Figure 2). For ease of interpretation, the scores are re-classified into very high (> average), high (>0.5 average), medium (>0.25 average), low (>0.1 average) and very low (<0.1 average).

From the tables, it is possible for an indicator to have a low score in terms of its impact on the broader (higher level) objective, but a high score relative to a particular objective. For example, from Table 1, CRC_1_4_2 has a low importance relative to the broader fishing industry focused objective, but high importance to the specific objective (1.4 Improve skills). This difference reflects the combination of the conditional probability tables linking the indicators to the objective, and the AHP weights that link the specific objectives to the broader objectives.

Relatively few indicators had a very low impact across both the specific and broader objectives, and all occurred in the commercial, recreational and charter objectives. These have been highlighted in red in Table 1. However, as noted previously, the combined effects of indicators can have a greater impact than the sum of the individual impacts. Further, increasing the number of nodes between the input and output nodes can dilute the sensitivity of the output to the inputs (Chen and Pollino, 2012). Those indicators that are aggregated into intermediate nodes in order to make the development of the BBN practical may suffer in terms of lower sensitivity scores (Jensen and Nielsen, 2007). As a result, removing indicators may have a greater impact on the results than the sensitivity analysis suggests. To test this, the model needs to be developed excluding the indicator and the results re-assessed.

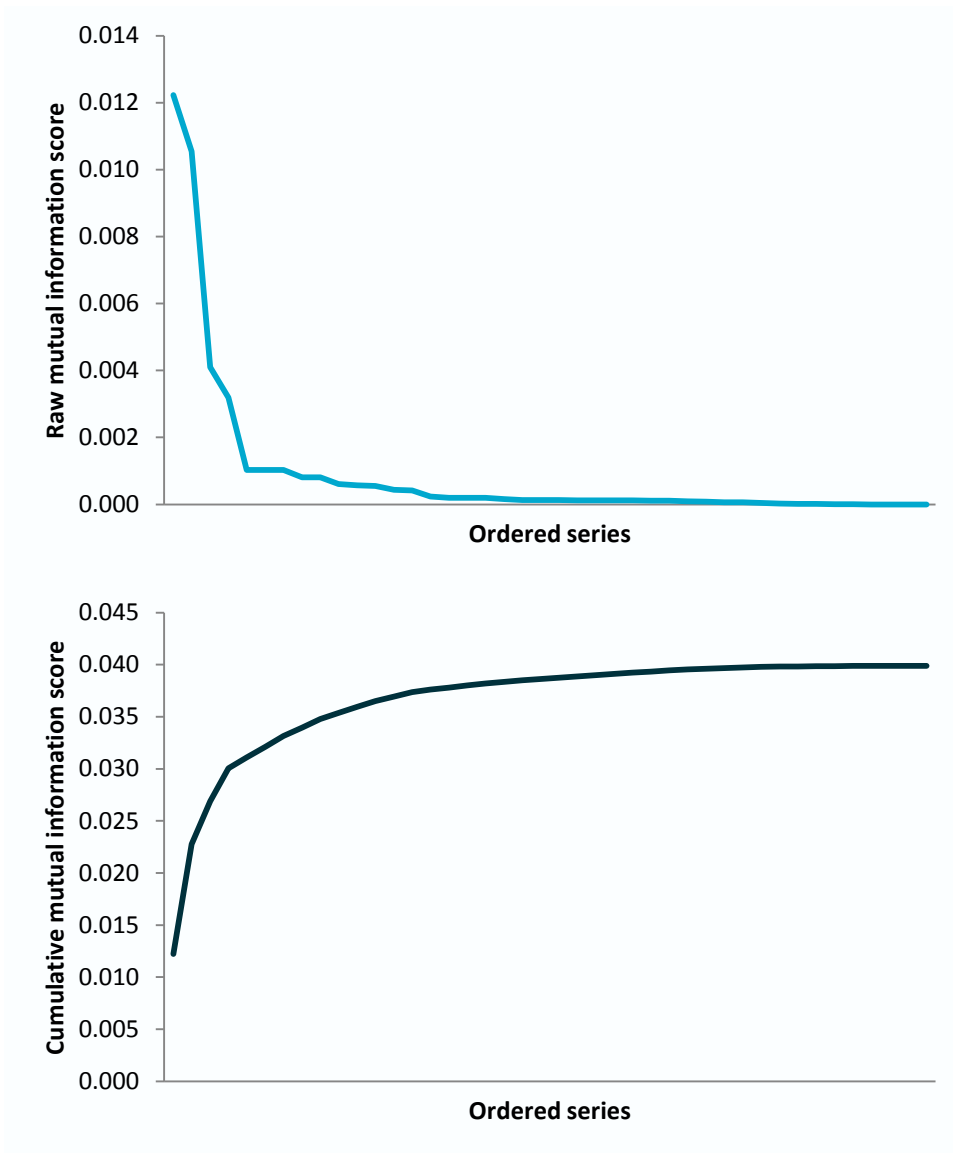


Figure 2. Individual and cumulative mutual information (entropy reduction) scores for the commercial, recreational and charter sectors

Table 1. Commercial, Recreational and Charter sector sensitivity analysis

Indicator	Higher order objective		Individual objective		Higher order objective		Individual objective	
	Mutual Info	Variance of Beliefs	Mutual Info	Variance of Beliefs	Mutual Info	Variance of Beliefs	Mutual Info	Variance of Beliefs
CRC_1_1_1	0.00013	4.42E-05	0.00656	0.002256	Low	Low	Low	Low
CRC_1_1_2	0.00016	0.000054	0.00801	0.002756	Low	Low	Low	Low
CRC_1_1_3	0.00081	0.000282	0.04221	0.0144	High	High	High	High
CRC_1_1_4	0.00081	0.000282	0.04221	0.0144	High	High	High	High
CRC_1_1_5	0.0002	7.06E-05	0.01047	0.0036	Low	Low	Low	Low
CRC_1_1_6	0.00057	0.000196	0.02922	0.01	High	High	Medium	High
CRC_1_2_1	0	0	0	0	Very Low	Very Low	Very Low	Very Low
CRC_1_2_2	0.00013	4.49E-05	0.01075	0.003713	Low	Low	Low	Low
CRC_1_2_3	0.00006	0.00002	0.00477	0.00165	Very Low	Very Low	Very Low	Very Low
CRC_1_2_4	0.00001	2.8E-06	0.00067	0.000232	Very Low	Very Low	Very Low	Very Low
CRC_1_2_5	0.00002	7.8E-06	0.00186	0.000645	Very Low	Very Low	Very Low	Very Low
CRC_1_2_6	0.00013	4.49E-05	0.01075	0.003713	Low	Low	Low	Low
CRC_1_2_7	0.00009	3.12E-05	0.00746	0.002578	Very Low	Very Low	Low	Low
CRC_1_2_8	0.00006	0.00002	0.00477	0.00165	Very Low	Very Low	Very Low	Very Low
CRC_1_2_9	0.00044	0.000151	0.03647	0.012478	Medium	Medium	High	High
CRC_1_3_1	0.00012	4.15E-05	0.01639	0.005625	Low	Low	Medium	Medium
CRC_1_3_2	0.00012	4.15E-05	0.01639	0.005625	Low	Low	Medium	Medium
CRC_1_3_3	0.00012	4.15E-05	0.01639	0.005625	Low	Low	Medium	Medium
CRC_1_3_4	0.00012	4.15E-05	0.01639	0.005625	Low	Low	Medium	Medium
CRC_1_3_5	0.00003	1.18E-05	0.00465	0.0016	Very Low	Very Low	Very Low	Very Low
CRC_1_3_6	0.00055	0.000189	0.07565	0.0256	High	High	Very high	Very high
CRC_1_4_1	0.00008	2.94E-05	0.04448	0.015006	Very Low	Very Low	High	High
CRC_1_4_2	0.0002	6.89E-05	0.10584	0.035156	Low	Low	Very high	Very high
CRC_1_4_3	0.0002	6.89E-05	0.10584	0.035156	Low	Low	Very high	Very high
CRC_1_5_1	0.00042	0.000146	0.04569	0.015625	Medium	Medium	High	High
CRC_1_5_2	0.01054	0.003645	0.18872	0.0625	Very high	Very high	Very high	Very high
CRC_1_6_1	0.00004	1.34E-05	0.01041	0.0036	Very Low	Very Low	Low	Low
CRC_1_6_2	0.00002	0.000006	0.00462	0.0016	Very Low	Very Low	Very Low	Very Low
CRC_1_6_3	0.00011	3.72E-05	0.02905	0.01	Low	Low	Medium	High
CRC_1_6_4	0	8E-07	0.00065	0.000225	Very Low	Very Low	Very Low	Very Low
CRC_1_6_5	0	1E-07	0.00007	0.000025	Very Low	Very Low	Very Low	Very Low
CRC_1_6_6	0.00001	3.3E-06	0.0026	0.0009	Very Low	Very Low	Very Low	Very Low
CRC_1_6_7	0.00011	3.72E-05	0.02905	0.01	Low	Low	Medium	High
CRC_1_6_8	0.00024	8.37E-05	0.06593	0.0225	Medium	Medium	Very high	Very high
CRC_1_7_1	0.00061	0.00021	0.06593	0.0225	High	High	Very high	Very high
CRC_1_7_2	0.00319	0.001104	0.02905	0.01	Very high	Very high	Medium	High
CRC_1_8_1	0.0041	0.001421	0.45878	0.140625	Very high	Very high	Very high	Very high
CRC_1_8_2	0.00103	0.000355	0.01855	0.0064	Very high	Very high	Medium	Medium
CRC_1_8_3	0.00103	0.000355	0.01855	0.0064	Very high	Very high	Medium	Medium
CRC_1_8_4	0.00103	0.000355	0.01855	0.0064	Very high	Very high	Medium	Medium
CRC_1_9_1	0	0	0	0	Very Low	Very Low	Very Low	Very Low
CRC_1_9_2	0.01223	0.004225	1	0.25	Very high	Very high	Very high	Very high

Table 2. Indigenous communities' sensitivity analysis

Indicator	Higher order objective		Individual objective		Higher order objective		Individual objective	
	Mutual	Variance of	Mutual	Variance of	Mutual	Variance of	Mutual	Variance of

	Info	Beliefs	Info	Beliefs	Info	Beliefs	Info	Beliefs
Ind_2_1_1	0.00051	0.000177	0.02905	0.01	Low	Low	Low	Low
Ind_2_1_2	0.00205	0.00071	0.11871	0.04	Medium	Medium	High	High
Ind_2_1_3	0.00205	0.00071	0.11871	0.04	Medium	Medium	High	High
Ind_2_2_1	0.00932	0.003215	0.18872	0.0625	Very high	Very high	Very high	Very high
Ind_2_2_2	0.00932	0.003215	0.18872	0.0625	Very high	Very high	Very high	Very high
Ind_2_3_1	0.0011	0.000381	0.11871	0.04	Low	Low	High	High
Ind_2_3_2	0.0011	0.000381	0.11871	0.04	Low	Low	High	High
Ind_2_3_3	0.00028	9.53E-05	0.02905	0.01	Very Low	Very Low	Low	Low
Ind_2_4_1	0.00042	0.000144	0.03485	0.01	Very Low	Very Low	Low	Low
Ind_2_4_2	0.00167	0.000576	0.14679	0.04	Medium	Medium	High	High
Ind_2_5_1	0.01954	0.006724	0.18872	0.0625	Very high	Very high	Very high	Very high
Ind_2_5_2	0.00487	0.001681	0.04557	0.015625	Very high	Very high	Medium	Medium
Ind_2_5_3	0.00487	0.001681	0.04557	0.015625	Very high	Very high	Medium	Medium
Ind_2_6_1	0.0069	0.002381	1	0.25	Very high	Very high	Very high	Very high

Table 3. Regional associated communities' sensitivity analysis

Indicator	Higher order objective		Individual objective		Higher order objective		Individual objective	
	Mutual Info	Variance of Beliefs	Mutual Info	Variance of Beliefs	Mutual Info	Variance of Beliefs	Mutual Info	Variance of Beliefs
RAC_3_1_1	0.02221	0.007504	0.06593	0.0225	Very high	Very high	Low	Medium
RAC_3_1_2	0.12416	0.040855	0.39016	0.1225	Very high	Very high	Very high	Very high
RAC_3_2_1	0	0	1	0.25	Very Low	Very Low	Very high	Very high
RAC_3_3_1	0.00243	0.000827	0.18872	0.0625	Low	Low	High	High
RAC_3_3_2	0.00243	0.000827	0.18872	0.0625	Low	Low	High	High
RAC_3_4_1	0.00065	0.000221	0.39016	0.1225	Very Low	Very Low	Very high	Very high
RAC_3_4_2	0.00012	4.06E-05	0.06593	0.0225	Very Low	Very Low	Low	Medium
RAC_3_5_2	0.00077	0.000262	0.10482	0.030625	Very Low	Very Low	Medium	Medium

4 Preliminary fishery evaluations

The model results are estimates of the probability that the objectives have been achieved. These can be aggregated into probabilities that higher order objectives are achieved on average based in the individual objective weights under each higher order objective, and finally the probability that social objectives are achieved at a satisfactory level on average taking into account the weights of all the objectives.

The value of the probabilities that each objective is achieved is given for each of the case study fisheries in the sections below, and are also depicted graphically. For reporting purposes, a traffic light style report card may be more appropriate. The results are also presented in a report card style, with probabilities that the objective is met of less than 50% indicating a red traffic light, a probability of 50-60% indicating an orange light, and probabilities greater than 60 indicating a green light (i.e. there is sufficient likelihood that the objective has been met).

These results in the three case studies presented below are illustrative only as the results relating to indigenous indicators are not yet included. As a result, the overall social performance value is misleading as it is based on naive assumptions about the indigenous indicators.

4.1 South Australian rock lobster fishery

The performance of management in the south Australian rock lobster fishery in meeting the management objectives is given in Table 4 and illustrated in Figures 3-6. Social performance of management in the fishery was largely satisfactory, with most objectives being met in most parts of the fishery. The results indicate, however, that more may need to be done in terms of improving flexibility of opportunities in the fishery, and also in meeting the regional and associated community objectives.

Table 4. Illustrative results for the south Australian rock lobster fishery

Objective	All	southern zone	northern zone
Lower level objectives			
Commercial, recreational and charter			
• 1.1_Flexible_opportunities	52%	55%	47%
• 1.2 Cultural_Rec_Lifestyle	79%	80%	76%
• 1.3 Appropriate_mechanisms	81%	82%	80%
• 1.4 Improve_skills	64%	64%	64%
• 1.5 Trust	70%	71%	68%
• 1.6 Maximise_stewardship	94%	95%	92%
• 1.7 Transparent_Decisions	85%	84%	87%
• 1.8 Equitable_treatment	84%	86%	81%
• 1.9 Access_infrastructure	82%	83%	80%
Indigenous communities			
• 2.1 Maintain indigenous cultural and heritage v...	50%	50%	50%
• 2.2 Ensure access to seacou...	50%	50%	50%
• 2.3 Ensure opportunity for participation in man...	50%	50%	50%
• 2.4 High degree of trust	50%	50%	50%
• 2.5 Access to economic opportunities	50%	50%	50%
• 2.6 Collaborative inputs by Aboriginal communit...	50%	50%	50%
Regional and associated communities			
• 3.1 Positively influence community benefits	50%	50%	50%
• 3.2 Support cohesion	100%	100%	100%
• 3.3 Maximise community trust	13%	13%	13%
• 3.4 Culture and heritage value	100%	100%	100%
• 3.5 Develop community capacity	65%	65%	65%
Higher level objectives			
1. Commercial, recreational and charter communi...	78%	78%	75%
2 Indigenous communities	50%	50%	50%
3. Regional associated communities	58%	58%	58%
Overall performance			
Social performance of management	68%	69%	67%

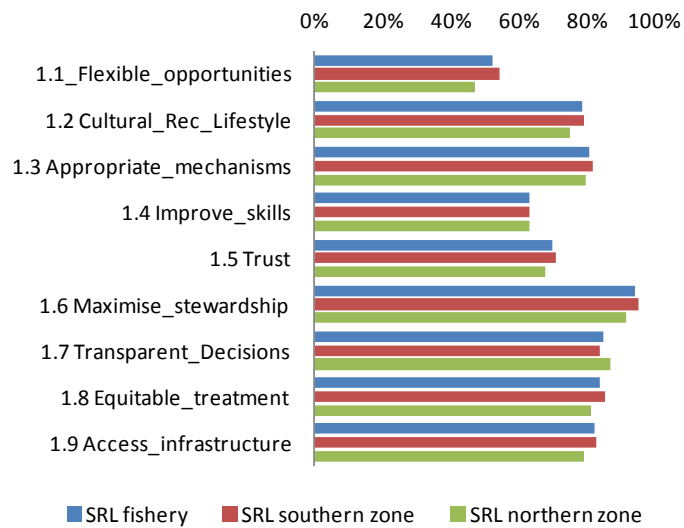


Figure 3. Commercial, recreational and charter performance, SA rock lobster

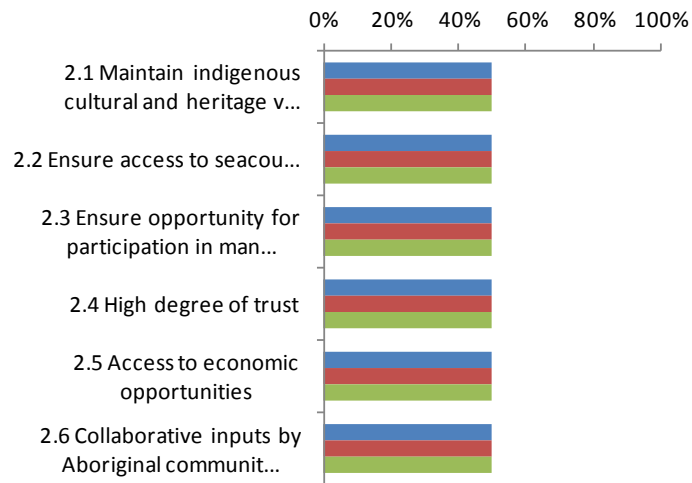


Figure 4. Indigenous communities' performance, SA rock lobster

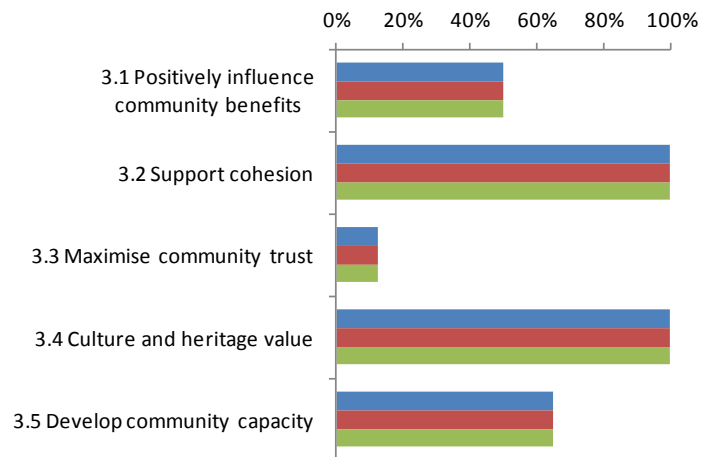


Figure 5. Regional and associated communities' performance, SA rock lobster

	All	southern zone	northern zone
Lower level objectives			
Commerical, recreational and charter			
1.1_Flexible_opportunities	Yellow	Yellow	Red
1.2 Cultural_Rec_Lifestyle	Green	Green	Green
1.3 Appropriate_mechanisms	Green	Green	Green
1.4 Improve_skills	Green	Green	Green
1.5 Trust	Green	Green	Green
1.6 Maximise_stewardship	Green	Green	Green
1.7 Transparent_Decisions	Green	Green	Green
1.8 Equitable_treatment	Green	Green	Green
1.9 Access_infrastructure	Green	Green	Green
Indigenous communities			
2.1 Maintain indigenous cultural and heritage v...			
2.2 Ensure access to seacou...			
2.3 Ensure opportunity for participation in man...			
2.4 High degree of trust			
2.5 Access to economic oppportunities			
2.6 Collaborative inputs by Aboriginal communit...			
Regional and assocaited communities			
3.1 Positively influence community benefits	Yellow	Yellow	Yellow
3.2 Support cohesion	Green	Green	Green
3.3 Maximise community trust	Red	Red	Red
3.4 Culture and heritage value	Green	Green	Green
3.5 Develop community capacity	Green	Green	Green
Higher level objectives			
1. Commercial, recreational and charter communi...	Green	Green	Green
2 Indigenous communities	Yellow	Yellow	Yellow
3. Regional associated communities	Yellow	Yellow	Yellow
Overall performance			
Social performance of management	Green	Green	Green

Figure 6. "Traffic light" report card on social performance, SA Rock Lobster

4.2 South Australian Marine Scalefish fishery

The performance of management in the south Australian marine scalefish fishery in meeting the management objectives is given in Table 5 and illustrated in Figures 7-10. As with the rock lobster fishery, social performance of management in the fishery was largely satisfactory, with most objectives being met in most parts of the fishery. The results indicate, however, that more may need to be done in terms of improving trust (from both fishers and communities) and perceptions of equity in the fishery. In absolute terms, the fishery scored lower than the rock lobster fishery in terms of overall management performance in achieving social outcomes.

Table 5. Illustrative results for the south Australian marine scalefish fishery

Objective	All	West Coast	Walleroo	
			Port Lincoln	surrounds
Lower level objectives				
Commercial, recreational and charter				
• 1.1_Flexible_opportunities	51%	49%	48%	53%
• 1.2 Cultural_Rec_Lifestyle	68%	64%	69%	67%
• 1.3 Appropriate_mechanisms	80%	80%	75%	75%
• 1.4 Improve_skills	64%	64%	64%	64%
• 1.5 Trust	49%	33%	33%	54%
• 1.6 Maximise_stewardship	93%	92%	92%	93%
• 1.7 Transparent_Decisions	62%	45%	45%	68%
• 1.8 Equitable_treatment	44%	48%	35%	52%
• 1.9 Access_infrastructure	85%	77%	91%	81%
Indigenous communities				
• 2.1 Maintain indigenous cultural and heritage v...	50%	50%	50%	50%
• 2.2 Ensure access to seacou...	50%	50%	50%	50%
• 2.3 Ensure opportunity for participation in man...	50%	50%	50%	50%
• 2.4 High degree of trust	50%	50%	50%	50%
• 2.5 Access to economic opportunities	50%	50%	50%	50%
• 2.6 Collaborative inputs by Aboriginal communit...	50%	50%	50%	50%
Regional and associated communities				
• 3.1 Positively influence community benefits	50%	50%	50%	50%
• 3.2 Support cohesion	100%	100%	100%	100%
• 3.3 Maximise community trust	13%	13%	13%	13%
• 3.4 Culture and heritage value	100%	100%	100%	100%
• 3.5 Develop community capacity	65%	65%	65%	65%
Higher level objectives				
1. Commercial, recreational and charter communi...	62%	58%	57%	64%
2 Indigenous communities	50%	50%	50%	50%
3. Regional associated communities	58%	58%	58%	58%
Overall performance				
Social performance of management	59%	57%	56%	60%

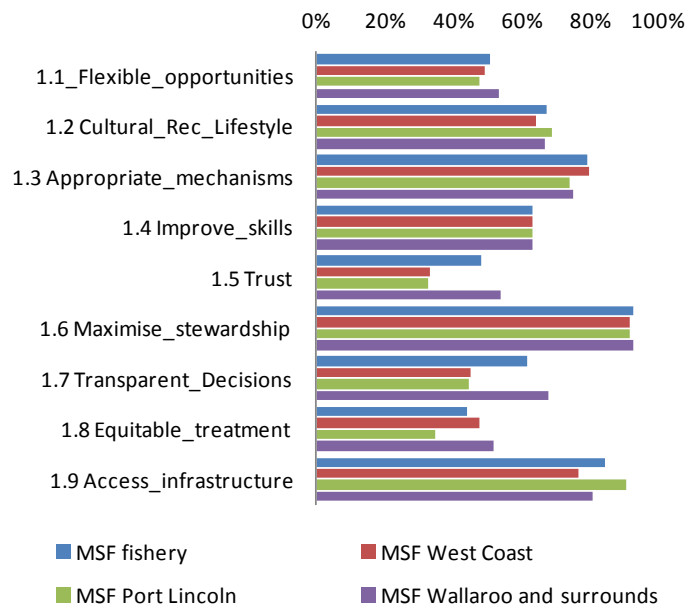


Figure 7. Commercial, recreational and charter performance, SA marine scalefish

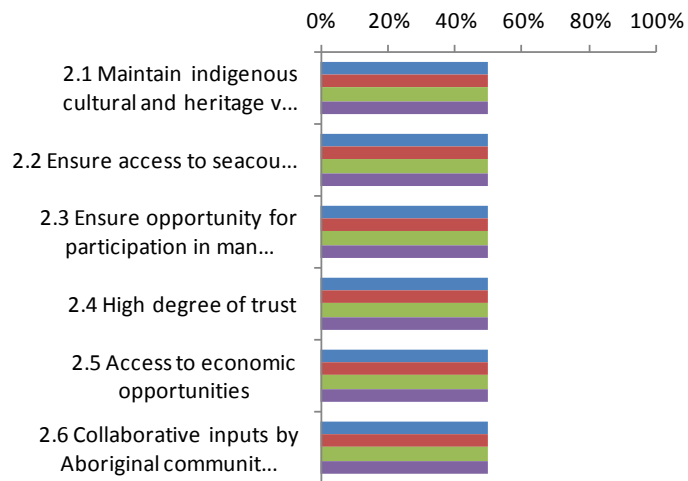


Figure 8. Indigenous communities' performance, SA marine scalefish

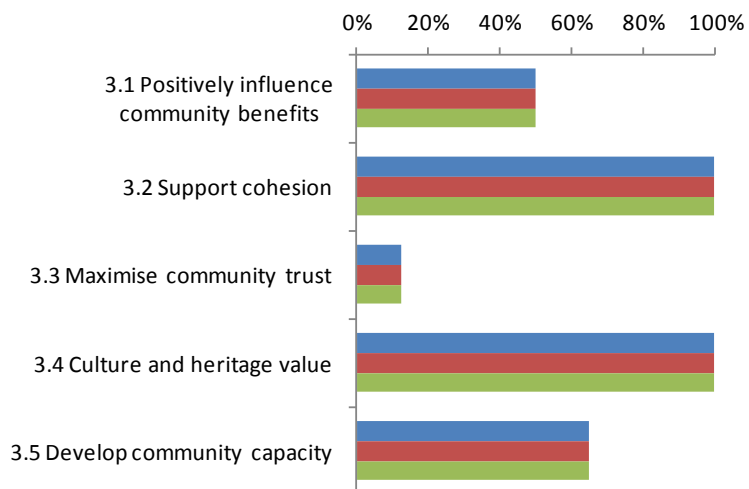


Figure 9. Regional and associated communities' performance, SA marine scalefish

	All	West Coast	Port Lincoln	Wallaroo and surrounds
Lower level objectives				
Commerical, recreational and charter				
1.1 Flexible_opportunities	Yellow	Red	Red	Yellow
1.2 Cultural_Rec_Lifestyle	Green	Green	Green	Green
1.3 Appropriate_mechanisms	Green	Green	Green	Green
1.4 Improve_skills	Green	Green	Green	Green
1.5 Trust	Red	Red	Red	Yellow
1.6 Maximise_stewardship	Green	Green	Green	Green
1.7 Transparent_Decisions	Green	Red	Red	Green
1.8 Equitable_treatment	Red	Red	Red	Yellow
1.9 Access_infrastructure	Green	Green	Green	Green
Indigenous communities				
2.1 Maintain indigenous cultural and heritage v...				
2.2 Ensure access to seacou...				
2.3 Ensure opportunity for participation in man...				
2.4 High degree of trust				
2.5 Access to economic opportunities				
2.6 Collaborative inputs by Aboriginal communit...				
Regional and assocaited communities				
3.1 Positively influence community benefits	Yellow	Yellow	Yellow	Yellow
3.2 Support cohesion	Green	Green	Green	Green
3.3 Maximise community trust	Red	Red	Red	Red
3.4 Culture and heritage value	Green	Green	Green	Green
3.5 Develop community capacity	Green	Green	Green	Green
Higher level objectives				
1. Commercial, recreational and charter communi...	Green	Yellow	Yellow	Green
2 Indigenous communities	Yellow	Yellow	Yellow	Yellow
3. Regional associated communities	Yellow	Yellow	Yellow	Yellow
Overall performance				
Social performance of management	Yellow	Yellow	Yellow	Green

Figure 10. "Traffic light" report card on social performance, SA marine scalefish

4.3 Queensland East Coast trawl fishery

The performance of management in the south Australian marine scalefish fishery in meeting the management objectives is given in Table 6 and illustrated in Figures 11-14. Performance in many areas in this fishery was relatively poor, particularly in relation to regional and associated communities. For the fishers themselves, there was an apparent lack of appropriate mechanisms regarding management processes and decision making, which may also have contributed to the low scores in relation to trust. In absolute terms, the fishery scored lower than the other two case study fisheries in terms of overall management performance in achieving social outcomes.

Objective	All	North	Central	South
Lower level objectives				
Commercial, recreational and charter				
• 1.1_Flexible_opportunities	65%	61%	67%	66%
• 1.2 Cultural_Rec_Lifestyle	66%	66%	67%	65%
• 1.3 Appropriate_mechanisms	49%	47%	51%	52%
• 1.4 Improve_skills	56%	56%	56%	56%
• 1.5 Trust	41%	44%	42%	36%
• 1.6 Maximise_stewardship	74%	80%	69%	73%
• 1.7 Transparent_Decisions	55%	60%	57%	47%
• 1.8 Equitable_treatment	77%	72%	75%	84%
• 1.9 Access_infrastructure	60%	61%	51%	51%
Indigenous communities				
• 2.1 Maintain indigenous cultural and heritage v...	50%	50%	50%	50%
• 2.2 Ensure access to seacou...	50%	50%	50%	50%
• 2.3 Ensure opportunity for participation in man...	50%	50%	50%	50%
• 2.4 High degree of trust	50%	50%	50%	50%
• 2.5 Access to economic opportunities	50%	50%	50%	50%
• 2.6 Collaborative inputs by Aboriginal communit...	50%	50%	50%	50%
Regional and associated communities				
• 3.1 Positively influence community benefits	0%	0%	0%	0%
• 3.2 Support cohesion	0%	0%	0%	0%
• 3.3 Maximise community trust	63%	63%	63%	63%
• 3.4 Culture and heritage value	69%	69%	69%	69%
• 3.5 Develop community capacity	16%	16%	16%	16%
Higher level objectives				
1. Commercial, recreational and charter communi...	62%	62%	60%	60%
2 Indigenous communities	50%	50%	50%	50%
3. Regional associated communities	11%	11%	11%	11%
Overall performance				
Social performance of management	47%	47%	46%	46%

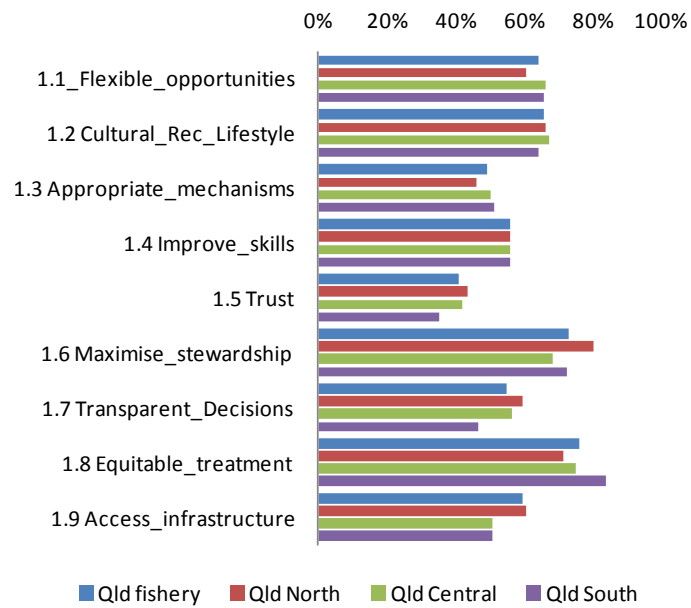


Figure 10. Commercial, recreational and charter performance, Queensland East coast trawl

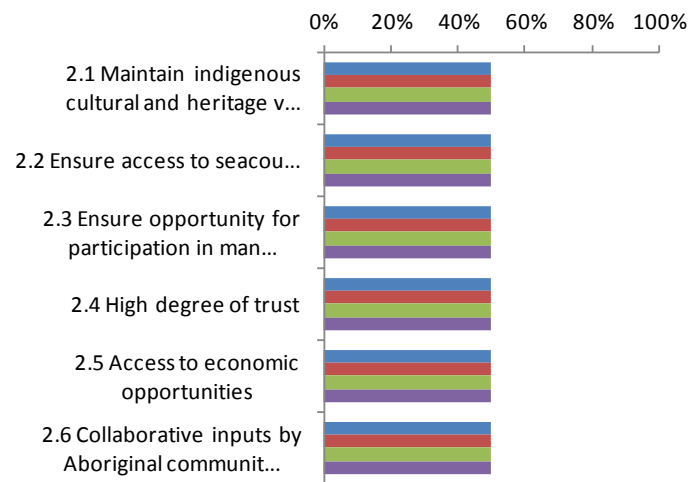


Figure 11. Indigenous communities' performance, Queensland East coast trawl

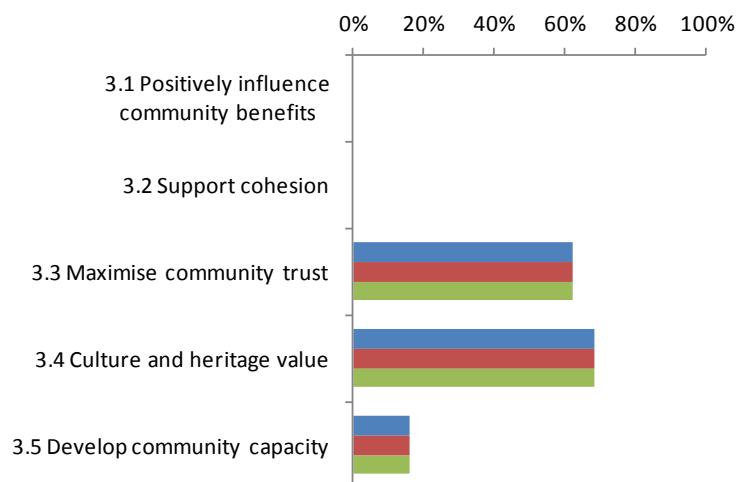


Figure 13. Regional and associated communities' performance, Queensland East coast trawl

Lower level objectives	All	North	Central	South
Commerical, recreational and charter				
1.1 Flexible_opportunities	Green	Green	Green	Green
1.2 Cultural_Rec_Lifestyle	Green	Green	Green	Green
1.3 Appropriate_mechanisms	Red	Red	Yellow	Yellow
1.4 Improve_skills	Yellow	Yellow	Yellow	Yellow
1.5 Trust	Red	Red	Red	Red
1.6 Maximise_stewardship	Green	Green	Green	Green
1.7 Transparent_Decisions	Yellow	Green	Yellow	Red
1.8 Equitable_treatment	Green	Green	Green	Green
1.9 Access_infrastructure	Green	Green	Yellow	Yellow
Indigenous communities				
2.1 Maintain indigenous cultural and heritage v...				
2.2 Ensure access to seacou...				
2.3 Ensure opportunity for participation in man...				
2.4 High degree of trust				
2.5 Access to economic opportunities				
2.6 Collaborative inputs by Aboriginal communit...				
Regional and assocaited communities				
3.1 Positively influence community benefits	Red	Red	Red	Red
3.2 Support cohesion	Red	Red	Red	Red
3.3 Maximise community trust	Green	Green	Green	Green
3.4 Culture and heritage value	Green	Green	Green	Green
3.5 Develop community capacity	Red	Red	Red	Red
Higher level objectives				
1. Commercial, recreational and charter communi...	Green	Green	Green	Green
2 Indigenous communities	Yellow	Yellow	Yellow	Yellow
3. Regional associated communities	Red	Red	Red	Red
Overall performance				
Social performance of management	Red	Red	Red	Red

Figure 14. "Traffic light" report card on social performance, Queensland East coast trawl

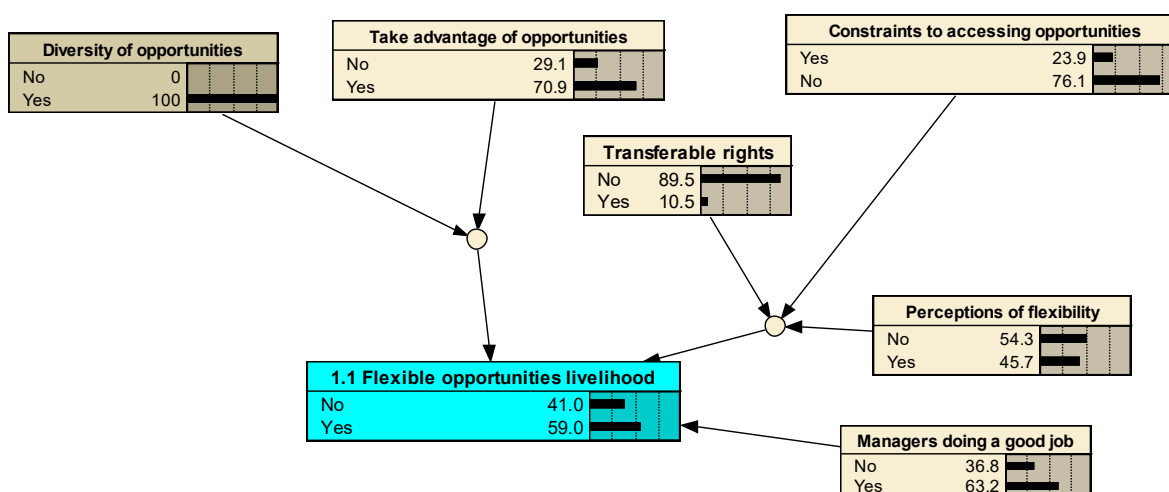
5 Annex 1: Workshop participants

Participant	Organisation	Area of expertise
Sean Pascoe	CSIRO	Economics, modelling, multicriteria analysis
Cathy Dichmont	CSIRO	Fisheries science, modelling, management
Olivier Thebaud	CSIRO	Economics, modelling
Toni Cannard	CSIRO	Social science, marine science
Rob Kenyon	CSIRO	Data collection, fisheries
Lianos Triantafillos	PIRSA	Fisheries management
Eddie Jebreen	DAFF	Fisheries management
Kate Brooks	KAL	Social science

6 Annex 2: Description of the indicators and data sources

6.1 1. Commercial, recreational and charter objectives

6.1.1 OBJECTIVE 1.1 PROVIDE FLEXIBLE OPPORTUNITIES TO ENSURE FISHERS CAN MAINTAIN OR ENHANCE THEIR LIVELIHOOD, WITHIN THE CONSTRAINTS OF ECOLOGICAL SUSTAINABILITY



Indicator CRC_1_1_1_Diversity

Indicator Title Diversity of opportunity

Data required Subjective estimate of diversity (% or just yes/no)

Where from Manager's survey

Indicator CRC_1_1_2_Take_advantage

Indicator Title Take advantage of opportunities

Data required Subjective estimate of proportion of fishers taking advantage of the opportunities (percentage)

Where from Manager's survey

Question 5. What proportion of opportunities to enter the fishery are being accessed at the moment (eg is 100% of quota being utilised, or 100% of available licences)?

Indicator CRC_1_1_3_Transferable_rights
Indicator Title Transferable rights
Data required Yes/No
Where from Manager's survey

Question 8. Are use rights in the fishery readily transferable between fishers (eg quotas and licences can be transferred from one user to another easily)?

Indicator CRC_1_1_4_Constraints
Indicator Title Constraints to accessing opportunities
Data required Yes/No
Where from Manager's survey

Question 11. In your opinion, does fisheries management constrain access of fishers to livelihood opportunities in ways other than constraints imposed in order to ensure ecological sustainability? (for example, through high entry costs or other restrictions)?:

Indicator CRC_1_1_5_Management_flexible
Indicator Title Perception of flexibility
Data required Survey based estimate of fishers' perceptions about flexibility of management. Measure is the percentage of responses that either strongly disagree or disagree (%No) and percentage of responses that either strongly agree ,or agree or neither agree nor disagree (%Yes).
Where from Fisher survey

Indicator CRC_1_1_6_Satisfied_mgt

Indicator Title Managers doing a good job

Data required Perceptions that fisheries managers are doing a good job of management. Measure is percentage of responses that either strongly disagree or disagree (%No) and percentage of responses that either strongly agree ,or agree or neither agree nor disagree (%Yes).

Where from Fisher survey

SA survey

3a. To what extent do you agree or disagree with the following statements?

(tick one response only)

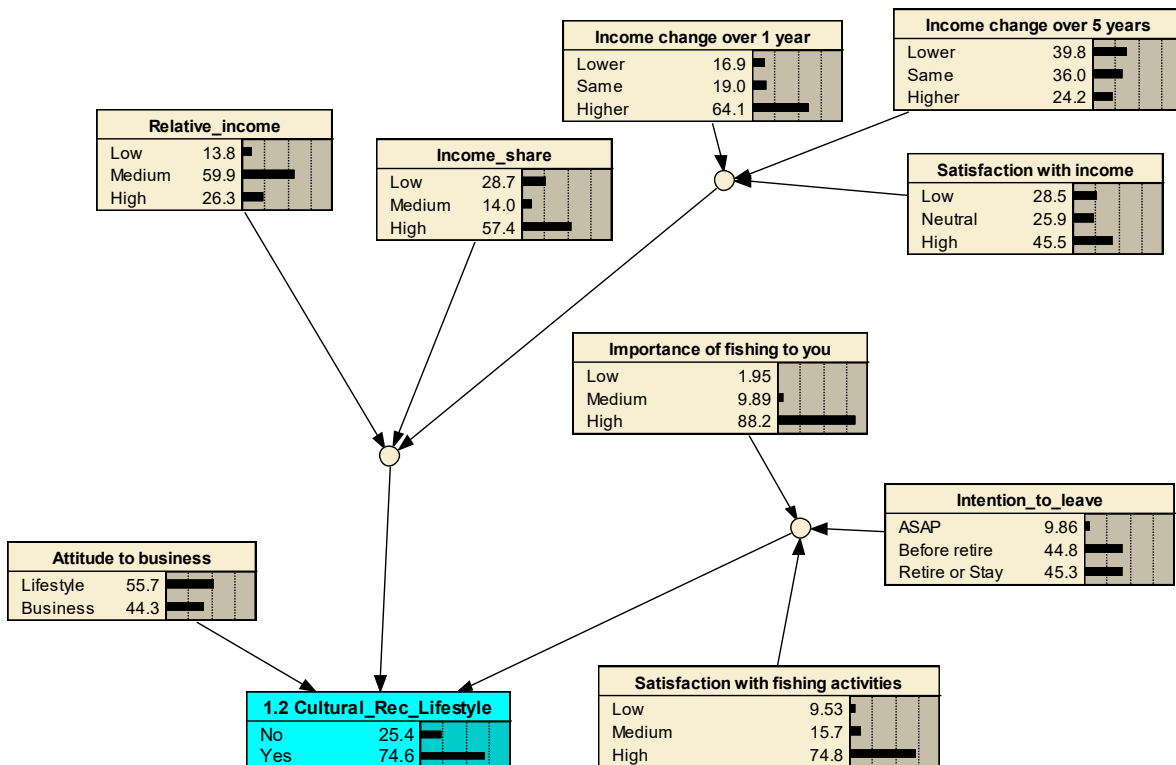
	Strongly disagree	<i>Disagree</i>	Neither agree nor disagree	Agree	Strongly agree	Don't know
PIRSA do a good job of managing commercial fishing in SA	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I trust PIRSA to make the right decisions for managing commercial fishing in SA	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I understand how decisions about fisheries management are made	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I am satisfied with the level of consultation PIRSA undertakes with fishers on management decisions about the [specify fishery]	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If I want to have a say in commercial fishing management, I know how to	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Commercial fishing management plans are flexible enough to allow fishers to adapt to changing conditions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I actively participate in providing comments and/or feedback to PIRSA fisheries managers about fisheries management (either through my representative or directly)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

3a. To what extent do you agree or disagree with the following statements?

(tick one response only)

	Strongly disagree	← Neither →		Strongly agree	Don't know
DEEDI fisheries managers are doing a good job of managing commercial fishing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I trust DEEDI to make the right decisions for managing commercial fishing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I understand how decisions about fisheries management are made	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Commercial fishing management plans are flexible enough to allow fishers to adapt to changing conditions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

6.1.2 OBJECTIVE 1.2 MAXIMISE CULTURAL, RECREATIONAL AND LIFESTYLE BENEFITS (INCLUDING HEALTH BENEFITS) OF FISHING FOR THOSE WHO PARTICIPATE IN FISHING ACTIVITIES, WITHIN THE CONSTRAINTS OF ECOLOGICAL SUSTAINABILITY



Indicator CRC_1_2_1_Attitude (Commercial fisheries only)

Indicator Title Attitude to business

Data required Distribution of responses from survey about the way they view fishing.
Business = proportion of all responses of 5, 6 or 7

Where from Fisher survey

SA survey

1d Tick the point on the scale below that best represents how you view your commercial fishing activities (tick one response only)

←The lifestyle of commercial fishing is as important to me as the business aspects				I view fishing principally as a business, → which I participate in to earn income		
1	2	3	4	5	6	7
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Queensland survey

1b. Which statement most describes your attitude towards fishing?

(tick one response only)

←The lifestyle of commercial fishing is as important to me as the business aspects				I view fishing principally as a business, → which I participate in to earn income		
1	2	3	4	5	6	7
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Indicator CRC_1_2_2_Relative_income

Indicator Title Income relative to region

Data required Survey based estimates of fishing income and data on regional income
Qld: 30% percentile \$41k (low); 70% percentile \$103k (high) 2009-10; rest are medium (\$41k<income<\$103k)
SA: 30% percentile \$36k (low); 70% percentile \$92k (high) 2009-10; rest are medium (\$36k<income<\$92k)

Where from Survey and ABS

Indicator CRC_1_2_4_Income_1yr

Indicator Title Income change over 1 year

Data required The measure is the distribution of responses (percentage in each category: Lower = Much lower or lower; Same = about the same; Higher = Higher or much higher.

An explicit question is included in the current surveys (but was not asked in the pilot study with the SA marine and Scalefish fishery – which instead used satisfaction questions as proxy but this was proven not to be ideal). The value can also be derived from other estimates of income from fishing over time. To measure this would need regular economic surveys or specific social surveys of fishers. This is possible for the main SA fisheries as regular surveys are undertaken (every three years with estimates produced for the intervening years) and many commonwealth fisheries (from ABARES surveys) but for other states data will need to be collected in the social survey.

Note: data on changes over three years were also collected but it was considered that this is not necessary as good an indicator as a comparison of one and 5 years would be more reliable in terms of identifying spikes or sustained trends.

Where from Survey – economic or social surveys

SA survey

Q8c. How does the level of income you gained from your fishing activities in [specify financial year] compare to the income you gained...

	Much lower	Lower	About the same	Higher	Much higher
...one year ago	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...three years ago	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...five years ago	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Queensland survey

1d. How does the level of income you gained from your fishing activities in 2010-11 compare to the income you gained...

	Much lower	Lower	About the same	Higher	Much higher
...one year ago	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...three years ago	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...five years ago	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Indicator CRC_1_2_5_Income_5yr

Indicator Title Income change over 5 year

Data required The measure is the distribution of responses (percentage in each category: Lower = Much lower or lower; Same = about the same; Higher = Higher or much higher.

An explicit question was included in the surveys (but was not asked in the pilot study with the SA marine and Scalefish fishery – which used satisfaction questions as a proxy but this was found not to be ideal). The value can also be derived from other estimates of income from fishing over time. To measure this would need regular economic surveys or specific social surveys of fishers. This is possible for the main SA fisheries as regular surveys are undertaken (every three years with estimates produced for the intervening years) and many commonwealth fisheries (from ABARES surveys) but for other states data will need to be collected in the social survey.

Note: data on changes over three years was also collected but it was considered that this is not necessary as an indicator as a comparison of one and 5 years would be more reliable in terms of identifying spikes or sustained trends.

Where from Survey – economic or social surveys

SA survey

Q8c. How does the level of income you gained from your fishing activities in [specify financial year] compare to the income you gained...

	Much lower	Lower	About the same	Higher	Much higher
...one year ago	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...three years ago	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...five years ago	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Queensland survey

1d. How does the level of income you gained from your fishing activities in 2010-11 compare to the income you gained...

	Much lower	Lower	About the same	Higher	Much higher
...one year ago	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...three years ago	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...five years ago	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Indicator	CRC_1_2_8_Intention_to_leave
Indicator Title	Intention to leave
Data required	ASAP = as soon as possible before retire is all except until retire or stay beyond retirement
Where from	Fisher survey

The surveys asked different questions to test different approaches. The SA survey had more time frames (6) whereas the Queensland survey asked just four levels. The SA results need to be considered in light of the fisher’s current age to interpret and multiple responses are possible (e.g. a fisher near retirement age may list within 5 years, within 10 years and when retire as the answer – or one of these). In the Queensland survey, the less than 5, 5-10 and 10-20 are collapsed into “before I retire”. This was to potentially avoid confusion as, for example, a 65 year old may leave in less than 5 years when they retire so two possible answers both are correct. However, the Queensland version does lose information on those who have a short time commitment to the fishery but are not desperate to exit.

SA survey

1e. How long do you intend to continue fishing commercially?

We ask this question because each fisherman is at a different stage of their working life, and we want to understand if the stage of your working life you are in influences some of your other views about fishing.

	I plan to leave as soon as possible	Less than 5 years	5 to 10 years	10 to 20 years	Until I retire	I plan to keep fishing beyond retirement age
How long do you intend to continue participating in the commercial fishing industry?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Queensland survey

1h. How long do you intend to continue fishing commercially?

We ask this question because each fisher is at a different stage of their working life, and we want to understand if the stage of your working life you are in influences some of your other views about fishing.

	I plan to leave as soon as possible	I plan to leave before retire	I plan to leave when I retire	I plan to keep fishing beyond retirement age
How long do you intend to continue participating in the commercial fishing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Indicator CRC_1_2_9_Satisfaction_fishing

Indicator Title Satisfaction with fishing activities last 12 months

Data required Degree to which fishers are satisfied over last 12 months (low <=3; medium = 4-6; high >=7). Use proportion of responses in each category.

Where from Fisher survey

SA survey

1b. On average, how satisfied have you been with your commercial fishing activities over the last 12 months?

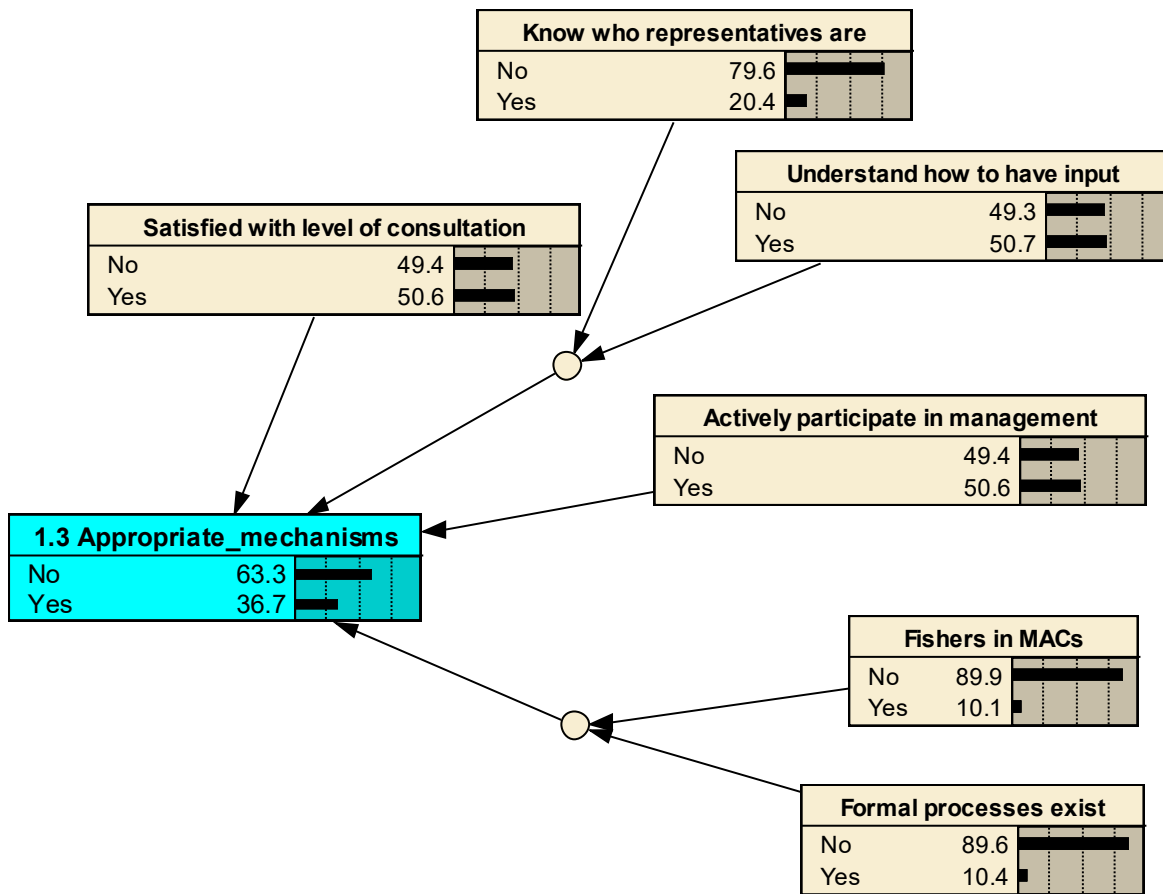
1 (Not at all satisfied)	2	3	4	5 (Somewhat satisfied)	6	7	8	9	10 (Very satisfied)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Queensland Survey

1e. On average, how satisfied have you been with your commercial fishing activities over the last 12 months?

1 (Not at all satisfied)	2	3	4	5	6	7	8	9	10 (Very satisfied)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

6.1.3 OBJECTIVE 1.3 ENSURE APPROPRIATE MECHANISMS EXIST FOR FISHER INVOLVEMENT IN DEVELOPMENT OF MANAGEMENT ADVICE



Indicator	CRC_1_3_1_Level_consultation
Indicator Title	Satisfied with level of consultation
Data required	Fisher perceptions of satisfaction with consultation process. Decided on just two levels: Yes >= Neither agree or disagree; No < Neither agree or disagree. The indicator is the proportion of responses in each category.
Where from	Fisher survey

SA survey

3a. To what extent do you agree or disagree with the following statements?

(tick one response only)

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	Don't know
PIRSA do a good job of managing commercial fishing in SA	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I trust PIRSA to make the right decisions for managing commercial fishing in SA	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I understand how decisions about fisheries management are made	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I am satisfied with the level of consultation PIRSA undertakes with fishers on management decisions about the [specify fishery]	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If I want to have a say in commercial fishing management, I know how to	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Commercial fishing management plans are flexible enough to allow fishers to adapt to changing conditions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I actively participate in providing comments and/or feedback to PIRSA fisheries managers about fisheries management (either through my representative or directly)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Queensland survey

4a. To what extent do you agree or disagree with the following statements?

(tick one response only)

	Strongly disagree	Neither			Strongly agree
		←—————→			
I am satisfied with the level of consultation DEEDI undertakes with fishers on management decisions about my fishery	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I have a good understanding of how I can have input into the development of management plans for my fishery	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I actively participate in providing comments and/or feedback to DEEDI fisheries managers about draft fisheries management plans (either through my representative or directly)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Indicator CRC_1_3_2_Know_reps
Indicator Title Know who representatives are
Data required Proportion of fishers who know who their representatives are.
Where from Survey of fishers

SA survey

4f. Do you know how to contact the people who represent your interests on fisheries management/advisory committees? (please circle one) **YES NO**

Queensland survey

4g. Do you know how to contact the people who represent your interests on fisheries management/advisory committees

YES NO

Indicator CRC_1_3_3_Understand_input
Indicator Title Understand how to have input
Data required Proportion of fishers who understand how to have an input into fisheries management (No < Neither agree nor disagree; Yes >= Neither agree nor disagree)

Where from Survey of fishers
The wording between the two surveys is slightly different, although there is no significant difference in their interpretation.

SA survey

3a. To what extent do you agree or disagree with the following statements?

(tick one response only)

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	Don't know
PIRSA do a good job of managing commercial fishing in SA	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I trust PIRSA to make the right decisions for managing commercial fishing in SA	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I understand how decisions about fisheries management are made	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I am satisfied with the level of consultation PIRSA undertakes with fishers on management decisions about the [specify fishery]	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If I want to have a say in commercial fishing management, I know how to	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Commercial fishing management plans are flexible enough to allow fishers to adapt to changing conditions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I actively participate in providing comments and/or feedback to PIRSA fisheries managers about fisheries management (either through my representative or directly)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Queensland survey

4a. To what extent do you agree or disagree with the following statements?

(tick one response only)

	Strongly disagree	Neither			Strongly agree
		←—————→			
I am satisfied with the level of consultation DEEDI undertakes with fishers on management decisions about my fishery	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I have a good understanding of how I can have input into the development of management plans for my fishery	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I actively participate in providing comments and/or feedback to DEEDI fisheries managers about draft fisheries management plans (either through my representative or directly)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Indicator CRC_1_3_4_Actively_participate

Indicator Title Actively participate in management

Data required Proportion of fishers who believe they actively participate in fisheries management. Yes >= Neither agree nor disagree.

There is a separate indicator of where fishers spend their time. This is less important for achieving the objective, but provides useful background information for managers on regulatory burden.

Where from Survey of fishers

An alternative measure may be managers' estimates of the proportion of fishers are actively involved in management (i.e. more than just turn up to group meetings)

SA survey

3a. To what extent do you agree or disagree with the following statements?

(tick one response only)

	Strongly disagree	<i>Disagree</i>	Neither agree nor disagree	Agree	Strongly agree	Don't know
PIRSA do a good job of managing commercial fishing in SA	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I trust PIRSA to make the right decisions for managing commercial fishing in SA	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I understand how decisions about fisheries management are made	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I am satisfied with the level of consultation PIRSA undertakes with fishers on management decisions about the [specify fishery]	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If I want to have a say in commercial fishing management, I know how to	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Commercial fishing management plans are flexible enough to allow fishers to adapt to changing conditions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I actively participate in providing comments and/or feedback to PIRSA fisheries managers about fisheries management (either through my representative or directly)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

4a. To what extent do you agree or disagree with the following statements?

(tick one response only)

	Strongly disagree	← Neither →			Strongly agree
I am satisfied with the level of consultation DEEDI undertakes with fishers on management decisions about my fishery	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I have a good understanding of how I can have input into the development of management plans for my fishery	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I actively participate in providing comments and/or feedback to DEEDI fisheries managers about draft fisheries management plans (either through my representative or directly)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Manager question

Question 15. Approximately what proportion of fishers and other stakeholders you aim to engage with have actively participated in fisheries management in the last 12 months, through any of the methods listed in the previous questions? If fishers don't talk directly to you, but instead talk to their representative organisation in order to give you feedback, you may need to consult that organisation prior to answering this question.

Indicator	CRC_1_3_5_Advisory_groups
Indicator Title	Fishers in MACs
Data required	Evidence that formal management advisory committees (or some alternative formal advisory group) exists and that fishers have representatives on this committee.
Where from	Manager's survey

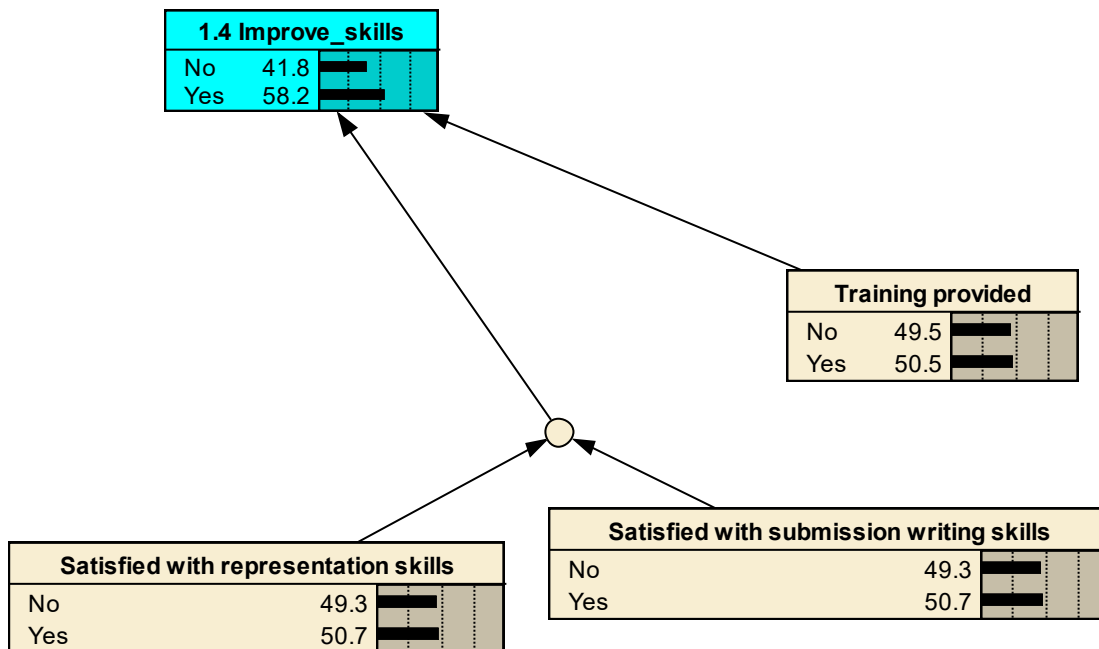
Question 12. Which of the following opportunities do fishers in your fishery have to provide input into fisheries management? (select all that apply)

- Contact with fisheries manager (fishers can call, email or otherwise talk directly to you)
- Contact via a representative organisation (an organisation exists that represents the interests of fishers to fisheries managers)
- Fishers are represented on a management committee
- Fishers are notified directly when there is a planned change to the fishery, and asked to provide feedback
- Other

Indicator	CRC_1_3_6_Processes
Indicator Title	Formal processes exist
Data required	Evidence of the existence of formal processes for stakeholder engagement that include feedback (Yes/No)
Where from	Manager's survey

Question 24. Is there a formal process of feedback to stakeholders that will be continued by other staff if a new person takes over management of the fishery?

6.1.4 OBJECTIVE 1.4 IMPROVE THE SKILLS OF FISHERS AND FISHERIES MANAGERS PARTICIPATING IN MANAGEMENT ADVISORY PROCESSES



Indicator	CRC_1_4_1_Training
Indicator Title	Training provided
Data required	Indication if formal training is provided to industry to participate more effectively in advisory groups
Where from	Manager's survey

Question 25. Which of the following opportunities did you provide to stakeholders involved in fisheries management in the last 12 months (all are methods of building skills and capacity to participate)? (select all that apply)

- Expert presentations discussing scientific data on the fishery
- Training courses for members of advisory committees or other stakeholders involved in management
- Resources to facilitate participation, such as reimbursement of travel costs to attend meetings
- Other (please describe below)

Indicator	CRC_1_4_2_Report_writing
Indicator Title	Satisfied with submission writing skills
Data required	Fishers' perceptions that they are satisfied with their skills. This would be limited to fishers with a formal representation role
Where from	Survey of fishers with representation role. Manager's survey if data unavailable from representatives.

No questions were asked in the two case study surveys as these were to fishers as a whole (not just representatives)

Potential question for representatives only

On average, how satisfied are you with your ability to communicate with managers through written submissions?

1		2		3		4		5		6		7		8		9		10	
(Not at all satisfied)																			(Very satisfied)
<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	

Related question from manager's survey that can be used as a proxy if data unavailable:

Question 26. Have you noticed any significant constraints or issues that prevent some stakeholders from participating effectively in fisheries management (eg through providing comments in submissions, or participating on advisory committees)?

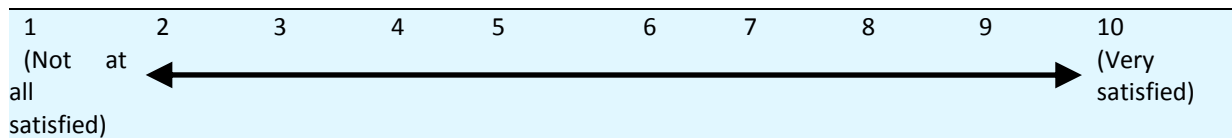
Question 27. If you answered yes to the previous question, what are these constraints (eg low literacy, lack of ability to travel to meetings, difficulty understanding science of the fishery, or others)?

Indicator	CRC_1_4_3_Negotiation
Indicator Title	Satisfied with representation skills
Data required	Fishers' perceptions that they are satisfied with their skills. This would be limited to fishers with a formal representation role
Where from	Survey of fishers with representation role

No questions were asked in the two case study surveys

Potential question for representatives only

On average, how satisfied are you with your ability to negotiate with managers?

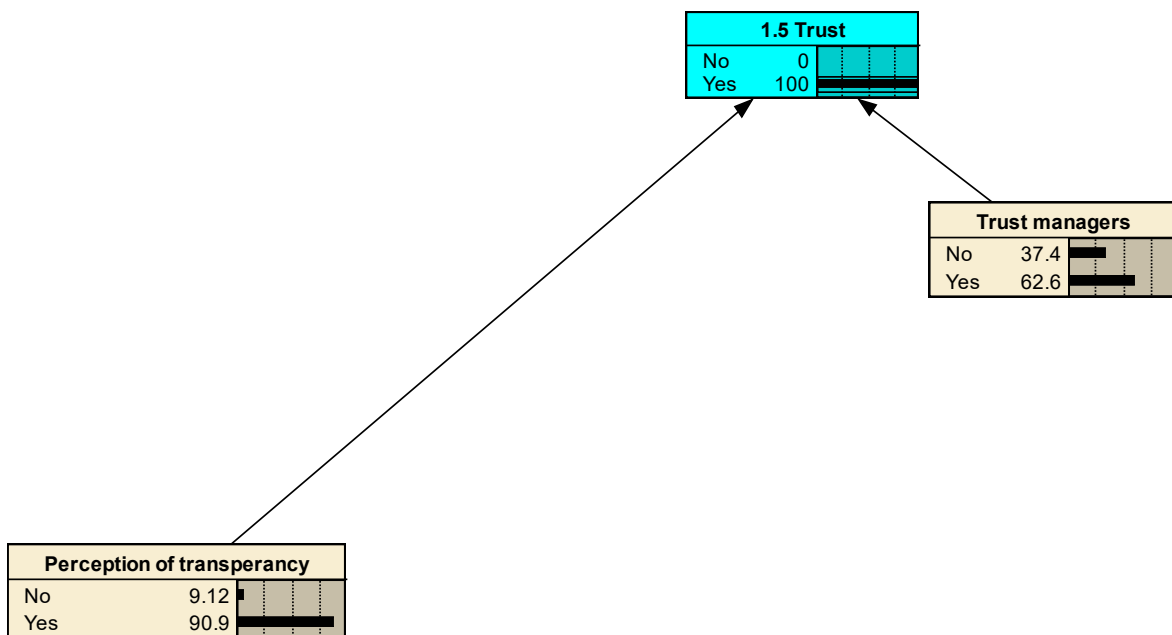


Related question from manager's survey that can be used as a proxy if data unavailable:

Question 26. Have you noticed any significant constraints or issues that prevent some stakeholders from participating effectively in fisheries management (eg through providing comments in submissions, or participating on advisory committees)?

Question 27. If you answered yes to the previous question, what are these constraints (eg low literacy, lack of ability to travel to meetings, difficulty understanding science of the fishery, or others)?

6.1.5 OBJECTIVE 1.5. INDUSTRY STAKEHOLDERS HAVE A HIGH LEVEL OF TRUST IN THE MANAGEMENT OF FISHERIES



Indicator	CRC_1_5_2_Transparency_percep
Indicator Title	Perception of transparency
Data required	Fishers' perceptions of transparency in decision making. Measure is proportion of fishers who believe that decision making is transparent (Yes >= Neither agree nor disagree)
Where from	Fisher surveys

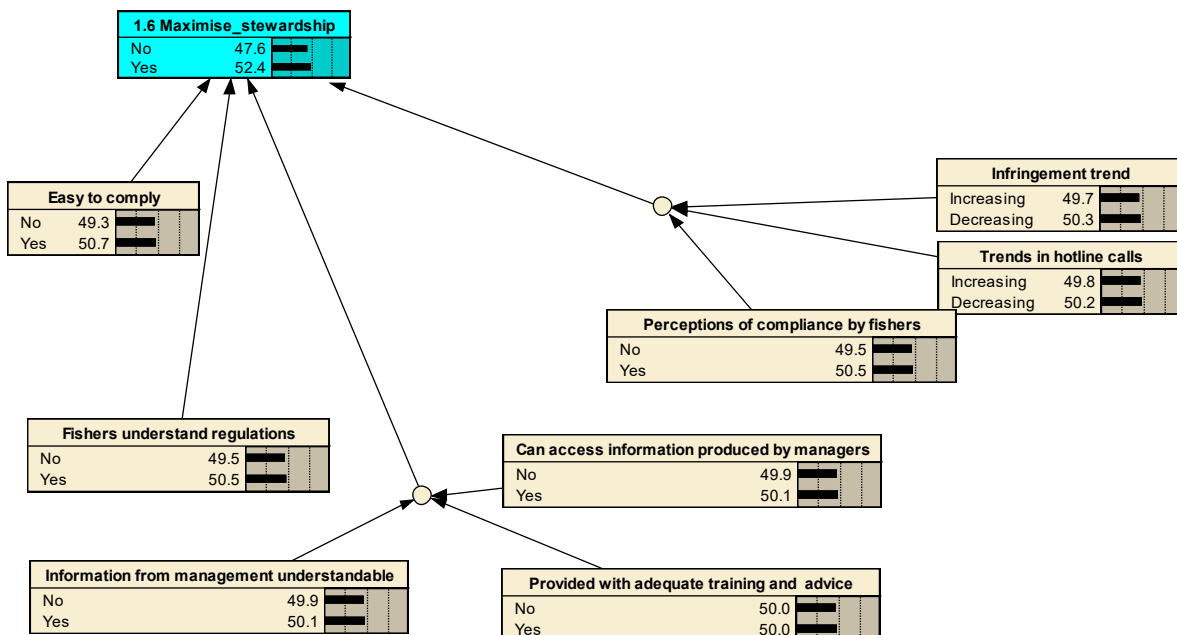
This indicator also feeds into objective 1.7 (transparency)

No questions relating to this were asked in the case study surveys, although the understanding question (CRC_1_7_1) is very similar and is likely to be correlated so can be used in the absence of specific data.

Potential question added into 3a:

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	Don't know
The process of decision making is transparent	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

6.1.6 OBJECTIVE 1.6. MAXIMISE STEWARDSHIP OF FISHERIES RESOURCES



Indicator CRC_1_6_1_Infringement_trend

Indicator Title Infringement trend

Data required Information on whether infringements are increasing, stable or decreasing. Measure is either increasing or decreasing, with staying stable considered part of decreasing. If there are different components/sectors of the fishery with different trends then the measure could be proportion of the fishery where infringements are stable or decreasing.

This is not a good indicator as reduced infringements may reflect either increased compliance or reduced monitoring and surveillance.

Where from Manager's survey

Question 28: How have the number of fisheries infringements/warnings/prosecutions changed over the last year?

	Recorded infringements	Warnings given to fishers	Prosecutions of fishers
Select one option from the drop down box	<input type="text"/>	<input type="text"/>	<input type="text"/>
Please add comments if you wish to	<input type="text"/>		

Indicator CRC_1_6_2_Hotline

Indicator Title Trends in hotline calls

Data required Information on whether calls to hotlines are increasing or decreasing. Measure is either increasing or decreasing, with staying stable considered not-increasing. If there are different components/sectors of the fishery with different trends then the measure could be proportion of the fishery where the number of calls is stable or decreasing.

As with infringements, this is not a good indicator as reduced calls may reflect either increased compliance or increased reluctance to report fellow fishers.

Where from Managers

Question 30. If you have a phone number people can call to report poor fishing behaviour, please answer this question. How has the number of calls to fisheries hotlines reporting concerns about fishing in your fishery changed over the last 12 months?

- Increased
- Stayed about the same
- Decreased
- Don't know/unsure

Please add a comment if you wish to

To what extent do you agree or disagree with the following statements?

	Strongly disagree	Neither			Strongly agree	Don't know
		←————→				
I can easily access information about the management of commercial fishing in Queensland	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The information DEEDI produces about commercial fishing is easy to understand	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Most commercial fishers comply with fishing rules and regulations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Most commercial fishers are responsible in how they fish	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I have a good understanding of fishing rules and regulations that apply to my fishing activities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
It is easy to comply with fishing rules and regulations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If I see other people doing the wrong thing while fishing, I report it to authorities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If I see someone doing the wrong thing when fishing, I know who to report it to	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

(tick one response only)

Indicator CRC_1_6_4_Info_Produced

Indicator Title Can access information produced by managers

Data required Fishers' perceptions about ease of obtaining information from managers. Yes >= neither agree nor disagree (excludes don't know)

Where from Fisher surveys

SA survey

2a. To what extent do you agree or disagree with the following statements?

	Strongly disagree	<i>Disagree</i>	Neither agree nor disagree	Agree	Strongly agree	Don't know
I can easily access information about commercial fishing management in SA	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The commercial fishing information PIRSA produces is easy to understand	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Most recreational fishers comply with fishing rules and regulations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I have a good understanding of fishing rules and regulations that apply to my fishing activities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Most commercial fishers fish responsibly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
It is easy to comply with fishing rules and regulations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If I see a fisher doing the wrong thing, I know who to report it to	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fishers are provided with adequate training and advice about good fishing practices (e.g. bycatch reduction)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If I see other people doing the wrong thing while fishing, I report it to authorities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Most commercial fishers comply with fishing rules and regulations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Most recreational fishers fish responsibly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

(tick one response only)

To what extent do you agree or disagree with the following statements?

	Strongly disagree	Neither			Strongly agree	Don't know
I can easily access information about the management of commercial fishing in Queensland	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The information DEEDI produces about commercial fishing is easy to understand	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Most commercial fishers comply with fishing rules and regulations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Most commercial fishers are responsible in how they fish	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I have a good understanding of fishing rules and regulations that apply to my fishing activities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
It is easy to comply with fishing rules and regulations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If I see other people doing the wrong thing while fishing, I report it to authorities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If I see someone doing the wrong thing when fishing, I know who to report it to	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

(tick one response only)

Indicator CRC_1_6_5_Adequate_training

Indicator Title Provided with adequate training and advice

Data required Fishers' perceptions about training and advice provided to them relating to their fishing activities that helps them to comply. Yes >= Neither agree nor disagree

Where from Fisher surveys

SA survey

This is the closest question but not sure it does what we think it does. It seems more on technical fishing training than training related to compliance.

2a. To what extent do you agree or disagree with the following statements?

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	Don't know
I can easily access information about commercial fishing management in SA	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The commercial fishing information PIRSA produces is easy to understand	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Most recreational fishers comply with fishing rules and regulations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I have a good understanding of fishing rules and regulations that apply to my fishing activities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Most commercial fishers fish responsibly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
It is easy to comply with fishing rules and regulations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If I see a fisher doing the wrong thing, I know who to report it to	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fishers are provided with adequate training and advice about good fishing practices (e.g. bycatch reduction)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If I see other people doing the wrong thing while fishing, I report it to authorities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Most commercial fishers comply with fishing rules and regulations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Most recreational fishers fish responsible	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

(tick one response only)

Queensland survey

This was not included in Queensland survey as a similar question was being asked in the USC survey and it was agreed that there would be no duplication. For future surveys the above question could be included.

Indicator CRC_1_6_6_Adequate_info

Indicator Title Information from management understandable

Data required Fishers' perception that information from management is understandable. Measure is the proportion of fishers who agree (Yes >= Neither agree nor disagree)

Where from Fisher surveys

2a. To what extent do you agree or disagree with the following statements?

	Strongly disagree	<i>Disagree</i>	Neither agree nor disagree	Agree	Strongly agree	Don't know
I can easily access information about commercial fishing management in SA	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The commercial fishing information PIRSA produces is easy to understand	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Most recreational fishers comply with fishing rules and regulations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I have a good understanding of fishing rules and regulations that apply to my fishing activities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Most commercial fishers fish responsibly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
It is easy to comply with fishing rules and regulations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If I see a fisher doing the wrong thing, I know who to report it to	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fishers are provided with adequate training and advice about good fishing practices (e.g. bycatch reduction)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If I see other people doing the wrong thing while fishing, I report it to authorities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Most commercial fishers comply with fishing rules and regulations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Most recreational fishers fish responsibly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

(tick one response only)

To what extent do you agree or disagree with the following statements?

	Strongly disagree	← Neither →		Strongly agree	Don't know
I can easily access information about the management of commercial fishing in Queensland	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The information DEEDI produces about commercial fishing is easy to understand	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Most commercial fishers comply with fishing rules and regulations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Most commercial fishers are responsible in how they fish	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I have a good understanding of fishing rules and regulations that apply to my fishing activities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
It is easy to comply with fishing rules and regulations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If I see other people doing the wrong thing while fishing, I report it to authorities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If I see someone doing the wrong thing when fishing, I know who to report it to	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Indicator CRC_1_6_7_Understand_regs

Indicator Title Fishers understand regulations

Data required Degree to which fishers understand regulation. Measure is the proportion of fishers who agree (Yes >= neither agree nor disagree) ("Don't know" is excluded)

Where from Fisher surveys

SA survey

2a. To what extent do you agree or disagree with the following statements?

	Strongly disagree	<i>Disagree</i>	Neither agree nor disagree	Agree	Strongly agree	Don't know
I can easily access information about commercial fishing management in SA	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The commercial fishing information PIRSA produces is easy to understand	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Most recreational fishers comply with fishing rules and regulations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I have a good understanding of fishing rules and regulations that apply to my fishing activities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Most commercial fishers fish responsibly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
It is easy to comply with fishing rules and regulations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If I see a fisher doing the wrong thing, I know who to report it to	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fishers are provided with adequate training and advice about good fishing practices (e.g. bycatch reduction)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If I see other people doing the wrong thing while fishing, I report it to authorities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Most commercial fishers comply with fishing rules and regulations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Most recreational fishers fish responsibly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

(tick one response only)

To what extent do you agree or disagree with the following statements?

	Strongly disagree	Neither			Strongly agree	Don't know
I can easily access information about the management of commercial fishing in Queensland	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The information DEEDI produces about commercial fishing is easy to understand	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Most commercial fishers comply with fishing rules and regulations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Most commercial fishers are responsible in how they fish	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I have a good understanding of fishing rules and regulations that apply to my fishing activities	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
It is easy to comply with fishing rules and regulations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If I see other people doing the wrong thing while fishing, I report it to authorities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If I see someone doing the wrong thing when fishing, I know who to report it to	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

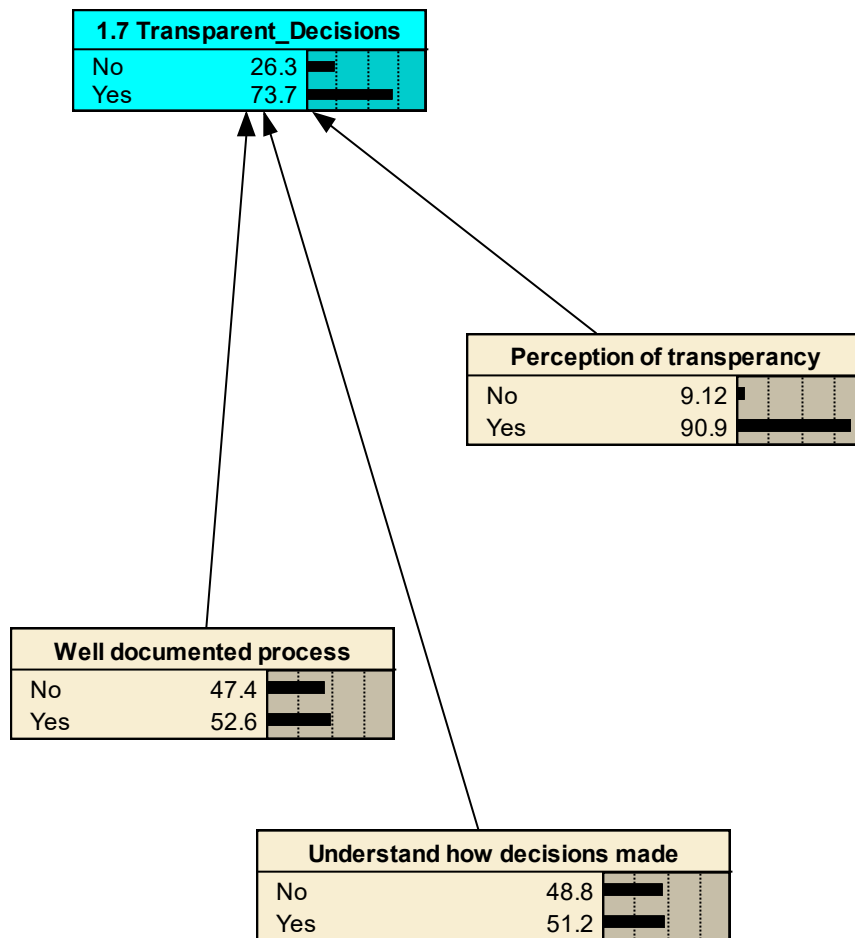
Indicator CRC_1_6_8_Comply_easy

Indicator Title Easy to comply

Data required Fisher perception as to how easy it is to comply with the regulations. Measure is the proportion of fishers who agree (Yes >= neither agree nor disagree)

Where from Fisher survey

6.1.7 OBJECTIVE 1.7. ENSURE TRANSPARENCY OF DECISION MAKING PROCESS BY MANAGEMENT BODIES



(also includes 1_5_2 covered above)

Indicator CRC_1_7_1_Understand_decisions

Indicator Title Understand how decisions made

Data required Proportion of fishers who understand how decisions are made. Yes >= neither agree nor disagree (ignoring N/A)

Where from Fisher survey

Indicator CRC_1_7_2_Documented_process

Indicator Title Well documented process

Data required Evidence that there are well document processes for decision making

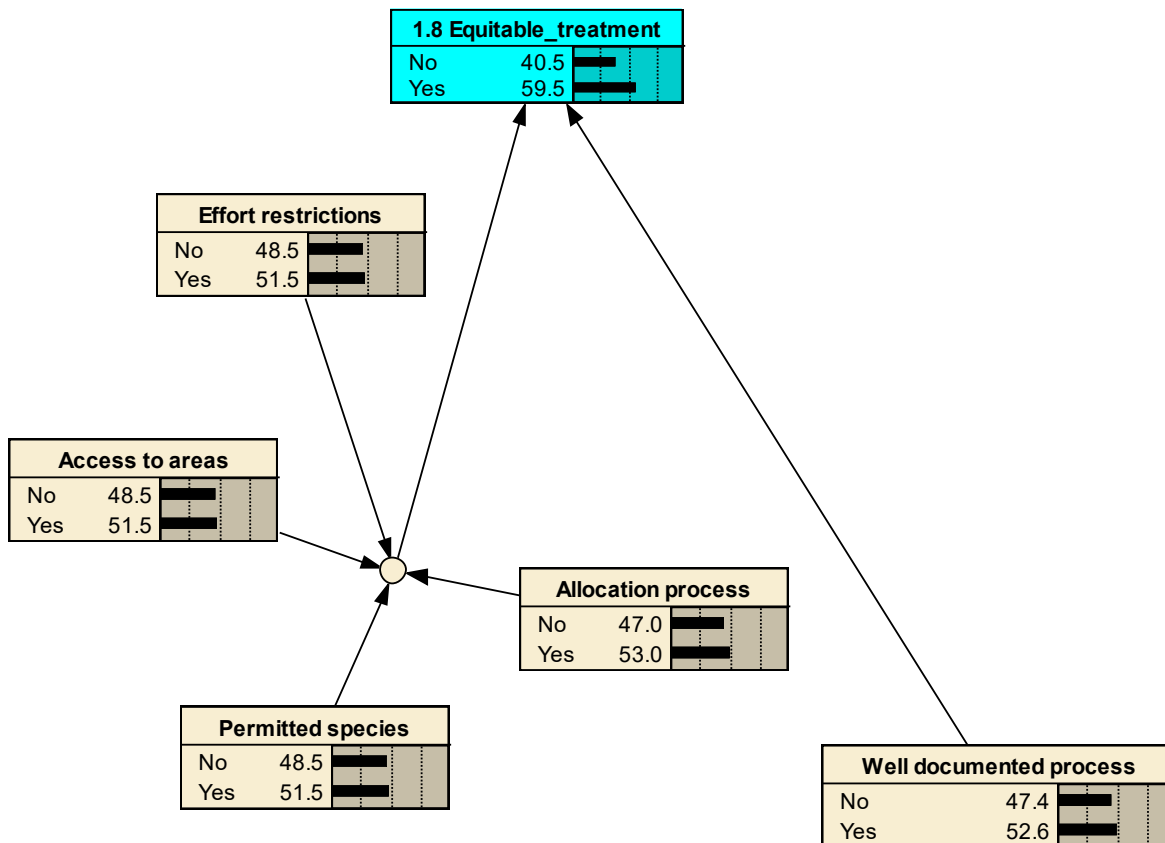
Where from Fisheries managers

(also feeds into objective 1.8)

Potential management question:

Are there well document processes for decision making that are available to fishers?

6.1.8 OBJECTIVE 1.8 ENSURE EQUITABLE TREATMENT AND ACCESS FOR FISHERS, WITHIN THE CONSTRAINTS OF ECOLOGICAL SUSTAINABILITY



(includes 1_7_1)

Indicator CRC_1_8_1_Allocation_process

Indicator Title Allocation process

Data required Fisher perception about equity of the allocation process. Measure is the proportion of fishers who believe that it is equitable. Yes => neither fair nor unfair

Where from Fisher survey

SA survey

3b. How fairly do you feel commercial fishers are treated by fisheries managers compared to other users of fisheries resources? Please answer for each of the areas listed.

How fair is the treatment of commercial fishers in terms of:	Very unfair	Unfair	Neither fair or unfair	Fair	Very fair
Gear restrictions (eg types of fishing gear you can use)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Access to fishing areas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Allocation of catch	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The processes used to make decisions about fisheries management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Queensland survey

3b. How fairly do you feel you are treated by fisheries managers compared to other users of fisheries resources in terms of ...

Please answer for each of the areas listed.

	Very unfair	Unfair	Neither fair nor unfair	Fair	Very fair
Effort restrictions (e.g. limit on days, types of fishing gear, Hull units etc)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Access to fishing areas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Permitted species	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The processes used to make allocation decisions about fisheries resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Indicator CRC_1_8_2_Permitted_species

Indicator Title Permitted species/allocation of catch

Data required Different questions/indicators relate to different types of fisheries. For quota fisheries, the indicator relates to allocation of catch. For non-quota fisheries, it relates to the species that are permitted to be landed (effectively allocation of species).

Fisher perception about equity of which species they are allowed to land. For quota species, this can be replaced with the perception about the allocation of catch of their main species. Measure is the proportion of fishers who believe that it is equitable. Yes >= neither fair nor unfair

Where from Fisher survey

SA survey

3b. How fairly do you feel commercial fishers are treated by fisheries managers compared to other users of fisheries resources? Please answer for each of the areas listed.

How fair is the treatment of commercial fishers in terms of:	Very unfair	Unfair	Neither fair or unfair	Fair	Very fair
Gear restrictions (eg types of fishing gear you can use)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Access to fishing areas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Allocation of catch	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The processes used to make decisions about fisheries management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Queensland survey

3b. How fairly do you feel you are treated by fisheries managers compared to other users of fisheries resources in terms of ...

Please answer for each of the areas listed.

	Very unfair	Unfair	Neither fair nor unfair	Fair	Very fair
Effort restrictions (e.g. limit on days, types of fishing gear, Hull units etc)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Access to fishing areas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Permitted species	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The processes used to make allocation decisions about fisheries resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Indicator CRC_1_8_3_Access

Indicator Title Access to areas

Data required Fisher perception about equity of which areas they are allowed to fish in. Measure is the proportion of fishers who believe that it is equitable. Yes >= neither fair nor unfair

Where from Fisher survey

SA survey

3b. How fairly do you feel commercial fishers are treated by fisheries managers compared to other users of fisheries resources? Please answer for each of the areas listed.

How fair is the treatment of commercial fishers in terms of:	Very unfair	Unfair	Neither fair or unfair	Fair	Very fair
Gear restrictions (eg types of fishing gear you can use)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Access to fishing areas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Allocation of catch	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The processes used to make decisions about fisheries management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Queensland survey

3b. How fairly do you feel you are treated by fisheries managers compared to other users of fisheries resources in terms of ...

Please answer for each of the areas listed.

	Very unfair	Unfair	Neither fair nor unfair	Fair	Very fair
Effort restrictions (e.g. limit on days, types of fishing gear, Hull units etc)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Access to fishing areas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Permitted species	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The processes used to make allocation decisions about fisheries resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Indicator CRC_1_8_4_Effort_restrictions

Indicator Title Effort/gear restrictions

Data required Fisher perception about equity in regard to the gears they are allowed to use and other restrictions (e.g. limits on effort). The actual question will relate to the relevant management control in the fishery being examined. Measure is the proportion of fishers who believe that it is equitable. Yes >= neither fair nor unfair

Where from Fisher survey

SA survey

3b. How fairly do you feel commercial fishers are treated by fisheries managers compared to other users of fisheries resources? Please answer for each of the areas listed.

How fair is the treatment of commercial fishers in terms of:	Very unfair	Unfair	Neither fair or unfair	Fair	Very fair
Gear restrictions (eg types of fishing gear you can use)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Access to fishing areas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Allocation of catch	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The processes used to make decisions about fisheries management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

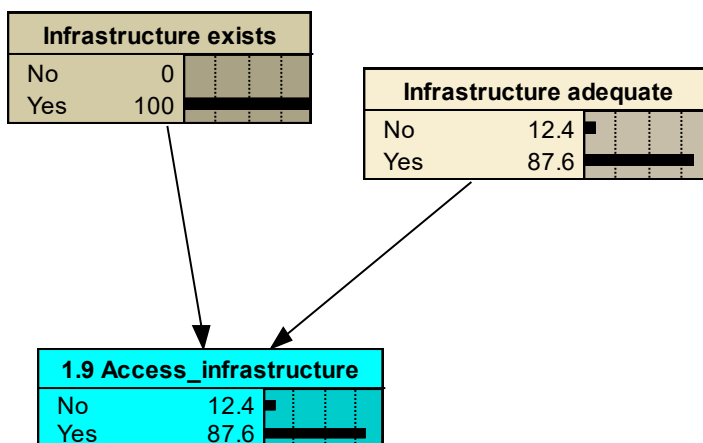
Queensland survey

3b. How fairly do you feel you are treated by fisheries managers compared to other users of fisheries resources in terms of ...

Please answer for each of the areas listed.

	Very unfair	Unfair	Neither fair nor unfair	Fair	Very fair
Effort restrictions (e.g. limit on days, types of fishing gear, Hull units etc)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Access to fishing areas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Permitted species	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The processes used to make allocation decisions about fisheries resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

6.1.9 OBJECTIVE 1.9. ENSURE ADEQUATE ACCESS TO INFRASTRUCTURE NEEDED FOR SUCCESSFUL OPERATION OF FISHING ACTIVITIES, WITHIN THE CONSTRAINTS OF ECOLOGICAL SUSTAINABILITY



Indicator CRC_1_9_1_Infrast_exists

Indicator Title Infrastructure exists

Data required Evidence that infrastructure exists. The measure can be a subjective assessment of the proportion of required infrastructure provided. Yes is the proportion that exists.

Where from Manager's survey

Potential management question:

What proportion of infrastructure needed by the commercial, recreational and charter community exists?

Indicator CRC_1_9_2_inf_adequate

Indicator Title Infrastructure adequate

Data required Fisher perceptions about the adequacy of infrastructure. Ideally it should correlate highly with managers perceptions about provision. Measure is based on the proportion of fishers satisfied over a broad range of infrastructure types (summed over the sub-categories). The list may vary depending on the needs of the fishery. Yes >= neither satisfied nor dissatisfied

Where from Fisher survey.

SA survey

7a. How satisfied are you with the level of access you have to the following infrastructure as part of your fishing activities?

	Very dissatisfied	Somewhat dissatisfied	Neither satisfied or dissatisfied	Somewhat satisfied	Very satisfied	N/A
Marines/mooring facilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Fuel and repair facilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Ice	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Cold storage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Roads accessing fishing areas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Fishing ramps/jetties/ wharves	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Bait and other supplies (other than ice)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Offloading facilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Seafood sorting facilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Other processing facilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Other (please describe)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

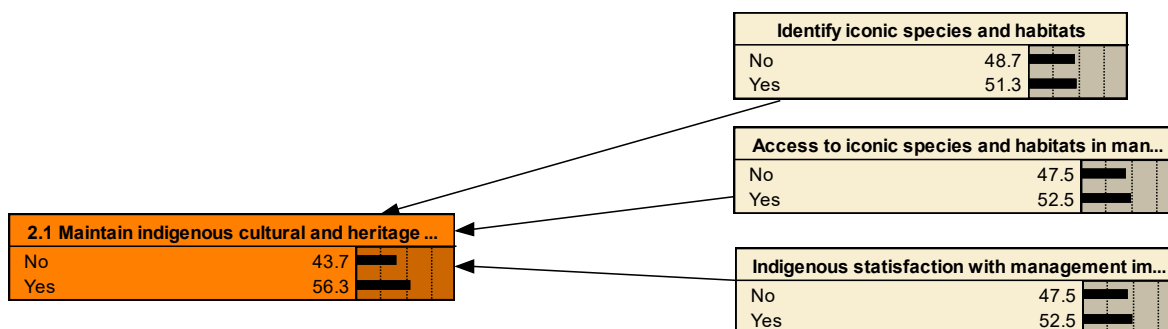
Queensland survey

How satisfied are you with the level of access you have to the following infrastructure as part of your fishing activities?

	Very dissatisfied	Somewhat dissatisfied	Neither satisfied or dissatisfied	Somewhat satisfied	Very satisfied
Mooring facilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fuel and repair facilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ice	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cold storage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Roads to access facilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Offloading facilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Seafood sorting facilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other processing facilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (please describe)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

6.2 2. Indigenous community objectives

6.2.1 OBJECTIVE 2.1 FISHERIES MANAGEMENT ACTIONS SUPPORT THE MAINTENANCE OF CULTURAL AND HERITAGE VALUES RELATED TO FISHING ACTIVITIES IN ABORIGINAL AND TORRES STRAIT ISLANDER COMMUNITIES, WITHIN THE CONSTRAINTS OF ECOLOGICAL SUSTAINABILITY.



Indicator Ind_2_1_1_iconic_species

Indicator Title Identify iconic species and habitats

Data required Evidence that iconic species and habitats have been identified relevant to indigenous communities. Recognition and protection of iconic species and habitat in fisheries management plans. The measure can be a subjective assessment as to what proportion of species and habitats have been assessed.

Where from Managers

Potential management question:

What proportion of species and habitats important to the maintenance of cultural and heritage values have been identified in the management plan?

Indicator Ind_2_1_2_access_iconic

Indicator Title Access to iconic species and habitats in management plan

Data required Evidence that there is continued access of identified community iconic species through habitat protection and catch management. The measure can be derived from the proportion of species/habitats that are restricted (i.e. 1- proportion restricted).

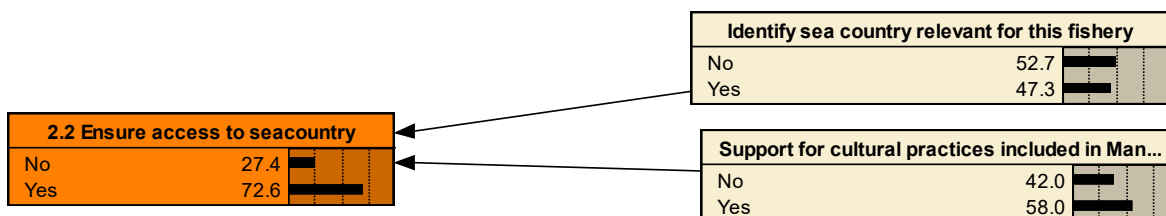
Where from Managers

Potential management question:

What proportion of access to species and habitats important to the maintenance of cultural and heritage values are restricted in the management plan?

Indicator	Ind_1_2_3_Satisfaction_iconic
Indicator Title	Indigenous satisfaction with management impacts on access to iconic species over time
Data required	Community perception of the impacts of management activities on the maintenance of values and cultural activities over time
Where from	Indigenous community survey or focus/advisory group

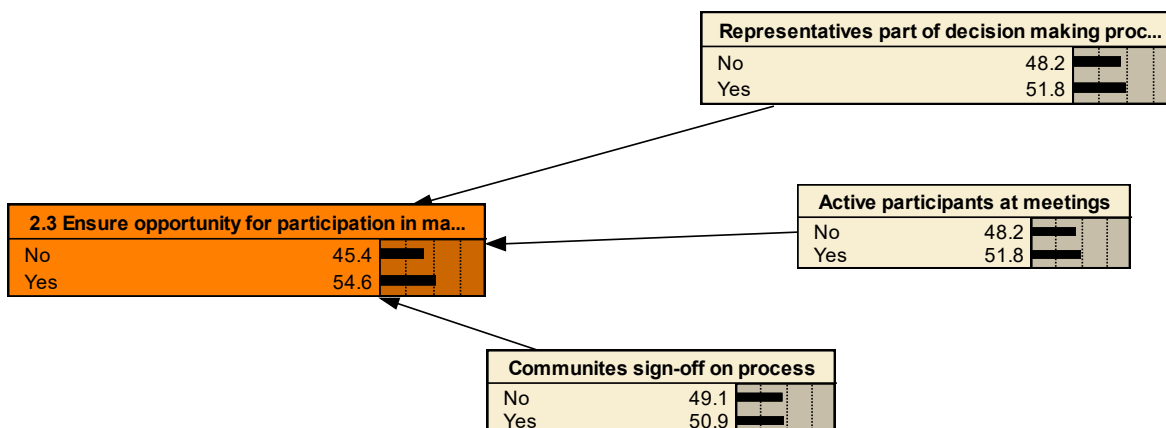
6.2.2 OBJECTIVE 2.2. ENSURE ACCESS TO ‘SEA COUNTRY’ TO ENABLE CONTINUATION OF CULTURAL FISHING ACTIVITIES, RESPECTING THE RIGHTS OF ABORIGINAL AND TORRES STRAIT ISLANDER PEOPLES TO THESE RESOURCES, WITHIN THE CONSTRAINTS OF ECOLOGICAL SUSTAINABILITY.



Indicator	Ind_2_2_1_Sea_country_ident
Indicator Title	Identify sea country relevant for this fishery
Data required	Management plans identify [and understand] the Traditional Owners historical context of the Sea Country and their management processes. The aim is to ensure fisheries managers are aware of the worldview of the Aboriginal community they engage with. This is aimed to improve communication and collaboration on management plans by developing mutual understanding and respect of each other's needs.
Where from	Indigenous community survey or focus/advisory group

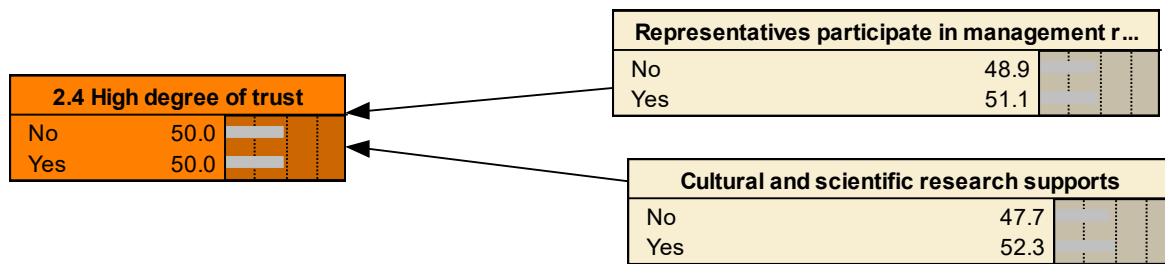
Indicator	Ind_2_2_2_sea_country_man
Indicator Title	Support for cultural practices included in management considerations
Data required	Support annual and seasonal practices of cultural and customary take including the cultural values that underpin the take
Where from	Indigenous community survey or focus/advisory group

6.2.3 OBJECTIVE 3.3 PROVIDE OPPORTUNITIES FOR ABORIGINAL AND TORRES STRAIT ISLANDER COMMUNITIES TO PARTICIPATE IN FISHERIES MANAGEMENT DECISION MAKING PROCESSES.



Indicator	Ind_2_3_1_Reps_identified
Indicator Title	Representatives part of decision making process
Data required	Representatives from the Aboriginal communities are active participants in fisheries management decision making. Indicator is that representatives have a formal role in decision making May be “yes” or “no”
Where from	Indigenous community survey or focus/advisory group
Indicator	Ind_2_3_2_Attend_meetings
Indicator Title	Active participants at meetings
Data required	Nominated representatives of Aboriginal communities associated with ‘Sea Country’ and a fishery are active participants in fisheries management decision making. Indicator may be the proportion of meetings that representatives attended (%).
Where from	Indigenous community survey or focus/advisory group
Indicator	Ind_2_3_3_Indig_satisfaction
Indicator Title	Communities sign-off on process
Data required	Nominated representatives seek community signoff of fisheries management plans. Measure is the proportion of management plans that gain community sign-off.
Where from	Indigenous community survey or focus/advisory group

6.2.4 OBJECTIVE 2.4 ABORIGINAL AND TORRES STRAIT ISLANDER COMMUNITIES ASSOCIATED WITH SEA COUNTRY HAVE A HIGH LEVEL OF TRUST IN THE MANAGEMENT OF FISHERIES



Indicator Ind_2_4_1_partipate_review

Indicator Title Representatives participate in management review

Data required Community nominees participate in the evaluation process of fisheries management plans Measure is the proportion of management plans that are reviewed with representative participation.

Where from Indigenous community survey or focus/advisory group
Managers

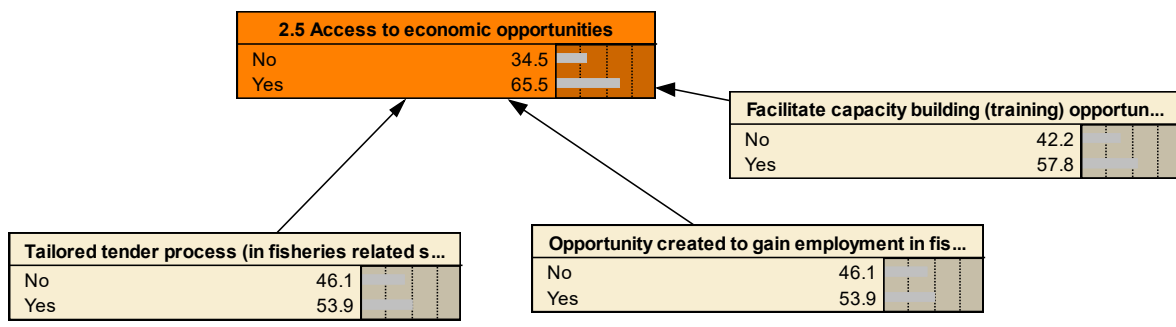
Indicator Ind_2_4_2_collab_research

Indicator Title Cultural and scientific research supports management

Data required Collaborative cultural and scientific research is supported to ensure fisheries management is consistent and supportive of cultural and customary take. Measure is proportion of fisheries management plans supported by cultural research (where relevant).

Where from Indigenous community survey or focus/advisory group
Managers

6.2.5 OBJECTIVE 2.5. ENSURE ACCESS TO INCOME EARNING OPPORTUNITIES FOR ABORIGINAL AND TORRES STRAIT ISLANDER COMMUNITY MEMBERS RELATED TO THE MANAGEMENT OF FISHERIES MARINE AND WATER RESOURCES, INCLUDING PARTICIPATION IN DATA COLLECTION PROCESSES, WITHIN THE CONSTRAINTS OF ECOLOGICAL SUSTAINABILITY.



Indicator Ind_2_5_1_training_capacity

Indicator Title Facilitate capacity building (training) opportunities

Data required Training and capacity building opportunities are identified and supported
Group suggested measures:

- Aboriginal community members are involved in education and compliance of fisheries management plans
- Training opportunities are accessed by Aboriginal communities members
- Percentage of certification achieved through training opportunities

Measure to be one of these (TBA)

Where from Indigenous community survey or focus/advisory group
Managers

Indicator Ind_2_5_2_Management_work



Indicator Title Opportunity created to gain employment in fisheries related work



Data required Aboriginal and Torres Strait Islander communities are able to access income-earning opportunities related to fisheries, marine and water resources. Measure may be yes/no

Where from Indigenous community survey or focus/advisory group
Managers

Indicator	Ind_2_5_3_Tender_process
Indicator Title	Tailored tender process (in fisheries related services) to indigenous communities
Data required	Tendering process that is tailored to Aboriginal and Torres Strait Islander employment circumstances for the communities associated with the 'sea country' in the fishery. Measure may be yes/no or proportion of tenders that are tailored to indigenous communities
Where from	Indigenous community survey or focus/advisory group Managers

6.2.6 OBJECTIVE 2.6. ENSURE COLLABORATIVE INPUTS BY ABORIGINAL COMMUNITIES, REGIONAL AND INDUSTRY SECTORS ON THE BENEFITS EACH SECTOR OFFERS TO FISHERIES MANAGEMENT.

2.6 Collaborative inputs by Aboriginal commu...		
No	45.4	
Yes	54.6	

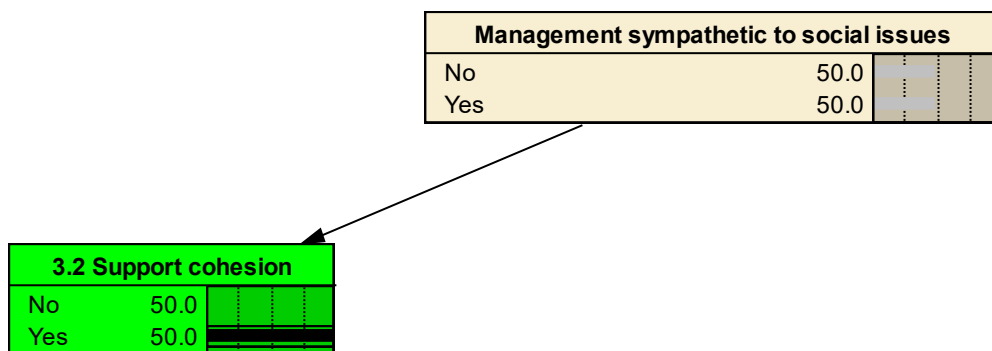
Ability to participate in fisheries education pro...		
No	50.0	
Yes	50.0	



Indicator	Ind_2_6_1_Fisheries_educ
Indicator Title	Ability to participate in fisheries education processes
Data required	Aboriginal groups participate in the fisheries ESD education process to build capability and increase participation amongst sectors to strengthen fisheries management. Measure may be yes/no on provision of opportunities
Where from	Indigenous community survey or focus/advisory group Managers

Indicator	RAC_3_1_2_Proportion_employ
Indicator Title	Proportion direct and indirect employment
Data required	Over time this reflects if employment is increasing or decreasing. Regional employment is assumed directly proportional to direct employment (this is also an assumption in input-output analysis that is used to derive employment flow-on effects). Note: this is a longitudinal indicator – not a point in time.
Where from	General fleet information (changes in number of boats) provided by fisheries managers

6.3.2 OBJECTIVE 3.2: TO FACILITATE AND SUPPORT THE COHESION AND CONNECTEDNESS OF FISHERS WITH THEIR REGIONAL COMMUNITIES THROUGH FISHERIES MANAGEMENT, WITHIN THE CONSTRAINTS OF ECOLOGICAL SUSTAINABILITY



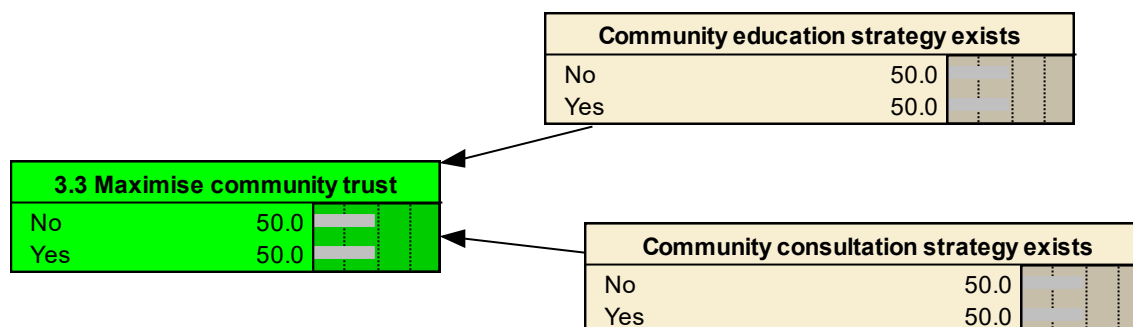
Indicator	RAC_3_2_1_sympathetic_mgt
Indicator Title	Management sympathetic to social issues
Data required	Evidence of recognition in management plans of key dates, holidays, needs of fishers to enable them to take part in community life
Where from	Fisheries managers

Question 42. Sometimes managers need to consider local cultural and social needs when planning their fisheries management. Can you identify any key community issues that need to be addressed in your management activities to ensure you contribute to local community wellbeing? For example, this might include identifying dates when fishers need to be able to participate in community activities, or when fishing (or conversely, placing restrictions on fishing) may be considered culturally inappropriate.

- Yes
- No
- Unsure/don't know

If yes, please describe briefly the cultural considerations

6.4 Objective 3.3: To maximise community trust in fisheries agencies to manage fisheries.



Indicator	RAC_3_3_1_Education_strategy
Indicator Title	Community education strategy exists
Data required	Existence of education strategies documented by managers
Where from	Managers

Fisheries managers document the strategies in place. The presence of processes for improving awareness, communication and hence trust indicates a higher likelihood of community trust, but is not in and of itself indicative that the processes have succeeded in achieving this trust.

Question 45. Do you or others in your organisation provide training and education opportunities for the non-fishing public?

Question 46. Do you or others in your organisation contribute to training and education opportunities provided by other groups (eg you might give a talk at a school or a public event)?

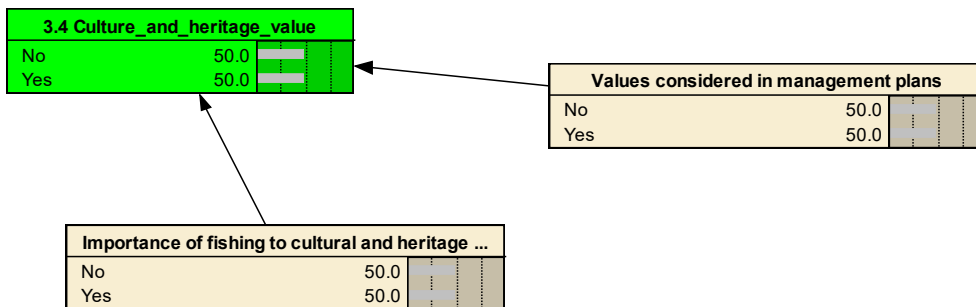
Indicator	RAC_3_3_2_Consult_strategy
Indicator Title	Community consultation strategy exists
Data required	Existence of consultation strategies documented by managers
Where from	Manager's survey

Fisheries managers document the strategies in place. The presence of processes for improving awareness, communication and hence trust indicates a higher likelihood of community trust, but is not in and of itself indicative that the processes have succeeded in achieving this trust.

Question 40. Do you have specific strategies in place to build and maintain the public's trust in fisheries management?

Question 41. If you answered yes to the previous question, are these strategies documented in your fisheries management planning documents?

6.4.1 OBJECTIVE 3.4: ENSURE FISHERIES MANAGEMENT CONTRIBUTES TO THE MAINTENANCE OF CULTURAL AND HERITAGE VALUES RELATED TO FISHING ACTIVITIES, WITHIN THE CONSTRAINTS OF ECOLOGICAL SUSTAINABILITY



Indicator RAC_3_4_1_Mgt_C_and_H

Indicator Title Values considered in management plans

Data required Fisheries managers identify whether management plans (i) identify the nature of relevant cultural and heritage values, (ii) identify how fisheries management may affect these (positively or negatively), and (iii) put in place actions intended to maintain or enhance these values. Measure may be proportion of these considerations in the management plan (i.e. 33% if 1, 66% if 2, 100% if all 3)

Where from Managers

Question 44. Which of the following methods do you use to identify the cultural and heritage values that arise from your fishery for communities in which the fishery operates? (select all that apply)

- Your own knowledge about the community
- Consultation with local experts eg tourism office, heritage office
- Consultation with Indigenous groups
- Consultation with other stakeholder groups eg local council
- Consultation with fishers
- Community survey
- I don't identify cultural and heritage values at all
- Other (please describe below)

Please describe methods if you selected 'other'

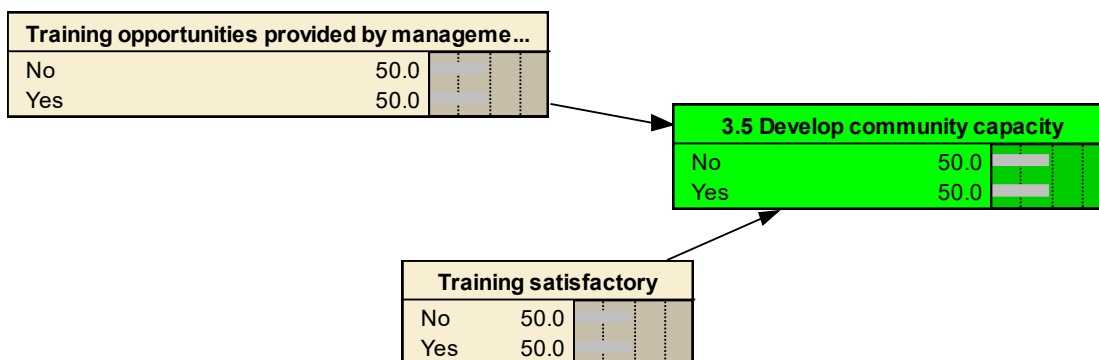
Indicator RAC_3_4_2_Imp_CH_fishing

Indicator Title Importance of fishing to cultural and heritage values

Data required Subjective assessment of the importance of fishing to the culture and heritage of the area

Where from The indicator can be measured in two ways: by asking informed experts how much fishing contributes to the cultural heritage this town, or community members via survey.

6.4.2 OBJECTIVE 3.5: TO FACILITATE CAPACITY BUILDING (THROUGH SKILLS AND KNOWLEDGE DEVELOPMENT) FOR COMMUNITY MEMBERS TO ENHANCE STEWARDSHIP OF FISHERIES RESOURCES



Indicator RAC_3_5_1_training_op

Indicator Title Training opportunities provided by management

Data required Indicator of whether training opportunities are offered and taken up by public (Yes/No response)

Where from Managers

Recording of the number and type of training and educational opportunities provided for the general public (e.g. webpages, brochures, campaigns, school education activities etc) and, where appropriate, participation in/accessing of these opportunities

Question 45. Do you or others in your organisation provide training and education opportunities for the non-fishing public?

Question 46. Do you or others in your organisation contribute to training and education opportunities provided by other groups (eg you might give a talk at a school or a public event)?

Indicator RAC_3_5_2_training_satisf

Indicator Title Training satisfactory

Data required Percentage of trainees satisfied with the training provided

Where from Managers (based on feedback from training events)

Subjective response

7 Annex 3: Linkages and conditional probabilities within the BBN

The conditional probabilities were derived through a workshop. For small linkages, the probabilities were derived directly through discussion and negotiation. For larger linkages, a more formulaic approach was adopted, where importance shares were allocated to the indicators and used to derive the conditional probabilities given the indicator outcomes. These weights were determined through discussions with the expert group.

In several instances an intermediate node was used to link some indicators that were related. This was to reduce the number of linkages into each objective to a manageable number. A limit of a maximum of four linkages into an objective was generally imposed.

7.1 1. Commercial, Recreational and Charter Communities

7.1.1 OBJECTIVE 1.1 FLEXIBLE OPPORTUNITIES

Node	CRC_1_1_N1 (Opportunities)
Model	Conditional probabilities assessed directly
Linking	Diversity of opportunities Take advantage of opportunities

Indicator outcome		Node outcome	
Diversity of opportunities	Take advantage of opportunities	No	Yes
No	No	100	0
No	Yes	85	15
Yes	No	90	10
Yes	Yes	0	100

Node	CRC_1_1_N2 (Institutions)	
Model	$\Pr(O = Yes) = \sum w \Pr(I), \Pr(I) = 100 \text{ if Yes, } 0 \text{ if No}$ $\Pr(O = No) = 100 - \Pr(O = Yes)$	
Linking	Indicator/Node	Weight
	Transferable rights	0.4
	Constraints to access opportunities	0.4
	Perceptions of flexibilities	0.2

Objective	1.1 Flexible opportunities	
Model	$\Pr(O = Yes) = \sum w\Pr(I)$, $\Pr(I) = 100$ if Yes, 0 if No $\Pr(O = No) = 100 - \Pr(O = Yes)$	
Linking	Indicator/Node	Weight
	CRC_1_1_N1	0.6
	CRC_1_1_N2	0.2
	Managers doing a good job	0.2

7.1.2 1.2 CULTURAL, REC AND LIFESTYLE BENEFITS

Node	CRC_1_2_N1 (Income satisfaction)	
Model	$\Pr(O = increased) = \sum w\Pr(I)$, $\Pr(I) = 100$ if High, 50 if Medium, 0 if Low $\Pr(O = not_increased) = 100 - \Pr(O = increased)$	
Linking	Indicator/Node	Weight
	Income change over 1 year	0.15
	Income change over 5 years	0.25
	Satisfaction with income	0.60
Node	CRC_1_2_N2 (Income contribution to lifestyle)	
Model	$\Pr(O = High) = \sum w\Pr(I)$, $\Pr(I) = 100$ if High, 50 if Medium, 0 if Low $\Pr(O = Low) = 100 - \Pr(O = High)$	
Linking	Indicator/Node	Weight
	Income relative to region	0.3
	Income share	0.2
	CRC_1_2_N1 (satisfaction)	0.5

Node CRC_1_2_N3 (Attachment)

Model $\Pr(O = Attached) = \sum w \Pr(I)$, $\Pr(I) = 100$ if High/Retire, 50 if Medium/Before retire, 0 if Low/ASAP

$$\Pr(O = Not_attached) = 100 - \Pr(O = Attached)$$

Linking

Indicator/Node	Weight
Importance of fishing to you	0.25
Intention to leave	0.2
Satisfaction with fishing activities	0.55

Objective 1.2 Cultural, recreational and lifestyle

Model $\Pr(O = Yes | Attitude) = \sum w \Pr(I)$, $\Pr(I) = 100$ if Yes, 0 if No

$$\Pr(O = No) = 100 - \Pr(O = Yes)$$

Note: the contribution of the income and attachment indicators to the overall objective depends on whether fishers view fishing as predominantly a lifestyle or business activity.

Linking

Indicator/Node	Weight	
	Lifestyle	Business
Attitude		
CRC_1_2_N2 (income)	0.2	0.8
CRC_1_2_N3 (attachment)	0.8	0.2

7.1.3 1.3 APPROPRIATE MECHANISMS

Node CRC_1_3_N1 (Understand process)

Model Conditional probabilities assessed directly

Linking Understand how to have input
Know who representative are

Indicator outcome		Node outcome	
Understand how to have input	Know who representative are	No	Yes
No	No	100	0
No	Yes	25	75
Yes	No	25	75
Yes	Yes	0	100

Node CRC_1_3_N2 (governance structures)

Model Conditional probabilities assessed directly

Linking Fishers in MACs
Formal process exists

Indicator outcome		Node outcome	
Fishers in MACs	Formal process exists	No	Yes
No	No	100	0
No	Yes	20	80
Yes	No	80	20
Yes	Yes	0	100

Objective 1.3 Appropriate mechanisms

Model $\Pr(O = Yes) = \sum w \Pr(I)$, $\Pr(I) = 100$ if Yes, 0 if No
 $\Pr(O = No) = 100 - \Pr(O = Yes)$.

Linking

Indicator/Node	Weight
CRC_1_3_N1 (process)	0.30
CRC_1_3_N2 (governance)	0.40
Actively participate in management	0.15
Satisfied with consultation	0.15

7.1.4 1.4 IMPROVE SKILLS

Node CRC_1_4_N1 (Satisfied with skill level)

Model Conditional probabilities assessed directly

Linking Satisfied with representation skills
Satisfied with submission writing skills

Indicator outcome		Node outcome	
Satisfied with representation skills	Satisfied with submission writing skills	No	Yes
No	No	100	0
No	Yes	40	60
Yes	No	40	60
Yes	Yes	0	100

Objective 1.4 Improve skills

Model Conditional probabilities assessed directly

Linking CRC_1_4_N1
Training provided

Indicator outcome		Node outcome	
CRC_1_4_N1	Training provided	No	Yes
No	No	100	0
No	Yes	70	30
Yes	No	20	80
Yes	Yes	0	100

7.1.5 1.5 TRUST

Objective	1.5 Trust
Model	Conditional probabilities assessed directly
Linking	Trust managers Perceptions of transparency

Indicator outcome		Node outcome	
Trust managers	Perceptions of transparency	No	Yes
No	No	100	0
No	Yes	30	70
Yes	No	80	20
Yes	Yes	0	100

7.1.6 1.6 MAXIMISE STEWARDSHIP

Node CRC_1_6_N1 (compliance trends)

Model $\Pr(O = \text{Decreasing}) = \sum w\Pr(I)$, $\Pr(I) = 100$ if Decreasing/Yes, 0 if No
 $\Pr(O = \text{Increasing}) = 100 - \Pr(O = \text{Decreasing})$

Linking	Indicator/Node	Weight
	Trends in hotline calls	0.25
	Infringement trends	0.55
	Perceptions of compliance by fishers	0.20

Node CRC_1_6_N2 (Information)

Model $\Pr(O = \text{Yes}) = \sum w\Pr(I)$, $\Pr(I) = 100$ if Yes, 0 if No
 $\Pr(O = \text{No}) = 100 - \Pr(O = \text{Yes})$

Linking	Indicator/Node	Weight
	Can access information produced by managers	0.30
	Information understandable	0.60
	Provided with adequate training	0.20

Objective	1.6 Maximise stewardship	
Model	$\Pr(O = Yes) = \sum w\Pr(I)$, $\Pr(I) = 100$ if Yes/increasing, 0 if No/decreasing $\Pr(O = No) = 100 - \Pr(O = Yes)$	
Linking	Indicator/Node	Weight
	CRC_1_6_N1	0.10
	Easy to comply	0.30
	CRC_1_6_N2	0.40
	Fishers understand regulations	0.20

7.1.7 1.7 TRANSPARENT DECISIONS

Objective	1.7 Transparent decisions	
Model	$\Pr(O = Yes) = \sum w\Pr(I)$, $\Pr(I) = 100$ if Yes, 0 if No $\Pr(O = No) = 100 - \Pr(O = Yes)$	
Linking	Indicator/Node	Weight
	Well documented process	0.20
	Perceptions of transparency	0.50
	Understand how decisions are made	0.30

7.1.8 1.8 EQUITABLE TREATMENT

Node	CRC_1_8_N1 (Perception equitable treatment)	
Model	$\Pr(O = Yes) = \sum w\Pr(I)$, $\Pr(I) = 100$ if Yes, 0 if No $\Pr(O = No) = 100 - \Pr(O = Yes)$	
Linking	Indicator/Node	Weight
	Effort restrictions	0.20
	Access to areas	0.20
	Permitted species	0.20
	Allocation process	0.40

Objective	1.8 Equitable treatment	
Model	$\Pr(O = Yes) = \sum w \Pr(I)$, $\Pr(I) = 100$ if Yes, 0 if No $\Pr(O = No) = 100 - \Pr(O = Yes)$	
Linking	Indicator/Node	Weight
	CRC_1_8_N1 (perceptions)	0.80
	Well documented process	0.20

7.1.9 1.9 ACCESS TO INFRASTRUCTURE

Objective	1.9 Access to infrastructure
Model	Conditional probabilities assessed directly
Linking	Infrastructure exists Infrastructure adequate

Indicator outcome		Node outcome	
Infrastructure exists	Infrastructure adequate	No	Yes
No	No	100	0
No	Yes	0	100
Yes	No	100	0
Yes	Yes	0	100

7.1.10 2.1 MAINTAIN INDIGENOUS CULTURAL AND HERITAGE VALUES

Objective	2.1 Maintain indigenous cultural and heritage values	
Model	$\Pr(O = Yes) = \sum w \Pr(I)$, $\Pr(I) = 100$ if Yes, 0 if No $\Pr(O = No) = 100 - \Pr(O = Yes)$	
Linking	Indicator/Node	Weight
	Identify iconic species and habitats	0.20
	Access to iconic species and habitats	0.40
	Indigenous satisfaction with management	0.40

7.1.11 2.2 ENSURE ACCESS TO SEACOUNTRY

Objective 2.2 Ensure access to seacountry

Model Conditional probabilities assessed directly

Linking Identify seacountry relevant for this fishery
Support for cultural practices included in Management considerations

Indicator outcome		Node outcome	
Identify seacountry	Support for cultural practices	No	Yes
No	No	100	0
No	Yes	50	50
Yes	No	50	50
Yes	Yes	0	100

7.1.12 2.3 ENSURE OPPORTUNITY FOR PARTICIPATION IN MANAGEMENT

Objective 2.3 Ensure opportunity for participation in management

Model $\Pr(O = Yes) = \sum w \Pr(I)$, $\Pr(I) = 100$ if Yes, 0 if No
 $\Pr(O = No) = 100 - \Pr(O = Yes)$

Linking

Indicator/Node	Weight
Representatives part of decision making	0.40
Active participants in meetings	0.40
Communities sign off on process	0.20

7.1.13 2.4 HIGH DEGREE OF TRUST

Objective 2.4 High degree of trust

Model Conditional probabilities assessed directly

Linking Representatives participate in management review
Cultural and scientific research supports management

Indicator outcome		Node outcome	
Representatives participate	Cultural and scientific research	No	Yes
No	No	100	0
No	Yes	60	40
Yes	No	40	60
Yes	Yes	0	100

7.1.14 2.5 ACCESS TO ECONOMIC OPPORTUNITIES

Objective 2.5 Access to economic opportunities

Model $\Pr(O = Yes) = \sum w \Pr(I)$, $\Pr(I) = 100$ if Yes, 0 if No
 $\Pr(O = No) = 100 - \Pr(O = Yes)$

Linking

Indicator/Node	Weight
Opportunity created to gain employment in fisheries related work	0.25
Tailored tender process (in fisheries related services) to indigenous communities	0.25
Facilitate capacity building (training) opportunities	0.50

7.1.15 2.6 COLLABORATIVE INPUTS BY ABORIGINAL COMMUNITIES TO FISHERIES ESD EDUCATION

Objective 2.6 Collaborative inputs by Aboriginal communities to fisheries ESD education

Model Only one indicator

Linking Ability to participate in fisheries education processes

Indicator outcome	Objective outcome	
Ability to participate in fisheries education processes	No	Yes
No	100	0
Yes	0	100

7.1.16 3.1 POSITIVELY INFLUENCE COMMUNITY BENEFITS

Objective 3.1 Positively influence community benefits

Model Conditional probabilities assessed directly

Linking Changes in the proportion local expenditure
Cultural and scientific research supports management

Indicator outcome		Objective outcome	
Changes in the proportion local expenditure	Proportion direct and indirect employment	No	Yes
Decrease	Decrease	100	0
Decrease	Increase	30	70
Increase	Decrease	70	30
Increase	Increase	0	100

7.1.17 3.2 SUPPORT COHESION

Objective 3.2 Support cohesion

Model Only one indicator

Linking Management sympathetic to social issues

Indicator outcome	Objective outcome	
Management sympathetic to social issues	No	Yes
No	100	0
Yes	0	100

7.1.18 3.3 MAXIMISE COMMUNITY TRUST

Objective 3.3 Maximise community trust

Model Conditional probabilities assessed directly

Linking Community education strategy exists
Community consultation strategy exists

Indicator outcome		Objective outcome	
Community education strategy exists	Community consultation strategy exists	No	Yes
No	No	100	0
No	Yes	50	50
Yes	No	50	50
Yes	Yes	0	100

7.1.19 3.4 CULTURE AND HERITAGE VALUE

Objective 3.4 Culture and heritage value

Model Conditional probabilities assessed directly

Linking Values considered in management plans
Importance of fishing to cultural and heritage values

Indicator outcome		Objective outcome	
Values considered in management plans	Importance of fishing to cultural and heritage values	No	Yes
No	No	100	0
No	Yes	70	30
Yes	No	30	70
Yes	Yes	0	100

7.1.20 3.5 DEVELOP COMMUNITY CAPACITY

Objective 3.5 Develop community capacity

Model Conditional probabilities assessed directly

Linking Training opportunities provided by management
Training satisfactory

Indicator outcome		Objective outcome	
Training opportunities provided by management	Training satisfactory	No	Yes
No	No	100	0
No	Yes	100	0
Yes	No	70	30
Yes	Yes	0	100

8 Objective weights

The objectives are linked together using weights obtained by a separate survey of fisheries managers. The survey utilised the Analytic Hierarchy Process (AHP), a method for assessing relative preferences between objectives based on a series of pair-wise comparisons. The approach has had numerous applications in fisheries (refs), including Australian fisheries (refs).

The full analysis is reported separately (to be completed). The distribution of the weights used in the analysis for the two case study fisheries is illustrated in Figures 15 and 16. From this, it can be seen that there is a wide range of opinions as to the importance of each objective, although the median tended to follow similar patterns. At the higher level (Figure 16), there was a high degree of similarity between the states. The BBN used the mean scores in each state when aggregating across the objectives.

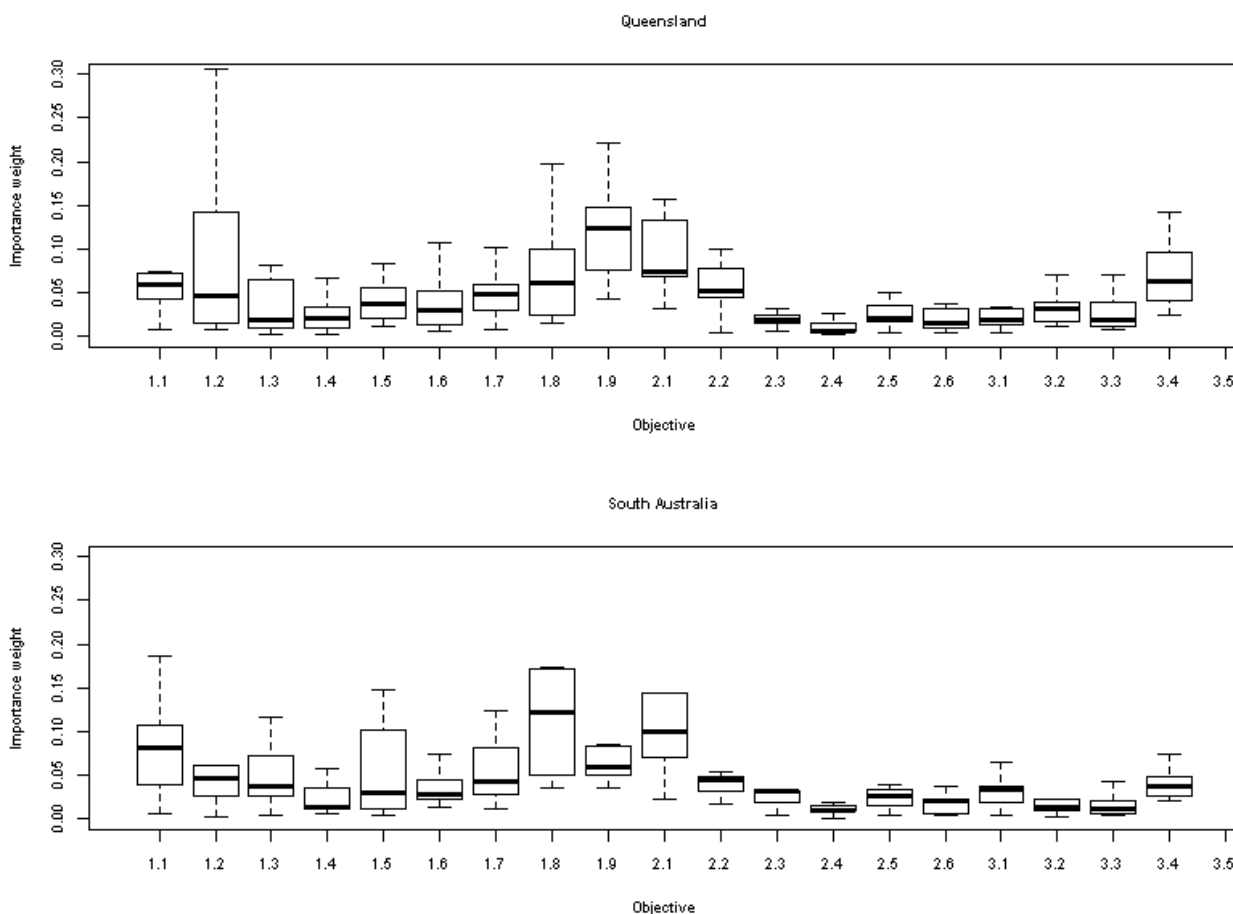


Figure 15. Comparison of objective weight distributions in the two case study states

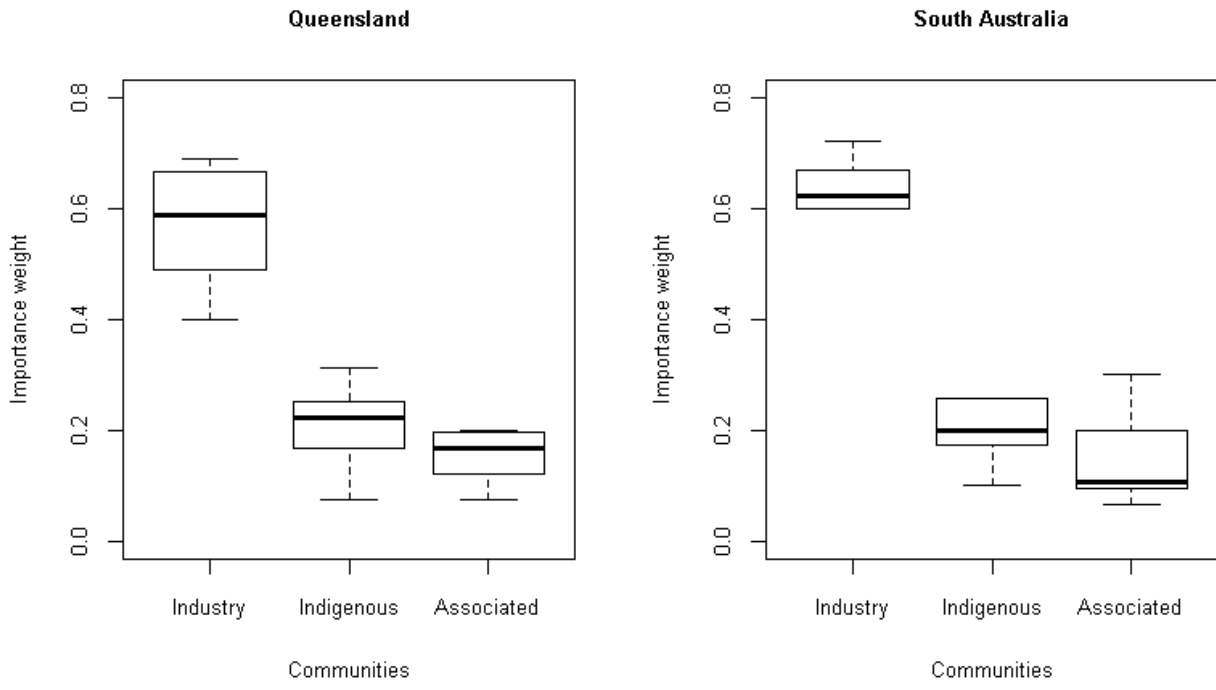


Figure 16. Higher level objectives relative importance

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Part 1: Introduction to social objectives and indicators in fisheries management

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INTRODUCTION

Why include social objectives in fisheries management?

Humans derive many social benefits from fisheries. These include benefits associated with generation of jobs and income, the nutrition derived from eating the catch and the cultural, spiritual, physical and mental health benefits associated with fishing. These social benefits are influenced by the actions of fisheries managers. For example, fisheries managers may influence the number of jobs that can be generated in commercial fisheries, the work hours of fishers, access of Indigenous fishers to culturally important aquatic/marine resources, or the wellbeing of recreational fishers, to name just a few. Successful fisheries management also requires co-operation of fishers and communities. Unless fisheries management supports social wellbeing, people are unlikely to be concerned, engaged or supportive of fisheries management (Garcia et al. 2003). For this reason, fisheries managers need to understand what social benefits and costs are associated with the fisheries they manage, and actively manage them to ensure they achieve positive social outcomes.

The importance of including social objectives in fisheries management is recognised in many policies and programs intended to guide sustainable fisheries management. This includes the principle of ecologically sustainable development (ESD¹), which underpins Australian fisheries management and is commonly agreed as the way forward in both fisheries and marine ecosystem management (Fletcher et al. 2002), the Marine Stewardship Council (MSC) certification process and the UNESCO Food and Agricultural Organisation (FAO)'s Code of Conduct (FAO 1995).

Social objectives form a core part of the ESD management framework (see Figure 1). The information provided in the Guide is designed to help fisheries managers to engage with this important aspect of ESD. It assists fisheries managers identify and assess social objectives and ensure that social aspects are explicitly addressed when making fisheries management decisions. It also retains flexibility to incorporate new ideas from ongoing research and data sources in the future.

How does this Guide help?

Incorporating social objectives into fisheries management can seem an insurmountable task. Indeed, few fisheries managers can confidently identify the social objectives of their management activities, let alone monitor progress towards achieving these objectives.

The objectives and indicators in the Guide were developed and tested in case studies of the Queensland East Coast Trawl Fishery, the South Australian communities of Ceduna, Port Lincoln and Wallaroo (in which a diversity of fisheries operate) and the Indigenous community of Narungga of Point Pearce (in South Australia), in consultation with fisheries managers across Australia.

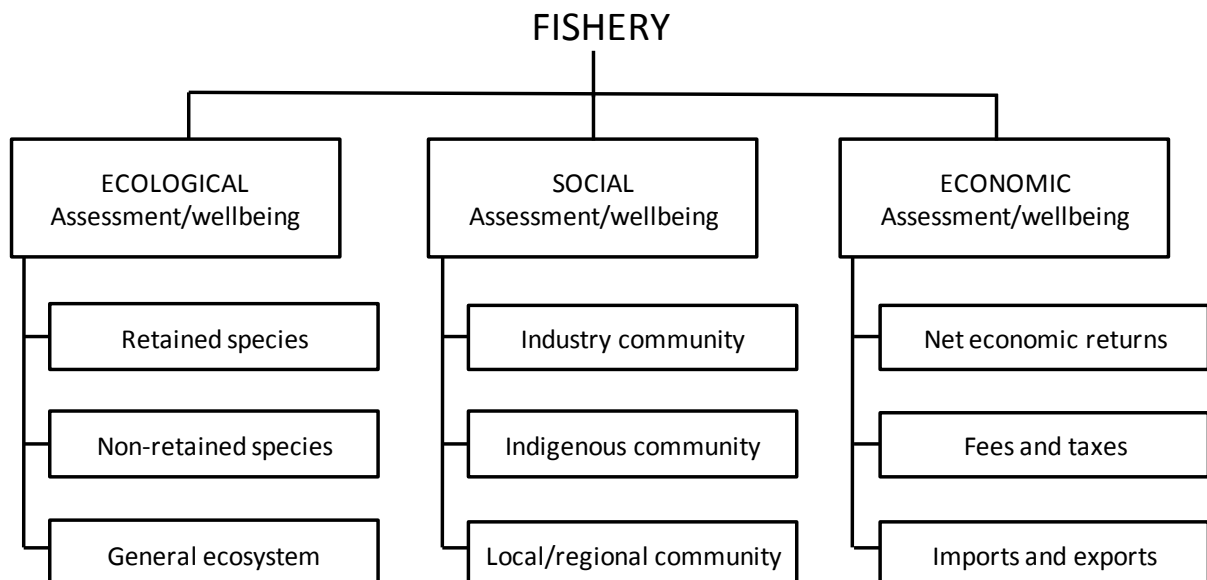
¹ <http://www.environment.gov.au/about/esd/index.html>

These case studies enabled testing of methods to incorporate social objectives that relate to the three ESD ‘communities’ identified in Figure 1: the industry community (including commercial, charter and recreational fishers and associated businesses); the Indigenous community (including all Indigenous people, not just those involved in fishing); and the local/regional community (referring to the people living in communities associated with fishing, or the broader public). Throughout this report, these three ESD communities are referred to as the ‘industry’, ‘Indigenous’ and ‘local/regional’ communities, although the industry community is usually separated into its constituent parts (commercial, recreational and/or charter fishers).

All three communities are critical to consider as part of fisheries management. While it is tempting to focus only on people directly involved in fishing – particularly commercial, recreational, charter and Indigenous fishers – the broader community is an important stakeholder. People living in local/regional communities are affected by decisions made by fisheries management agencies, and also provide the social licence to operate needed for successful fisheries management and operation of the fishing industry.

The following Guide takes fisheries managers through the steps of implementing social objectives, in an ESD context, by helping them identify, document, and manage social objectives relevant to their fishery. The Guide also helps fisheries managers identify what they can influence and what factors remain outside their direct influence. This is important to know because it helps them better target management of social objectives to those issues that fisheries managers can address.

Figure 1 Ecologically Sustainable Development (ESD) Hierarchical Tree Framework (adapted from Fletcher et al. 2002).



How do I use the Guide?

The Guide is divided into 3 major sections:

SECTION 1 – RECOMMENDED PROCESS FOR INCORPORATING SOCIAL OBJECTIVES (page 9)

Step 1: Balancing ESD – risks and prioritisation

Step 1 situates social objectives in the context of ESD and focuses on identifying processes for balancing ecological, economic and social objectives by undertaking a risk assessment (or revisiting a risk assessment that has been previously conducted). The goal of the risk assessment is to ensure it has considered the economic and social elements of the fishery, as well as establishing ecological objectives and associated indicators for measurement and ongoing assessment. This step also includes important information on how to make decisions when ecological, economic and social objectives conflict.

- *use this step to understand the social risks associated with fisheries management and their relationship to economic and ecological risks; and from this to identify strategic requirements and priorities for managing social objectives (page 11).*

Step 2: Identifying social objectives

Step 2 discusses how to select and evaluate social objectives relevant to a fishery and its resources. It includes the consideration of upstream reporting requirements such as harvest strategies and fisheries status reports.

- *use this step to make initial decisions about which social objectives are relevant to the fishery (page 14).*

Step 3: Requirements, people and resources

Step 3 guides fisheries managers through assessing the practical requirements for managing social objectives, specifically, identifying the human and financial resources that may be required and time involved. It includes the identification of existing processes that can be used for data collection or other aspects of assessing and managing the selected social objectives.

- *use this step to analyse the resources and requirements involved in incorporating social objectives into fisheries management (page 21).*

Step 4: Selecting social indicators

Step 4 provides an overview of all the different indicators that can be used to measure each social objective. Summary tables that describe each indicator and the methods, costs and complexity to measure them are provided for all three communities (i.e. industry, Indigenous or local/regional). These summary tables also identify the independence of each indicator and the page number in Part 2 of the Guide where additional information can be found.

- *use this step to select the indicators you will use to measure against each selected objective-from step 2 (page 23).*

Step 5: Data collection methods

Step 5 details how to plan data collection for selected indicators.

- *use this step to map out and resource data collection processes (page 36).*

Step 6: Using social data in fisheries management

Step 6 discusses how to integrate the social data and associated analysis of performance against social objectives into the fisheries management decision making processes.

- *use this step when planning how the information will be used, monitored and acted upon in fisheries management processes (page 39).*

When including social objectives in fisheries management, it is important that management is able to be responsive to any issues identified when monitoring performance against each social objective. Ultimately, the goal of incorporating social objectives into fisheries management is to make changes that improve how well these social objectives are achieved.

While it can be challenging to respond to some social issues, it is critical for fisheries managers to, at the outset of the process of incorporating social objectives, consider (and ideally document) how they will respond if, and when, they identify they are not achieving their social objectives. This ensures that the process of monitoring social objectives is linked to meaningful changes to fisheries management when, and as, necessary.

Monitoring social objectives without having a means of implementing changes to fisheries management in response to any problems identified risks being a tokenistic exercise that can result in reduced trust in fisheries management by the industry, Indigenous or local/regional communities.

SECTION 2 – OTHER SOCIAL INFORMATION NEEDS (page 40)

Section 2 describes other social data you may want to collect to help you better manage the social dimensions of your fishery, through providing contextual information about the social dimensions of fishing and associated activities. Use this section to identify data collection needs.

SECTION 3 – DATA COLLECTION METHODS (page 46)

Section 3 provides advice on how to most efficiently and effectively collect social data.

1. RECOMMENDED PROCESS FOR INCORPORATING SOCIAL OBJECTIVES

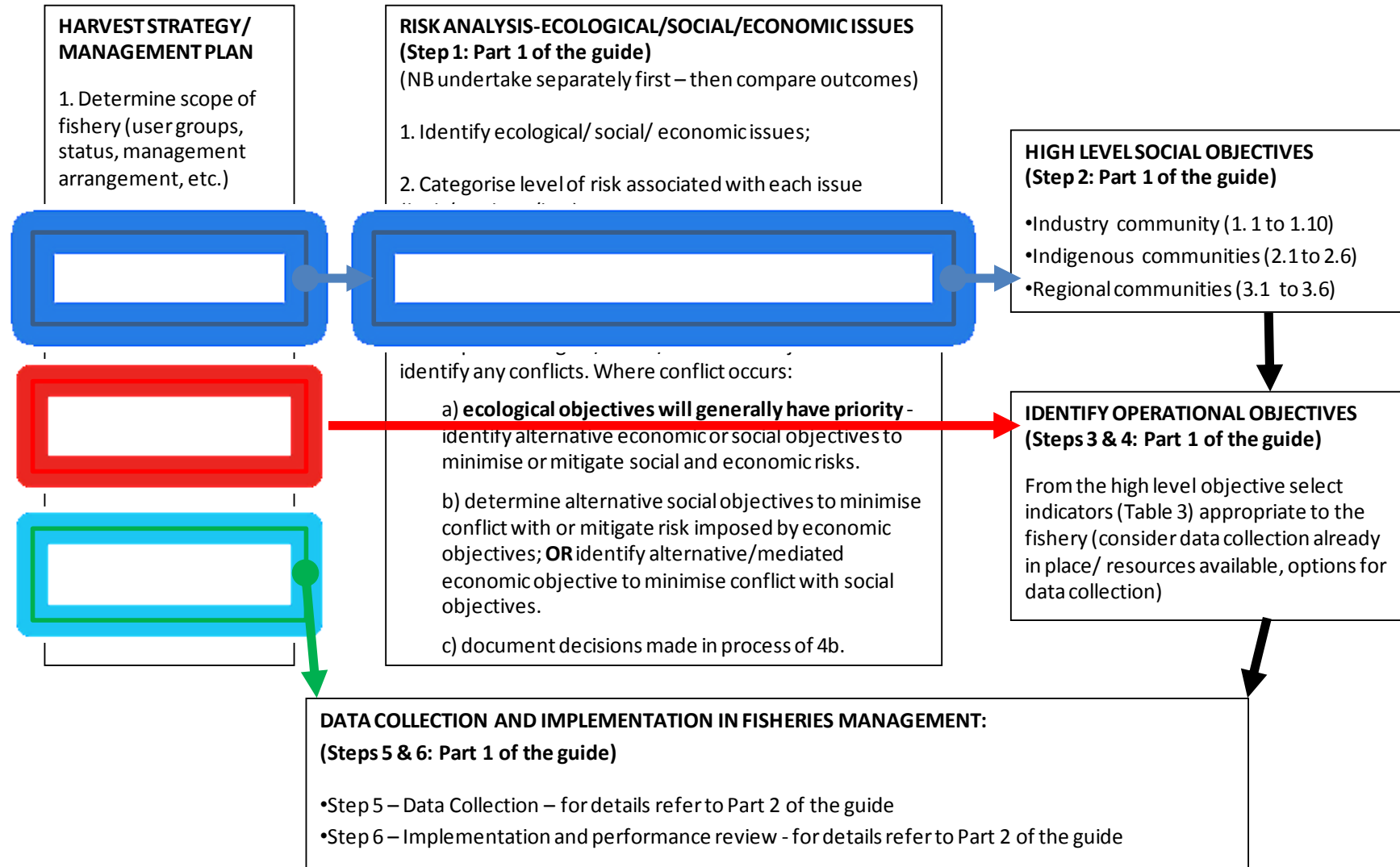
The following sections guide fisheries managers through a recommended process for incorporating social objectives into fisheries management. As these steps are highly inter-related, Box 1 and Figure 2 provide an overview of how they fit together. This is followed by more detailed description of each step.

Box 1: Flowchart that summarises Steps 1 and 2 of the process to identifying suitable social objectives for the incorporation into management systems such as a harvest strategy/management plan

Determine all higher level objectives (ecological, economic and social) for the fishery in question by engaging with fishers and relevant stakeholders

1. Determine scope of the fishery
 - Review all available information on the fishery, e.g. users groups, existing management arrangements, assess fishery biological status-determining ESD status of the fishery
 - Identify relevant legislation and over-arching policy objectives
 - Identify relevant stakeholders groups, e.g. fishers/community/Indigenous groups/non government organisations (NGOs) /associated industry/other management groups etc) and mechanisms for engagement.
2. Identify and agree on issues, and undertake risk analysis
 - Undertake risk analysis and then define high-level social, economic and ecological objectives to be achieved (e.g. use ESD reporting framework to conduct assessment of ecological, economic and social risks to the fishery (e.g. Fletcher 2012).
3. Translate high level objectives into operational objectives
 - Operational objectives need to be clear, measurable and directly linked to high-level objectives.
4. Implement, monitor and performance review
 - Implement and monitor the performance of operational objectives using performance indicators
 - evaluate and report on the performance of operational objectives in delivering acceptable community objective outcomes

Figure 2 A schematic representation of how the various steps in selecting social objectives fit within the overall fishery management framework.



Step 1: Balancing ESD – risks and prioritisation

ESD has been widely used in modern resource management and is a common high-level legislative objective across Australian fisheries management jurisdictions. The *National Strategy for Ecologically Sustainable Development (1992)*² defines ESD as:

"Using, conserving and enhancing the community's resources so that ecological processes, on which life depends, are maintained, and the total quality of life, now and in the future, can be increased."

Aside from the *National Strategy for Ecologically Sustainable Development (1992)*, an ESD approach has been codified in various key documents, most notably the *United Nations Convention on the Law of the Sea 1982 (UNCLOS)*, the *FAO's Technical Guideline for responsible fisheries*³ and the *United Nations Code of Conduct for Responsible Fisheries*⁴. ESD is also incorporated in the *Guidelines for the ecologically sustainable management of fisheries*, to support fishery assessment for export under the *Commonwealth Environment Protection and Biodiversity Conservation Act 1999*⁵.

The core objectives of the *National Strategy for Ecologically Sustainable Development (1992)* set out the strategic and policy framework under which governments will cooperatively make decisions and take actions to pursue ESD in Australia. These core objectives are:

- To enhance individual and community well-being and welfare by following a path of economic development that safeguards the welfare of future generations;
- To provide for equity within and between generations; and
- To protect biological biodiversity and maintain essential ecological process and life-support systems.

The *National Strategy for Ecologically Sustainable Development (1992)* also lists seven guiding principles, one of which is *"decisions and actions should provide for broad community involvement on issues which affect them"*. This strategy states that these core objectives and guiding principles need to be considered as a package to pursue ESD, and that no objective or principle should predominate over others. As such, a balanced approach to the three major components of ESD, namely ecological, economic and social issues (Figure 1) is required, and must also consider this balance into the future. Yet, some jurisdictions give the environmental component higher precedence, either through legislation (e.g. see section 7(2) of the *South Australian Fisheries Management Act 2007*) or through case law findings (see Sloan et al. 2014).

How to apply ESD to fisheries management

Before social objectives can be incorporated into fisheries management, *all* management objectives (i.e. ecological, economic and social) for managing the fishery must be determined. This is critical as there is potential for conflict between ecological, social and economic objectives. Ensuring all three are considered together enables identification of any trade-offs or conflicts, and agreement on how to prioritise issues across the three types of objectives.

² <http://www.environment.gov.au/about/esd/publications/strategy/index.html>

³ <ftp://ftp.fao.org/docrep/fao/005/y4470e/y4470e00.pdf>

⁴ <http://www.fao.org/docrep/005/v9878e/v9878e00.html>

⁵ <http://www.environment.gov.au/about/esd/index.html>

Many processes can be used to determine appropriate ecological, social and economic objectives. One is the toolbox for the adoption of ecosystem approaches to fisheries developed by the FAO (2011), described in Box 2, which includes a process, not only of identifying objectives, but for integrating these into management (similar to the process we recommend in our 6 steps):

Box 2: Process recommended by the FAO (2011) for adopting ecosystem approaches to fisheries management (also see Fletcher et al. 2013)

Phase 1 - Initiation and Scope - Based on government and stakeholder input generate an agreed and clear definition of the fishery plus a shared understanding of the social, economic and ecological objectives to be achieved.

Phase 2 - Identification of Assets, Issues and their Priority - Identify all relevant resource 'assets', community outcomes and the issues affecting their management (generated either by the fishery or external factors) and determine priorities for action to best achieve objectives.

Phase 3 - Development of Management System - Develop a management system to cost-effectively and holistically deal with all high priority issues that includes clear operational objectives and the ability to monitor and assess performance.

Phase 4 - Implementation, Monitoring and Performance Review - Document the actions to implement the management system, monitor their completion plus evaluate and report on their performance in delivering acceptable community outcomes.

Whatever the process used to identify the ecological, social and economic objectives, the following considerations must be addressed:

1. The current stock status of the fishery. The priorities or objectives for a fishery are often linked to stock status. For example, an economic objective such as maximising profit is likely to be a higher priority for an under-fished fishery than for one that is over-fished (where the highest priority is to ensure the fishery is sustainably fished). To ensure consistency amongst fisheries management jurisdictions, the guidelines in the National Fish Stock Status Reporting framework used in the *Status of key Australian fish stocks reports* (Flood et al. 2012) should be used to assess fishery stock status.
2. Inclusion of appropriate mechanisms to engage fishers and other key stakeholders. Actively involving fishers and other key stakeholders can not only bring otherwise unavailable local knowledge to the process, but is more likely to result in management arrangements that are respected and complied with willingly (Matic-Skoko et al. 2011; Sloan et al. 2014).
3. Ensure the process enables identification and discussion of the trade-offs between the ecological, economic and social outcomes being sought, preferably in consultation with all key stakeholders. Priorities often vary between different stakeholder groups, and identification of best compromise outcomes requires a mutual understanding of the different groups' priorities. Unless this is done, there is no clarity on how the fishery should be operated in terms of addressing ecological, economic and social performance outcomes. Lack of clarity can result in *ad-hoc* decisions and sub-optimal use of resources, which increases the probability of serious conflicts, as different interest groups jostle for greater shares of the benefits (Cochrane 2002).

Achieving these three things requires determining the relative priority of all objectives using some form of risk assessment and/or prioritisation procedure. Currently, it is common to only consider ecological objectives as part of risk assessments in Australian fisheries; we recommend shifting beyond this to also incorporate economic and social objectives into risk assessment processes.

There are several approaches to completing a risk and prioritisation process between the ecological, economic and social wellbeing aspects of fisheries management. One of the most effective ways to identify and prioritise the full suite of ecological, economic and social issues in a fishery is to use the national ESD reporting framework tool developed by Fletcher et al. (2002). An updated framework that includes multi-fishery and international applications is provided in Fletcher (2012). Another way is to weight objectives through a stakeholder process using the Analytic Hierarchy Process (AHP; see Appendix 1; Part 2 of this Guide; Pascoe et al. 2013). Because risk includes uncertainty, these assessments can be completed with little or no quantitative data. Risk assessments and AHP weightings are not necessarily alternatives; they can be used in combination. Note that there are many more ways to undertake a risk assessment and/or prioritisation than those identified here (e.g. Fletcher et al. 2010).

Once the ecological, social and economic issues that require direct intervention have been identified, a structured management system such as a fishery management plan or harvest strategy that will deliver successful outcomes needs to be developed. We describe doing this for social objectives in Step 5 of this Guide, but it is useful to consider here the need to do this for all types of objectives – ecological, social and economic. Across all these types of objectives, it is important to determine specifically what you want the fishery to achieve for each issue, and why. These objectives need to be clear, measurable and directly linked to one, or more, of the ‘high level’ issues. To ensure each objective is being achieved, there needs to be some way of measuring if the management system is working or not. This involves having one or more indicators to measure performance plus having performance measures (limits, triggers, targets, etc.) that clearly describe what levels of the indicator define acceptable performance. We identify social indicators in Step 3 of this Guide. Finally, it requires having specific management actions to address the findings identified as each objective is monitored and its performance relative to others assessed (Pascoe et. al 2009b; 2013).

Interactions between social, ecological and economic objectives

When using social objectives, it is important to always consider their potential interactions with ecological and economic sustainability, in order to identify where management of one objective may compromise another. Note that in most jurisdictions the ecological objectives will take priority due to either legislation or case law findings. The interplay between economic and social objectives must be informed by the risk assessment in an effort to minimise the greatest risks and maximise benefits.

The social objectives discussed in this Guide should be applied by fisheries managers ***within the constraints of ecological sustainability***. If it is not possible to meet a given social objective within these constraints, then the social objective should be considered subsidiary to ensuring ecological sustainability. This is critical as, while it may be possible to achieve some social objectives in the short-term even though they lead to ecological decline, the medium and/or long-term ESD social objective of equity within and between generations is obviated.

Step 2: Identifying social objectives

The information provided below is an overview only and should be read in conjunction with the extensive detail provided in Part 2 of this Guide. Part 2 of the Guide provides detailed guidance on how to collect social data, and other methodological issues that fisheries managers may need to consider in order to implement social objectives in their fisheries management processes. Ideally, social objectives are incorporated into documents that have a high level of certainty and accountability such as fishery management plans or harvest strategies.

Identifying which social objectives will – and won't – be actively managed

It is critical to decide what social objectives are relevant to a particular fishery's management situation – and which are not. To be effective, the chosen social objective needs to have a direct and practical interpretation in the context of the management of the fishery and, most importantly, performance against this objective needs to be measurable and auditable (Fletcher et al. 2005). The objective should also be consistent with, and clearly linked, to any higher-level issues that appear in legislation, policy directives, fishery management plans or harvest strategies (i.e. provide the justification for selecting this objective over other possible objectives) (Fletcher et al. 2002).

The social objectives identified in this Guide: (i) reflect the intent and direction of legislation for Commonwealth, State and Territory managed fisheries; (ii) are relevant to Australian fisheries managers; and (iii) are able to be influenced by fisheries management⁶. These objectives are summarised in Figure 3.

Following the ESD framework, the objectives are dealt with as they are relevant to industry communities (commercial, charter and recreational fishers) (Table 3), Indigenous communities (Table 4) and local/regional communities (Table 5).

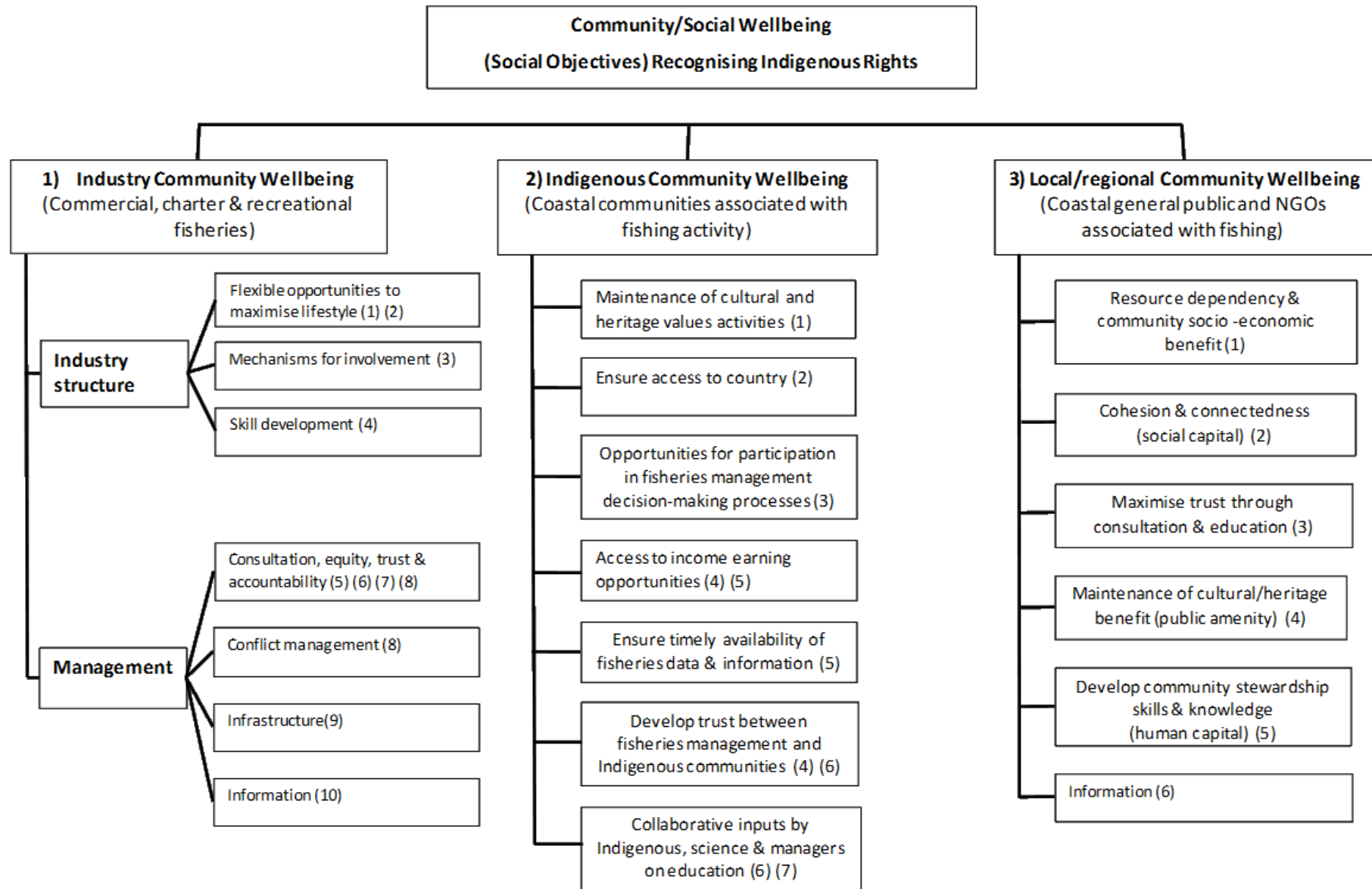
Each of these tables briefly identifies:

- the objective name and number;
- the indicator name and number;
- the method of data collection;
- level of probable cost;
- difficulty involved in measuring each indicator; and
- where to find more information in Part 2 of this Guide.

⁶ To find out more about how these social objectives were selected from the many objectives that could be considered, see FRDC Report No. 2010/040 'Developing and testing social objectives of fisheries management' by Triantafillos et al. (2014).

Figure 3 Social objectives relevant to Australian fisheries management.

(NB: The numbers in brackets refer to the objectives detailed in each sector)



Which social objectives are most important for my fishery?

Not all social objectives and associated indicators will apply to all fisheries. This means that, in this step, fisheries managers need to identify which social objectives are of most relevance and utility to their fishery. This will vary depending on the individual fishery and its characteristics. However, as part of this project, we identified that some social objectives are typically considered important irrespective of the fisheries context in which they are applied.

The use of fisheries resources provides a multitude of social benefits and costs. Some of these are strongly influenced by fisheries management, while others aren't, and these factors will vary by fishery and management jurisdiction. Fisheries legislation and policies typically don't specify the exact types of social objectives fisheries managers should consider, instead using generic terms such as '*maximising community wellbeing*' or '*preserving cultural heritage*'. The potential multitude of benefits and costs means that fisheries managers may need to manage their fishery for several distinct social objectives. To assist in this process, the Guide includes a set of recommended and ranked social objectives for applicability to national fisheries management. These social objectives are listed in Tables 1 and 2. Information on each of these recommended objectives, and on their relative priority as determined in consultation with fisheries managers during this project, is provided in Part 2 of the Guide.

To help in the selection of the most appropriate social objectives, fisheries managers from across Australia were asked to rank the relative importance of different social objectives using an AHP, using methods described in Appendix 1⁷. The results showed that the relative importance of most objectives varies depending on the location and type of fishery involved (Tables 1 and 2). Further illustration of this is provided in Figures 9 and 10 of Appendix 1.

The process to rank the relative importance of different social objectives using an AHP was undertaken in 2012, and although there was a wide range of opinion by individual fisheries managers as to the relative importance of the different objectives in each broad fisheries management jurisdiction, there was a fair degree of consistency, on average, across the different jurisdictions in terms of ranking (Tables 1 and 2).

The objectives highlighted in blue or green in Table 1 are those which were considered of high importance in all or almost all fisheries management jurisdictions and contexts, and should be considered 'essential' social objectives in most contexts. Others were ranked as important in some situations but not in others.

For each ESD community, high level groups of objectives such as '*industry structure*' have been identified, together with specific, but still theoretical objectives such as '*Mechanisms for involvement*'.

⁷ Information was collected for each State/Territory as well as Commonwealth agencies responsible for management and policy. State/Territory level estimates are available, but several agencies requested that aggregated results be presented.

Table 1 Relative (rank) importance of the different social objectives assessed by fisheries managers from different parts of Australia in 2012, using an Analytic Hierarchy Process.

(NB: Western Australia is included in Southern States; Ranking is from 1 = highest, to 20 = lowest; 'CC Only' means objectives is relevant to the commercial and charter fisheries only). Blue boxes represent the highest ranked objectives for the different regions while the green boxes represent the second to fifth highest ranked objectives.

Objective	Southern States	Northern States	Common-wealth	National average
Commercial, recreational and charter communities				
1.1 Provide flexible opportunities to ensure fishers can maintain or enhance their livelihood (CC only)	3	4	3	4
1.2 Maximise cultural, recreational and lifestyle benefits (including health benefits) of fishing	5	3	6	5
1.3 Ensure appropriate mechanisms exist for fisher involvement in development of fisheries management advice	7	13	7	8
1.4 Improve the ability of fishers to participate effectively in fisheries management advisory processes	16	18	20	19
1.5 Industry stakeholders have a high level of trust in the management of fisheries	9	10	13	10
1.6 Maximise stewardship of fisheries resources	10	14	8	9
1.7 Ensure transparent decision making process by fisheries agencies	6	7	10	7
1.8 Ensure equitable treatment and access for fishers	2	5	4	2
1.9 Ensure adequate access to infrastructure needed for successful operation of fishing activities	4	1	2	3
1.10 Ensure fisheries information is available in a timely and publicly accessible manner	No AHP allocated given this is a requirement in all fisheries			
Indigenous communities (NB: These objectives may differ to those in section 2 due to case study outcomes) ⁸				
2.1 Maintenance of cultural and heritage values related to fishing activities in Indigenous communities	17	12	17	16
2.2 Ensure provision of access to 'Country' to enable continuation of traditional activities	12	17	12	15
2.3 Ensure appropriate consultation of Indigenous people	15	11	9	11
2.4 Ensure open and transparent communication	18	16	14	18
2.5 Develop economic opportunities	13	8	15	13
2.6 Ensure collaborative inputs by Aboriginal communities	13	8	15	13
Regional and associated communities				
3.1 Positively influence fisheries related socioeconomic benefits for regional communities	1	2	1	1
3.2 Facilitate/support the cohesion/connectedness of fishers with their regional communities through fisheries management	8	6	5	6
3.3 Maximise community trust in fisheries agencies to manage fisheries	11	19	18	12
3.4 Ensure fisheries management contributes to the maintenance of cultural and heritage values related to fishing activities	20	20	19	20
3.5 Facilitate capacity building for community members to enhance stewardship of fisheries resources	19	15	11	17
3.6 Ensure fisheries information is available in a timely and publicly accessible manner.	No AHP allocated given this is a requirement in all fisheries			

⁸ The rankings of the indigenous community objectives were deemed to be generally low due to a lack of fisheries manager expertise or confidence in this domain.

Table 2 Relative importance of each of the different social objectives assessed by fisheries managers from different parts of Australia in 2012, using an Analytic Hierarchy Process*.

Objective number	Southern States	Northern States	Common-wealth	National average
Commercial, Recreational and Charter communities				
1.1-Flexible opportunities to enhance livelihood	10.00%	7.20%	8.80%	9.20%
1.2-Maximise benefits of fishing	6.90%	9.40%	5.90%	7.10%
1.3-Ensure mechanisms for involvement	5.30%	3.50%	5.50%	5.00%
1.4-Participation in management advisory processes	2.50%	2.50%	2.80%	2.60%
1.5-Level of trust in management	4.00%	4.00%	3.40%	3.90%
1.6-Maximise stewardship of fisheries resources	3.70%	3.40%	4.90%	3.90%
1.7-Transparency of decision making process	6.00%	4.70%	4.20%	5.30%
1.8-Equitable treatment and access for fishers	12.00%	6.70%	7.40%	9.90%
1.9-Access to infrastructure	8.70%	11.70%	9.60%	9.50%
1.10-Timely and publically available information	<i>was not assessed as part of the AHP analysis</i>			
Indigenous communities				
2.1-Maintenance of Indigenous cultural & heritage values	2.50%	3.50%	3.10%	2.80%
2.2-Provision of access to 'country'	3.00%	3.00%	3.50%	3.10%
2.3-Consultation of Indigenous people	2.50%	3.60%	4.70%	3.30%
2.4-Open and transparent communication	2.20%	3.00%	3.20%	2.60%
2.5-Development of economic opportunities	2.80%	4.70%	3.10%	3.20%
2.6-Ensure collaborative input by communities	2.80%	4.70%	3.10%	3.20%
Local/regional communities				
3.1-Influence benefits for regional communities	13.20%	11.40%	11.00%	12.40%
3.2-Connect fishers with regional communities	4.90%	6.20%	6.20%	5.50%
3.3-Maximise community trust to manage fisheries	3.60%	2.40%	3.10%	3.20%
3.4-Maintenance of community cultural & heritage values	1.30%	1.30%	3.00%	1.70%
3.5-Capacity building to enhance stewardship	2.10%	3.10%	3.70%	2.70%

* Objective number 3.6 was not assessed as part of the AHP analysis.

In this Guide, we have then identified one or more 'operational' objectives against each of these higher level theoretical objectives, enabling fisheries managers to apply operational objectives suited to monitoring as part of their day-to-day management. Objectives are numbered – for example, Objective 1.1 is identified in this table as being an industry community objective that relates to 'flexible opportunities to maximise lifestyle'.

To select social objectives, fisheries managers should first identify what social objectives already exist for their fishery, and secondly, identify further objectives from the list in Tables 1 to 4, in consultation with stakeholders. These objectives should then be used in relevant risk assessment processes (as described in Step 1).

Prioritising social objectives

Assessing the relative importance of different social objectives is important when assessing overall performance of management, as well as determining which objectives require greater attention in terms of information collection. There are numerous techniques available to help decide the relative importance of objectives. These include the AHP process described earlier and other methods such as score allocation. For this project, we used the AHP to assess the relative importance of the different social objectives recommended in this Guide (Saaty 1980). This same process can, if desired, be used at the fishery level, to decide which social objectives (and ecological and economic objectives) are of higher priority, and which of lower priority, given the characteristics, contexts, risks and needs of the communities associated with an individual fishery. AHP has been used in a number of fisheries applications to determine management objective importance and assist in decision making (Leung et al. 1998; Soma 2003; Mardle et al. 2004; Wattage and Mardle 2005; Nielsen and Mathiesen 2006; Himes 2007; Pascoe et al. 2009a; Pascoe et al. 2009b; Pascoe et al. 2013).

If fisheries managers wish to apply the AHP to determine the relative importance of the social objectives they have identified for their fishery, it is possible to use the AHP interactive survey instrument developed for this project (FRDC project 2010/040-see Triantafillos et al. 2014; Appendix 1). This instrument was developed as a spreadsheet and is freely available for fisheries management agencies to use and modify. It can be obtained by emailing Dr Sean Pascoe (sean.pascoe@csiro.au), who can also provide advice on any modifications that may be appropriate for a particular jurisdiction's application.

The spreadsheet of the interactive survey instrument can be used in one of two ways. To get an idea of the range of views, individuals can be asked to use the instrument to evaluate each social objective against all others using pair-wise comparison (i.e. comparing two objectives, and assessing whether they are equally important, or if one is more important than the other). The results of these comparisons are combined to derive averages and distributions. Alternatively, the spreadsheet can be completed in a workshop where the scores are discussed and a consensus score entered. The latter approach may provide a better estimate of the agency view, although loses information about the diversity of opinion in the agency and elsewhere.

The spreadsheet enables immediate feedback to participants on the implications of their preferences on objective weights and also the level of consistency in their responses. If a respondent has been inconsistent, for example, ranking social objectives in such a way that one is inconsistently considered more or less important than another, this is automatically identified and the participant prompted to reconsider their pair-wise weightings. Inconsistency is a common problem in AHP and reflects the difficulties in assigning consistent preferences over multiple objectives. While other approaches such as score allocation remove this inconsistency problem in the short term, these have been found to be less robust in determining true preferences (Saaty 1980; 1982). The feedback built into the spreadsheet enables fisheries managers and others consulted to re-assess their preferences if problems of inconsistency become apparent or if the resultant weightings were not as anticipated.

Who to include in the prioritisation process?

The priorities set in an AHP, or other similar process, will only be as relevant as the people who are involved in setting the priorities. Different stakeholder groups are likely to have different preference structures, and understanding these differences will help in the development of more appropriate decision making processes. Therefore, it is critical to identify who should be included in setting those priorities, whether you are using the AHP or a different process to identify these priorities. This requires careful consideration of the range of stakeholders who should be included in the priority setting process for the objectives, and whether existing institutions already set up in the fishery should be utilised, e.g. existing management advisory committees. Expertise based advisory committees that involve fishery managers, scientists, fishers and relevant key stakeholders of the broader community can work well to achieve the desired level of engagement. Experience nationally suggests that, where resources permit, involving independent expertise in the process (from outside of the jurisdictional arrangements) can also be very beneficial, particularly for transparency (Sloan et al. 2014).

Step 3: Requirements, people and resources

After selecting your social objectives, the next step is to check that the objectives selected are able to be measured, and are adequate for the reporting requirements of the management jurisdiction in which they are being applied. Fisheries managers should assess the reporting requirements of all reporting structures, including the following:

Harvest strategies: A harvest strategy brings together all of the key elements and management functions used to make decisions about the level of fishing that should be applied to a fish stock or a fisheries management unit, to maximize the likelihood of achieving ecological, economic and social sustainability. The application of the key elements of harvest strategies (which include defined operational objectives, indicators, reference points, acceptable levels of risks, monitoring, assessment and decision rules) vary significantly in their implementation across Australian fisheries management jurisdictions (see Sloan et al. 2014). Developing a harvest strategy includes several core components and social objectives should be incorporated at each stage. For example, social objectives should be included (along with ecological and economic objectives) when identifying measurable objectives for a defined fishery. Subsequent stages should then identify indicators of performance and reference points for the social indicators identified, as well as defined acceptable levels of risk for social issues, and a strategy for monitoring and assessing performance of the indicator(s).

Allocation/reallocation processes: Understanding the contribution of fisheries to social outcomes – part of managing social objectives – can form an important part of allocation and reallocation processes.

State and national level reporting requirements: In many cases, data on social performance will need to be integrated, or at least aligned, with that from other fisheries for purposes of reporting at State and National levels (e.g. the National Fisheries Status Report by Flood et al. 2012). Where this is likely to occur, consultation with other fisheries managers and relevant authorities must be undertaken, as it will be important that all fisheries involved report on a set of common social objectives (while also potentially including other objectives at a fishery level that are not reported at state or national scale). This is particularly important for migratory fish that cross National or State jurisdictions, or fish that occur as straddling stocks. In the absence of effective regulation, trans-boundary or migratory fish may be particularly susceptible to overfishing. Trans-boundary governance and cooperation are therefore needed (Sloan et al. 2014), along with collaborative action to regulate fisheries and maintain ecological, social and economic performance of the fishery. The effectiveness of governance structures at facilitating management of trans-boundary stocks depends on strong collaboration between management jurisdictions.

Resources available

In addition to knowing the reporting requirements for which social objectives may be needed, it is necessary to identify the people who will be involved, and the resources available to undertake this. Make sure the following are identified for all reporting requirements and day-to-day management uses of information related to social objectives:

- a) Who needs to be involved (within and outside the fisheries management agency) in terms of:
 - having input in determining the social objectives of this fishery; and
 - making the final determination of which objectives will be used.
- b) What resources are available to support incorporation of social objectives:
 - Staff time;
 - Funding (e.g. to collect new data, or bring in experts to assist with data collection/management/analysis/communications);
 - Time available for any consultation processes (e.g. to design surveys) needed; and
 - Existing data collection processes (e.g. it may be possible to add 'social' questions to existing surveys already being sent to fishers).

Identifying these issues up front helps make subsequent decisions about which social objectives and indicators will be adopted in the management of the agency's fisheries.

Identify current activities and data collection processes: The next critical step is to identify whether any existing processes either: (i) already collect data that can be used to inform social objectives; or (ii) provide opportunities for additional collection of data that may inform social objectives. For example, if existing surveys already collect ecological or economic data from fishers, it may be possible to add additional questions to these that gather the data needed to assess performance against social objectives, and thus reduce the cost of collecting social data about the fishery. Identifying what collection processes may already be in place that could be utilised and data already collected are essential steps in planning the resource requirements for the implementation of social objectives in fisheries management.

Before selecting social objectives, fisheries managers should ask the following questions:

- What sources of general data are currently available, and do any of these provide relevant information? e.g. Australian Bureau of Statistics (ABS) for age/ occupation/ income etc., ABARES for regional industry economic reports or RIRDC for industry issue reports (e.g. Primary Industries Health and Safety Program - <http://www.rirdc.gov.au/research-programs/rural-people-issues/primary-industries-health-and-safety-program>)
- What data are currently collected specifically for the fishery?
- How recently were/when will data (next be) collected for the fishery and what was/will be collected?
- Can additional questions be added to the current format/method of data collection?
- Do the people that handle the data have skills in social data collation and analysis?

Step 4: Selecting social indicators

Having identified the social objectives in Step 2 and the resources available in Step 3 (which may have caused a revision of the objectives selected in Step 2), the next step is to select the indicators that will be used to monitor performance with respect to achieving the social objectives. To interpret performance, the social objectives need to be expressed in the form of quantifiable reference points. Reference points can be thought of as ‘benchmarks’ of performance against an objective. In fisheries management, there are three types of reference points that are often used to measure and compare fishery performance of an objective. These are commonly referred to as ‘limit’, ‘target’ and ‘trigger’ reference points.

Limit reference points define thresholds in a fishery that are considered undesirable and likely to put the fishery at unacceptable risk (Davies et al. 2007; FAO Fisheries Resources Division 1999). Limit reference points have been typically associated with objectives tailored towards biological sustainability rather than economic or social objectives (Davies et al. 2007; FAO Fisheries Resources Division 1999). However, there are instances where limit reference points can be set above biological sustainability thresholds to meet economic or social minimum standards (see Sloan et al. 2014). In comparison, target reference points identify desirable conditions of the fishery at which management should aim. Target reference points are not relevant for all objectives and tend to be of most value for objectives that relate to desired economic and social outcomes. Trigger reference points are levels of an indicator at which changes in management are considered or adopted (Sloan et al. 2014).

Sometimes fully measuring an objective requires multiple indicators, as each indicator examines a different dimension of the objective. Given this, a number of indicators were tested for each social objective. The Guide only includes indicators that were considered of high relevance to its operational objective after analysing its performance through a Bayesian Belief Network (BBN) modelling process⁹, and consultation with fisheries managers.

Tables 3 to 5 list the indicators that can be used to measure each of the social objectives listed in Step 2 (Table 1), and identify:

- **Indicator name and number:** explains what the indicator tells fisheries managers and what aspect of the objective it measures, to assist in evaluating how useful the indicator will be to management of the fishery. It also indicates if the indicator only applies to certain fishing sectors (e.g. commercial, recreational, charter or customary Indigenous).
- **Measurement methods:** indicates whether the necessary data for the indicator can be gathered from existing fisheries management agency knowledge and records, or if fishers will need to be surveyed or other sources of data used.
- **Measurement costs:** indicates the level of cost to measure the indicator. Costs are categorised as low, medium, high or very high. It is not possible to provide an estimate of the dollar cost, as this will vary depending on the size and nature of the

⁹ See Pascoe et al. (2013) for a detailed report on this modelling process.

fishery and data collection history. Therefore, this information simply indicates the typical cost of an indicator relative to others in the table.

- **Measurement complexity:** indicates what level of difficulty is involved in analysing the indicator. Low complexity indicators require little analysis of data, whereas high complexity indicators may require the fisheries manager to engage experts or spend time developing analysis skills.
- **Independence of indicator:** indicates the independence of each indicator. To ensure robustness, it is often best to use indicators that involve independently verifiable sources of information. Some of the indicators are based on the opinion of fisheries managers; these generally have lower independence as they are more easily subject to bias than other types of indicators. We provide a ranking of the level of indicator 'independence'.
- **Additional information:** indicates where more information about the indicator can be found in Part 2 of the Guide, where each indicator is described in detail. It includes the following information:
 - Name of the indicator;
 - The social objective the indicator addresses;
 - Why is the indicator measured;
 - How is it measured;
 - How it is analysed and interpreted;
 - Key considerations (when deciding whether to use the indicator);
 - Decision triggers and suggested management responses; and
 - Examples (of the indicator, drawn from Australian case studies).

This information can be used to help pick the appropriate indicators to test the objectives. More detailed processes are also available to better design a 'package' of indicators that best meets particular needs; these are briefly discussed below.

Evaluation of objectives and indicators prior to implementation

In general, it is often recommended that an evaluation of the likely performance of any proposed operational objective and its associated indicators be undertaken prior to implementation. Such testing is particularly important when information is incomplete and imprecise, and when the relationship between the decision making process and management actions is complex (Davies et al. 2007). There are various quantitative, qualitative, empirical and experiential methods available to undertake an assessment of whether the objectives and indicators are likely to be appropriate (e.g. management strategy evaluation-MSE), which can assist in identifying which indicators are most relevant (Sloan et al. 2014). The objectives and indicators in this Guide have been evaluated for their appropriateness and applicability to Australian fisheries contexts. This provides a useful initial validation, which means they can be used as presented if desired. That said, it can be useful to undertake further assessment that more specifically identifies which objectives and indicators best measure social outcomes for a specific fishery, given that each fishery differs from others.

Options include the use of BBN modelling processes, such as those used to validate objectives and indicators for this Guide. Further information on this type of process can be found in Pascoe et al. (2013), which reports on the BBN modelling process used to help develop and evaluate indicators included in this Guide.

Another, more complex approach is to use a simulation model to represent the true assumed underlying dynamics of the resource and generate future data to evaluate how different objectives in a harvest strategy will impact on the future fishery performance, through comparing the relative performance of possible alternatives. This is commonly done by Monte Carlo simulation modelling and allows explicit calculation of the probability of breaching reference points (Australian Government 2007).

However, a MSE methods need not be simulation based, an exercise that can be time consuming and costly. More qualitative methods can also be applied, and 'empirical' tests can also be undertaken – 'what if' the harvest strategy had been applied in the past, given the history of stock status observed (see Smith et al. 2004) or even how well has this type of approach worked in the past here or elsewhere (Sloan et al. 2014).

The focus of the MSE, irrespective of the method used, is to identify whether the proposed harvest strategy is likely to be suitably 'robust' based on known and plausible sources of uncertainty in the status and dynamics of the fishery. In other words, it provides a basis to identify if the strategy that is most likely to meet objectives in spite of the uncertainty in the status and dynamics of the fishery, and the fishery's response to different levels of harvest and management strategies (Davies et al. 2007). This process is just as applicable to social objectives as it is to the ecological objectives for which it is more commonly undertaken.

When selecting indicators, bear in mind that the indicators listed for each objectives are not substitutes for each other; each measures a different aspect of the objective, and together they provide a useful picture of performance against the objective. Note also that incorporating social objectives doesn't have to be a costly, time-intensive process, as it can be tailored to the resources available. However, there are trade-offs involved. For example, sometimes lower cost indicators are less robust or less transparent to external observers (such as the public) than higher cost ones.

While the Guide recommends that, wherever possible, all indicators for each objective be measured, sometimes available resources do not permit all indicators to be measured, particularly those that involve higher cost measurement methods. To that end, the indicators in the Guide for each objective have been ranked from most important (e.g. Indicator 1.1.1) to that which, if any have to be dropped, would be the least important (e.g. Indicator 1.1.15). This assists in making decisions about how to best use available resources.

It is also essential to note that the following tables are summaries of the more detailed information on each indicator provided in Part 2 of this Guide. These tables should be used to identify potential indicators; then Part 2 should be used to examine each of the indicators in more detail, and to find out how to collect data, analyse and assess the performance of the indicator relative to the objective.

Further, it is important to note that a number of indicators (e.g. 1.7.1, 1.7.2 or 1.8.1) are designed to measure subjective perceptions. In many cases, this is because the topic being examined is inherently subjective – e.g. an indicator measuring whether a recreational fisher is satisfied with their fishing, as an overall measure of the psychological benefits of fishing, can only ever be measured based on perception.

These perceptions are often highly correlated to very concrete outcomes. Several thousand studies on subjective quality of life worldwide have found that a person reporting they are subjectively highly satisfied with their overall quality of life is likely to live longer and have fewer mental and physical health problems (Diener et al. 2002). This suggests that ‘subjective’ does not mean the indicator is measuring something removed from reality.

A person’s perception of a situation also often drives their response to it, irrespective of whether their perception is objectively accurate. Hence, even where objective measures are also possible, it is often critical for fisheries managers to understand these perceptions. In those cases where there is both an objective and subjective measure of an indicator, awareness of the alignment between perception (subjective) and the objective measure can help managers identify communication gaps and needs.

The following tables use the terms listed below in the ‘measurement methods’ column; as these are often unfamiliar, we have provided definitions of each:

- **Management agency:** This refers to data obtained from either: (i) from fisheries managers through direct survey or, if only one or two fisheries managers, less formal communication; or (ii) records and documents generated or utilised by the fisheries management agency.
- **ABS:** This refers to data available from the Australian Bureau of Statistics (ABS), specifically the data the ABS generate from their five-yearly national *Census of Population and Housing*, which is publicly available on the internet.
- **Survey:** This refers to data collected via a survey of a particular group (most commonly fishers, but sometimes members of an advisory committee, community group or others). Information on what questions to include when surveying different groups are provided in Section 4, Part 2 of the Guide. Section 3 of Part 2 describes the methods that can be used to undertake a survey (e.g. phone, internet, mail surveys):
 - **Fisher survey:** A survey of particular groups of fishers;
 - **Survey of fishers involved in consultation:** A survey of only those fishers involved in a specific consultation process (e.g. through asking people who attend a public meeting as part of the consultation to complete a short survey);
 - **Survey of members of advisory committees:** A survey of the stakeholders who are members of advisory committees (or groups), defined as a group of representative stakeholders who meet regularly to discuss issues and agree on plans of action around a common interest;

- **Survey of general public:** A survey of the general public (including both fishers and non-fishers, rather than targeted only at fishers); and
- **Survey of training course participants:** A survey of only those people involved in a specific training course (e.g. through asking people who attend the course to complete a short survey).
- **Stakeholder consultation:** This refers to obtaining advice and data from those who have a 'stake' or interest in the fishery and may include the general public, local government, NGO's, community representatives etc., as well as industry (fisher/wholesale/retail components). This can be undertaken utilising one on one interviews, focus groups, surveys, etc., dependent upon the complexity of the issue at hand (see Section 3).
- **Focus groups:** Refers to use of group interactions to generate information and data for an indicator. In this instance it refers to gathering a group of people together who have similar characteristics (e.g. all commercial or recreational fishers) to comment on or discuss a particular issue on a single occasion (refer to Section 3).

In addition, some broader terms such as 'consultation' are used when describing Indigenous community indicators; this is deliberately broader than the more specific measures for other communities, as the type of consultation cannot be more precisely specified without further work.

Table 3 Recommended social Indicators for the Industry (commercial, charter and recreational fisheries) community.

NB: 'CC only' are applicable to Commercial and Charter only. *costs could be considered low when processes are already in place to collect data.

Objective number and name	Indicator number and name	Measurement method/s	Measurement costs	Measurement complexity	Independence of indicator	Additional information
1.1-Provide flexible opportunities to ensure fishers can maintain or enhance their livelihood, within the constraints of ecological sustainability (Page 21)	1.1.1-Provision of livelihood opportunities: cost of entry and access to fisheries (CC only)	Management agency	Low	Low	High	Page 47-
	1.1.2-Perception of flexibility: fisher belief that management processes are flexible enough to allow them to adapt to changing conditions	Fisher survey	Medium*	Low	High	Page 49
	1.1.3-Existence of transferable property or use rights that allow access to marine and aquatic resources (CC only)	Management agency	Low	Low	Medium	Page 52
	1.1.4-Proportion of fishers accessing a livelihood from fishing (CC only)	Management agency	Low	Medium	Medium	Page 54
	1.1.5-Constrains on access to livelihood opportunities imposed by fisheries management (CC only)	Management agency	Low	Low	Low	Page 57
1.2-Maximise cultural, recreational and lifestyle benefits (including health benefits) of fishing for those who participate in fishing activities, within the constraints of ecological sustainability (Page 22)	1.2.1-Level of satisfaction fishers have with their fishing activities	Fisher survey	Medium	Low	High	Page 59
	1.2.2-Level of satisfaction fishers are achieving the cultural, recreational and lifestyle benefits important to them from fishing	Fisher survey	Medium	High	High	Page 62
	1.2.3-Level of satisfaction fishers have with their fishing-derived income (CC only)	Fisher survey	Medium	Low	High	Page 65
	1.2.4-Perceived importance of fishing activities to fisher's life	Fisher survey	Medium	Medium	High	Page 68
	1.2.5-Fishers' plans to leave fishing (CC only)	Fisher survey	Medium	Low	High	Page 70

Objective number and name	Indicator number and name	Measurement method/s	Measurement costs	Measurement complexity	Independence of indicator	Additional information
1.3 -Ensure appropriate mechanisms exist for fisher involvement in development of fisheries management advice (Page 23)	1.3.1 -Level of satisfaction fishers have with the amount of consultation undertaken by fisheries managers	Survey of fishers involved in consultation processes	Medium	Low	High	Page 73
	1.3.2 -Proportion of fishers actively participating in fisheries management and advisory groups	Management agency &/or fisher survey	Medium	Low	Medium-High	Page 75
	1.3.3 -Presence of fisher representatives on fisheries management advisory groups	Management agency	Low	Low	Low	Page 78
	1.3.4 -Existence of formal documented processes for providing feedback to stakeholders about fisheries management decisions, and how stakeholder input was used in those decisions	Management agency	Low	Low	Medium	Page 80
	1.3.5 -Level of fisher awareness of methods to have input into fisheries management processes	Management agency & fisher survey	Medium	Low	High	Page 82
	1.3.6 -Level of knowledge fishers have on how to contact their representatives in fisheries management/ advisory processes	Fisher survey	Medium	Low	High	Page 84
1.4 -Improve the ability of fishers to participate effectively in fisheries management advisory processes (Page 24)	1.4.1 -Level of satisfaction fisher representatives have with their overall representation skills and resources	Survey of members of advisory committees	Low	Low	High	Page 86
	1.4.2 -Provision of support for stakeholders to effectively participate in fisheries management processes	Management agency	Low	Low-Medium	Medium	Page 88
1.5 -Industry stakeholders have a high level of trust in the management of fisheries (Page 25)	1.5.1 -Level of fisher trust in the fisheries agency responsible for the fishery	Fisher survey	Medium	Low	High	Page 90
	1.5.2 -Fisher perception of the outcomes of fisheries management	Fisher survey	Medium	Low	High	Page 92

Objective number and name	Indicator number and name	Measurement method/s	Measurement costs	Measurement complexity	Independence of indicator	Additional information
1.6 -Maximise stewardship of fisheries resources (Page 26)	1.6.1 -Trends in fisheries infringements	Management agency	Low	Low	High	Page 94
	1.6.2 -Proportion of fishers who believe that, overall, most fishers comply with fishing rules and regulations	Fisher survey	Medium	Low	Medium	Page 96
	1.6.3 -Fisher understanding of rules and regulations	Fisher survey	Medium	Low	High	Page 98
	1.6.4 .-Level of ease of fisher compliance with rules and regulations	Fisher survey	Medium	Low	High	Page 100
	1.6.5 -Level of fisher perception of the availability of adequate training and advice regarding good fishing practices	Fisher survey	Medium	Low	High	Page 102
1.7 -Ensure transparent decision-making process by fisheries agencies (Page 27)	1.7.1 -Level of perceived transparency by fishers of fisheries management decision-making processes	Fisher survey	Medium	Low	High	Page 104
	1.7.2 -Documentation of fisheries management decision making processes	Management agency	Low	Low	Low-Medium	Page 106
1.8 -Ensure equitable treatment and access for fishers (Page 28)	1.8.1 -Level of fisher perceived equity/ fairness of the processes and outcomes of fisheries management	Fisher survey	Medium	Low	High	Page 108
1.9 -Ensure adequate access to infrastructure needed for successful operation of fishing activities, within the constraints of ecological sustainability (Page 29)	1.9.1 -Gaps in availability of infrastructure needed by fishers	Management agency	Low	Medium	Medium	Page 111
	1.9.2 -Level of satisfaction fishers have with access to different types of fishing infrastructure	Fisher survey	Medium	Low	High	Page 114
1.10 -Ensure fisheries information is available in a timely and publicly accessible manner (Page 30)	1.10.1 -Access to fisheries information about the fishery	Fisher survey	Medium	Low	High	Page 117
	1.10.2 -Level of currency, independence and accessibility of information about the fishery	Management agency	Low	Low	High	Page 119

Table 4 Recommended social Indicators for the Indigenous community.

NB: The following objectives and indicators have resulted from consultation with Indigenous fisheries managers and one case study (the Narungga Community). They should NOT be considered conclusive and the authors deem them to be useful only as a starting point to be explored in collaboration with a fishery's associated Indigenous community for relevance and application. The term 'Country' is utilised here to refer to 'Country' associated with both marine and freshwater aquatic resources.

Objective number and name	Indicator number and name	Measurement method/s	Measurement costs	Measurement complexity	Independence of indicator	Additional information
2.1-Fisheries management actions support the maintenance of cultural and heritage values related to fishing activities in Aboriginal and Torres Strait Islander communities (NB: Indicator 2.2.1 must be undertaken to effectively implement Indicators under 2.1) (Page 32)	2.1.1-Level of recognition and protection of both iconic species and habitat in fisheries management plans	Management agency	Low-Medium	Low	Low	Page 123
	2.1.2-Existence of continued access to identified community iconic species through habitat protection and catch management	Management agency & discussions with community representatives	Medium-High	High	High	Page 125
	2.1.3-Level of Indigenous community satisfaction with management impacts on access to iconic species over time	Survey of Indigenous community or advice from advisory group	Medium-High	Medium-High	High	Page 127
2.2-Ensure access to 'Country' ¹⁰ to enable continuation of cultural fishing activities, respecting the rights of Aboriginal and Torres Strait Islander peoples to these resources (Page 33)	2.2.1-Identification of 'Country' relevant to the fishery	Survey of Indigenous community or advice from advisory group	Medium-High	High	Very high	Page 129
	2.2.2-Level of management arrangement support for cultural practices included in management considerations	Consultation with Indigenous community & advice from advisory group	Medium-High	High	Very high	Page 131
2.3-Provide opportunities for Aboriginal and Torres Strait Islander communities to	2.3.1-Level of Indigenous community representation in fisheries management decision making processes	Consultation with Indigenous community & advice	Medium-High	Medium	Very high	Page 133

¹⁰ Based on legislative requirements

Objective number and name	Indicator number and name	Measurement method/s	Measurement costs	Measurement complexity	Independence of indicator	Additional information
participate in fisheries management decision making processes (Page 34)		from advisory group				
	2.3.2 -Level of active participation by nominated community representatives associated with 'Country' and a fishery, in fisheries management decision making processes	Management agency or advice from advisory group	Low-Medium	Medium	Very high	Page 135
	2.3.3 -Community sign-off is obtained on fisheries management arrangements	Management agency	Low-Medium	Medium-High	High	Page 137
2.4 -Optimise access to income earning opportunities for Aboriginal and Torres Strait Islander community members related to the management of fisheries (Page 35)	2.4.1 -Level of income-earning opportunities available to Aboriginal and Torres Strait Islanders related to the fishery, marine and/or water resources	Management agency	Low	Low	Low	Page 139
	2.4.2 -Number of procurement processes that allow for the select tendering of Indigenous community members from the communities associated with the fishery's identified 'Country'	Management agency	Low	Low	Not available	Page 141
	2.4.3 -Number of fishery-related training and capacity-building opportunities available to the Indigenous communities associated with the fishery	Management agency	Low	Low	Not available	Page 143
2.5 -Make fisheries collected data available in a timely and publicly accessible manner (Page 36)	2.5.1 -Acceptance by community of fisheries information provided by their fishery management nominee as being relevant, requested and inclusive of their concerns, within the constraints of confidentiality	Management agency & sign-off by Indigenous community	Low	High	Not available	Page 145

Objective number and name	Indicator number and name	Measurement method/s	Measurement costs	Measurement complexity	Independence of indicator	Additional information
2.6-Aboriginal and Torres Strait Islander communities associated with 'Country' aquatic resources have a high level of trust in the management of fisheries (Page 37)	2.6.1-Level of community nominee's participation in the evaluation process of fisheries management arrangements	Management agency and/or advice from advisory group	Low	High	Not available	Page 147
	2.6.2-Level of collaborative, cultural and scientific research undertaken to ensure fisheries management is consistent with, and supportive of, cultural and customary take	Management agency & discussions with community representatives	Low	High	Not available	Page 149
2.7-Ensure collaborative inputs by Aboriginal and Torres Strait Islander communities, regional and industry sectors on the benefits each sector offers to fisheries management (Page 38)	2.7.1-Level of Aboriginal and Torres Strait Islander groups participation with other sectors and management in any fisheries ESD education processes	Management agency	Low	High	Not available	Page 151

Table 5 Recommended social Indicators for the local/regional community.

^ABS data can also be used under certain circumstances

Objective number and name	Indicator number and name	Measurement method/s	Measurement costs	Measurement complexity	Independence of indicator	Additional information
3.1-Positively influence fisheries related socio-economic benefits for regional communities, within the constraints of ecological sustainability (Page 39)	3.1.1-Level of contribution of fisheries to direct employment in defined communities	Fisher survey followed by expert economic modelling and analysis	Very high	Very high	Medium	Page 153
	3.1.2-Proportion of direct and indirect employment in a region dependent on fishing	Fisher survey followed by expert economic modelling and analysis^	Very high	Very high	High	Page 157
3.2-Facilitate and support the cohesion and connectedness of fishers with their regional communities through fisheries management (Page 40)	3.2.1-Level of recognition of key social and community needs in fisheries management processes	Management agency	Low	Medium	Medium-High	Page 160
3.3-Maximise community trust in fisheries agencies to manage fisheries (Page 41)	3.3.1-Level of fisheries management agency involvement in community education/ outreach activities	Management agency	Low	Low	High	Page 163
3.4-Ensure fisheries management contributes to the maintenance of cultural and heritage values related to fishing activities (Page 42)	3.4.1-Number of cultural and heritage values associated with fishing are identified and managed as part of fisheries management	Management agency	Low	Low	Medium	Page 165
	3.4.2-Importance of fishing to the culture and heritage of a community/ region	Consultation with local experts or survey of general public	Low-High	Medium-High	Medium-High	Page 167
3.5-Facilitate capacity building (through skills and knowledge development) for community members to enhance	3.5.1-Number of fisheries management agency training and educational opportunities provided to the general public	Management agency	Low	Low	High	Page 169

Objective number and name	Indicator number and name	Measurement method/s	Measurement costs	Measurement complexity	Independence of indicator	Additional information
stewardship of fisheries resources (Page 43)	3.5.2 -Level of satisfaction of community members with their participation in training and educational opportunities	Survey of training course participants	Medium	Medium	High	Page 171
3.6 -Ensure fisheries information is available in a timely and publicly accessible manner (Page 44)	3.6.1 -Community satisfaction with access to fisheries management information	Survey of general public	High	Medium	High	Page 173

Step 5: Data collection methods

Having identified the objectives and indicators that will be used to support management of the social dimensions of fishing, the next step is to make a plan for data collection. To be effective, the monitoring of indicators needs to occur regularly, and use consistent methods that enable identification of trends over time.

The regularity of data collection should be decided based on:

- How often structured fisheries management systems such as management plans and harvest strategies are likely to change. For example, if a management plan is revised once every five years, it may be decided to only collect some types of data once every five years (although data may need to be collected more regularly for indicators that vary a lot – see Box 3).
- The resources available, including both funding and staff time.
- The time frame over which it is expected change might occur in the indicator. There is no use in collecting data annually if change is only likely to occur over a longer period; conversely, collecting data only occasionally may be unhelpful if there is considerable annual or seasonal variation in the indicator, and as a result, occasional monitoring does not establish a useful trend. Box 3 provides a general guide to selecting an appropriate time frame for data collection.
- The cost and time required to collect data for the indicator. Section 3 describes the methods used to collect data for each indicator, including information about sample sizes and response rates – ‘Data collection methods’ (page 46). This can be used in combination with assessment of the individual circumstances of the fishery, to help assess cost and time requirements. As noted earlier, it is not possible to provide a generic cost or time requirement for collecting data for each indicator, as this must be determined for each individual fisheries situation, based on factors such as size of the fishery, number of people to be included in data collection processes, etc.

Based on these considerations, plans must be made as to how often data will be collected for each indicator, using what method, and the allocation of adequate resources for collecting these data. Box 4 gives an example of this type of plan.

Wherever possible, existing processes to collect data should be used, through actions such as adding social questions to existing surveys of fishers/fisheries managers/community stakeholders. This can reduce the cost and time involved in data collection and ensures data are collected regularly, as well as reducing the effort required for fishers and other groups to participate in surveys. A good example of this occurred in South Australia, where fisheries managers identified the ability to add social questions to an existing survey conducted every five years of recreational fishers, which previously only focused on gathering catch and effort data.

Using existing processes to collect data enables social data to be gathered at much lower cost than if an entirely separate survey was used to collect these data. Further information on data collection methods, sample sizes and response rates is incorporated in Section 3 – ‘Data collection methods’ – page 46.

Box 3: How often and when should data be collected?

For most social indicators, data collection will occur either annually, or at less frequent intervals such as every second, third, or every fifth year. Data collection should occur only as frequently as needed, in order to reduce cost as well as the burden of completion of surveys by fishers and other groups. As is emphasised in Section 3, wherever possible the length of surveys should be minimised. Therefore, if an indicator only needs measuring every 5 years but an annual survey of fishers is undertaken, questions for that indicator should be included only on every fifth survey, to reduce the time required of fishers and ‘survey fatigue’ of respondents.

The timing of data collection should be decided using the following criteria:

- **How often will the information be used?** If your fisheries management plan is revised once every 10 years, how often should you collect data during the 10 years between revisions? To help you answer this question, the following points need to be considered as well.
 - **Do the fishing activities relevant to this indicator change substantially at different times of year, and will this affect data collection?** If the answer to both questions is yes, then data will need to be collected at specified times during the year to effectively monitor the indicator.
 - **How often can the groups who need to provide data be expected to do so?** For example, if data collection requires a survey of fishers, how often are they willing to be surveyed? Answering this question will often require discussion with fisher representatives, to identify how best to reduce the burden regular surveying can place on fishers, while still gathering data with adequate regularity.
 - **How frequently is the indicator likely to change?** Some indicators don’t need to be measured very often because they don’t change often. Others will need to be measured more frequently because they can change in a short space of time. For example, one indicator asks how easy fishers find it to comply with fishing rules and regulations. This indicator only needs to be measured every two to three years, unless there is a significant change to the rules and regulations, when it would need to be measured more frequently because the changes made may impact on the ease fishers find it to comply with the new rules and regulations. Another indicator that may need more frequent review is the fishing-related income earned by fishers. This often fluctuates substantially annually, and it is better to collect data regularly, to ensure underlying trends can be observed, rather than at less regular intervals.

Having considered these three criteria, make a plan for data collection.

Box 4: Example of a data collection plan for the indicator 'cultural benefits of fishing', in a recreational fishery

Fishery type:

Recreational fishery

Indicator name:

- Cultural benefits of fishing

Data collection methods:

- (i) Focus groups (to identify key issues and themes to assist in developing a survey; and (ii) survey of recreational fishers (to gain the views of a broad sample).

How often will data be collected?

- Once every year: data to be collected that monitors whether recreational fishers are achieving desired cultural benefits.
- Once every 5 years: data identifying the cultural benefits fishers associate with recreational fishing (ensuring that any changes in benefits are identified). This will be done through focus groups with fishers.

When will data be collected?

- During summer months when recreational fishing participation is highest. This is the time when fishers will be best aware of cultural benefits, having been fishing recently. It also maximises the inclusion of fishers from interstate and occasional fishers, as they are more likely to be participating in fishing activities at the time.

Data collection process

- Questions will be added to an existing annual survey of recreational fishing catch undertaken by the fisheries management agency.

What data will be collected?

- In this section, specify the wording of relevant survey questions and methods to be used to collate data (e.g. for an example of the wording that could be used, refer to the questionnaire used to survey the social aspects of recreational fishing in South Australia during 2012 - Appendix 12 of Part 2 of the Guide).

Data storage:

- Data will be stored in a spreadsheet to be managed by the staff member responsible for managing the recreational fishery. Handover between staff members will include training in how to understand and analyse data. The spreadsheet will include metadata explaining how to interpret the information, ensuring that ability to use the information and compare data over time is not lost when staffing changes occur.

Resourcing:

- Staff time to be adequately allocated to undertake focus group/survey development, implementation and analysis.
- Costs will come from the budget to undertake the focus group and survey of recreational fish.

Step 6: Using social data in fisheries management

Once individual indicators have been measured, analysed and interpreted, the next question is *'how do I use this to inform the management of my fishery?'* The data from different indicators will provide a picture of how well the management of a fishery is achieving different objectives – or specific dimensions of each objective, in the case of objectives in which multiple indicators are used. Using these data meaningfully as part of fisheries management requires the establishment of clear processes for documenting, reviewing and acting on changes in indicators over time. In particular, it is critical to have clear management responses in place that specify what should be done if analysis of indicators suggests one or more social objectives are not being adequately met. Fisheries managers should clearly identify and document trigger reference points at which management action needs to be taken to address declining performance.

For each indicator, associated trigger reference points are suggested and described in Section 2, Part 2 of the Guide, providing a means for evaluating when management action is needed, and the types of actions that might be taken. To ensure actions are undertaken in response to changes in indicators, these action triggers need to be included in relevant documents such as fishery management plans or other structured documents with a high level of certainty and accountability such as harvest strategies and relevant policy documents. In most cases, when a trigger reference point is crossed, fisheries managers will need to further evaluate what is preventing achievement of the social objective, in order to identify the most appropriate management actions to address the problem. In many cases this will be assisted by the indicator itself, as indicators are generally designed to identify what aspect of fisheries management is influencing a given objective, and hence give an idea of where and what type of action may be needed to address the triggering of reference point. For example, indicators for the objective of *'achieving equity and fairness in management'* identify whether perceptions of unfairness relate to the process of decision making or to different aspects of outcomes such as the distribution of access to fish stock, regulations regarding use of equipment or other factors, and whether these perceptions are increasing, decreasing or static.

When analysing a change in the social performance of a fishery, the first question to be assessed is whether this is due to unavoidable changes in fisheries management relating to ecological sustainability issues. This determines whether the change is something fisheries managers have scope to address. If achieving ecological sustainability is the reason for an undesirable change in performance against a social objective, the fisheries managers should explore options for addressing the issues that do not threaten ecological sustainability. It is also important to identify if the change is likely to be temporary and recover without action. Where this is the case, fisheries managers may be best to reserve taking action.

Finally, it is critical to identify if the change in an indicator is due to non-environmental factors outside fisheries management control, such as a rise in the Australian dollar. If it is, it may still be possible to identify management actions that lessen the negative impacts on fishers or the general community, despite not being able to address the ultimate drivers of the change. Alternatively, it may be appropriate to flag the issue with senior management and consider alerting any other allied department or agency that could assist in arresting an undesirable change.

2. OTHER SOCIAL INFORMATION NEEDS

The indicators summarised in Tables 3 to 5, and described in detail in Section 2 of Part 2 of the Guide, enable monitoring of the performance of a fishery against particular social objectives. In addition to this, fisheries managers often need information that can help inform their management towards social objectives. For instance, it may be necessary to track how the demographic characteristics of the fishery are changing over time, such as the age of fishers, given the influence this can have on motivation both to fish and use of catch. This type of social information can help identify key issues that need to be considered by management.

Information on what sample survey questions can be used to gather this additional social data is given in Section 4, Part 2 of the Guide.

How are demographic characteristics of fishers changing? Are different types of people going fishing? Why is this changing? What are the implications for fisheries management? Obtaining answers to these questions typically requires a survey of fishers. Qualitative methods are not appropriate in the case of these questions as the goal here is to identify trends in the proportion of fishers with different characteristics, which requires quantitative, statistical data. Such information can help target necessary management actions across all objectives. For example, it may be identified that older and younger fishers typically fish for different reasons (something found in the South Australian data, where younger recreational fishers were more likely to fish to catch and release, while older people to fish to catch a feed - see Schirmer et al. 2014). If, for example, it is identified that the number of young people participating in fishing is declining over time, a change in fisheries management may be explored to better support the types of fishing activities considered a priority by young fishers.

Figure 4 provides an example of these types of data, drawing on a survey of South Australian recreational fishers conducted for this project, used to identify the types of fishing platforms used by different age groups of fishers. It can be seen that, in this case, younger fishers were more likely to go charter fishing or freshwater fishing, while older fishers were more likely to participate in non-charter boat fishing and inshore fishing. This type of information can be used to identify key management needs into the future – e.g. if a trend to increasing use of charter fishing occurs, the ways people are educated about appropriate fishing practices may need to change, to being delivered via charter operators.

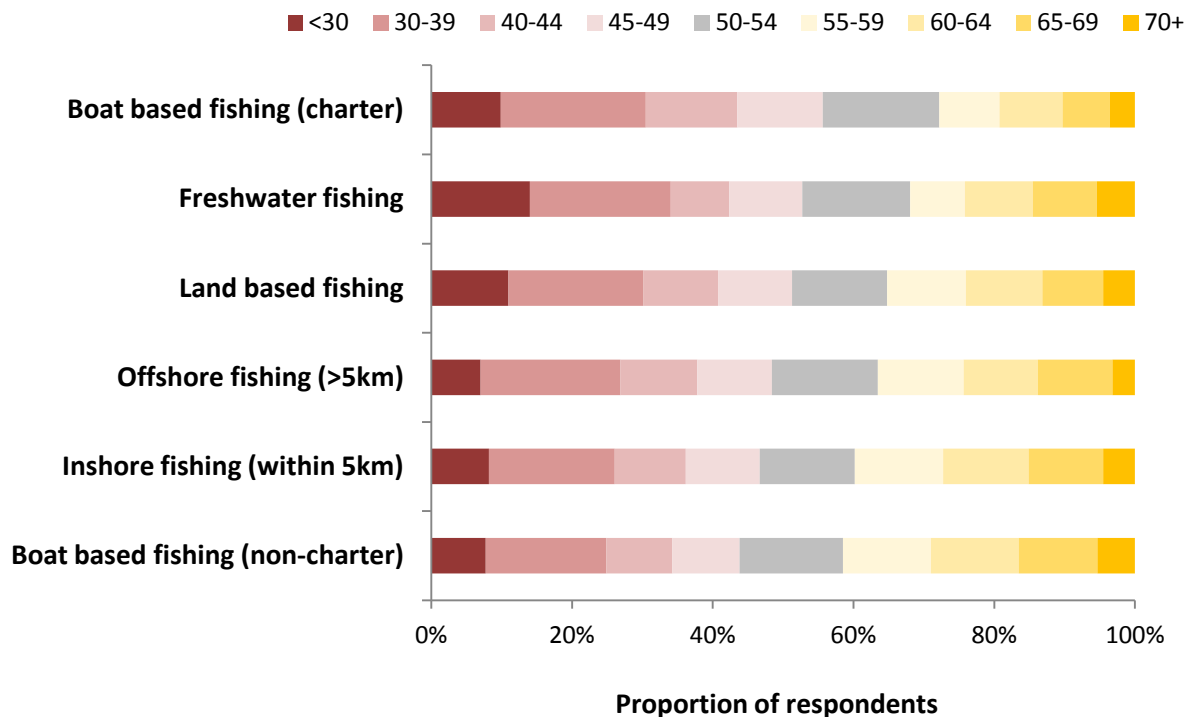


Figure 4 Use of different fishing platforms by South Australian recreational fishers in 2012, by nine different age groups (years).

How is dependence on fishing as a livelihood changing? Are commercial fishers fully dependent on fishing for their livelihood, or do they have other income sources? How attached do they feel to fishing as a livelihood, versus viewing it as an income earning activity without cultural significance? This type of information helps contextualise decision making regarding livelihood (Objective 1.1 and 1.2), by helping identify the reasons fishers are involved in fishing, and in identifying the consequences of a change in fishing income for the households of fishers.

Figure 5 compares the average proportion of household income earned from fishing by fishers in different South Australian commercial fisheries (i.e. Marine Scalefish Fishery, Southern Zone Rock Lobster Fishery, Abalone Fishery and Northern Zone Rock Lobster Fishery).

It can be seen that the proportion of household income coming from fishing varies not only by fishery, but by region – for example, fishers in the South Australian Marine Scalefish Fishery are more likely to earn all their income from fishing if they are based in the Southern Eyre Peninsula, whereas those based in the Far West (e.g. Ceduna) are more likely to derive household income from other sources, as well as from fishing. This type of information can help fisheries managers identify the likely implications of changes in management for fishing households in different regions.

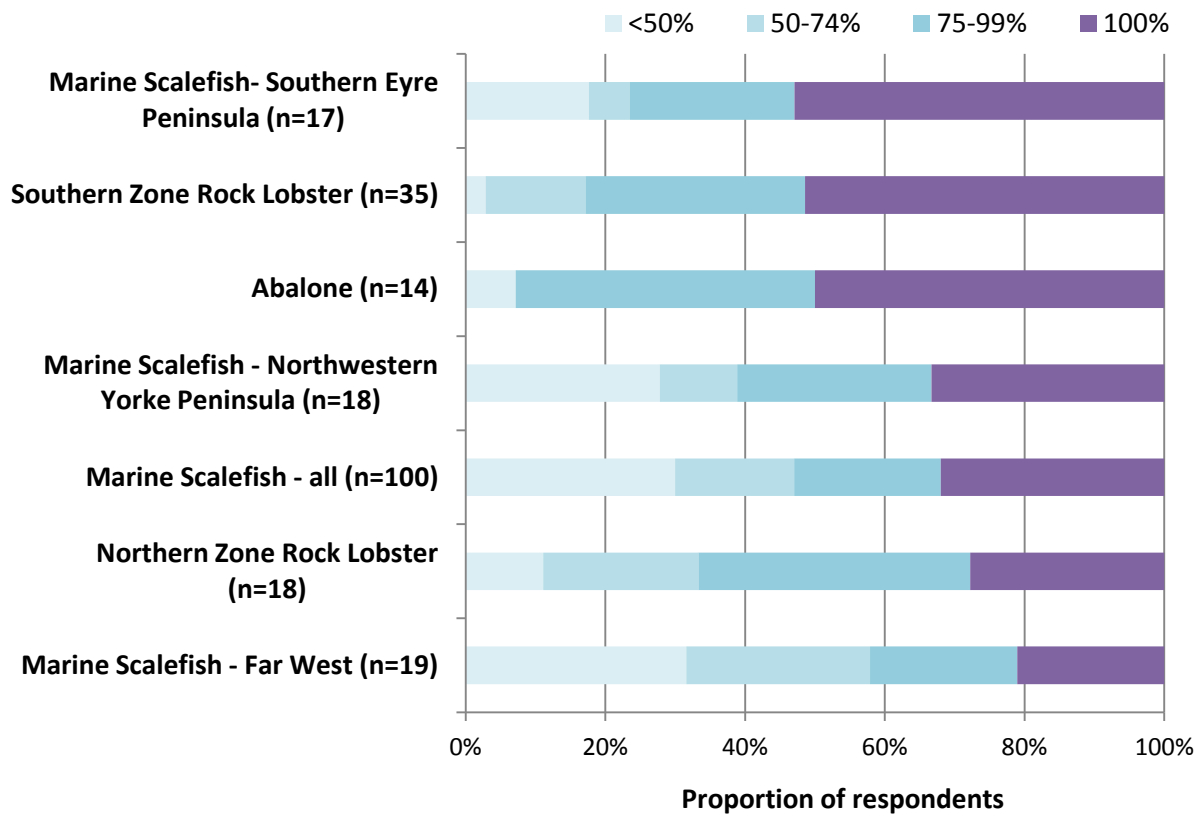


Figure 5 Proportion of household income earned in several Southern Australian commercial fisheries.

How are fisher’s values and preferences changing over time? This is particularly the case for recreational fisheries, where the aspects of fishing that provide social benefit may change over time. For example, a survey of the social aspects of South Australian recreational fishers found that older recreational fishers were more likely to value catching fish to eat than younger fishers, while younger fishers were more likely to value the solitude associated with fishing (Figure 6).

This suggests there may be a shift in the types of benefits recreational fishers seek from fishing over time. Fisheries managers need to consider what this change means when making decisions on fisheries management arrangements. Options include actively seeking to ensure fishing areas are not overly constrained to one area if seeking to provide the solitude experience valued by younger fishers; but for older fishers might choose to invest in artificial reefs that attract congregations of fish and enable easier catch of fish for eating.

Measurement of fisher’s values and preferences can be done through direct survey or through qualitative methods such as focus groups. The examples given throughout the Guide were validated in surveys to test these indicators and can be replicated readily using the questions provided.

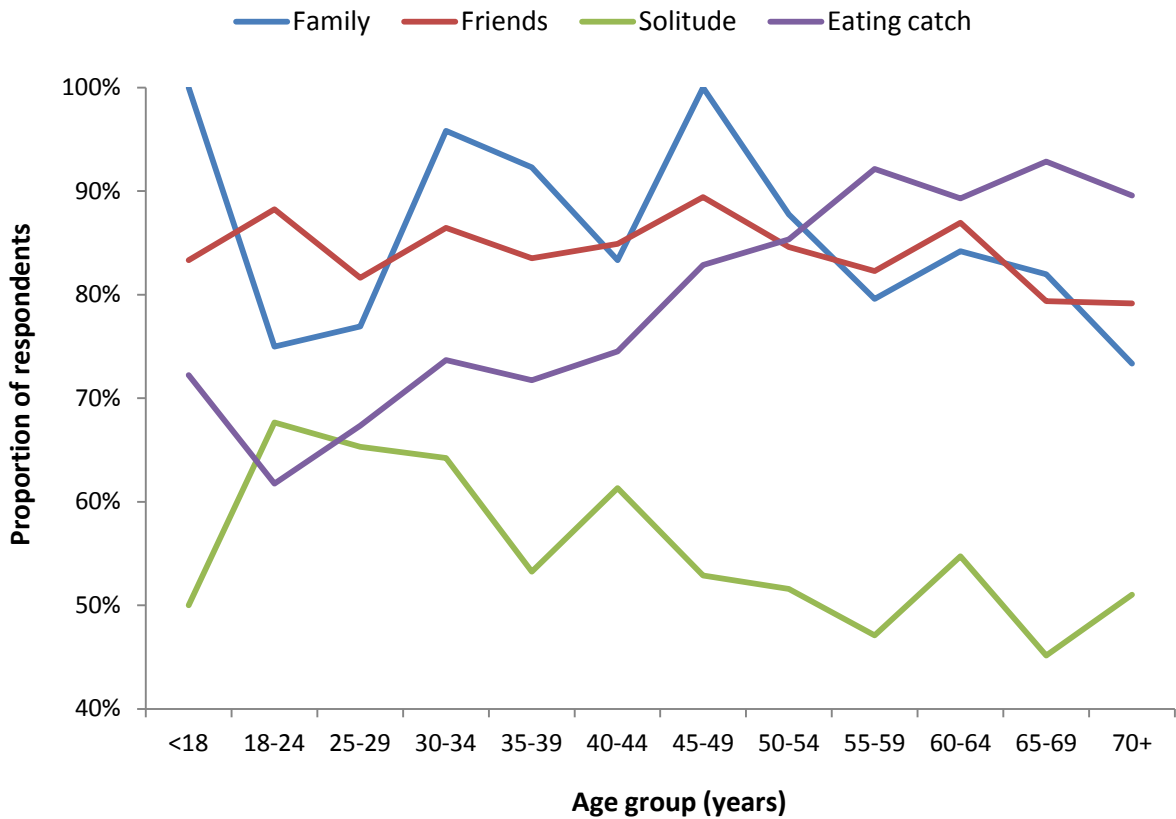


Figure 6 Proportion of respondents who rated different aspects of recreational fishing in South Australia as being important, by age group (yrs).

How do fishers prefer to interact with fisheries managers? What level of participation do different types of fishers want to have in fisheries management and what methods do they prefer for this (e.g. do they prefer public meetings, providing written submissions, or other methods of providing input)? Having this information can help identify why fishers are or aren't participating in fisheries management, and how to improve the methods used to involve fishers, thus supporting achieving Objective 1.3.

For example, in the South Australian recreational fisher's survey, participants were given a list of options for being involved in fisheries management and asked to identify how interested they would be in each. The least popular options were interacting with the fisheries management agency (PIRSA Fisheries and Aquaculture), via social media or smartphone apps, while the most popular options for receiving information were by email/post, website interaction and public meetings (Figure 7).

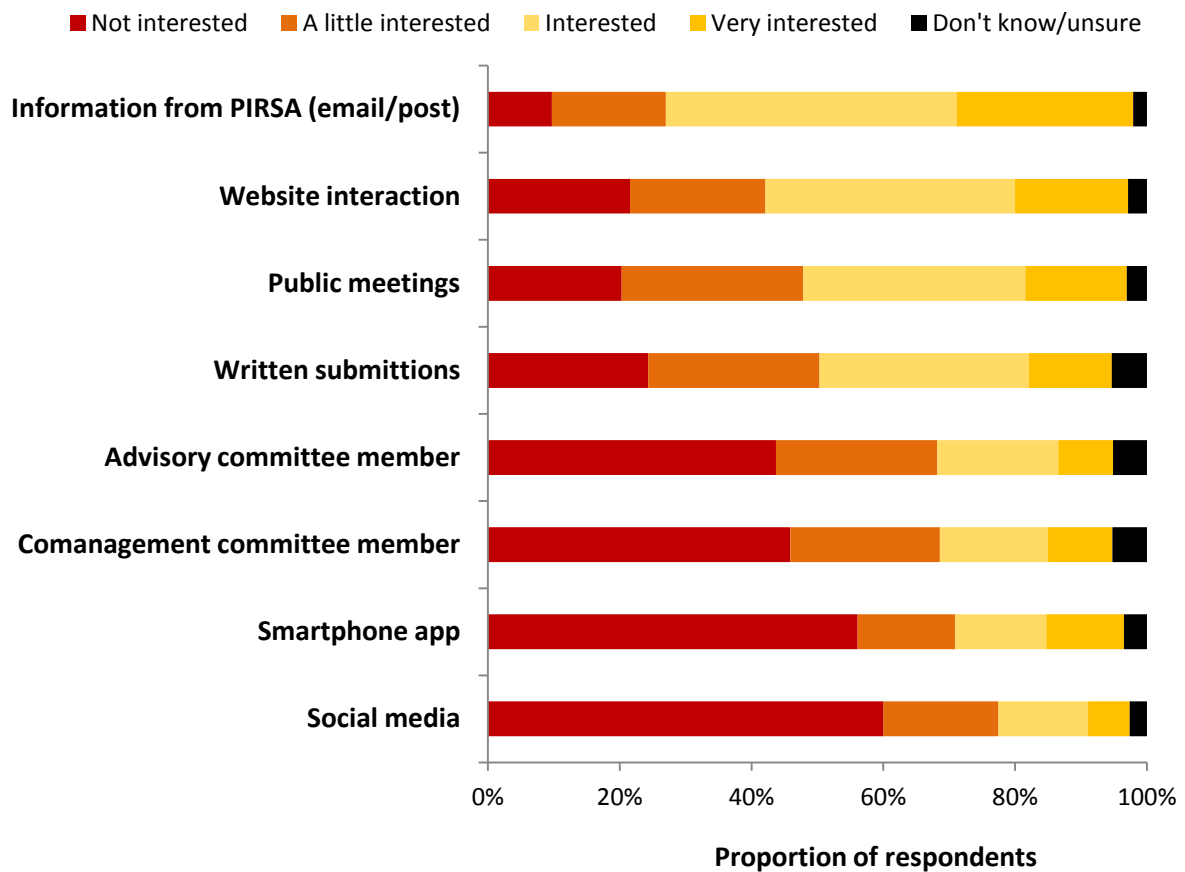


Figure 7 Level of interest expressed by South Australian recreational fishers in participating in fisheries management using different methods.

How do fishers prefer to access information? What methods of information dissemination best reach different groups of fishers? How is this changing? How can information best be designed and delivered to reach target groups? This type of information enables the identification of the best methods for communicating with stakeholders, and will therefore support achieving Objective 1.10.

Figure 8 provides an example, again from the South Australian recreational fisher survey, of the information sources most commonly used by the recreational fishers who responded to the survey. The survey questions in this case were designed to ask about locally relevant sources of information, such as the FishSA website, Strike & Hook website, in addition to broader categories applicable in any jurisdiction, such as pamphlets, brochures, fisheries management agency website, media releases. This highlights how survey questions can be readily customised to local contexts.

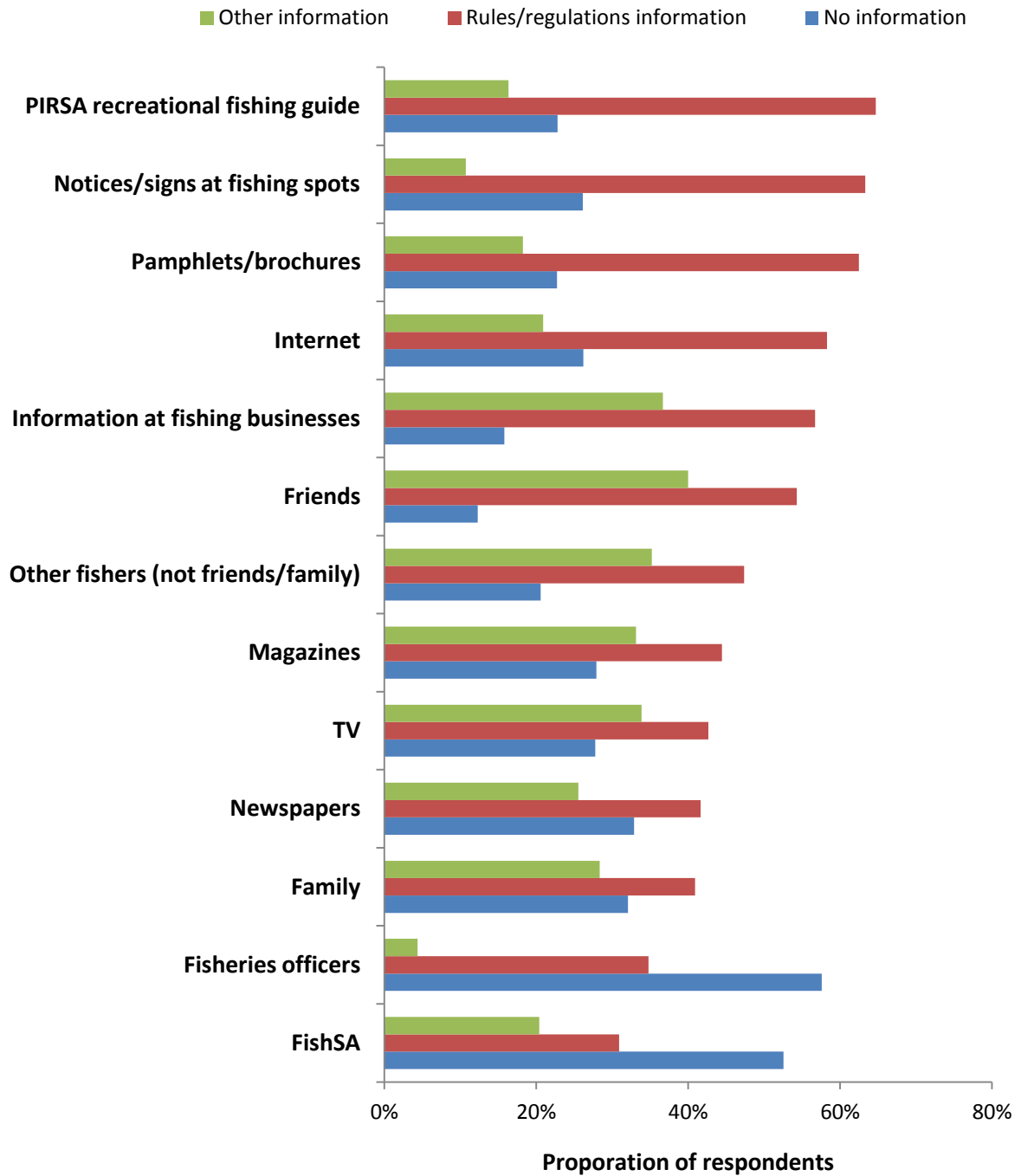


Figure 8 Proportion of South Australian recreational fishers who reported accessing information about recreational fishing from different sources.

3. DATA COLLECTION METHODS

This section provides a guide to collecting data using the following methods required for the indicators recommended in Part 2 of the Guide:

- Survey of commercial fishers;
- Survey of recreational fishers;
- Survey of the general public;
- Fisheries management agency records;
- Survey of stakeholders involved in consultation/ advisory committees/ communication processes;
- Consultation with Indigenous groups;
- Consultation with experts/stakeholders; and
- ABS statistics.

In regard to surveying commercial or recreational fishers to collect data, information on what sample survey questions can be used to gather these types of data are given in Section 4, Part 2 of the Guide.

For an overview of the data collection methods in regard to cost, time and options, along with key considerations to ensure high quality data are collected, the Fisheries Research and Development Corporation (FRDC) and Rural Industries Research and Development Corporation (RIRDC) have generated a guide to Social Science Research data collection methods that can be utilised as a further reference to the information provided here.

The document, titled 'Social science research for our natural resources', is available in limited hard copies from the FRDC and the RIRDC. Alternatively these documents can be downloaded from the FRDC & RIRDC web sites:

http://www.frdc.com.au/research/Documents/SS_Research_report_August_2011.pdf or
<https://rirdc.infoservices.com.au/items/11-087>.

Information is also available from ABARES on community and stakeholder engagement, in the form of 'Biosecurity engagement guidelines', available at:

http://adl.brs.gov.au/data/warehouse/pe_brs90000004183/BiosecurityEngagementGuidelines2010_ap14.pdf.

There is also the document 'Engaging in Biosecurity: Literature review of Community Engagement Approaches' which includes not only methods but considerations to bear in mind when undertaking engagement for the purposes of consultation of Indigenous/experts or stakeholders. This document is available at the website of: http://daff.gov.au/abares/publications_remote_content/publication_topics/social_issues?q_content_src=%2BdXJsPWh0dHAIM0EIMkyIMkyXNDMuMTg4LjE3LjIwJTJGYW5yZGwIMkZEQUZGU2VydmljZSUyRmRpc3BsYXkucGhwJTNGZmlkJTNEcGVfYnJzOTAwMDAwMDQxNTMueG1sJmFsbD0x.

A very large range of other guides to community engagement can also be found on the internet, many developed for use in either natural resource management or in rural and regional communities in Australia, both relevant contexts for fisheries managers. See the following links for useful guides, although it is helpful to search for guides online and evaluate which best meet specific consultation and engagement needs:

- A guide for engaging the community about controversial issues in forest management, which suggests techniques also applicable in fisheries - <http://www.plantations2020.com.au/assets/acrobat/Community-engagement.pdf> and http://www.crcforestry.com.au/research/programme-four/communities/4.3.3_community_engagement.html
- The South Australian community engagement guide - blogs.dfc.sa.gov.au/m/dfcweb_corp/458/download.aspx

Survey and consultation/qualitative data gathering techniques

Surveys and consultation processes can use many different data collection methods, each involving different levels of costs and time. The best way to reduce the cost involved in surveying or collecting data from fishers or any existing group associated with a fishery is to add social indicator questions to existing surveys or consultation processes already accepted by fishers or associated groups. In some states, fishers are periodically surveyed by fisheries management agencies to identify opinions on planned changes to fisheries management, to gather data on catch, and to gather economic data on the fishery. These vehicles can therefore be utilised to collect social data as well. This approach also applies to Indigenous, advisory or other stakeholder groups, where meetings or data collection may already be occurring. The utilisation of these typically decreases costs associated with implementing an assessment method, and as importantly often increases the acceptance and uptake by both fishers and fisheries managers of the method, to provide adequate levels and quality of information. For example, if fishers are used to responding to an existing survey, similar levels of response are likely to be achieved if a small number of 'social' questions are added to it, whereas designing an entirely new survey and delivering it separately may achieve a lower response rate as fishers are unfamiliar with the new process.

Surveys:

Fishers: Surveys are very useful with fishers (commercial, charter and recreational) but the optimal method used to collect the data will vary depending upon which group is the focus of the fishery. When considering whether to use a survey, and what type of survey is best, levels of literacy, availability of contact information, time and funds available, and geographical spread of the target fishers need to be considered. Identifying appropriate sample sizes of commercial or charter fishers is not difficult given that the total number and contact details are known through licensing information, although achieving an adequate response can be challenging in situations of low trust, in which fishers may be reluctant to complete surveys. The same cannot be said for recreational fishers in those states and territories without a licensing system, in which it is more challenging to identify how many recreational fishers there are, or how to contact them.

General public: Surveys of the general public are extremely useful, but typically quite expensive. Sample sizes and selection methods/stratification must be considered to ensure that an appropriately sized and diverse sample is selected to be representative of the general public perceptions and concerns. Given the complexity in ensuring this, it is recommended that an expert in general public surveying and sampling be engaged to assist in these instances.

Response rates: A common question asked is ‘what sample size is sufficient to be considered representative of the group being surveyed (e.g. commercial fishers or the general public)?’ There is no simple answer to this question; assuming there is no bias in who responds to the survey, then the sample size needed for statistically robust analysis will vary depending on the confidence interval desired in the results (i.e. how confident you need to be in the answers) and the overall size of the group. Where the group being surveyed is small – for example, a commercial fishery with only 20 licence holders – a much larger proportion need to be surveyed to achieve statistical robustness than is the case for surveying a large group. The following website provides helpful information on these issues, and on calculating appropriate sample sizes:

<http://www.surveysystem.com/sscalc.htm>.

It should also be noted that in many cases, survey responses are biased. For example, in recreational fishing surveys, responses may be biased towards avid fishers, whose strong interest in fishing makes them more likely to respond to a survey compared to those who fish only once or twice a year. For this reason, it is helpful to analyse responses for likely sources of bias, and to consider how to correct for these. In the case of recreational fishers, this bias can be addressed by explicitly comparing the responses of avid and less avid fishers, to see if they differ (and hence if the bias to more avid fishers has skewed overall results).

Sample sizes are often limited by the budget available for data collection. It is noteworthy that only one indicator in this Guide (Indicator 3.6.1-Level of community satisfaction with access to fishery management information) suggests the utilisation of general public surveys. For all other objectives, indicators were designed that do not require large-scale surveys of the general public, as it was considered unlikely that fisheries management agencies could regularly afford such surveys. For more detail on the considerations and benefits of the different methods listed below, please refer to page 35 of the document titled ‘Social science research for our natural resources’¹¹.

Internet surveys: Currently the cheapest method of surveying of fishers, stakeholder groups or the general public is via the internet, if most have access to the internet and use it regularly. Multiple online survey businesses enable easy internet hosting of surveys, with pre-designed templates and relatively low cost (e.g. www.surveymonkey.com). The internet has proven very successful with recreational fishers, but is not appropriate for commercial fisheries whose fishers do not, at this time, use the internet often or may have varying levels of literacy.

¹¹http://www.frdc.com.au/research/Documents/SS_Research_report_August_2011.pdf.

Mail surveys: The second cheapest method is to use mail surveys. Mail surveys can achieve a high response rate if multiple reminders are used to encourage survey completion, with selected respondents phoned or mailed reminder card(s) at 7-9 day intervals. This involves both costs in printing, mailing, follow-up mailing or phone calls, and data collation and entry. Varying levels of literacy may make participation challenging for some. Additionally, in the case of recreational fishers, the ability to contact fishers to participate may be limited by the availability of contact data and privacy provisions. Similarly, mail surveys of the general public depend on the availability of address lists and appropriateness of these to the fishery under review.

Phone surveys: Phone surveys are often relatively unsuccessful for commercial fishers, who have irregular hours and are often unavailable by phone. They can be useful as a 'back up' method (e.g. where a fisher is unable to meet face-to-face or complete a paper survey, and instead answers questions by phone), but they are not recommended as the main survey method as they are relatively expensive and do not necessarily achieve higher or more representative responses than the cheaper methods of internet surveys and mail.

Face-to-face surveys: Face-to-face surveys are the most expensive survey method, requiring considerably more staff time and training than other methods, as well as involving significant travel costs to visit fishers, selected stakeholders or canvassing points where members of the public would have the time and inclination to participate in a survey. However, this method can be useful where fishers are already being visited for other purposes, or members of the public interacting with the marine environment can easily be targeted (e.g. boat ramps; jetties; tourism outlets, etc).

Once data have been collected via one of the survey methods above, the survey results can easily be recorded in a database such as Microsoft Excel for analysis. The methods for analysing each indicator from the data gathered are described for each indicator in Section 2, Part 2 of the Guide. An example of an online survey is available at <http://www.surveygizmo.com/survey-software-support/example-surveys/> to show how such a survey can operate.

Consultation/ qualitative data gathering:

Focus groups, group interviews and workshops: These are all forms of group interaction, and although the specific definition of each differs, their format may often be very similar, if not, in fact, identical. Focus groups generally involve gathering people who have very similar perspectives to discuss their views on a specific topic. By contrast, group interviews include people who may have a diversity of views. Lastly, workshops are most commonly defined by bringing people together with expertise on a particular issue. In the context of seeking to collect information from 'Advisory' or 'Community' groups, as is suggested for a number of indicators, these are generally undertaken utilising face-to-face meetings or can also employ on line forums or teleconference meetings. For more detail on the considerations and

benefits of different methods, please refer to page 28 of the document 'Social science research for our natural resources'¹².

Individual interviews: This method of data collection may be employed to collect information from individual experts or stakeholders such as community council executives. These can be undertaken with identified individuals either by phone or face-to-face, depending upon the geographical spread of the respondents sought, and the time and funds available. For more detail on the considerations and benefits of different methods, please refer to page 23 of the document 'Social science research for our natural resources'¹³.

Qualitative data is generally analysed thematically, to identify common issues/ perceptions/beliefs/ visions/ or perspectives of management approaches. A variety of methods can be used to organise such themes that vary in complexity from general narratives, word frequency counts to identify the level of importance of an issue, to the use of specifically designed software such as NVivo and Dedoose. A comparison of the benefits and applicability of different packages to different purposes and resources can be found at <http://www.bu.edu/tech/support/desktop/distribution/nvivo/comparison/>.

Other data collection points:

Fisheries management agency records: A number of the indicators refer to the utilisation of data collected from fisheries management agencies. In this instance, fisheries managers are surveyed to provide the information identified as required to measure specific indicators. For speed and cost minimisation, the recommended method for surveying fisheries managers in Australia is to use an online survey. As with fishers, stakeholder or general public data collection, once data has been gathered, the survey results should be recorded in a database such as Microsoft Excel and analysed. The methods for analysing each indicator from the data gathered are described for each indicator in Section 2, Part 2 of the Guide.

Australian Bureau of Statistics (ABS): The Australian Bureau of Statistics is only cited as a data source for one indicator: Indicator3.1.2-Proportion of direct and indirect employment in a region dependent on fishing. The Australian Bureau of Statistics is a good source of data for the general public which is most commonly sourced from the five yearly 'Population and Housing Census', although the ABS also collects data via many other surveys. Information specifically in regard to 'Labour Force' (direct full time and part time employment) for a region can be obtained by local government area or a number of other geographic boundaries from the ABS. To identify general employment in a region (not broken down by industry), data can be downloaded by navigating from the home page of the ABS (www.abs.gov.au) through the following steps:

1. From the home page, select 'Statistics' under 'All Statistics' on the top left hand drop down menu;

¹²http://www.frdc.com.au/research/Documents/SS_Research_report_August_2011.pdf.

¹³http://www.frdc.com.au/research/Documents/SS_Research_report_August_2011.pdf.

2. From the next page loaded, select 'Census data' from the grey drop down menu on the right hand side of the page;
3. On the next page, select 'Quickstats' from the drop down menu on the left hand side of the page, under 'Data and Analysis'.
4. This will then load a page where on the right hand side the location for the information being sought, can be entered.
5. From the page next loaded, select 'People' and scroll down to 'People – Employment'.

An example of this page is for the town of Port Lincoln is:

http://www.censusdata.abs.gov.au/census_services/getproduct/census/2011/quickstat/SSC40590?opendocument&navpos=220.

More specifically, it is possible to obtain data on the number of people employed in certain fisheries related jobs. This can be done by downloading tables, for a region, showing 'employment by industry', using the following steps:

1. From the home page, select 'Statistics' under 'All Statistics' on the top left hand drop down menu;
2. From the next page loaded, select 'Census data' from the grey drop down menu on the right hand side of the page;
3. On the next page, click on 'Tablebuilder'. You will then need to register for the freely available Tablebuilder product. Once registration is complete, and you have logged into Tablebuilder, you can download data on employment in fishing related jobs under the 'Employment, income and unpaid work' database, in which you can specify what regions you want information for in the 'geographical areas' part of the left-hand side menu, and then click on the following links in the 'employment, income and unpaid work classifications' menu to find information on employment in fishing:
 - Industry → industry of employment → agriculture, forestry and fishing → aquaculture
 - Industry → industry of employment → agriculture, forestry and fishing → fishing, hunting and trapping → fishing (this then breaks down into a further 6 types of fishing)
 - Industry → industry of employment → manufacturing → food product manufacturing → seafood processing.

Detailed information on how employment in these fishing-related jobs has been defined can be found in ANZSIC (2006).

The selection and interpretation of census and other Australian Bureau of Statistics data can be difficult, particularly to ensure that the data being used is correctly interpreted for the purpose it is being used for. Consequently, although the steps provided above are to encourage the use of this publicly available rich data source, it is provided with a caution to ensure that it is done so with a correct interpretation of the data.

4. DEFINITIONS

ESD: The term 'Ecologically Sustainable Development' (ESD) was adopted in Australia by the National Strategy on ESD (1992) and includes three key elements:

- *'To protect biological diversity and maintain essential ecological processes and life-support systems.*
- *To enhance individual and community wellbeing and welfare by following a path of economic development that safeguard the welfare of future generations;*
- *To provide for equity within and between generations; and*

To be consistent with ESD principles, *"resources not only need to be used sustainably, but how they are used, who benefits and when, along with the impacts of their use, all need to be evaluated"* (Fletcher et.al 2002).

Objective: An objective is the outcome that is to be achieved, e.g. 'equitable treatment and access for fishers'.

Indicator: An indicator is the means to be able to measure the achievement of an objective. Note there may be several indicators for one objective. This is either to ensure that all aspects of the objective are covered in situations where an objective is multidimensional; alternatively there may be several ways to measure the achievement of the same objective that is subjective to the particular situation, in which case the indicator is selected specifically for the fishery that the objective is being applied to.

Performance measure/reference points: This is the measure that is used to interpret the indicator data to determine if the objective is being met/exceeded/not being met.

Cultural: This is seen as 'the total ways of living built up by a group of human beings, which is passed from one generation to the next'.

Customary fishing: This is identified by the Victorian Department of Primary Industries, 'Aboriginal Fishing Strategy' as: fishing undertaken by traditional owners for the purposes of satisfying their non-commercial personal, domestic or communal needs in accordance with traditional laws and customs. As part of the Strategy's implementation, an interpretation of this definition will be developed that appropriately reflects both the aspirations of Traditional Owners and Government policy directions.

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APPENDIX 1 – AHP METHODS AND VARIABILITY IN WEIGHTING OF OBJECTIVES

AHP is based upon the construction of a series of pair-wise comparison matrices which compare sub-objectives to one another. One of the advantages of the pair-wise comparison method is it makes the process of assigning weights much easier for participants because only two elements or objectives are being compared at any one time rather than all objectives having to be compared with each other simultaneously. The comparison process is based on psychological experiments and is designed to allow for, as closely as possible, a reflection of a person's true feelings in making comparisons between two items whilst minimising any confusions or difficulties involved (Saaty 1980; 1982).

The results are not presented in this Guide for each fisheries management agency, as some agencies expressed concerns about the views of the respondents not necessarily representing the views of the agency as a whole. Instead, the weightings were presented aggregated over Commonwealth and State agencies. The latter were sub-grouped into 'Northern' states with mostly tropical or sub-tropical fisheries, and 'Southern' states with mostly temperate or cold water fisheries. Western Australia was included with the southern states as much of the value of fisheries production derives from rock lobster fisheries which are mostly in the south of the state.

The weights in Table 2 reflect the views of a limited number of individuals involved in fisheries management and policy in each management agency rather than the views of the broader public or other stakeholder groups (including fishers). Other studies have found that the views of commercial fishers and fisheries managers are often well aligned in terms of management objective importance (due to the history of interactions between these groups in policy and management development), but may differ substantially in other stakeholder groups (Pascoe et al. 2013). If the objective weightings are reflective of the agency's priorities, then they do not need to be re-assessed. If broader consultation process is required, then this can be undertaken by individual management agencies using the spreadsheet instrument developed in the project.

Figure 9 Variability in importance of individual social objectives as ranked by fisheries managers from different parts of Australia in 2012 using an Analytic Hierarchy Process.

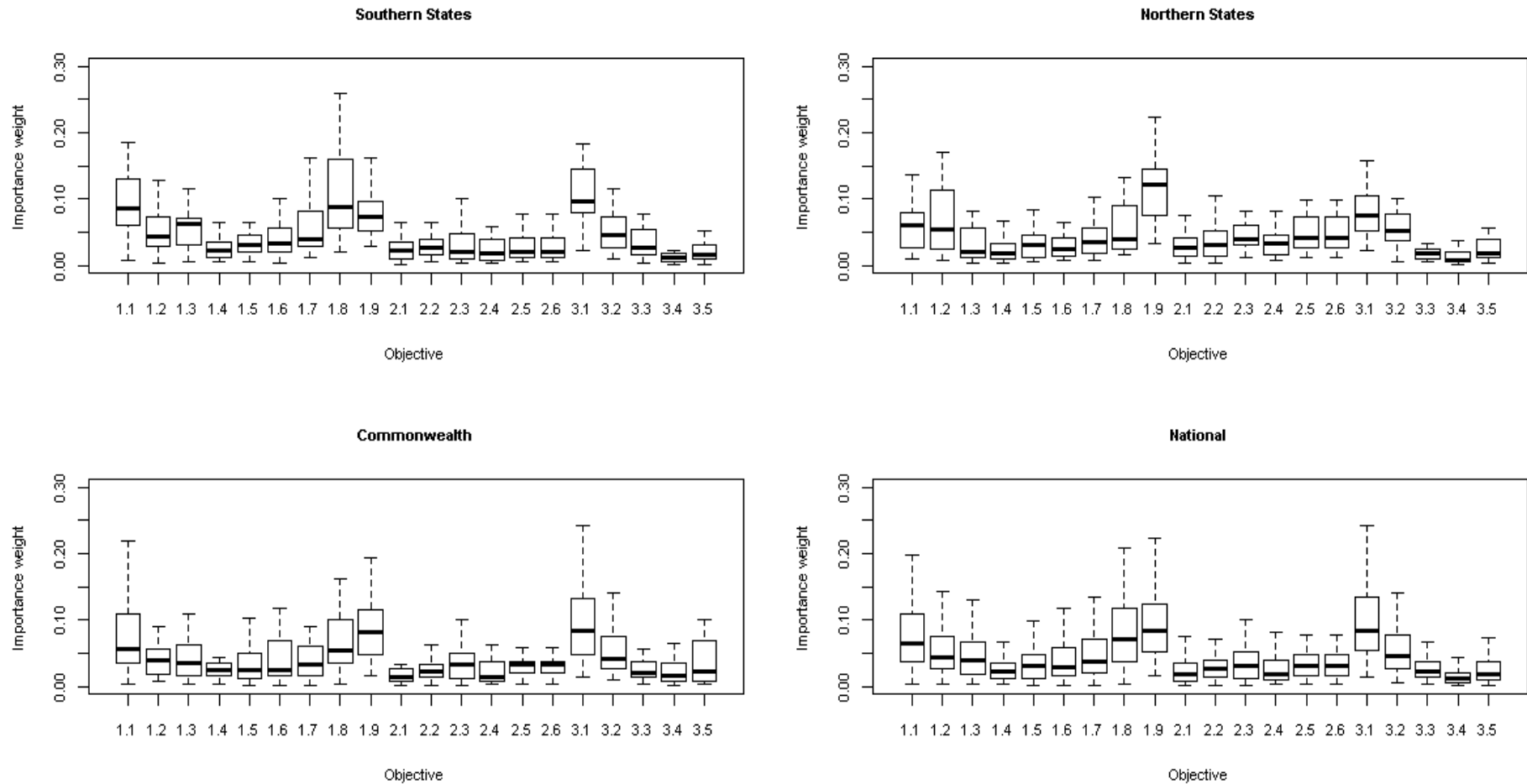
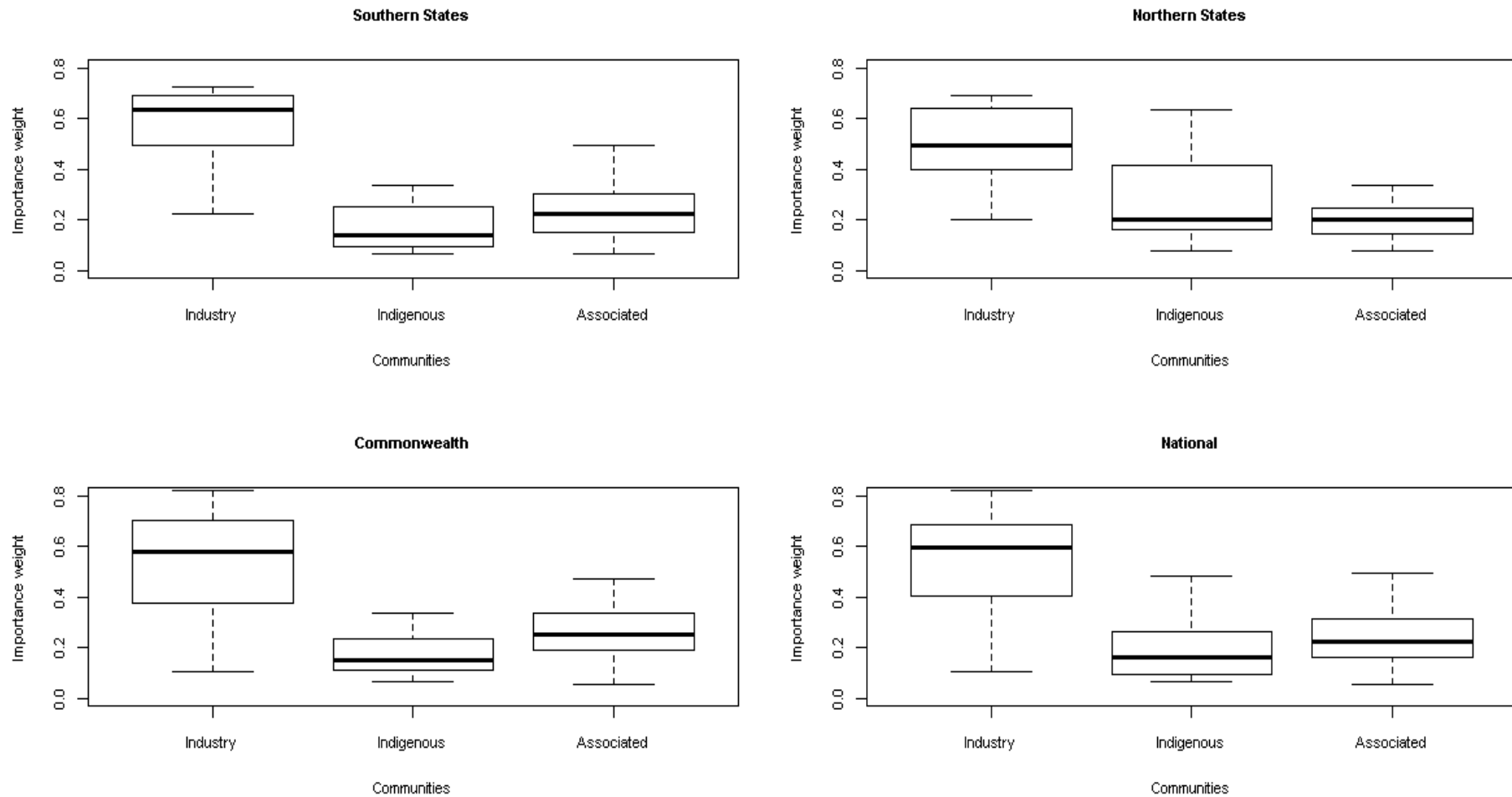


Figure 10 Variability in importance of community level objectives as ranked by fisheries managers from different parts of Australia in 2012 using an Analytic Hierarchy Process.



Managing the social dimensions of fishing

PART 2: Implementing social objectives and indicators in fisheries management

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INTRODUCTION

Why include social objectives in fisheries management?

As detailed in Part 1 of this Guide, humans derive many social benefits, and may also suffer costs, from fishing activities. These range from those associated with generation of jobs and income, to the nutrition derived from eating the catch and the cultural, spiritual, physical and mental health benefits and costs associated with fishing. If the issues described in Part 1 have been considered and worked through, the actions of fisheries managers can significantly influence the optimisation of benefits and minimise the social costs of fisheries management activities.

How does this part of the Guide help?

This part of the Guide is essential in bringing social objectives and indicators to life; providing the tools for fisheries managers to be able to engage with the social dimension of fisheries management as more than theoretical concept. It does this by providing the detailed information needed to measure and monitor indicators and to assess the performance of those indicators against social objectives. Detailed guidance is given on not only on what each individual social objective and indicators involves, but also on how to collect data and interpret them, along with recommended management actions or where further research/data collection may be required. Importantly, as stated in Part 1 of the Guide, it is essential to include Indigenous communities and local/regional communities when identifying social objectives of fisheries management. This moves beyond previous initiatives that have typically focused on the social effects of management on commercial, recreational and charter fishers alone. Note, however, that the social objectives and indicators for Indigenous communities included in Sections 1 & 2 have *not* been tested rigorously across multiple communities and *should be considered only as a starting point for engaging* with Indigenous communities in regard to the social effects of fisheries management decisions and implementation of management arrangements.

How do I use this part of the Guide?

This part to the Guide is divided into four main sections. There are:

SECTION 1 – SOCIAL OBJECTIVES – DETAILED DESCRIPTION (page 19)

Section 1 provides an overview of each social objective, including when, why and how it is relevant to fisheries management and potential challenges/issues. This assists in making decisions about which social objectives are relevant in different fisheries contexts.

SECTION 2 – SOCIAL INDICATORS – DETAILED DESCRIPTIONS (page 45)

Section 2 provides a detailed overview of each social indicator, including when, why and how it is relevant to fisheries management, and key consideration.

SECTION 3 – DATA COLLECTION METHODS (page 175)

Section 3 provides advice on how to most efficiently and effectively collect social data.

SECTION 4 – SAMPLE SURVEY QUESTIONS (page 181)

Section 4 provides information on sample survey questions and data collection methods that can be used to collect social data. Use this when designing questionnaires that fisheries managers or fishers will complete.

Each section and the relevant steps therein are described on the following pages. However, **before proceeding**, it is essential to have worked through the risk assessment and the contextual and resource planning around utilising social objectives, described in Part 1 of this Guide. This should be undertaken *prior to* finalising which objectives are going to be used and commencing collection of indicator data to inform those objectives. Figures 1 & 2 and Tables 1 to 4 are repeated from Part 1 of the Guide, as a quick reference to the different groups of social objectives and how they fit into the Ecologically Sustainable Development (ESD) framework common to all Australian fisheries. Fisheries managers must ensure that appropriate elements of each of the three ESD groups are addressed in the development of management arrangements for the fishery and the identification of indicators to address selected objectives.

Figure 1 identifies where social considerations fit within the broader set of considerations included in the ESD framework. Figure 2 then considers only the ‘social’ part of the ESD framework and expands it to identify what different communities should be considered (industry, Indigenous and local/regional), and the types of social objectives relevant to each of these communities. Choices about the social objectives relevant to a fishery should be made based on the needs of an individual fishery, but it is helpful to understand how the needs and situation of one fishery compares to others across Australia. Table 1 lists the different social objectives described in detail in Section 1 and identifies which were considered of high priority by the greatest numbers of Australian fisheries managers. We recommend this be used to help guide selection of social objectives in any fishery, as objectives of high relevance nationally should typically be measured in all fisheries, whereas those which were of less relevance may only be appropriate to measure if particularly relevant to the fisheries concerned. Finally, Tables 2 to 4 identify individual indicators that can be used to measure each social objective, and summarise their key characteristics. These tables are simply summary points – for full details of the intricacies of measurement, evaluation and import of each objective and associated indicator(s), they should be read in conjunction with Sections 1 & 2.

Figure 1 Ecologically Sustainable Development (ESD) Hierarchical Tree Framework (adapted from Fletcher et al. 2002).

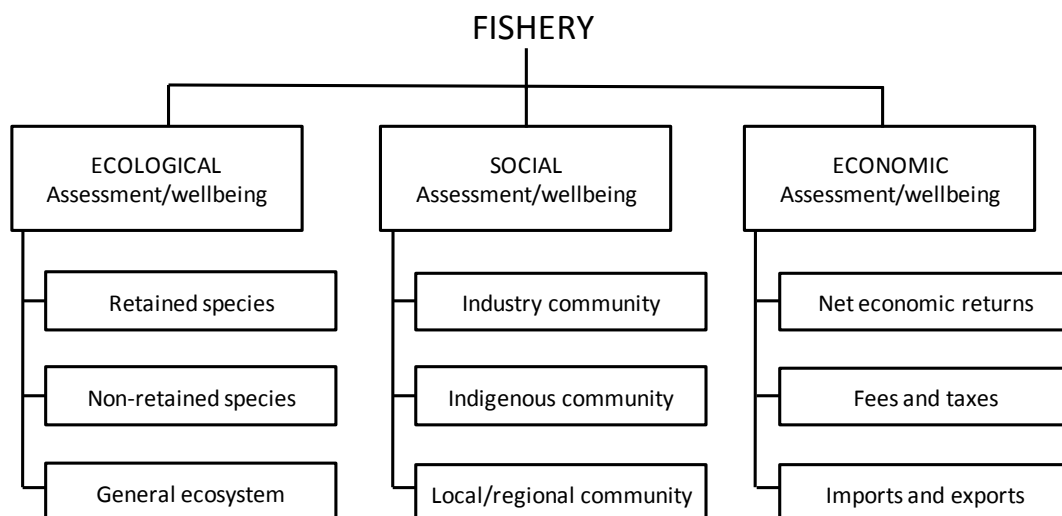


Figure 2 Social objectives relevant to Australian fisheries management.

NB: The numbers in brackets refer to the objectives detailed in each sector.

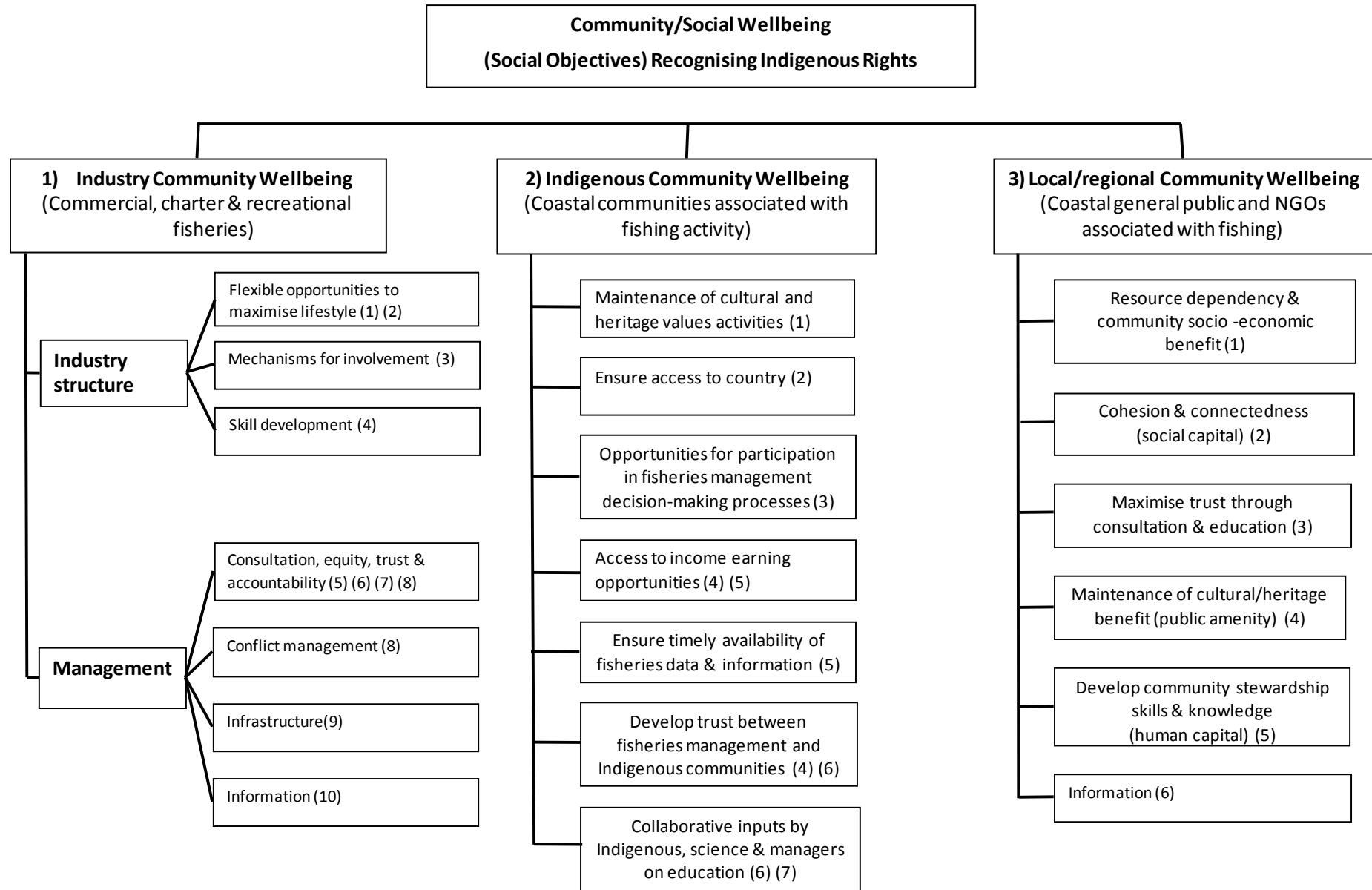


Table 1 Relative (rank) importance of the different social objectives assessed by fisheries managers from different parts of Australia in 2012, using an Analytic Hierarchy Process.

NB: Western Australia is included in Southern States; Ranking is from 1 = highest, to 20 = lowest; 'CC Only' refers to Commercial and Charter fisheries only. Blue boxes represent the highest ranked objectives for the different regions while the Green boxes represent the second to fifth highest ranked objectives.

Objective	Southern States	Northern States	Common-wealth	National average
Commercial, recreational and charter communities				
1.1 Provide flexible opportunities to ensure fishers can maintain or enhance their livelihood (CC only)	3	4	3	4
1.2 Maximise cultural, recreational and lifestyle benefits (including health benefits) of fishing	5	3	6	5
1.3 Ensure appropriate mechanisms exist for fisher involvement in development of fisheries management advice	7	13	7	8
1.4 Improve the ability of fishers to participate effectively in fisheries management advisory processes	16	18	20	19
1.5 Industry stakeholders have a high level of trust in the management of fisheries	9	10	13	10
1.6 Maximise stewardship of fisheries resources	10	14	8	9
1.7 Ensure transparent decision making processes by fisheries agencies	6	7	10	7
1.8 Ensure equitable treatment and access for fishers	2	5	4	2
1.9 Ensure adequate access to infrastructure needed for successful operation of fishing activities	4	1	2	3
1.10 Ensure fisheries information is available in a timely and publicly accessible manner	No AHP allocated given this is a requirement in all fisheries			
Indigenous communities (NB: These objectives may differ to those in section 2 due to case study outcomes) ¹				
2.1 Maintenance of cultural and heritage values related to fishing activities in Indigenous communities	17	12	17	16
2.2 Ensure provision of access to 'Country' to enable continuation of traditional activities	12	17	12	15
2.3 Ensure appropriate consultation of Indigenous people	15	11	9	11
2.4 Ensure open and transparent communication	18	16	14	18
2.5 Develop economic opportunities	13	8	15	13
2.6 Ensure collaborative inputs by Aboriginal communities	13	8	15	13
Regional and associated communities				
3.1 Positively influence fisheries related socioeconomic benefits for regional communities	1	2	1	1
3.2 Facilitate/support the cohesion/connectedness of fishers with their regional communities through fisheries management	8	6	5	6
3.3 Maximise community trust in fisheries agencies to manage fisheries	11	19	18	12
3.4 Ensure fisheries management contributes to the maintenance of cultural and heritage values related to fishing activities	20	20	19	20
3.5 Facilitate capacity building for community members to enhance stewardship of fisheries resources	19	15	11	17
3.6 Ensure fisheries information is available in a timely and publicly accessible manner.	No AHP allocated as it is a requirement in all fisheries			

¹ The rankings of the indigenous community objectives were deemed to be generally low due to a lack of fisheries manager expertise or confidence in this domain. This is supported by the higher rankings noted by fisheries managers in the northern States.

Table 2 Recommended social Indicators for the Industry (commercial, charter and recreational fisheries) community.

NB: 'CC only' refer to Commercial and Charter only. *costs could be considered low when processes are already in place to collect data.

Objective number and name	Indicator number and name	Measurement method/s	Measurement costs	Measurement complexity	Independence of indicator	Additional information
1.1-Provide flexible opportunities to ensure fishers can maintain or enhance their livelihood, within the constraints of ecological sustainability (Page 21)	1.1.1-Provision of livelihood opportunities: cost of entry and access to fisheries (CC only)	Management agency	Low	Low	High	Page 47
	1.1.2-Perception of flexibility: fisher belief that management processes are flexible enough to allow them to adapt to changing conditions	Fisher survey	Medium*	Low	High	Page 49
	1.1.3-Existence of transferable property or use rights that allow access to marine and aquatic resources (CC only)	Management agency	Low	Low	Medium	Page 52
	1.1.4-Proportion of fishers accessing a livelihood from fishing (CC only)	Management agency	Low	Medium	Medium	Page 54
	1.1.5-Constrains on access to livelihood opportunities imposed by fisheries management (CC only)	Management agency	Low	Low	Low	Page 57
1.2-Maximise cultural, recreational and lifestyle benefits (including health benefits) of fishing for those who participate in fishing activities, within the constraints of ecological sustainability (Page 22)	1.2.1-Level of satisfaction fishers have with their fishing activities	Fisher survey	Medium	Low	High	Page 59
	1.2.2-Level of satisfaction fishers are achieving the cultural, recreational and lifestyle benefits important to them from fishing	Fisher survey	Medium	High	High	Page 62
	1.2.3-Level of satisfaction fishers have with their fishing-derived income (CC only)	Fisher survey	Medium	Low	High	Page 65
	1.2.4-Perceived importance of fishing activities to fisher's life	Fisher survey	Medium	Medium	High	Page 68
	1.2.5-Fishers' plans to leave fishing (CC only)	Fisher survey	Medium	Low	High	Page 70

Objective number and name	Indicator number and name	Measurement method/s	Measurement costs	Measurement complexity	Independence of indicator	Additional information
1.3 -Ensure appropriate mechanisms exist for fisher involvement in development of fisheries management advice (Page 23)	1.3.1 -Level of satisfaction fishers have with the amount of consultation undertaken by fisheries managers	Survey of fishers involved in consultation processes	Medium	Low	High	Page 73
	1.3.2 -Proportion of fishers actively participating in fisheries management advisory groups	Management agency &/or fisher survey	Medium	Low	Medium-High	Page 75
	1.3.3 -Presence of fisher representatives on fisheries management advisory groups	Management agency	Low	Low	Low	Page 78
	1.3.4 -Existence of formal documented processes for providing feedback to stakeholders about fisheries management decisions, and how stakeholder input was used in those decisions	Management agency	Low	Low	Medium	Page 80
	1.3.5 -Level of fisher awareness of methods to have input into fisheries management processes	Management agency & fisher survey	Medium	Low	High	Page 82
	1.3.6 -Level of knowledge fishers have on how to contact their representatives in fisheries management/ advisory processes	Fisher survey	Medium	Low	High	Page 84
1.4 -Improve the ability of fishers to participate effectively in fisheries management advisory processes (Page 24)	1.4.1 -Level of satisfaction fisher representatives have with their overall representation skills and resources	Survey of members of advisory committees	Low	Low	High	Page 86
	1.4.2 -Provision of support for stakeholders to effectively participate in fisheries management processes	Management agency	Low	Low-Medium	Medium	Page 88
1.5 -Industry stakeholders have a high level of trust in the management of fisheries (Page 25)	1.5.1 -Level of fisher trust in the fisheries agency responsible for the fishery	Fisher survey	Medium	Low	High	Page 90
	1.5.2 -Fisher perception of the outcomes of fisheries management	Fisher survey	Medium	Low	High	Page 92

Objective number and name	Indicator number and name	Measurement method/s	Measurement costs	Measurement complexity	Independence of indicator	Additional information
1.6 -Maximise stewardship of fisheries resources (Page 26)	1.6.1 -Trends in fisheries infringements	Management agency	Low	Low	High	Page 94
	1.6.2 -Proportion of fishers who believe that, overall, most fishers comply with fishing rules and regulations	Fisher survey	Medium	Low	Medium	Page 96
	1.6.3 -Fisher understanding of rules and regulations	Fisher survey	Medium	Low	High	Page 98
	1.6.4 -Level of ease of fisher compliance with rules and regulations	Fisher survey	Medium	Low	High	Page 100
	1.6.5 -Level of fisher perception of the availability of adequate training and advice regarding good fishing practices	Fisher survey	Medium	Low	High	Page 102
1.7 -Ensure transparent decision-making process by fisheries agencies (Page 27)	1.7.1 -Level of perceived transparency by fishers of fisheries management decision making processes	Fisher survey	Medium	Low	High	Page 104
	1.7.2 -Documentation of fisheries management decision making processes	Management agency	Low	Low	Low-Medium	Page 106
1.8 -Ensure equitable treatment and access for fishers (Page 28)	1.8.1 -Level of fisher perceived equity/ fairness of the processes and outcomes of fisheries management	Fisher survey	Medium	Low	High	Page 108
1.9 -Ensure adequate access to infrastructure needed for successful operation of fishing activities, within the constraints of ecological sustainability (Page 29)	1.9.1 -Gaps in availability of infrastructure needed by fishers	Management agency	Low	Medium	Medium	Page 111
	1.9.2 -Level of satisfaction fishers have with access to different types of fishing infrastructure	Fisher survey	Medium	Low	High	Page 114
1.10 -Ensure fisheries information is available in a timely and publicly accessible manner (Page 30)	1.10.1 -Access to fisheries information about the fishery	Fisher survey	Medium	Low	High	Page 117
	1.10.2 -Level of currency, independence and accessibility of information about the fishery	Management agency	Low	Low	High	Page 119

Table 3 Recommended social Indicators for the Indigenous community.

NB: The following objectives and indicators have resulted from consultation with Indigenous fisheries managers and one case study (the Narungga Community). They should NOT be considered conclusive and the authors deem them to be useful only as a starting point to be explored in collaboration with a fishery's associated Indigenous community for relevance and application. The term 'Country' is utilised here to refer to 'Country' associated with both marine and freshwater aquatic resources.

Objective number and name	Indicator number and name	Measurement method/s	Measurement costs	Measurement complexity	Independence of indicator	Additional information
2.1-Fisheries management actions support the maintenance of cultural and heritage values related to fishing activities in Aboriginal and Torres Strait Islander communities (NB: Indicator 2.2.1 must be undertaken to effectively implement Indicators under 2.1) (Page 32)	2.1.1-Level of recognition and protection of both iconic species and habitat in fisheries management plans	Management agency	Low-Medium	Low	Low	Page 123
	2.1.2-Existence of continued access to identified community iconic species through habitat protection and catch management	Management agency & discussions with community representatives	Medium-High	High	High	Page 125
	2.1.3-Level of Indigenous community satisfaction with management impacts on access to iconic species over time	Survey of Indigenous community or advice from advisory group	Medium-High	Medium-High	High	Page 127
2.2-Ensure access to 'Country' ² to enable continuation of cultural fishing activities, respecting the rights of Aboriginal and Torres Strait Islander peoples to these resources (Page 33)	2.2.1-Identification of 'Country' relevant to the fishery	Survey of Indigenous community or advice from advisory group	Medium-High	High	Very high	Page 129
	2.2.2-Level of management arrangement support for cultural practices included in management considerations	Consultation with Indigenous community & advice from advisory group	Medium-High	High	Very high	Page 131
2.3-Provide opportunities for Aboriginal and Torres Strait Islander communities to	2.3.1-Level of Indigenous community representation in fisheries management decision making processes	Consultation with Indigenous community & advice	Medium-High	Medium	Very high	Page 133

² Based on legislative requirements

Objective number and name	Indicator number and name	Measurement method/s	Measurement costs	Measurement complexity	Independence of indicator	Additional information
participate in fisheries management decision making processes (Page 34)		from advisory group				
	2.3.2 -Level of active participation by nominated community representatives associated with 'Country' and a fishery, in fisheries management decision making processes	Management agency or advice from advisory group	Low-Medium	Medium	Very high	Page 135
	2.3.3 -Community sign-off is obtained on fisheries management arrangements	Management agency	Low-Medium	Medium-High	High	Page 137
2.4 -Optimise access to income earning opportunities for Aboriginal and Torres Strait Islander community members related to the management of fisheries (Page 35)	2.4.1 -Level of income-earning opportunities available to Aboriginal and Torres Strait Islanders related to the fishery, marine and/or water resources	Management agency	Low	Low	Low	Page 139
	2.4.2 -Number of procurement processes that allow for the select tendering of Indigenous community members from the communities associated with the fishery's identified 'Country'	Management agency	Low	Low	Not available	Page 141
	2.4.3 -Number of fishery-related training and capacity-building opportunities available to the Indigenous communities associated with the fishery	Management agency	Low	Low	Not available	Page 143
2.5 -Make fisheries collected data available in a timely and publicly accessible manner (Page 36)	2.5.1 -Acceptance by community of fisheries information provided by their fishery management nominee as being relevant, requested and inclusive of their concerns, within the constraints of confidentiality	Management agency & sign-off by Indigenous community	Low	High	Not available	Page 145

Objective number and name	Indicator number and name	Measurement method/s	Measurement costs	Measurement complexity	Independence of indicator	Additional information
2.6-Aboriginal and Torres Strait Islander communities associated with 'Country' aquatic resources have a high level of trust in the management of fisheries (Page 37)	2.6.1-Level of community nominee's participation in the evaluation process of fisheries management arrangements	Management agency and/or advice from advisory group	Low	High	Not available	Page 147
	2.6.2-Level of collaborative, cultural and scientific research undertaken to ensure fisheries management is consistent with, and supportive of, cultural and customary take	Management agency & discussions with community representatives	Low	High	Not available	Page 149
2.7-Ensure collaborative inputs by Aboriginal and Torres Strait Islander communities, regional and industry sectors on the benefits each sector offers to fisheries management (Page 38)	2.7.1-Level of Aboriginal and Torres Strait Islander groups participation with other sectors and management in any fisheries ESD education processes	Management agency	Low	High	Not available	Page 151

Table 4 Recommended social Indicators for the local/regional community.

^ABS data can also be used under certain circumstances.

Objective number and name	Indicator number and name	Measurement method/s	Measurement costs	Measurement complexity	Independence of indicator	Additional information
3.1-Positively influence fisheries related socio-economic benefits for regional communities, within the constraints of ecological sustainability (Page 39)	3.1.1-Level of contribution of fisheries to direct employment in defined communities	Fisher survey followed by expert economic modelling and analysis	Very high	Very high	Medium	Page 153
	3.1.2-Proportion of direct and indirect employment in a region dependent on fishing	Fisher survey followed by expert economic modelling and analysis^	Very high	Very high	High	Page 157
3.2-Facilitate and support the cohesion and connectedness of fishers with their regional communities through fisheries management (Page 40)	3.2.1-Level of recognition of key social and community needs in fisheries management processes	Management agency	Low	Medium	Medium-High	Page 160
3.3-Maximise community trust in fisheries agencies to manage fisheries (Page 41)	3.3.1-Level of fisheries management agency involvement in community education/ outreach activities	Management agency	Low	Low	High	Page 163
3.4-Ensure fisheries management contributes to the maintenance of cultural and heritage values related to fishing activities (Page 42)	3.4.1-Number of cultural and heritage values associated with fishing are identified and managed as part of fisheries management	Management agency	Low	Low	Medium	Page 165
	3.4.2-Importance of fishing to the culture and heritage of a community/ region	Consultation with local experts or survey of general public.	Low-High	Medium-High	Medium-High	Page 167
3.5-To facilitate capacity building (through skills and knowledge development) for community members to	3.5.1-Number of fisheries management agency training and educational opportunities provided to the general public	Management agency	Low	Low	High	Page 169

Objective number and name	Indicator number and name	Measurement method/s	Measurement costs	Measurement complexity	Independence of indicator	Additional information
enhance stewardship of fisheries resources (Page 43)	3.5.2 -Level of satisfaction of community members with their participation in training and educational opportunities	Survey of training course participants	Medium	Medium	High	Page 171
3.6 -Ensure fisheries information is available in a timely and publicly accessible manner (Page 44)	3.6.1 -Community satisfaction with access to fisheries management information	Survey of general public	High	Medium	High	Page 173

1. SOCIAL OBJECTIVES - DETAILED DESCRIPTION

To assist in selecting the social objectives (detailed in Tables 2 to 4) most relevant to the management of your fishery, this section provides a detailed overview of each social objective and when, why and how it is relevant to fisheries management. For each social objective, the following elements have been identified:

- Groups (e.g. commercial, recreational or charter) within the community to which the objective applies (not applicable for Indigenous or local/regional community objectives);
- Description and definition (of the objective);
- How fisheries managers can influence the objective;
- What constitutes success in meeting the objective; and
- Challenges/issues that managers of the fishery should be aware of.

In this section, only the social objective is discussed. The indicators that can inform the achievement of the objective are comprehensively discussed in Section 2 'Social Indicators - detailed description' (from page 45).

The following social objectives (and indicators in the subsequent section) are designed to apply to three quite distinct communities. These are the industry, Indigenous and local/regional communities, as defined in the ESD framework. The focus of the objectives for each of the three communities is quite different, but equally important to consider relative to the benefits and losses achieved by ecological and economic objectives, in the development of fisheries management processes.

Objectives 1.1 to 1.10 address achieving outcomes for the 'Industry community', defined as fishers – be they commercial (including Indigenous commercial fisher), charter, or recreational. Objectives 2.1 to 2.7 address achieving outcomes for the 'Indigenous community' associated with fisheries through traditional 'Country'³ where fishing activities occur. Objectives 3.1 to 3.6 address achieving outcomes for members of the general public of communities (Local/regional community) associated with, or affected by, fishing activities – and, by extension, the benefits that may be achieved for the broader Australian public.

The social objectives for Indigenous communities were derived from: a single case study undertaken in South Australia (the Narungga Community of Point Pearce); reference to and discussions with Indigenous fisheries managers in the Northern Territory; the Torres Strait Regional Authority on Thursday Island; and some feedback from the FRDC Indigenous Reference Group (IRG). At this level of testing, the social objectives described cannot be assumed to be applicable to all Indigenous communities associated with managed fisheries across Australia. The indicators subsequently suggested (page 122) are theoretical at this time, and as a result the complexity or costs to collect the indicators are estimates only.

³ 'Country' refers to both sea country and country containing other aquatic resources that are the focus of fishing activities.

It must be noted that engaging with fishers or fishing-related communities that include Indigenous members will require going beyond the standard forms of engagement. This is a critical issue, as decisions regarding using any of the social objectives suggested for Indigenous communities must be based on meaningful and appropriate engagement, undertaken in a manner agreed to by those communities.

To find out more about the methodology used to develop and test all the objectives and indicators contained here, please refer to the Project Report for the work that gave rise to this Guide – the FRDC Project 2010/040 by Triantafillos et al. (2014) – available from the FRDC website: <http://frdc.com.au/research/final-reports/Pages/default.aspx>.

Industry (commercial, recreational and charter) community

The industry community includes all commercial, recreational and charter fishers, both Indigenous and non-Indigenous. It is important to ensure the social objectives described in this section are understood as applying to both Indigenous and non-Indigenous fishers. Given the historic lack of visibility of Indigenous fishers, we raise some important considerations for this type of fishers below.

Indigenous commercial fishing and the fishers taking part in it, are treated here equally with all others pursuing fishing as an income generating (commercial and charter sectors) or recreational activity. Specific Indigenous community needs are then explored in more detail in the Indigenous community objectives.

Note that recreational fishing by Indigenous people is sometimes considered to be a part of customary⁴ fishing activities. Here we describe it as recreational, acknowledging that there are important relationships and sometimes distinctions between the two.

While every endeavour should be made to treat all fishers equitably, Indigenous fishers may, due to historic means of engagement (or lack thereof), be external to the fisheries management processes. Consequently it is incumbent upon fisheries managers to:

- (i) identify if any Indigenous fishers are in the fishery under review;
- (ii) to explore current and best methods of engagement with Indigenous fishers; and
- (iii) identify methods to understand Indigenous fisher experience, views and perceptions; and where possible, integrate the benefits of Traditional Fisheries Knowledge.

⁴ Customary fishing can be broadly defined as the shared norms, rules, values or institutions accepted by particular Indigenous groups. This is different to cultural fishing (see p.34)

Objective 1.1-Provide flexible opportunities to ensure fishers can maintain or enhance their livelihood, within the constraints of ecological sustainability

Groups to which the objective applies: Commercial and charter fishers, downstream businesses (e.g. seafood processors); does not apply to recreational fishers.

Description & definitions: Fisheries managers need to ensure their management provides opportunity for commercial fishers, charter fishers and associated businesses to achieve a viable livelihood. While fisheries managers are not responsible for the livelihood outcomes of these fishers, as they have no control over factors such as markets or business skills of fishers, they are responsible for ensuring that management provides these businesses with the opportunity to achieve a livelihood. The term 'livelihood' means many things to different people, but in the context of commercial and charter fisheries, it refers to the ability to earn income from fishing activities. In general, to achieve a viable livelihood (from a management perspective) fishers need:

- Secure access to adequate fish stocks to enable a sustainable livelihood, typically with some kind of transferable property right attached. It is possible for managers to influence the nature and distribution of property rights attached to fish stocks and to influence how fishers can access them, through the use of input and output controls;
- Access to infrastructure needed to undertake fishing (addressed by Objective 1.9);
- Access to fishing and business management skills needed to make a positive return from fishing (something not typically influenced directly by fisheries managers); and
- Viable markets in which the return achieved from fishing activities (e.g. catching fish, tourism, etc.) is adequate to cover costs of business operation. Fisheries managers typically have little to no influence over these markets.

How do fisheries managers influence this objective? Fisheries managers principally influence this social objective through the overall fisheries management framework, through which fishers are given rights to operate in a given fishery. The degree to which these rights are transferable are a key element of providing flexible opportunities.

What constitutes success in meeting this objective? This objective will be successfully achieved if: (i) fisheries management enables secure access to fish stocks that is flexible to both deal with stock fluctuations, while also considering access requirements (e.g. through fishers having transferable property rights); and (ii) the regulatory framework does not unnecessarily reduce ability to successfully run a business. If these conditions are in place, livelihood outcomes will be facilitated, although actual outcomes achieved will still depend on the combination of a fisher's business management/ fishing skills and market trends. The objective supports the work of fisheries managers to create a framework of opportunities at the fleet or resource scale that fishers can capitalise on at the business level.

Challenges/issues: It is critical to distinguish between the factors a fisheries manager can influence relating to livelihood, and those they cannot. Therefore, indicators for this objective aim to identify whether the management framework provides a flexible commercial livelihood opportunity, rather than to measure livelihood outcomes, which are also influenced by multiple external non-fisheries factors, such as market prices.

Objective 1.2-Maximise cultural, recreational and lifestyle benefits (including health benefits) of fishing for those who participate in fishing activities, within the constraints of ecological sustainability

Groups to which the objective applies: All fishers (commercial, charter, recreational and customary Indigenous).

Description & definitions: In charter, recreational and some Indigenous fisheries, the principal goal of fisheries management is to ensure maintenance of cultural, recreational and/or lifestyle benefits arising from that fishing. For example, in recreational fisheries, the management objective may be to maximise the ability of fishers to achieve benefits such as relaxation, stimulation/challenge of fishing and being outdoors. In customary fishing it not only includes interacting with family and friends but also cultural education, all factors that ensure fishing provides lifestyle and recreation benefits. This objective also applies to commercial fishers for whom fishing is often as important culturally as it is a lifestyle choice.

How do fisheries managers influence this objective? A wide range of actions by fisheries managers may influence this objective. Examples that enable fishers to achieve cultural, recreational and lifestyle benefits include ensuring:

- Fishing has flexibility to take place during (or outside of-for commercial operators) culturally/socially significant periods, such as Easter or during school holidays when families can achieve important recreation benefits;
- Fishers can use particular fishing methods considered to have high cultural or recreational significance;
- Fishers have access to fish species with spiritual or cultural significance; and
- Regulations are clearly communicated and easy to comply with, ensuring fishers can achieve goals of relaxation, 'unwinding' etc., which are often important to recreational fishers.

What constitutes success in meeting this objective? As the benefits people wish to derive from fishing change over time, measuring progress against this objective requires a two-step process: (i) first, identifying the extent to which different benefits are important to or desired by fishers; and (ii) second, identifying the extent to which these benefits are being achieved. This two-step process ensures that fisheries managers are constantly aware of the changing nature of social preferences regarding fishing and that they can then manage their fisheries to try to maximise the benefits of most importance to fishers.

Challenges/issues: The cultural, recreational and lifestyle benefits considered important by fishers change over time. It is critical for fisheries managers to regularly evaluate which benefits are of greatest relevance to fishers, to ensure they are monitoring the most important and relevant issues.

Objective 1.3-Ensure appropriate mechanisms exist for fisher involvement in development of fisheries management advice

Groups to which the objective applies: All fishers (commercial, charter, recreational and customary Indigenous).

Description & definitions: Successful fisheries management requires some level of stakeholder participation in decision making. Different levels or types of participation are appropriate for different situations. For example, basic consultation (in which stakeholders are informed about, and asked to comment on, fishery management plans but have no further involvement in decision making) may be appropriate for some management decisions, while co-management (in which stakeholders actively participate in development of fishery management plans, and recommendations to the relevant Minister or other decision making authority) is appropriate in others.

How do fisheries managers influence this objective? Fisheries managers have considerable influence through the design and implementation of the processes by which fishers can be involved in fisheries management. This objective is affected by the time and resources available to fisheries managers to involve fishers in management processes.

What constitutes success in meeting this objective? Success is defined as ensuring fishers are able to be involved in development of management decisions at the level they desire. This means that, rather than assuming that all stakeholders wish to be fully engaged in decision making processes through co-management or other 'intensive' forms of involvement, it is more appropriate to identify the level of participation desired and the extent to which this desired level is being achieved. Success is therefore defined as providing the desired opportunity for input, as measured by the number and type of opportunities provided, and assessing whether all fishers have opportunity to be involved, if they wish. This can be demonstrated through documenting that opportunities have been provided for input, using a range of methods (e.g. written, oral, group, individual, etc.) that do not exclude any groups from having input if they so choose.

Challenges/issues: It is critical to distinguish between providing adequate opportunity for input and level of involvement. Success is defined based on whether opportunity for involvement exists, rather than whether that opportunity is taken up, as it is often unclear whether low/high participation rates in fisheries management processes indicate success. For instance, if fishers choose not to attend public meetings it may mean they are comfortable with existing fisheries management, rather than indicating that mechanisms are not in place for fisher involvement. Alternatively, if available mechanisms are not being taken up, it is important to examine the reasons why, as it is equally possible that fishers are not attending because they are so disenchanted with fisheries management, or perceive decision making to lack transparency, as it is that fishers are satisfied with management and don't feel the need to engage. This objective will only be comprehensively informed if a combination of the recommended indicators are employed to ensure that not only are mechanisms in place, but they are also appropriate to engage fishers of the fishery to provide necessary feedback and involvement.

Objective 1.4-Improve the ability of fishers to participate effectively in fisheries management advisory processes

Groups to which the objective applies: All fishers participating in management advisory processes, particularly members of fishing advisory and management committees.

Description & definitions: For co-management arrangements to be successful, fishers who participate on management and advisory committees need to be supported to participate effectively. This can be achieved through providing resources to participate (such as covering travel costs) and building skills that enable participants to engage constructively in these types of processes and to advocate on behalf of the groups they represent (e.g. providing adequate induction programs to ensure representatives understand processes and requirements and how to engage with them).

The types of resources and skills that can enable fishers to participate successfully in management advisory processes include:

- Adequate knowledge of scientific terminology and concepts to interpret data on fisheries ecological status. This can be supported through actions such as providing training to help fishers understand the scientific terms and concepts used, and seminars from scientists;
- Induction to the decision making processes and systems that advisory committees work within;
- Writing and communication skills, including skills in negotiation and conflict management; and
- Resources such as funding to cover travel costs, provision of childcare, or other mechanisms to enable people to commit time to participating in fisheries management.

How do fisheries managers influence this objective? Fisheries managers can invest in providing training opportunities or other methods for building the skills of fishers to participate. They can also ensure they identify appropriate meeting locations and times that fishers are able to attend without incurring substantial loss of income, and that do not conflict with family responsibilities such as child care.

What constitutes success in meeting this objective? This objective is met if stakeholders are able to effectively participate in fisheries management advisory processes, through having the capacity to understand and communicate about fisheries issues, and adequate resources and time to participate.

Challenges/issues: In some cases, fishers may be unwilling to identify that they find it difficult to understand the scientific concepts underpinning fisheries management or that they have limited reading and writing skills. It is essential for fisheries managers to be sensitive when assessing these knowledge and skill related issues, in order to ensure they build capacity of fishers to play a meaningful role in fisheries management processes.

Objective 1.5-Industry stakeholders have a high level of trust in the management of fisheries

Groups to which the objective applies: All fishers (commercial, charter, recreational and customary Indigenous).

Description & definitions: Fisheries managers manage fisheries resources on behalf of all fishers, as well as in the interests of the broader community. Given this role, it is important that the industry and other stakeholders on whose behalf fisheries are managed, trust fisheries managers to do so appropriately. Trust is defined here as the belief that fisheries managers are appropriately managing a given fishery to protect the resource in the interests of the broader public. It is useful to consider trust in both the process and the outcomes of fisheries management. For example, a person may believe the process used to make fisheries management decisions does not take into account the views of all stakeholders and thus have a low level of trust in the process of fisheries management. However, they may believe that despite this, fisheries management is achieving the outcomes considered important, indicating a trust in the outcomes of management. Alternatively fishers may feel the process used to make management decisions is appropriate and trustworthy, but that external factors, such as illegal fishing that depletes stocks, mean they have little trust in the ability of fisheries managers to achieve desired outcomes.

How do fisheries managers influence this objective? Through identifying how the process used to make management decisions is perceived by fishers and any critical issues of trust that need to be addressed. In this way, it is possible to assess if this objective is being achieved or what steps may be required to do so. For example, the non-achievement of this objective might identify the requirement for management to invest in greater two-way communication to ensure that management decisions are both fair and perceived to be so, and that fisheries management is perceived to be, as well as actually, contributing to achieving ecological sustainability of the fishery.

What constitutes success in meeting this objective? Stakeholders indicate a high level of trust in both the process of fisheries management, and the outcomes of this type of management.

Challenges/issues: Levels of trust can change rapidly, particularly when high profile management decisions are made. Regular measurement of levels of trust, enabling comparisons of changes over time, can assist in identifying when issues such as media coverage of specific management decisions are having a significant influence on trust. It is helpful to explore the reasons for changes in trust, in order to identify what aspects of fisheries management need to change in order to increase levels of trust.

Objective 1.6-Maximise stewardship of fisheries resources

Groups to which the objective applies: All fishers (commercial, charter, recreational and customary Indigenous).

Description & definitions: Achieving sustainable management of fisheries requires fishers to comply with regulations regarding fishing activities, and to be responsible for their fishing activities. A key objective of fisheries management is therefore to ensure fishers are aware of their social responsibilities and are motivated to comply with these. This type of awareness and sense of obligation is often referred to as ensuring fishers feel they are 'stewards' of the fishery's resources.

How do fisheries managers influence this objective? Through education and communication initiatives that build awareness of ecological issues and of the need for fisher commitment to the sustainability of all fishing activities.

What constitutes success in meeting this objective? This objective is met successfully if fishers have high levels of compliance with regulations regarding fishing activities and are motivated to encourage each other to comply.

Challenges/issues: Fishers can feel high levels of stewardship, but have differing views to fisheries managers about the actions required to achieve stewardship ideals.

Objective 1.7-Ensure transparent decision making processes by fisheries agencies

Groups to which the objective applies: All fishers (commercial, charter, recreational and customary Indigenous).

Description & definitions: Achieving trust in fisheries management from fishers and other stakeholders requires transparency when management decisions are made. Transparency means that decision making processes are clear and understandable (even if fishers don't agree with them), with the reasons for decisions made within that process being clearly based on evidence available to public scrutiny.

How do fisheries managers influence this objective? It is influenced through ensuring a clear and understandable process for decision making, as well as clear communication to fishers about that process, the basis of it and its outcomes.

What constitutes success in meeting this objective? If fishers understand how fisheries management decisions are made and feel that the reasoning behind decisions, as well as the process, are consistent and clearly communicated, this objective is met.

Challenges/issues: Fisheries managers do not typically have complete control over decision making, as in many jurisdictions the final decisions are made by the Minister with responsibility for fisheries. This limits the influence of fisheries managers on parts of the decision making process and may reduce perceptions of transparency amongst fishers, particularly if decisions made are not consistent with the outcomes of consultation processes with fisher or if they conflict with available data.

Objective 1.8-Ensure equitable treatment and access for fishers

Groups to which the objective applies: All fishers (commercial, charter, recreational and customary Indigenous).

Description & definitions: Ensuring equitable treatment of fishers is an objective considered of high priority across many Australian fisheries. Equity broadly refers to how fairly any one group of fishers feels they are treated relative to other fishers and relevant stakeholders. Equitable treatment does not mean equal treatment; it is entirely possible for resources to be distributed unequally, but for that distribution to be considered equitable given the differing needs of the groups to whom those resources were distributed. Equity can be measured in multiple dimensions, including the fairness of decision making processes.

For fishers to perceive the management decision-making process as 'fair', they must feel they were fairly treated as part of the processes used to make decisions. This does not, however, guarantee that the outcomes of this process will be viewed as fair. Thus, it is important to measure both the perceived fairness of the decision-making processes, and the perceived fairness of the outcomes of these processes. In this objective, four dimensions of equity relevant to fishers are included: (i) fair distribution of fisheries resources (e.g. access to fish stocks); (ii) fair access to fishing areas; (iii) the distribution of impacts of fisheries rules and regulations on different fishers; and (iii) the fairness of decision making processes.

How do fisheries managers influence this objective? Equitable treatment is influenced both through the design of decision making processes and the principles used to determine the outcomes of those processes. Fisheries managers should have clear principles for decision making, which incorporate those of equity. Consultation processes with fishers can be used to collaboratively agree on what principles should be followed to ensure equity. Agreement on such principles can, in turn, improve perceptions of fairness, as fishers have a clear understanding of both the process to be employed and the principles against which to evaluate the equity of decision making in a fishery, which they have themselves contributed to setting.

What constitutes success in meeting this objective? If a majority of all types of fishers perceive decisions as equitable, this objective has been met. This definition of success has two elements to it. First, it does not require that all fishers perceive decisions as equitable, reflecting that this is unlikely to be realised in practice. Second, it does require that perceptions of equity are similar across different groups, which indicates that no one group is being disadvantaged compared to others in the decision making processes.

Challenges/issues: Perceptions of equitable treatment vary from person to person. As a result, there is sometimes scepticism regarding whether monitoring fisher perceptions is the best approach to monitoring equity. However, these perceptions are ultimately what matter, as equity is a subjective concept. Fisheries managers in South Australia identified the results of indicators of this objective as highly useful when they were tested.

Objective 1.9-Ensure adequate access to infrastructure needed for successful operation of fishing activities, within the constraints of ecological sustainability

Groups to which the objective applies: All fishers (commercial, charter, recreational and customary Indigenous).

Description & definitions: Having access to appropriate infrastructure enables all fishers (commercial, charter, recreational and Indigenous) to achieve social benefits from fishing. This infrastructure varies in scope and nature, from fish cleaning tables to roads, wharfs, and loading/unloading facilities. Infrastructure used by all types of fishers includes roads to fishing areas, wharves/jetties, ice, fuel, bait and other supplies. Infrastructure used mostly by recreational fishers includes fish-cleaning tables, toilets at fishing locations, access to dams or other specific fishing areas such as rivers, fish-ways, fish attraction devices, and local accommodation. Infrastructure used mostly by commercial fishers includes seafood sorting and processing facilities, in addition to the infrastructure listed above.

There is a need to identify the types of infrastructure of most relevance in different jurisdictions, and the level of influence fisheries managers have over the provision, maintenance or access to this infrastructure.

How do fisheries managers influence this objective? Fisheries managers may not have direct influence over the condition of many types of fishing infrastructure. Where they do – for example, over artificial reefs, fish-ways, and access to some types of infrastructure – they can incorporate plans to ensure adequate provision of such infrastructure in their management processes. Where they do not have direct influence, it is useful to identify opportunities for fisheries managers to influence the agencies that maintain other types of infrastructure and incorporate strategies for doing so in fisheries management plans or other management processes. This means the fisheries manager ensures that the managers of the infrastructure understand the benefits it provides to fishers and are aware of the consequences for fishers of changes to that infrastructure.

What constitutes success in meeting this objective? Subject to identifying what, if any, gaps there are in the provision of infrastructure, success is defined as fisheries managers achieving fisher satisfaction with their access to different types of fishing infrastructure.

Challenges/issues: Fisheries managers often have little or no direct influence over the quality or provision of key types of fishing infrastructure. This may not be recognised or understood by fishers, who may not distinguish between the different government agencies with jurisdiction over various forms of infrastructure.

Objective 1.10-Ensure that fisheries information is available in a timely and publicly accessible manner

Groups to which the objective applies: All fishers (commercial, recreational, charter and customary Indigenous) and all other fisheries stakeholders.

Description & definitions: A key role of fisheries managers is providing information about the fisheries they manage to stakeholders with an interest in fisheries management (e.g. about issues such as the status of fish stocks and the impact fishing has on the environment). It is important to ensure this information is available in a timely manner and that it is readily accessible to the stakeholders who use it.

How do fisheries managers influence this objective? Fisheries managers influence this objective through their commissioning, analysis and communication of fisheries-related information and reports to fishers.

What constitutes success in meeting this objective? Success occurs if fisheries information: (i) covers the areas on which stakeholders agree information is needed, including biophysical, social and economic data; (ii) is collected and analysed using objective methods; (iii) is made available to stakeholders within a timeframe in which the information remains relevant and has most usefulness; and (iv) is made readily accessible to fishers and stakeholders with an interest in fisheries management.

Challenges/issues: Some types of information, such as commercial information about catch value, are highly sensitive. Although it is important to ensure adequate data are available to fishers and the stakeholders with an interest in fisheries management, it is important that the release of this type of information does not cause inappropriate harm to fishers. Some fishers and stakeholders with an interest in fisheries management may have literacy challenges, while others may have online access issues (such as those found in some Indigenous communities). The latter presents difficulties in reliably accessing web based information, which is a distribution method often taken for granted by many government agencies as accessible to all.

Indigenous community

This section describes objectives designed for the Indigenous community. For the purposes of this section, and others in this Guide, the terms cultural and customary are defined as follows:

- (a) **Cultural:** is seen as 'the total ways of living built up by a group of human beings, which is passed from one generation to the next', given to them by reason of their birth⁵; and
- (b) **Customary:** can be broadly defined as the shared norms, rules, values or institutions accepted by particular Indigenous groups⁶.

LIMITATIONS: the following objectives for the Indigenous community have not been subjected to the same examination and testing that the preceding and following objectives and indicators for the industry and local/regional ESD communities have.

The following social objectives for the Indigenous community and indicators in Section 2 are included here to both highlight the importance of inclusion of Indigenous community wellbeing in social objectives for Australian fisheries management and to provide a framework to commence and build upon work in this area. However, they have only been theoretically tested through extensive consultation with one community (the Narrunga Community from Point Pearce in South Australia). Data was not collected for the indicators and benchmarks identified are purely theoretical and have not been set based on any case study data.

These social objectives and indicators were however, originally developed and refined from data collected from the broad Australian literature on Indigenous objectives for indicators of wellbeing (e.g. Trewin and Madden 2005) and added to from the marine resource use perspective through international work undertaken extensively by the UNESCO Food and Agricultural Organisation in 2006 (Stamatopoulou and Raj 2006) amongst others (see the FRDC Project Report 2010/040 by Triantafillos et al. 2014 for full details).

The project team recommends that, for the purposes of implementation, the following objectives (and indicators in Section 2) be regarded as suggestions and a starting point to be trialled with Indigenous communities associated with managed fisheries.

⁵ <http://australia.gov.au/about-australia/australian-story/austn-indigenous-cultural-heritage>; (accessed on 29/4/13)

⁶ <http://www.alrc.gov.au/publications/7.%20The%20Scope%20of%20the%20Report/definition-aboriginal-customary-laws>; (accessed 29/4/13)

Objective 2.1-Fisheries management actions support the maintenance of cultural and heritage values related to fishing activities in Aboriginal and Torres Strait Islander communities

Description & definitions: Fishing and related aquatic activities are often critical to the maintenance of cultural and heritage values for Aboriginal and Torres Strait Islander communities. Cultural and heritage values are not ‘things’, but are better considered as processes, that are maintained through the active engagement of Aboriginal and Torres Strait Islander people in fishing and related activities. Fisheries management should actively aim to support the maintenance of these cultural and heritage values.

How do fisheries managers influence this objective? Through access arrangements, closures, or other restrictions, fisheries management affects the ability of Aboriginal and Torres Strait Islanders to undertake the activities necessary to maintain cultural and heritage values related to fishing and aquatic activities. This can occur in multiple ways that will vary depending on the communities and fisheries involved. It is critical for fisheries managers to maintain ongoing consultation with Aboriginal and Torres Strait Islander communities to ensure fisheries management is aware of the implications of fisheries management decisions for these communities.

What constitutes success in meeting this objective? Fisheries managers need to have a clear and transparent process in place for identifying cultural and heritage values for Aboriginal and Torres Strait Islander communities related to fishing activities, as well as for ensuring the maintenance of these values, and monitoring whether these values are being maintained.

Challenges/issues: It is critical to ensure that the full range of cultural and heritage values are understood, and to re-identify these as they can change over time (as they do in non-Indigenous communities). Aboriginal and Torres Strait Islander communities are diverse, and identifying the full range of cultural and heritage values may require extensive consultation.

Objective 2.2-Ensure access to 'Country'⁷ to enable continuation of cultural fishing activities, respecting the rights of Aboriginal and Torres Strait Islander peoples to these resources

Description & definitions: It is essential to respect the rights of Indigenous people through ensuring access to relevant resources, such as the aquatic resources of 'Country' for traditional activities/subsistence use and to maintain the cultural and heritage values for Aboriginal and Torres Strait Islander communities. Fisheries managers have a range of direct actions and influence available to them, from negotiating Indigenous Land Use Agreements to the designation of zones for particular traditional/cultural uses. Providing access for Indigenous use may involve closing access to others and the presence of Native Title claims may affect levels of control. In addition, fisheries managers will only have control over some types of access related to fisheries, not over all land, sea and water resource access issues. This objective is aimed at ensuring that management decisions do not deny access by the Indigenous community to the resources of their 'Country', that precludes the use of fishing resources to undertake cultural activities as defined in cultural and customary take.

How do fisheries managers influence this objective? Management decisions may affect the ability of Aboriginal and Torres Strait Islanders to access 'Country' to maintain cultural activities relating to fishing. This can occur in multiple ways that will vary depending on the communities and fisheries involved. Communication is paramount and it is critical for fisheries managers to maintain ongoing consultation with Indigenous communities to ensure that both themselves as managers, and the communities are aware of the implications of management decisions.

What constitutes success in meeting this objective? In general, to achieve a provision of access to 'Country', fisheries managers must have considered the following elements:

- Management has identified the cultural and customary aquatic resources of 'Country' (e.g. they're described in fisheries management plans), where possible; and
- Management does not exclude use of 'Country' aquatic resources for cultural take by Indigenous community members.

Fisheries managers should communicate these provisions to other relevant government (State and Commonwealth) for consideration and inclusion in marine environmental policy.

Challenges/issues: It is critical to ensure that the full range of cultural associations with 'Country' be identified and understood by fisheries managers. These will need updating, as they can change over time. Indigenous communities are diverse and identifying the full range of values may require extensive consultation. Additionally, factors such as the identification of 'Country' in geographic terms can be difficult as these may be designated by elements other than fixed geographical points. These need to be identified as clearly as possible and communicated to fisheries management agencies and local fisheries managers. Other influencing elements of this objective include identifying and agreeing in collaboration with the community if allocations for cultural and customary purposes is appropriate and monitoring the level of take.

⁷ 'Country' relates to both sea and inland waters – not only marine resources.

Objective 2.3-Provide opportunities for Aboriginal and Torres Strait Islander communities to participate in fisheries management decision-making processes

Description & definitions: As with all other groups, it is essential for fisheries managers to ensure appropriate consultation and engagement with Indigenous people, and/or that there is provision of opportunities to have their views represented in decision making processes. This objective is aimed at ensuring Aboriginal and Torres Strait Islander communities not only have the opportunity to have their views or concerns heard in an appropriate forum, but also the opportunity to be aware of, and participate in, the decision-making processes, if desired. This will facilitate the development of more open and collaborative relationships, increasing opportunities for making concerns known regarding community access or impacts outside the meeting environment. In turn, this is reasonably expected to increase Indigenous community connection with their resources, empowerment, and involvement with governance and self-governance processes, and to decrease conflict over, and the time taken to manage fisheries resources.

How do fisheries managers influence this objective? It is broadly posed that representatives from Aboriginal and Torres Strait Islander communities associated with aquatic resources be invited to be active participants in advisory bodies (e.g. management advisory committees) for fisheries management decision making processes. Participation can only be effective where it is on the basis of open, honest and respectful two way communications between all parties. Consequently, in order to achieve this objective there may be differing levels of relationship building to be undertaken prior to this being able to be achieved.

What constitutes success in meeting this objective? These are suggested to include:

- Identified representative of 'Country' or the community associated with the aquatic resource;
- Increased levels of participation in decision making processes (meeting attendance/ roles undertaken etc); and
- Signed off satisfaction with the processes by the associated communities.

Challenges/issues: Potential conflicts of interest may occur if the identified representative may also have vested fishing interests. In such cases, the dual responsibility must be clarified and clearly understood by all parties, as these objectives are focussed on the well-being of the overall community, not just Indigenous fishing activity. Additionally, it should be recognised that although fisheries managers may have authority in regard to managing the aquatic resource, they do not necessarily have the skills or experience in regard to Indigenous community engagement, liaison and relationship development. If the fisheries managers don't have the skills necessary to effectively engage with the Indigenous community, they should include someone who can, in the decision making process.

Objective 2.4-Optimise access to income earning opportunities for Aboriginal and Torres Strait Islander community members related to the management of fisheries

Description & definitions: This objective addresses the preference/requirement (in the case of some states, a legislated requirement) to ensure that Indigenous communities have the opportunity to both benefit from, and contribute to, fisheries management activities, in areas other than commercial, cultural or customary fishing. These areas may include contracts tendered for coastal or fish surveys, or where fisheries managers may work with Indigenous communities to facilitate development of new enterprises based on use of fisheries resources. This does not involve the continuation of cultural and customary activities, but can involve development of new ways of interacting with and using fisheries resources that contribute positively to the income opportunities of Indigenous communities.

How do fisheries managers influence this objective? Fisheries managers can identify areas where the skills of Aboriginal and Torres Strait Islanders may be able to be utilised in the processes of fisheries management. Alternatively, they may identify areas where there is an opportunity in the operations of the fishery to assist and facilitate in developing the skills and, thereby, capacity of community members. This can occur in multiple ways that will vary depending on the communities and fisheries involved. It is critical for fisheries managers to maintain ongoing consultation with Aboriginal and Torres Strait Islander communities to ensure they are aware of the implications of fisheries management decisions, and the opportunities that may be presented by them, for these communities.

What constitutes success in meeting this objective? Fisheries managers need to have a clear process in place for identifying available skills and utilising them as far as possible and practicable in the areas where management have decision making powers. Success in meeting this objective occurs where Indigenous communities have been contracted or employed by fisheries management agencies, or other fishery related organisation, to carry out some aspect of fishery management.

Challenges/issues: While fisheries management agencies may encourage Indigenous participation in fisheries management activities, fisheries managers cannot: (i) force community members to become engaged; or (ii) undertake actions that contravene the applicable agency's guidelines for competitive tenders.

Fisheries managers have a level of control, but not necessarily adequate skills and resources in the area of community engagement.

Objective 2.5-Make fisheries collected data available in a timely and publicly accessible manner

Description & definitions: This objective addresses (as with all groups in the social objectives/well-being component of ESD) the need for information about fisheries management processes to be freely available and accessible to relevant groups.

How do fisheries managers influence this objective? Fisheries managers can ensure that where reports or research data has been generated and approved for public release, that it is made available on the public record as soon as it is possible and reasonable to do so. For fishery information relative to Indigenous community groups, this entails identifying and addressing specific literacy or technology access issues that may preclude or limit Indigenous community member access to information that is readily available to other communities. It is incumbent upon fisheries managers to work with appropriate agencies to identify alternative delivery methods appropriate to the needs of the Indigenous as well as other communities associated with the fishery.

What constitutes success in meeting this objective? Fisheries managers need to have a clear process in place for identifying information dissemination needs and processes, along with researched and documented information sharing preferences for Indigenous communities that are associated with the fishery resource and fisheries management processes.

Challenges/issues: The key challenges of this objective are the issues of: (i) identifying any literacy constraints and alternative delivery methods; and (ii) consistency of levels of access to technology that may commonly be utilised to deliver or make information available to the public.

Objective 2.6-Aboriginal and Torres Strait Islander communities associated with 'Country' aquatic resources have a high level of trust in the management of fisheries

Description & definitions: This objective seeks to address issues of trust, which is recognised as being earned on an ongoing basis, as against being bought or generated by one specific activity at a single point of time. This objective is seeking to generate improved relationships throughout the entire fisheries management planning and implementation cycle.

How do fisheries managers influence this objective? Fisheries managers can positively influence the achievement of this objective through open, honest (transparent) and constructive interactions that seek to continuously improve engagement processes and information sharing. To be effective, these activities must be undertaken in an atmosphere of respect for the sovereignty that Indigenous people identify with in regard to natural resources.

What constitutes success in meeting this objective? Fisheries managers develop relationships with Indigenous communities that are not only open and sharing but encourage and support the integration of traditional knowledge into western scientific and management approaches. This would be achieved through ensuring meaningful participation of Indigenous community representatives in fisheries management processes and meaningful collaboration between fisheries managers, researcher and Indigenous peoples in regard to engagement with Traditional Fisheries Knowledge. Note that meaningful does not necessarily mean ever-increasing amounts of engagement, which can create undue burden for those involved, but carefully designed engagement that genuinely meets the rights, desires and needs of Indigenous communities.

Challenges/issues: The key challenge for this objective is likely to be the challenge of achieving cultural shifts in interaction between parties that may well be generational in nature. It should not be seen as a short term objective but rather a long term one, likely to achieve incremental gains in the shorter term.

Objective 2.7-Ensure collaborative inputs by Aboriginal and Torres Strait Islander communities, regional and industry sectors on the benefits each sector offers to fisheries management

Description & definitions: This objective seeks to increase dialogue, respect and collaboration between Indigenous communities, the regional communities in which they are situated and the fishing industry, with a view to building a mutually beneficial relationship focussed on the stewardship of the fisheries resource.

How do fisheries managers influence this objective? Fisheries managers can positively influence the achievement of this objective through open, honest, and positive interactions that seek to continuously identify and improve engagement opportunities and information sharing between these parties and in regard to fisheries stewardship.

What constitutes success in meeting this objective? Aboriginal and Torres Strait Islander community groups participate along with community, management and scientific agencies in fisheries ESD education processes to both build Indigenous capability and participation, and to engage the broader community with Indigenous fisheries knowledge and culture.

Challenges/issues: The key challenge for this objective is likely to be the challenge of achieving cultural shifts in interaction between parties that may well be generational in nature. It should not be seen as a short term objective but rather a long term one, likely to achieve incremental gains in the shorter term.

Local/regional community

The objectives below are designed to apply to the general public living in communities associated with fishing, and more broadly to the general Australian public as a whole.

Objective 3.1-Positively influence fisheries related socio-economic benefits for regional communities, within the constraints of ecological sustainability

Description & definitions: The legislation many jurisdictions operate under specifies that fisheries management should aim to maximise benefits for communities, therefore, it is important for fisheries managers to identify how fisheries-related activities are benefiting communities. Measuring performance against this objective requires identifying the types of social and economic benefits to be considered. The benefits most commonly identified are: (i) employment opportunities resulting from fishing activities, both directly and indirectly; and (ii) presence of population who reside in a region due to their participation in the industry, and thus contribute to local services and community activities. What is regarded as a 'benefit' to local/regional communities will vary from situation to situation. A positive benefit in one community may be regarded as a negative outcome in another. For example, an increase in fishing activity and therefore employment may be regarded as good in one community, but in another, it may be in conflict with other coastal activities such as coastal development and tourism. This high level objective can therefore cover a diversity of situations.

How do fisheries managers influence this objective? Fisheries managers influence this objective through affecting when and how fishers can interact with the communities they live in. These effects can be a result of the way access rights are allocated or the level of management and other participation fees levied on fishers. Management decisions may affect the contribution of fishers to regional economies by changing their fishing activities, their free time, their disposable income, or influencing other aspects of their lives.

What constitutes success in meeting this objective? Decision-making processes clearly identify the potential effects of fisheries management on the ability of fishers to economically contribute directly to their local/regional community. For instance, fisheries management plans may consider possible strategies to reduce impacts on disposable income of fishers or to encourage expenditure and employment in local/regional communities, if this is considered appropriate. This may be as simple as minimising increases in access and licence fees or a more complex requirement in regard to processing locations for catch relative to landing sites.

Challenges/issues: Fisheries managers need to consider all the effects of management decisions to ensure minimal negative economic impact on fishers and to maximise their ability to contribute to regional economies. However, in some cases, the ecological imperative to protect stocks may be deemed to outweigh the risk of financial detriment to a local/regional community.

Objective 3.2-Facilitate and support the cohesion and connectedness of fishers with their regional communities through fisheries management

Description & definitions: Fisheries management should support local/regional communities through ensuring fishers have an opportunity to contribute to, and participate in, activities of the broader community and therefore to contribute to social capital in their communities. This, in turn, may also build support for fisheries management. Fisheries managers need to ensure their management decisions recognise particular community sensitivities and respond to these, such as changing access arrangements for particular holidays or festivals to allow fisher participation. Opening and closing time of fisheries that coincide with peak holiday and family interaction times can benefit or detract from community cohesion and fisher connectedness with their community. The Queensland Prawn Trawl Fishery, for example, closes over Christmas to enable those employed in the fishery to spend time with their families and communities.

How do fisheries managers influence this objective? Fisheries managers influence this objective through affecting when and how fishers can interact with the communities they live in. This influence can be a result of the way access is structured, property rights distributed and fisheries seasons timed, which has effects on distances travelled by fishers and time spent time away from families and communities. The timing and location of consultation processes may also affect the ability of fishers to participate in either management processes or family and community activities. For instance, holding meetings in communities at the same time as a school event may create a conflict for the fisher and erode an opportunity to build community cohesion if they participate in the fishery management activity.

What constitutes success in meeting this objective? Fisheries management processes clearly consider the ability of fishers to be connected with their community, and relevant documents include strategies to ensure fishers are able to take part in their communities, while still also being involved in fisheries management decision making process as appropriate. This may be as simple as specifying that fisheries consultation processes should take place at times that do not clash with local community events that fishers may wish to take part in, or as complex as closing a fishery at particular times of year, as in the examples given above.

Challenges/issues: Fisheries managers need to understand the key activities and events in the communities the fishery is linked to, in order to be able to consider the potential effects of management decisions and to ensure fishers can maintain connections to their community. In some cases, fishers may feel that changing management to improve community connectedness would have negative impacts that outweigh the community benefit. For instance, when considering closing a fishery during a culturally important holiday, fisheries managers need to weigh up the potential loss of income to fishers with the community benefits achieved.

Objective 3.3-Maximise community trust in fisheries agencies to manage fisheries

Description & definitions: Fisheries managers manage the fisheries resources on behalf of the broader community, as well as the fishing industry. Given this role, it is important that the broader community on whose behalf fisheries are managed, trust managers to manage the fisheries appropriately. Trust here is defined as the belief that fisheries managers are appropriately managing a given fishery to protect the resource in the interests of the broader public. It is useful to consider trust in both the process and the outcomes of fisheries management. For example, a person may believe the process used to make management decisions does not take into account the views of all stakeholders and thus have a low level of trust in the process of fisheries management agencies, but may believe the fisheries manager is achieving the outcomes considered important, thus indicating a trust in the outcomes of management. Alternatively, they may feel the processes used to make management decisions are appropriate and trustworthy, but that external factors, such as illegal fishing that depletes stocks, mean they have little trust in the ability of fisheries managers to achieve desired outcomes.

How do fisheries managers influence this objective? Through identifying how the processes used to make management decisions are perceived by the local/regional communities and any critical issues of trust that need to be addressed are identified. This might, for example, identify that fisheries managers need to better communicate how they ensure different groups are treated equitably in their decision making processes or how their fishery management plan is contributing to achieving ecological, economic and social sustainability of the fishery.

What constitutes success in meeting this objective? Stakeholders indicate a high level of trust in the both the processes of fisheries management, and the outcomes of this management.

Challenges/issues: Levels of trust can change rapidly, particularly when high profile management decisions are made. Regular measurement of levels of trust, enabling comparisons of changes over time, can assist in identifying when issues such as media coverage of specific management decisions are having a significant influence on trust. It is helpful to explore the reasons for changes in trust, in order to identify what aspects of fisheries management need to be addressed to increase levels of trust.

Objective 3.4-Ensure fisheries management contributes to the maintenance of cultural and heritage values related to fishing activities

Description & definitions: Fishing is associated with a number of cultural and heritage values in Australia. The specific nature of these values will vary from place to place. Fisheries managers need to ensure their management processes respect and, where possible, contribute to the maintenance of these values. Even where this is not an explicit outcome to be achieved that is documented (e.g. in fisheries management plans), it is an important knowledge objective for informing and facilitating how fisheries resources should be managed. It is essential for fisheries managers to understand and monitor cultural and heritage values associated with fishing over time, as consideration of this affects broader community acceptance and appreciation of industry activities.

How do fisheries managers influence this objective? Fisheries managers can influence cultural and heritage values in a number of ways. An example is the designation of cultural/heritage areas in aquatic environments that has occurred in locations such as the Great Barrier Reef Marine Protected Area. Cultural and heritage values are also addressed through actions such as declaration of traditional fishing grounds (occurring in New South Wales), protection of Indigenous fish traps and specifying the types of fishing practice allowed based on culture/heritage – e.g. only fly fishing is allowed when trout fishing in some New South Wales rivers. Finally, fisheries managers may specifically manage a fishery to ensure availability of stocks for cultural purposes. Some fisheries, such as the turtle/dugong fishery, are managed principally in this way.

What constitutes success in meeting this objective? This objective is successfully met if cultural and heritage values are clearly identified and understood by fisheries managers and the ways in which fisheries management impacts these values is included in structured documents such as fishery management plans, together with strategies for maintaining these values, or minimising negative effects.

Challenges/issues: The full identification of cultural and heritage values is often challenging and may require wide consultation with local groups. Fisheries managers should ensure they take advantage of existing local expertise in these areas by consulting with experts on these matters such as local government staff or tourism authorities.

Objective 3.5-Facilitate capacity building (through skills and knowledge development) for community members to enhance stewardship of fisheries resources

Description & definitions: To help in achieving sustainability, fisheries managers often need to invest in the development of the skills and knowledge of key stakeholders. The development of these skills gives these stakeholders the capacity to effectively enhance the stewardship of fisheries resources. Fisheries managers may not be directly involved in delivering this capacity building, but have a role in facilitating it, and ensuring it delivers appropriate information.

How do fisheries managers influence this objective? Through activities such as giving talks to community groups or schools, providing information sessions, holding public meetings and having stalls at community events such as boat shows. These activities should be underpinned by strategic consideration of the types of skills and knowledge fisheries managers wish to build in the local/regional communities.

What constitutes success in meeting this objective? Having a clear plan for the types of skills and knowledge needed by community members to enhance stewardship of fisheries resources and the methods by which fisheries managers will contribute to the building of these skills and knowledge.

Challenges/issues: Fisheries managers often have limited resources to invest in broader capacity building programs that go beyond fishers to the broader community.

Objective 3.6-Ensure that fisheries information is available in a timely and publicly accessible manner[^]

Description & definitions: A key role of fisheries managers is providing information about fisheries to stakeholders with an interest in fisheries management, e.g. about issues such as the status of fish stocks and the impact fishing has on the environment, amongst other things. It is important to ensure this information is available in a timely manner and that it is readily accessible to the stakeholders who use it.

How do fisheries managers influence this objective? Fisheries managers influence this objective through their commissioning, analysis and communication of fisheries-related information and reports to local communities.

What constitutes success in meeting this objective? Success occurs if fisheries information: (i) covers the areas on which stakeholders agree information is needed, including biophysical, social and economic data; (ii) is collected and analysed using objective methods; (iii) is made available to stakeholders within a timeframe in which the information remains relevant and has most usefulness; and (iv) is made readily accessible to stakeholders.

Challenges/issues: Some types of information, such as commercial information about catch value, are highly sensitive. Although it is important to ensure adequate data are available to fishers and stakeholders with an interest in fisheries management, it is important that the release of this type of information does not cause inappropriate harm to fishers. Some stakeholders have literacy challenges while others may have online access issues (communities). The latter presents difficulties in reliably accessing web based information, which is a distribution method often taken for granted by many government agencies as accessible to all.

[^]This objective is essentially the same as that used for Objective 1.10 with the exception that it is directed more to the broader community, i.e. non-fishing stakeholders that are affected directly or indirectly by fisheries management.

2. SOCIAL INDICATORS - DETAILED DESCRIPTION

The indicator(s) for the preceding objectives are described in turn on the following pages. The basic information needed to employ the indicator is provided, including:

- The social objective this indicator addresses;
- What the indicator is and why it is measured;
- An overview on how to collect data and the cost, complexity and independence of the indicator;
- How to measure the indicator;
- How to analyse and interpret the indicator, using a ‘traffic light’ system in which:
 - **Green** means the indicator is being met and no further management action is needed (other than existing management actions in place to ensure the indicator is continuously achieved);
 - **Orange** means the indicator is ‘borderline’ and management action is needed to improve performance;
 - **Red** means the indicator is not being met, and urgent management action is needed to address the issue;
- Key considerations to be aware of when measuring the indicator, including any difficulties with analysis and interpretation;
- Decision triggers and management responses; and
- Where possible, examples of the indicator⁸, showing how fisheries performed according to data collected in 2012, utilising the traffic light system.

The thresholds set in the ‘traffic light’ system (i.e. in the red, orange and green boxes) throughout this section were based on data collected in case studies undertaken for the development of this Guide (see the FRDC Project 2010/040 report by Triantafillos et al. 2014 for methodological details), a Bayesian Belief Network (BBN) modelling process (see Pascoe et al. 2013) and presentation and discussion of indicators with: (i) a South Australian Indigenous community; (ii) fisheries managers in both South Australia and Queensland; and (iii) attendees at the National Recreational Fishing Conference in August 2012.

The indicators for Indigenous communities have been developed on the basis of one case study (the Narungga Community of Point Pearce in South Australia) and consultation with Northern Territory fisheries managers, the Torres Strait Regional Authority and some feedback from the FRDC Indigenous Reference Group. As noted elsewhere, they have not been tested through data collection and should be considered a framework that supports further engagement and development in partnership with Indigenous communities.

⁸ These are taken from case studies in commercial and recreational fisheries in South Australia and some limited cases in Queensland, as part of the FRDC Project 2010/040 (Triantafillos et al. 2014). Consequently examples are not available for Indigenous communities or local/regional communities.

Similarly, the indicators for the 'local/regional community' objectives have not been fully extrapolated in terms of case study examples for the objectives identified, due to project cost constraints. However, they have been developed through extensive consultation with a range of stakeholders and a review of other work in this area (refer to the methods section of the FRDC Project 2010/040 report by Triantafillos et al. 2014 on developing these objectives and indicators).

Although based on the best evidence available and the combined expertise of the project team and various groups consulted during the project, given the few case studies undertaken, the thresholds identified should be considered as good guidelines only. If the thresholds indicated do not apply to the specific fishery under consideration, consider altering them to better suit the circumstances of that fishery.

With all the indicators, a summary box is included that describes the source of the data, measurement cost and complexity and the level of indicator independence. A higher level of independence is a positive element in an indicator, as it means the data collected are reliable and less subject to bias than other forms of potential measurement; and that the indicator reliably provides information on whether the overall objective has been achieved independent of other indicators.

Industry community

Indicator 1.1.1-Provision of livelihood opportunities: costs of entry and access to fisheries *

**This indicator applies to commercial and charter fishers only.*

How do you collect data:	Measurement cost:	Measurement complexity:	Indicator independence:
Management agency	Low	Low	High

Social objective this indicator addresses: Objective 1.1 - Provide flexible opportunities to ensure fishers can maintain or enhance their livelihood, within the constraints of ecological sustainability.

What is the indicator? This indicator identifies whether fisheries management is providing livelihood opportunities and whether fishers are able to access these opportunities, through measuring change in the cost of entering a fishery, and maintaining access to a fishery.

Why is it measured? It is important to identify whether it is getting easier or harder for fishers to access a livelihood from commercial fishing in a given fishery.

How is it measured? This indicator is measured using data from the fisheries management agency and is a low-cost indicator requiring relatively little resourcing to monitor over time:

- (i) Identifying how the costs of gaining entry to the fishery (e.g. through purchasing a licence, or quota, or both) have changed relative to returns over time. This can be tracked at intervals of one year or more.
- (ii) Identifying how the costs of maintaining access to the fishery (i.e. fees paid on a regular basis to fisheries management agencies), have changed over time relative to returns. This can be tracked at intervals of one year or more; often an interval of 3-5 years is best to account for short term fluctuations in returns.

How is it analysed and interpreted? The costs of entry and maintenance of access are critical influences on the ability of fishers to gain a livelihood from fishing. If these costs are increasing at a higher rate than returns from the fishery, this indicates that access to livelihood opportunities is decreasing, and should be flagged as an area of concern, potentially requiring action by fisheries managers. If costs of entry and maintenance of access are staying steady, or decreasing over time, management action is not needed.

This indicator is being met if: costs of entry and of maintaining access are falling or remaining stable over time relative to returns from the fishery	There is need to consider further management action if: costs of entry and of maintaining access have risen relative to returns from the fishery, but during only one period (i.e. there is no ongoing pattern of increasing costs)	There is an urgent need for management action if: costs of entry and of maintaining access have risen relative to returns from the fishery for more than one year
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Key considerations: This indicator uses independent and verifiable data, meaning it has a high level of independence. As the objective was ranked highly important by Australian fisheries managers and the indicator is relatively simple to monitor and low cost to administer, it is a useful indicator to measure.

Decision triggers and management responses: If costs of entry and maintenance of access increase at a higher rate than returns from the fishery over *two consecutive periods* – indicating they are not a result of temporary declines in market prices that will correct itself without intervention – there is a need for management action. Where management action is needed, fisheries managers should:

- Identify why livelihood opportunity is decreasing;
- Identify if/how fisheries management is contributing to these factors; and
- Identify actions to address the loss of livelihood opportunity and if they are within the control of fisheries management.

Examples

Table 5 gives a worked example of the steps of collecting data, analysing it and identifying whether the indicator is green, orange or red for the East Coast Trawl Fishery of Queensland and the Marine Scalefish, Rock Lobster and Abalone fisheries of South Australia.

Table 5 Step by step guide to measuring Indicator 1.1.1, using data from the East Coast Trawl Fishery of Queensland and the Marine Scalefish, Rock Lobster and Abalone fisheries of South Australia.

<p>Ask these questions of fisheries managers:</p>	<p>Think about how fishers are able to gain entry to the fishery (e.g. buying a licence, etc). Q. ‘How have the costs of entry changed over the last 3 years relative to returns?’ <input type="checkbox"/> Costs of entry to the fishery have increased more than average return to fishers <input type="checkbox"/> Costs of entry have not increased more than average returns <input type="checkbox"/> Costs of entry and returns have both changed at about the same rate <input type="checkbox"/> Unsure/don’t know</p> <p>Now, think about the methods by which fishers maintain access to the fishery (e.g. through an annual fee). Q. ‘How have costs of maintaining access changed over the last 3 years relative to returns?’ <input type="checkbox"/> Costs of maintaining access have increased more than average return to fishers <input type="checkbox"/> Costs of maintaining access have not increased more than average returns <input type="checkbox"/> Costs of maintaining access and returns have both changed at about the same rate <input type="checkbox"/> Unsure</p> <p>Notes: It is recommended to ask about a 3 year timeframe as this helps uncover long-term trends rather than short-term fluctuations. This indicator can still be measured yearly, as each year people can answer based on the previous 3 years.</p>																	
<p>Analyse the basic data:</p>	<table border="1"> <thead> <tr> <th>Fishery</th> <th>How have costs of entry changed relative to 2009-2012 returns?</th> <th>How have costs of maintaining access to the fishery changed relative to 2009-2012 returns?</th> </tr> </thead> <tbody> <tr> <td>Marine Scalefish (SA)</td> <td>Increased</td> <td>Increased</td> </tr> <tr> <td>East Coast Trawl (QLD)</td> <td>Increased</td> <td>Increased</td> </tr> <tr> <td>Rock Lobster (SA)</td> <td>Increased</td> <td>Stayed about the same</td> </tr> <tr> <td>Abalone (SA)</td> <td>Stayed about the same</td> <td>Stayed about the same</td> </tr> </tbody> </table>	Fishery	How have costs of entry changed relative to 2009-2012 returns?	How have costs of maintaining access to the fishery changed relative to 2009-2012 returns?	Marine Scalefish (SA)	Increased	Increased	East Coast Trawl (QLD)	Increased	Increased	Rock Lobster (SA)	Increased	Stayed about the same	Abalone (SA)	Stayed about the same	Stayed about the same		
Fishery	How have costs of entry changed relative to 2009-2012 returns?	How have costs of maintaining access to the fishery changed relative to 2009-2012 returns?																
Marine Scalefish (SA)	Increased	Increased																
East Coast Trawl (QLD)	Increased	Increased																
Rock Lobster (SA)	Increased	Stayed about the same																
Abalone (SA)	Stayed about the same	Stayed about the same																
<p>Identify if indicator is green, orange or red</p>	<p>SA Abalone Fishery</p>	<p>SA Marine Scalefish Fishery QLD East Coast Trawl Fishery SA Rock Lobster Fishery</p>	<p>None are red as increases have not yet been recorded over more than one period</p>															

Indicator 1.1.2-Perception of flexibility: fisher belief that management processes are flexible enough to allow them to adapt to changing conditions

How do you collect data: Fisher survey	Measurement cost: Low	Measurement complexity: Low	Indicator independence: High
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Social objective this indicator addresses: Objective 1.1 - Provide flexible opportunities to ensure fishers can maintain or enhance their livelihood, within the constraints of ecological sustainability.

What is the indicator? This indicator identifies whether fishers believe management processes are flexible enough to let them adapt their fishing to changing conditions.

Why is it measured? It is important to identify the views of fishers on whether management processes enable adequate flexibility. Flexibility is critical to ensuring an ongoing viable livelihood, and in the case of recreational fishing, enjoyment of the resource. Management processes that enable fishers to adapt to changes in the external environment, such as markets, weather, etc., will support livelihood and resource enjoyment.

How is it measured? This indicator is measured through a survey of fishers, with fishers asked whether they agree or disagree with the statement '*Fisheries management is flexible enough to allow fishers to adapt to changing conditions*'.

How is it analysed and interpreted?

This indicator is being met if: the proportion of fishers who think fisheries management is flexible is 50% or greater and this has remained stable or is increasing over time.	There is need to consider further management action if: the proportion of fishers who think fisheries management is flexible is <50% but is increasing over time. This means the indicator is moving positively, but further monitoring or management action is required.	There is an urgent need for management action if: the proportion of fishers who think fisheries management is flexible is decreasing over time, or is <50% and stable or decreasing. This means the indicator is not being met and management action is urgently required.
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Key considerations: This indicator is based on fisher perception or opinion, but is considered to have a high level of independence as it provides a 'check' for other Objective 1.1 indicators that are based largely on data produced by fisheries managers. It is important to ensure that in any survey, fishers are given opportunities to identify particular fisheries management issues separately to answering this question, to ensure they do not answer this question negatively as a protest against concerns not related to the flexibility of management.

Decision triggers and management responses: If a low proportion of fishers believe fisheries management is flexible, or if the proportion reporting this is declining over time, management action is needed. The actions to be taken are:

- Identify why fishers believe flexibility is inadequate. This can be done through direct discussions with fishers (e.g. one-on-one with fishers or through focus groups. Consideration should be given on whether an independent expert is required to assess the issues; and
- Identify whether fisheries management actions have the ability to address the issues identified and, if so, develop and implement appropriate strategies.

Examples

Table 6 gives a worked example of the steps of collecting data, analysing it and identifying whether the indicator is green, orange or red for the Marine Scalefish, Rock Lobster and Abalone fisheries of South Australia.

Table 6 Step by step guide to measuring Indicator 1.1.2, using data from the Marine Scalefish, Rock Lobster and Abalone fisheries of South Australia.

<p>Include this question in a survey of fishers:</p>	<p>Q. 'To what extent do you agree or disagree with the following statement...' [a list of statements will follow; the one relevant to this indicator is as follows; see Section 6 for a visual presentation of the question formatting] 'Fisheries management is flexible enough to allow fishers to adapt to changing conditions'</p> <p><input type="checkbox"/> Strongly disagree <input type="checkbox"/> Disagree <input type="checkbox"/> Neither agree nor disagree <input type="checkbox"/> Agree <input type="checkbox"/> Strongly agree <input type="checkbox"/> Unsure</p> <p>Notes: When conducting the survey, include both this and a number of other statements from the attached sample on the survey. To analyse the responses, sum 'strongly disagree' and 'disagree'; and 'strongly agree' and 'agree'. However it is still useful to have the disaggregated and more detailed data—as it may be applicable to explore for example if there is sign of a positive trend with a growing number of people indicating they 'disagree' rather than 'strongly disagree'.</p>			
<p>Analyse the basic data:</p>	<p>Fishery</p>	<p>Disagree (strongly disagree and disagree)</p>	<p>Neither disagree nor agree</p>	<p>Agree (strongly agree & agree)</p>
	<p>Marine Scalefish (SA)</p>	<p>54.2 %</p>	<p>21.0%</p>	<p>24.8%</p>
	<p>Rock Lobster (SA)</p>	<p>50.8%</p>	<p>25.4%</p>	<p>23.7%</p>
	<p>Abalone (SA)</p>	<p>23.5%</p>	<p>17.6%</p>	<p>58.8%</p>
<p>Identify if indicator is green, orange or red</p>	<p>SA Abalone Fishery</p>	<p>SA Marine Scalefish Fishery SA Rock Lobster Fishery (as a trend is not yet known, these fisheries have been ranked as orange until the % of fishers who feel management is inflexible is growing or declining)</p>		<p>None are red as this indicator has not yet been measured at two points in time to establish a trend</p>

It may also be useful to analyse data by different regions within a fishery. Here, several regions within South Australia were compared and responses ranked to identify which fishery (by region) had the greatest satisfaction with flexibility of fisheries arrangements (Figure 3).

It can be seen in this figure that there is considerable variation in views of fishers operating in different regions, and across different fisheries.

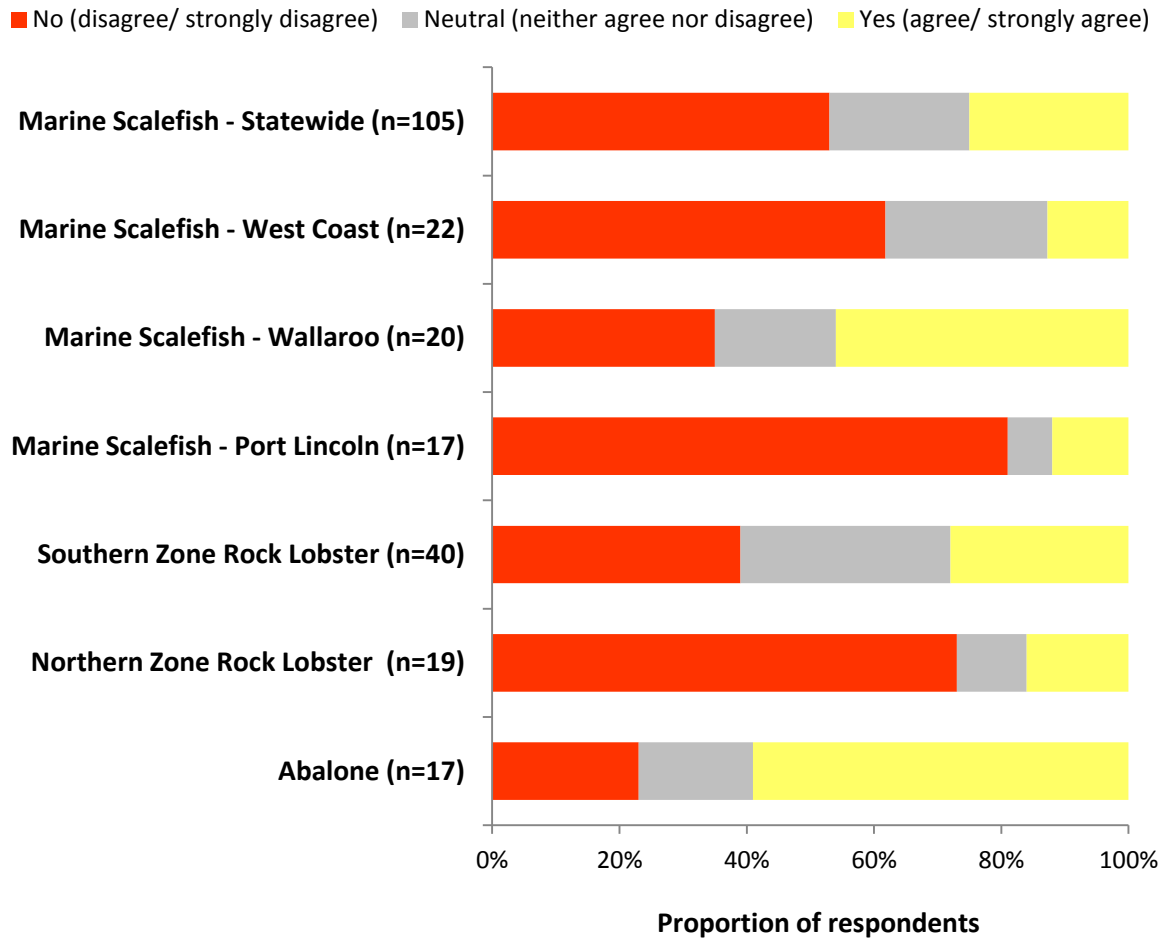


Figure 3 Comparison response of commercial fishers to the statement *'Fisheries management is flexible enough to allow fishers to adapt to changing conditions'* in the Marine Scalefish, Rock Lobster and Abalone fisheries of South Australia from several different regions.

Indicator 1.1.3-Existence of transferable property or use rights that allow access to marine and aquatic resources*

**This indicator applies to commercial and charter fishers only.*

How do you collect data: Management agency	Measurement cost: Low	Measurement complexity: Low	Indicator independence: Medium
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Social objective this indicator addresses: Objective 1.1 - Provide flexible opportunities to ensure fishers can maintain or enhance their livelihood, within the constraints of ecological sustainability.

What is the indicator? The way fisheries managers assign rights to fish stocks and enable fishers to manage and trade those rights, influences the ability of a fisher to make a livelihood from fishing. This indicator monitors whether fishers are provided flexible opportunities through the assignment of clear and flexible property or use rights. It only measures opportunity in relation to property or use rights.

Why is it measured? Flexible property rights are argued to provide better opportunity for fishers to make a viable livelihood, as they provide fishers with a right of access that can be traded for a market value and that has some security.

How is it measured? This indicator is measured using data from the fisheries management agency. It is measured by identifying the extent to which property and use rights are clear and flexible, based on the following questions:

- *'Are use rights in the fishery readily transferable between fishers (e.g. quotas and licences can be transferred from one user to another easily)?'*
- *'If use rights are transferable, are there established markets enabling transfer (e.g. has anyone used that right of transfer in recent times)?'*
- *'If use rights are transferable, is there a clear market price for the transferable rights?' This would be evidenced by, for example, recent transactions that have set a price. If few transactions occur, there may not be a clear price for the rights.*

All three questions are important, as in some cases, transferable rights are traded so rarely that there is in effect no market for them, thus reducing the ability of fishers to enact the flexibility of use rights.

How is it analysed and interpreted? This indicator is simple to analyse and interpret: answering 'yes' to all three questions indicates a positive outcome; while a 'no' indicates an area of potential concern for fisheries managers.

This indicator is being met if: use rights are transferable, there is an established market and an established price.	There is need to consider further management action if: use rights are transferable, but there is not an established market or price.	There is an urgent need for management action if: use rights are not readily transferable.
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Key considerations: This indicator is relatively simple to monitor and is low cost. However, fisheries managers need to ensure they consider whether the use rights of fishers are truly transferable when answering the questions – e.g. even a transferable quota system can be difficult to use if it is accompanied by onerous regulations or imposition of costs associated with transfer. Because the answer to these questions relies partly on the opinion of the fisheries managers, and not fully on independent data, the independence of this indicator is considered medium rather than high.

Decision triggers and management responses: If the answer to any of the three questions posed is ‘no’, this should trigger management action by fisheries managers to: (i) identify why flexibility in transfer of property rights is not being achieved; and (ii) actions that can address barriers to establishing flexible use rights and/or their trade.

Example

Table 7 gives a worked example of the steps of collecting and analysing the data, and identifying whether the indicator is green, orange or red for the East Coast Trawl Fishery of Queensland and the Marine Scalefish, Rock Lobster and Abalone fisheries of South Australia.

Table 7 Step by step guide to measuring Indicator 1.1.3, using data from the East Coast Trawl Fishery of Queensland and the Marine Scalefish, Rock Lobster and Abalone fisheries of South Australia.

<p>Ask these questions of fisheries managers:</p>	<p>Q. ‘Are the use rights readily transferable between fishers (e.g. quotas and licences can be transferred from one user to another easily)?’ <input type="checkbox"/>Yes <input type="checkbox"/>No</p> <p>Q. ‘If use rights are readily transferable is there an established market enabling transfer (e.g. has anyone used that right of transfer in recent times)?’ <input type="checkbox"/>Yes <input type="checkbox"/>No <input type="checkbox"/>Unsure</p> <p>Q. ‘If use rights are readily transferable is there a market price for transferable rights (e.g. recent transactions have set a price)?’ <input type="checkbox"/>Yes <input type="checkbox"/>No <input type="checkbox"/>Unsure</p> <p>Notes: Transferable rights are only truly transferable if a market exists for them. This is why the two follow-up questions regarding market transactions are included as part of the indicator.</p>			
<p>Analyse the basic data:</p>	<p>Fishery</p>	<p>Are use rights readily transferable?</p>	<p>If rights are transferable, is there an established market?</p>	<p>If rights are transferable, is there a clear market price?</p>
	<p>Marine Scalefish (SA)</p>	<p>Yes</p>	<p>Yes</p>	<p>Yes</p>
	<p>East Coast Trawl (QLD)</p>	<p>Yes</p>	<p>Yes</p>	<p>Yes</p>
	<p>Rock Lobster (SA)</p>	<p>Yes</p>	<p>Yes</p>	<p>Yes</p>
	<p>Abalone (SA)</p>	<p>Yes</p>	<p>Yes</p>	<p>Yes</p>
<p>Identify if indicator is green, orange or red</p>	<p>SA Abalone Fishery SA Marine Scalefish Fishery QLD East Coast Trawl Fishery SA Rock Lobster Fishery</p>		<p>None</p>	<p>None</p>

Indicator 1.1.4-Proportion of fishers accessing a livelihood from fishing*

**This indicator applies to commercial and charter fishers only.*

How do you collect data:	Measurement cost:	Measurement complexity:	Indicator independence:
Management agency	Low	Medium	Medium

Social objective this indicator addresses: Objective 1.1 - Provide flexible opportunities to ensure fishers can maintain or enhance their livelihood, within the constraints of ecological sustainability.

What is the indicator? This indicator identifies what percentage of livelihood opportunities (e.g. quota, licences, or permits) are being actively used by fishers.

Why is it measured? The proportion of opportunities being actively accessed indicates whether fisheries management is providing a framework within which a fishing-based livelihood can occur.

How is it measured? This indicator is measured using data from the fisheries management agency. It is measured by:

- (i) Identifying what proportion of opportunities to enter the fishery is being accessed at a given point in time (e.g. is 100% of quota being utilised); and
- (ii) Identifying how this proportion changes over time.

For this indicator, it is critical to identify what is considered to represent utilisation of opportunities. The following definitions have been developed to provide a guide:

- Quota: If 100% of quota is being caught (even if this occurs through the quota holder leasing their quota to another person), there is full utilisation of livelihood opportunities;
- Licences: If 100% of licences available are: (i) allocated to fishers, if relevant; and (ii) being actively used by those fishers (either to fish themselves, or to lease to another person who uses the licence to fish), there is full utilisation. If some licences are allocated to fishers who do not actively use the licence, there is not full utilisation; and
- Gear/effort: It is more difficult to define when there is full utilisation of livelihood opportunities when the fishery is managed used gear or effort restrictions. Fisheries managers will need to develop a definition of utilisation that is appropriate to the particular management arrangements in place.

How is it analysed and interpreted? This indicator is relatively simple to monitor and is low cost. Over time, the percentage of opportunities being accessed can be compared. Measuring as a percentage is important, as this means it is possible to compare the utilisation of opportunities over time even when the nature of fisheries management changes (e.g. from a limited entry fishery to a quota based fishery). Full utilisation is generally an indicator of good performance, while falling rates of utilisation indicate poor performance. The threshold below which rates of utilisation indicate fisheries management is constraining livelihood opportunities should be determined by fisheries managers based on the specific circumstances of the fishery, and documented in its management plan or other relevant structured documents.

This indicator is being met if: >90% of livelihood opportunities are being taken up.	There is need to consider further management action if: <90% of livelihood opportunities are being taken up, but there is either stability, or growth in the proportion of livelihood opportunities being taken up.	There is an urgent need for management action if: the proportion of livelihood opportunities being taken up is decreasing.
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Key considerations: This indicator is relatively simple to monitor and low cost, making it useful to measure. Interpretation of the indicator will be needed, as the reasons for low utilisation of livelihood opportunities will vary, and will not always be caused by fisheries management. For instance, a drop in market prices may result in reduction in catch below quota levels. However, even when the cause of low utilisation is not fisheries management, it may require a management response. As the indicator requires fisheries managers to determine what they consider to be a 'livelihood opportunity', the independence of this indicator is regarded as medium.

Decision triggers and management responses: If the rate of utilisation of livelihood opportunities is decreasing over time, or if it falls below a pre-determined trigger (determined on a fishery by fishery basis based on the characteristics of that fishery), there is a need for management action by fisheries managers. Where management action is needed, fisheries managers should:

- Identify why utilisation of livelihood opportunities are decreasing;
- Identify if and how fisheries management is contributing to these factors; and
- Identify actions to address these factors.

Examples

Table 8 gives a worked example of the steps of collecting data, analysing it and identifying whether the indicator is green, orange or red for the East Coast Trawl Fishery of Queensland and the Marine Scalefish, Rock Lobster and Abalone fisheries of South Australia.

Table 8 Step by step guide to measuring Indicator 1.1.4, using from the East Coast Trawl Fishery of Queensland and the Marine Scalefish, Rock Lobster and Abalone fisheries of South Australia.

<p>Ask this question of fisheries managers:</p>	<p>Q. 'What proportion of opportunities to enter the fishery are being accessed at the moment (e.g. 100% of quota being utilised or 100% of available licences)?'</p> <p><input type="checkbox"/> 100% <input type="checkbox"/> 90-99% <input type="checkbox"/> 80-89% <input type="checkbox"/> 70-79% <input type="checkbox"/> 60-69% <input type="checkbox"/> 50-59%</p> <p><input type="checkbox"/> 40-49% <input type="checkbox"/> 30-39% <input type="checkbox"/> 20-29% <input type="checkbox"/> 10-19% <input type="checkbox"/> 0-10%</p> <p>Notes: The question asks for responses in categories that span 10%, as this helps: (i) overcome any uncertainty in estimation; and (ii) ensures that natural small variations are not recorded as a trend – instead, a reasonably large change in utilisation of opportunities is needed to be considered a change in measurement for purposes of the indicator.</p> <p>A key challenge is how to identify what constitutes 'all opportunities being utilised'. This needs to be clearly defined for the specific fishery, based on how access entitlements are structured, but some guidance is given below:</p> <ul style="list-style-type: none"> • Quota: If 100% of quota is 'owned' by either the owner, or by lessees using that person's quota, this is considered full utilisation (i.e. if an owner is leasing quota it should still be considered as being an opportunity that is being accessed). • Licences: If there are a limited number of licences, and some are not purchased, the fishery is under-utilised. <p>Sometimes quota or licences may be owned, but not utilised – in other words, they become latent quota. Determination is required as to if this counts as underutilisation of opportunities, dependent on the fishery's context.</p>												
<p>Analyse the basic data:</p>	<table border="1"> <thead> <tr> <th>Fishery</th> <th>What proportions of opportunities to enter the fishery are being accessed at the moment?</th> </tr> </thead> <tbody> <tr> <td>Marine Scalefish (SA)</td> <td>90-99%</td> </tr> <tr> <td>East Coast Trawl (QLD)</td> <td>50-59%</td> </tr> <tr> <td>Rock Lobster (SA)</td> <td>100%</td> </tr> <tr> <td>Abalone (SA)</td> <td>100%</td> </tr> </tbody> </table>	Fishery	What proportions of opportunities to enter the fishery are being accessed at the moment?	Marine Scalefish (SA)	90-99%	East Coast Trawl (QLD)	50-59%	Rock Lobster (SA)	100%	Abalone (SA)	100%		
Fishery	What proportions of opportunities to enter the fishery are being accessed at the moment?												
Marine Scalefish (SA)	90-99%												
East Coast Trawl (QLD)	50-59%												
Rock Lobster (SA)	100%												
Abalone (SA)	100%												
<p>Identify if indicator is green, orange or red</p>	<p>SA Marine Scalefish Fishery SA Rock Lobster Fishery SA Abalone Fishery</p>		<p>QLD East Coast Trawl Fishery</p>										

Indicator 1.1.5-Constraints on access to livelihood opportunities imposed by fisheries management*

**This indicator applies to commercial and charter fishers only*

How do you collect data: Management agency	Measurement cost: Low	Measurement complexity: Low	Indicator independence: Low
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Social objective this indicator addresses: Objective 1.1 - Provide flexible opportunities to ensure fishers can maintain or enhance their livelihood, within the constraints of ecological sustainability.

What is the indicator? This indicator identifies whether management actions are maintaining, reducing or enhancing the ability of fishers to access livelihood opportunities, by identifying whether these actions are constraining livelihood opportunities for reasons other than ecological sustainability.

Why is it measured? This indicator provides context to Indicator 1.1.4 and is extremely relevant when Indicator 1.1.4 is orange or red (less than 100% of livelihood opportunities are being utilised, and/or the proportion being utilised is decreasing). This indicator asks the fisheries manager to consider whether the lack of utilisation of livelihood opportunities is a result of management decisions or due to factors outside the control of fisheries managers. It also asks fisheries managers to consider the effects of management decisions – often made for other reasons than ensuring livelihood of fishers – on the ability of fishers to make a livelihood from fishing.

How is it measured? This indicator is measured by asking the fisheries manager to consider whether, in their opinion, management arrangements constrain access of fishers to livelihood opportunities in ways other than constraints imposed in order to ensure ecological sustainability – e.g. through high entry costs or other restrictions.

How is it analysed and interpreted?

This indicator is being met if: fisheries management actions are not constraining access to livelihood opportunities, except where constraint is necessary for ecological reasons.	There is need to consider further management action if: fisheries management actions are constraining access to livelihood for reasons other than ecological sustainability, with potentially adverse effect on ability of fishers to make a livelihood from fishing, but this effect is likely to be small or temporary.	There is an urgent need for management action if: fisheries management actions are constraining access to livelihood for reasons other than ecological sustainability, and this situation is ongoing.
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Key considerations: This indicator is simple to measure and low cost, however, it relies on the opinion of the fisheries manager. Therefore, its level of independence is considered low. One way to increase the independence of the indicator is to hold a formal consultation process with fishers, processors and wholesalers, in which they are asked to identify whether management actions are affecting access to livelihood opportunities and to come to agreement on whether and how this is occurring. This provides a greater degree of independence to measurement of the indicator, but also incurs greater cost.

Decision triggers and management responses: Fisheries managers need to take action if management arrangements are having an adverse effect on the ability of fishers to make a livelihood from fishing. The actions to be taken will depend on the individual fishery and the way that decisions are affecting livelihood, however, fisheries managers should consider the following:

- If the impacts on livelihood are avoidable – what different approaches to achieving fisheries management outcomes can be used to avoid having a negative impact on a fisher’s livelihoods?
- If the impacts on livelihood are unavoidable – e.g. a management decision must be implemented that will negatively impact livelihood, but is essential for maintaining ecological sustainability – what actions can be taken to mitigate or minimise the livelihood impact on affected fishers?

Examples

Table 9 gives a worked example of the steps of collecting data, analysing it and identifying whether the indicator is green, orange or red for the East Coast Trawl Fishery of Queensland and the Marine Scalefish, Rock Lobster and Abalone fisheries of South Australia.

Table 9 Step by step guide to measuring Indicator 1.1.5, using data from the East Coast Trawl Fishery of Queensland and the Marine Scalefish, Rock Lobster and Abalone fisheries of South Australia.

Ask these questions of fisheries managers:	<p>Q. ‘In your opinion, does fisheries management constrain access of fishers to livelihood opportunities in ways other than constraints imposed in order to ensure ecological sustainability (e.g. through high entry costs or other restrictions)?’</p> <p><input type="checkbox"/>Yes <input type="checkbox"/>No <input type="checkbox"/>Unsure</p> <p><i>If yes, is this constraint temporary/short term or long term?</i></p> <p><input type="checkbox"/>Short-term/temporary <input type="checkbox"/>Long-term <input type="checkbox"/>Unsure</p>		
Analyse the basic data:	Fishery	Does fisheries management constrain access for reasons other than ecological sustainability?	
	Marine Scalefish (SA)	Yes	
	East Coast Trawl (QLD)	No	
	Rock Lobster (SA)	Yes	
	Abalone (SA)	Yes	
Identify if indicator is green, orange or red	QLD East Coast Trawl Fishery	SA Marine Scalefish Fishery SA Rock Lobster Fishery SA Abalone Fishery	

Indicator 1.2.1-Level of satisfaction fishers have with their fishing activities

How do you collect data: Fisher survey	Measurement cost: Medium	Measurement complexity: Low	Indicator independence: High
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Social objective this indicator addresses: Objective 1.2 - Maximise cultural, recreational and lifestyle benefits (including health benefits) of fishing for those who participate in fishing activities, within the constraints of ecological sustainability.

What is the indicator? This indicator measures how satisfied fishers feel with their fishing activities and how this is changing over time.

Why is it measured? A fisher's overall satisfaction with their fishing is a useful indicator of whether they are achieving the benefits they consider important from fishing. This indicator therefore provides an overall measure of whether fishers are achieving an appropriate mix of benefits from fishing. It should be considered a 'headline' indicator; other indicators for this objective then 'unpack' this headline to identify which benefits are important to fishers and if they are being met.

How is it measured? This indicator is measured through a fisher survey, with fishers asked how satisfied they feel with their fishing activities and how this is changing over time. In the example given below, the time frame is over the last 12 months and over a scale of 1 to 10. Since satisfaction varies significantly over individual fishing trips, an assessment over a 12 month period ensures the identification of longer-term changes in satisfaction that may result from changes in fisheries management, rather than shorter-term, temporary changes that are the result of issues such as poor weather conditions or a bad fishing trip.

It is possible to modify the period asked about, where relevant (e.g. in a fishery open for only part of the year, it may be most relevant to ask only about the period when it was open). As with all the other indicators in this Guide, where possible, fishing satisfaction should be assessed on repeated surveys, to enable identification of any trends in satisfaction over time. However, if only a single survey is undertaken, it is also possible to ask fishers how their satisfaction has changed over the last three years. While this type of 'retrospective' question can be hard for some fishers to answer and is not as reliable as measuring regularly over the same time period, it gives some indication of perceived change over time in situations where a regular survey is unlikely to be implemented.

How is it analysed and interpreted?

This indicator is being met if: >50% of fishers are satisfied with their fishing, and the proportion who are neutral or satisfied is growing over time	There is need to consider further management action if: <50% of fishers indicate they are neutral or highly satisfied with their fishing overall, but this proportion is increasing (suggests a positive change but continuing action is needed).	There is an urgent need for management action if: the proportion of fishers indicating they are neutral or highly satisfied with their fishing is declining, or <50% are neutral/satisfied and there is no change in satisfaction.
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Key considerations: This indicator requires a survey of fishers, but is relatively easy to interpret, as all that is needed is to report the proportion of fishers reporting they are satisfied. In the example below, the definition of 'satisfied' is a rating of 7 or more on a 10

point rating scale, but it is possible to define what constitutes satisfaction according to any scale chosen. While ‘satisfaction’ can seem a broad term, a large number of surveys use this type of scale to define it, and find that most people can accurately identify their overall level of satisfaction in the way required for this question.

Decision triggers and management responses: If less than 50% of fishers are satisfied with their fishing overall, or the proportion of fishers who are satisfied is dropping over time, fisheries managers need to take action. The management actions that should be implemented are, in order:

- First, identify what is causing the ongoing low satisfaction with fishing, or declining satisfaction. Indicators 1.2.2/3/4/5 can provide some guidance to this, by identifying the aspects of fishing that fishers are most and least satisfied with. However, to fully unpack the reasons for changes in levels of satisfaction in areas that are not immediately explicable, commissioning of experts to identify the causes may be required.
- Second, identify if, when and how fisheries managers can address the causes of low or declining satisfaction. It will not always be possible for fisheries managers to address causes, in which case, it will be necessary to explore any mitigating or minimising options for negative effects of management arrangements.
- Finally, incorporate management actions to address low satisfaction in the fishery’s decision making processes and planning.

Examples

Table 10 gives a worked example of the steps of collecting data, analysing it and identifying whether the indicator is green, orange or red for the Recreational, Rock Lobster and Abalone fisheries of South Australia.

Table 10 Step by step guide to measuring Indicator 1.2.1, using data from the Recreational, Rock Lobster and Abalone fisheries of South Australia.

Include this question in a survey of fishers:	<p>Q. ‘On average, how satisfied have you been with your fishing activities over the last 12 months (please tick one box on the scale of 1 to 10 below)?’</p>			
	<p>Notes: Asking about views for the last 12 months ensures the fishers respond based on their overall experience rather than any individual fishing trip.</p>			
Analyse the basic data:	Fishery	Unsatisfied (1-3)	Neither (4-6)	Highly satisfied (7-10)
	Recreational (SA)	4.9%	31.2%	63.9%
	Rock Lobster (SA)	11.7%	11.7%	76.7%
	Abalone (SA)	0%	11.8%	88.2%
Identify if indicator is green, orange or red	SA Recreational Fishery SA Rock Lobster Fishery SA Abalone Fishery			

In the case where a comparison of fisheries or regions is beneficial, this can also be undertaken with the data. An example of this is provided in Figure 4, which indicates that within the South Australian Rock Lobster Fishery, fishers in the Northern Zone were less satisfied with their fishing activities compared to those in the Southern Zone.

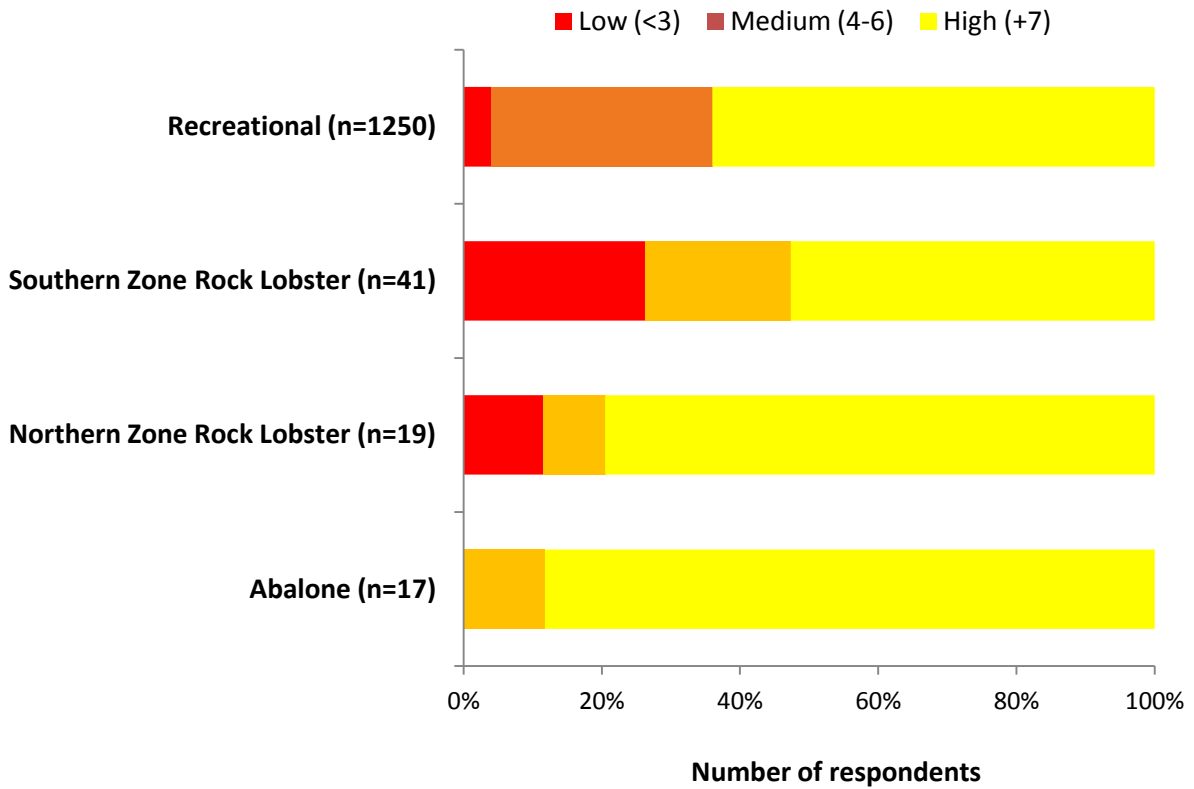


Figure 4 Satisfaction of fishers in the Abalone, Southern Zone Rock Lobster, Northern Zone Rock Lobster and Recreational fisheries of South Australia.

Indicator 1.2.2-Level of satisfaction fishers are achieving with the cultural, recreational and lifestyle benefits important to them from fishing

How do you collect data: Fisher survey	Measurement cost: Medium	Measurement complexity: High	Indicator independence: High
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Social objective this indicator addresses: Objective 1.2 - Maximise cultural, recreational and lifestyle benefits (including health benefits) of fishing for those who participate in fishing activities, within the constraints of ecological sustainability.

What is the indicator? Whereas Indicator 1.2.1 identifies how satisfied fishers are with their fishing activities overall, this indicator identifies how satisfied fishers are with the non-income related aspects of their fishing.

Why is it measured? When there is a change in satisfaction with fishing, it is often because fishers are not able to achieve the things they find important about their fishing (e.g. catching fish to eat, spending time with family or friends, or taking part in fishing competitions, or being able to undertake fishing activities that are important to their social identity). As different people fish for different reasons, this indicators helps 'unpack' these motivations to identify what types of things are generating satisfaction from fishing and are supported in the management arrangements of fishery.

How is it measured? This indicator is measured via a survey of fishers, with fishers asked how satisfied they are with a number of aspects of their fishing. They are given the option of indicating that the aspect being asked about doesn't apply to them (e.g. they don't find this important).

How is it analysed and interpreted?

<p>This indicator is being met if: >50% of fishers indicate they are satisfied or very satisfied with their ability to achieve the benefits they find highly important from fishing, and this percentage is growing over time.</p>	<p>There is need to consider further management action if: <50% of fishers indicate they are satisfied or very satisfied with their ability to achieve the benefits they find highly important from fishing, but this percentage is growing over time, suggesting that there is positive change but continuing action is needed.</p>	<p>There is an urgent need for management action if: a declining proportion of fishers are indicating they are satisfied with their ability to achieve the benefits they find highly important from, or <50% are satisfied and there is no change in satisfaction.</p>
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Key considerations: This indicator requires a survey of fishers and is reasonably complex to measure. It does, however, provide a useful guide for fisheries managers to identify which benefits are important to fishers, facilitating improved tailoring of management to support fishers to achieve these benefits. This indicator requires investment of time by the fisheries manager to understand and analyse responses. If this investment of time is not possible, consideration should be given to engaging an expert to analyse these data.

Decision triggers and management responses: Fisheries managers need to take management action if less than 50% of fishers are satisfied with their ability to achieve some or all of the benefits they find important from fishing, or the proportion of fishers who are satisfied is dropping over time.

The management actions that should be implemented are, in order:

- First, identify what is causing the ongoing low satisfaction with the fisher’s ability to achieve particular types of benefits. This may require the services of an expert;
- Second, identify whether and when fisheries managers can take management action to address the causes of low or declining satisfaction. It will not always be possible for fisheries managers to address causes; and
- Finally, incorporate management actions to address low satisfaction in fisheries management processes and planning.

Examples

Table 11 gives a worked example of the steps of collecting data, analysing it and identifying whether the indicator is green, orange or red for the South Australian Rock Lobster Fishery.

Table 11 Step by step guide to measuring Indicator 1.2.2, using data from the South Australian Rock Lobster Fishery.

Include this question in a survey of fishers:	Q. ‘How satisfied are you with the following aspects of your current fishing activities?’ (please tick one box only for each statement)					
		Very unsatisfied	Somewhat unsatisfied	Neither	Somewhat satisfied	N/A
	Relaxation/unwinding	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Spending time in the outdoors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Spending time with family	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Spending time with friends	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Continuing a family tradition of fishing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Being on my own/getting away from people	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Being a part of the fishing industry	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	The enjoyment or sport of catching fish, etc	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	The money made from my fishing business	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Passing on knowledge about fishing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Being a part of the fishing industry	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Notes: You will need to edit this list of topics to vary it based on aspects of fishing that are of particular importance in the fishery you manage, and to remove items that aren’t relevant.					
Analyse the basic data:	See Figure 5 showing the basic data the South Australian Rock Lobster Fishery					
Identify if indicator is green, orange or red:	The SA Rock Lobster Fishery is ‘green’ for all aspects considered important by fishers.					

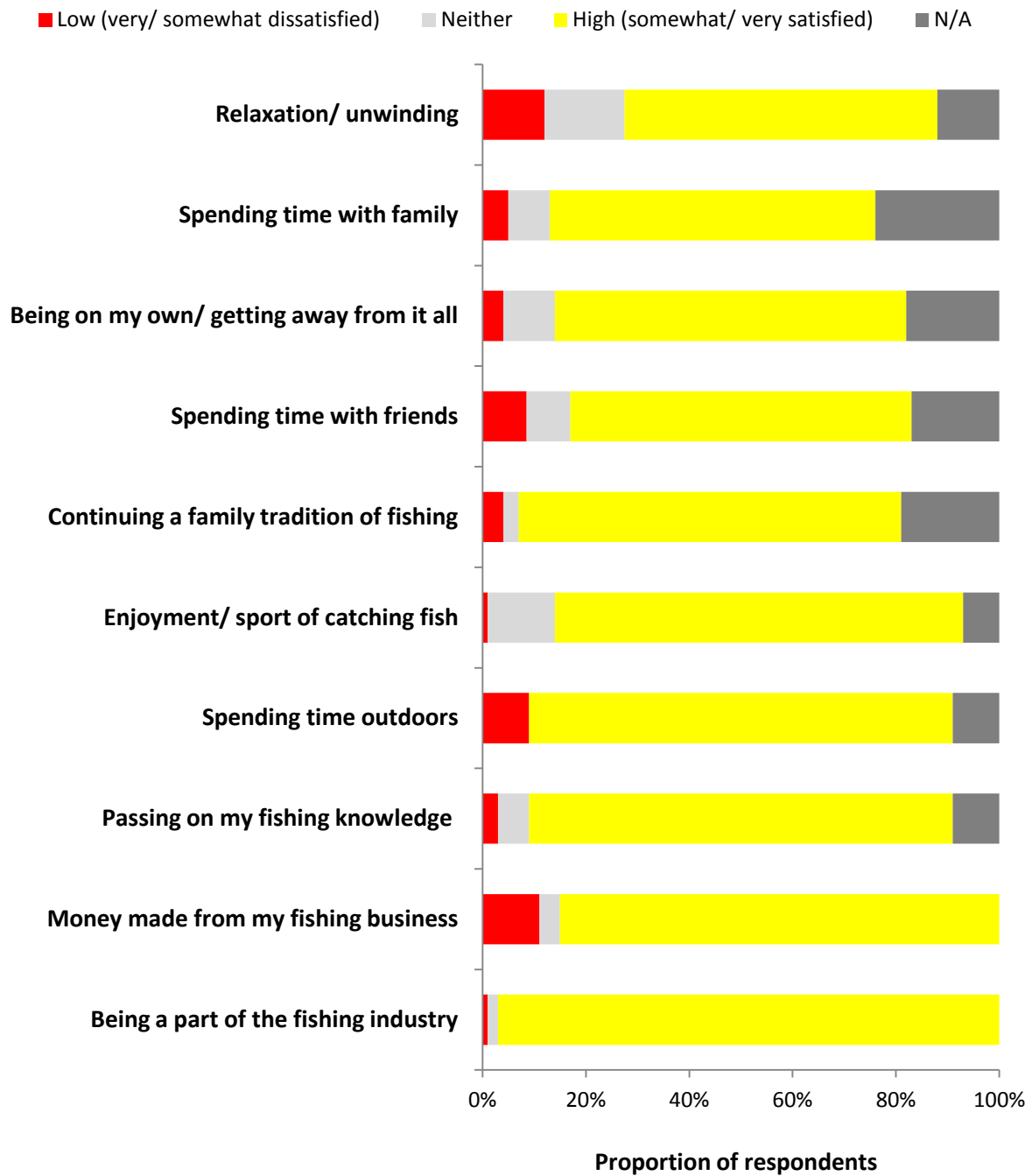


Figure 5 Satisfaction of commercial fishers in the South Australian Rock Lobster Fishery on a range of issues.

Indicator 1.2.3-Level of satisfaction fishers have with their fishing-derived income*

**This indicator applies to commercial and charter fishers only.*

How do you collect data: Fisher survey	Measurement cost: Medium	Measurement complexity: Low	Indicator independence: High
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Social objective this indicator addresses: Objective 1.2 - Maximise cultural, recreational and lifestyle benefits (including health benefits) of fishing for those who participate in fishing activities, within the constraints of ecological sustainability.

What is the indicator? This indicator asks fishers how satisfied they are with the income they receive from their fishing activities as this contributes to their lifestyle benefits.

Why is it measured? When considering whether fisheries managers are providing opportunities for fishers to achieve desired benefits, satisfaction with fishing income is often a better measure than the dollar value of that income. This is because different fishers will be satisfied with quite different amounts of income. For instance, a fisher who fishes part-time while earning income from activities other than fishing, and who lives in an area where living costs are low, may be satisfied with a lower amount of fishing income than another fisher who fishes full-time, has no other source of income, and lives in an area where living costs are high.

How is it measured? This indicator is measured via a survey of fishers, with fishers asked to rate how satisfied they are with the income they derive from fishing.

How is it analysed and interpreted?

This indicator is being met if: <50% of fishers indicate they are dissatisfied with their fishing income, and the proportion reporting being satisfied is increasing over time.	There is need to consider further management action if: >50% of fishers indicate they are dissatisfied with their fishing income, but this percentage is declining over time, suggesting that there is positive change but continuing	There is an urgent need for management action if: the proportion of fishers indicating they are dissatisfied with their fishing income is growing or >50% are dissatisfied and there is no change in satisfaction.
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Key considerations: This indicator requires a survey of fishers, but is relatively easy to measure and interpret. All that is needed is the recording of the proportion of fishers reporting they are satisfied with their fishing-derived income, and how this is changing over time.

When this indicator was initially tested, a concern was raised that fishers might all report being dissatisfied with their income. However, when this question was tested, it was found fishers did provide a range of responses (as can be seen in the example in Table 12), and did not feel any incentive to report being dissatisfied.

Decision triggers and management responses: If an increasing proportion of fishers are reporting being dissatisfied with their fishing income, or if the proportion is more than 50%, management action may be needed. The steps that should be taken include:

- First, identify why satisfaction is declining. This may or may not be the result of management decisions (e.g. dissatisfaction may be the result of low market prices);
- Second, identify possible management actions that may improve satisfaction with fishing income. Even if the cause of the problem is not related to management, fisheries managers should still consider if any management action can be taken that could improve satisfaction; and
- Finally, implement identified actions.

Examples

Table 12 gives a worked example of the steps of collecting data, analysing it and identifying whether the indicator is green, orange or red for the Marine Scalefish, Rock Lobster and Abalone fisheries of South Australia.

Table 12 Step by step guide to measuring Indicator 1.2.3, using data from the Marine Scalefish, Rock Lobster and Abalone fisheries of South Australia.

Include this question in a survey of fishers:	<p>Q. 'How satisfied are you with the income you earned from your fishing in [name of fishery] over the last 12 months?'</p> <input type="checkbox"/> Very dissatisfied <input type="checkbox"/> Dissatisfied <input type="checkbox"/> Neither dissatisfied nor satisfied <input type="checkbox"/> Satisfied <input type="checkbox"/> Very satisfied			
Analyse the basic data:	<p>Fishery</p>	<p>Dissatisfied (very dissatisfied and dissatisfied)</p>	<p>Neither dissatisfied nor satisfied</p>	<p>Satisfied (very satisfied and satisfied)</p>
	Marine Scalefish (SA)	28.9%	26.0%	45.2%
	Rock Lobster (SA)	14.5%	10.9%	74.5%
	Abalone (SA)	29.4%	23.5%	47.0%
Identify if indicator is green, orange or red	<p>SA Marine Scalefish Fishery SA Rock Lobster Fishery SA Abalone Fishery</p>			

Figure 6 shows that fishers in the Southern Zone Rock Lobster Fishery were more satisfied with their income derived from fishing than fishers from the Northern Zone Rock Lobster and Abalone fisheries of South Australia. This figure also shows that fishers in the Marine Scalefish Fishery from the West Coast region were the least satisfied with their fishing income.

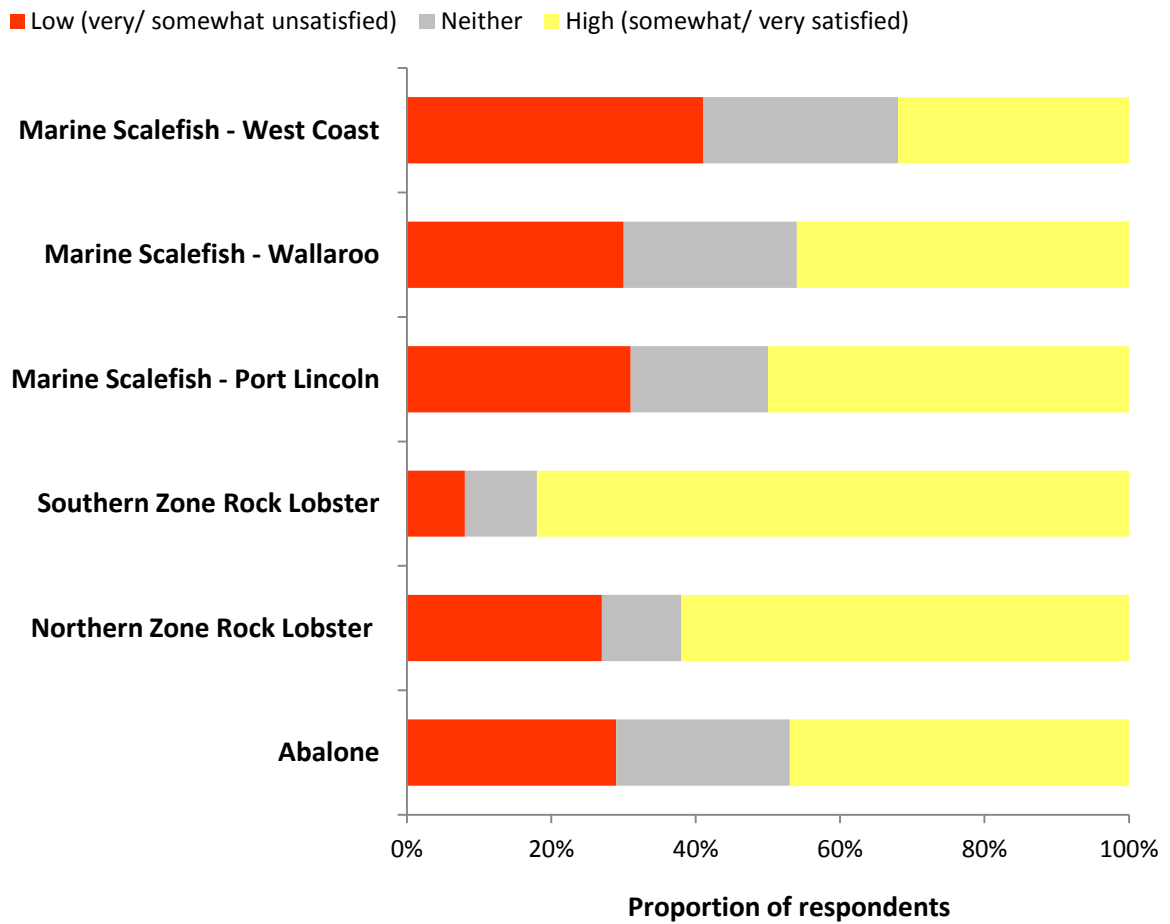


Figure 6 Satisfaction of commercial fishers in the Abalone, Rock Lobster and Marine Scalefish fisheries of South Australia, with income derived from fishing in the last 12 months.

Indicator 1.2.4- Perceived importance of fishing activities to the fisher's life

How do you collect data: Fisher survey	Measurement cost: Medium	Measurement complexity: Medium	Indicator independence: High
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Social objective this indicator addresses: Objective 1.2 - Maximise cultural, recreational and lifestyle benefits (including health benefits) of fishing for those who participate in fishing activities, within the constraints of ecological sustainability.

What is the indicator? This indicator asks fishers how important their fishing activities are to their life overall.

Why is it measured? This indicator helps contextualise other indicators measured for Objective 1.2. Understanding how important fishing is to the life of a fisher helps identify how critical it is to address issues such as declining satisfaction with fishing or a reduction in ability to achieve particular benefits. For example, if 50% of fishers indicate they are dissatisfied with their ability to catch a fish to eat, but the same 50% also say fishing has relatively low importance to their life, there is less urgency for management action than if these fishers indicate fishing is of central importance to their life.

How is it measured? This indicator is measured through a survey of fishers, with fishers asked how important their fishing is to their life, on a scale of one to ten (alternative scales can be used if desired).

How is it analysed and interpreted? This indicator is a contextual indicator. On its own, there is no 'right' or 'wrong' answer, and fisheries managers should not attempt to change how important fishing is to the lives of people who engage in it. Rather, they should use information from this indicator to contextualise the results of other indicators measured for Objective 1.2. This indicator can assist in determining where and when management action is needed in response to the outcomes of other indicators.

Key considerations: While the question itself is easy to include on a survey and to analyse, its usefulness is highest when the answers to this question are utilised to contextualise responses to other survey questions, such as those identifying whether fishers are satisfied with the benefits they achieve from fishing. This means it can be reasonably complex to use these data meaningfully. If adequate resources are not available to invest in learning how to analyse these data, consideration should be given to engaging an expert.

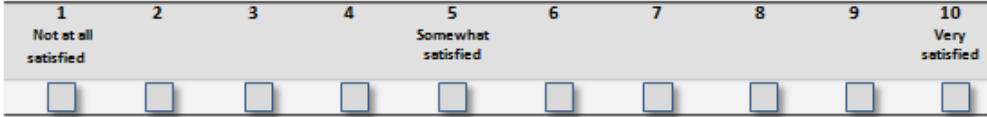
Decision triggers and management responses: The information from this indicator should be used to assist in deciding on appropriate management actions, in combination with the results from the other indicators for Objective 1.2. Where other indicators suggest there is a need for management action, there is a need to evaluate the importance of fishing.

If fishers report fishing is highly important to their life— suggesting it has potential to substantially impact their overall wellbeing – management action should be a higher priority. If fishers report fishing being of low importance to their life overall, management action to address low satisfaction in the areas measured by other indicators (e.g. income, or the various non-monetary benefits of fishing such as spending time with family) may become a lower priority.

Examples

Table 13 gives a worked example of the steps of collecting data and analysing it for the Recreational, Rock Lobster and Abalone fisheries of South Australia.

Table 13 Step by step guide to measuring Indicator 1.2.4, using data from the Recreational, Rock Lobster and Abalone fisheries of South Australia.

<p>Include this question in a survey of fishers:</p>	<p>Q. 'How important are your fishing activities to you?'</p>  <p>Notes: Commercial fishing is often more than 'just a job' to fishers, and because of this, this question asks you how important your fishing activities are as a part of your life. Please indicate on the scale of 1 to 10 below. 1 means that, while you enjoy fishing, it is not of much importance to your life, and 10 means it is the most important part of your life.</p>																			
<p>Analyse the basic data:</p>	<table border="1"> <thead> <tr> <th>Fishery</th> <th>Unimportant (1-3)</th> <th>Neither (4-6)</th> <th>Important (7-10)</th> </tr> </thead> <tbody> <tr> <td>Recreational (SA)</td> <td>2.9%</td> <td>15.0%</td> <td>82.2%</td> </tr> <tr> <td>Rock Lobster (SA)</td> <td>1.7%</td> <td>10.0%</td> <td>88.3%</td> </tr> <tr> <td>Abalone (SA)</td> <td>0%</td> <td>0%</td> <td>100%</td> </tr> </tbody> </table>	Fishery	Unimportant (1-3)	Neither (4-6)	Important (7-10)	Recreational (SA)	2.9%	15.0%	82.2%	Rock Lobster (SA)	1.7%	10.0%	88.3%	Abalone (SA)	0%	0%	100%			
Fishery	Unimportant (1-3)	Neither (4-6)	Important (7-10)																	
Recreational (SA)	2.9%	15.0%	82.2%																	
Rock Lobster (SA)	1.7%	10.0%	88.3%																	
Abalone (SA)	0%	0%	100%																	
<p>Interpret the results</p>	<p>This indicator is not rated as green, orange or red. Instead, the results provide information on how much changes to fisheries management are likely to affect a fisher's life overall. In the fisheries tested, fishing was ranked as very important to the lives of the large majority of fishers, indicating that changes to fisheries management would have a significant impact on fishers. Note, however, responses to the recreational fishing survey are biased towards avid fishers, so the recreational fishing results over-estimate the proportion of fishers for whom recreational fishing is a very important part of their life (for the other fisheries, no bias was identified in responses).</p>																			

Indicator 1.2.5-Fisher's plans to leave fishing*

**This indicator applies to commercial and charter fishers only.*

How do you collect data:	Measurement cost:	Measurement complexity:	Indicator independence:
Fisher survey	Medium	Low	High

Social objective this indicator addresses: Objective 1.2 - Maximise cultural, recreational and lifestyle benefits (including health benefits) of fishing for those who participate in fishing activities, within the constraints of ecological sustainability.

What is the indicator? This indicator asks commercial and charter fishers what their plans are for retiring or otherwise stopping fishing for their livelihood.

Why is it measured? This indicator provides information that helps fisheries managers evaluate whether a change in satisfaction is associated with fishers changing their plans regarding their fishing future. For example, if high numbers of fishers report low satisfaction, and also report they plan to leave fishing as soon as possible, this suggests that the low satisfaction is resulting in a critical behavioural response that may impact fisheries management. If this occurred, fisheries managers would need to consider the consequences of the identified number of fishers exiting fishing and the management issues involved in ensuring new fishers who purchase quota or licences are aware of and comply with management requirements. In uncommon circumstances⁹, this indicator may also be a measure of the effectiveness of management arrangements to encourage fishers out of the industry. In these circumstances, the interpretation of the indicator would be different to that below.

How is it measured? This indicator is measured via a survey of fishers, with fishers asked when they plan to stop fishing for a living; as soon as possible, within the next five years, at retirement age, or whether they plan to fish as long as they possibly can.

How is it analysed and interpreted? The interpretation below is based on the premise that it is a management objective to retain fishers in the fishery. As noted above, different interpretations are needed if the management objective is to encourage exit from the fishery.

<p>This indicator is being met if: >50% of fishers indicate they plan to fish to retirement age or beyond. This indicates that fisheries management is enabling fishers to achieve benefits they desire from fishing (although fisheries managers may need to consider how to address issues associated with increasing age of fishers if most indicate they plan to fish for as long as possible).</p>	<p>There is need to consider further management action if: <50% of fishers plan to fish to retirement age or beyond, but few fishers indicate they plan to leave as soon as possible.</p>	<p>There is an urgent need for management action if: >30% of fishers indicate they plan to leave fishing as soon as possible (after ensuring this is not simply reflecting that fishers are at retirement age).</p>
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⁹ These may occur where it has been identified that for the greater community good (e.g. for ecological reasons) the level of commercial and charter fishing should be reduced.

Key considerations: This indicator requires a survey of fishers, but can be readily interpreted and reported on by fisheries managers. The key consideration needed when analysing the data is to identify whether the results of the indicator suggest a need to further explore why fishers are planning to either leave fishing soon, or to stay fishing as long as possible.

Decision triggers and management responses: If a high proportion of fishers plan to leave fishing as soon as possible, this suggests that fishing conditions are so poor that a sustainable livelihood is not possible, and requires urgent management action. If few fishers are planning to fish to retirement, management action may also be needed, although only after evaluation of the reasons fishers are planning early retirement (e.g. early retirement may be planned due to fishers earning a very high income from fishing). Fisheries managers should:

- Identify whether and how management is contributing to a high proportion of fishers planning to leave fishing;
- Identify the implications for management of fishers leaving fishing (and likely lower revenue and/or high numbers of new entrants to fishing, if relevant); and
- Identify appropriate management actions, if any, and implement these.

Examples

Table 14 gives a worked example of the steps of collecting data, analysing it and identifying whether the indicator is green, orange or red. The examples given are from the Southern Zone Rock Lobster, Northern Zone Rock Lobster and Abalone fisheries of South Australia.

Table 14 Step by step guide to measuring Indicator 1.2.5, using data from the Southern Zone Rock Lobster, Northern Zone Rock Lobster and Abalone fisheries of South Australia.

Include this question in a survey of fishers:	<p>Q. 'How long do you intend to continue participating in the commercial fishing industry?'</p> <table border="1"> <tr> <td>As soon as possible</td> <td><5 years</td> <td>5-10 years</td> <td>10-20 years</td> <td>Until retirement</td> <td>Beyond retirement</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>					As soon as possible	<5 years	5-10 years	10-20 years	Until retirement	Beyond retirement													
	As soon as possible	<5 years	5-10 years	10-20 years	Until retirement	Beyond retirement																		
Analyse the basic data:		<table border="1"> <thead> <tr> <th rowspan="2">Fishery</th> <th colspan="4">Plan to leave:</th> </tr> <tr> <th>As soon as possible</th> <th>Before retiring</th> <th>Until retiring</th> <th>Beyond retirement age</th> </tr> </thead> <tbody> <tr> <td>Rock Lobster (SA)</td> <td>7.0%</td> <td>42.1%</td> <td>8.8%</td> <td>42.1%</td> </tr> <tr> <td>Abalone (SA)</td> <td>11.8%</td> <td>41.2%</td> <td>0%</td> <td>47.10%</td> </tr> </tbody> </table>				Fishery	Plan to leave:				As soon as possible	Before retiring	Until retiring	Beyond retirement age	Rock Lobster (SA)	7.0%	42.1%	8.8%	42.1%	Abalone (SA)	11.8%	41.2%	0%	47.10%
Fishery	Plan to leave:																							
	As soon as possible	Before retiring	Until retiring	Beyond retirement age																				
Rock Lobster (SA)	7.0%	42.1%	8.8%	42.1%																				
Abalone (SA)	11.8%	41.2%	0%	47.10%																				
Identify if indicator is green, orange or red	SA Rock Lobster Fishery	SA Abalone Fishery																						

A comparison of the intentions of commercial fishers in three of the highest value fisheries in South Australia showed that fishers in the Northern Zone Rock Lobster Fishery were more likely to be considering leaving fishing as soon as possible or before retirement, compared to the Southern Zone Rock Lobster Fishery, although less planned to leave as soon as possible than was the case for fishers in the Abalone Fishery.

This suggests that there appears to be greater confidence and/or perceived reason to stay in the Southern Zone Rock Lobster Fishery in the immediate future for fishers, than either of the Northern Zone Rock Lobster or the Abalone fisheries of South Australia.

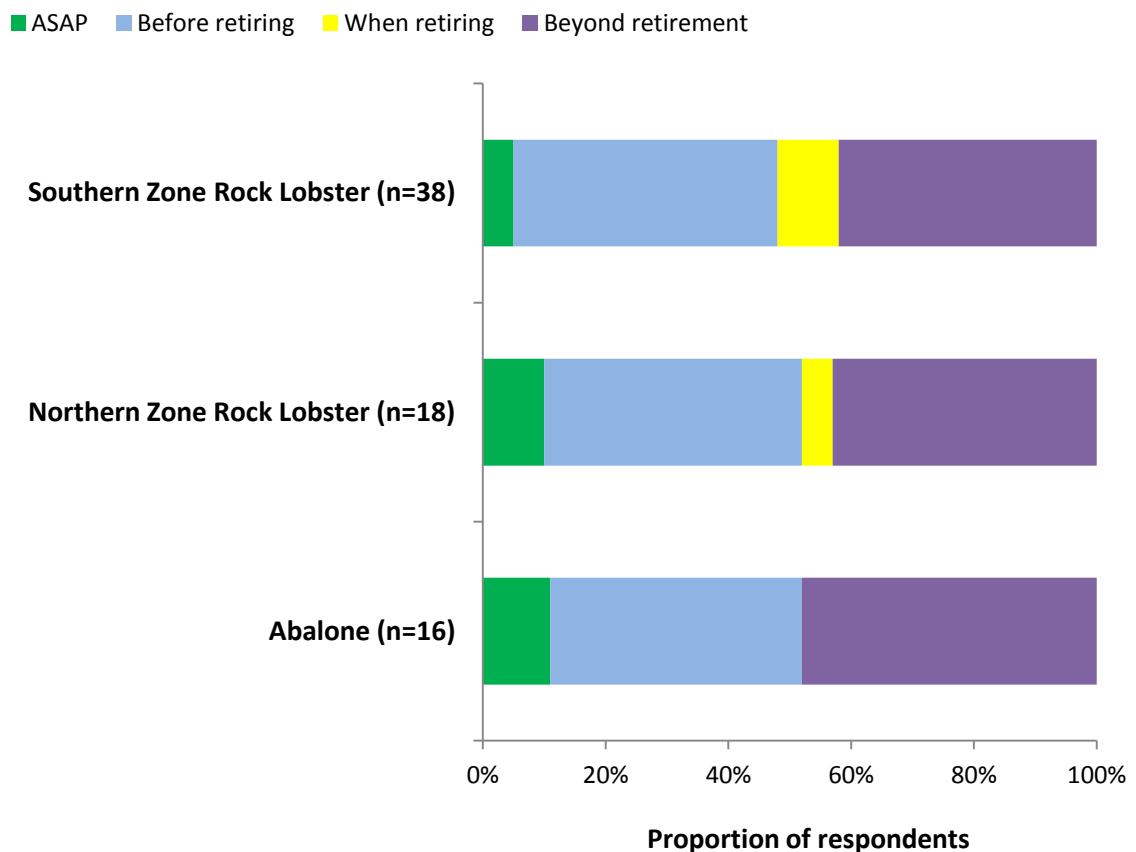


Figure 7 Comparison of intentions of commercial fishers to leave fishing for the Southern Zone Rock Lobster, Northern Zone Rock Lobster and Abalone fisheries of South Australia. ASAP = As soon as possible.

Indicator 1.3.1-Level of satisfaction fishers have with the amount of consultation undertaken by fisheries managers

How do you collect data: Survey of fishers involved in consultation processes.	Measurement cost: Medium	Measurement complexity: Low	Indicator independence: High
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Social objective this indicator addresses: Objective 1.3 - Ensure appropriate mechanisms exist for fisher involvement in development of fisheries management advice.

What is the indicator? This indicator measures how satisfied fishers feel with the level of consultation undertaken by fisheries managers. As with other indicators, longitudinal data sets can be used to measure of how this is changing over time.

Why is it measured? A fisher's overall satisfaction with fisheries consultation processes is a useful indicator of whether these consultation processes are effective. This indicator therefore provides an overall measure of whether consultation processes are satisfactory. It should be considered a 'headline' indicator. Other indicators for this objective then 'unpack' this headline to identify what aspects of consultation are working well and those which are not.

How is it measured? This indicator is measured through a survey of fishers involved in consultation processes, in which they are asked how satisfied they feel with consultation by fisheries managers. This is achieved by asking them the extent to which they agree or disagree with the following statement: *'I am satisfied with the level of consultation [fisheries management agency] undertakes with fishers on management decisions about the [specify fishery]'*.

How is it analysed and interpreted?

This indicator is being met if: <45% of fishers indicate they are dissatisfied with consultation, and this percentage is falling over time.	There is need to consider further management action if: >45% but <55% of fishers indicate they are dissatisfied with the level of consultation, but this percentage is declining over time, suggesting that there is positive change but continuing action is needed.	There is an urgent need for management action if: the proportion of fishers indicating they are dissatisfied with fisheries consultation is increasing, or >55% are dissatisfied and there is no change in this level.
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Key considerations: It is possible that an increase in dissatisfaction reflects fisher's concerns about the outcomes of fisheries consultation processes, rather than the consultation processes *per se*. However, when tested during the fisher surveys of the Marine Scalefish, Rock Lobster, Abalone and Recreational fisheries of South Australia, the question specified was interpreted correctly by respondents as being about the process of consultation.

Including this indicator together with others measuring satisfaction with various outcomes of fisheries management helps to provide fishers with an opportunity to comment on their views of both the outcomes of fisheries management and the consultation processes used.

Decision triggers and management responses: If satisfaction with consultation processes is declining, or is very low overall, fisheries managers should:

- Identify what aspects of their consultation processes are considered insufficient. This requires evaluating the methods used and whether all stakeholders are being reached by these methods and are able to take part in the consultation processes held. Some of the other indicators for Objective 1.3 assist with this; however, expert assistance may be needed to fully evaluate limitations of the consultation processes. This stage can also be used to identify if an increase in dissatisfaction with consultation is a ‘protest’ against outcomes of those management processes; and
- Identify strategies to address identified gaps and issues with existing consultation processes and implement these.

Examples

Table 15 gives a worked example of the steps of collecting data, analysing it and identifying whether the indicator is green, orange or red for the Marine Scalefish, Rock Lobster, Abalone and Recreational fisheries of South Australia.

Table 15 Step by step guide to measuring Indicator 1.3.1, using data from the Marine Scalefish, Rock Lobster, Abalone and Recreational fisheries of South Australia.

Include these questions in a survey of fishers:	<p>Q. To what extent do you agree or disagree with the following statement: ‘I am satisfied with the level of consultation [fisheries management agency] undertakes with fishers’.</p> <p><input type="checkbox"/> Strongly disagree <input type="checkbox"/> Disagree <input type="checkbox"/> Neither agree nor disagree <input type="checkbox"/> Agree <input type="checkbox"/> Strongly agree <input type="checkbox"/> Unsure</p>			
Analyse the basic data:	Fishery	Disagree (strongly disagree & disagree)	Neither agree nor disagree	Agree (strongly agree & agree)
	Marine Scalefish (SA)	42.9%	20.0%	37.1%
	Rock Lobster (SA)	42.4%	20.3%	37.3%
	Abalone (SA)	11.8%	23.5%	64.7%
	Recreational (SA)	49.5%	27.8%	22.7%
Identify if indicator is green, orange or red	SA Marine Scalefish Fishery SA Rock Lobster Fishery SA Abalone Fishery	SA Recreational Fishery		

Indicator 1.3.2-Proportion of fishers actively participating in fisheries management advisory groups

How do you collect data: Management agency & fisher survey	Measurement cost: Medium	Measurement complexity: Low	Indicator independence: Medium-management agency High-fisher survey
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Social objective this indicator addresses: Objective 1.3 - Ensure appropriate mechanisms exist for fisher involvement in development of fisheries management advice.

What is the indicator? This indicator measures the proportion of fishers participating in fisheries management, utilising participation in consultation and management processes.

Why is it measured? Measuring whether stakeholders are participating in fisheries management is useful to identify whether there are critical issues that need to be addressed in order to ensure that fisheries managers hear the views of all fishers as part of making management decisions. However, the indicator does not provide any guidance on what might be causing low rates of participation.

How is it measured? This indicator can be measured in two ways. First, fisheries managers can record participation in consultation processes over time and identify whether it is increasing or decreasing. In some cases, this will require data requests to representative organisations and identifying what proportion of the membership of that organisation are actively involved in commenting on management issues. Second, this indicator can be measured via a survey of fishers, in which fishers are asked whether they have participated in any consultation activities (usually specifying the types of consultation the fisheries management agency uses).

How is it analysed and interpreted? The analysis and interpretation of this indicator can be difficult, as the reasons for an increase in participation can be positive or negative (e.g. a change in consultation methods may reach a larger number of fishers or a change to management may be controversial and attract high participation by fishers seeking to protest it), as can the reasons for a decrease in participation (this may be the result of lack of opportunities to consult or of increasing confidence in management resulting in fishers not feeling a need to participate). Therefore, this indicator should be used to identify where further information may be needed to evaluate the reasons for a change in participation, and to contextualise other indicators. It should not be the sole indicator used to measure this objective.

This indicator is being met if: >50% of commercial fishers & >10% of recreational fishers take part in consultation activities, and this is stable over time (i.e. high participation is not because of a controversial fisheries decision, but is sustained irrespective of the particular issues of the day).	There is need to consider further management action if: <10% of recreational fishers or <50% of commercial fishers take part in consultation activities with managers	There is an urgent need for management action if: participation in consultation is declining over time, or is low. What is considered low will vary by fishery. A higher participation may be expected from commercial fishers compared to recreational fishers, as decisions affect their daily lives.
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Key considerations: Considerable care is needed in interpreting results of this indicator. For the reasons noted earlier, further work should always be done to identify the reasons for a particular level of participation in consultation activities or a decline in this level.

Decision triggers and management responses: This indicator provides a guide to when fisheries managers should undertake further investigation of the adequacy of their consultation processes. When low proportions of fishers participate in consultation, or participation is declining, the reasons for this change should first be assessed through identifying why people are not choosing to participate (Indicators 1.3.3 to 1.3.6 provide information on this). After identifying the causes of non-participation, the necessity for management action can be assessed. If low participation is a result of high trust in fisheries management, for example, no action may be needed, whereas if it is a result of fishers not being offered consultation options they can access easily, there is a clear need to design and implement new approaches to consultation.

Examples

Tables 16 and 17 give worked examples of the steps of collecting data, analysing it and identifying whether the indicator is green, orange or red. The examples given in Table 19 are from the Marine Scalefish and Recreational fisheries of South Australia, while Table 20 provides the results from the East Coast Trawl Fishery of Queensland and the Marine Scalefish, Rock Lobster and Abalone fisheries of South Australia.

Table 16 Step by step guide to measuring Indicator 1.3.2, using data from the Marine Scalefish and Recreational fisheries of South Australia.

Include this question in a survey of fishers:	<p>Q. 'Have you had any involvement in recreational fishing management processes (e.g. through attending public meetings, making a submission, talking to the fishery manager, talking to committee members, or others)?'</p> <p><input type="checkbox"/>Yes <input type="checkbox"/>No</p>		
Analyse the basic data:	Fishery	Yes	No
	Marine Scalefish (SA)	22.2%	77.8%
	Recreational (SA)*	30.9%	69.1%
	* the results from the Recreational Fishery of South Australia are likely overestimate involvement as more avid fishers were more likely to respond to the survey		
Identify if indicator is green, orange or red	SA Recreational Fishery	SA Marine Scalefish Fishery	

Table 17 Step by step guide to measuring Indicator 1.3.2, using data from the East Coast Trawl Fishery of Queensland and the Marine Scalefish and Recreational fisheries of South Australia.

Ask these questions of fisheries managers:	<p>Q. 'Approximately what proportion of the fishers in your fishery have you communicated with in each of the following ways in the last 12 months (face to face meeting, phone conversation, letter or email, meeting with groups, meeting with association)?'</p> <p>Q. 'Approximately what proportion of fishers and other stakeholders that you aim to engage with have actively participated in fisheries management in the last 12 months, through any of the methods listed in the previous questions?'</p>						
Analyse the basic data:	What proportion of fishers in your fishery have you communicated within each of the following ways in the last 12 months?					What proportion of fishers/ stakeholders that you aim to	
	Fishery	Face to face	Phone	Letter or emails	Meet with groups	Meet with association	engage with have actively participated in fisheries management in the last 12 months
	Marine Scalefish (SA)	<20%	< 20%	40-59%	< 20%	20-39%	20-39%
	East Coast Trawl (QLD)	<20%	< 20%	80% +	< 20%	< 20%	< 20%
	Rock Lobster (SA)	<20%	< 20%	< 20%	< 20%	40-59%	20-39%
	Abalone (SA)	<20%	20-39%	< 20%	< 20%	40-59%	40-59%
Identify if indicator is green, orange or red	SA Abalone Fishery		SA Marine Scalefish Fishery QLD East Coast Trawl Fishery SA Rock Lobster Fishery				

Indicator 1.3.3-Presence of fisher representatives on fisheries management advisory groups

How do you collect data: Management agency	Measurement cost: Low	Measurement complexity: Low	Indicator independence: Low
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Social objective this indicator addresses: Objective 1.3 - Ensure appropriate mechanisms exist for fisher involvement in development of fisheries management advice.

What is the indicator? This indicator identifies whether fishers have opportunities to be represented on fisheries management advisory groups (e.g. by having a member of their fishing association sit on the advisory group).

Why is it measured? It is critical to ensure fishers have a mechanism by which they can have their views heard as part of fisheries management. This indicator assesses if one critical mechanism is in place, i.e. having representation on advisory groups. Such representation facilitates having fishers' views heard when decision making processes are undertaken.

How is it measured? This indicator is measured by asking the fisheries manager to answer 'yes', 'no' or 'some, but not all' to the question '*do all fishers have representatives who advocate for their interests on fisheries management advisory groups?*' The question can only be answered 'yes' if all fishers are represented and this requires that industry representatives represent all fishers. If this is not the case – i.e. if the fisher representative represents only the 10% of fishers who are members of their fishing association and the other 90% of fishers are not represented – the fisheries manager should answer 'some, but not all'. The fisheries manager is also asked to answer 'yes' or 'no' to the questions '*do you specifically identify and document what individuals and groups are materially affected by management of this fishery?*' and '*do you specifically identify and document what individuals and groups have an interest in the management of this fishery even if they are not materially affected by management decisions?*' (see fisheries managers survey in Appendix 4).

How is it analysed and interpreted?

This indicator is being met if: the fisheries manager answers 'yes' to all three questions	There is need to consider further management action if: the fisheries manager answers 'some, but not all' to the question ' <i>do all fishers have representatives who advocate for their interests on fisheries management advisory groups?</i> ', or answers 'no' to one or both of the other two questions.	There is an urgent need for management action if: the fisheries manager answers 'no' to the question ' <i>do all fishers have representatives who advocate for their interests on fisheries management advisory groups?</i> ', or answers 'no' to the other two questions.
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Key considerations: While this indicator can appear simple, it is more complex than it first appears. It asks the fisheries manager to analyse the extent to which representatives sitting on a management advisory group truly represent the interests of all the fishers whose views need representation. This may require the fisheries manager to explore exactly what proportion of fishers are represented by different fishing associations, and how fishers who are not formal members of fishing associations or other groups can have their views heard.

Decision triggers and management responses: If the answer is ‘some but not all’ or ‘no’ to the question ‘do all fishers have representatives who advocate for their interests on fisheries management advisory groups?’, then management action is needed:

- If current representatives can advocate for some, but not all, fishers, consideration should be given to:
 - Can the fisheries management agency provide support to assist the fishing associations to survey or canvas the views of fishers who aren’t their members, thus enabling them to better represent their views?
 - Can other methods be used to canvas the views of fishers not currently represented?
- If there are no representatives of fishers on management advisory groups:
 - Carefully identify what groups currently exist that can advocate on behalf of fishers, and whether they represent all fishers; and
 - Identify appropriate representation based on this analysis and identify pathways and action plans to gain representation.

Examples

Table 18 gives a worked example of the steps of collecting data, analysing it and identifying whether the indicator is green, orange or red for the East Coast Trawl Fishery of Queensland and the Marine Scalefish, Rock Lobster and Abalone fisheries of South Australia.

Table 18 Step by step guide to measuring Indicator 1.3.3, using data from the East Coast Trawl Fishery of Queensland and the Marine Scalefish, Rock Lobster and Abalone fisheries of South Australia.

Ask these questions of fisheries managers:	<p>Q. ‘Do all fishers have representatives who advocate for their interests on fisheries management advisory groups?’</p> <p>Q. ‘Do you specifically identify and document what individuals and groups are materially affected by management of this fishery?’</p> <p>Q. ‘Do you specifically identify and document what individuals and groups have an interest in the management of this fishery even if they are not materially affected by management decisions?’</p>			
Analyse the basic data:	Fishery	Do all fishers have industry representatives	Do you identify who is materially affected	Do you identify who has an interest in management
	Marine Scalefish (SA)	Yes	Yes	Yes
	East Coast Trawl (QLD)	No	Yes	Yes
	Rock Lobster (SA)	Yes	Yes	Yes
	Abalone (SA)	Yes	Yes	Yes
Identify if the indicator is green, orange or red:	SA Marine Scalefish Fishery SA Rock Lobster Fishery SA Abalone Fishery			QLD East Coast Trawl Fishery

Indicator 1.3.4-Existence of formal documented processes for providing feedback to stakeholders about fisheries management decisions, and how stakeholder input was used in those decisions

How do you collect data: Management agency	Measurement cost: Low	Measurement complexity: Low	Indicator independence: Medium
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Social objective this indicator addresses: Objective 1.3 - Ensure appropriate mechanisms exist for fisher involvement in development of fisheries management advice.

What is the indicator? This indicator asks whether processes exist to provide stakeholders with feedback on how their input has been used when making management decisions.

Why is it measured? One of the most challenging aspects of consulting stakeholders is an often low willingness on the part of stakeholders to invest time and effort in participating in consultation activities. This reluctance often results from disillusionment and a sense that their input is not being heard. Conversely, stakeholders who are given feedback telling them how their input was used feel better valued and are more likely to continue participating in consultation processes. Ensuring a formal process of feedback exists is therefore critical to ensuring long-term success of consultation processes. Formalising feedback processes ensures they continue even when fisheries management staffing changes occur.

How is it measured? The fisheries manager is asked to answer the following questions:

- *‘Is there a formal process of feedback to stakeholders that will be continued by other staff if a new person takes over management of the fishery (yes, no, unsure)?’*
- *‘How often is feedback provided to stakeholders about their input into management processes (never, occasionally when significant changes in fishery management occur, regularly as part of updates about management, or other)?’* and
- *‘When feedback is provided to stakeholders, how is it provided (e.g. informally or formally through conversations, in writing letters sent to individuals, newsletters or notices, by placing a notice on the website, or other)?’*

How is it analysed and interpreted?

This indicator is being met if: a formal, regular process for providing feedback is in place, and is a documented part of management processes.	There is need to consider further management action if: feedback is given, but not in a formalised manner, and without documented requirements to provide feedback in management plans and other relevant documents.	There is an urgent need for management action if: feedback is not given to stakeholders, or feedback is given only very infrequently.
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Key considerations: Provision of feedback is often done in a relatively *ad hoc* manner, without consistent consideration of whether stakeholders are receiving appropriate feedback. Fisheries managers are not considered to have met this indicator unless they have a consistent, documented feedback process that will survive changes in staffing. This can seem an onerous requirement, however, having such a process for providing feedback can reduce administrative difficulties associated with tracking people who have given input, as it will ensure consistent tracking of and communication with stakeholders during and after consultation processes.

Decision triggers and management responses: If there is a lack of feedback to stakeholders on how their input provided in consultation processes is used, or only informal and *ad hoc* feedback provided, the following management action is needed:

- First, decide what types of feedback will be provided and when (i.e. for what types of decisions and in what format). More active feedback is preferable, e.g. through individualised letters written to stakeholders. However, this is not always feasible and more passive feedback, such as a notice on a website with fishers sent the link in a group email, can be a significant step forward in terms of providing feedback; and
- Second, ensure this type of feedback is formally required as part of the work activities of the fisheries manager (and considered when setting workloads and rewarded in performance reviews).

Examples

Table 19 gives an example of the steps of collecting data, analysing it and identifying whether the indicator is green, orange or red for the East Coast Trawl Fishery of Queensland and the Marine Scalefish, Rock Lobster and Abalone fisheries of South Australia.

Table 19 Step by step guide to measuring Indicator 1.3.4, using data from the East Coast Trawl Fishery of Queensland and the Marine Scalefish, Rock Lobster and Abalone fisheries of South Australia.

Ask these questions of fisheries managers:	<p>Q. 'Is there a formal process of feedback to stakeholders that will be continued by other staff if a new person takes over management of the fishery (yes, no, unsure)?'</p> <p>Q. 'How often do you provide feedback to stakeholders about how their input to management processes (never, occasionally when significant changes in fishery management occur, regularly as part of updates about management, or other)?'</p> <p>Q. 'When you provide feedback to stakeholders, how do you provide it (informally or formally)?'</p>			
Analyse the basic data:	<p>Fishery</p>	<p>Is there a process to provide feedback?</p>	<p>How often is feedback provided?</p>	<p>How is feedback provided?</p>
	Marine Scalefish (SA)	No	Occasionally-for significant changes to management	Letter/email, newsletter, media release Informal phone conversation
	East Coast Trawl (QLD)	Yes	Occasionally-for significant changes to management	Letter/email, website
	Rock Lobster (SA)	No	Occasionally-for significant changes to management	Letter/email, newsletter, media release Informal phone conversation
	Abalone (SA)	No	Occasionally-for significant changes to management	Letter/email, newsletter, media release Informal phone conversation
Identify if the indicator is green, orange or red:	QLD East Coast Trawl Fishery	SA Marine Scalefish Fishery SA Rock Lobster Fishery SA Abalone Fishery		

Indicator 1.3.5-Level of fisher awareness of methods to have input into fisheries management processes

How do you collect data: Management agency and fisher survey	Measurement cost: Medium	Measurement complexity: Low	Indicator independence: High
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Social objective this indicator addresses: Objective 1.3 - Ensure appropriate mechanisms exist for fisher involvement in development of fisheries management advice.

What is the indicator? This indicator identifies whether fishers have adequate knowledge of the ways in which they can have their say as part of fisheries management processes.

Why is it measured? For fishers to take part in consultation processes, they must first be aware that the consultation process exists. Lack of awareness of methods by which they can have a say is a common reason for lack of participation in consultative processes. Fisheries managers should therefore invest in ensuring fishers are aware of opportunities to be involved in such processes.

How is it measured? This indicator can be measured using two sources of information, which are complementary (one does not replace the other, but each on its own can provide useful information). First, fisheries managers can be asked to identify the methods by which they currently make fishers aware of consultation processes. Second, a survey of fishers can be used to identify how many fishers agree with the statement '*if I want to have a say in how [name of fishery] is managed, I know how to*'. The latter is an objective measure of fisher awareness of consultation processes. Together, this information enables identification of whether there is adequate awareness (fisher survey data) and what methods may be working or not working to raise that awareness (fisheries manager data).

How is it analysed and interpreted? Different thresholds may need to be applied for recreational and commercial fisheries. In the latter, the expectation should be that the large majority (>90%) of fishers know how to have a say, whereas for recreational fisheries, where many fishers may not take an interest in or have contact with fisheries management, a lower threshold may be acceptable.

This indicator is being met if: 70% of fishers are aware of how they can have a say in how the fishery is managed, and this is staying stable or increasing over time.	There is need to consider further management action if: 30-70% of fishers are aware of how they can have a say in how the fishery is managed, even if this proportion is increasing over time	There is an urgent need for management action if: the proportion of fishers who know how to have a say is declining, or is <30%.
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Key considerations: The 'threshold' level considered to be an acceptable proportion of fishers who understand how they can have input into fisheries management may vary for different fisheries, as not all fishers wish to have any input to consultative processes. An appropriate threshold can be determined by asking, as part of a fishery survey, whether they wish to have a say in fisheries management. The proportion indicating they would prefer to have a say can be used to set appropriate threshold targets relevant to the specific fishery.

Decision triggers and management responses: If too few fishers are aware of how they can have a say in fisheries management, management action is needed. Specifically, management should invest in better identifying the methods by which fishers can be readily made aware of consultation opportunities. Consideration may be given to whether (and which) fishers will be reached by notices placed in key fishing locations, on fishing websites, in newsletters, in newspapers, or whether an email database needs to be developed and maintained over time that can be used to notify interested fishers of opportunities to participate in consultation activities.

Examples

Table 20 gives a worked example of the steps of collecting data, analysing it and identifying whether the indicator is green, orange or red for the Rock Lobster, Abalone and Recreational fisheries of South Australia.

Table 20 Step by step guide to measuring Indicator 1.3.5, using data from the Rock Lobster, Abalone and Recreational fisheries of South Australia.

<p>Include this question in a survey of fishers:</p>	<p>Q. To what extent do you agree or disagree with the following statements... [a list of statements will follow; the one relevant to this indicator is as follows] 'If I want to have a say in the management of [fishery], I know how to'.</p> <p><input type="checkbox"/> Strongly disagree <input type="checkbox"/> Disagree <input type="checkbox"/> Neither agree nor disagree <input type="checkbox"/> Agree <input type="checkbox"/> Strongly agree <input type="checkbox"/> Unsure</p>			
<p>Analyse the basic data:</p>	<p>Fishery</p>	<p>Disagree (strongly disagree & disagree)</p>	<p>Neither agree nor disagree</p>	<p>Agree (strongly agree & agree)</p>
	<p>Rock Lobster (SA)</p>	<p>11.9%</p>	<p>5.1%</p>	<p>83.1%</p>
	<p>Abalone (SA)</p>	<p>0%</p>	<p>5.9%</p>	<p>94.2%</p>
	<p>Recreational (SA)</p>	<p>38.5%</p>	<p>24.7%</p>	<p>36.8%</p>
<p>Identify if indicator is green, orange or red</p>	<p>SA Rock Lobster Fishery SA Abalone Fishery</p>	<p>SA Recreational Fishery</p>		

Indicator 1.3.6–Level of knowledge fishers have on how to contact their representatives in fisheries management/ advisory processes

How do you collect data: Fisher survey	Measurement cost: Medium	Measurement complexity: Low	Indicator independence: High
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Social objective this indicator addresses: Objective 1.3 - Ensure appropriate mechanisms exist for fisher involvement in development of fisheries management advice.

What is the indicator? This indicator identifies the level of a fisher’s knowledge about how to contact the people who represent their interests in fisheries management processes – e.g. staff of fishing associations or clubs who participate in these processes to represent fisher’s views.

Why is it measured? For fishers to be appropriately represented, they must be aware of who their representatives are. Similarly to Indicator 1.3.5, a lack of awareness of the representatives they can contact to present their views is a common reason for lack of participation in consultative processes. Fisheries managers should therefore invest in ensuring fishers are aware of who their representatives are.

How is it measured? This indicator can be measured using a survey of fishers to identify how many fishers agree with the statement ‘*do you know how to contact the people who represent your interests on fisheries advisory committees?*’ This is an objective measure of fisher awareness of how to contact representatives if they have issues around fisheries management they would like to have raised.

How is it analysed and interpreted? Different thresholds may need to be applied for recreational and commercial fisheries. In the latter, the expectation should be that the large majority (>90%) of fishers know how to contact their industry representatives, whereas for recreational fisheries, where many fishers may not take an interest in, or wish, to have contact with representatives, a lower threshold could be deemed acceptable.

This indicator is being met if: >70% of fishers are aware of how they can contact their industry representative, and this is staying stable or growing over time.	There is need to consider further management action if: only 30-70% of fishers are aware of how they can contact their industry representative, even if this proportion is growing over time	There is an urgent need for management action if: the proportion of fishers who know how to contact their industry representative is declining, or is <30%.
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Key considerations: As with Indicator 1.3.5, the ‘threshold’ level considered to be an acceptable proportion of fishers who understand who their representative is may vary for different fisheries. An appropriate threshold can be determined by asking, as part of a survey of fishers, whether fishers wish to have a say in fisheries management either directly, or via a representative. The proportion indicating they would prefer to have a say via a representative can be used to set appropriate threshold targets relevant to the specific fishery.

Decision triggers and management responses: If too few fishers are aware of whom their representatives are, management action is needed. Specifically, management should invest in better identifying how to communicate to fishers who their representatives are, and whether those representatives need support to ensure they can communicate their presence to fishers. Fisheries managers may, for example, consider which fishers will be reached by notices placed in key fishing locations, on fishing websites, in newsletters, in newspapers, or whether an email database needs to be developed and maintained over time that can be used to notify interested fishers of who their representatives are and how to contact them.

Examples

Table 21 gives a worked example of the steps of collecting data, analysing it and identifying whether the indicator is green, orange or red for the Marine Scalefish, Rock Lobster and Abalone fisheries of South Australia.

Table 21 Step by step guide to measuring Indicator 1.3.6, using data from the Marine Scalefish, Rock Lobster and Abalone fisheries of South Australia.

Include this question in a survey of fishers:	<p>Q. 'Do you know how to contact the people who represent your interests on fisheries advisory committees?'</p> <p><input type="checkbox"/>Yes <input type="checkbox"/>No</p>		
Analyse the basic data:	Fishery	Yes	No
	Marine Scalefish (SA)	75.2%	24.8%
	Rock Lobster (SA)	91.1%	8.9%
	Abalone (SA)	94.1%	5.9%
	Recreational (SA)	39.6%	60.4%
Identify if indicator is green, orange or red	<p>SA Marine Scalefish Fishery</p> <p>SA Rock Lobster Fishery</p> <p>SA Abalone Fishery</p>	SA Recreational Fishery	

Indicator 1.4.1-Level of satisfaction fisher representatives have with their overall representation skills and resources

How do you collect data: Survey of members of advisory committees	Measurement cost: Low	Measurement complexity: Low	Indicator independence: High
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Social objective this indicator addresses: Objective 1.4 - Improve the ability of fishers to participate effectively in fisheries management advisory processes.

What is the indicator? This indicator identifies whether the individuals responsible for representing the views of different fisher groups in management advisory processes (e.g. through writing submissions or sitting on committees) have adequate skills and knowledge to successfully take part in these processes.

Why is it measured? It is increasingly common to involve representatives of different fisher groups in fisheries management, through asking them to take part in committees providing management advice, writing submissions, etc. This type of representation can require sophisticated skills in interpreting complex scientific data, communication and negotiation. For example, if you ask representatives to help make allocation or reallocation decisions, you need to ensure they have the skills needed to interpret key scientific data, as well as potentially to have knowledge of principles of equity and justice used to inform allocation decisions. Participation can also result in considerable cost for representatives who often commit significant amounts of time and may incur travel costs or lost income from their 'day-jobs' to participate in consultative processes.

How is it measured? This is measured through a survey of fisher representatives in advisory committees to identify their level of satisfaction with their skills and with the resources available to enable them to successfully represent the interests of the people who views they are responsible for representing. They are asked how satisfied they are with the ability to understand fisheries management information they have to read as part of their representation role, interpret relevant scientific data and communicate the views of their group verbally and in writing. They are also asked whether they incur travel or other costs to undertake their representation that are not reimbursed by their organisation or the fisheries management agency. This can be partnered by adding the fisheries manager's own assessment of skills and resourcing needs and whether these are being met (measured in Indicator 1.4.2). However, if only the view of the fisher manager is used, the independence of the indicator is reduced.

How is it analysed and interpreted?

This indicator is being met if: >80% of representatives are satisfied with their skills and resources, and those who are not satisfied have mechanisms by which they can improve their skills and access to resources.	There is need to consider further management action if: some representatives (20-50%) are dissatisfied with some types of skills or access to resources.	There is an urgent need for management action if: >50% of representatives are dissatisfied with their skills or resources.
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Key considerations: The specific questions for this indicator need to be customised to the skills needed to successfully participate in those representative processes required for the fishery.

Decision triggers and management responses: If key skills and resources are identified as lacking by a significant proportion of representatives, management action is needed to address the ability of representatives to effectively participate in management decision making processes.

Examples

No data were collected during this study from fisher representatives who sit on advisory committees. We suggest data is collected for this indicator using the following questions on surveys of members of representatives participating in management advisory processes (with suggested response options in brackets):

- *'I understand the fisheries management information I am presented in this group'* (strongly disagree, disagree, neither, agree, strongly agree):
- *'I am able to effectively represent my group on this committee I have the skills I need to interpret and understand scientific data on this fishery'* (strongly disagree, disagree, neither, agree, strongly agree):
- *'Adequate resources are provided to help me fulfil my role on this committee'* (strongly disagree, disagree, neither, agree, strongly agree); and
- *'Further training in understanding the information we examine on this committee would be useful'* (strongly disagree, disagree, neither, agree, strongly agree).

Additional statements can be added as necessary, tailored to evaluating whether people have access to the skills and resources they need to effectively represent their groups.

Indicator 1.4.2-Provision of support for stakeholders to effectively participate in fisheries management processes

How do you collect data: Management agency	Measurement cost: Low	Measurement complexity: Low-Medium	Indicator independence: Medium
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Social objective this indicator addresses: Objective 1.4 - Improve the skills of fishers and fisheries managers participating in fisheries management advisory processes.

What is the indicator? This indicator identifies whether fisheries managers are enabling capacity building of those involved in fisheries management, through supporting access to the skills and resources they need to effectively represent fisher views.

Why is it measured? This indicator partners Indicator 1.4.1 by identifying how the fisheries management agency is supporting capacity building and must be undertaken in conjunction with 1.4.1. As described for Indicator 1.4.1, sometimes stakeholders asked to participate in management processes lack the skills or resources to do so effectively. Fisheries managers need to address capacity constraints by ensuring stakeholders can build the specific skills (e.g. ability to interpret scientific data) and access the resources necessary (e.g. having travel costs provided) to enable them to participate effectively in these processes.

How is it measured? This indicator is measured by asking fisheries managers to identify whether they have provided access to expertise, skills building and other resources in the previous 12 months (including expert presentations discussing scientific data, training courses for stakeholders, reimbursement of travel costs or other payments, or other support).

How is it analysed and interpreted? This indicator can only be properly analysed and interpreted in partnership with Indicator 1.4.1, which provides the data needed to evaluate whether the methods documented in Indicator 1.4.2 are sufficient to meet the needs of representatives.

This indicator is being met if: representatives are being provided opportunities to build capacity and access resources in all areas that have been identified as critical to ensuring they can successfully contribute to fisheries management.	There is need to consider further management action if: representatives are being provided opportunities to build capacity and access resources in some, but not all areas that have been identified as critical to ensuring they can successfully contribute to fisheries management.	There is an urgent need for management action if: representatives are being provided opportunities to build capacity and access resources in few or none of the areas that have been identified as critical to ensuring they can successfully contribute to fisheries management.
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Key considerations: This is a contextual indicator and the provision of particular types of capacity building opportunities or resources can only be considered successful if management has first identified the specific skill and resource-related needs of representatives taking part in fisheries management. It is therefore critical to have evaluated these needs (through Indicator 1.4.1 or other means) prior to measuring this indicator.

Decision triggers and management responses: If representatives are not being provided adequate access to skills building and resources that they need to successfully take part in fisheries management processes, management action is needed. Fisheries managers should first identify what specific skills and resources are believed to be lacking and then identify, in collaboration with those representatives and representative bodies, the actions that can best address this, and ensure that representatives are given access to these skills and resources wherever possible.

Examples

Table 22 gives a worked example of the steps of collecting data, analysing it and identifying whether the indicator is green, orange or red for the East Coast Trawl Fishery of Queensland and the Marine Scalefish, Rock Lobster and Abalone fisheries of South Australia.

Table 22 Step by step guide to measuring Indicator 1.4.2, using data from the East Coast Trawl Fishery of Queensland and the Marine Scalefish, Rock Lobster and Abalone fisheries of South Australia.

<p>Include this question in a survey of fishers:</p>	<p>Q. ‘Which of the following opportunities did you provide to stakeholders involved in fisheries management in the last 12 months (all are methods of building skills and capacity to participate)?’</p> <p><input type="checkbox"/> Expert presentations discussing scientific data on the fishery</p> <p><input type="checkbox"/> Training courses for members of advisory committees or other stakeholders involved in management</p> <p><input type="checkbox"/> Resources to facilitate participation, such as reimbursement of costs to attend meetings</p> <p><input type="checkbox"/> Other (please describe)</p>				
<p>Analyse the basic data:</p>		<p>Which of the following opportunities did you provide to stakeholders involved in fisheries management in the last 12 months</p>			
	<p>Fishery</p>	<p>Expert presentations</p>	<p>Training course</p>	<p>Resources</p>	<p>Other</p>
	<p>Marine Scalefish (SA)</p>	<p>Yes</p>	<p>No</p>	<p>No</p>	<p>No</p>
	<p>East Coast Trawl (QLD)</p>	<p>Yes</p>	<p>No</p>	<p>Yes</p>	<p>No</p>
	<p>Rock Lobster (SA)</p>	<p>Yes</p>	<p>No</p>	<p>Yes</p>	<p>No</p>
	<p>Abalone (SA)</p>	<p>Yes</p>	<p>No</p>	<p>Yes</p>	<p>No</p>
<p>Identify if indicator is green, orange or red</p>			<p>SA Marine Scalefish Fishery QLD East Coast Trawl Fishery SA Rock Lobster fishery SA Abalone Fishery Note: this ranking of orange assumes some training is needed; ideally, this would be evaluated through Indicator 1.4.1 and if training was not needed, these fisheries would be ‘green’, with the exception of the Marine Scalefish fishery given the lack of provision of resources.</p>		

Indicator 1.5.1-Level of fisher trust in the fisheries agency responsible for the fishery

How do you collect data: Fisher survey	Measurement cost: Medium	Measurement complexity: Low	Indicator independence: High
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Social objective this indicator addresses: Objective 1.5 - Industry stakeholders have a high level of trust in the management of fisheries.

What is the indicator? This indicator measures whether fishers trust the fisheries management agency to manage the fishery.

Why is it measured? Many of the objectives in this Guide aim to ensure that management processes are in place that enable fishers to receive positive social benefits from their fishing activities. One of the outcomes desired by fisheries managers is that fishers trust their management, and a high level of trust is a useful indicator of whether there are overall problems in terms of management achieving desired social outcomes.

How is it measured? This indicator is measured through a fisher survey, with fishers asked the extent to which they agree or disagree with the following statement: *'I trust [fisheries management agency] to make the right decisions for managing [fishery]'*.

How is it analysed and interpreted?

This indicator is being met if: the proportion of fishers indicating they don't trust the fisheries management agency is <50%, and stable or growing.	There is need to consider further management action if: the proportion of fishers indicating they don't trust the fisheries management agency is >50%, but declining.	There is an urgent need for management action if: the proportion of fishers indicating they don't trust the fisheries management agency is >50% and stable or increasing, or is <50% but increasing over time.
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Key considerations: This is a useful overall indicator of whether a range of social outcomes are being achieved by fisheries managers. If trust is high, this is typically associated with fishing having a range of positive outcomes. If trust is low, there are some issues, but this indicator does not identify what the specific issues are. One option that can be used to better identify the specific trust issues is to ask survey respondents to describe the reasons why they do or don't trust fisheries managers.

Decision triggers and management responses: If the indicator suggests trust is low or declining, fisheries managers need to identify and address the cause of low/declining trust. The analysis of other social indicators can assist with this, but external expertise may need to be used to more formally analyse trust issues. Where there is low trust, this may interfere with successful data collection by fisheries managers, as fishers who do not trust the fisheries management agency are unlikely to be willing to respond to surveys or other requests for input from the agency. In this case, it is recommended to commission an independent evaluation of the issues that are occurring. Once the causes of low trust are identified, management actions can be identified and put in place to address them. Because trust is something that takes a long time to build, especially where it has been low previously, the strategies used should be designed to operate over a long time period.

Examples

Table 23 gives a worked example of the steps of collecting data, analysing it and identifying whether the indicator is green, orange or red for the Rock Lobster, Abalone and Recreational fisheries of South Australia.

Table 23 Step by step guide to measuring Indicator 1.5.1, using data from the Rock Lobster, Abalone and Recreational fisheries of South Australia.

<p>Include this question in a survey of fishers:</p>	<p>Q. To what extent do you agree or disagree with the following statements?...‘I trust [fisheries management agency] to make the right decisions for managing [name of fishery]’</p> <p><input type="checkbox"/> Strongly disagree <input type="checkbox"/> Disagree <input type="checkbox"/> Neither agree nor disagree <input type="checkbox"/> Agree <input type="checkbox"/> Strongly agree <input type="checkbox"/> Unsure</p>			
<p>Analyse the basic data:</p>	<p>Fishery</p>	<p>Disagree (strongly disagree & disagree)</p>	<p>Neither agree nor disagree</p>	<p>Agree (strongly agree & agree)</p>
	<p>Rock Lobster (SA)</p>	<p>52.5%</p>	<p>20.3%</p>	<p>27.1%</p>
	<p>Abalone (SA)</p>	<p>41.2%</p>	<p>29.4%</p>	<p>29.4%</p>
	<p>Recreational (SA)</p>	<p>36.7%</p>	<p>28.6%</p>	<p>34.7%</p>
<p>Identify if indicator is green, orange or red</p>	<p>SA Abalone Fishery SA Recreational Fishery</p> <p>These fisheries are rated green; if subsequent surveys identify a trend of increasing proportion of fishers distrusting fisheries management, they would be re-categorised as orange.</p>	<p>SA Rock Lobster Fishery</p> <p>This fishery is rated orange; if a subsequent survey identified growth in the proportion of fishers who distrust fisheries management, it would shift to being a red indicator</p>		

Indicator 1.5.2-Fisher perceptions¹⁰ of the outcomes of fisheries management

How do you collect data: Fisher survey	Measurement cost: Medium	Measurement complexity: Low	Indicator independence: High
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Social objective this indicator addresses: Objective 1.5 - Industry stakeholders have a high level of trust in the management of fisheries

What is the indicator? This indicator measures whether fishers believe the fisheries management agency is doing a good job of managing the fishery.

Why is it measured? Similar to Indicator 1.5.1, identifying whether fishers think the fisheries management agency is doing a good job is a useful indicator of whether there are overall problems in terms of management achieving desired social outcomes. This indicator is slightly different to Indicator 1.5.1, in that rather than asking about trust, it asks whether the agency is doing a good job. In some cases, fishers may distrust the agency but believe that, at a particular point in time, they are doing a good job (see example in Table 24, where this type of response is seen). The answers to Indicator 1.5.1 provide a longer-term perspective on the relationship between the fisher and the fisheries management agency, while this indicator gives a better understanding of the level of support for the fisheries management agency's actions in the shorter term.

How is it measured? This indicator is measured through a fisher survey, with fishers asked the extent to which they agree or disagree with the following statement: '*[Fisheries management agency] do a good job of managing [fishery]*'.

How is it analysed and interpreted?

<p>This indicator is being met if: the proportion of fishers indicating they don't think the fisheries management agency is doing a good job is <50%, and stable or declining.</p>	<p>There is need to consider further management action if: the proportion of fishers indicating they don't think the fisheries management agency is doing a good job is >50%, but declining.</p>	<p>There is an urgent need for management action if: the proportion of fishers indicating they don't think the fisheries management agency is doing a good job is <50% but increasing or >50% and either stable or increasing.</p>
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Key considerations: This is a useful overall indicator of whether a range of social outcomes are being achieved by fisheries managers. If most fishers think fisheries managers are doing a 'good job', this is typically associated with fishing having a range of positive outcomes in the short-term (although fishers may still not trust that these positive outcomes will continue into the future). One option that can be used to better identify the issues on which management is perceived positively, versus negatively, is to ask survey respondents to describe the areas in which fisheries managers are doing a good versus a poor job.

¹⁰ Perception, as previously noted, is a valid indicator in this context, as the perceptions of fishers about the appropriateness of management drive their responses to this management, and are indicators of fundamental challenges that need to be addressed on an ongoing basis in fisheries management. Perceptions must be recognised and responded to by fisheries managers to avoid perverse or unwanted outcomes, such as reduced levels of compliance with fisheries regulations.

Decision triggers and management responses: If the proportion of fishers who think management is doing a good job is low or declining, management action is needed. The first step is to identify what aspects of fisheries management are considered to be poor. Analysing results of other social indicators can assist with this, but in some cases external expertise may need to be used to more formally analyse performance issues. Once the causes of negative perceptions are identified, management actions can be identified and put in place to address them.

Examples

Table 24 gives a worked example of the steps of collecting data, analysing it and identifying whether the indicator is green, orange or red for the Rock Lobster, Abalone and Recreational fisheries of South Australia.

Table 24 Step by step guide to measuring Indicator 1.5.2, using data from the Rock Lobster, Abalone and Recreational fisheries of South Australia.

<p>Include these questions in a survey of fishers:</p>	<p>Q. To what extent do you agree or disagree with the following statement?... '[fisheries management agency] do a good job of managing [name of fishery]'</p> <p><input type="checkbox"/> Strongly disagree <input type="checkbox"/> Disagree <input type="checkbox"/> Neither agree nor disagree <input type="checkbox"/> Agree <input type="checkbox"/> Strongly agree <input type="checkbox"/> Unsure</p>			
<p>Analyse the basic data:</p>	<p>Fishery</p>	<p>Disagree (strongly disagree & disagree)</p>	<p>Neither agree nor disagree</p>	<p>Agree (strongly agree & agree)</p>
	<p>Rock Lobster (SA)</p>	<p>36.2%</p>	<p>27.6%</p>	<p>36.2%</p>
	<p>Abalone (SA)</p>	<p>5.9%</p>	<p>35.3%</p>	<p>58.9%</p>
	<p>Recreational (SA)</p>	<p>24.6%</p>	<p>32.8%</p>	<p>42.6%</p>
<p>Identify if indicator is green, orange or red</p>	<p>SA Rock Lobster Fishery SA Abalone Fishery SA Recreational Fishery These fisheries are rated green; if subsequent surveys identify a trend of increasing % of fishers who don't think fisheries management is doing a good job, they would be re-categorised as orange.</p>			

Indicator 1.6.1-Trends in fisheries infringements

How do you collect data: Management agency	Measurement cost: Low	Measurement complexity: Low	Indicator independence: High
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Social objective this indicator addresses: Objective 1.6 - Maximise stewardship of fisheries resources.

What is the indicator? This indicator measures whether the number of reported fisheries infringements is increasing, staying the same or decreasing over time.

Why is it measured? If fishers have a strong sense of being stewards of the fishery, this should reduce their engagement in activities that infringe fishing rules. One overall measure of whether this is the case is to track the number of fisheries infringements over time.

How is it measured? This indicator is measured by fisheries manager using infringement records to identify if the number of infringements is remaining stable, increasing or declining over time. If data are available, it is best measured as number of infringements per unit of spending on policing and compliance, to ensure that changes in spending on these activities are not the cause of a change in recorded infringements.

How is it analysed and interpreted?

This indicator is being met if: infringements are dropping over time (as long as this is not the result of a decline in resources dedicated to policing & compliance activities)	There is need to consider further management action if: Infringements are increasing over time (as long as this is not the result of an increase in resources dedicated to policing & compliance activities).	There is an urgent need for management action if: Infringements are increasing rapidly over time (as long as this is not the result of an increase in resources dedicated to policing & compliance activities).
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Key considerations: This indicator has important limitations that must be taken into consideration when interpreting its results. Many factors may contribute to a change in fisheries infringements, only one of which is a change in the responsibility fishers feel to fish sustainably (other factors may include a change in the resources directed to compliance activities or changes in regulations, etc.). Additionally, a change in feeling a sense of stewardship may result both in the reduction of illegal activities, but also in increasing reporting of remaining illegal fishing by fishers, thus resulting in an increase in the number of reported infringements. The interpretation of this indicator therefore requires considerable care and must draw on contextual information about the level of investment contributed to compliance efforts and other information available to the fisheries manager.

Decision triggers and management responses: If infringements are growing over time and the cause is not an increased investment in policing and compliance activities, management action is needed. First, management should investigate whether there are changes other than a fall in stewardship behaviour that are causing the rise in infringements. If no other causes are identified, there is a need to implement new strategies to encourage positive stewardship behaviour by fishers. Consider engaging experts to help identify what strategies would best encourage this type of positive behaviour.

Examples

Table 25 gives a worked example that takes you through the steps of collecting data and analysing it for the East Coast Trawl Fishery of Queensland and the Marine Scalefish, Rock Lobster and Abalone fisheries of South Australia.

Table 25 Step by step guide to measuring Indicator 1.6.1, using data from the East Coast Trawl Fishery of Queensland and the Marine Scalefish, Rock Lobster and Abalone fisheries of South Australia.

Ask this question of fisheries managers:	Q. 'How has the number of fisheries infringements/cautions/prosecutions changed over the last year?'						
Analyse the basic data:	How has the number of fisheries infringements/cautions/prosecutions changed over the last year?						
	Fishery	Number of infringements	Cautions given	Prosecutions	Number of infringements recorded in the fishery in the last 12 months?	Spend on compliance activities and education activities in the last 12 months?	Infringements per \$1000 spent on compliance & education
	Marine Scalefish (SA)	Yes	No	No	Data not collected		No
	East Coast Trawl (QLD)	Yes	No	Yes			No
	Rock Lobster (SA)	Yes	No	Yes			No
	Abalone (SA)	Yes	No	Yes			No
Identify if indicator is green, orange or red	It isn't possible to identify if the indicator is green, orange or red until data are collected for two points in time.						

Indicator 1.6.2-Proportion of fishers who believe that, overall, most fishers comply with fishing rules and regulations

How do you collect data: Fisher survey	Measurement cost: Medium	Measurement complexity: Low	Indicator independence: Medium
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Social objective this indicator addresses: Objective 1.6 - Maximise stewardship of fisheries resources.

What is the indicator? This indicator identifies whether fishers believe that, in general, fishers comply with fishing rules and regulation. This is a measure of self-assessed stewardship since it measures the extent to which fishers perceive social norms encourage compliance with rules and regulation. A social norm refers to the unwritten rules that guide people in how they should behave. If most people feel that most fishers comply with fishing rules and regulations, they are more likely to feel influenced to comply themselves.

Why is it measured? Fisheries management is most effective when fishers feel motivated to act as stewards of the resource. High levels of stewardship are associated with lower costs of management and compliance activities, and a greater ability to achieve ecological sustainability. This indicator is measured to monitor whether there is any change over time in the proportion of fishers who comply with fishing rules and regulations, which in turn is a measure of whether fishers feel motivated as stewards of the resource to comply.

How is it measured? This indicator is measured through a survey of fishers, with fishers asked whether they agree versus disagree with the statement '*most [recreational/commercial] fishers comply with fishing rules and regulations*' (with either 'recreational' or 'commercial' inserted depending on which fishers are being surveyed). This question asks for the general observations of fishers regarding the behaviour of both themselves and other fishers. Although people have an incentive to lie when asked if they themselves are complying with rules and regulations, they are more likely to answer honestly when asked what they have observed in terms of other fisher's behaviour when they are fishing. However, as fishers are commenting on other's behaviour rather than only their own, this indicator has lower independence than some others.

How is it analysed and interpreted?

This indicator is being met if: >80% of fishers agree that in general fishers comply with fishing rules and regulations.	There is need to consider further management action if: between 60-80% of fishers agree with the statement, or if >80% agree but there is a decline over time in the proportion who agree	There is an urgent need for management action if: there is ongoing decline in the proportion of fishers who agree with the statement, or if <60% agree with it.
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Key considerations: The thresholds set for this indicator are high. To be 'green' over 80% of fishers must agree with the statement that, in general, fishers comply with fishing rules and regulations. This is because social norms around stewardship only work well if a large majority of the community follow them. If a small proportion of people don't follow fishing rules and regulations, this is indicative of ongoing problems.

Decision triggers and management responses: When the indicator is ‘orange’ or ‘red’, management action is needed to increase fisheries stewardship. Two steps are required:

- First, identify why the sense of stewardship amongst fishers is declining. This might be occurring for a range of reasons, from a loss of trust in fisheries management, to low knowledge of fishing rules and regulations, reduced investment in education and compliance activities, to changes over time in the demographics of fishers (e.g. if there has been a substantial shift to new groups fishing who did not previously fish, this might be associated with a change in stewardship); and
- Second, identify what management actions are most likely to address these, and implement these actions.

Examples

Table 26 gives a worked example of the steps of collecting data, analysing it and identifying whether the indicator is green, orange or red for the Rock Lobster, Abalone and Recreational fisheries of South Australia.

Table 26 Step by step guide to measuring Indicator 1.6.2, using data from the Rock Lobster, Abalone and Recreational fisheries of South Australia.

<p>Include this question in a survey of fishers:</p>	<p>Q. To what extent do you agree or disagree with the following statement?...‘Most fishers comply with fishing rules and regulations’ and ‘Most fishers fish responsibly’</p> <p><input type="checkbox"/> Strongly disagree <input type="checkbox"/> Disagree <input type="checkbox"/> Neither agree nor disagree <input type="checkbox"/> Agree <input type="checkbox"/> Strongly agree <input type="checkbox"/> Unsure</p>			
<p>Analyse the basic data:</p>	<p>Fishery</p>	<p>Disagree (strongly disagree & disagree)</p>	<p>Neither agree nor disagree</p>	<p>Agree (strongly agree & agree)</p>
	<p>Rock Lobster (SA)</p>	<p>0%</p>	<p>3.4%</p>	<p>96.6%</p>
	<p>Abalone (SA)</p>	<p>0%</p>	<p>0%</p>	<p>100%</p>
	<p>Recreational (SA)</p>	<p>12.9%</p>	<p>17.5%</p>	<p>69.6%</p>
<p>Identify if indicator is green, orange or red</p>	<p>SA Rock Lobster Fishery SA Abalone Fishery</p>	<p>SA Recreational Fishery</p>		

Indicator 1.6.3-Fisher understanding of rules and regulations

How do you collect data: Fisher survey	Measurement cost: Medium	Measurement complexity: Low	Indicator independence: High
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Social objective this indicator addresses: Objective 1.6 - Maximise stewardship of fisheries resources.

What is the indicator? This indicator identifies if fishers have an accurate understanding of fishing rules and regulations.

Why is it measured? Fishers cannot be successful stewards if they lack knowledge of fishing rules and regulations. This indicator is a critical measure of one of the key prerequisites of achieving successful stewardship by fishers.

How is it measured? This indicator is measured via a survey of fishers, with fishers asked to answer multiple choice questions regarding key fishing rules and regulations in the fishery being assessed. The percentage of fishers who correctly identify the relevant rule and regulation then forms the score for the indicator question (e.g. if the bag limit for a particular species is 10, and 80% of fishers select '10' from the multiple choice options, the indicator score is 80%. If for another indicator question only 60% of fishers answer correctly, the overall score for the indicator drops to 70; being $(80+60)/2=70$).

How is it analysed and interpreted?

This indicator is being met if: >90% of fishers correctly identify the relevant rules and regulations.	There is need to consider further management action if: between 70-90% of fishers correctly identify rules and regulations, or if >80% correctly identify them but there is a decline in the proportion over time.	There is an urgent need for management action if: there is ongoing decline in the proportion of fishers who correctly identify rules and regulations over time, or <70% of fishers correctly understand rules and regulations.
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Key considerations: This indicator is more complex than others, as the questions asked will differ for every fishery – the questions must be designed specifically to ask about the rules and regulations that apply in that fishery. Therefore, the fisheries manager has a bigger task than for some other indicators.

When designing questions, it is important to provide realistic options in each of the multiple choices and to ensure there is no ambiguity in the answers. For example, if bag limits for a species vary depending on time of year, the question must specify the time of year for which the fisher should answer. There is also a high threshold for success, as it is critical that the majority of fishers correctly understand rules and regulations in order to achieve environmental sustainability.

Decision triggers and management responses: When the indicator is 'orange' or 'red', management action is needed to increase fisheries stewardship. Two steps are required:

- First, identify which fishers have low understanding of rules and regulations, and why. For example, a low understanding may only occur amongst younger fishers who have had less involvement in education activities, or in other groups. Alternatively, a low understanding might also be related to increasing complexity of the rules and regulation, or changes in investment in communication about the rules and regulations; and
- Second, identify what management actions are most likely to address these, and implement these actions. These management actions are likely to include improving communication with and education for fishers, actions that can be best designed with expert advice.

Examples

No data were collected during this study for this indicator. Appropriate survey questions need to be designed based on the rules and regulations that apply to the fishery being scrutinised.

Indicator 1.6.4-Level of ease of fisher compliance with rules and regulations

How do you collect data: Fisher survey	Measurement cost: Medium	Measurement complexity: Low	Indicator independence: High
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Social objective this indicator addresses: Objective 1.6 - Maximise stewardship of fisheries resources.

What is the indicator? This indicator identifies whether fishers find it easy to comply with fishing rules and regulations in the fishery being assessed.

Why is it measured? Fishers can only be successful stewards if they are able to comply with fishing rules and regulations. If the rules and regulations are overly complex or difficult to comply with, stewardship will be correspondingly low.

How is it measured? This indicator is measured through a survey of fishers, with fishers asked the extent to which fishers agree or disagree that it is easy to comply with fishing rules and regulations.

How is it analysed and interpreted?

This indicator is being met if: >80% of fishers agree that it is easy to comply with fishing rules and regulations	There is need to consider further management action if: between 60-80% of fishers agree that it is easy to comply, or if >80% agree but there is a decline over time in the proportion who agree.	There is an urgent need for management action if: there is ongoing decline in the proportion of fishers who agree with the statement, or <60% agree with it.
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Key considerations: The thresholds set for this indicator are high. To be 'green' over 80% of fishers must agree with the statement that in general, it is easy to comply with fishing rules and regulations. This is because difficulty complying is an important trigger of poor stewardship behaviour, and if any significant subgroup of fishers find it difficult to comply, this can be associated with unsustainable levels of fishing.

Decision triggers and management responses: When the indicator is 'orange' or 'red', management action is needed to increase fisheries stewardship. Two steps are required:

- First, identify which rules and regulations are difficult to comply with, and why fishers find it difficult to comply with them.
- Second, identify what management actions are most likely to address these, and implement these actions.

Examples

Table 27 gives a worked example of the steps of collecting data, analysing it and identifying whether the indicator is green, orange or red for the Rock Lobster, Abalone and Recreational fisheries of South Australia.

Table 27 Step by step guide to measuring Indicator 1.6.4, using data from the Rock Lobster, Abalone and Recreational fisheries of South Australia.

<p>Include this question in a survey of fishers:</p>	<p>Q. To what extent do you agree or disagree with the following statement?...‘It is easy to comply with fishing rules and regulations’</p> <p><input type="checkbox"/> Strongly disagree <input type="checkbox"/> Disagree <input type="checkbox"/> Neither agree nor disagree <input type="checkbox"/> Agree <input type="checkbox"/> Strongly agree <input type="checkbox"/> Unsure</p>			
<p>Analyse the basic data:</p>	<p>Fishery</p>	<p>Disagree (strongly disagree & disagree)</p>	<p>Neither agree nor disagree</p>	<p>Agree (strongly agree & agree)</p>
	<p>Rock Lobster (SA)</p>	<p>13.6%</p>	<p>11.9%</p>	<p>74.6%</p>
	<p>Abalone (SA)</p>	<p>17.7%</p>	<p>11.8%</p>	<p>70.5%</p>
	<p>Recreational (SA)</p>	<p>5.6%</p>	<p>7.8%</p>	<p>86.6%</p>
<p>Identify if indicator is green, orange or red</p>	<p>SA Recreational Fishery</p>	<p>SA Rock Lobster Fishery SA Abalone Fishery</p>		

Indicator 1.6.5-Level of fisher perception of the availability of adequate training and advice regarding good fishing practices

How do you collect data: Fisher survey	Measurement cost: Medium	Measurement complexity: Low	Indicator independence: High
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Social objective this indicator addresses: Objective 1.6 - Maximise stewardship of fisheries resources.

What is the indicator? This indicator identifies whether fishers feel there is adequate training and advice available to them to enable them to fish responsibly.

Why is it measured? Fisheries stewardship is only achieved if fishers are able to develop the skills and knowledge needed to be successful stewards. This indicator identifies if available training and advice is considered adequate by fishers.

How is it measured? This indicator is measured through a survey of fishers, with fishers asked the extent to which they agree or disagree with the statement '*fishers are provided with adequate training and advice about good fishing practices*'. An example of what is meant by good fishing practices can be given if considered necessary to help fishers better understand the question.

How is it analysed and interpreted?

This indicator is being met if: >50% of fishers agree that adequate training and advice is available, or are 'neutral'.	There is need to consider further management action if: >50% of fishers are neutral or agree that adequate training and advice is available, but this percentage is declining over time.	There is an urgent need for management action if: there is ongoing decline in the proportion of fishers who believe adequate training and advice is available, or >50% of fishers disagree that adequate training/advice is available.
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Key considerations: This indicator does not specify which organisations should provide training and advice, but rather it identifies if there is any perceived lack of availability of this training and advice. It is important for fisheries managers to identify any gaps, irrespective of whether these gaps are the result of management actions, as any gaps may reduce compliance with fishing rules and regulations, and hence affect the management of the fishery.

Decision triggers and management responses: When the indicator is "orange" or "red", management action is needed to increase fisheries stewardship. Two steps are required:

- First, identify what types of training and advice are most needed, and what organisations are best placed to provide these – further consultation may be required to gain this information; and
- Second, identify what management actions are most likely to address the gaps in training and advice (e.g. supporting relevant organisations to provide further training opportunities), and implement actions.

Examples

Table 28 gives a worked example of the steps of collecting data, analysing it and identifying whether the indicator is green, orange or red for the Marine Scalefish, Rock Lobster, Abalone and Recreational fisheries of South Australia.

Table 28 Step by step guide to measuring Indicator 1.6.5, using data from the Marine Scalefish, Rock Lobster, Abalone and Recreational fisheries of South Australia.

<p>Include this question in a survey of fishers:</p>	<p>Q. To what extent do you agree or disagree with the following statement?...‘Fishers are provided with adequate training and advice about good fishing practices’</p> <p><input type="checkbox"/> Strongly disagree <input type="checkbox"/> Disagree <input type="checkbox"/> Neither agree nor disagree <input type="checkbox"/> Agree <input type="checkbox"/> Strongly agree <input type="checkbox"/> Unsure</p>			
<p>Analyse the basic data:</p>	<p>Fishery</p>	<p>Disagree (strongly disagree & disagree)</p>	<p>Neither agree nor disagree</p>	<p>Agree (strongly agree & agree)</p>
	<p>Marine Scalefish (SA)</p>	<p>50.1%</p>	<p>25.9%</p>	<p>24.0%</p>
	<p>Rock Lobster (SA)</p>	<p>6.9%</p>	<p>20.7%</p>	<p>72.4%</p>
	<p>Abalone (SA)</p>	<p>6.3%</p>	<p>6.3%</p>	<p>87.5%</p>
	<p>Recreational (SA)</p>	<p>31.4%</p>	<p>27.7%</p>	<p>40.9%</p>
<p>Identify if indicator is green, orange or red</p>	<p>SA Rock Lobster Fishery SA Abalone Fishery SA Recreational Fishery</p>			<p>SA Marine Scalefish Fishery</p>

Indicator 1.7.1-Level of perceived transparency by fishers of fisheries management decision making processes

How do you collect data: Fisher survey	Measurement cost: Medium	Measurement complexity: Low	Indicator independence: High
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Social objective this indicator addresses: Objective 1.7 - Ensure transparent decision making process by fisheries agencies.

What is the indicator? This indicator identifies to what extent fishers perceive management decision making processes to be transparent (i.e. they understand how and why decisions are made).

Why is it measured? Fishers are more likely to trust fisheries management if they feel the processes used to make decisions are transparent. When fishers perceive that decisions are made via a 'hidden' or unclear process, they are less likely to trust either the process, or the outcomes of that process.

How is it measured? This indicator is measured via a survey of fishers, with fishers asked the extent to which they agree or disagree with the statement '*I understand how decisions about fisheries management are made*'.

How is it analysed and interpreted?

This indicator is being met if: >70% of fishers agree or strongly agree that they understand how decisions are made about fisheries management.	There is need to consider further management action if: >50% of fishers are neutral or agree that they understand how decisions are made about fisheries management, but this percentage is declining over time.	There is an urgent need for management action if: >50% of fishers disagree that they understand how decisions are made about fisheries management or there is ongoing decline in the proportion of fishers who understand the processes.
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Key considerations: This indicator asks fishers whether they understand how management decisions are made, rather than asking them whether they think the decision making processes are transparent. This is because the word 'transparent' is not always well understood by many people and hence should not be used in questions about transparency of decision making.

Decision triggers and management responses: When the indicator is 'orange' or 'red', management action is needed to address transparency issues. Several steps are required:

- Identify what factors are contributing to the lack of perceived transparency. This may include both the way management decisions are made and the way this process is communicated to stakeholders. This is likely to require further in-depth consultation, for which it may be appropriate to obtain external expert assistance in the form of a social research to fully investigate the issues underlying fisher perceptions;
- Identify whether, and how, fisheries managers can address transparency issues; and
- Identify what management actions are most likely to address transparency issues and implement these actions.

Examples

Table 29 gives a worked example of the steps of collecting data, analysing it and identifying whether the indicator is green, orange or red for the Rock Lobster, Abalone and Recreational fisheries of South Australia.

Table 29 Step by step guide to measuring Indicator 1.7.1, using data from the Rock Lobster, Abalone and Recreational fisheries of South Australia.

<p>Include these questions in a survey of fishers:</p>	<p>Q. To what extent do you agree or disagree with the following statement?...‘I understand how decisions about fisheries management are made’</p> <p><input type="checkbox"/> Strongly disagree <input type="checkbox"/> Disagree <input type="checkbox"/> Neither agree nor disagree <input type="checkbox"/> Agree <input type="checkbox"/> Strongly agree <input type="checkbox"/> Unsure</p>			
<p>Analyse the basic data:</p>	<p>Fishery</p>	<p>Disagree (strongly disagree & disagree)</p>	<p>Neither agree nor disagree</p>	<p>Agree (strongly agree & agree)</p>
	<p>Rock Lobster (SA)</p>	<p>18.6%</p>	<p>13.6%</p>	<p>67.8%</p>
	<p>Abalone (SA)</p>	<p>5.9%</p>	<p>5.9%</p>	<p>88.2%</p>
	<p>Recreational (SA)</p>	<p>34.7%</p>	<p>32.5%</p>	<p>32.8%</p>
<p>Identify if indicator is green, orange or red</p>	<p>SA Rock Lobster Fishery SA Abalone Fishery</p>	<p>SA Recreational Fishery Note: Given that recreational fishers are less likely to engage in the process of fisheries management a lower ‘achievement’ level for this indicator may be appropriate. However it would still be essential to monitor the changes in this indicator over time, to ensure the number of recreational fishers who understand how management decisions are made is not falling over time.</p>		

Indicator 1.7.2-Documentation of fisheries management decision making processes

How do you collect data: Management agency	Measurement cost: Low	Measurement complexity: Low	Indicator independence: Low-Medium
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Social objective this indicator addresses: Objective 1.7 - Ensure transparent decision making process by fisheries management agencies.

What is the indicator? This indicator identifies whether the decision making processes used by fisheries managers are adequately documented and communicated.

Why is it measured? To achieve transparency, it is critical that the ways in which management decisions are made are consistently documented and this information made readily available.

How is it measured? Fisheries managers are asked to identify whether the processes by which management decisions are made are clearly documented and set out (i.e. stakeholders can find out what process will be used to make management decisions before those decisions are made).

How is it analysed and interpreted?

This indicator is being met if: the process by which fisheries management decisions will be made is clearly documented and accessible to all stakeholders; and this documented process has been followed in all decision making during the past 12 months.	There is need to consider further management action if: the process of decision making by fisheries managers is documented, but not easily accessible to stakeholders; or the documented process is not always being followed.	There is an urgent need for management action if: there is little or no documentation and communication of decision making processes by fisheries managers, and/or no consistent process used to make management decisions.
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Key considerations: This indicator relies on fisheries managers critically evaluating whether they are documenting how decisions will be made and ensuring these processes are followed consistently. It thus relies on fisheries managers honestly reflecting on these issues. Because there is no independent check of these opinions, unless matched with a survey of fishers that asks their views on the same issues, the independence of the indicator is considered low.

Decision triggers and management responses: If decision making processes for fisheries management are not thoroughly documented, and/or are not being followed, steps should be taken to redress this. When documenting and communicating how management decisions are made, fisheries managers must consider how best to ensure that all relevant stakeholders can easily find out what the decision making process is.

Examples

No data were collected for this indicator, as it was identified as important only after analysing results of data that were collected for this project. However, Table 30 provides an example showing the steps of collecting data, analysing it and identifying whether the indicator is green, orange or red for two hypothetical fisheries.

Table 30 Step by step guide to measuring Indicator 1.7.2, using data from two hypothetical fisheries.

<p>Ask these questions of fisheries managers:</p>	<p>Q. 'Are management decisions made using pre-established processes that are documented (e.g. there is a clear and documented process to be followed to make decisions)?'</p> <p><input type="checkbox"/>Yes <input type="checkbox"/>No</p> <p>If yes, were these processes always adhered to in the last 12 months?</p> <p><input type="checkbox"/>Yes <input type="checkbox"/>No</p> <p>If yes, how many of these documented processes are made readily available to the public via your website and hard copy documents available on request, including guidance on the process to be used to make decisions, guidance on how to be involved, and publication of the results of past decisions (none, some, about half, most, all)?</p>			
<p>Analyse the basic data:</p>	<p>Fishery</p>	<p>Are decision making processes well documented?</p>	<p>Were documented processes adhered to in last 12 months?</p>	<p>How many documented processes and outcomes of decisions are made available to public?</p>
	<p>Hypothetical fishery 1</p>	<p>Yes</p>	<p>Yes</p>	<p>About half</p>
	<p>Hypothetical fishery 2</p>	<p>Yes</p>	<p>No</p>	<p>Some</p>
<p>Identify if the indicator is green, orange or red:</p>	<p>Hypothetical fishery 1</p>		<p>Hypothetical fishery 2</p>	

Indicator 1.8.1-Level of fisher perceived equity/ fairness of the processes and outcomes of fisheries management

How do you collect data: Fisher survey	Measurement cost: Medium	Measurement complexity: Low	Indicator independence: High
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Social objective this indicator addresses: Objective 1.8 - Ensure equitable treatment and access for fishers.

What is the indicator? This indicator identifies whether fishers feel they are treated fairly by fisheries management.

Why is it measured? Ensuring management treats fishers equitably – meaning that all fishers have just and fair treatment – is a legislated requirement in many Australian fisheries management jurisdictions. When fisheries managers were asked what social objectives were most important as part of FRDC project 2010/040 (Triantafillos et al. 2014), ensuring equitable and fair treatment was highly ranked (falling within the top three objectives) by almost all fisheries managers. This indicator relies on perception, this perception is the reality as experienced by fishers, regardless of management intent, and these perceptions need to be addressed through management plans and actions.

How is it measured? This indicator is measured by a fisher survey, as equitable treatment can only be said to be occurring if fishers perceive it is present. Fishers are asked to rate how fairly they feel they are treated compared to other users of the resource in terms of: (i) gear restrictions; (ii) access to fishing areas; (iii) allocation of catch; and (iv) the processes used to make decisions about fisheries management. Asking about all four dimensions of equity is important, as ratings of fairness will differ for these different management areas.

How is it analysed and interpreted?

This indicator is being met if: <50% of fishers believe they are treated unfairly on any of the four dimensions of equity measured (gear restrictions, access, allocation and decision making processes)	There is need to consider further management action if: >50% of fishers believe they are treated unfairly on any one of the four dimensions of equity measured, or <50% believe this, but the proportion feeling they are treated unfairly is increasing.	There is an urgent need for management action if: >50% of fishers believe they are treated unfairly on more than one of the four dimensions of equity measured, and this proportion is increasing.
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Key considerations: This indicator measures different dimensions of equity. If the fishery being reviewed involves management arrangements other than gear restrictions, access restrictions or allocation processes, it may be appropriate to include additional questions that ask about the perceived equity of these management arrangements. This indicator is considered to have high independence, as it is measured independently of the fisheries management agency.

Decision triggers and management responses: When the indicator is ‘orange’ or ‘red’, management action is needed to address transparency issues. Several steps are required:

- Identify what factors are contributing to the lack of perceived equity. This should be relatively evident from the data gathered, but it may be necessary to explore why fishers feel gear restrictions or area allocations are unfair;

- Identify how fisheries managers can address equity issues. In some cases, fisheries managers will not have any influence. In these, the best management action may be to improve communication to fishers regarding who is responsible for making decisions such as closure of particular areas to fishing; and
- Identify what management actions are most likely to address equity issues and implement these actions.

Examples

Table 31 gives a worked example of the steps of collecting data, analysing it and identifying whether the indicator is green, orange or red. The examples given are from the Abalone, Recreational and Rock Lobster fisheries of South Australia.

Table 31 Step by step guide to measuring Indicator 1.8.1, using data from the Abalone, Recreational and Rock Lobster fisheries of South Australia.

Include this question in a survey of fishers:	Q. 'How fairly do you feel recreational fishers are treated by fisheries managers compared to other users of fisheries resources?'						
	How fair is the treatment of recreational fishers in terms of:	Very unfair	Unfair	Not fair nor unfair	Fair	Very fair	Unsure
	Gear restrictions (e.g. types of fishing gear you can use)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Access to fishing areas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Allocation of catch	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	The processes used to make decisions about fisheries management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Analyse the basic data:	See Figure 8, which provides data on perceived fairness for the Abalone, Rock Lobster and Recreational fisheries of South Australia						
Identify if indicator is green, orange or red	SA Abalone Fishery		SA Rock Lobster Fishery		SA Recreational Fishery		

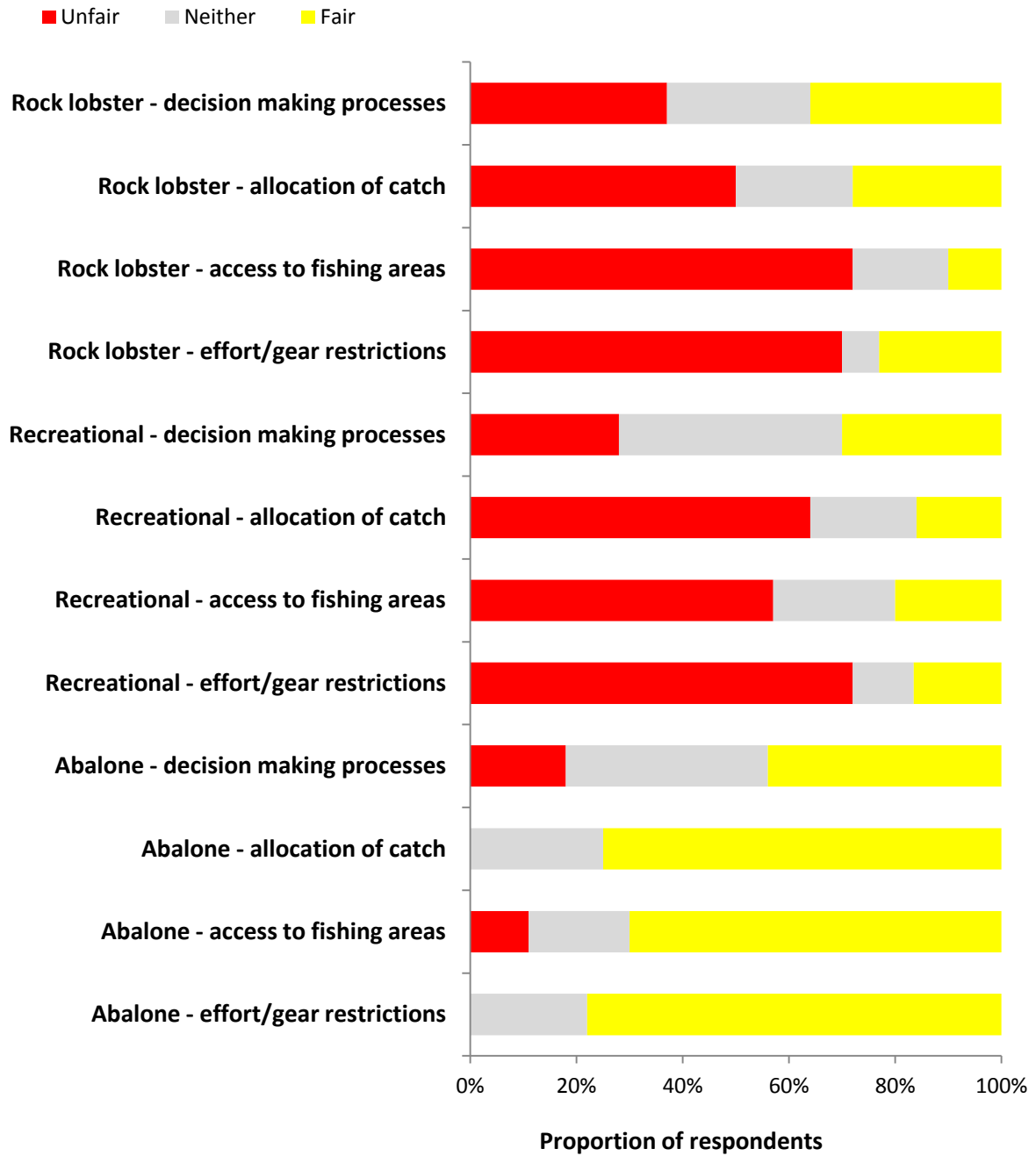


Figure 8 Perceived fairness of different aspects of fisheries management by fishers in the Abalone, Recreational and Rock Lobster fisheries of South Australia.

Indicator 1.9.1-Gaps in availability of infrastructure needed by fishers

How do you collect data: Management agency	Measurement cost: Low	Measurement complexity: Medium	Indicator independence: Medium
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Social objective this indicator addresses: Objective 1.9 - Ensure adequate access to infrastructure needed for successful operation of fishing activities, within the constraints of ecological sustainability.

What is the indicator? This indicator identifies if there are any gaps in the infrastructure available to fishers that have an impact on fisheries management.

Why is it measured? Fisheries managers typically have little or no direct influence over the infrastructure available to fishers, although there are exceptions in some jurisdictions. Where access to infrastructure does have implications for fishers and leads to management challenges, fisheries managers may need to monitor this access and identify suitable management actions. For example, in the case studies undertaken for this project, a lack of refuelling facilities for rock lobster fishers on the west coast of South Australia effectively restricted the area in which these fishers could target rock lobster. This may result in targeting of rock lobster to particular areas, rather than across the entire fishery, which increases the risk of localised depletion of stocks.

How is it measured? This question is measured by asking fisheries managers to answer the following questions:

- *'Are there gaps/problems with any of the fishing infrastructure you directly manage, which should be taken into consideration when making management decisions?'* The fisheries manager is asked to answer yes/no, to briefly describe any gaps/problems, and to rate the extent to which each has a significant influence on their ability to manage the fishery sustainably.
- *'Are there gaps/problems with any of the fishing infrastructure you don't directly manage, which should be taken into consideration when making management decisions?'* The fisheries manager is asked to answer yes/no, to briefly describe any gaps/problems, and to rate the extent to which each has a significant influence on their ability to manage the fishery sustainably.

How is it analysed and interpreted?

This indicator is being met if: no gaps/problems are identified	There is need to consider further management action if: gaps/problems are identified, but they have only a small impact on fisheries management.	There is an urgent need for management action if: gaps/problems are identified, and they are having a significant impact on fisheries management.
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Key considerations: This indicator requires some careful consideration by fisheries managers, as infrastructure gaps are often taken as a 'given' issue, even where they lead to management challenges. This indicator is based on the premise that even where infrastructure is not directly controlled by a fisheries manager, they still need to consider and understand how that infrastructure impacts on the ability of fishers to equitably access the resource and for managers to manage the fishery successfully.

As a part of this, the fishery manager may decide to implement management actions that aim to influence those who do manage the infrastructure in question (e.g. a local government). Although the indicator relies upon data from fisheries managers alone, it can easily be externally verified, and hence is considered to have a medium level of independence.

Decision triggers and management responses: If the indicator is 'orange' or 'red', management action is needed:

- If the infrastructure is owned/managed by the fisheries management agency then corrective actions and any associated budget needs should be explored and a plan of action to correct and fill the gap undertaken;
- Where it is not possible to modify/correct the infrastructure gap that exists, the relative impact on fishers needs to be established and mitigating measures identified (such as alternative access points/changed access areas and spatial closures/altered catch limits etc); and
- Where mitigating measures can be identified, a plan to implement must be actioned, along with any changes to management systems such as harvest strategies and management plans that are required to accommodate the mitigation measures.

Alternatively:

- If the infrastructure in question is not directly controlled by the fisheries manager, the fisheries manager should, in the first instance, identify who or what agency does control the infrastructure and establish what opportunities are available to influence investment in that infrastructure.

Examples

Table 32 gives a worked example of the steps of collecting data, analysing it and identifying whether the indicator is green, orange or red for two hypothetical fisheries, as this indicator was redesigned based on results of initial attempts to measure it during the study.

Table 32 Step by step guide to measuring Indicator 1.9.1, using data from two hypothetical fisheries.

<p>Ask these questions of fisheries managers:</p>	<p>Q. ‘Are there gaps/problems with any of the fishing infrastructure you directly manage, which should be taken into consideration when making management decisions?’</p> <p>The manager is asked to answer yes/no, to briefly describe any gaps/problems, and to rate the extent to which each has a significant influence on their ability to manage the fishery successfully.</p> <p>Q. ‘Are there gaps/problems with any of the fishing infrastructure you don’t directly manage, which should be taken into consideration when making management decisions?’ The manager is asked to answer yes/no, to briefly describe any gaps/problems, and to rate the extent to which each has a significant influence on their ability to manage the fishery sustainably.</p>			
<p>Analyse the basic data:</p>	<p>Are there gaps/problems with any of the fishing infrastructure you directly manage?</p>			
	<p>Fishery</p>	<p>Gaps/problems</p>	<p>If yes, what are they?</p>	<p>If yes, how big an influence does this have on ability to manage fishery?</p>
	<p>Hypothetical fishery 1</p>	<p>No</p>	<p>N/A</p>	<p>N/A</p>
	<p>Hypothetical fishery 2</p>	<p>Yes</p>	<p>FAD¹¹ resulting in overfishing</p>	<p>Large</p>
	<p>Are there gaps/problems with any of the fishing infrastructure you don’t directly manage?</p>			
	<p>Fishery</p>	<p>Gaps/problems</p>	<p>If yes, what are they?</p>	<p>If yes, how big an influence does this have on your ability to manage fishery?</p>
	<p>Hypothetical fishery 1</p>	<p>Yes</p>	<p>Lack of fuel facilities results in the targeting of fish in small part of total fishing area</p>	<p>Small</p>
<p>Hypothetical fishery 2</p>	<p>No</p>	<p>N/A</p>	<p>N/A</p>	
<p>Identify if indicator is green, orange or red</p>		<p>Hypothetical fishery 1</p>	<p>Hypothetical fishery 2</p>	

¹¹ ‘FAD’ refers to Fish Attraction Device(s)

Indicator 1.9.2-Level of satisfaction fishers have with access to different types of fishing infrastructure

How do you collect data: Fisher survey	Measurement cost: Medium	Measurement complexity: Low	Indicator independence: High
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Social objective this indicator addresses: Objective 1.9 - Ensure adequate access to infrastructure needed for successful operation of fishing activities, within the constraints of ecological sustainability.

What is the indicator? This indicator measures how satisfied fishers are with their level of access to different types of fishing infrastructure.

Why is it measured? This indicator is largely measured to assess the effectiveness of actions undertaken as a result of issues identified from 1.9.1, and to assess the ongoing changes in fisher satisfaction with the infrastructure arrangements of the fishery. Importantly, this level of satisfaction may impact on other areas of fisher behaviour such as compliance and stewardship, and may also have broader ranging effects on the community (e.g. competition for an inadequate number of boat ramps can result in social conflict). Additionally, in some cases, a lack of satisfaction with infrastructure by fishers can result in sustainability problems (e.g. a lack of launching points in a region may mean fishing is concentrated around the few launching points that are available, resulting in localised depletion of stocks). It is useful to assess whether there are critical infrastructure gaps, in order to identify whether management action is needed to respond to the fishing implications of these gaps.

How is it measured? This indicator is measured by asking fishers the extent to which they are dissatisfied versus satisfied with their access to various types of infrastructure. The following types of infrastructure may be asked about, although these should be tailored to include only those relevant to the particular fishery being assessed (e.g. marinas/mooring facilities, fuel and repair facilities, reservoirs, roads accessing fishing areas, fishing ramps/jetties/wharves, bait and other supplies, fish cleaning benches and offal disposal facilities, fish attraction devices/artificial reefs, accommodation near fishing areas, etc).

How is it analysed and interpreted?

This indicator is being met if: <50% of fishers are dissatisfied with any of the types of infrastructure and rates of dissatisfaction are staying stable or declining.	There is need to consider further management action if: <50% of fishers are dissatisfied with any of the types of infrastructure, but the rate of dissatisfaction is growing.	There is an urgent need for management action if: >50% of fishers are dissatisfied with any of the types of infrastructure.
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Key considerations: It is important to carefully identify the types of infrastructure that should be assessed as part of this indicator. Include all relevant types, even if they are not directly managed by the fisheries management agency. Often infrastructure gaps are taken as a 'given' issue, and hence the management challenge in terms of fisher behaviour is overlooked. This indicator is based on the premise that even where infrastructure is not directly controlled by a fisheries manager, they still need to consider and understand how that infrastructure impacts on fisher ability to equitably access the resource and sustainable management of the fishery. As a part of this, the manager may decide to implement actions that aim to influence those who do manage the infrastructure (e.g. a local government).

Decision triggers and management responses: If the indicator is orange or red, management action should be considered. Two steps are needed:

- First, identify the implications of fisher dissatisfaction for both their ability to achieve desired social objectives from fishing (e.g. is this reducing their ability to achieve benefits measured in industry objectives 1.1 and 1.2), and ability to successfully manage the fishery to achieve these objectives; and
- Second, follow the steps described in Indicator 1.9.1 to identify appropriate management actions in cases where dissatisfaction requires action by fisheries management.

Examples

Table 33 gives a worked example of the steps of collecting data, analysing it and identifying whether the indicator is green, orange or red for the Marine Scalefish and Recreational fisheries of South Australia.

Table 33 Step by step guide to measuring Indicator 1.9.2, using data from the Marine Scalefish and Recreational fisheries of South Australia.

Include these questions in a survey of fishers:	Q. 'How satisfied are you with the infrastructure provided for fishing?'						N/A
	Very dissatisfied	Somewhat dissatisfied	Not satisfied nor dissatisfied	Somewhat satisfied	Very satisfied		
Marinas/mooring facilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Fuel and repair facilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Reservoirs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Roads accessing fishing areas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Fishing ramps/jetties/wharves	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Bait and other supplies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Fish cleaning benches & offal disposal facilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Fish attraction devices/artificial reefs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Toilets	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Accommodation near fishing areas (e.g. caravan parks)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Analyse the basic data:	See Figures 9 and 10, which provides data for the satisfaction of fishers in the South Australian Marine Scalefish Fishery and the South Australian Recreational Fishery, respectively.						
Identify if indicator is green, orange or red	SA Marine Scalefish Fishery		SA Recreational Fishery-reservoirs and FAD ¹² s only				

¹² FAD refers to Fish Attraction Device

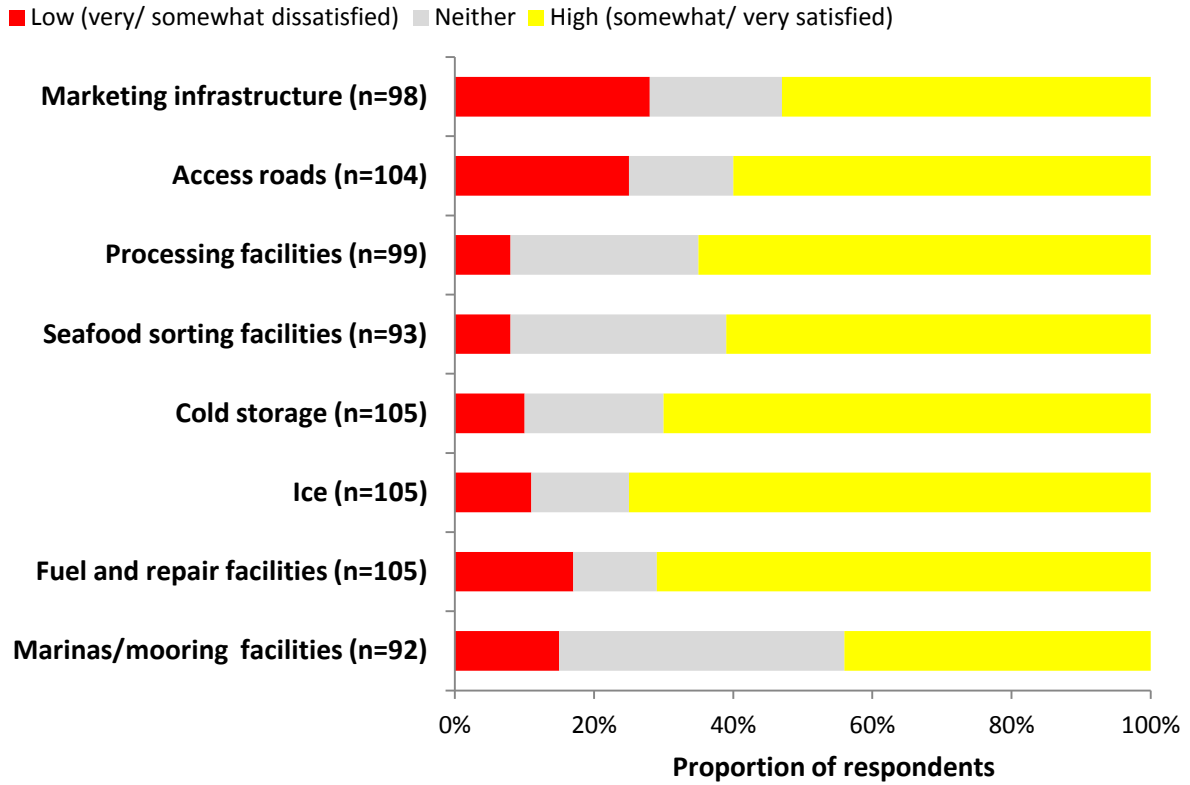


Figure 9 Satisfaction of commercial fishers from the South Australian Marine Scalefish Fishery with access to infrastructure.

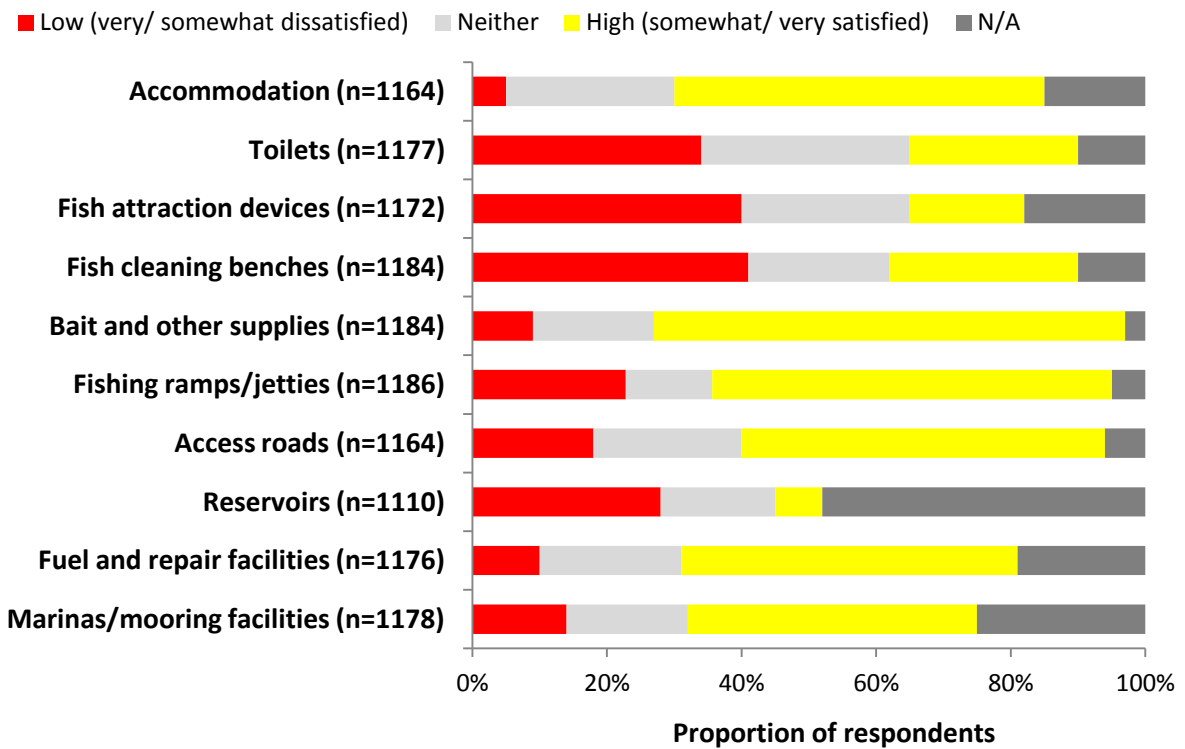


Figure 10 Satisfaction of South Australian recreational fishers with access to infrastructure.

Indicator 1.10.1-Access to fisheries information about the fishery

How do you collect data: Fisher survey	Measurement cost: Medium	Measurement complexity: Low	Indicator independence: High
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Social objective this indicator addresses: Objective 1.10 - Ensure fisheries information is available in a timely and publicly accessible manner.

What is the indicator? This indicator examines whether fishers are satisfied with their access to fisheries related information. A fisher is considered to have access if they can publicly access information in a timely manner, and can understand that information.

Why is it measured? If fisheries information is available in a timely and publicly accessible manner, and is readily understandable, this should result in high levels of satisfaction with information provision by fishers. This indicator is therefore an ‘outcome’ measure, identifying if the methods used to deliver information are working successfully.

How is it measured? This indicator is measured through a survey of fishers in which they are asked to indicate how much they agree versus disagree with the following statements:

- *‘I can easily access information about the management of [fishery]’; and*
- *‘The information [fisheries management agency] provides is easy to understand.’*

How is it analysed and interpreted?

This indicator is being met if: >70% of fishers feel they can both access and understand fisheries information, and this proportion is stable or growing over time.	There is need to consider further management action if: the proportion of fishers who can easily access and/or understand fisheries information is between 50-70% (e.g. if one or both measures is between these thresholds) and this proportion is stable or growing over time.	There is an urgent need for management action if: the proportion of fishers who feel they can both access and understand fisheries information is <50%, or if it is >50% it is declining over time.
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Key considerations: This indicator should be analysed only for people who indicate they have actively sought to use information produced by the fisheries management agency. Responses from people who don’t use this type of information should be excluded from the analysis; their responses may be misleading because those who don’t actively seek or use information are unlikely to know if they can easily access it, or understand it.

Decision triggers and management responses: If the indicator is orange or red, management action is needed:

- Identify what the access and/or comprehension problems are by trying to ascertain *‘Why are fishers finding it hard to access information?’* and *‘How could information be better communicated?’* Indicator 10.1.2 has questions that help evaluate this, and you may consider including additional survey questions that identify how fishers prefer to receive information to help you assess these issues; and
- Identify appropriate management actions to address these problems and implement them as part of the management process.

Examples

Table 34 gives a worked example of the steps of collecting data, analysing it and identifying whether the indicator is green, orange or red for the Rock Lobster, Abalone and Recreational fisheries of South Australia.

Table 34 Step by step guide to measuring Indicator 1.10.1, using data from the Rock Lobster, Abalone and Recreational fisheries of South Australia.

<p>Include these questions in a survey of fishers:</p>	<p>Q. To what extent do you agree or disagree with the following statements...‘I can easily access information about [name of fishery] management’ and ‘The information produced by [management agency] about [name of fishery] is easy to understand’</p> <p><input type="checkbox"/> Strongly disagree <input type="checkbox"/> Disagree <input type="checkbox"/> Neither agree nor disagree <input type="checkbox"/> Agree <input type="checkbox"/> Strongly agree <input type="checkbox"/> Unsure</p>			
<p>Analyse the basic data:</p>	<p>‘I can easily access information about the management of the fishery’</p>			
	<p>Fishery</p>	<p>Disagree (strongly disagree & disagree)</p>	<p>Neither agree nor disagree</p>	<p>Agree (strongly agree & agree)</p>
	<p>Rock Lobster (SA)</p>	<p>3.5%</p>	<p>15.4%</p>	<p>81.2%</p>
	<p>Abalone (SA)</p>	<p>0%</p>	<p>18.7%</p>	<p>81.3%</p>
	<p>Recreational (SA)</p>	<p>8.9%</p>	<p>14.6%</p>	<p>76.5%</p>
	<p>‘The information produced by the fishery manager about the fishery is easy to understand’</p>			
	<p>Fishery</p>	<p>Disagree (strongly disagree & disagree)</p>	<p>Neither agree nor disagree</p>	<p>Agree (strongly agree & agree)</p>
	<p>Rock Lobster (SA)</p>	<p>18.6%</p>	<p>13.6%</p>	<p>67.8%</p>
	<p>Abalone (SA)</p>	<p>5.9%</p>	<p>5.9%</p>	<p>88.2%</p>
	<p>Recreational (SA)</p>	<p>34.7%</p>	<p>32.5%</p>	<p>32.8%</p>
<p>Identify if the indicator is green, orange or red:</p>	<p>SA Abalone Fishery</p>	<p>SA Rock Lobster Fishery SA Recreational Fishery</p>		

Indicator 1.10.2-Level of currency, independence and accessibility of information about the fishery

How do you collect data: Management agency	Measurement cost: Low	Measurement complexity: Low	Indicator independence: High
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Social objective this indicator addresses: Objective 1.10 - Ensure fisheries information is available in a timely and publicly accessible manner

What is the indicator? This indicator evaluates whether the management of the fishery facilitates information being available in a timely manner, that the collection of data uses independently verifiable processes and that information is readily accessible to the public.

Why is it measured? Fisheries managers must not only provide information, but it must be credible, timely and easily accessible. The objective is to ensure stakeholders have access to appropriate information when they need it and, in time, to have meaningful input into fisheries management. Ideally, requirements to produce information should be embedded in documented fisheries management processes.

How is it measured? This indicator asks the fisheries manager to identify whether catch data, stock estimates, economic data and social data are collected for the fishery. For each type of information that is collected, they are asked if the information is:

- (i) Released to fishers;
- (ii) Released to stakeholders other than fishers;
- (iii) Released to the general public;
- (iv) Collected or verified independently of fishers;
- (v) Released to fishers/stakeholders/public within 12 months of collection;
- (vi) Collected at least once a year; or
- (vii) Collected at least once every 5 years.

Fisheries managers answer 'yes', 'no' or 'sometimes' to each of these questions.

How is it analysed and interpreted?

<p>This indicator is being met if: the fisheries manager answers 'yes' to all questions for the types of data they report—in other words, information is collected using independently verifiable processes; is collected at least every 1-5 years; is released to the general public (with the exception of commercially sensitive data); and is released within 12 months of being collected.</p>	<p>There is need to consider further management action if: the fisheries manager answers 'sometimes' to more than three questions, indicating variability in data collection and dissemination, while answering yes to the remaining questions; or indicates that no economic or social data are being collected.</p>	<p>There is an urgent need for management action if: no catch or stock estimate data are being collected; or if the fisheries managers answer 'no' to any of the other questions, with the exception of whether information is collected at least once a year (as some information cannot be collected annually), and whether catch and economic information is released to the public (this may be withheld to preserve commercial confidentiality).</p>
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Key considerations: This indicator does not require fisheries managers to collect all the four types of data asked about in order to be successful (i.e. on catch, stock, economic and social data). Many fisheries collect no social or economic data. While collection of economic and social data is encouraged, a lack of collection of these is considered an ‘orange’ indicator as it suggests a need to review whether these types of data should be collected and disseminated. This indicator is considered to have high independence as, although data are provided by fisheries managers, they can be readily verified independently.

Decision triggers and management responses: Management action is needed if the indicator is ‘orange’ or ‘red’:

- **Orange:** fisheries managers need to review information collection and dissemination practices to identify if they are meeting stakeholder needs. The results of Indicator 1.10.1 can assist with identifying this. If stakeholders are satisfied, there may be no need for further management action; if they are dissatisfied, further management action should be taken, as described below.
- **Red** (or assessment of an orange indicator suggests management action is needed): Fisheries managers need to identify what actions are needed to improve information collection and dissemination. To do this, answers to the following questions are needed: (i) *‘Which types of information are lacking?’*; (ii) *‘Is it a lack of data collection or poor quality data collection that is the problem?’*; (iii) *‘If the problems are in information dissemination, how can the ease with which stakeholders can access information be improved, while also meeting any needs to ensure commercially sensitive data are protected?’*; and (4) *‘How can fisheries managers speed up the process of making data available publicly?’* The answers to these questions will vary, and can form the basis of taking action to improve information flows.

Examples

Table 35 gives a worked example of the steps of collecting data, analysing it and identifying whether the indicator is green, orange or red for the East Coast Trawl Fishery of Queensland and the Marine Scalefish, Rock Lobster and Abalone fisheries of South Australia.

Table 35 Step by step guide to measuring Indicator 1.10.2, using data from the from the East Coast Trawl Fishery of Queensland and the Marine Scalefish, Rock Lobster and Abalone fisheries of South Australia.

<p>Ask these questions of fisheries managers:</p>	<p>Q. 'Do you collect (i) catch data, (ii) stock estimates, (iii) economic data and (iv) social data for this fishery?'</p> <p><input type="checkbox"/>Yes <input type="checkbox"/>No If yes, the following questions are asked (yes, no or unsure):</p> <ul style="list-style-type: none"> • Is this information released to fishers? • Is this information released to stakeholders other than fishers? • Is this information is released to the general public? • Is this information released to within 12 months of collection? • is this information is collected at least once a year? • Is this information collected at least once every 5 years? 							
			Information released				Information collected	
	Fishery	Catch data	Fishers	Others	Public	Within yr	Each yr	Every 5 yr
	Marine Scalefish (SA)	Yes	Yes	Yes	Unsure	Yes	Yes	Yes
	East Coast Trawl (QLD)	Yes	Yes	Yes	Yes	No	Yes	Yes
	Rock Lobster (SA)	Yes	Yes	Yes	Unsure	Yes	Yes	Yes
	Abalone (SA)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Fishery	Stock estimate	Fishers	Others	Public	Within yr	Each yr	Every 5 yr
	Marine Scalefish (SA)	Yes	Yes	Yes	Unsure	No	No	Yes
	East Coast Trawl (QLD)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Rock Lobster (SA)	Yes	Yes	Yes	Unsure	Yes	Yes	Yes
	Abalone (SA)	Yes	Yes	Yes	No	Yes	Yes	Yes
	Fishery	Economic data	Fishers	Others	Public	Within yr	Each yr	Every 5 yr
	Marine Scalefish (SA)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	East Coast Trawl (QLD)	No						
	Rock Lobster (SA)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Abalone (SA)	Yes	Yes	Yes	No	Yes	Yes	Yes
	Fishery	Social data	Fishers	Others	Public	Within yr	Each yr	Every 5 yr
	Marine Scalefish (SA)	No						
East Coast Trawl (QLD)	No							
Rock Lobster (SA)	No							
Abalone (SA)	No							
Identify if the indicator is green, orange or red:			SA Abalone Fishery SA Marine Scalefish Fishery SA Rock Lobster Fishery		QLD East Coast Trawl Fishery			

Indigenous community

As described earlier, the indicators for the Indigenous community should be considered provisional and as providing a basis for further development. As such, only limited assessment of the independence of indicators can be made and no sample questions have been developed nor examples provided for any of these indicators, as data was not collected for them and they have not undergone rigorous review (see Part 1 of the Guide and Section 1 of this part of the Guide for further discussion).

Many indicators, but not all, were included in the BBN analysis undertaken for this project. Other indicators were developed only after the BBN analysis was undertaken. Where BBN analysis occurred, we provide some discussion of whether the indicator was found to be of high relevance in measuring the objective, a helpful indication of its overall usefulness.

There may be more than one 'Country' associated with a fishery (i.e. where 'Country' areas of different communities cross over). In such cases, the steps associated with measuring the indicator will have to be undertaken with the communities associated with each 'Country' identified.

Indicator 2.1.1-Level of recognition and protection of both iconic species and habitat in fisheries management plans

How do you collect data: Management agency	Measurement cost: Low-Medium	Measurement complexity: Low	Indicator independence: Low
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Social objective this indicator addresses: Objective 2.1 - Fisheries management actions support the maintenance of cultural and heritage values related to fishing activities in Aboriginal and Torres Strait Islander communities.

What is the indicator? This indicator identifies whether fisheries management arrangements have identified Indigenous iconic species (if any) in the fishery and its associated habitat, and respects the need for protection of both species and habitat explicitly noted in the fisheries management arrangements.

Why is it measured? It is important to identify if culturally significant aquatic species and associated habitats exist and, if so, if they are recognised and protected to ensure sustainability and facilitate the preservation of Indigenous cultural and heritage values.

How is it measured? This indicator is measured using data from the fisheries management agency. It is a medium cost indicator initially, but would then require relatively little resourcing to monitor over time.

The steps for measuring the indicator are:

- (i) Identify the Indigenous community associated with the fishery;
- (ii) In collaboration with the community, identify any Indigenous iconic species and associated habitat in the fishery;
- (iii) Identify the management arrangements suggested for the recognition of, and respect for, protection of the species to be signed off by the community; and
- (iv) Identify the management arrangements that are in place for listing and recognition of iconic species and associated habitats and 'Country', and that are signed off by the community.

How is it analysed and interpreted?

This indicator is being met if: If all measures were in place and signed off by the community, or either of measures (i) or (ii) identify that there are no Indigenous communities connected with the fishery, or there are no iconic species, as signed off by the Indigenous community.	There is need to consider further management action if: measures (i) and (ii) are in place, but (iii) and (iv) aren't though they are being considered, or are in place, but as yet without community sign-off.	There is an urgent need for management action if: None of these measures have been considered, or these measures were in place but the Indigenous community had withdrawn its sign-off.
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Key considerations: It is recommended that Indicator 2.2.1 is undertaken in concert with other indicators under Objective 2.1 to provide parameters of the interaction of the fishery with Indigenous 'Country' of cultural significance. The BBN analysis undertaken for this project suggested this indicator has a relatively low influence on the measurement of the overall objective, but is very useful in terms of building communication, awareness and trust and where endorsed by the community provides a high level of transparency. The determination of an iconic species requires further clarification and determination of a nationally acceptable definition. While the objective was not ranked highly important by Australian fisheries managers, this indicator is of a medium level complexity to obtain in the first instance, but thereafter, relatively simple to monitor. It has a medium cost (based on the investment of time in engagement) in terms of data collection, but given its contribution to trust and communication, it is a fundamental social feature of a fishery to measure.

Decision triggers and management responses: There is a need for management action by fisheries managers if:

- Management arrangements do not consider or recognise (possible) iconic species;
- There are no management arrangements for the protection of iconic species in place;
- The community refuses to endorse a management arrangement; or
- The community withdraws their endorsement of a management arrangement over the life of a plan.

In these cases, a lack of recognition and/or protection of an iconic species is indicated, and there is a need for management action by fisheries managers.

Where management action is needed, fisheries managers should:

- Identify if and/or why iconic species have not been identified;
- Liaise with fishery related communities to identify species and understand traditional and customary Indigenous interaction with the species;
- Identify what management steps are required for fisheries management to identify, recognise and seek to protect Indigenous iconic species;
- Seek community input to and endorsement of management arrangements as proposed; and
- Identify actions and times frames to put management steps into place.

Indicator 2.1.2-Existence of continued access to identified community iconic species through habitat protection and catch management

How do you collect data: Management agency & discussions with community representative	Measurement cost: Medium-High	Measurement complexity: High	Indicator independence: High
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Social objective this indicator addresses: Objective 2.1 - Fisheries management support the maintenance of cultural and heritage values related to fishing activities in Aboriginal and Torres Strait Islander communities.

What is the indicator? This indicator identifies whether fisheries management arrangements allow continued access for Indigenous people to iconic species, through ensuring species catch and habitat protection efforts are in place for fishery species associated with identified 'Country'.

Why is it measured? This indicator is only required and measured if iconic species are identified in Indicator 2.1.1. It is important to ensure not only the identification of culturally significant species and associated habitats, but also that access arrangements are in place so traditional activities can continue. This is measured to ensure that the fishery arrangements are in place to allow preservation of cultural and heritage values.

How is it measured? This indicator is measured using both data from the fisheries management agency and from collaborative discussions with community representatives. It is therefore a medium to high cost indicator, in regard to time and associated resourcing. To be most effective, a level of engagement and relationship building with communities is required to ensure appropriate measures are in place, and comprehensive understanding for both fishery managers and Indigenous community members exists regarding the arrangements.

The steps for measuring the indicator are:

- (i) In collaboration with the community, identify protection methods and catch management arrangements for iconic species and habitat;
- (ii) In collaboration with the community, identify access arrangements for Indigenous and non-Indigenous community members to iconic species and associated habitat in the fishery;
- (iii) Identify whether management arrangements are in place for protection of the species and whether these are signed off by the community of concern; and
- (iv) Identify whether management arrangements are in place for continued customary access to the species that are signed off by the community of concern.

How is it analysed and interpreted?

This indicator is being met if: all four measures are in place and signed off by the community.	There is need to consider further management action if: measures (i) and (ii) are in place, but not (iii) or (iv), but are being considered, or are in place but as yet without community sign-off.	There is an urgent need for management action if: none of these measures are in place; or were in place but the community has withdrawn its sign-off.
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Key considerations: This indicator is entirely dependent on Indicator 2.1.1 being undertaken in the first instance. The BBN analysis suggested it has a relatively high influence on the measurement of the overall objective and is essential to building respect, communication, awareness and trust. By being endorsed by the community, it also provides a high level of transparency. An 'iconic' species requires further clarification and determination of a nationally acceptable definition, along with what is accepted by all parties as 'appropriate access'. While the objective is of a high level of complexity to obtain in the first instance, thereafter, it would be relatively simple to monitor. It has a medium to high cost (based on the investment of time in communication) in terms of data collection. However, given its contribution to trust and communication, it is a fundamental social feature of a fishery to measure.

Decision triggers and management responses: There is a need for management action by fisheries managers if:

- Management systems such as management plans do not consider or recognise protection methods and catch management arrangements in any way for identified iconic species;
- There are no management arrangements in place for the protection of iconic species;
- The community refuses to endorse arrangements proposed by fisheries management; or
- The community withdraws their endorsement of a fisheries management arrangement.

In these cases, a lack of perceived or real access to iconic species resulting from inadequate protection is indicated and there is a need for action by fisheries managers.

Where management action is needed, fisheries managers should:

- Identify if and/or why iconic species have not been regarded as requiring protection;
- Identify what management steps are required for fisheries management to recognise and put in place protection and catch management arrangements for Indigenous iconic species;
- Seek community input to and endorsement of management arrangements as proposed; and
- Identify actions and times frames to put management steps into place.

Indicator 2.1.3-Level of Indigenous community satisfaction with management impacts on access to iconic species over time

How do you collect data: Survey of Indigenous community or advice from advisory group	Measurement cost: Medium-High	Measurement complexity: Medium-High	Indicator independence: High
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Social objective this indicator addresses: Objective 2.1 - Fisheries management actions support the maintenance of cultural and heritage values related to fishing activities in Aboriginal and Torres Strait Islander communities.

What is the indicator? This indicator identifies the levels of, and changes in, the satisfaction of the Indigenous community¹³ with the fisheries management impacts on their access to iconic species over time.

Why is it measured? This indicator is only measured where iconic species are identified in Indicator 2.1.1. It is important to ensure not only that culturally significant species and associated habitats are identified, and that access arrangements are put in place, but also that these arrangements are satisfactory. If these arrangements don't meet the needs of the community (generating satisfaction) then there is not only a waste of management resources occurring, but there is likely a worsening in the relationship between communities and fisheries management – a relationship that is essential for effective resource management. This is also a significant indicator for addressing the intent of Objective 1.2, which focuses on ensuring cultural, recreational and lifestyle benefits are maximised, from the perspective of customary fishing activities.

How is it measured? This indicator is measured using data generated by community feedback, in the form of either a community survey or advice received from an advisory/focus group. In some cases, it may be considered prudent to undertake a community survey in addition to receiving advice from an advisory group, where there are obvious divisions in the community. It is therefore a medium to high cost indicator in regard to time and associated resourcing.

The steps for measuring the indicator are:

- (i) Undertake a community survey and/or receive advice from a community advisory or focus group on the levels of satisfaction within the community in regard to access arrangements for catching/collecting iconic species; and
- (ii) Seek and obtain community sign-off on the results of the survey and/ or advice from the advisory or focus group.

¹³ From this point on, Indigenous communities are referred to as 'the community' in this and subsequent indicators focused on Indigenous communities.

How is it analysed and interpreted?

This indicator is being met if: If both measures are in place and the levels of satisfaction are high (suggested 50% or >) or increasing.	There is need to consider further management action if: both measures were in place, but the levels of satisfaction either low or satisfactory, or were stable for two or more periods of review.	There is an urgent need for management action if: neither of these measures were in place; or were in place but communities had withdrawn their sign-off.
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Key considerations: This indicator is entirely dependent on Indicators 2.1.1 and 2.1.2 being undertaken; it should not be undertaken in isolation. This indicator has a high level of significance on the measurement of the achievement of the overall objective. The endorsement by the community also provides a high level of transparency and independence. As with all the indicators of this objective, the determination of an iconic species requires further clarification and determination of a nationally acceptable definition, along with what is accepted by all parties as 'appropriate access'.

Decision triggers and management responses: There is a need for management action by fisheries managers if:

- They do not consider or recognise iconic species or habitats, identify protection methods, or include catch management arrangements;
- There are levels of conflict, distrust or anxiety between fisheries management and Indigenous communities associated with the fishery;
- The community refuses to endorse management arrangements, or
- The community withdraws their endorsement of a management arrangement.

In these cases, management action is needed as it highlights an overall lack of satisfaction with management arrangements for access to iconic species.

Where management action is needed, fisheries managers should:

- Identify if and/or why iconic species have not been regarded as requiring protection.
- Identify what management steps are required for fisheries management to recognise and put in place protection and catch management arrangements for Indigenous iconic species, suitable to the associated communities.
- Seek community input to and endorsement of management proposals; and
- Identify actions and times frames to put management steps into place.

Examples

No examples are provided here as this indicator is a preliminary one that requires testing with a range of Indigenous communities and fisheries for verification.

Indicator 2.2.1-Identification of ‘Country’ relevant to the fishery

How do you collect data: Survey of Indigenous community or advice from advisory group	Measurement cost: Medium-High	Measurement complexity: High	Indicator independence: Very high
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Social objective this indicator addresses: Objective 2.2 - Ensure access to ‘Country’ to enable continuation of cultural fishing activities, respecting the rights of Aboriginal and Torres Strait Islander peoples to these resources.

What is the indicator? This indicator identifies the extent and methods of recognition of Indigenous ‘Country’.

Why is it measured? This indicator relates directly, and is an extremely useful precursor, to undertaking the indicators in Objective 2.1, as it focuses on identifying ‘Country’ that contains iconic species. In order to identify culturally significant species and associated habitats, it is necessary to identify the regions related to the fishery where iconic species of Indigenous communities may occur. ‘Country’ has significance much greater than a geographical boundary, being connected with heritage and cultural norms and expectations in relation to its community interaction and use, that fisheries managers must develop and ensure an understanding of and respect for. This is fundamental to the ability of management arrangements being developed to recognise and facilitate the continuation of cultural practises.

How is it measured? While it has been noted that a simple approach could be to use ‘Country’ maps to identify areas of ‘Country’ that contain fisheries under management, consultation has identified that these don’t always exist. Additionally, where such maps do exist, they don’t always record that there are other communities with ‘Country’ that utilise the same geographic areas. Consequently, it is recommended that this indicator also employs community consultation, either generally with community members, or through advice received from a regular advisory group or specifically created focus group. In some cases it may be considered prudent to undertake both community consultation as well as receive advisory group advice to ensure a comprehensive understanding of the all the cultural attachments to and understandings of interactions of the fishery with ‘Country’. It is therefore is a relatively high cost indicator in regard to time and the associated resourcing.

The steps for measuring the indicator are:

- (i) Meet with community advisory group or survey community members to identify;
 - a) Geographical and other parameters of ‘Country’ that are associated with the fishery, and
 - b) The traditional and customary uses and interactions with ‘Country’ associated with the fishery that has cultural significance for the Indigenous community.
- (ii) Seek and obtain community sign-off on the resulting documentation of ‘Country’ and its cultural significance.

How is it analysed and interpreted?

This indicator is being met if: If all elements of both measures are in place and the 'Country' is identified and agreed upon.	There is need to consider further management action if: both measures are in place, but the identification of details is still being clarified, or the community has not signed off on the documentation.	There is an urgent need for management action if: neither of the measures are in place; or were in place but communities have withdrawn their sign-off.
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Key considerations: This indicator is a precursor to measuring Indicators 2.1.1, 2.1.2 and 2.1.3. This indicator has a very high level of significance to the measurement of the achievement of the overall objective. The endorsement by the community also provides the high level of transparency that contributes to the development of trust and understandings.

Decision triggers and management responses: There is a need for management action by fisheries managers if:

- Management arrangements do not consider or recognise 'Country' in any way;
- There are levels of conflict, distrust or anxiety between fisheries management and Indigenous communities associated with the fishery in relation to respect for 'Country';
- The community refuses to endorse management arrangements; or
- The community withdraws their endorsement of a management arrangement.

In these cases, management action is needed because they highlight a failure to adequately identify or show respect/understanding for 'Country'.

Where management action is needed, fisheries managers should:

- Take steps to identify 'Country', or review their interpretation of it with a new consultation process;
- Identify what management steps are required, or believe to be required by the community, for fisheries management to put in place recognise and respect 'Country'; and
- Identify actions and times frames to put management steps into place.

Indicator 2.2.2-Level of management arrangement support for cultural practices included in management considerations

How do you collect data: Consultation with Indigenous community & advice from advisory group	Measurement cost: Medium-High	Measurement complexity: High	Indicator independence: Very high
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Social objective this indicator addresses: Objective 2.2 - Ensure access to 'Country' to enable continuation of cultural fishing activities, respecting the rights of Aboriginal and Torres Strait Islander peoples to these resources.

What is the indicator? This indicator identifies the cultural practices of communities associated with the fishery and 'Country', and whether management arrangements explicitly take these into consideration.

Why is it measured? The identification of cultural practices allows for the consideration of and support for them in management arrangements. With this information it becomes possible to incorporate consideration of and, allowance for, them in management arrangements.

How is it measured? This indicator is measured using community consultation and management advice in the form of advice received from an advisory/ focus group to identify practices for consideration/inclusion in management arrangements. It is therefore a medium to high cost indicator in regard to time and associated resourcing.

The steps for measuring the indicator are:

- (i) Meet with a community advisory and/or community focus groups to identify cultural practices associated with 'Country' and the fishery;
- (ii) Ensure management arrangements acknowledge and allow for the continuation of Country/fishery related cultural practices; and
- (iii) Obtain community sign-off on the resultant management arrangements, ensuring they appropriately acknowledge and support the community's cultural practices.

How is it analysed and interpreted?

This indicator is being met if: all three measures are in place.	There is need to consider further management action if: measures (i) and (ii) are in place, but the results are still awaiting sign-off by the community.	There is an urgent need for management action if: none of the measures, or in place; or (i) is in place but communities have either not signed off, or have withdrawn sign-off.
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Key considerations: This indicator has a very high level of significance to the measurement of the achievement of the overall objective. The endorsement by the community also provides a high level of transparency that contributes to the development of trust and understanding.

Decision triggers and management responses: There is a need for management action by fisheries managers if:

- Management arrangements do not consider or recognise cultural activities of 'Country' associated with the fishery;
- There are levels of conflict, distrust or anxiety between fisheries management and Indigenous communities in relation to respect for the cultural activities of 'Country' associated with the fishery;
- The community refuses to endorse management arrangements; or
- The community withdraws their endorsement of a management arrangement.

In these cases, management action is needed as it highlights a failure to adequately identify or show respect for/understanding of cultural activities of 'Country' associated with the fishery.

Where management action is needed, fisheries managers should:

- Take steps to identify 'Country' related cultural practices that are associated with the fishery, or review current fisheries management interpretation of related cultural practices, using a new consultation process;
- Identify what management steps are required, or are believed to be required by the community, for fisheries management to recognise and respect 'Country' cultural practices; and
- Identify actions and times frames to put management steps into place.

Indicator 2.3.1-Level of Indigenous community representation in fisheries management decision making processes

How do you collect data: Consultation with Indigenous community & advice from advisory group	Measurement cost: Low-Medium	Measurement complexity: Medium	Indicator independence: Very high
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Social objective this indicator addresses: Objective 2.3 - Provide opportunities for Aboriginal and Torres Strait Islander communities to participate in fisheries management decision making processes.

What is the indicator? This indicator examines whether Aboriginal or Torres Strait Islander communities are appropriately represented in fisheries management processes. It is focused on facilitating engagement of those associated with 'Country' in fisheries management processes.

Why is it measured? The indicator recognises the social and cultural importance of the role that Indigenous people can, and often would like to, play in the management of natural resources associated with their 'Country' and culture (in addition to the economic and environmental importance of this role). By reviewing whether management processes encourage adequate participation, and ensuring the representation encouraged is considered appropriate by Indigenous communities, this indicator supports improved opportunities for Indigenous representation in decision making processes.

How is it measured? This indicator is measured using a review of documentation, community consultation and focus/advisory group feedback. These are used to identify appropriate practices for ensuring Indigenous representation in management processes. It is therefore a medium to high cost indicator in regard to time and associated resourcing.

The steps for measuring the indicator are to use documentation review, consultation and feedback from advisory groups (as appropriate) to:

- (i) Identify preferred approaches for Indigenous participation in fisheries management processes and whether there are appropriate opportunities for:
 - a) Indigenous representatives to nominate to participate in management processes; and
 - b) Training to develop representation skills.
- (ii) Identify if there are agreed Indigenous representatives for 'Country';
- (iii) Meet with community advisory and/or community focus groups to identify appropriate representatives to participate in management and decision-making processes of the fishery, on behalf of the community;
- (iv) Ensure management arrangements support and facilitate the participation of Indigenous representatives for the community associated with the fishery; and
- (v) Obtain community sign-off on the appointment of the representative.

How is it analysed and interpreted?

This indicator is being met if: If all five measures have been addressed and the fifth measure is in place.	There is need to consider further management action if: measures (i) to (iv) are in place, but the results are still waiting for sign-off by the community.	There is an urgent need for management action if: none of the measures, or in place; or (i) is in place but but communities have either not signed off, or have withdrawn sign-off.
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Key considerations: This indicator has a very high level of significance to the assessment of the achievement of the overall objective. The endorsement by the community also provides a high level of transparency that contributes to the development of trust and understanding.

Decision triggers and management responses: There is a need for management action by fisheries managers if:

- Management arrangements do not consider or recognise the cultural need of Indigenous communities to have involvement and representation in fishing associated decision making forums;
- There are levels of conflict, distrust or anxiety between fisheries management and Indigenous communities in relation to respect for 'Country' associated with the fishery;
- The community refuses to endorse management arrangements; or
- The community withdraws their endorsement of a management arrangement.

In these cases, management action is needed as it highlights a failure to adequately identify or show respect for/understanding of 'Country' associated with the fishery

Where management action is needed, fisheries managers should:

- Take steps to identify a representative for communities associated with the fishery;
- Identify means for the inclusion of Indigenous community representatives into fisheries decision making processes; and/or
- Identify actions and times frames to put management steps into place.

Indicator 2.3.2-Level of active participation by nominated community representatives associated with 'Country' and a fishery, in fisheries management decisions making processes

How do you collect data: Management agency or advice from advisory group	Measurement cost: Low-Medium	Measurement complexity: Medium	Indicator independence: Very high
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Social objective this indicator addresses: Objective 2.3 - Provide opportunities for Aboriginal and Torres Strait Islander communities to participate in fisheries management decision making processes.

What is the indicator? This indicator identifies whether Aboriginal or Torres Strait Islander community representatives are actively participating in fisheries management processes. It is focused on understanding the effectiveness of agency facilitation of Indigenous engagement of communities associated with 'Country' that the fishery operates in.

Why is it measured? The indicator recognises the social and cultural importance of the role that Indigenous people can, and often would like to, play in the management of natural resources associated with their 'Country' and culture (in addition to the economic and environmental importance of this role). By examining whether representation is occurring, and having a process of identifying the most appropriate mechanisms, this indicator supports improved opportunities for Indigenous representatives to participate in decision making processes.

How is it measured? This indicator can be measured two ways. In the first instance, the fishery manager can record the extent to which Indigenous representatives attend and participate in meetings and other relevant activities. However, a more independent measure is to obtain feedback from Indigenous communities about whether they are satisfied with the nature and extent of participation by representatives. This feedback can be obtained via consultation with an advisory group (if one exists) or via other culturally appropriate consultation and engagement approaches. It is expected to be a medium to low cost indicator in regard to time and associated resourcing.

The steps for measuring the indicator are:

- (i) For meetings within the review period, identify the number of meetings that;
 - a) The nominated Indigenous representative(s) attended,
 - b) Decisions influenced by the Indigenous representative(s), and
 - c) Decisions made where the Indigenous representative voted or had their community's perspective acknowledged in some other way.
- (ii) Consult with community to identify satisfaction with participation; and
- (iii) Obtain community sign-off on the continuation of the identified level of participation by the representative and the advice received by fisheries management.

How is it analysed and interpreted?

This indicator is being met if: if all three measurements are in place.	There is need to consider further management action if: measure (i) and (ii) are in place (completely), but the results are still waiting sign-off by the community.	There is an urgent need for management action if: none of the measures are in place; or (i) is in place but communities have either not signed off, or have withdrawn sign-off.
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Key considerations: This indicator has a high level of significance to the measurement of the achievement of the overall objective. Obtaining endorsement by the community also provides a high level of independence and transparency that contributes to the development of trust and understanding.

Decision triggers and management responses: There is a need for management action by fisheries managers if:

- Management arrangements do not consider or recognise the cultural need of Indigenous communities to have involvement and representation in fishing associated decision making forums;
- There are levels of conflict, distrust or anxiety between fisheries management and Indigenous communities in relation to respect for 'Country' associated with the fishery;
- The community refuses to endorse management arrangements; or
- The community withdraws their endorsement of a management arrangement.

In these cases, management action is needed as it highlights a failure to adequately facilitate the participation of Indigenous and traditional owners in decision making processes affecting 'Country' associated with the fishery.

Where management action is needed, fisheries managers should:

- Take steps to identify necessary arrangements to facilitate the active participation of the community representative associated with the fishery;
- Identify means for achieving the recognition and respect for the perspectives and input of Indigenous community representatives in the fisheries decision making processes; and/or
- Identify actions and times frames to put management steps into place.

Indicator 2.3.3-Community sign-off is obtained on fisheries management arrangements

How do you collect data: Management agency	Measurement cost: Low-Medium	Measurement complexity: Medium-High	Indicator independence: High
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Social objective this indicator addresses: Objective 2.3 - Provide opportunities for Aboriginal and Torres Strait Islander communities to participate in fisheries management decision-making processes.

What is the indicator? This indicator identifies whether Indigenous representatives have signed-off on fisheries management arrangements. It was developed through discussions with an Indigenous reference group in South Australia and was identified as a result of community perception that having a community sign-off process was a good representation of satisfaction with the processes to develop fisheries management arrangements.

Why is it measured? This indicator is measured to ensure management processes have adequately incorporated Indigenous views, values and concerns into the development of fisheries management arrangements. The indicator recognises the social and cultural importance of the role that Indigenous people can, and often would like to, play in the management of natural resources associated with their 'Country' and culture (in addition to the economic and environmental importance of this role).

How is it measured? This indicator is measured by identifying whether Indigenous representatives have secured sign-off on fisheries management arrangements from the communities they represent. If sign-off has not occurred, further work may be required to identify the reasons for this. While this indicator is low to medium cost to measure if sign-off has occurred, this indicator will be a higher cost if sign-off has not been achieved and investigation of the reasons for this is needed.

This indicator is measured by Indigenous community representatives providing management with community sign-off on the fisheries management arrangements in place, for the fisheries associated with the community's 'Country'. If sign-off is not achieved, consultation should be undertaken to identify the reasons for lack of sign-off.

How is it analysed and interpreted?

This indicator is being met if: if community sign-off is received by management from representatives of the Indigenous community	There is need to consider further management action if: management is still waiting for community sign-off from representatives of the Indigenous community	There is an urgent need for management action if: there is no Indigenous representative or there is no engagement by that person in a community sign-off process; or these had been in place but communities had withdrawn their sign-off.
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Key considerations: This indicator is highly independent, as it is based on evidence of community sign-off.

Decision triggers and management responses: There is a need for management action by fisheries managers if:

- Management arrangements do not consider or recognise the cultural need of Indigenous communities to have involvement and representation in fishing associated decision making forums;
- There are levels of conflict, distrust or anxiety between fisheries management and Indigenous communities in relation to respect for 'Country' associated with the fishery;
- The community refuses to endorse management arrangements; or
- The community withdraws their endorsement of a management arrangement.

In these cases, management action is needed as it highlights a failure to adequately facilitate the participation of Indigenous and traditional owners in decision making processes affecting 'Country' associated with the fishery.

Where management action is needed, fisheries managers should:

- Take steps to identify necessary arrangements to facilitate the engagement of the representative with community sign-off processes;
- Identify any necessary amendments that may be required to management arrangements to facilitate the representative seeking sign-off; and/or
- Identify actions and times frames to put management steps into place.

Indicator 2.4.1-Level of income earning opportunities available to Aboriginal and Torres Strait Islanders related to the fishery, marine and/ or water resources

How do you collect data: Management agency	Measurement cost: Low	Measurement complexity: Low	Indicator independence: Low
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Social objective this indicator addresses: Objective 2.4 - Optimise access to income earning opportunities for Aboriginal and Torres Strait islander community members related to the management of fisheries.

What is the indicator? This indicator identifies whether processes are in place to facilitate the inclusion of Indigenous community members into the work of fisheries management agencies.

Why is it measured? This indicator is measured to identify whether income earning opportunities are available to Aboriginal and Torres Strait Islanders.

How is it measured? This indicator is measured by identifying whether opportunities are being identified and/or provided for Indigenous people to develop income earning opportunities associated with fishing. It is expected to be a low cost indicator in the first instance, but may incur time and additional resourcing if the indicator is not achieved.

The steps for measuring the indicator are:

- (i) Identify whether fisheries management provides appropriate opportunities for the inclusion of Indigenous peoples in income earning opportunities created by the fishery and its management. Opportunities might include creation of business or employment opportunities. This includes:
 - a) Identifying income earning opportunities appropriate to Indigenous community members, both directly from the fishery, and in associated employment in fisheries management activities.
 - b) Advertising positions or communication of these opportunities in culturally appropriate locations and utilising culturally appropriate methods.
 - c) Clear and documented consideration of the benefit Indigenous people can bring to the knowledge requirements of the opportunities being advertised and to the sustainable harvesting of species in the fishery.
 - d) In some cases, developing specific programs to support Indigenous people to develop new income earning opportunities, or to develop skills and access resources to do this.
- (ii) Identifying whether documented processes ensure appropriate consideration of Indigenous applicants.

How is it analysed and interpreted?

This indicator is being met if: both measures are in place.	There is need to consider further management action if: measure (i) is in place or in the process of being met, but still waiting to be fully documented and incorporated into standard procedure.	There is an urgent need for management action if: there are no measures in place.
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Key considerations: This indicator has a low level of significance to the measurement of the achievement of the overall objective. However, income earning opportunities are a key issue for Indigenous communities and explicit consideration of this in fisheries management arrangements is a contributor to improved communication and relations with communities associated with fisheries under management.

Decision triggers and management responses: There is a need for management action by fisheries managers if management arrangements:

- Do not consider or recognise the availability of Indigenous people and their expertise in the creation and filling of income earning positions or opportunities through fisheries management arrangements of fisheries associated with their 'Country'; or
- There are levels of conflict, distrust or anxiety between fisheries management and Indigenous communities associated with the fishery in relation to respect for Sea Country.

In these cases, management action is needed as it indicates a failure to adequately identify or recognise opportunities for Indigenous income earning opportunities in relation to fisheries management arrangements.

Where management action is needed, fisheries managers should:

- Take steps to identify necessary arrangements to facilitate the creation of initiatives that enable Indigenous peoples to access income earning opportunities;
- Identify any necessary amendments that may be required to management arrangements to facilitate access by Indigenous peoples to income earning positions; and/or
- Undertake actions and identify times frames to put management steps into place.

Indicator 2.4.2-Number of procurement processes that allow for the select tendering of Indigenous community members from the communities associated with the fishery’s identified ‘Country’

How do you collect data: Management agency	Measurement cost: Low	Measurement complexity: Low	Indicator independence: Not Available
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Social objective this indicator addresses: Objective 2.4 - Optimise access to income earning opportunities for Aboriginal and Torres Strait islander community members related to the management of fisheries.

What is the indicator? This indicator identifies whether tendering processes preference the use of available Indigenous skills.

Why is it measured? This indicator is measured to help ensure processes are in place to facilitate the inclusion of Indigenous community members in the contracted work of fisheries management agencies. Giving priority for contracted procurement of skills, etc. to Indigenous community members who have the skills sought is seen as a significant economic and social contribution to Indigenous Australians. This is through both contributions to income and support for the use of existing knowledge and skills. Utilising the skills and capacity of these community members assists them in deriving income from the activities of the fishery.

How is it measured? This indicator may be measured using data from the fisheries management agency and is a low cost indicator requiring relatively little resourcing to monitor over time.

The steps for measuring the indicator are:

- (i) Identify the Indigenous community associated with the fishery;
- (ii) Identify the skills that exist in the community or levels of interest in developing skills (and therefore their capacity to participate in the fishery);
- (iii) Identify positions and activities required by fisheries management activities that could be met by the skills of Indigenous community members;
- (iv) Clearly consider and document consideration of the benefit that Indigenous people bring to the knowledge requirements of the positions being advertised;
- (v) Identify whether documented management actions ensure tendering processes preference the use of available Indigenous skills (i.e. in the stated preference for Indigenous applicants and organisations with verified skills and capacity, as well as advertising positions in, and with, culturally appropriate locations and methods); and
- (vi) Review tenders and contracts awarded to Indigenous parties, to identify if the tendering processes are being successful or otherwise and why.

How is it analysed and interpreted?

This indicator is being met if: measures (i) and (ii) identify no Indigenous communities are connected with the fishery or skills/interest in the fishery; or alternatively, all measurements are in place.	There is need to consider further management action if: measures (i) to (vi) are in place or in the process of being met, but still subject to a review and analysis, or incorporation into standard procedure.	There is an urgent need for management action if: none of these steps are considered or in place.
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Key considerations: This indicator is not ranked in regard to its significance to the measurement of the objective's achievement. However, income earning opportunities are a key issue for Indigenous communities and explicit consideration of this in fisheries management arrangements is a contributor to improved communication and relations with communities associated with fisheries under management.

Decision triggers and management responses: There is a need for management action by fisheries managers if:

- Management arrangements do not consider or recognise (possible) existing Indigenous skills that could be utilised in the fishery; or
- There are no management tendering arrangements in place for giving preference to the use of identified Indigenous skills in the awarding of contracts.

In these cases, management action is needed as there is an identified lack of procurement processes appropriate to maximise utilisation of Indigenous skills.

Where management action is needed, fisheries managers should:

- Identify if and/or why skills and capacity have not been identified;
- Identify what management steps are required for fisheries management arrangements to identify skills sets, recognise these and modify procurement processes;
- Identify with community representative(s) measures to address any lack of tender uptake that is within the control of fisheries managers;
- Ensure that processes are documented and identified as mandatory in recruitment processes; and
- Undertake actions and identify times frames to put management steps into place.

Indicator 2.4.3-Number of fishery-related training and capacity-building opportunities available to Indigenous communities associated the fishery

How do you collect data: Management agency	Measurement cost: Low	Measurement complexity: Low	Indicator independence: Not available
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Social objective this indicator addresses: Objective 2.4 - Optimise access to income earning opportunities for Aboriginal and Torres Strait islander community members related to the management of fisheries.

What is the indicator? This indicator examines whether fisheries management arrangements provide for appropriate training opportunities to increase capacity for Indigenous engagement with the fishery.

Why is it measured? It is important to ensure Indigenous people are supported to be involved with the management of resources in their 'Country'. This support includes capacity building measures such as training and other related opportunities.

How is it measured? This indicator is measured using fisheries management agency advice in the form of identified and documented opportunities for Indigenous community members to participate in education and compliance processes of fisheries management. It is expected to be a low cost indicator in the first instance, but may incur time and additional resourcing if the indicator is not achieved.

The steps for measuring the indicator are:

- (i) Identify whether and what training and education opportunities are being provided that are targeted to Indigenous peoples. This includes identification of;
 - a) Training opportunities able to be accessed by Indigenous community members,
 - b) Indigenous participation in through training opportunities and level of certification achieved (where relevant), and
 - c) The number of Indigenous community members involved in the delivery of education and training in relation to fisheries management.
- (ii) Processes are documented and identified as mandatory in fisheries management arrangements.

How is it analysed and interpreted?

This indicator is being met if: both measures are in place.	There is need to consider further management action if: measure (i) is in place or in the process of being met, but still waiting to be fully documented and incorporated into standard procedure.	There is an urgent need for management action if: there is no process in place.
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Key considerations: This indicator is not ranked in regard to its significance to the measurement of the objective's achievement. However, training and capacity building underpin the ability to participate in income generating opportunities which is a key issue for Indigenous communities. The explicit consideration of this in fisheries management arrangements is a contributor to improved communication and relations with Indigenous communities associated with fisheries under management.

Decision triggers and management responses: There is a need for management action by fisheries managers if management arrangements:

- Do not consider or recognise the provision for, or inclusion of, Indigenous people in the delivery of training and capacity building opportunities related to the management of fisheries associated with identified 'Country'; or
- Provide low or no level of participation in training and development opportunities by Indigenous community members associated with the fishery.

In these cases, management action is needed because it indicates a failure to adequately identify or activate opportunities for Indigenous capacity building in relation to fisheries management arrangements affecting associated 'Country'.

Where management action is needed, fisheries managers should:

- Take steps to identify necessary arrangements to include Indigenous community members in both access to, and inclusion in, training and capacity building activities for the fishery;
- Identify any necessary amendments that may be required to management arrangements to facilitate access by Indigenous peoples to training and development opportunities; and/or
- Undertake actions and identify times frames to put management steps into place.

Indicator 2.5.1-Acceptance by community of fisheries information provided by their fishery management nominee as being relevant, requested and inclusive of their concerns, within the constraints of confidentiality

How do you collect data: Management agency & sign-off by Indigenous community	Measurement cost: Low	Measurement complexity: High	Indicator independence: Not Available
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Social objective this indicator addresses: Objective 2.5 - Make fisheries collected data available in a timely and publicly accessible manner.

What is the indicator? This is an indicator of the successful transfer of information and knowledge about fisheries management activities and outcomes to identified associated Indigenous communities. It is suggested that this indicator be linked with the indicators of Objective 2.3 to ensure that community representatives provide relevant information back to their communities. This maximises the likelihood that the information would be delivered to those to whom it is most relevant and in an appropriate manner.

Why is it measured? It is measured to ensure that Indigenous communities have access to information about the management of the fishery related to their ‘Country’ in both a timely and transparent manner.

How is it measured? It is suggested that this indicator be measured through the receipt of community sign-off of fisheries management arrangements – indicating that they had received information about the arrangements and their development, and agreed to them. It would be necessary to ensure that the representative seeking community sign-off understood that this is the perceived meaning of community sign-off of the management arrangements.

The steps may include:

- (i) Identifying a representative for the Indigenous community associated with the fishery;
- (ii) Ensuring the understanding by the representative of all the implications of the management arrangements which affect a fisheries species that fall within the community’s ‘Country’ and of any ‘iconic’ species; and
- (iii) Confirmation in writing or other appropriate means, that the representative has received community ‘sign-off’ on the fisheries management arrangements.

How is it analysed and interpreted?

This indicator is being met if: all three measures are in place	There is need to consider further management action if: only measures (i) and (ii) are being met or in the process of being met, but still waiting for community sign-off.	There is an urgent need for management action if: there is no process in place; or the community had withdrawn their sign-off of a plan/arrangement.
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Key considerations: This indicator is not ranked in regard to its significance to the measurement of the objective's achievement. Further this indicator and its measure rely on clarity of common understandings and consistent communication between parties, which could confound the indicator's meaningful and/or successful implementation. Attention should be given to these details.

Decision triggers and management responses: There is a need for management action by fisheries managers if management arrangements:

- Do not consider or recognise the need for clear and culturally appropriate communication of fisheries management arrangements for fisheries within identified associated 'Country'; or
- Are not endorsed by the Indigenous community and/or withdraw their endorsement of a management arrangement over the life of arrangement.

In these cases, management action is needed because a lack of facilitation of the communication of management arrangements is indicated.

Where management action is needed, fisheries managers should:

- Identify a representative for each community associated with the fishery who can appropriately and legitimately communicate information about the management arrangements of the fishery;
- Identify what management steps are required to ensure comprehensive engagement with and understanding of the fisheries management arrangements by the community representative; and
- Identify time frames and undertake actions to put management steps into place.

Indicator 2.6.1-Level of community nominee’s participation in the evaluation process of fisheries management arrangements

How do you collect data: Management agency and/or advice from advisory group	Measurement cost: Low	Measurement complexity: High	Indicator independence: Not Available
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Social objective this indicator addresses: Objective 2.6 - Aboriginal and Torres Strait Islander communities associated with ‘Country’ aquatic resources have a high level of trust in the management of fisheries.

What is the indicator? This indicator identifies the level of participation of community representatives through the entire cycle of fisheries management development.

Why is it measured? It is measured to evaluate the effectiveness of inclusion of community representatives in the development of fisheries management arrangements. Such an indicator is directed at increasing the level of transparency between the community and fisheries management, and consequently increasing trust and respect both ways, for the management of the fishery and in areas associated with the management of resources of ‘Country’.

How is it measured? It is suggested that this indicator be measured through the documentation of the steps of the management cycle in which community representatives are both present and participative.

The steps for measuring the indicator are:

- (i) Identification of a representative for the Indigenous community associated with the fishery;
- (ii) Identification of:
 - a) Attendance by the representative at meetings where decisions on fisheries management arrangements are made, and
 - b) Level of participation at meetings (this may be an average of the representative’s evaluation on a scale of 1 – 5) or other means deemed appropriate and as agreed by both the representative and the fisheries manager).
- (iii) Confirmation in writing (or other appropriate means) that the representative both accepts the summary of their participation and the management steps taken to facilitate their attendance and/or has provided input about any necessary management actions required to facilitate increased attendance or participation in processes.

How is it analysed and interpreted?

This indicator is being met if: all three measures are in place	There is need to consider further management action if: only measures (i) and (ii) are in place but subject to agreement with the advisory group.	There is an urgent need for management action if: there is no process in place; or the advisory group has withdrawn their acceptance of the summary.
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Key considerations: This indicator is not ranked in regard to its significance to the measurement of the objective's achievement. Further, this indicator and its measure rely on clarity of common understandings and consistent communication between parties, which could confound the indicator's meaningful and/or successful implementation and consequently close attention should be given to these details.

Decision triggers and management responses: There is a need for management action by fisheries managers if management arrangements:

- Do not involve an Indigenous representative in fisheries management evaluation and decision making processes for fisheries associated with 'Country',
- Do not have methods in place for the inclusion of relevant community representatives in the evaluation of management arrangements for the fishery, or
- Are not endorsed the community representative or they withdraw their endorsement of a summary of participation subsequent over the life of the management arrangement.

In these cases, management action is needed because there is an identified lack of facilitation of participation by Indigenous representatives.

Where management action is needed, fisheries managers should:

- Identify a community representative for each community associated with the fishery who can appropriately and legitimately participate in evaluation processes of the management arrangements for the fishery;
- Identify what management steps are required to ensure comprehensive participation by the community representative(s) in the evaluation processes of the management arrangements for the fishery; and
- Identify time frames and undertake actions to put management steps into place.

Indicator 2.6.2-Level of collaborative, cultural and scientific research undertaken to ensure fisheries management is consistent with, and supportive of, cultural and customary take

How do you collect data: Management agency & discussions with community representatives	Measurement cost: Low	Measurement complexity: High	Indicator independence: Not Available
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Social objective this indicator addresses: Objective 2.6 - Aboriginal and Torres Strait Islander communities associated with 'Country' aquatic resources have a high level of trust in the management of fisheries.

What is the indicator? This indicator identifies the level of collaboration initiated and supported by fisheries management between scientific management approaches and Indigenous cultural knowledge in support of cultural and customary take.

Why is it measured? It is measured to engender understanding and trust between the different management styles and, as importantly, to maximise resource sustainability outcomes through the blending of scientific and traditional knowledge.

How is it measured? Extensive further work is required on this indicator. In the most basic instance, it can be measured through the documentation of the steps taken by fisheries managers to ensure where a fishery is connected with identified Indigenous 'Country' that appropriate Indigenous representatives are included on research projects to share knowledge and evaluate scientific findings in the light of Traditional Fishing Knowledge (TFK).

The steps for measuring the indicator are:

- (i) Identifying research projects that encompass species/stocks that are Indigenous 'iconic' species or included in fisheries encompassed by identified fisheries associated 'Country';
- (ii) Identifying and documenting inclusion and/or consultation processes with Indigenous representatives at each of the project's development, implementation and write-up phases;
- (iii) Identifying steps that could be facilitated by fisheries managers to improve engagement of Indigenous representatives in scientific research projects;
- (iv) Documenting the parties participating in research projects, the respective contributions and the potential for greater collaboration; and
- (v) Communicating research outcomes to all participant parties.

How is it analysed and interpreted?

This indicator is being met if: all five measures are in place.	There is need to consider further management action if: measures (i) and (ii) are in place, or the process of being implemented, but the remainder are outstanding.	There is an urgent need for management action if: there is no consideration of the inclusion of Indigenous knowledge in scientific research and/or there are no processes in place to facilitate and document the outcomes of any such occurrences.
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Key considerations: This indicator is not ranked in regard to its significance to the measurement of the objective's achievement. Further, this indicator and its measure rely on common understandings and consistent communication regarding expectations and extensive respect between parties. These issues could confound the indicator's meaningful and/or successful implementation, and consequently close attention should be given to these details in its further development.

Decision triggers and management responses: There is a need for management action by fisheries managers if management arrangements:

- Do not consider or recognise the need for incorporation of traditional management knowledge/practices in management and research arrangements within identified 'Country';
- Have no methods in place for the inclusion of relevant traditional management knowledge and integration of this with western scientific approaches in the development and implementation of management and research arrangements for the fishery, or
- Are not formally acknowledged or recognised where traditional fisheries knowledge is considered in research.

In these cases, management action is needed because a lack of collaboration around scientific research that respects traditional Indigenous knowledge is indicated. Where management action is needed, fisheries managers should:

- Identify a representative/advisory group for each community associated with the fishery who can appropriately and legitimately provide information on key species and the traditional management methods used for these;
- Ensure comprehensive documentation (within the constraints of cultural requirements) of traditional management practices, and identify alignment and divergence from western scientific management practices;
- Identify appropriate review of research outcomes by Indigenous community members/ advisory group and incorporate feedback into outcomes and assessments;
- Identify relevant further collaborative research where alignment is not apparent or divergence is evident of management approaches with both western and traditional research partners; and
- Identify time frames and undertake actions to put management steps into place.

Indicator 2.7.1-Level of Aboriginal and Torres Strait Islander groups participation with other sectors and management in any fisheries ESD education processes

How do you collect data: Management agency	Measurement cost: Low	Measurement complexity: High	Indicator independence: Not available
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Social objective this indicator addresses: Objective 2.7 - Ensure collaborative inputs by Aboriginal and Torres Strait Islander communities, regional and industry sectors on the benefits each sector offers to fisheries management.

What is the indicator? This indicator identifies the level of collaboration initiated and supported by fisheries management between the commercial fishing industry, regional community and Indigenous communities on community ESD and sustainability initiatives.

Why is it measured? It is measured to engender understanding and develop collaborative relationships between the different groups interacting with the fishery resource.

How is it measured? This is a complex indicator to measure. In the first, and most basic, instance, it is recommended that this indicator is measured through the documentation of the management steps taken to identify ESD education processes and the roles that the Indigenous, industry and local/regional communities sectors do, and could, play in those activities.

The steps for measuring the indicator are:

- (i) Identifying ESD education practices of the fisheries management agency in relation to the fishery.
- (ii) Identifying and documenting consultation activities with Indigenous, industry and local/regional community sectors as to their abilities and skills to contribute to these ESD education practices.
- (iii) Identifying steps to allow the participation of Indigenous groups in ESD education practices that could be facilitated by fisheries management.
- (iv) Document the:
 - a) Parties participating in ESD education processes, and
 - b) Their respective contributions and the potential for greater collaboration.
- (v) Communicate ESD collaboration outcomes to all participant parties.

How is it analysed and interpreted?

This indicator is being met if: all five measures are in place	There is need to consider further management action if: measures (i) to (iii) are in place, or the process of being implemented, but (iv) and (v) remain outstanding.	There is an urgent need for management action if: there is no process in place.
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Key considerations: This indicator is not ranked in regard to its significance to the measurement of the objective's achievement. Further, this indicator and its measure rely on common understandings and consistent communication regarding expectations, and extensive respect between parties. These issues could confound the indicator's meaningful and/or successful implementation, and consequently close attention should be given to these details.

Decision triggers and management responses: There is a need for management action by fisheries managers if management arrangements:

- Do not consider or recognise the need for incorporation of traditional knowledge in ESD education processes in fisheries management arrangements for fisheries within identified 'Country';
- Have no methods in place for the inclusion of relevant traditional knowledge and integration of this with existing or future ESD education processes; or
- Don't allow for the evaluation of the facilitation that may be required to engage Indigenous communities in participating in ESD educative processes,

In these cases, management action is needed because a lack of support for the participation of Indigenous communities in ESD education is indicated.

Where management action is needed, fisheries managers should:

- Identify a representative/advisory group for each community associated with the fishery who can appropriately and legitimately provide guidance on their desire to be involved in the delivery of ESD education;
- In collaboration with Indigenous community representatives identify methods to integrate Indigenous community knowledge into ESD educative processes; and
- Identify time frames and undertake actions to put management steps into place.

Local/regional community

Indicator 3.1.1-Level of contribution of fisheries to direct employment in defined communities

How do you collect data: Fisher survey followed by expert economic modelling and analysis	Measurement cost: Very high	Measurement complexity: Very high	Indicator independence: Medium
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Social objective this indicator addresses: Objective 3.1 - Positively influence fisheries related socio-economic benefits for regional communities, within the constraints of ecological sustainability.

What is the indicator? This indicator identifies the direct employment contributions of fishing to local communities, based on estimating the level of employment generated in defined regions by a particular fishery. The estimate is confined to 'direct' employment, defined as jobs that are directly generated in fishing, and excluding 'indirect' or flow-on jobs (see Indicator 3.1.2).

Why is it measured? Fisheries legislation commonly requires fisheries managers to manage the fishery for maximum community benefit. This indicator helps measure how the fishery is contributing to communities through its generation of employment.

How is it measured? It is recommended that fisheries managers consider engaging an expert to undertake the measurement and analysis of this indicator, as it is more complex to estimate than most others in this Guide.

This indicator is measured through:

- (i) Defining the communities of relevance to the fishery (see Box 3 for detailed explanation; these may be 'nested regions', e.g. a local, regional and state community, where local may be part of a region), based on the knowledge of fisheries manager of the relevant communities for that fishery. This definition should be clearly documented¹⁴;
- (ii) Gathering data on employment via fisher surveys, which ask fishers to identify the employment generated in their business;
- (iii) Extrapolating from the sample obtained to identify the likely full amount of employment generated across the entire fishery; and
- (iv) Estimating total direct employment for each of the defined geographic regions identified in Step (i).

This indicator is more complex than most others as, unlike some others, it requires a fisher survey and also statistical analysis of the results of that survey, rather than calculation of a relatively simple indicator as is the case for most other indicators.

¹⁴ It is important to clearly document what geographic regions are considered relevant to the fishery, to ensure continuity of data collection over time.

In the fisher survey, fishers should be asked how much employment their business generates, including:

- Number of full-time, part-time and casual employees who were employed in the last 12 months by the community in which they live. This means that, for the communities identified as relevant, the fisher will be asked how many employees lived in each community. If, for example, it is considered important to identify how much employment the fishery generates in each of three local government areas, the fisher would be asked to answer a table like the one shown below.
- Total full-time equivalent employment (FTE) across those employees. See the table below for an example of this type of survey question.

In the last 12 months, how many people were employed in total in your fishing business?	Number of people or full-time equivalents
Full-time:	
Part-time – number of people:	
Part-time – full-time equivalent (i.e. if you added up the hours worked, what proportion of a full-time job would it be equivalent to. For example, if you employed 3 people part-time, and each worked 10 hours per week, this would be an FTE of 0.75)	
Casual – number of people:	
Casual – full-time equivalent:	

The survey will in most cases collect data from only a sample of fishers – that is, not 100% of fishers will answer the survey. Consequently, the employment generated by the fishing businesses who did not respond to the survey must be estimated based on the responses that were obtained. To do this, it is critical to assess whether the ‘missing fishers’ who did not participate in the survey have the same characteristics as those who did. For example, if a survey has achieved a response from 50% of fishers, it is necessary to determine if the 50% who responded to the survey have similar characteristics to those who didn’t respond to the survey. It is also necessary to assess whether the survey non-respondents differed in terms of typical employment (e.g. were smaller businesses less likely to respond than large ones?). This is possible to do by looking at whether catch volumes and values of those who responded are typical of the whole fishery and using this to identify likely ‘missing employment’. Such an analysis has to be undertaken based on knowledge of the specific fishery. The steps in determining employment are therefore based on response and catch rates, and are:

- Undertake a survey of fishers and identify the total response rate (i.e. percentage of licenced fishers who completed the survey), e.g. this response rate may be 50%.
- Identify the proportion of total catch these fishers took from the fishery using catch records. It may be identified, for example, that the fishers who responded were responsible for 75% of the catch, despite only 50% of businesses having responded to the survey. This suggests that smaller fishing businesses have not been as likely to respond to the survey. The survey results would then be analysed to identify what

the typical employment per unit of catch volume was for small versus large businesses, as it is possible that small businesses employ more people per unit of catch than the larger boats who did respond.

- Assuming that smaller businesses employ around the same number of people per unit of catch as larger businesses, the missing employment would be estimated as being around 25% of total employment, and can be imputed. If, however, smaller boats are found to employ more people per unit of catch, this analysis may suggest the missing employment is closer to 35% of the total employment in the fishery.
- These complexities are important, and highlight that this exercise is often best undertaken by experts who can undertake professional assessment of response bias in fisher surveys.

How is it analysed and interpreted?

<p>This indicator is being met if: employment is staying stable or growing over time that is located in the communities defined by the fisheries manager as being of relevant.</p>	<p>There is need to consider further management action if: employment is declining over time, but not rapidly, or not consistently for a long period, that is located in the communities defined by the fisheries manager as being of relevant. While this may be a result of factors such as technology improvement, is still warrants consideration.</p>	<p>There is an urgent need for management action if: employment is declining rapidly in the communities defined by the fisheries manager as being of relevance. What is considered rapid, and the timeframe over which the trend would need to be considered a concerning trend rather than normal short-term fluctuations in employment, and should be determined on a fishery by fishery basis.</p>
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Key considerations: This indicator was considered highly important by fisheries managers and is of medium independence (it was not considered of high independence because some data must be imputed). It is quite complex to measure in a meaningful way and requires considerable care in estimation. For these reasons, consideration should be given to engaging an expert to generate this type of data.

Decision triggers and management responses: Where management action is needed (i.e. the indicator is 'orange' or 'red'), fisheries managers should:

- Identify why employment is declining, including whether the decline is a consequence of intended or unintended management actions or other factors;
- Identify implications of the decline for fisheries management. Even if the decline in employment is caused by factors unrelated to management, it may have some important effects or influences on the fishery and therefore, sustainable management of the fishery for social, economic or ecological reasons; and
- Identify and implement any actions to address the decline, if considered appropriate.

Examples

See Indicator 3.1.2, as it shows results of work undertaken by EconSearch for the South Australian Marine Scalefish Fishery.

Box 3: Defining 'local/regional' community

What is a 'regional community'? When someone asks you how much benefit your fishery generates for the 'local community', what does that mean?

Defining what generic terms such as 'local' and 'regional' mean in practice is difficult, as people's ideas about what is local versus non-local will vary from place to place and community to community. When assessing indicators that require a survey of a 'community' in order to analyse fisheries activities within a particular region, it is necessary to identify what regions/communities will be assessed, based on analysis of the relevant local situation.

Given that the jobs generated by a given fishery may be spread across multiple towns, it is critical to carefully consider what regions need to be included when estimating the employment generated. Ideally, commonly recognised geographic boundaries should be used, such as local government area (LGA) boundaries. Where possible, align the boundaries of the communities to those used by the Australian Bureau of Statistics (ABS) to enable comparison of fisheries employment data with other information generated by the ABS. Doing this enables you to compare the amount of people employed in fishing in a given community (whether a town, LGA or other boundary is used) with the estimates of total employment produced by the ABS for that same region, and use this to estimate what percentage of employment depends on fishing.

To use this approach, first identify where the people who work in the fishery typically live and what geographic boundaries best define these communities – for example, whether local government areas work best, or regions that are often analysed by government agencies or referred to by local residents. Once communities are defined, ensure that these communities are clearly documented, so that estimates of employment and other relevant information are collected for the same regions over time.

All relevant data for a fishery– such as employment data – should then use these regions as a reference point (e.g. ask fishers what proportion of their employees live in each region when surveying them).

It can then be identified if a decline in employment in one region has been matched by an increase in another, or whether other changes in the spatial patterns of employment have occurred. This assists in understanding the implications of any changes in employment or other activities in a single region, and puts these in the context of the changes occurring in surrounding regions.

Indicator 3.1.2-Proportion of direct and indirect employment in a region dependent on fishing

How do you collect data: Fisher survey followed by expert economic modelling and analysis	Measurement cost: Very high	Measurement complexity: Very high	Indicator independence: High
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Social objective this indicator addresses: Objective 3.1 - Positively influence fisheries related socio-economic benefits for regional communities, within the constraints of ecological sustainability.

What is the indicator? This indicator identifies the contribution of fishers to regional communities through their direct and indirect employment, and how this changes over time. See Box 3 in the previous indicator for a discussion of how to define boundaries of local/regional communities. ‘Direct’ employment refers to employment that fishers generate as part of their fishing activities. ‘Indirect’ employment refers to the ‘flow-on’ employment this fishing activity then generates – e.g. as a result of the additional spending by people in bait and tackle shops at which fishers have spent money, or employment in processing operations or fish retail stores. This indicator is highly complex, and requires significantly more investment than other indicators (including Indicator 3.1.1, which is a necessary prerequisite for measuring Indicator 3.1.2).

Why is it measured? Fisheries legislation commonly requires fisheries to be managed for ‘*maximum community benefit*’. This indicator helps measure how the fishery is contributing to regional communities and is more comprehensive than Indicator 3.1.1 (direct employment), as it traces the flows of employment generated by fishers as the effect of their activities move through the economy of a region. This indicator is, however, more complex to measure.

How is it measured? This indicator is measured by collecting the same data used for Indicator 3.1.1, but then undertaking economic modelling to identify the indirect or ‘flow-on’ effect of this employment, i.e. how much additional employment occurs in the economy of a defined region as a result of fishers. This modelling should be undertaken by a trained economist who specialises in using input-output (I-O) or computable general equilibrium (CGE) models, the two model types most commonly used to identify indirect economic impacts. In most regions, it is possible to identify consulting firms who have developed I-O or CGE models for that region.

Note: while economic modelling techniques are used to measure this indicator, the outcomes are information that helps identify the social benefit derived from the fishery – if a fishery is supporting the presence of people in a community, it is supporting not only economic activity but also a wide range of social connections and activities in that community.

How is it analysed and interpreted?

This indicator is being met if: employment <i>is staying stable or growing over time</i> . in the communities defined by the fishery manager as being of relevance to the fishery.	There is need to consider further management action if: employment <i>is declining over time, but not rapidly, or not consistently</i> for a long period. in the communities defined by the fishery manager as being of relevance to the fishery. This may be a result of factors such as technology improvement, but warrants consideration.	There is an urgent need for management action if: employment <i>is declining rapidly</i> in the communities defined by the fishery manager as being of relevance to the fishery. What is considered rapid, and the timeframe over which the trend would need to be observed to be considered a concerning trend rather than normal short-term fluctuations in employment, should be determined on a fishery by fishery basis.
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Key considerations: Modelling indirect employment requires professional expertise and this needs to occur in addition to collecting data via survey. Consequently, this is a very high cost indicator. When commissioning experts to undertake this work, it is critical that the boundaries are specified of the geographic region related to the fishery for which analysis of indirect expenditure is required. It is also necessary to check that the economic model being used can produce outputs for the regions of interest – e.g. some models are designed only to produce data for very large regions, and cannot produce estimates of indirect employment for smaller regions such as local government areas.

If a very small region (e.g. a single town) is specified, the indirect employment identified may be low because much of the indirect employment may occur outside that town. This is simply because much of the spending by fishers will end up flowing outside a small town quite quickly – to give an example, a deckhand who lives in a large regional city might do 90% of their shopping in that city and hence 90% of the initial indirect benefit of that spending occurs in that city. If they live in a small town, however, they are likely to spend a larger proportion of their income in other towns, as there are fewer goods and services available in their home town. This means much of the indirect benefit occurs outside the small town. For this reason, it may be appropriate to analyse indirect employment over a larger region in order to fully capture the flow-on effects generated by fishing activities.

Decision triggers and management responses

Where employment is declining for a fishery, management action may be required:

- Identify why employment is declining, including whether it is driven by intended management actions, or other factors;
- Identify implications of the decline for fisheries management. Even if the decline in employment is caused by factors unrelated to management, it may have some important effects or influences on fisheries management; and
- Identify and implement any actions to address the decline, if considered appropriate.

Examples

Figure 11 shows an example of data on direct and indirect employment in the South Australian Marine Scalefish Fishery over time, generated by EconSearch, a firm engaged by Primary Industries and Regions South Australia (PIRSA) Fisheries and Aquaculture to undertake regular economic surveys of this commercial fishery. In the period from 1997 to 2004, the indicator would have been considered orange or red, given the thresholds considered relevant by the fisheries managers. However, since 2005/06 the indicator would have been considered green.

This measure is for the region or 'community' of the State of South Australia. EconSearch also generates data for smaller regions that identify trends in individual regions considered relevant; refer to their report to see examples of these (EconSearch 2012).

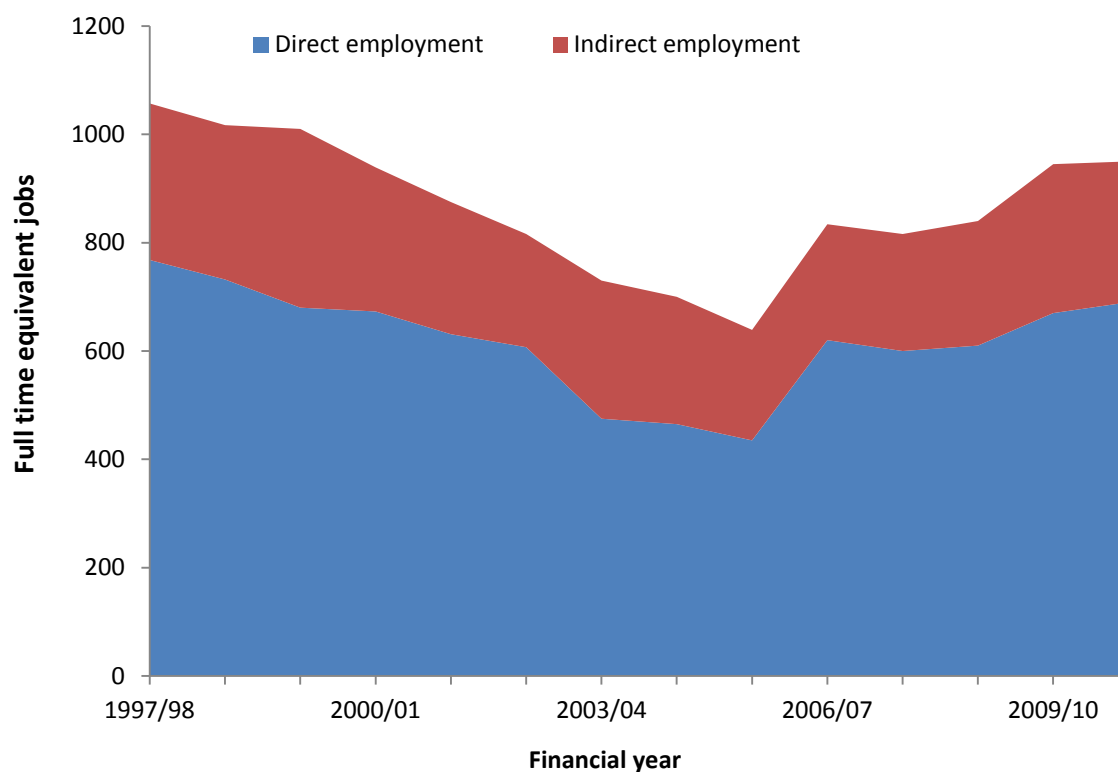


Figure 11 Total direct and indirect employment generated by the South Australian Marine Scalefish Fishery, 1997/98 to 2010/11 (EconSearch 2012).

Indicator 3.2.1-Level of recognition of key social and community needs in fisheries management processes

How do you collect data: Management agency	Measurement cost: Low	Measurement complexity: Medium	Indicator independence: Medium-High
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Social objective this indicator addresses: Objective 3.2 - Facilitate and support the cohesion and connectedness of fishers with their regional communities through fisheries management.

What is the indicator? This indicator identifies whether key social and community needs are recognised and addressed in fisheries management processes.

Why is it measured? Recognising community needs and addressing them helps build public understanding of, and support for, the industry. Fisheries management processes should be sensitive to the social and cultural practices of different communities and the groups within those communities. To address policy objectives of social benefit, fisheries managers also need to be aware of supporting local communities through ensuring fishers have opportunity to contribute to and participate in broader community activities. This in turn generates social capital that contributes to the cohesion and connectedness of regional communities.

As a result, management processes need to recognise particular community sensitivities and respond to these. For example, this may require consideration of any need to restrict access to areas with cultural importance on certain dates, to change access arrangements for particular holidays or festivals, or to allow the transfer of knowledge within families through providing access to fishing opportunities. Opening and closing time of fisheries that coincide with peak holiday and family interaction times can benefit or detract from community cohesion and fisher connectedness with their community and these issues need to be carefully assessed. For example, the Queensland Prawn Trawl Fishery now closes over the Christmas period in recognition of these needs, enabling fishers to spend time with their family and community during this important social period. In the South Australian Marine Scalefish Fishery, the use of hauling nets by commercial fishers is not permitted in coastal waters during certain holiday periods (e.g. Christmas, Easter etc) in order to reduce social conflict with recreational fishers.

How is it measured? This indicator is measured using data from fisheries managers, in which they are asked to answer the following question:

- (i) *'Can key community issues be identified that need to be addressed in management activities to ensure contribution by the fishery to local community wellbeing (yes/no/unsure)?'*
 - Sometimes fisheries managers need to consider local cultural and social needs when planning their decisions. For example, this might include identifying dates when fishers need to be able to participate in community activities (in small communities this could be as simple as the football or volunteer fire fighting group training times), or when fishing (or conversely, placing restrictions on fishing) may be considered culturally inappropriate. Other examples include where fisheries managers might need to consider

potential for social conflict, impacts on amenity, and whether management arrangements effects the ability of fishers to take part in community life.

- (ii) If yes, document briefly the cultural considerations;
- (iii) For each issue, establish and document clear guidelines on how it is addressed in the decision making processes (e.g. requirement to close fishery, or to ensure requests for meetings with fishers do not clash with particular community events); and
- (iv) The parties concerned with the issues agree on the management arrangements to mitigate or minimise negative management effect. If considered appropriate, they sign-off on the documentation of the fisheries management arrangements put in place. Note that for some issues, achieving formal sign-off may be considered overly onerous given the nature of the issue involved, whereas for others it may be important – this should be assessed on a case by case basis.

How is it analysed and interpreted? If no issues connected with the fishery are identified, or for issues identified, the measures are met, and then also signed off by the parties concerned, then the indicator would be seen as being met (green). If any of the measures are being met, but an identified need for sign-off has not been achieved, then the management activities would be considered to be positively moving toward being met, but that further management action is required (orange). Alternatively, if none of the measures have been undertaken, or an identified need for sign-off has not occurred or has been withdrawn, then the indicator is not being met, and management action is urgently required (red).

This indicator is being met if: issues are being actively identified, addressed in management processes, and signed off by concerned parties.	There is need to consider further management action if: no issues are being identified, or some issues are identified but not addressed in management processes.	There is an urgent need for management action if: no issues known or unknown are being identified or addressed.
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Key considerations: This indicator is a low cost indicator that is moderately complex to measure. If sign-off is achieved, it can be considered to have high independence, as the stakeholders involved have confirmed their views on the appropriateness of management arrangements.

Decision triggers and management responses: If the indicator is orange or red, fisheries managers should:

- Identify the ways in which the activity of the fishery interacts with the community (both directly and indirectly through restriction of fisher engagement in community activities);
- Identify the reasons for changes in community needs over time, if any have been identified as part of the process of measuring the indicator, and investigate what management actions could potentially address the issue; and
- Identify actions and times frames to put identified management steps into place.

Examples

Table 36 gives a worked example of the steps of collecting data, analysing it and identifying whether the indicator is green, orange or red for the East Coast Trawl Fishery of Queensland and the Marine Scalefish, Rock Lobster and Abalone fisheries of South Australia.

Note that in this indicator, the original measurement did not ask fisheries managers to specify if sign-off had been achieved from key stakeholders. Whether this is needed should be evaluated based on the nature of the issue and the desires of the stakeholders involved.

Table 36 Step by step guide to measuring Indicator 3.2.1, using data from the East Coast Trawl Fishery of Queensland and the Marine Scalefish, Rock Lobster and Abalone fisheries of South Australia.

<p>Ask this question of fisheries managers:</p>	<p>Sometimes fisheries managers need to consider local cultural and social needs when planning their fisheries management.</p> <p>Q. 'Can you identify any key community issues that need to be addressed in your management activities to ensure you contribute to local community wellbeing?'</p> <p>For example, this might include identifying dates when fishers need to be able to participate in community activities, or when fishing may be considered culturally inappropriate. Other examples include where you might need to consider potential for social conflict, impacts on amenity, and whether management impacts ability of fishers to take part in community life. (yes/no/unsure)</p>																							
<p>Analyse the basic data:</p>	<table border="1"> <thead> <tr> <th>Fishery</th> <th>Issues identified</th> <th>Description</th> <th>Addressed in management processes?</th> </tr> </thead> <tbody> <tr> <td>Marine Scalefish (SA)</td> <td>Yes</td> <td>Use of hauling nets in coastal waters during certain holiday periods</td> <td>Yes</td> </tr> <tr> <td>East Coast Trawl (QLD)</td> <td>No</td> <td></td> <td></td> </tr> <tr> <td>Rock Lobster (SA)</td> <td>Yes</td> <td></td> <td>Unsure</td> </tr> <tr> <td>Abalone (SA)</td> <td>Yes</td> <td></td> <td>Unsure</td> </tr> </tbody> </table>	Fishery	Issues identified	Description	Addressed in management processes?	Marine Scalefish (SA)	Yes	Use of hauling nets in coastal waters during certain holiday periods	Yes	East Coast Trawl (QLD)	No			Rock Lobster (SA)	Yes		Unsure	Abalone (SA)	Yes		Unsure			
Fishery	Issues identified	Description	Addressed in management processes?																					
Marine Scalefish (SA)	Yes	Use of hauling nets in coastal waters during certain holiday periods	Yes																					
East Coast Trawl (QLD)	No																							
Rock Lobster (SA)	Yes		Unsure																					
Abalone (SA)	Yes		Unsure																					
<p>Identify if the indicator is green, orange or red:</p>	<p>SA Marine Scalefish Fishery</p>	<p>SA Rock Lobster Fishery SA Abalone Fishery (in both cases due to the fact that the details are not described and adequately documented)</p>	<p>QLD East Coast Trawl Fishery</p>																					

Indicator 3.3.1-Level of fisheries management agency involvement in community education/ outreach activities

How do you collect data: Management agency	Measurement cost: Low	Measurement complexity: Low	Indicator independence: High
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Social objective this indicator addresses: Objective 3.3 - Maximise community trust in fisheries agencies to manage fisheries.

What is the indicator? This indicator identifies whether the fisheries management agency contributes to training and education opportunities provided to the public, either by running their own workshops/courses, or by contributing to the education and training run by other organisations.

Why is it measured? Providing opportunities for community members to learn more about fishing, and how to fish responsibly, is one way of building community understanding of, and therefore, trust in the fisheries management agency. Well targeted and implemented education processes ensure members of the public better understand why fisheries management arrangements are in place and the purpose they serve. This indicator is measured in the same way as Indicator 3.5.1, but for a different purpose. Whereas Indicator 3.5.1 aims to facilitate capacity building, the same education and outreach activities can build trust in the fisheries management agency.

How is it measured? This indicator is measured by asking the fisheries manager to answer the following questions:

- ‘Does the organisation provide training and education opportunities for the non-fishing public (yes/no)?’ If yes, the fisheries manager is asked to list the types of opportunities and the number so these can be tracked and compared over time; and
- ‘Does the organisation contribute to training and education opportunities provided by other groups (e.g. fisheries managers might give talks at schools/universities or a public event) (yes/no)?’ If yes, the manager is asked to list the type and number of opportunities so these can be tracked and compared over time.

How is it analysed and interpreted?

This indicator is being met if: education and training opportunities are being provided (whether directly or indirectly), and the number is remaining stable or increasing over time.	There is need to consider further management action if: education and training opportunities are being provided, but the number is falling over time.	There is an urgent need for management action if: no education and training opportunities are being provided.
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Key considerations: This indicator is simple to measure, as the data can be generated by fisheries managers and independently verified as necessary. It does not evaluate whether these opportunities are resulting in positive outcomes in terms of enhancing public trust or identify what proportion of the public are being reached. This more detailed type of evaluation is partly addressed by Indicator 3.5.2, but may also require more in-depth analysis than is possible when assessing overall social objectives, particularly if the indicator has moved from green to orange or red. This indicator should be used as a guide to identify if any activity is happening, and consider what other evaluation will be needed to identify the effectiveness of training and education.

Decision triggers and management responses: If no education and training opportunities are being provided or the number of education and training opportunities is falling over time, management action is needed. The following steps are recommended:

- Evaluate whether there is a need for the fisheries management agency to contribute more to community education/training. This requires identifying whether other organisations are providing these types of opportunities and, if so, if the existing offerings are appropriate to support community stewardship of fisheries resources; and
- If there is a lack of education/training, or existing education/training would benefit from input by fisheries managers to improve stewardship outcomes, management should identify opportunities to build these opportunities (both directly via the fisheries management agency and indirectly through encouraging other groups to provide education/training). This may require bringing in experts to help design appropriate materials (e.g. training courses, or education kits for school children).

Where the assessment identifies a need to change current practices (e.g. by deciding to require fisheries managers to contribute to a course on a recurring basis), it is important to consider where and how this should be documented as part of management arrangements, thus ensuring that the practice continues even if there is a changeover of staff.

Examples

Table 37 gives a worked example of the steps of collecting data, analysing it and identifying whether the indicator is green, orange or red for the East Coast Trawl Fishery of Queensland and the Marine Scalefish, Rock Lobster and Abalone fisheries of South Australia.

Table 37 Step by step guide to measuring Indicator 3.3.1, using data from the East Coast Trawl Fishery of Queensland and the Marine Scalefish, Rock Lobster and Abalone fisheries of South Australia.

Ask these questions of fisheries managers:	<p>Q. 'Do you or others in your organisation provide training and education opportunities for the non-fishing public (yes/no)?' If yes, how often?</p> <p>Q. 'Do you or others in your organisation contribute to training and education opportunities provided by other groups (e.g. you might give a talk at a school or a public event) (yes/no)?' If yes, how often/types?</p>			
Analyse the basic data:	Fishery	Provide training & education	Contribute to training & education	If yes, how often?
	Marine Scalefish (SA)	No	Yes	Not assessable
	East Coast Trawl (QLD)	No	Yes	Not assessable
	Rock Lobster (SA)	No	Yes	Not assessable
	Abalone (SA)	No	Yes	Not assessable
Identify if the indicator is green, orange or red:		All fisheries are considered orange by default until the trend in education opportunities over time is known.		

Indicator 3.4.1-Number of cultural and heritage values associated with fishing are identified and managed as part of fisheries management

How do you collect data: Management agency	Measurement cost: Low	Measurement complexity: Low	Indicator independence: Medium
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Social objective this indicator addresses: Objective 3.4 - Ensure fisheries management contributes to the maintenance of cultural and heritage values related to fishing activities.

What is the indicator? This indicator identifies whether fisheries management processes include provisions to identify and consider the cultural and heritage values associated with fishing for associated communities.

Why is it measured? Fishing is associated with a number of cultural and heritage values in Australia, which many communities believe contribute significantly to their identity and social fabric. The specific nature of these values will vary from community to community. Fisheries managers need to ensure their management respects and, where possible, contributes to maintenance of these values. Doing this requires that management processes explicitly consider these issues when making decisions on fisheries management arrangements.

How is it measured? This indicator is measured by the fisheries manager, based on answers to the following question: *'Which of the following methods do you use to identify the cultural and heritage values associated with your fishery, which contribute to the communities in which the fishery operates (select all that apply)?'* The following options are given: (i) I don't identify cultural and heritage values at all; (ii) my own knowledge about the community; (iii) consultation with local experts e.g. tourism office, heritage office; (iv) consultation with Indigenous groups; (v) consultation with other stakeholder groups e.g. local council; (vi) consultation with fishers; (vii) community survey; and other (please describe).

How is it analysed and interpreted?

This indicator is being met if: the fisheries manager identifies cultural and heritage values, and consults with two or more external stakeholders to help identify these values (e.g. local experts).	There is need to consider further management action if: the fisheries manager identifies cultural and heritage values, but primarily based on their own knowledge with little or no consultation with other groups.	There is an urgent need for management action if: the fisheries manager doesn't identify cultural and heritage values at all.
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Key considerations: This indicator is designed to encourage more in-depth consultation with experts regarding cultural and heritage issues. Undertaking the activities associated with this indicator should ideally 'spark' ideas and understanding of how fisheries management impacts on cultural heritage (positively and negatively), and lead to development of strategies to address these as part of management processes, which may have a positive effect on the fishery's social licence to operate in its immediate community. As measurement of the indicator relies on the opinions of the fisheries manager and sometimes on informal consultation by them, its independence is medium.

Decision triggers and management responses: If the indicator is ‘orange’ or ‘red’, management action is needed:

- **Orange** - management needs to identify people other than the fishery manager who can be consulted to provide a wider understanding of cultural and heritage issues. If considered appropriate, these cultural and heritage issues need to be documented.
- **Red** - management needs to commence consultation about and documentation of cultural and heritage values that may be associated with the fishery, using both the fisheries manager’s own knowledge and that of external experts.

Examples

Table 38 gives a worked example of the steps of collecting data, analysing it and identifying whether the indicator is green, orange or red for the East Coast Trawl Fishery of Queensland and the Marine Scalefish, Rock Lobster and Abalone fisheries of South Australia.

Table 38 Step by step guide to measuring Indicator 3.4.1, using data from the East Coast Trawl Fishery of Queensland and the Marine Scalefish, Rock Lobster and Abalone fisheries of South Australia.

Ask this question of fisheries managers:	<p>Q. ‘Which of the following methods do you use to identify the cultural and heritage values associated with your fishery, which contribute to the communities in which the fishery operates (select all that apply)?’</p> <ul style="list-style-type: none"> • I don’t identify cultural and heritage values at all • My own knowledge about the community • consultation with local experts e.g. tourism office, heritage office • consultation with Indigenous groups • consultation with other stakeholder groups e.g. local council • consultation with fishers • community survey • other (please describe) 								
	Fishery	Which of the following methods do you use to identify the cultural and heritage values associated with your fishery, which contribute to the communities in which the fishery operates?							
		Don't identify	Own	Consultation with				Survey	Other
	Expert			Indigenous	Others	Fishers			
	Marine Scalefish (SA)	No	Yes	Yes	No	Yes	Yes	No	No
	East Coast Trawl (QLD)	No	Yes	No	No	Yes	Yes	No	No
Rock Lobster (SA)	No	Yes	Yes	No	Yes	Yes	No	No	
Abalone (SA)	No	No	Yes	No	Yes	Yes	No	No	
Identify if the indicator is green, orange or red:	SA Marine Scalefish Fishery QLD East Coast Trawl Fishery SA Rock Lobster Fishery SA Abalone Fishery								

Indicator 3.4.2-Importance of fishing to the culture and heritage of a community/ region

How do you collect data: Consultation with local experts or survey of the general public	Measurement cost: Low (consultation)- High (survey of public)	Measurement complexity: Medium-High	Indicator independence: Medium-High
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Social objective this indicator addresses: Objective 3.4 - Ensure fisheries management contributes to the maintenance of cultural and heritage values related to fishing activities.

What is the indicator? This indicator examines how important values identified under 3.4.1 and related to fishing activities are to the community in defining the culture and heritage of the community/region in which they take place.

Why is it measured? Fishing is associated with a number of cultural and heritage values in Australia, and as noted previously, the specific nature of these values and the importance placed upon them will vary from community to community. Fisheries managers need to ensure management arrangements respect, and appropriately contribute to, the maintenance of these values. In many coastal towns, the fishing industry is considered to form an integral part of the cultural heritage of the town. This culture/heritage may provide a basis for other activities, such as tourism (e.g. visitors may expect to see commercial fishing boats as part of the visual experience of the town).

A change in management arrangements that affect the experience of this cultural heritage may have broader impacts beyond fishing, which fisheries managers need to understand and consider when making decisions. Additionally, in some jurisdictions fisheries managers have the ability to change fisheries management on cultural grounds, e.g. by declaring traditional fishing grounds or maintaining (or restricting) some types of fishing methods on cultural grounds.

How is it measured? This indicator can be measured in two ways: (i) via limited survey/consultation with local experts undertaken by fisheries managers (low cost); or (ii) a survey of the general community utilising external assistance (high cost). The types of local experts fisheries managers may consult include any experts on culture and heritage of the region, tourism and visitor's centre staff, local government staff and local residents with an in-depth understanding of the community/region. In both cases, the following questions are asked:

- (i) *'How important is the [name of fishery] to the culture and heritage of [community/town/region] in relation to: (measured on a scale of 1 being 'no importance' to 10 being 'very high importance')?'*
 - a) List the aspects identified under 3.2.1
- (ii) *'What aspects of fishing are critical to maintaining this cultural heritage?' [this is an open ended question – e.g. it might identify that (a) it is important to ensure boats can moor at jetties near the town centre so they are visible, rather than at other moorings further away, or (b) fishing needs to be able to occur during certain cultural events or festivals]*

- (iii) *‘Over the last [specify period of time], is the strength of this fishing-related cultural heritage’:*
- Declining a lot;
 - Declining a little;
 - Staying the same;
 - Growing a little;
 - Growing a lot; and
 - Don’t know/unsure.
- (iv) If you specified that fishing related heritage is growing or declining, please describe why you believe this is happening.

How is it analysed and interpreted?

This indicator is being met if: the strength or importance of the majority of fishing-related cultural heritage is stable or growing over time.	There is need to consider further management action if: the strength or importance of the majority of fishing-related cultural heritage is declining over time.	There is an urgent need for management action if: the strength or importance of fishing-related cultural heritage is declining over time, and the reasons for the decline have to do with fisheries management decisions.
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Key considerations: This indicator is more qualitative than most others, as cultural and heritage issues will vary widely and are not generally quantifiable into any simple metric. It can often be difficult to identify whether and how fisheries management contributes to culture and heritage. However, the execution of this indicator will assist in identifying, and integrating consideration of, cultural and heritage issues into fisheries management processes.

Decision triggers and management responses: If indicator is orange or red, management action is needed by fisheries managers to:

- Identify whether and how fisheries management is contributing to any decline, through, for example, a reduction of access of areas to fishery or other change to management.
- Identify whether and what management actions may be appropriate. This should be considered even if fisheries management isn’t the cause of a decline in fishing related heritage, as it may be possible to manage the fishery in a way that counteracts external factors driving decline.

Examples

Data were not collected for this indicator as opportunities did not arise during the study to do so. Data can be collected for this indicator by using the evaluation questions provided above.

Indicator 3.5.1-Number of fisheries management agency training and education opportunities provided to the general public

How do you collect data: Management agency	Measurement cost: Low	Measurement complexity: Low	Indicator independence: High
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Social objective this indicator addresses: Objective 3.5 - Facilitate capacity building (through skills and knowledge development) for community members to enhance stewardship of fisheries resources.

What is the indicator? This indicator identifies the number of fisheries management agency training and education opportunities provided to the public, either by running their own workshops/ courses, or by contributing the education and training run by other organisations.

Why is it measured? Providing opportunities for community members to learn more about fishing and how to fish responsibly is one way of maintaining and growing the stewardship of fisheries resources by the general community. This indicator is measured in the same way as Indicator 3.3.1, but for a different purpose. Whereas Indicator 3.3.1 aims to facilitate trust in the fisheries management agency, the same activities are also used to build capacity, which can only occur if these opportunities are being provided with some frequency.

How is it measured? This indicator is measured by asking the fisheries manager to answer the following questions:

- *'Does the organisation provide training and education opportunities for the non-fishing public (yes/no)?* If yes, the fisheries manager is asked to list the types of opportunities and also the number so that these can be tracked and compared over time.
- *'Does the organisation contribute to training and education opportunities provided by other groups (e.g. fisheries managers might give talks at schools/universities or a public event) (yes/no)?'* If yes, the fisheries manager is asked to list the types of opportunities and also the number, so these can be tracked and compared over time.

How is it analysed and interpreted?

This indicator is being met if: education and training opportunities are being provided (whether directly or indirectly), and the number is increasing over time.	There is need to consider further management action if: education and training opportunities are being provided, and the number is falling over time.	There is an urgent need for management action if: education and training opportunities are not being provided.
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Key considerations: This indicator is fairly simple, as it asks whether training and education opportunities are being provided. It does not evaluate whether these opportunities are resulting in positive outcomes in terms of enhancing stewardship or identify what proportion of the public are being reached. This more detailed type of evaluation is partly addressed by Indicator 3.5.2, but may also require more in-depth analysis than is possible when assessing overall social objectives. This indicator is used as a guide to identify the level of training and educational opportunities being provided, and to prompt consideration of what further activities may be appropriate for the fisheries management agency to engage in.

Decision triggers and management responses: If no education and training opportunities are being provided or the number of education and training opportunities is falling over time, management action is needed. The following steps are recommended:

- Evaluate whether there is a need for the fisheries management agency to contribute more to community education and training. This requires identifying whether other organisations are providing these types of opportunities and, if so, if the existing offerings are appropriate to support community stewardship of fisheries resources.
- If there is a lack of education/training or existing education/training would benefit from input by fisheries managers to improve stewardship outcomes, identify opportunities to build these education/training opportunities (both directly via the fisheries management agency and indirectly through encouraging other groups to provide education and training). This may require bringing in experts to help design appropriate materials (e.g. training courses or education kits for school children, to give two examples).

Examples

Table 39 gives a worked example of the steps of collecting data, analysing it and identifying whether the indicator is green, orange or red for the East Coast Trawl Fishery of Queensland and the Marine Scalefish, Rock Lobster and Abalone fisheries of South Australia.

Table 39 Step by step guide to measuring Indicator 3.5.1, using data from the East Coast Trawl Fishery of Queensland and the Marine Scalefish, Rock Lobster and Abalone fisheries of South Australia.

Ask these questions of fisheries managers:	<p>Q. 'Do you or others in your organisation provide training and education opportunities for the non-fishing public (yes/no)?' If yes, how often?</p> <p>Q. 'Do you or others in your organisation contribute to training and education opportunities provided by other groups (e.g. you might give a talk at a school or a public event) (yes/no)?' If yes, how often/what types?</p>			
Analyse the basic data:	Fishery	Provide training & education	Contribute to training & education	If yes, how often?
	Marine Scalefish (SA)	No	Yes	Not assessable
	East Coast Trawl (QLD)	No	Yes	Not assessable
	Rock Lobster (SA)	No	Yes	Not assessable
	Abalone (SA)	No	Yes	Not assessable
Identify if the indicator is green, orange or red:		All fisheries are considered orange by default as it is not possible to identify the number of opportunities being provided or contributed to.		

Indicator 3.5.2-Level of satisfaction of community members with their participation in training and educational opportunities

How do you collect data: Survey of training course participants	Measurement cost: Medium	Measurement complexity: Medium	Indicator independence: High
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Social objective this indicator addresses: Objective 3.5 - Facilitate capacity building (through skills and knowledge development) for community members to enhance stewardship of fisheries resources.

What is the indicator? This indicator measures whether people who participate in training and educational opportunities are satisfied with those opportunities, and gain the types of skills and knowledge that can support stewardship.

Why is it measured? This indicator is a measure of outcomes, compared to Indicator 3.5.1, which measures the number of opportunities being provided, but not whether they are achieving their intended outcome.

How is it measured? This indicator is measured by surveying people who take part in training courses and education opportunities to evaluate whether these opportunities contributed effectively to their capacity to be stewards of the fishery. The evaluation instrument developed is brief and can be customised to ask additional questions relevant to the specific education/training opportunities being evaluated. Participants are asked to rate the effectiveness of the training/education opportunities (on a scale of 1-10, where 1 = not at all effective and 10 = very effective) through a short series of questions:

- *'[Name of training/education opportunity] improved my knowledge of how to care for fisheries resources [replace 'fisheries resources' with the name of particular species or regions the training focused on, for this and subsequent questions]';*
- *'[Name of training/education opportunity] improved my understanding of fisheries resources';*
- *'I was satisfied with the quality of the material covered in [Name of training/education opportunity]';*
- *'I was satisfied with the topics covered in [Name of training/education opportunity]' (if you felt there were gaps that should have been covered, you should rate the course lower than if it covered all the topics you felt it should); and*
- *'I am better able to take care of fisheries resources as a result of attending [Name of training/education opportunity]'.*

Training providers may also wish to ask more specific questions about the quality of the trainers, of the methods used to educate/train, of the training venue (if relevant), or other aspects of the education/training that will vary depending on the individual situation.

How is it analysed and interpreted?

This indicator is being met if: the mean score from the participant's ratings is >7 (out of a possible 10), and if mean ratings from participants are stable or growing over time (the latter applies only if multiple courses are evaluated over time).	There is need to consider further management action if: average participant ratings are growing over time but are <7; or if participants rate one or two aspects of the education/training poorly while all others are rated highly.	There is an urgent need for management action if: average participant ratings are >7 but declining over time, or are <7 and stable or declining.
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Key considerations: This indicator is fairly simple in its focus on the perceived quality of training and education opportunities being provided. It does not fully evaluate whether these opportunities are resulting in positive outcomes in terms of enhancing stewardship or identify what proportion of the public are being reached, these things require more in-depth analysis than is possible when assessing overall social objectives. Use this indicator as a guide to identify the perceived quality and likely effectiveness of training that is occurring.

Decision triggers and management responses: If participants are giving low ratings to some or all aspects of the training and education opportunities being provided, a more in-depth evaluation should be conducted to identify what aspects of these opportunities need improving, and how best to do this. This can be done through a more detailed survey of participants, and/or through holding focus groups or interviews with participants to identify further how the training/education could be improved.

Examples

Data were not collected for this indicator as opportunities did not arise during the study to do so. Data can be collected for this indicator by using the evaluation questions provided above.

Indicator 3.6.1- Community satisfaction with access to fisheries information

How do you collect data: Survey of general public	Measurement cost: Medium-High	Measurement complexity: Medium	Indicator independence: High
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Social objective this indicator addresses: Objective 3.6 - Ensure fisheries information is available in a timely and publicly accessible manner

What is the indicator? This indicator examines whether members of the community are satisfied with their access to fisheries related information.

Why is it measured? In addition to knowing whether fishers feel able to access information (see Indicator 1.10.1), it is useful to check if members of the general community feel able to access information about fishing issues. This is because accessing information is critical to ensuring transparency of fisheries management, and trust in this management by the public. When issues of public interest emerge (e.g. public debate over the use of particular fishing practices or management arrangements), members of the public not engaged in fishing may seek information about fishing, and this indicator identifies whether they feel able to access that information.

How is it measured? This indicator is measured through a survey of the general public. They are asked to indicate how much they agree versus disagree with the following statements:

- ‘I use or seek information produced by [fisheries management agency] about [fishery]’;
- ‘I can easily access information about the management of [fishery]’; and
- ‘The information [fisheries management agency] provides is easy to understand’.

How is it analysed and interpreted?

This indicator is being met if: >70% of community members (who use information from the fisheries management agency) feel that in both cases they can both access and understand fisheries information, and this proportion is stable or growing over time.	There is need to consider further management action if: the proportion of community members who can easily access and/or understand fisheries information is 50-70% (e.g. if one or both measures is between these thresholds) and this proportion is stable or growing over time.	There is an urgent need for management action if: the proportion of fishers who feel they can both access and understand fisheries information is <50%, or if it is >50% but declining over time.
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Key considerations: This indicator should be analysed only for people who indicate they have actively sought to use information produced by the fisheries management agency. Responses from people who don’t use information should be excluded from the analysis because they may be misleading (i.e. those who don’t actively seek or use information are unlikely to know if they can easily access it, or understand it).

Decision triggers and management responses: If the indicator is orange or red, management action is needed and fisheries managers should:

- Identify what the problems are by trying to ascertain ‘Why are members of the public finding it hard to access information?’ or ‘How could information be better communicated?’ This may be done using some of the questions included in the questionnaire used to survey the social aspects of recreational fishing in South

Australia in 2012 about information preferences (see Appendix 2), but adapted for use in a survey of the general public. Indicator 10.1.2 also has questions that help you evaluate this; and

- Identify appropriate management actions to address these problems, and implement them as part of the management process.

Examples

This indicator was not tested in this study, as available funding did not allow a survey of the general community. Indicator 1.10.2 provides similar information and can be used as a guide for how to collect and interpret information for this indicator.

3. DATA COLLECTION METHODS (AS ALSO PROVIDED IN PART 1)

This section provides a guide to collecting data using the following methods required for the indicators recommended in this Guide:

- Survey of commercial fishers;
- Survey of recreational fishers;
- Survey of the general public;
- Fisheries management agency records;
- Survey of stakeholders involved in consultation/ advisory committees/ communication processes;
- Consultation with Indigenous groups;
- Consultation with experts/stakeholders; and
- ABS statistics.

In regard to surveying commercial, recreational fishers or fisheries managers to collect data, information on what sample survey questions can be used to gather these types of data are given in Section 4 of this part of the Guide.

For an overview of the data collection methods in regard to cost, time and options, along with key considerations to ensure high quality data are collected, the Fisheries Research and Development Corporation (FRDC) and Rural Industries Research and Development Corporation (RIRDC) have generated a guide to Social Science Research data collection methods that can be utilised as a further reference to the information provided here.

The document titled 'Social science research for our natural resources' is available in limited hard copies from the FRDC and the RIRDC. Alternatively these documents can be downloaded from the FRDC & RIRDC web sites:

http://www.frdc.com.au/research/Documents/SS_Research_report_August_2011.pdf or <https://rirdc.infoservices.com.au/items/11-087>.

Information is also available from ABARES on community and stakeholder engagement, in the form of 'Biosecurity engagement guidelines', available at:

http://adl.brs.gov.au/data/warehouse/pe_brs90000004183/BiosecurityEngagementGuidelines2010_ap14.pdf.

There is also the document 'Engaging in Biosecurity: Literature review of Community Engagement Approaches' which includes not only methods but considerations to bear in mind when undertaking engagement for the purposes of consultation of Indigenous/experts or stakeholders. This is available at the website of:

http://daff.gov.au/abares/publications_remote_content/publication_topics/social_issues?sq_content_src=%2BdXJsPWh0dHAIMOEIMkYIMkYxNDMuMTg4LjE3LjIwJTJGYW5yZGwIMkZEQUZGU2VydmljZSUyRmRpc3BsYXkucGhwJTNGZmlkJTNEcGVfYnJzOTAwMDAwMDQxNTMueG1sJmFsbD0x.

A very large range of other guides to community engagement can also be found on the internet, many developed for use in either natural resource management or in rural and regional communities in Australia, both relevant contexts for fisheries managers. See the following links for useful guides, although it is helpful to search for guides online and evaluate which best meet specific consultation and engagement needs:

- A guide for engaging the community about controversial issues in forest management, which suggests techniques also applicable in fisheries - <http://www.plantations2020.com.au/assets/acrobat/Community-engagement.pdf> and http://www.crcforestry.com.au/research/programme-four/communities/4.3.3_community_engagement.html
- The South Australian community engagement guide - blogs.dfc.sa.gov.au/m/dfcweb_corp/458/download.aspx

Survey and consultation/ qualitative data gathering techniques

Surveys and consultation processes can use many different data collection methods, each involving different levels of costs and time. The best way to reduce the cost involved in surveying or collecting data from fishers or any existing group associated with a fishery is to add social indicator questions to existing surveys or consultation processes already accepted by fishers or associated groups. In some states, fishers are periodically surveyed by fisheries management agencies to identify opinions on planned changes to fisheries management, to gather data on catch, and to gather economic data on the fishery. These vehicles can therefore be utilised to collect social data as well. This approach also applies to Indigenous, advisory or other stakeholder groups, where meetings or data collection may already be occurring. The utilisation of these typically decreases costs associated with implementing an assessment method, and as importantly often increases the acceptance and uptake by both fishers and fisheries managers of the method, to provide adequate levels and quality of information. For example, if fishers are used to responding to an existing survey, similar levels of response are likely to be achieved if a small number of 'social' questions are added to it, whereas designing an entirely new survey and delivering it separately may achieve a lower response rate as fishers are unfamiliar with the new process.

Surveys:

Fishers: Surveys are very useful with fishers (commercial, charter and recreational) but the optimal method used to collect the data will vary depending upon which group is the focus of the fishery. When considering whether to use a survey, and what type of survey is best, levels of literacy, availability of contact information, time and funds available, and geographical spread of the target fishers need to be considered. Identifying appropriate sample sizes of commercial or charter fishers is not difficult given that the total number and contact details are known through licensing information, although achieving an adequate response can be challenging in situations of low trust, in which fishers may be reluctant to complete surveys. The same cannot be said for recreational fishers in those states and territories without a licensing system, in which it is more challenging to identify how many recreational fishers there are, or how to contact them.

General public: Surveys of the general public are extremely useful, but typically quite expensive. Sample sizes and selection methods/stratification must be considered to ensure that an appropriately sized and diverse sample is selected to be representative of the general public perceptions and concerns. Given the complexity in ensuring this, it is recommended that an expert in general public surveying and sampling be engaged to assist in these instances.

Response rates: A common question asked is ‘what sample size is sufficient to be considered representative of the group being surveyed (e.g. commercial fishers or the general public)?’ There is no simple answer to this question; assuming there is no bias in who responds to the survey, then the sample size needed for statistically robust analysis will vary depending on the confidence interval desired in the results (i.e. how confident you need to be in the answers) and the overall size of the group. Where the group being surveyed is small – for example, a commercial fishery with only 20 licence holders – a much larger proportion need to be surveyed to achieve statistical robustness than is the case for surveying a large group. The following website provides helpful information on these issues, and on calculating appropriate sample sizes:

<http://www.surveysystem.com/sscalc.htm>.

It should also be noted that in many cases, survey responses are biased. For example, in recreational fishing surveys, responses may be biased towards avid fishers, whose strong interest in fishing makes them more likely to respond to a survey compared to those who fish only once or twice a year. For this reason, it is helpful to analyse responses for likely sources of bias, and to consider how to correct for these. In the case of recreational fishers, this bias can be addressed by explicitly comparing the responses of avid and less avid fishers, to see if they differ (and hence if the bias to more avid fishers has skewed overall results).

Sample sizes are often limited by the budget available for data collection. It is noteworthy that only one indicator in this Guide (Indicator 3.6.1-Level of community satisfaction with access to fishery management information) suggests the utilisation of general public surveys. For all other objectives, indicators were designed that do not require large-scale surveys of the general public, as it was considered unlikely that fisheries management agencies could regularly afford such surveys. For more detail on the considerations and benefits of the different methods listed below, please refer to page 35 of the document titled ‘Social science research for our natural resources’¹⁵.

Internet surveys: Currently the cheapest method of surveying of fishers, stakeholder groups or the general public is via the internet, if most have access to the internet and use it regularly. Multiple online survey businesses enable easy internet hosting of surveys, with pre-designed templates and relatively low cost (e.g. www.surveymonkey.com). The internet has proven very successful with recreational fishers, but is not appropriate for commercial fisheries whose fishers do not, at this time, use the internet often or may have varying levels of literacy.

¹⁵http://www.frdc.com.au/research/Documents/SS_Research_report_August_2011.pdf.

Mail surveys: The second cheapest method is to use mail surveys. Mail surveys can achieve a high response rate if multiple reminders are used to encourage survey completion, with selected respondents phoned or mailed reminder card(s) at 7-9 day intervals. This involves both costs in printing, mailing, follow-up mailing or phone calls, and data collation and entry. Varying levels of literacy may make participation challenging for some. Additionally, in the case of recreational fishers, the ability to contact fishers to participate may be limited by the availability of contact data and privacy provisions. Similarly, mail surveys of the general public depend on the availability of address lists and appropriateness of these to the fishery under review.

Phone surveys: Phone surveys are often relatively unsuccessful for commercial fishers, who have irregular hours and are often unavailable by phone. They can be useful as a 'back up' method (e.g. where a fisher is unable to meet face-to-face or complete a paper survey, and instead answers questions by phone), but they are not recommended as the main survey method as they are relatively expensive and do not necessarily achieve higher or more representative responses than the cheaper methods of internet surveys and mail.

Face-to-face surveys: Face-to-face surveys are the most expensive survey method, requiring considerably more staff time and training than other methods, as well as involving significant travel costs to visit fishers, selected stakeholders or canvassing points where members of the public would have the time and inclination to participate in a survey. However, this method can be useful where fishers are already being visited for other purposes, or members of the public interacting with the marine environment can easily be targeted (e.g. boat ramps; jetties; tourism outlets, etc).

Once data have been collected via one of the survey methods above, the survey results can easily be recorded in a database such as Microsoft Excel for analysis. The methods for analysing each indicator from the data gathered are described for each indicator in Section 2, Part 2 of the Guide. An example of an online survey is available at <http://www.surveygizmo.com/survey-software-support/example-surveys/> to show how such a survey can operate.

Consultation/ qualitative data gathering:

Focus groups, group interviews and workshops: These are all forms of group interaction, and although the specific definition of each differs, their format may often be very similar, if not, in fact, identical. Focus groups generally involve gathering people who have very similar perspectives to discuss their views on a specific topic. By contrast, group interviews include people who may have a diversity of views (e.g. fishers, NGOs and general community members). Lastly, workshops are most commonly defined by bringing people together with expertise on a particular issue. In the context of seeking to collect information from 'Advisory' or 'Community' groups, as is suggested for a number of indicators, these are generally undertaken utilising face-to-face meetings or can also employ on line forums or teleconference meetings. For more detail on the considerations and benefits of different

methods, please refer to page 28 of the document 'Social science research for our natural resources'¹⁶.

Individual interviews: This method of data collection may be employed to collect information from individual experts or stakeholders such as community council executives. These can be undertaken with identified individuals either by phone or face-to-face, depending upon the geographical spread of the respondents sought, and the time and funds available. For more detail on the considerations and benefits of different methods, please refer to page 23 of the document 'Social science research for our natural resources'¹⁷.

Qualitative data is generally analysed thematically, to identify common issues/ perceptions/beliefs/ visions/ or perspectives of management approaches. A variety of methods can be used to organise such themes that vary in complexity from general narratives, word frequency counts to identify the level of importance of an issue, to the use of specifically designed software such as NVivo and Dedoose. A comparison of the benefits and applicability of different packages to different purposes and resources can be found at <http://www.bu.edu/tech/support/desktop/distribution/nvivo/comparison/>.

Other data collection points:

Fisheries management agency records: A number of the indicators refer to the utilisation of data collected from fisheries management agencies. In this instance, fisheries managers are surveyed to provide the information identified as required to measure specific indicators. For speed and cost minimisation, the recommended method for surveying fisheries managers in Australia is to use an online survey. As with fishers, stakeholder or general public data collection, once data has been gathered, the survey results should be recorded in a database such as Microsoft Excel and analysed. The methods for analysing each indicator from the data gathered are described for each indicator in Section 2, Part 2 of the Guide.

Australian Bureau of Statistics (ABS): The Australian Bureau of Statistics is only cited as a data source for one indicator: Indicator 3.1.2-Proportion of direct and indirect employment in a region dependent on fishing. The Australian Bureau of Statistics is a good source of data for the general public which is most commonly sourced from the five yearly 'Population and Housing Census', although the ABS also collects data via many other surveys. Information specifically in regard to 'Labour Force' (direct full time & part time employment) for a region can be obtained by local government area or a number of other geographic boundaries from the ABS. To identify general employment in a region (not broken down by industry), data can be downloaded by navigating from the home page of the ABS (www.abs.gov.au) through the following steps:

1. From the home page, select 'Statistics' under 'All Statistics' on the top left hand drop down menu;

¹⁶ http://www.frdc.com.au/research/Documents/SS_Research_report_August_2011.pdf.

¹⁷ http://www.frdc.com.au/research/Documents/SS_Research_report_August_2011.pdf.

2. From the next page loaded, select 'Census data' from the grey drop down menu on the right hand side of the page;
3. On the next page, select 'Quickstats' from the drop down menu on the left hand side of the page, under 'Data and Analysis'.
4. This will then load a page where on the right hand side the location for the information being sought, can be entered.
5. From the page next loaded, select 'People' and scroll down to 'People – Employment'.

An example of this page is for the town of Port Lincoln is provided in the following link:

http://www.censusdata.abs.gov.au/census_services/getproduct/census/2011/quickstat/SSC40590?opendocument&navpos=220.

More specifically, it is possible to obtain data on the number of people employed in certain fisheries related jobs. This can be done by downloading tables, for a region, showing 'employment by industry', using the following steps:

1. From the home page, select 'Statistics' under 'All Statistics' on the top left hand drop down menu;
2. From the next page loaded, select 'Census data' from the grey drop down menu on the right hand side of the page;
3. On the next page, click on 'Tablebuilder'. You will then need to register for the freely available Tablebuilder product. Once registration is complete, and you have logged into Tablebuilder, you can download data on employment in fishing related jobs under the 'Employment, income and unpaid work' database, in which you can specify what regions you want information for in the 'geographical areas' part of the left-hand side menu, and then click on the following links in the 'employment, income and unpaid work classifications' menu to find information on employment in fishing:
 - Industry → industry of employment → agriculture, forestry and fishing → aquaculture
 - Industry → industry of employment → agriculture, forestry and fishing → fishing, hunting and trapping → fishing (this then breaks down into a further 6 types of fishing)
 - Industry → industry of employment → manufacturing → food product manufacturing → seafood processing.

Detailed information on how employment in these fishing-related jobs has been defined can be found in ANZSIC (2006).

The selection and interpretation of census and other Australian Bureau of Statistics data can be difficult, particularly to ensure that the data being used is correctly interpreted for the purpose it is being used for. Consequently, although the steps provided above are to encourage the use of this publicly available rich data source, it is provided with a caution to ensure that it is done so with a correct interpretation of the data.

4. SAMPLE SURVEY QUESTIONS

Many of the indicators recommended in this Guide require collection of data using surveys of particular groups (commercial fishers, recreational fishers, fisheries managers and participants in fisheries management processes). Designing and collecting data for surveys is an area requiring considerable expertise. To enable fisheries managers to collect their own data, we have tested survey questions. The individual questions that can be used to measure each indicator have been specified when each indicator is described. It is important not to change these questions in any way except one; the wording of a question may need to be altered to ensure it uses terms appropriate to the fishery or region being reviewed, or asks about issues of local relevance. These recommended alterations are identified in the description of each indicator in the previous section. Other than these types of changes, it is not recommended to alter these questions without first obtaining advice from experts who have experience in designing survey questions.

There are many common difficulties when designing survey questions and changing questions without first thoroughly testing the revised question can result in biased or irrelevant results (commonly the result of issues such as asking a question that is ambiguously phrased or asks about more than one thing in a single question). We designed our questions in consultation with fishers and fisheries managers from across Australia and then tested them via surveys. The results were evaluated to identify whether the questions were answered consistently and whether survey participants had any difficulties responding to the questions. Questions that appeared problematic were then revised and tested again. In some cases, the questions asked have a longer history, being drawn from commonly used survey questions that are asked of many people (not just fishers).

If the recommended questions do not meet the needs of the fishery under review, fisheries managers should ideally engage an expert to assist in designing survey questions, then test them on a small sample of people from the groups who are the focus of the survey, and where necessary, consider revising them prior to implementation in a full survey. It can be difficult to see how to bring questions together to form a survey without viewing 'real-life' examples. To assist with this, Appendices 2, 3 & 4 contain copies of: (i) a recreational fisher survey; (ii) commercial fisher survey and (iii) fisheries manager survey. These surveys contain most of the questions recommended in this Guide and provide an example of how a survey can be formatted and questions placed together. These surveys also serve a further purpose; they contain a number of additional questions that do not measure specific indicators, but instead gather information that can be used to support fisheries management for social objectives. To give an example, the recreational fisher survey asks questions about how recreational fishers prefer to be involved in fisheries management (e.g. through attending public meetings versus making written submissions). This information was not needed to measure a specific indicator, but instead collected data that could help fisheries managers make appropriate decisions about how best to design their management so that it would achieve Objective 1.3 – ensuring appropriate opportunities for fisher involvement in management. The survey forms include a number of these questions. Examples of their analysis can be found in Schirmer (2013).

5. DEFINITIONS

ESD: The term 'Ecologically Sustainable Development' (ESD) was adopted in Australia by the National Strategy on ESD (1992) and includes three key elements:

- *'To protect biological diversity and maintain essential ecological processes and life-support systems.*
- *To enhance individual and community wellbeing and welfare by following a path of economic development that safeguard the welfare of future generations;*
- *To provide for equity within and between generations; and*

To be consistent with ESD principles, *"resources not only need to be used sustainably, but how they are used, who benefits and when, along with the impacts of their use, all need to be evaluated"* (Fletcher et.al 2002).

Objective: An objective is the outcome that is to be achieved, e.g. 'equitable treatment and access for fishers'.

Indicator: An indicator is the means to be able to measure the achievement of an objective, Note there may be several indicators for one objective. This is either to ensure that all aspects of the objective are covered in situations where an objective is multidimensional; alternatively there may be several ways to measure the achievement of the same objective that is subjective to the particular situation, in which case the indicator is selected specifically for the fishery that the objective is being applied to.

Performance measure/reference points: This is the measure that is used to interpret the indicator data to determine if the objective is being met/exceeded/not being met.

Cultural: This is seen as 'the total ways of living built up by a group of human beings, which is passed from one generation to the next'.

Customary fishing: This is identified by the Victorian Department of Primary Industries, 'Aboriginal Fishing Strategy' as: fishing undertaken by traditional owners for the purposes of satisfying their non-commercial personal, domestic or communal needs in accordance with traditional laws and customs. As part of the Strategy's implementation, an interpretation of this definition will be developed that appropriately reflects both the aspirations of Traditional Owners and Government policy directions.

6. REFERENCES

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7. APPENDICES

Appendix 1-Example of traffic light report for the Queensland East Coast Trawl Fishery and South Australian Recreational Fishery

The traffic light system was applied to data collected in two case study fisheries (see Fig 40). The purpose of this figure is to illustrate a potential reporting structure consistent with other status reports (e.g. the annual National Fisheries Status Report produced by ABARES; Flood et al. 2012).

The surveys undertaken as part of these case studies were based on indicators identified earlier in the project, so, in some instances, data relating to the final indicator set identified in this Guide were not collected.

The results highlight which areas need further attention in each fishery, including where fisheries management may need to explicitly consider incorporating measures to achieve the social objective. Over time, changes in these indicators provide a measure as to how fisheries management is improving in terms of achieving social objectives.

The results also highlight how interpretation of social outcomes needs to be taken in context. In the case of the Queensland East Coast Trawl Fishery, reductions in fleet activity have contributed to the failure to meet the contribution to local and regional economies (Objective 3.1). This, however, is a result of declining prawn prices and increasing fuel prices rather than a consequence of any direct fisheries management action. As with other components of the fisheries status reports, a discussion of the key factors affecting the interpretation of the results will be required.

Table 40 Traffic light report for the East Coast Trawl Fishery of Queensland and Recreational Fishery of South Australia. South Australia.

Objective	Indicator	East Coast Trawl Fishery (QLD)	Recreational Fishery (SA)
Commercial, Recreational and Charter fishing Community			
1.1-Provide flexible opportunities to ensure fishers can maintain or enhance their livelihood	1.1.1-Provision of livelihood opportunity: How is the ability of fishers to access livelihood changing?	Red	Grey
	1.1.2-Perception of flexibility: Do fishers believe fishing management processes are flexible enough to allow them to adapt to changing conditions?	Red	Grey
	1.1.3-Transferable property or use rights exist for accessing marine and aquatic resources	Green	Grey
	1.1.4-Proportion of fishers accessing livelihood opportunities: What % of the livelihood opportunities (e.g. quota, licences) are being taken up in the fishery?	Red	Grey
	1.1.5-Are fisheries management decisions ensuring ongoing access to livelihood opportunities?	Green	Grey
1.2-Maximise cultural, recreational and lifestyle benefits (including health benefits) of fishing	1.2.1-Fisher's overall satisfaction with their fishing activities over the last 12 months	Green	Green
	1.2.2-How satisfied are fishers that they are achieving the cultural, recreational and lifestyle benefits important to them from fishing	Green	Green
	1.2.3-How satisfied are fishers with their fishing derived income?	Green	Grey
	1.2.4-Fisher's plans regarding leaving fishing (their future fishing plans)	Green	Grey
1.3-Ensure appropriate mechanisms exist for fisher involvement in development of management advice	1.3.1-How satisfied are fishers with the level of consultation undertaken by fisheries managers?	Red	Green
	1.3.2-What proportion of fishers actively participate in fisheries management & advisory groups	Green	Green
	1.3.3-Do fishers have opportunity to be represented on fisheries management advisory groups	Red	Green
	1.3.4-Do the fisheries agencies have a formal, documented process for providing feedback to stakeholders about management decisions, and how stakeholder input was used in those decisions?	Green	Green
	1.3.5-Are fishers aware of the methods by which they can have input into fisheries management processes?	Green	Green

Objective	Indicator	East Coast Trawl Fishery (QLD)	Recreational Fishery (SA)
1.4-Improve the skills of fishers participating in management advisory processes	1.3.6-Do fishers know how to contact the people who represent their interests in fisheries management/advisory processes?	Green	Red
	1.4.1-Are fisher representatives satisfied with their overall representation skills and resources? 1.4.2-Are stakeholders involved in fisheries management supported to effectively take part?	Yellow	Green
1.5-Industry stakeholders have a high level of trust in the management of fisheries	1.5.1-To what extent do fishers trust the fisheries management agency to make the right decisions for managing the fishery?	Red	Green
	1.5.2-Do fishers perceive managers as doing a good job of fisheries management?	Red	Green
1.6-Maximise stewardship of fisheries resources	1.6.1-How is the number of fisheries infringements changing over time	Yellow	Green
	1.6.2-Proportion of fishers who believe that, overall, most fishers comply with fishing rules and regulations	Green	Green
	1.6.3-To what extent do fishers accurately understand regulations?	Green	Green
	1.6.4-Do fishers find it easy to comply with fishing rules and regulations?	Green	Green
	1.6.5-Do fishers feel adequate training and information about good fishing practices is available to them?	Green	Green
1.7-Ensure transparent decision making process by management bodies	1.7.1-To what extent do fishers feel the process of decision making about fisheries management is transparent?	Red	Green
	1.7.2-Is the process of fisheries decision making well documented?	Green	Green
1.8-Ensure equitable treatment and access for fishers	1.8.1-How equitable/fair do fishers feel the process and outcomes of fisheries management are?	Green	Green
1.9-Ensure adequate access to infrastructure needed for successful operation of fishing activities	1.9.1-Are there any gaps in availability of fishing infrastructure needed by fishers?	Red	Green
	1.9.2-How satisfied are fishers with their level of access to different types of fishing infrastructure	Green	Green
1.10-Ensure fisheries information is available in a timely and publicly accessible manner.			
Local/regional Communities			
3.1-Positively influence fisheries related socioeconomic benefits for regional communities.	3.1.1-Contribution of fisheries to local economic activity	Red	Red

Objective	Indicator	East Coast Trawl Fishery (QLD)	Recreational Fishery (SA)
	3.1.2-Proportion of direct and indirect employment in a region dependent on fishing		
3.2-Facilitate and support the cohesion and connectedness of fishers with their regional communities through fisheries management.	3.2.1-Recognition of key social and community needs in fisheries management processes		
3.3-Maximise community trust in fisheries agencies to manage fisheries.	3.3.1-Fisheries management agency involvement in community education/outreach activities		
3.4-Ensure fisheries management contributes to the maintenance of cultural and heritage values related to fishing activities.	3.4.1-Cultural and heritage values associated with fishing are identified and managed as part of fisheries management 3.4.2-Assessment of the importance of fishing to the culture and heritage of a community/region		
3.5-Facilitate capacity building for community members to enhance stewardship of fisheries resources.	3.5.1-Fisheries management agency provides training and educational opportunities to the general public 3.5.2-Satisfaction of community members with their participation in training and educational opportunities		
3.6-Ensure fisheries information is available in a timely and publicly accessible manner.			

Key:

Meets Objective	Needs further action	Urgent need for action	Not applicable	No information
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Appendix 2-Example questionnaire used to survey the social aspects of recreational fishing in South Australia in 2012.



Survey of the Social Aspects of Recreational Fishing in South Australia, 2012



QUESTION AND ANSWER BOOKLET

Please record your responses in this booklet and return it in the reply paid envelope provided

Part A: Your participation in recreational fishing

Recreational fishing includes line fishing, crabbing, cockling, dabbling and spearfishing, and any other catch of fish or other marine species for recreation.

Yes No

Have you participated in recreational fishing in the last 12 months in South Australia? (please tick one)

→ If you ticked YES, please go to Part B (you do not need to complete the question below)

→ If you ticked NO, please indicate why you have not fished recreationally in the last 12 months (tick all that apply)

I have never fished recreationally in SA

I used to fish recreationally in SA but haven't recently, for the following reasons:

(please describe why you haven't fished recently, eg changes in fishing conditions, or in your life)

If you ticked 'no' to Part A, please return the survey – you do not need to answer further questions

Part B: Your views about fishing and its importance to you

B1. How important are your recreational fishing activities to you?

(please tick one box below. A rating of 1 means that, while you enjoy fishing, it is not important to your life, and 10 means it is the most important part of your life)

Not at all important					Somewhat important					Very important
1	2	3	4	5	6	7	8	9	10	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

B2. How does the level of satisfaction you gain from your fishing activities now compare to the satisfaction you felt... (please tick one box for each statement; if you did not fish one year, three years or five years ago, please tick 'N/A')

	Much lower	Lower	About the same	Higher	Much higher	N/A
...one year ago	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...three years ago	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...five years ago	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

B3. If you indicated your level of satisfaction has changed, please describe why it has changed (eg change in your personal life, changed fishing conditions, or other reasons).

If your level of satisfaction has not changed, please go to Question B4.

B4. On average, how satisfied have you been with your recreational fishing activities over the last 12 months? (please tick one box on the scale of 1 to 10 below)

Not at all									Somewhat			Very	
satisfied	1	2	3	4	5	6	7	8	9	10	satisfied	satisfied	
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			

B5. On average, how satisfied have you been with your life in general in the past month (not necessarily related to fishing)? (please tick one box only)

	Very	Somewhat	Neither	Somewhat	Very	Don't
	dissatisfied	dissatisfied	satisfied or	satisfied	satisfied	know
			dissatisfied			
Your satisfaction with your life in general in the last month	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

B6. How important is each of the following aspects of your fishing activities to you? (please tick one box only for each statement)

	Not important	A little important	Important	Very important	N/A
Relaxation/unwinding	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Spending time in the outdoors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Spending time with family	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Spending time with friends	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Continuing a family tradition of fishing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Being on my own/getting away from people	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Participating in fishing competitions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The enjoyment or sport of fishing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Eating the fish, crabs etc that I catch	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Passing on knowledge about fishing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (please describe)					
_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Part C. Your fishing activities

C1. Approximately what percentage of your recreational fishing took place in South Australia in the last 12 months?	<input type="text"/> %
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C2. Approximately how many years have you been recreational fishing in South Australia?
(please tick one box only)

0-5 years
 6-10 years
 11-15 years
 16-20 years
 20-29 years
 >30 years

C3. Where you fish

Please list the three locations in South Australia where you have fished most often in the last 12 months, by listing the nearest town, launching point or other location you used

Beach/launching point name (if known)	Nearest town
1. Beach/ launch point name: <input type="text"/>	Nearest town: <input type="text"/>
2. Beach/ launch point name: <input type="text"/>	Nearest town: <input type="text"/>
3. Beach/ launch point name: <input type="text"/>	Nearest town: <input type="text"/>

C4. Which of the following types of fishing do you do? (please tick all that apply)

Land based fishing (eg from beach/jetty/raking for crabs)	<input type="checkbox"/>
Boat based fishing (non-charter)	<input type="checkbox"/>
Boat based fishing (charter)	<input type="checkbox"/>
Inshore fishing (fishing within 5 kilometres of land)	<input type="checkbox"/>
Offshore fishing (fishing more than 5 kilometres from land)	<input type="checkbox"/>
Freshwater fishing (eg in rivers, dams)	<input type="checkbox"/>
Other (please describe) _____	<input type="checkbox"/>

C5. What are the main species you targeted when fishing in the last 12 months? (please tick all that apply)	<input type="checkbox"/> King George Whiting <input type="checkbox"/> Snapper <input type="checkbox"/> Squid (calamari) <input type="checkbox"/> Other (please specify) _____ _____
C6. What are the main species you caught over the last 12 months? (please tick all that apply)	<input type="checkbox"/> King George Whiting <input type="checkbox"/> Snapper <input type="checkbox"/> Squid (calamari) <input type="checkbox"/> Other (please specify) _____

C7. Thinking about the fishing that you've done in the last 12 months (including in other states), have you fished LESS, MORE or ABOUT THE SAME amount compared with the previous 12 months? (please tick one box only)

<input type="checkbox"/> Less	<input type="checkbox"/> More	<input type="checkbox"/> Same	<input type="checkbox"/> Don't know/ unsure
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C8. If you indicated that you fished MORE or LESS, what are the main reasons for this change (please tick all that apply) If you indicated you fished about the same amount, please go to C9.

Work/business related (e.g. more/less busy, shift work)	<input type="checkbox"/>
Personal health/fitness	<input type="checkbox"/>
Personal preference (e.g. you have a new business, sport, hobby)	<input type="checkbox"/>
Home/family related (e.g. you are renovating, have a new baby)	<input type="checkbox"/>
Social (e.g. your friends fish more or less often)	<input type="checkbox"/>
Weather conditions	<input type="checkbox"/>
Changes in bag/possession limits	<input type="checkbox"/>
Change in technology (eg GPS, boat with different motor)	<input type="checkbox"/>
Location related (e.g. you have shifted house)	<input type="checkbox"/>
Other 'access' related (e.g. you bought/sold a boat or holiday house, or have had nearby jetty closures)	<input type="checkbox"/>
Fuel costs (boat, car etc)	<input type="checkbox"/>
Other costs (please specify)	<input type="checkbox"/>

Fishing quality/catch rates (e.g. better/worse)	<input type="checkbox"/>
You are undertaking different kinds of fishing/targeting of catch	<input type="checkbox"/>
Environmental reasons (e.g. water quality or water levels) (please specify)	<input type="checkbox"/>

No reason/unsure	<input type="checkbox"/>
Other (please specify)	<input type="checkbox"/>

C9. Thinking about the main species you catch, what do you do with your legal catch? (your legal catch means the fish you catch that are above the legal size limit– don't include juvenile fish that you returned)

Catch use	Approx. % catch you do this with (eg 20%)
Catch and release (of legal size fish – don't include juveniles)	<input type="text"/> %
Eaten by your household	<input type="text"/> %
Given to others	<input type="text"/> %
Used as bait by your household	<input type="text"/> %
Disposed of	<input type="text"/> %
Other (please describe)	<input type="text"/> %

C10. Do you or any other member of your household own a boat (or multiple boats) that you use for recreational fishing? (include part-ownership, canoes, kayaks and motorised boats; do not include paddle skis or windsurfers) Yes No

→ If you ticked YES, what is your homeport (or where you store your boat) Port:

→ If you ticked YES, does your boat have an echo sounder (sonar, fishfinder)? Yes No

→ If you ticked YES, does your boat have a GPS (global positioning system, including hand held)? Yes No

C11. How did you learn your fishing skills? (please tick all that apply)

Self taught eg through experience and accessing information online, in magazines Taught by family member

Worked in a fishing business (not family) Learned from other fishers (not family)

Formal training through a training course Other

Part D. Access to fishing infrastructure

D1. How satisfied are you with the level of access you have to the following infrastructure for recreational fishing? (please tick one box only for each statement)

	Very dissatisfied	Somewhat dissatisfied	Neither satisfied or dissatisfied	Somewhat satisfied	Very satisfied	N/A
Marinas/mooring facilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fuel and repair facilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Reservoirs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Roads accessing fishing areas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fishing ramps/jetties/wharves	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bait and other supplies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fish cleaning benches & offal disposal facilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fish attraction devices/artificial reefs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Toilets	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Accommodation near fishing areas (eg caravan parks)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (please describe)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Part E: Your knowledge of fisheries rules, regulation and management

This part of the survey asks for your views on the effectiveness of various aspects of fisheries management by the Department of Primary Industries and Regions SA (PIRSA), the government agency responsible for managing recreational fishing in South Australia.

E1. To what extent do you agree or disagree with the following statements?

(please tick one box only for each statement)

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	Don't know
I can easily access information about recreational fishing management in SA	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The recreational fishing information PIRSA provides is easy to understand	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I use information produced by PIRSA about recreational fishing in SA	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fishers are provided with adequate training and advice about good fishing practices (e.g. handling of released fish)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I have a good understanding of recreational fishing rules/regulations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
It is easy to comply with fishing rules and regulations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If I see a fisher doing the wrong thing, I know who to report it to	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Most recreational fishers comply with fishing rules and regulations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Most recreational fishers fish responsibly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Most commercial fishers fish responsibly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If I see other people doing the wrong thing while fishing, I report it to authorities eg FISHWATCH	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I have a good knowledge of bag and size limits	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

E2. Do you use the following methods to find information on recreational fishing?

(tick one box for each statement)

	<u>I don't get any information from this source</u>	<u>I get information on fishing rules and regulations from this source</u>	<u>I get other fishing information from this source (eg on fishing conditions, methods)</u>
Notices/signs posted at boat launching ramps, on jetties or at beaches	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fisheries officers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Internet (eg PIRSA website)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other fishers (not friends or family)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Newspapers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Radio	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fishing association (e.g SARFAC)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Magazines	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pamphlets/brochures	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Information provided at fishing related businesses (eg bait/tackle suppliers)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Friends	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Family	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fishcare volunteers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SMS Fish	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Charter fishing businesses	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Information provided at caravan parks/tourist accommodation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TV programs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Recreational fishing guide by PIRSA	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fishnet Australia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fishers for Conservation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
FishSA	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Spoiled	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Recfish Australia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Strike and Hook	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Australian Maritime Safety Authority	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (please describe)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Part F. Your views on fisheries management

F1. To what extent do you agree or disagree with the following statements?

(tick one box for each statement)

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	Don't know
PIRSA do a good job of managing recreational fishing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I trust PIRSA to make the right decisions for managing recreational fishing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I understand how decisions about fisheries management are made	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I am satisfied with the level of consultation PIRSA undertakes with fishers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If I want to have a say in recreational fishing management, I know how to	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

F2. How fairly do you feel recreational fishers are treated by fisheries managers compared to other users of fisheries resources? (please tick one box for each of the statements)

How fair is the treatment of recreational fishers in terms of:	Very unfair	Unfair	Neither fair or unfair	Fair	Very fair	Don't know
Gear restrictions (eg types of fishing gear you can use)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Access to fishing areas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Allocation of catch	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The processes used to make decisions about fisheries management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

F3. Your views about public perceptions of fishers (please tick one box for each statement)

	Very negatively	Negatively	Neither	Positively	Very positively	Don't know
How do you believe most people in the general community perceive commercial fishers?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How do you believe most people in the general community perceive recreational fishers?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

F4. Your knowledge of groups who represent recreational fishers

Are you a member of any recreational fishing association/club/ organisation? (please tick one)	<input type="checkbox"/> Yes	<input type="checkbox"/> No
→ If you ticked YES, please list the groups you are a member of	Name/s of groups: _____	
Do you know how to contact the people who represent your interests on fisheries advisory committees? (please tick one)	<input type="checkbox"/> Yes	<input type="checkbox"/> No

F5. Your involvement in recreational fishing management

Have you had any involvement in recreational fishing management? (eg through attending public meetings to discuss proposed management changes, making a submission to PIRSA, or joining an advisory committee)	<input type="checkbox"/> Yes	<input type="checkbox"/> No
→ If you ticked YES, please describe the types of involvement you have had (eg attending public meetings, making a submission)	_____ _____	

F6. If you wanted to know more about a recreational fishing management issue (such as bag or size limits for particular species), or to have your views heard about it, which of the following methods would you be interested in using? (please tick one box for each option)

How interested would you be to...	Not at all interested	A little interested	Interested	Very interested	Don't know/unsure
...receive information by PIRSA (eg by email or post)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...providing your views in written submissions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...attend public meetings about fisheries management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...be a member of a committee that makes recommendations about fisheries management (but does not make final decisions)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...be a member of a co-management committee that makes decisions regarding fisheries management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...contact PIRSA via social media networks (eg. Facebook, Twitter)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...access or submit information or comment online via the PIRSA website	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...access a smartphone application (eg. iPhone or android app)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Part G. Your contributions to the communities in which you fish

G1. Approximately how much did you spend on fishing activities in the last 12 months? (please tick one box only).

Include spending on fuel, accommodation, boat maintenance and repair, purchase of fishing gear and supplies such as bait, ice etc, and food when travelling for fishing trips.

If you went on a holiday where only part of your time was spent fishing, estimate costs based on the proportion of time spent fishing (eg if one day of a five day holiday was spent fishing, include 20% of your petrol, accommodation and food costs).

<input type="checkbox"/> \$0-499	<input type="checkbox"/> \$500-999	<input type="checkbox"/> \$1,000-4,999	<input type="checkbox"/> \$5,000-9,999	<input type="checkbox"/> \$10,000-19,999
<input type="checkbox"/> \$20,000-49,999	<input type="checkbox"/> \$50,000-99,999	<input type="checkbox"/> > \$100,000		

G2. Do you own a holiday home that you purchased partly so you could go fishing in the local area? Yes No

G3. Where did your spending on fishing activities occur in the last 12 months?

(please list the top five towns/local government areas where spending occurred, and estimate what % of spending occurred in each. If a lot of your spending occurred online, please write 'internet').

We understand you may not be able to do this easily, and have given two examples to assist. You only need to make a rough estimate of your proportion of spending (please do not spend time going through your records)

Location (town, local government area, or internet)	Types of spending (eg fuel, boat repair, food, accommodation, hiring charter boat)	Approximate % of expenditure on fishing spent here
<i>Example 1: Internet</i>	<i>Rod and reel package, echo sounder, fishing magazine subscription</i>	<i>20%</i>
<i>Example 2: Ceduna</i>	<i>Fuel, food, motel</i>	<i>50%</i>
1.		<input type="text"/> %
2.		<input type="text"/> %
3.		<input type="text"/> %
4.		<input type="text"/> %
5.		<input type="text"/> %

Part H. Information about you

The last section of the survey asks for some information about you. We ask these questions because we want to find out if people in different situations – for example, in different age groups – fish in different ways. This will help fisheries managers identify the needs of different recreational fishers.

H1. Personal details

How old are you?	<input type="text"/>	years
What is your gender?	<input type="checkbox"/> Male	<input type="checkbox"/> Female
How many children do you have? (If none, please write '0')	<input type="text"/>	
Which of the following best describes your marital status at present? (please tick one box only)	<input type="checkbox"/> Currently married or de facto <input type="checkbox"/> Never married or de facto <input type="checkbox"/> Separated/ divorced <input type="checkbox"/> Widowed	
What is your occupation? (if retired, please write 'retired')	<input type="text"/>	
How many hours do you work per week? (include unpaid work such as volunteering or domestic duties; provide the average over the last 12 months)	<input type="text"/>	hours
Where do you live? (please name the town, or nearest town if you live on a rural property; and provide the postcode)	Town: <input type="text"/>	Postcode: <input type="text"/>
Did you choose to live in this location because of your fishing activities? (eg so you could fish from a place close to where you live)	<input type="checkbox"/> Yes	<input type="checkbox"/> No
What is your ancestry? (eg Australian, Chinese, English, German, Irish, Greek, Scottish, Vietnamese)	<input type="text"/>	

H2. What is the highest formal education level you have achieved? (please tick one box only)

<input type="checkbox"/> Primary school	<input type="checkbox"/> TAFE diploma (post high-school)
<input type="checkbox"/> Up to fourth year of high school	<input type="checkbox"/> University degree
<input type="checkbox"/> High school certificate	<input type="checkbox"/> Postgraduate degree

H3. In financial year 2010-11, what was your total household income before tax? This includes the income earned by all working people in your household. (please tick one box only). *Please note: if you choose not to answer this question, we would appreciate you still returning the survey with this question uncompleted.*

<\$20,000	\$20,001- \$40,000	\$40,001- \$60,000	\$60,001- \$80,000	\$80,001- \$100,000	\$100,001- \$120,000	\$120,001- \$140,000	\$140,001- \$160,000	>\$160,000
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Part I. Your participation in this survey

11. How did you find out about this survey? (please tick one box only)

I was emailed the link to the survey by a friend or colleague	<input type="checkbox"/>
I heard about the survey on the radio or by reading a newspaper or magazine	<input type="checkbox"/>
I was handed the survey while fishing	<input type="checkbox"/>
I was handed the survey while at a bait and tackle shop	<input type="checkbox"/>
I was handed the survey while at a caravan park or other accommodation	<input type="checkbox"/>
I was sent the survey because I had participated in a previous fishing survey	<input type="checkbox"/>
From a notice promoting the survey	<input type="checkbox"/>
Other (please describe) _____	<input type="checkbox"/>

If you would like to enter the draw to win a charter boat fishing trip or vouchers for fishing gear, please provide your email address, phone number and postal address below. Please note, completed surveys must be received by 29 February 2012, to be eligible for the prize draw. Winners will be drawn on 12 March 2012 and notified by 16 March 2012. Please also indicate if you would like to be sent a summary of the results of the project. Your contact details will not be used for purposes other than sending you information about this survey, and entering you in the prize draw.

Name: _____
Email: _____
Phone number: _____
Postal address: _____
<input type="checkbox"/> I would like to be sent a summary of survey results and would prefer to receive it by <input type="checkbox"/> email <input type="checkbox"/> mail
I am willing to participate in future surveys like this one <input type="checkbox"/> Yes <input type="checkbox"/> No

If you have any further comments or feedback, please provide it below (please attach a separate sheet of paper if the space below is not enough):

Thank you for completing the survey.

Appendix 3-Example questionnaire used to survey the social and economic aspects of the Northern Zone Rock Lobster Fishery of South Australia.

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EconSearch Pty Ltd
 214 Kensington Road
 Marryatville SA 5068
 Tel: 08 8431 5533
 Fax: 08 8431 2210
 Contact: Stacey Paterson or
 Lisa Rippin

Northern Zone Rock Lobster Economic Indicators Study 2010/11

Please read this first:

- Please only include the amounts that can be attributed to your Northern Zone Rock Lobster fishing business for the 2010/11 financial year
- If exact figures are not available, please provide careful estimates.

PART A CAPITAL

1. What is the length of your boat? _____
2. What is the engine capacity of your boat? _____
3. In the following table, please include a list of all fishing gear and equipment that you use for fishing in the Northern Zone Rock Lobster fishery, including electronic equipment, sheds, trailers and motor vehicles (please give values *exclusive* of GST).

Item	Age (yrs)	Current value \$	Replacement cost \$
Boat engine			
Boat (without engine)			
Electronic Equipment			
Fishing Gear (specify)			
Sheds/buildings			
Motor vehicles			
Trailers			
Other equipment (specify)			

4. If this capital is not solely used for the Northern Zone Rock Lobster fishery, what is the percentage of your capital used for the Northern Zone Rock Lobster fishery? _____ %
5. If your capital has other uses, what are these uses?

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6. How many pots did you own during the 2010/11 financial year? _____

Leasing to...

7. How many pots did you **lease to** other licence holders during the 2010/11 financial year?

8. If you did lease pots to other licence holders during 2010/11, how much did you receive per pot?

9. How many kilograms of quota did you **lease to** other licence holders during the 2010/11 financial year?

10. If you did lease quota to other licence holders during 2010/11, how much did you receive per kilogram of quota?

Leasing from...

11. How many pots did you **lease from** other licence holders during the 2010/11 financial year?

12. If you did lease pots from other licence holders during 2010/11, how much did you pay per pot?

13. How many kilograms of quota did you **lease from** other licence holders during the 2010/11 financial year?

14. If you did lease quota from other licence holders during 2010/11, how much did you pay per kilogram of quota?

Licence value...

15. What is your estimation of the current market value of your fishing licence (meaning what is the value of the pots you own)?

\$ _____ /pot or \$ _____ total value of fishing licence

PART B EXPENDITURE

1. Are skipper wages charged as a percentage share of landed value? **Yes / No**

2. If so, what's the skippers percentage share of landed value in 2010/11? _____

3. How many crew (deckies) do you normally have? _____

4. Are crew wages charged as a percentage share of landed value? **Yes / No**

5. If so, what's the crew percentage share of landed value in 2010/11? _____

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6. Please provide estimates of your direct costs and administrative costs associated with fishing in the Northern Zone Rock Lobster fishery for the whole of the 2010/11 financial year. For your administrative costs, only include the amount that can be attributed to Rock Lobster fishing (please provide values *exclusive* of GST).

Direct Fishing Costs (2010/11)	\$ (excl. GST)
Boat Fuel & Lubricants	
Ice, Bait	
Skipper Fees	
Crew Wages	
Provisions	
Fishing licence fees	
Repairs and maintenance to boat and equipment	
Slipping/mooring/boat survey	
Protective Clothing	
Freight and Marketing	
Other fishing costs (provide details)	
Administrative Costs (2010/11)	
Insurances – vessels	
Insurances – other	
Legal & Accounting	
Communication –telephone, fax, email	
Power	
Repairs and maintenance to Buildings/Plant	
Repairs and maintenance to Motor Vehicles	
Rates and Rents	
Leasing Charges and Fees	
Interest and borrowing costs	
Travel, accommodation	
Membership, association expenses	
Other expenses (specify)	

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PART C EMPLOYMENT

1. How many people are employed in your Northern Zone Rock Lobster fishing activity (including yourself, paid employees and unpaid family helpers involved in running the fishing business, whether they are involved in actual fishing time, maintenance of fishing equipment, or the management (eg bookkeeping, negotiating with processors, attending meetings) of the fishing operations)?

Year	Full-Time	Part Time	
		No of Persons	Full Time Equivalent
Actual 2010/11			
Estimated 2011/12			

2. Please estimate the number of days in 2010/11 that were spent on these activities by people who were not paid a wage (assuming an average of 8 hours per day).

	Fishing (boat time) (days)	Repairs & Maintenance (days)	Management & Administration (days)
You (licence holder)			
Family (unpaid)			
Other unpaid labour			

PART D SALES

1. Estimate the net value of the fish that you caught and sold during **2010/11**, that is, the income you received from fish sales **after** marketing costs (commission, freight, packing etc) were deducted.

Species	Sales (\$)	Weight (tonnes)

2. Number of fishing days for 2010/11 _____
3. Average number of shots per day for 2010/11 _____

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PART E Your views about fishing and its importance to you

1. How important are your fishing activities to you?

Commercial fishing is often more than 'just a job' to fishers, and because of this, this question asks you how important your fishing activities are as a part of your life. Please indicate on the scale of 1 to 10 below. 1 means that, while you enjoy fishing, it is not of much importance to your life, and 10 means it is the most important part of your life.

1	2	3	4	5	6	7	8	9	10
Not very important				Somewhat important					Very important
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2. On average, how satisfied have you been with your commercial fishing activities over the last 12 months?

1	2	3	4	5	6	7	8	9	10
Not at all satisfied				Somewhat satisfied					Very satisfied
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3. How satisfied are you with the following aspects of your current fishing activities?

Tick one box for each statement. If it doesn't apply to you (e.g. many fishers don't work with family), tick 'N/A'

	Very unsatisfied	Somewhat unsatisfied	Neither	Somewhat satisfied	Very satisfied	N/A
Relaxation/unwinding	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Spending time in the outdoors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Spending time with family	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Spending time with friends	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Continuing a family tradition of fishing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Being on my own/getting away from it all	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Being a part of the fishing industry	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The enjoyment or sport of catching fish, crabs etc	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The money made from my fishing business	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Passing on knowledge about fishing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

4. Tick the point on the scale below that best represents how you view your commercial fishing activities (tick one response only)

←The lifestyle of commercial fishing is as important to me as the business aspects				I view fishing principally as a business, which I participate in to earn income→		
1	2	3	4	5	6	7
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

5. How long do you intend to continue fishing commercially? (tick one response only)

We ask this question because each fisherman is at a different stage of their working life, and we want to understand if the stage you are at influences some of your other views about fishing.

	I plan to leave as soon as possible	Less than 5 years	5 to 10 years	10 to 20 years	Until I retire	I plan to keep fishing beyond retirement age
How long do you intend to continue participating in the commercial fishing industry?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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6. On average, how satisfied have you been with the following aspects of your life and work over the past month? (Tick one box only for each statement)

	Very dissatisfied	Somewhat dissatisfied	Neither satisfied or dissatisfied	Somewhat satisfied	Very satisfied
Life in general (not necessarily related to fishing)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Your present financial situation (not necessarily related to fishing)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Your own health (not necessarily related to fishing)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The income you receive from fishing and fishing-related activities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The work/life balance you achieve with your fishing work	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

7. Your views about public perceptions of fishers (tick one box only for each statement)

	Very negatively	Negatively	Neither/Neutral	Positively	Very Positively
How do you believe most people in the general community perceive commercial fishers?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How do you believe most people in the general community perceive recreational fishers?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

PART F Information and knowledge of fisheries rules, regulation and management

1. To what extent do you agree or disagree with the following statements? (tick one box only for each statement)

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	Don't know
PIRSA do a good job of managing commercial fishing in SA	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I trust PIRSA to make the right decisions for managing commercial fishing in SA	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I understand how decisions about fisheries management are made	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I am satisfied with the level of consultation PIRSA undertakes with fishers on management decisions about the Northern Zone Rock Lobster Fishery	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If I want to have a say in commercial fishing management, I know how to	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Commercial fishing management plans are flexible enough to allow fishers to adapt to changing conditions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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2. How fairly do you feel commercial fishers are treated by fisheries managers compared to other users of fisheries resources? (tick one box only for each statement)

How fair is the treatment of commercial fishers in terms of:	Very unfair	Unfair	Neither fair or unfair	Fair	Very fair
Gear restrictions (e.g. types of fishing gear you can use)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Access to fishing areas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Allocation of catch	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The processes used to make decisions about fisheries management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3. To what extent do you agree or disagree with the following statements? (tick one response only)

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	Don't know
I can easily access information about commercial fishing management in SA	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The commercial fishing information PIRSA produces is easy to understand	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Most recreational fishers comply with fishing rules and regulations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I have a good understanding of fishing rules and regulations that apply to my fishing activities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Most commercial fishers fish responsibly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
It is easy to comply with fishing rules and regulations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If I see a fisher doing the wrong thing, I know who to report it to	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fishers are provided with adequate training and advice about good fishing practices (e.g. bycatch reduction)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If I see other people doing the wrong thing while fishing, I report it to authorities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Most commercial fishers comply with fishing rules and regulations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Most recreational fishers fish responsibly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

PART G Your participation in fisheries management

1. Are you a member of any fishing association/industry organisation? YES NO

If yes, please list the groups you are a member of:

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2. Do you know how to contact the people who represent your interests on fisheries management/advisory committees? (please circle one) YES NO

3. Please indicate the time spent on the following fisheries management-related activities during times when you are not fishing

Fisheries management related activity	Hours per month (average)
Attending meetings, seminars, workshops that are fishing industry related	
Participation in fishing-related research (does not include the provision of catch and effort data)	
Provision of technical advice to committees, panels etc. on matters related to the fishing industry	
Other (please specify):	

4. If you want to have a say in how commercial fishing is managed, which of the following methods do you prefer? (tick one answer for each option)

How interested are you to...	Not at all interested in using this	A little interested	Interested	Very interested	Don't know/unsure
...receive information from PIRSA (e.g. by email or post)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...provide your views in written submissions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...attend public meetings about fisheries management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...attend meetings between commercial fishers and PIRSA (members of the public not invited)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...be a member of a committee that makes recommendations about fisheries management, but not final decisions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...be a member of a committee that makes decisions about fisheries management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...contact PIRSA via social media networks (e.g. Facebook, Twitter)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...access or submit information or comment online via the PIRSA website	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...use a smartphone application (e.g. iPhone/android app)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

CONFIDENTIAL

5. Where did your spending on fishing activities occur in the last 12 months?

(please list the top five towns/local government areas where spending occurred, and estimate what % of spending occurred in each. If a lot of your spending occurred online, please write 'internet')

Location (town, local government area, or internet)	Types of spending (e.g. fuel, boat repair)	Approximate % of spending on fishing activities spent here

6. Please indicate the time spent on community-related activities

Community Activity	Hours per month (average)
Participating in conservation activities (e.g. bird counts, water watch)	
Participating in marine rescue and recovery	
Volunteering for community services (e.g. CFS, SES, ambulance, schools)	
Participating in local sporting groups	
Participating in local civic groups (e.g. Rotary, Lions)	
Other (please specify):	

7. In addition to the above, are there other ways in which you as a member of the Northern Zone Rock Lobster fishery contribute to the social, environmental and heritage values of the local community?

CONFIDENTIAL

PART H Access to fishing infrastructure

1. How satisfied are you with the level of access you have to the following infrastructure as part of your fishing activities?

	Very dissatisfied	Somewhat dissatisfied	Neither satisfied or dissatisfied	Somewhat satisfied	Very satisfied	N/A
Marines/mooring facilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Fuel and repair facilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Ice	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Cold storage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Roads accessing fishing areas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Fishing ramps/jetties/ wharves	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Bait and other supplies (other than ice)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Offloading facilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Seafood sorting facilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Other processing facilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Other (please describe) _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

PART I Your fishing activities

1. Thinking about the fishing that you've done in 2010/11 (including in other states), have you fished less, more or about the same amount compared with the 12 months prior to that? (please tick one)

Less More Same Don't know/unsure

If you indicated that you fished more or less, what are the main reasons for this change (please describe below)

2. In financial year 2010/11, approximately what % of your household income was earned from commercial fishing (or from a specific commercial fishery)? _____%

3. How does the level of income you gained from your fishing activities in 2010/11 compare to the income you gained...

	Much lower	Lower	About the same	Higher	Much higher
...one year ago	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...three years ago	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...five years ago	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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4. If you indicated your income has changed, what are the main reasons for the change?

5. What is the name of your homeport? _____

6. How did you learn your fishing skills? (tick all that apply)

<input type="checkbox"/> Self-taught e.g. through experience and accessing information online, in magazines	<input type="checkbox"/> Taught by family member
<input type="checkbox"/> Worked in a fishing business (not family)	<input type="checkbox"/> Learned from other fishers (not family)

PART J Information about you

How old are you?	_____ years
What is your gender?	<input type="checkbox"/> Male <input type="checkbox"/> Female
How many children do you have? (If none, please write '0')	No. of children: _____
How many years have you worked in commercial fishing?	_____ years
How long have you owned a licence in SZRL fishery?	_____ years
How many generations of your family have worked in commercial fishing?	_____ generations
Where do you live?	_____ town (nearest town if in rural area) _____ postcode
Did you choose to live in this location because of your fishing activities? (e.g. so you could live in a place close to where you fish)	<input type="checkbox"/> YES <input type="checkbox"/> NO

1. Please tick the highest formal education level you have achieved: (Tick one box)

<input type="checkbox"/> Primary school	<input type="checkbox"/> TAFE diploma (post high-school)
<input type="checkbox"/> Fourth year of high school	<input type="checkbox"/> University degree
<input type="checkbox"/> High school certificate	<input type="checkbox"/> Postgraduate degree

2. If you work outside the fishing industry in addition to your work in fishing, what type of job do you have outside fishing?

3. How many hours do you work per week? (include the total hours from all jobs you do) (please provide the average over the last 12 months) _____ hours

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The following question, like others, is voluntary. We are asking it to get a better understanding of the economic wellbeing of fishing families. We ask that you still participate in the rest of the survey even if you choose not to provide information about household income.

4. In financial year 2010/11, what was your total household income before tax? This includes the income earned by all working people in your household. (Tick one box).

<\$20,000	\$20,001- \$40,000	\$40,001- \$60,000	\$60,001- \$80,000	\$80,001- \$100,000	\$100,001- \$120,000	\$120,001- \$140,000	\$140,001- \$160,000	>\$160,000
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

PART K FURTHER COMMENTS

Please provide any additional comments that could assist in preparing the report.

Thank you for completing this survey

Appendix 4-Example questionnaire used to survey fisheries managers from Australia.

Fisheries manager survey

*** 1. This survey is designed to be answered for a specific fishery, by fisheries managers. To begin, we ask for your name and the name of the fishery for which the survey is being completed.**

Your name:

Name of the fishery you manage:

2. . If you manage a single fishery for multiple purposes, please select as many as apply.

Commercial

Recreational

Indigenous

Other

Fisheries manager survey

Objective 1 - Opportunity for livelihood

A key social objective of commercial fisheries management is to provide livelihood opportunities for fishers, within the constraints of ecological sustainability. The questions in this section ask questions that evaluate the opportunity provided for livelihood in the fishery you manage.

The questions in this section should be completed only for commercial fisheries. If you manage a non-commercial fishery, please go to the next page.

3. Think about how fishers gain entry to the fishery (eg by purchasing a licence, or quota). How have costs of entering the fishery changed in the last three years?

- Entry costs have increased
- Entry costs have stayed about the same
- Entry costs have decreased
- Unsure/don't know

If you wish, please provide more detail here

4. Think about how fishers are able to gain entry to the fishery (eg through purchasing a licence, or quota, or both). How have the costs of entry changed over the last 3 years relative to returns?

- Costs of entry have increased more than average returns to fishers from the fishery
- Costs of entry have not increased more than average returns
- Costs of entry and returns have both increased at about the same rate
- Unsure/don't know

Please provide more detail if needed

Fisheries manager survey

5. What proportion of opportunities to enter the fishery are being accessed at the moment (eg is 100% of quota being utilised, or 100% of available licences)?

- 100%
- 90-99%
- 80-89%
- 70-79%
- 60-69%
- 50-59%
- 40-49%
- 30-39%
- 20-29%
- 10-19%
- 0-10%
- Not applicable as open access fishery
- Unsure/don't know

Provide further comment below if you wish

6. Now, please think about the methods by which fishers maintain access to the fishery (eg through an annual fee). How have costs of maintaining access, ie fees paid on a regular basis to management agencies, changed over time?

- Fees have increased
- Fees have stayed about the same
- Fees have decreased
- Unsure/don't know

7. Still thinking about costs of maintaining access to the fishery: How have these costs changed over the last 3 years relative to returns?

- Costs of maintaining access have increased more than average returns to fishers from the fishery
- Costs of maintaining access have not increased more than average returns
- Costs of maintaining access and returns have both increased at about the same rate
- Unsure/don't know

Please provide more detail if needed

Fisheries manager survey

8. Are use rights in the fishery readily transferable between fishers (eg quotas and licences can be transferred from one user to another easily)?

- Yes
 No
 Unsure/don't know

9. If use rights are transferable, is there an established markets enabling transfer (eg has anyone used that right of transfer in recent times)?

- Yes
 No
 Unsure

10. If use rights are transferable, is there a clear market price for the transferable rights (this would be evidenced by, for example, recent transactions that have set a price. If few transactions occur, there may not be a clear price for the rights)

- Yes
 No
 Unsure

11. In your opinion, does fisheries management constrain access of fishers to livelihood opportunities in ways other than constraints imposed in order to ensure ecological sustainability? (for example, through high entry costs or other restrictions)?

- Yes
 No
 Unsure

Fisheries manager survey

Objective 3 - Ensure fisher involvement in management

Another important social objective for fisheries management is to ensure fishers are able to be involved in management. The questions on this page apply to all fisheries.

12. Which of the following opportunities do fishers in your fishery have to provide input into fisheries management? (select all that apply)

- Contact with fisheries manager (fishers can call, email or otherwise talk directly to you)
- Contact via a representative organisation (an organisation exists that represents the interests of fishers to fisheries managers)
- Fishers are represented on a management committee
- Fishers are notified directly when there is a planned change to the fishery, and asked to provide feedback
- Other

If you specified other, please describe below

13. When fishers are asked to provide feedback to fisheries management, which of the following formats are they usually able to provide feedback in? (select all that apply)

- Face to face meeting
- Phone discussion
- Written input on paper or by email
- Online feedback
- Other

If you indicated other, please specify

14. Approximately what proportion of the fishers in your fishery have you communicated with in each of the following ways in the last 12 months?

	Face to face meeting with individual fishers	Phone conversation	Sending letter or email communication	Meeting with groups of fishers	Meeting with individuals appointed to represent a larger group of fishers
Answer	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Fisheries manager survey

15. Approximately what proportion of fishers and other stakeholders you aim to engage with have actively participated in fisheries management in the last 12 months, through any of the methods listed in the previous questions? If fishers don't talk directly to you, but instead talk to their representative organisation in order to give you feedback, you may need to consult that organisation prior to answering this question.

- Less than 20%
- 20-39%
- 40-59%
- 60-79%
- More than 80%

16. Do you specifically identify and document what individuals and groups are materially affected by management of this fishery?

- Yes
- No
- Unsure/don't know

17. Do you specifically identify and document what individuals and groups have an interest in the management of this fishery even if they are not materially affected by management decisions?

- Yes
- No
- Unsure/don't know

18. Do all stakeholders who are materially affected by fisheries management have an opportunity to be represented on management advisory groups?

- Yes
- No
- Unsure

19. Do all stakeholders who have an interest in, but are not materially affected by, fisheries management have an opportunity to be represented on management advisory groups?

- Yes
- No
- Unsure

Fisheries manager survey

20. Within your organisation, are there clearly designated contact people whose responsibility is to liaise with specific stakeholders in your fishery?

- Yes
 No
 Unsure

21. How do you ensure stakeholders know who to contact if they wish to discuss management of this fishery? (select all that apply)

- Contact names and numbers are listed on our website
 Stakeholders are sent a list of contacts by email or email
 Other (please specify below)

Other (please specify)

22. How often do you provide feedback to stakeholders about how their input to management processes was used?

- Never
 Occasionally, but only for big changes in fishery management
 Regularly as part of updates about management
 Other (please describe below)

Other (please specify)

23. When you provide feedback to stakeholders, how do you provide it? (select all that apply)

- Informally through conversations in person or on the phone
 Formally through conversations or by phone (you keep records of who you contacted and when)
 In writing through letters or emails sent to each fisher individually
 In writing through newsletters or notices sent to all fishers
 By placing a notice on the website
 Other (please describe below)

Other (please specify)

Fisheries manager survey

24. Is there a formal process of feedback to stakeholders that will be continued by other staff if a new person takes over management of the fishery?

- Yes
- No
- Unsure

Fisheries manager survey

Objective 4

Sometimes stakeholders asked to be involved in fisheries management processes need support to participate effectively. This page asks questions about the support needs for your fishery, and the types of capacity building activities you conduct with stakeholders. Managers of all fisheries should answer these questions.

25. Which of the following opportunities did you provide to stakeholders involved in fisheries management in the last 12 months (all are methods of building skills and capacity to participate)? (select all that apply)

- Expert presentations discussing scientific data on the fishery
- Training courses for members of advisory committees or other stakeholders involved in management
- Resources to facilitate participation, such as reimbursement of travel costs to attend meetings
- Other (please describe below)

Other (please specify)

26. Have you noticed any significant constraints or issues that prevent some stakeholders from participating effectively in fisheries management (eg through providing comments in submissions, or participating on advisory committees)?

- Yes
- No
- Unsure

27. If you answered yes to the previous question, what are these constraints (eg low literacy, lack of ability to travel to meetings, difficulty understanding science of the fishery, or others)?

Fisheries manager survey

Objective 6 - Stewardship of fisheries resources

This section asks you questions intended to identify whether fishers have a strong sense of stewardship in the fishery, and how this impacts on fisheries management. Managers of all fisheries should answer these questions.

28. How have the number of fisheries infringements/warnings/prosecutions changed over the last year?

	Recorded infringements	Warnings given to fishers	Prosecutions of fishers
Select one option from the drop down box	<input type="text"/>	<input type="text"/>	<input type="text"/>
Please add comments if you wish to	<input type="text"/>		

29. What was the total number of infringements recorded in the fishery in the last 12 months, and your total spend on compliance activities and education activities?

Number of infringements:	<input type="text"/>
\$ spent on compliance effort (excluding education initiatives):	<input type="text"/>
\$ spent on education initiatives:	<input type="text"/>

30. If you have a phone number people can call to report poor fishing behaviour, please answer this question. How has the number of calls to fisheries hotlines reporting concerns about fishing in your fishery changed over the last 12 months?

- Increased
- Stayed about the same
- Decreased
- Don't know/unsure

Please add a comment if you wish to

Fisheries manager survey

Objective 8 - Equitable treatment and access for fishers

Equitable treatment of fishers is an important social objective for fisheries management. The following questions should be answered by managers of all types of fisheries.

31. Are the mechanisms/methods by which fish stocks are allocated & reallocated to different groups of fishers documented and made publicly available?

- Yes
 No
 Unsure/don't know
 Not applicable

32. Are mechanisms/rules used to guide allocation & reallocation for this fishery stable (ie consistent over time)?

- Yes
 No
 Unsure/don't know
 Not applicable

33. Are mechanisms/rules used to guide allocation & reallocation for this fishery easy to understand?

- Yes
 No
 Unsure/don't know
 Not applicable

34. How do you ensure that the resource allocation process for your fishery is (i) transparent (in other words, readily understandable and clear) and (ii) equitable to all users of the fishery?

Fisheries manager survey

Objective 9 - Access to infrastructure

Fisheries managers do not always have direct power to influence fishing infrastructure. However, in some cases they do, and on this page we ask questions about the infrastructure you may have management power for. In addition, sometimes fisheries managers may seek to influence infrastructure that is managed by other people, and we ask you questions about that infrastructure as well. Managers of all types of fisheries should answer the questions on this page.

35. What fishing infrastructure do you directly manage or have influence over in your fishery (eg artificial reefs; fish benches provided at jetties, unloading facilities, other)?

36. How adequate is the infrastructure you have direct influence over?

- Very inadequate
- Inadequate
- Neither adequate/inadequate
- Adequate
- Very adequate

Please add comments if you wish

37. What fishing infrastructure do you NOT have directly influence over currently, but affects your ability to successfully manage your fishery? (eg artificial reefs; fish benches provided at jetties, unloading facilities, access of fishers to fuel in different parts of the fishery, other)

38. How adequate is the infrastructure you have do not directly manage, but would like to have some influence over?

- Very inadequate
- Inadequate
- Neither adequate/inadequate
- Adequate
- Very adequate

Please add comments if you wish

Fisheries manager survey

Objective 10 - Provision of information

The provision of information about the fishery to stakeholders is an important part of fisheries management. This page asks questions about the types of information you collect and release to stakeholders and the general public. Managers of all types of fisheries should answer these questions.

39. Please identify the types of information collected about your fishery

	Catch data	Stock estimates	Economic data on the fishery	Social data on the fishery
Is this type of information collected for this fishery?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is this information released to fishers in the fishery?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is this information released to stakeholders other than fishers?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is this information released to the general public?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is this information collected or verified independently of fishers?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is this information released to stakeholders within 12 months of data collection?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is this information collected at least once a year?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is this information collected at least once every five years?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Fisheries manager survey

Community objectives - Maximise community trust in fisheries management

Fisheries managers are managing fisheries on behalf of the broader public and their interest, and legislative requirements often require managers to ensure they are ensuring community benefit from the fishery. This page asks several questions about how you manage for the general community (whereas previous sections asked about management more for fishers and stakeholders with a specific interest in the fishery). Managers of all fisheries should answer these questions.

40. Do you have specific strategies in place to build and maintain the public's trust in fisheries management?

- Yes
 No
 Unsure/don't know

If yes, what are these strategies (briefly describe)?

41. If you answered yes to the previous question, are these strategies documented in your fisheries management planning documents?

- Yes
 No
 Unsure/don't know

If yes, what are these strategies (briefly describe)?

42. Sometimes managers need to consider local cultural and social needs when planning their fisheries management. Can you identify any key community issues that need to be addressed in your management activities to ensure you contribute to local community wellbeing? For example, this might include identifying dates when fishers need to be able to participate in community activities, or when fishing (or conversely, placing restrictions on fishing) may be considered culturally inappropriate.

- Yes
 No
 Unsure/don't know

If yes, please describe briefly the cultural considerations

Fisheries manager survey

43. If you answered yes to the previous question, are these issues and your plans for managing them documented in your fisheries management planning documentation?

- Yes
 No
 Unsure/don't know

Please add a comment if you wish

44. Which of the following methods do you use to identify the cultural and heritage values that arise from your fishery for communities in which the fishery operates? (select all that apply)

- Your own knowledge about the community
 Consultation with local experts eg tourism office, heritage office
 Consultation with Indigenous groups
 Consultation with other stakeholder groups eg local council
 Consultation with fishers
 Community survey
 I don't identify cultural and heritage values at all
 Other (please describe below)

Please describe methods if you selected 'other'

45. Do you or others in your organisation provide training and education opportunities for the non-fishing public?

- Yes
 No
 Unsure/don't know

If yes, please describe the types of activities

Fisheries manager survey

46. Do you or others in your organisation contribute to training and education opportunities provided by other groups (eg you might give a talk at a school or a public event)?

- Yes
- No
- Unsure/don't know

If yes, please describe the types of activities

Appendix 19: Notes to review comments on draft final Guide to Social objectives and indicators, March 2013

Notes to review comments on draft final Guide to Social objectives and indicators

Meeting for FRDC Project 2010/040 - Thursday 14th March 2013

Attending: Lianos Triantafillos & Kate Brooks

Purpose:

- to review feedback received on draft SO&I Guide
- allocate tasks in relation to incorporating feedback into final SO&I Guide
- Discuss content and method of writing up draft final project report.

In relation to Draft Final Report:

Guide Feedback received from:

- Michelle Wenner – Vic DPI, Fisheries Manager
- Sevaly Sen - NSW (Economist)
- Rick Fletcher – WA Fisheries and ESD
- Chris Calogeras – FRDC Indigenous Reference Group
- Hillary Revill – TAS Fisheries Manager
- Ann Fleming & Bo Carne – NT Fisheries Manager and Indigenous Fisheries Manger

Review of feedback

All feedback was reviewed and adopted as follows:

1. Michelle Wenner – VIC DPI

- P.9 Both comments **agreed**
- P.11 – **Agreed**
- P.22 – review wording in first para of last box of figure 5 – **Agreed**
- P.28 – First comment – not possible; second comment – suggested indicator previously discussed and **agreed did not inform the objective as membership does not relate necessarily to involvement.**
- P.73 – both comments accepted and **agreed**

2. Sevaly Sen – NSW

- P.12 – Spell out AHP – **Agreed**
- P.13 review text in box and revise to address issue of ‘compromise’ . **Agreed**
- P. 13 insert ‘chosen’ in first paragraph. **Agreed**
- P.14 LIANOS to contact Sean and obtain justification of the use of fisheries managers only in AHP rankings and how much of the results were determined by the overarching social objectives in the primary legislation.

Action: Reference to be made to the review of primary legislation in introduction.

- P.15 – Note that ‘mechanisms’ not connected to anything. **Action: noted but incorrect – disregarded but wording reviewed.**
- P.17 & 18 Move Figures 3 & 4 to appendix – **Agreed.**
- P.19 insert/correct text in para 2 – **Agreed**
- P.21 – table 2 include identification of the objectives – **Agreed.** LIANOS to insert descriptors used in Figure 2 for each objective.
- State and Commonwealth to be in capitals where representing legislative bodies – **Agreed.** LIANOS to undertake search and replace.
- P.23 First para, first line – insert ‘considered’ in place of ‘you believe are’ – **Agreed**
- P.23 Suggestion to insert “if primary...” – **disregarded** as legislation is not required to enable it.
- P.27 – suggestion re insertion of other sources of data – **Agreed.** KATE to include in step 3, p. 24
- Pp. 28-33 confusion over measurements. – **Agreed.** KATE to insert a preface to tables 3, 4 & 5 regarding the need to read the following tables in conjunction with the full explanations and descriptions of Objectives and Indicators in Sections 3 & 4.
- Pp.28-33 – concern over indicators being posed as questions rather than statements – **Agreed.** KATE to review all indicators and revise as statements. Any that cannot be revised as such will be identified and reviewed for continued inclusion in the document.
- P.29 - Indicator 1.3.6 – change Methods to ‘Fishers’ – **Agreed**
- P.30 – [correct and include Indicator 1.10.1]
Indicator 1.10.2 considers alternative measurement of # of formats; frequency of updates; and frequency of access. KATE to consider, review and make recommendations. **Agreed,** and indicator covers currency, independence and accessibility of fishery information.
- P.30 – 1.7.1/2 & 1.8.1 Concern over transparency and measuring perception rather than reality. **Agreed,** KATE to include general reference to the intent to measure perceptions as these are fisher’s ‘reality’ in the Preface to the table.
- P.31 – 2.2 Use ‘ensure’ rather than optimise – **considered and disregarded** as this was discussed extensively and not used as fisheries managers may not have the ability to ‘ensure’. KATE to include FN to detail that ‘optimise is based on legislative requirements’.
- P.31 – 2.2.1 Use sea country maps – **considered and disregarded** as it was noted at the IRG meeting that an Indigenous communities don’t necessarily have full details noted in Sea Country Maps. KATE to review indicator explanation to ensure that these are considered and used where available to augment local knowledge.
- P.31 – 2.3.1. include ‘of communities are supported to be’ after ‘representatives – **agreed.** Consider inclusion of ‘documentation of training/call for nominations’ as an indicator – KATE to review. **Reviewed and not included at this time** due to the focus being on inclusive indicators rather than those that could be undertaken at arm’s length.

- P.31 – 2.3.2. Suggested analysis of participation rates as measurement method – KATE to review. **Agreed** and included.
- P.33 – 3.5.1 Consider the number of training programs as an indicator – KATE to consider and add/modify as appropriate. **Agreed** and included.
- P.33 – 3.6.1 Consider the time of collection to time of publication and # of methods of delivery as alternative or additional indicators for 3.6. KATE to consider and add/modify as appropriate. **Agreed** and included as an additional optional measurement of the indicator.
- P.35 – Recommend inclusion of data collection methods and discussion of sample sizes. KATE to review to confirm inclusion elsewhere and document and cross reference as appropriate. **Done**.
- P.36 – BOX 1 recommended inclusion of discussion about sample sizes and response rates – KATE to review as per previous point. **Already included** on p.43 Section 3.
- P.37 – Box 2 – Inclusion of ‘non-market’ prior to cultural benefits – **disregarded** as it is obvious the context of the discussion of recreational fishing that cultural benefits are ‘non- market’.
- P.39 – Confusion over tables – **Agreed**. KATE to include heading and brief introduction and discussion of the purpose of the tables.
- P.40 – delete “and indicators’ in the first line – **Agreed**. Also noted for KATE to add “discussed under section 3” in the second last line after ...instance, the indicators [discussed...”
- P.42 – Insert “From a fishery management perspective” last line before first dot point – **Agreed**.
- P. 42 – at end of first dot point query on how managers influence. KATE to add “through the use of input and output controls”
- P.67 – Indicator 1.1.1. Review wording to become a statement rather than question - **Agreed**.
- P.68 – Not sure about low cost – KATE to add explanation “due to data being provided directly by fisheries managers”.
- P.73 – 1.1.3 Revise wording of indicator – **Agreed**
- P.74 – remove the word ‘clear’ from the text in table 11 Q.3 – **Agreed**.
- P.75 – insert ‘used’ before ‘by fishers’ in sixth line of text – **Agreed**
- P.75 – review the word ‘meaningful’ in 8th line of text – **Agreed**
- P.75 – maybe other reasons for low participation rate. **Noted but covered in explanation** that this indicator is of changes in proportion of fishers accessing livelihood opportunities and changes in access rates should be further investigated for causes as discussed under management responses.
- P.77 – query purchases of licences ‘from whom’ – **disregarded** as the in the context the government is the only body to sell licences.
- P.77 – need to move QLD East Coast Trawl Fishery across to orange zone – **Agreed**.

3. Rick Fletcher – WA

- Concern of too prescriptive particularly in relation to the use of AHP – noted however it was identified that in the past other guides have been deemed not prescriptive enough to be easily useful to fisheries managers. Caveats are contained in the document to identify that this is one recommended way of addressing social objectives. KATE & LIANOS to review in the process of all other review to ensure this is underlined. Re AHP, reference to discretionary use of AHP and that it is only one way of addressing social objectives is **already there on pp. 6 & 10.**
- List of methods and objectives etc should be clearly listed as examples – **Agreed** LIANOS and KATE to action.
- Should be stressed that going through the process of explicitly considering social aspects in a fishery is the most important aspect – not the specific tools that are used in doing so – **Agreed.** LIANOS and KATE to action
- Need to fit the objectives in with the economic and environmental - **Agreed.** LIANOS to address by ensuring this is highlighted in review of steps 1 & 2
- P. 8 note one reason for considering social impacts is the generation of political impacts – **Agreed.** LIANOS to include in steps 1 and/or 2 comment(s) such as “important to include Commercial/recreational/charter; Indigenous; and Associated Communities to assist in mitigating potential political impacts of fisheries and fisheries management activities”.
- “People are likely to be concerned if fisheries management doesn’t support social wellbeing” – **Agreed.** LIANOS/KATE review for emphasis
- P.11 EAF net page is inaccurate – replace with reference to FRDC 2000/145 by Fletcher (2012) as provided. **Agreed.** LIANOS to action
- P. 11 Steps 1 - 5: revise with detail provided – **Agreed.** LIANOS to action in text and Figure 5
- P.12 Risk tables for economic and social assessments are most easily located in Fletcher et.al. 2011 – **Agreed.** LIANOS to update.
- P.12 Risk assessment and weighting are not necessarily alternatives – can be used in combination – **Agreed.** LIANOS to address
- P.12: Note that there are many more ways to undertake prioritisation than identified here – reference FAO fact sheets. **Agreed.** LIANOS to include in text.
- P.12: Query that reference to Sloan et al 2013 is not correct in reference to stock reporting framework – LIANOS to check and amend as appropriate.
- P.13 – Text ascribed to Fletcher et al 2002 in first paragraph should be Fletcher et al., 2005 – update with reference provided. **Agreed.** LIANOS to update.
- P.13 Reference to justifications about regional and fishery by fishery analysis needs to be clarified – does not appear to be consistent. **Agreed.** LIANOS to review and address.
- P. 18 Disagreement with the decision to recommend risk assessment prior to objective selection. **Noted that this was subject of much project team discussion. Decision to clarify the circularity of the situation,** and that if you have social

objectives to start with then these should be used in the risk assessment, if not a risk assessment is likely to assist with the identification of social objectives, and the list of objectives should be used as prompts to that risk analysis. LIANOS to address in review.

- P.18 Note that AHP is only one way to prioritise (social) objectives – some mention of other alternatives would be useful. LIANOS to address, with input from SEAN.
- P. 36. Needs to be made clear up front that unless changes in management or other activities can be (and potentially will be) made to address shifts in an indicator – there is no point in measuring something. **Agreed.** KATE to address in revision of introduction.

4. Chris Calogeras – FRDC Indigenous Reference Group

- Suggestion to move the caveat on the indigenous data up to the front of the document – or elements of it. **Agreed** – KATE to address
- Extensive suggestions/comments received, which in the majority of cases noted the complexity of issues around indigenous community and fisheries management interactions, and the need to engage managers in considering Indigenous issues and perspectives. **Noted.**
- Specific suggestion from the IRG to hold a forum to address the objectives and indicators and secure broader stakeholder responses. This is noted, but not within the budget of the program. **Noted.** KATE to include in further development section of the final report.

5. Hillary Reville – TAS DPIWE

- Huge, very comprehensive, easy to follow; easy to understand and practical.

General comments:

Document is very big and unwieldy – recommend splitting it into two sections if possible.