Beyond engagement: moving towards a co-management model for recreational fishing in South Australia

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In light of the subject of this research, its conduct led to participation from a wide range of people who all contributed in some way to its success.

RecFish SA, both members and the committee, provided expertise, comment and assistance in many ways.

Many recreational fishers provided practical comments and views through surveys and assisted with providing data at recreational fishing events. This assistance provides the basis for the successful completion of this project.

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Executive Summary

Fisheries management across Australia principally aims to maximise the benefits to the community of a limited, naturally renewable fisheries resource. The effectiveness of this approach relies heavily on effective implementation of management decisions to ensure sustainability of the key species. The success of these decisions to achieve the desired outcome is facilitated through a sense of 'ownership' by the stakeholders involved. Co-management arrangements have been utilised in fisheries management for some time as a framework to enable input of stakeholders in fisheries management that promote this 'ownership' of management decisions.

Co-management approaches, by their intrinsic nature, require multiple fisheries stakeholders to work together and commit time and effort into participating in fisheries management processes. The intention of this is to achieve positive outcomes such as:

- for stakeholders to feel able to successfully have input into processes and know their voices and views are heard and responded to;
- to build greater trust in the processes used in, and outcomes of, fisheries management; and
- to ensure management processes are informed by the knowledge and views of all stakeholders, resulting in improved management decisions.

These outcomes may improve the social licence to operate for fishers with flow on positive impacts for fisheries management agencies managing those fisheries. However, to achieve these outcomes, co-management processes must be designed to support effective participation of all stakeholders involved.

Co-management frameworks have been developed in some jurisdictions in Australia, for example South Australia has developed a co-management policy (PIRSA 2013) that provides an overarching framework to promote co-management of fisheries in South Australia. However, predominately co-management arrangements have been developed for commercial fisheries.

Broad input from the recreational fishing sector at the fishery level or across sectors for specific management review processes are currently limited. A structured approach to recreational sector co-management is required to facilitate ongoing meaningful engagement with the sector, and also to translate the success of recent engagement efforts into an ongoing and enduring co-management approach for the recreational sector.

Co-management of recreational fishing in South Australia is impacted by many factors that have been highlighted as barriers to co-management in the commercial sectors including:

- Limited personnel

- Limited funding
- Limited capacity of recreational fishers to participate.

This research projects aims to investigate and assess engagement methods that may be utilised in co-management frameworks in recreational fisheries across Australia.

Methods

The methods used to conduct this research project included three phases:

Phase 1: Review of national recreational fisheries co-management

A literature review, qualitative interview of experts in recreational fisheries management and a stakeholder survey were conducted to identify and assess engagement activities in co-management frameworks nationally.

Phase 2: Case Study: Freshwater Catfish and inland fishing

A research project on assessing the stock status of Freshwater Catfish in the lower River Murray formed a case study for the broader co-management project. This case study used citizen science activities to collect recreational fishery-dependant data to inform the assessment. The provision of this data was essential in this case study due to the paucity of commercial data that has previously formed the main data source for previous stock status assessments.

Phase 3: Developing a co-management model for inland fishing

In order to gain a greater understanding of stakeholder views regarding the current status and future of fishing in the lower River Murray, an online survey was conducted to collect comments from fishers. A follow-up workshop was held to further investigate a co-management model for inland fishing in the lower River Murray that focusses on recreational fishers as the main sector in that fishery

Results

The results of the survey on national recreational fisheries co-management models provide insight into the considerations needed in designing processes for involving recreational fishing stakeholders. In particular, they point to a requirement to consider the needs of people in different age groups, with different levels of fishing activity, and who have different personality types, when providing opportunities for stakeholders to get involved.

To achieve success in engagement of recreational fishers in co-management models, it is essential to have in place good political support and management flexibility, and to provide meaningful opportunities for stakeholders to get involved in having a say on fishing. Irrespective of how participatory the process is, it must be transparent and fair, and ideally feedback should be

provided to stakeholders about the outcomes of the process. The survey results show that people who get involved in having a say using more intensive methods, such as being a member of a committee or collecting data in citizen science programmes also report the greatest benefits from their involvement.

Overall, the results of the study support that fisheries stakeholders often want to get involved in having a say, but that a shift is needed to using non-traditional consultation methods – such as surveys and online forums – and perhaps less emphasis given to traditional consultation methods of submissions and public meetings. While traditional methods should continue to be part of the range of methods used to involve fishers, providing a wider range of opportunities will ensure better representation of fishers. Ideally, processes for involving fishers should provide mechanisms by which all fishers can have input at the level they desire.

The findings of this research project highlight the potential benefits and costs of meaningful engagement of stakeholders in co-management frameworks to achieve fisheries management objectives. However, the success of engagement activities that form the basis of these co-management arrangements require careful consideration of the demographics of the stakeholders to be consulted with respect to interest, age, fishing avidity and involvement in established relevant organisations.

It is recommended that development of a co-management framework that effectively integrates recreational fishers, consider the following steps.

1. Consider the issue/s that have arisen and/or need to be addressed through a co-management framework
2. Consider the stakeholders that may be impacted by the identified issue/s. Are there one sector, or many sectors.
3. What do you know about the sectors identified including stakeholder demographics age, geographic location, education, personality traits etc. and the resources that are available to those stakeholders to engage in a co-management process?
4. Consider what activities need to be undertaken to meet the objectives of the co-management framework. Do you need to collate data, inform stakeholders or both? If collating data, is this collating stakeholder views, or collecting fishery data.
5. Consider a range of activities that may meet the required outcomes.
6. Consider opportunities to address identified challenges to activities to maximise effective outcomes

Keywords

Co-management, Freshwater Catfish, *Tandanus tandanus*, Murray Cod, *Maccullochella peelii*, South Australia, River Murray, fishing event, recreational fishing

Introduction

Fisheries management across Australia principally aims to maximise the benefits to the community of a limited, naturally renewable fisheries resource. The effectiveness of this approach relies heavily on effective implementation of management decisions to ensure sustainability of the key species. The success of these decisions to achieve the desired outcome is facilitated through a sense of 'ownership' by the stakeholders involved. Co-management arrangements have been utilised in fisheries management for some time as a framework to enable input of stakeholders in fisheries management that promote this 'ownership' of management decisions.

Co-management approaches, by their intrinsic nature, require multiple fisheries stakeholders to work together and commit time and effort into participating in fisheries management processes. The intention of this is to achieve positive outcomes such as:

- for stakeholders to feel able to successfully have input into processes and know their voices and views are heard and responded to;
- to build greater trust in the processes used in, and outcomes of, fisheries management; and
- to ensure management processes are informed by the knowledge and views of all stakeholders, resulting in improved management decisions.

These outcomes may improve the social licence to operate for fishers with flow on positive impacts for fisheries management agencies managing those fisheries. However, to achieve these outcomes, co-management processes must be designed to support effective participation of all stakeholders involved.

Co-management frameworks have been developed in some jurisdictions in Australia, for example South Australia has developed a co-management policy (PIRSA 2013) that provides an overarching framework to promote co-management of fisheries in South Australia. The PIRSA Co-Management Policy (PIRSA 2013) was developed to assist collaboration between PIRSA and fishing sectors and aims to increase sector responsibility in the administration and governance of fisheries. In South Australia, there are examples of co-management in the commercial sector already in place (e.g. Spencer Gulf Prawn Fishery) (Hollamby *et al.* 2010). In some cases, evaluation of co-management effectiveness

has been conducted focussing on the commercial sector (Neville 2011), but there has been limited attention directed towards the recreational sector.

Recently, Fisheries and Aquaculture Division of Primary Industries and Regions South Australia (PIRSA) has focussed its attention on engaging more comprehensively with the recreational fishing sector as a means of fostering recreational fisheries in South Australia. Effective engagement is the first step to co-management, and in 2010/11 an engagement project was undertaken by PIRSA seeking to understand what recreational fishing means to people and what future they want for their sector (Lang 2012).

In the context of recreational fishing there have been recent examples of co-management in relation to inland and lower River Murray recreational fishing. These include sector and community involvement in fish stocking of Murray Cod and other native fish and adjustment of bag limits to enable recreational sector co-management of reservoirs recently opened to fishing. Recreational sector representatives also regularly participate on key committees formed by PIRSA and industry to assist in the management of key shared resource fisheries.

There are many potential barriers to successful co-management related to limited resources, limited funding and increasing expectations for stakeholders. These barriers are widely documented in recent reviews and a wide range of suggested approaches to best practice design of co-management systems are available (e.g. Pomeroy et al. (2001) and Yandle (2003)). A review of co-management of fisheries in Australia (FRDC, 2008) highlighted three key considerations for developing successful co-management arrangements:

1. the need for leadership from fishing sectors and government to initiate and drive co-management;
2. an imperative of clearly defining expectations and objectives of fishing sectors and government to help achieve aims; and
3. the investment of time and resources to establish arrangements

These considerations are particularly important as the operating environment of fishing sectors and the government become more difficult due to access issues and other factors, such as socio-political influence and rapid information exchange through social media.

The recreational fishing sector has seen a number of changes in recent years including representation of the sector, changing leadership in key representative bodies and the completion of an engagement project between PIRSA and the recreational sector (Lang

2012). These events have provided an opportunity to investigate opportunity to further develop capacity in the recreational sector and the co-management arrangements in the recreational fishing sector in South Australia. The benefit from improvement of co-management of recreational fishing is anticipated to aid in the effectiveness of future fisheries management decisions related to recreational fishing in South Australia. Given this, a project investigating effective models for co-management of recreational fishing in South Australia is timely.

Need

There are formal, structured way of incorporating 'grass roots' input from the recreational sector into fisheries management processes in South Australia such as consultation on the review of bag and boat limits for key recreationally important marine fish species (PIRSA 2016, 2017). This input also applies with limited recreational fisher representation in some cross-sector committees that have been established to review management plans and harvest strategies in shared-access fisheries. However, broad input from the recreational fishing sector at the fishery level or across sectors for specific management review processes, has been limited.

This lack of broad input from the recreational sector also applies at times when it is only recreational fishing issues and management that are being considered and the ability to meaningfully engage with the broader sector through efficient engagement processes has had varied success in achieving their objectives.

A structured approach to recreational sector co-management is required to facilitate ongoing meaningful engagement with the sector, and also to translate the success of recent engagement efforts into an ongoing and enduring co-management approach for the recreational sector.

This research project was carried out in three phases to investigate effective engagement activities for recreational fishers for inclusion in a co-management framework.

Phase 1. Review of national recreational fisheries co-management

The first phase of this project provided a synopsis of co-management of recreational fishing already being undertaken in jurisdictions in Australia, and the perception of fisheries management agencies and the recreational sector of how successful these co-management

arrangements have been. The focus was on reviewing key literature and interviewing recreational fishing stakeholders, followed by a survey of recreational fishing stakeholders to identify the factors that potentially influence the success or effectiveness of co-management strategies. This component included assessment of all types of activities where recreational fishers participate in fisheries management and science initiatives, including activities such as consultation processes, public meetings, committees or taking part in a survey. Activities were assessed on the breadth of representation with regard to demographics, level of personal interest in the sector and the level of participation and the level of satisfaction for participating stakeholders.

To achieve this, a broad definition of 'co-management' was adopted, in which co-management was defined as *including any form of including stakeholders in discussions and/or management about recreational fisheries management and science. As co-management is often defined more narrowly than this, the terms 'having a say', 'involvement' and 'participation' are used interchangeably to refer to processes of stakeholders having communication and interaction about recreational fisheries management and science*.

Learnings from the first phase of the co-management project were considered in developing the methodology for a separate research project entitled Population dynamics and status of Freshwater Catfish (*Tandanus tandanus*) in the lower River Murray, South Australia (Ye et al. 2015). This research project was used as a case study to identify a preferred co-management model and the tools for identification of appropriate co-management models for shared and recreational only fisheries that formed phase 2 of the broader co-management project.

Phase 2. Case Study: Freshwater Catfish and inland fishing

The assessment of catfish stocks in South Australia has relied historically predominately on catch data from the commercial fishery. However, since the 1980's commercial interest in this species has reduced significantly, limiting the available information about the stock. This project considered alternative data sources for long-term monitoring of Freshwater Catfish incorporating complementary fishery-dependent and fishery-independent data from the recreational sector.

This research project highlighted the need for efficient and effective recreational data collection techniques, and the importance of ownership and input in management decisions for future management arrangements, sustainability of the key species and prosperity of the recreational sector.

A recreational fishing co-management group of representatives including members from recreational fishing bodies, fisheries management and science, was developed to test governance structures and exchange information relevant to the case study. This group, the South Australian Freshwater Catfish Working Group (FCWG), included key representatives who had previously worked together on Murray Darling Basin Authority Native Fish Strategy matters, and therefore had some pre-existing relationships. The aims of the FCWG were to represent the local community, managers and researchers in the design and implementation of Freshwater Catfish recreational fishing events designed to collect necessary fisheries data. In addition, the co-management activities aimed providing advice on the management of this protected species to stakeholders.

Phase 3. Development of a future co-management model for inland fishing

Following the co-management survey and case study, the third phase of the project involved investigating how to apply the learnings from the first two phases into developing a proposed co-management model that may be applied to the broader inland recreational fishery. This phase of the project culminated in a workshop organised by the recreational fishing sector in which proposed co-management models and key items for consideration regarding the development of the lower River Murray recreational fishery were considered and documented.

The lower River Murray recreational fishery in South Australia provides an opportunity for the recreational fishing sector and community to have a key involvement in managing native fish stocks and fishing activity to meet fisheries management objectives. The South Australian *Fisheries Management Act 2007* includes some key objectives including fostering recreational fishing and the optimal utilisation of aquatic resources for the benefit of the South Australian community.

Objectives

1. Identify, document and evaluate fisheries co-management models for recreational fishing across Australia
2. Conduct a Freshwater Catfish case study to evaluate the success of a potential co-management model
3. Conduct workshops to develop tools for co-management of recreational fishing using information from the case study and survey
4. Propose an appropriate and effective co-management model for recreational fishing in the lower River Murray in South Australia

Method

Phase 1: Review of national recreational fisheries co-management

Literature Review

A literature review of available literature, including commercial, academic and grey literature, was conducted to identify key learnings about successfully engaging recreational fishers in fisheries management and science. The literature reviewed encompassed a broad range of co-management approaches, specific fisheries and jurisdictions nationally and internationally.

Data collection

Data was collected for this study via (i) qualitative interviews and (ii) a survey (Appendix 1).

Qualitative interviews were conducted with nine people who were experts in recreational fisheries management in Australia and in stakeholder involvement. The nine were fisheries managers, representatives of recreational fishing organisations, or had roles in research or other sectors in which they took part in processes such as citizen science. They were asked to discuss their experiences with co-management, focusing on what had worked well and poorly in their experiences of co-management, and what could be done to improve

processes of involving stakeholders in fisheries management and science. The results of these interviews were principally used to help design a survey.

The survey of recreational fishing stakeholders was designed based on results of the literature review and interviews with experts, and pilot tested with a small subsample of key recreational fishing stakeholders before being launched broadly. The survey asked a range of questions about stakeholder experience with getting involved in having a say about fisheries issues, and about their fishing, and their skills and capacity for getting involved. The survey was conducted from April to May 2014. It was open to any person with an interest in recreational fishing in Australia. It could be completed online or on paper (Appendix 1), and was promoted via recreational fishing websites, email lists, clubs and organisations in Australia, as well as to recreational fisheries managers, and to key stakeholder groups known to get involved in discussing recreational fisheries management.

A presentation of the key findings of this phase were made to PIRSA and key recreational fishing representatives in South Australia following the completion of the survey in 2014. The results from this phase of the project were considered in developing methods for phase 2 and phase 3.

Phase 2: Case Study: Freshwater Catfish and inland fishing

Co-management body

To support this component of the project, a South Australian Freshwater Catfish Working Group (FCWG) was formed in 2013/14 with members from PIRSA, Recfish SA, Berri Barmera Local Action Planning, Renmark-Paringa Local Government Association, Department for Environment and Water, the Aquatic Sciences Research Division of the South Australian Research and Development Institute (SARDI) and Mid-Murray Local Government Association. A series of meetings were held prior to, during and following recreational freshwater fishing events that formed an important component of the recreational fishing data collection component of the project. The members of the FCWG provided significant contributions regarding resources and support for the fishing events, and being actively involved in discussions regarding future management options for Freshwater Catfish.

Recreational fishing events – recreational fishery-dependent data collection

SARDI worked closely with PIRSA and the FCWG, to design and implement a number of fishing events along the lower River Murray as part of the Freshwater Catfish case study to facilitate collection of recreational fishing data. With support from the FCWG, recreational fishers were invited and engaged in the fishing events, targeting Freshwater Catfish between November 2013 and February 2014.

Five two-day fishing events were run along the lower River Murray near the townships of Renmark, Blanchetown, Berri, Murray Bridge and Swan Reach. At each event day, recreational fishers received an information pack, which contained background information, rationale behind the research, a map of the area to be fished and a catch/effort log sheet. At the end of each fishing day, catch/effort log sheets were collected from participating fishers. Information recorded on the catch/effort log sheets was compiled for estimating the catch rates of Freshwater Catfish and analysing size composition. Subsamples of Freshwater Catfish were also collected by researchers from the fishing events and processed at SARDI laboratory to collect additional biological data (Ye et al. 2015).

Data analysis

The recreational fishery-dependent data collected through fishing events were integrated with fishery-independent data from a number of long-term fish population monitoring projects (not specifically targeting Freshwater Catfish) by SARDI to inform the assessment of stock status of Freshwater Catfish in the lower River Murray, South Australia (Ye et al. 2015).

Phase 3: Development of a future co-management model for inland fishing

Online Survey

In order to gain a greater understanding of stakeholder views regarding the current status and future of fishing in the lower River Murray, an online survey using the Survey Monkey platform was conducted to collect comments from fishers (Appendix 2). Analysis of survey information utilised ‘Campaign Monitor’.

The survey included a series of questions regarding demographics, participation, motivations and perceptions. The survey also included specific questions regarding stocking, funding, investment and community and Government roles in regards to

management of fisheries management in the lower River Murray. An additional question was asked regarding respondent participation in future consultation on the issue of co-management, which was used to design and invite participation to a stakeholder workshop on co-management (Appendix 2).

The survey was conducted for two weeks in November 2017. It was open to any person with an interest in recreational fishing in South Australia, both inland and in marine waters. It could be completed online, and was promoted via recreational fishing websites, email lists, and key social media platforms. A total of 545 surveys were completed.

Stakeholder Co-management Workshop

In the online survey, 160 respondents (just over a third of the responses to this question) had indicated they would be prepared to participate in a daytime workshop in the Riverland on the issue of co-management in the lower River Murray. However, after following up with the 160 respondents, only six agreed to attend a daytime workshop organised for December 2017. In March 2018, RecFish SA reconvened a stakeholder workshop which was held in Berri, South Australia and was organised and promoted by RecFish SA and supported by PIRSA.

The meeting was attended by interested recreational fishers, local Government representatives and the local State Member of Parliament. The structure of the event was designed to give participants an overview of what co-management is in a fisheries context, using information and examples from the PIRSA co-management policy. Participants at the workshop were given an overview of the survey results, and scientific information required to assess the sustainability of the lower River Murray recreational fishery and inform fisheries management. Recent proactive projects that were an example of co-management in practice, including Murray Cod stock enhancement were also outlined to the workshop.

A key component of the workshop was a session asking participants what co-management may look like in the lower River Murray to them, and an open discussion and potential priorities were set across various themes including:

- Legislation and Policy
- Education and Compliance
- Research and Monitoring
- Consultation and Engagement

- Funding and Development

Participants at the workshop were asked to rank, Federal, State and local government, recreational fishing club and organisations, broader community and business roles in the various themes and also nominate some key items to carry forward as a legacy of the workshop towards co-management of the lower River Murray recreational fishery.

Results

Phase 1: Review of national recreational fisheries co-management

A full description of the results from this phase of the research project are provided in Appendix 1, however, a summary of the key outcomes is provided here.

Literature Review

Available literature on stakeholder involvement in fisheries were found to focus more on the commercial sector, with few studies on stakeholder participation processes in recreational fishing across the world.

The literature available suggested multiple factors are important in achieving successful involvement of stakeholders in recreational fisheries management and science, including:

- Past relationships between stakeholders, which affect the ability of these stakeholders to work constructively together. Successful processes are those which build trust between stakeholders, for example between fisheries managers and fishers
- Setting clear goals and objectives for participatory processes helps stakeholders function effectively in these processes
- Institutional support and provision of resources
- Effective processes for communicating existing knowledge (scientific, local and other forms), and for generating new knowledge (e.g. through citizen science initiatives). Difficulty understanding or communicating science is a common challenge to successful participatory processes noted in the literature
- Building the capacity and skills of stakeholders to get involved successfully such as building strong leadership capabilities
- Ensuring fair process and fair outcomes of participatory processes, including ensuring all stakeholders who should be included are given the opportunity to take part and ensuring conflict resolution mechanisms exist
- Use of the optimum methods for involving stakeholders, which allow them to have a say in the way they find best for them. This may range from providing the opportunity for

stakeholders to complete a short survey through to holding public meetings, or establishing an advisory committee, to name just a few

- Ensuring appropriate institutional settings (including property or use rights)
- Using facilitators/chairs of committees
- Targeting engagement at the right geographic scale and scope of activity
- Clearly defining who is able to be involved

Expert interviews

In the qualitative expert interviews, participants discussed multiple issues related to stakeholder involvement in fisheries management and science. First, they were asked to define what they considered co-management to be. It was typically described as any process of involving a wider range of people in fisheries management, and sharing responsibility with these stakeholders. The benefits of co-management were described as:

- building a sense of stewardship of the resource by stakeholders;
- empowering a broader range of stakeholders to care for that resource;
- reducing conflict between stakeholders;
- reducing risk to government; and
- ensuring everyone gets to have a say rather than only highly vocal stakeholders.

Interviewees were asked what things help and hinder the success of efforts to involve stakeholders in fisheries management and science. The following key themes were identified:

- Supporting recreational fishing organisations to consult and represent views of recreational fishers can be successful if the organisation has adequate resources to fully consult fishers
- Political buy-in, adequate resourcing, effective leadership and good governance for all participants, as well as the ability to learn from (and accept) failure were critical to fostering genuine involvement of recreational fishers in engagement about recreational fishing matters.

- A common challenge was achieving genuine representativeness in stakeholder consultation processes, with many feeling that those claiming to represent fishers often only represent a sub-set of recreational fishers
- Culture change is needed in fisheries management agencies and representative organisations in order to shift to a greater use of participatory processes
- Flexibility in fisheries management is needed if stakeholder involvement is to result in successful change, with several experiencing difficulties when opportunities identified by stakeholders could not be implemented under current regulatory regimes, or could only be implemented with a substantial delay. Because of this, some processes had shifted to focusing on achieving change in fisher behaviour rather than formal changes to fisheries management
- Barriers to successfully involving stakeholders included lack of skills and capacity, difficulty in clearly communicating scientific information, lack of scientific data, lack of adequate time, lack of political buy-in, stakeholder fatigue, poor relationships between stakeholders, and lack of flexibility in fisheries management
- Citizen science was viewed as having many potential benefits, whereas some methods of involvement such as public meetings were often considered ineffective
- Use of online and social media approaches to engagement was of growing interest
- It was easier to achieve successful stakeholder involvement in some issues compared to others

Stakeholder survey

A total of 381 valid survey responses were received, however not all of the 381 answered every question on the survey. Of the 381 participants, the large majority (379 – 99%) were recreational fishers; 57% were members of recreational fishing organisations; 29% were office holders in a recreational fishing organisation such as a fishing club; 13% worked for a recreational fishing organisation or had done so in the past; and 4% of respondents were, or had recently been, recreational fisheries managers, representing a large proportion of recreational fisheries managers in Australia. Some of the recreational fishers who responded also had roles in fishing-related organisations or businesses.

The sample was focused on those with an interest in getting involved in recreational fishing management and science, and as such as not representative of the broader recreational

fishing community, many of whom do not wish to get involved in 'having a say' about fisheries management and science.

Analysis of the survey responses focused on identifying (i) how fishers prefer to be involved in fishing and engaging in fisheries issues and (ii) which types of fishers have different preferences for how they are involved. Responses were categorised for socio-demographic and fishing characteristics by age, personality traits (specifically, whether a person is introverted or extroverted, open to new experiences, or conscientious), wellbeing, level of formal education, involvement in recreational fishing organisations, type of fishing a person does, a person's satisfaction with their fishing, and fishing avidity.

While it was preferable to identify if there were differences by gender, cultural background, and whether a person is Aboriginal or Torres Strait Islander, the sample achieved did not include enough responses from women, people from diverse cultural backgrounds, or Aboriginal or Torres Strait Islander, to enable this type of analysis. These are important gaps that should be examined in future studies.

Geographic location of the respondent made little difference to the views recorded and was not included further in the analysis.

Who gets involved?

The majority of survey participants were interested in having their views represented to fisheries managers by people who represent fishers in their region (for example, staff of recreational fishing representative organisations). However, a substantial proportion of respondents did not know how to contact the people who represented the interests of fishers in their region.

Fewer than half (n=349) were actively involved in having a say on fisheries management (see Figure 8 in Appendix 1). It is noted, however, that these results may not be representative of all fishers in the recreational sector, as these results reflect the views of those who chose to participate in the survey, a group in which people interested in having a say about fishing are highly likely to be over-represented. The finding that even amongst recreational fishers who are highly motivated to get involved, less than half are actively involved, suggests there may be substantial potential to increase opportunities for those who have an interest to get more actively involved.

People under 65 years of age were less likely to be involved in having a say, less likely to know who fishing representatives were or how to contact them, and less likely to feel a need

to contact people who represent fishers (Figure 1) . People were more likely to be involved in having a say and interested in doing so if they had personality characteristics of an extrovert (meaning someone who enjoys engaging in interactions with others), and of someone who is open to new experiences; and if they were a member of a recreational fishing organisation (Appendix 1).

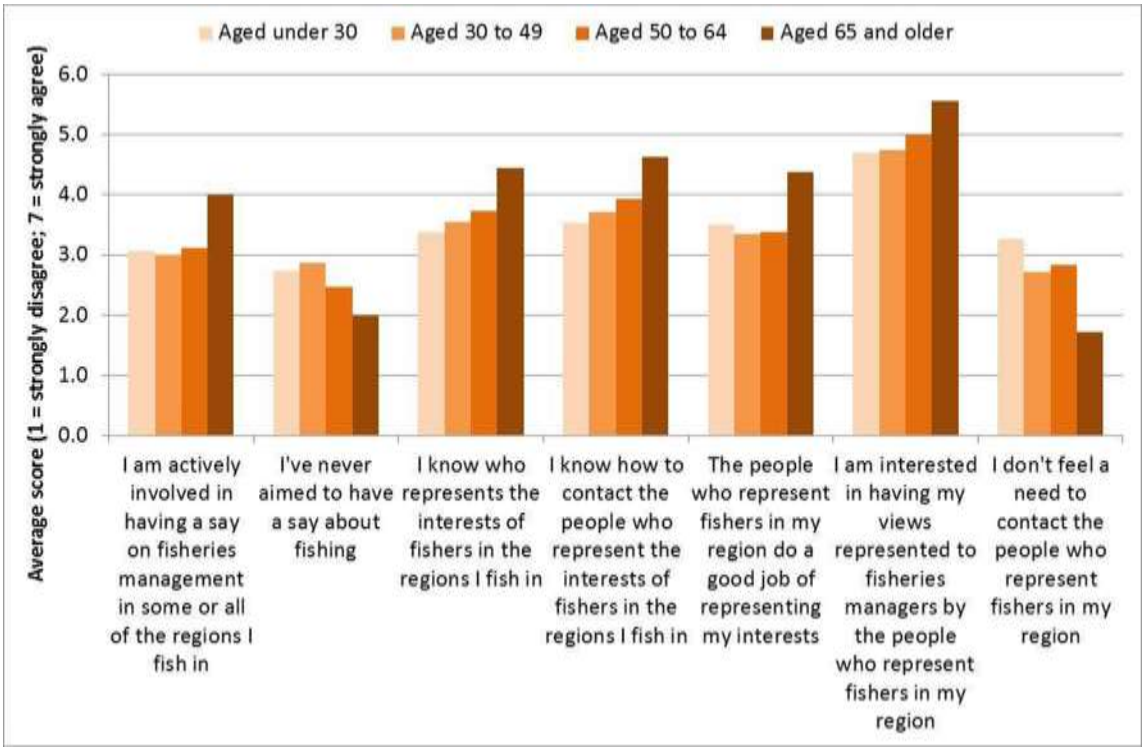

Figure 1: General awareness of and interest in having a say on recreational fishing - by age group. From Schirmer 2014., Figure 9 in Appendix 1).

What topics do stakeholders get involved in?

People's willingness to get involved in fisheries management is likely to vary depending on what issue they are having a say about. To better understand how the topic or issue affects willingness to have a say, survey participants were asked whether they had ever been involved in having a say on any of a number of topics common to recreational fisheries management. The topics recreational fishers had most commonly had some involvement in previously were commenting on proposed changes to catch or size limits, marine parks, and changes to fishing seasons or areas. A smaller proportion had experiencing getting involved in ongoing management of a particular fishery or species, proposed changes to regulations on fishing gear, or in processes involving allocation of resources between the commercial, recreational and Indigenous fishing sectors (Appendix 1).

The topics on which survey participants felt they were most likely to get involved in the future were marine parks, changes to fishing seasons or areas, and changes to catch or size limits. They were least likely to get involved in collecting scientific data to inform fisheries management and resource allocation processes (Appendix 1).

How do people get involved?

A critical factor for involvement of people in engagement processes is identifying ways that people prefer to have a say on fishing. The most common methods survey participants had been involved in fisheries management and science in the past were through online discussion forums, signing petitions, and completing surveys. The least common methods were getting involved in committees, writing letters, or collecting fishing related data. The 'traditional' consultation methods of public meetings, talking to fisheries representatives or making submissions were between these two extremes (Figure 2).

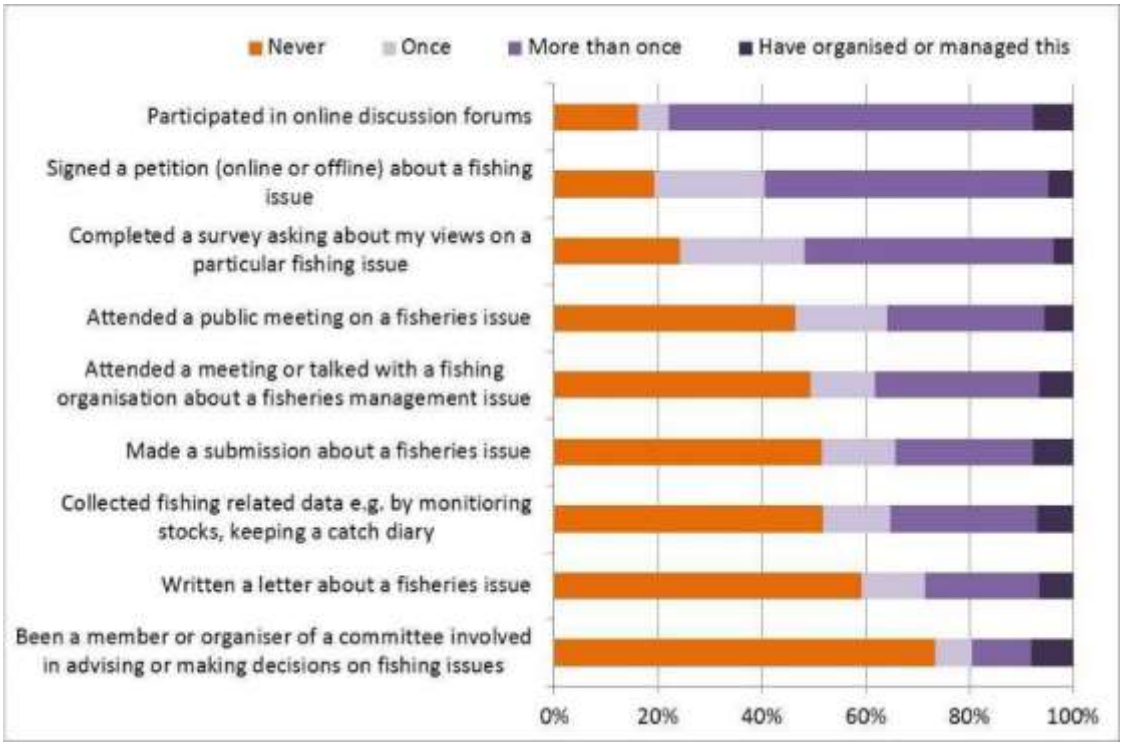

Figure 2: Methods survey respondents had used in the past to have a say about fishing (From Schirmer 2014., Figure 14 in Appendix 1).

Different types of fishers had significantly differing preferences for getting involved in different methods of engagement. While most methods of participating were principally used by avid fishers who were members of fishing organisations, and who were often also extroverts, an exception was online forums, which were used by almost all types of fishers irrespective of their fishing avidity. Fishers >30 years of age preferred traditional

consultation mechanisms such as attending public meetings, while younger fishers preferred mechanisms such as online forums (Appendix 1).

Having identified how fishers have been involved in the past, and on what topics, the next part of the survey asked participants to evaluate the costs and benefits of getting involved in different ways. Participants that had indicated they had previously used specific methods to get involved in having a say were asked their views on what worked well and poorly about getting involved in that way.

The engagement methods rated most highly as a good way of getting involved were collecting scientific data and being part of a committee, while submitting views via submissions, petitions or online forums were most likely to be rated a poor method of getting involved, and least likely to be rated a good method (Figure 3).

Committees were rated better than most other methods of involvement for being able to contribute views, learn new things, meet people and improve relationships, have views heard, generate new ideas, achieve positive change, receive feedback, and making people feel good (Appendix 1). However, committees ranked poorer in terms of involvement as it took up too much time (Figure 4) and was the least preferred activity for future involvement by survey participants (Figure 7).

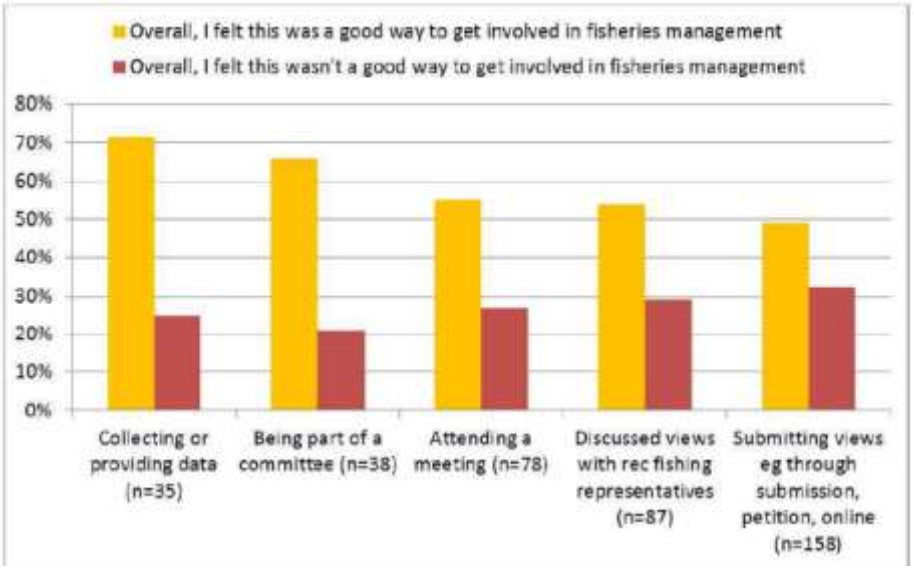

Figure 3: Overall rating of utility of getting involved using different methods (% of respondents who agreed with statement) (from Schirmer 2014. See Figure 19 in Appendix 1).

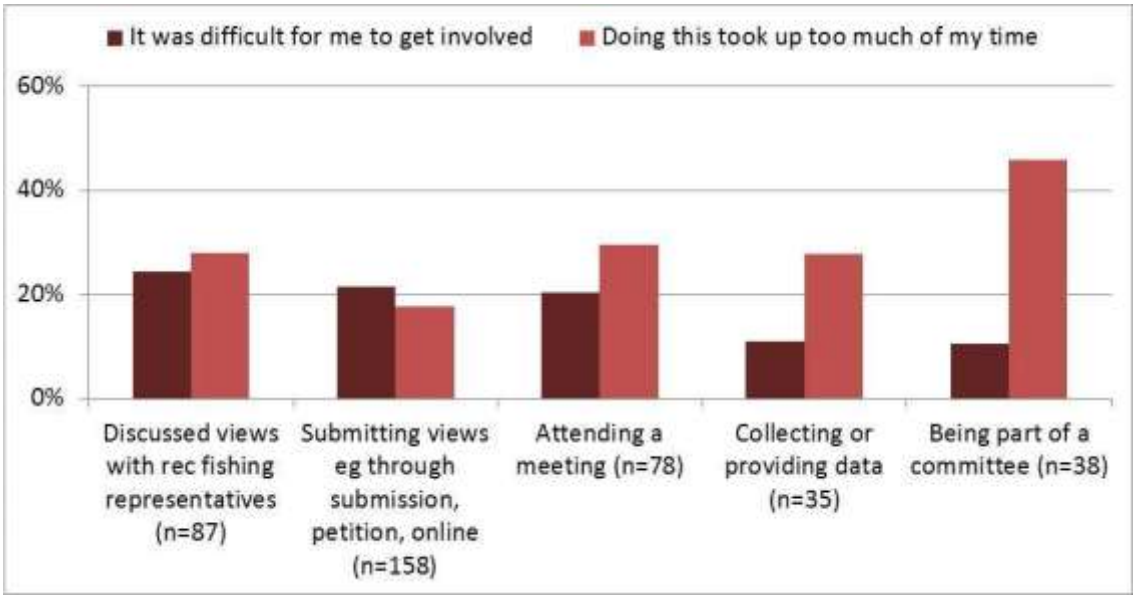

Figure 4: Ability to get involved using different methods (% of respondents who agree with statement). (from Schirmer 2014, Figure 21 in Appendix 1).

Collecting scientific data also rated highly as an engagement method (Figure 2), was good for the learning opportunities it provides, meeting people, and making people feel good and to a lesser extent for getting feedback and achieving positive change (although on the latter two it was not rated as highly as being a member of a committee) (Appendix 1).

Discussing views with recreational fishing representatives was rated as good for learning new things, meeting people, and making people feel good, but rated poorly in terms of receiving feedback or achieving action and outcomes, with few feeling it led to change (Figure 5).

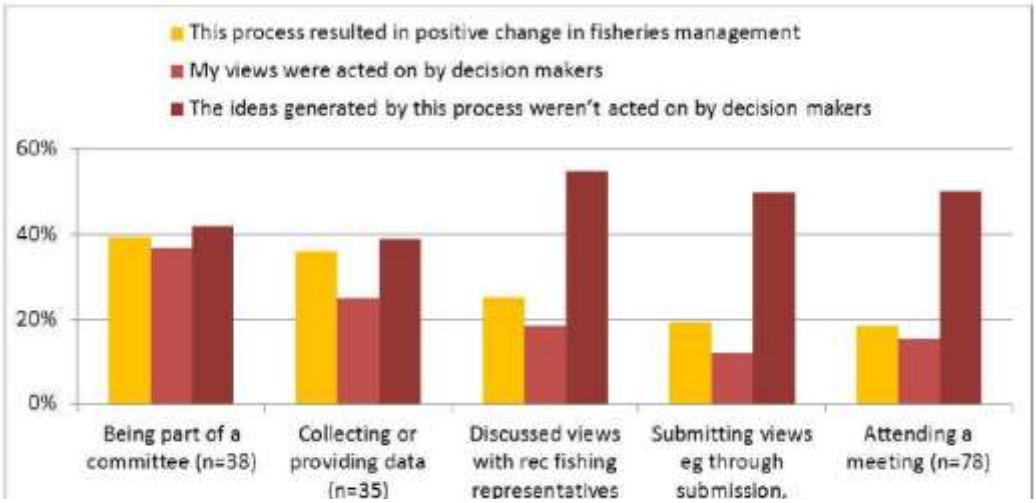

Figure 5: Outcomes achieved when using different methods (% of respondents who agreed with statement). (from Schirmer 2014, Figure 27 in Appendix 1).

Submitting views via submissions, petitions or forums was rated as poorer than most other methods in terms of receiving feedback, feeling that a person's views were heard, new ideas were generated (Appendix 1) or action taken (Figure 5).

Attending meetings was good for meeting new people, but rated poorly in terms of achieving action or outcomes (Figure 5), receiving feedback on outcomes, and feeling able to contribute views; it was also rated relatively poorly in relation to emotions with participants somewhat more likely to feel frustrated or stressed and less likely to feel good as a result of attending a meeting compared to some other methods (Appendix 1).

Irrespective of the method used, people who said that getting involved was 'good overall' were much more likely to say that getting involved made them feel good, improved relationships, let them be heard, and generated new ideas and action. Those who found having a say (for any method) 'bad overall' were much more likely to report feeling frustrated, stressed, to feel their views were not heard, and to feel that it was hard to get involved (Appendix 1).

What things are most important when having a say?

In addition to identifying what the costs and benefits of getting involved are, it is important to understand what things stakeholders value most about having a say. To help identify this, survey participants were asked how important it was to ensure that:

(i) everyone who is directly affected by a fisheries management issue has a chance to have a say about it;

(ii) there is clear explanation of the fisheries science involved in the issue;

(iii) they receive feedback about how their input is used; and

(iv) everyone who is interested gets a chance to have a say even if they are not directly affected by the issue.

While all four of these were considered important objectives of engagement by a majority of survey participants, ensuring those directly affected are able to have a say, and that there is clear explanation of the fisheries science, were rated by most participants as being more important than receiving feedback and ensure everyone with an interest has a say (Figure 6).

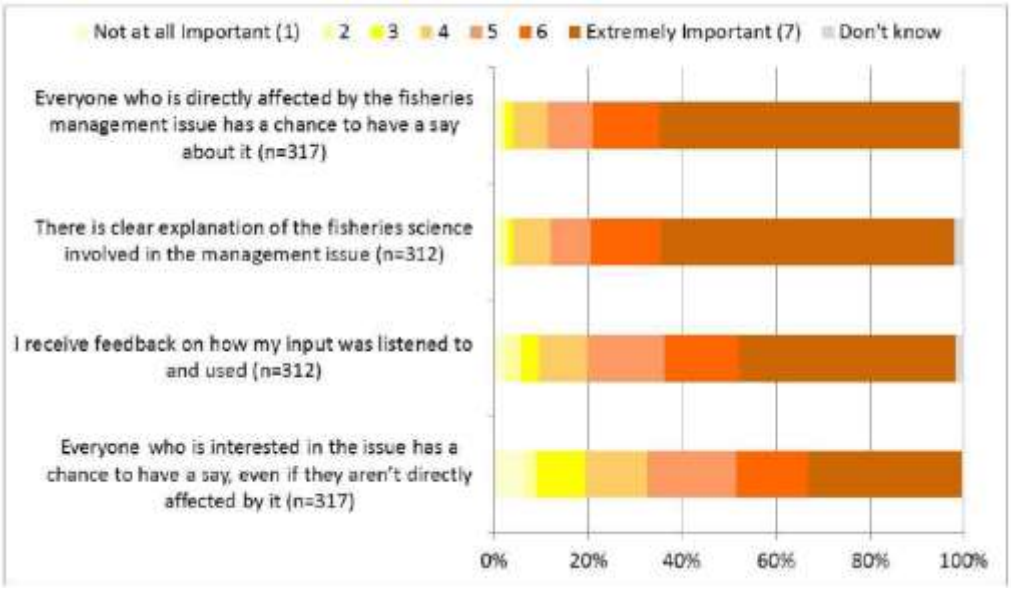

Figure 6: Importance of ensuring different outcomes when designing processes for involving stakeholders, as rated by survey respondents. (from Schirmer 2014, Figure 30 in Appendix 1).

Preferences for future involvement

Finally, survey participants were asked what ways they would prefer to get involved in fisheries management in future. This provided an opportunity for recreational fishers to

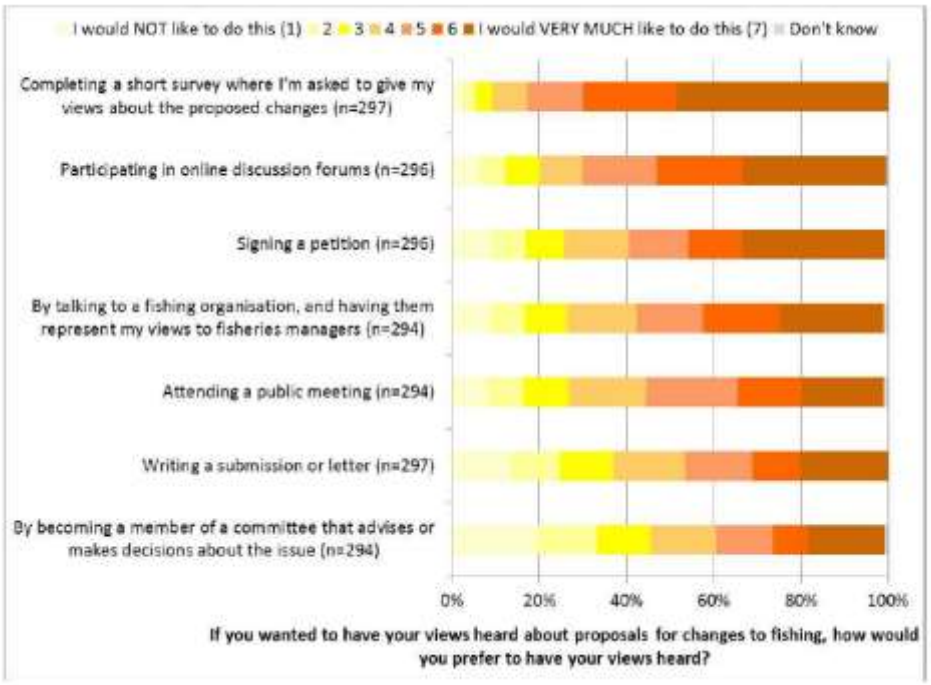

Figure 7: Preferred methods for getting involved in fisheries management in future (from Schirmer 2014, Figure 31 in Appendix 1).

identify whether they would like to get involved via methods they have not had opportunity to use in the past. Across all respondents the most preferred methods were having a say via completing a short survey, participating in online discussion forums, or signing a petition, even though these methods of involvement were not rated as having as many benefits as some other types of involvement. The least preferred methods were becoming a member of a committee, writing a submission or letter, or attending a public meeting (Figure 7). This suggests that, despite committee members reporting high benefits from participating in committees, a majority of fishers prefer being able to have a say via methods that involve a smaller commitment of time and effort, and which do not necessarily involve face to face interaction.

A full report on this component of the project has been produced (Schirmer 2014; *Getting involved in fisheries management and science: results of a survey of recreational fishers*), and is included at Appendix 1.

Phase 2: Case Study: Freshwater Catfish and inland fishing

Recreational fisher derived information

Through the five fishing events held in the lower River Murray from November 2013 to February 2014, engagement in the fishing days increased as different events were held. A total of 58 fishers participated in the events and a total of 72 Freshwater Catfish were sampled. Regular meetings of the FCWG were held to assist in running successful fishing events and engaging stakeholders and community representatives. The increasing participation in the fishing events and the success of the individual events directly related to the input of members of the FCWG.

In March 2014, PIRSA held a FCWG meeting in Murray Bridge to 1) present the data of Freshwater Catfish fishing events and the results of the population status assessment; 2) discuss management arrangement for Freshwater Catfish; and 3) evaluate the recreational fishing events. At this meeting, SARDI presented the available data and the results based on analysis of the fishery-dependent and fishery-independent information. Interactive discussions among the FCWG members regarding the interpretation of the results and management advice for this protected species contributed to the outcomes of this meeting.

The group acknowledged the valuable approach of using multiple data sources to understand the population dynamics and status of this threatened species. In particular, the long-term time series data (both historical commercial fishery data and scientific monitoring data) provide high value to assess the recent trend of population abundance in context of historical levels in the lower River Murray.

These information are critical for the population status determination in this case, given there is a current lack of long-term recreational fishery-dependent data. However, the 2013/14 recreational fishing events collected additional biological information on Freshwater Catfish to understand the population age structure and relative recruitment levels in recent years. Such data are important for population status assessment. Furthermore, recreational fishing events provide useful baseline data for comparison/analysis of abundance trends if the events are replicated in future years (Ye et al. 2015).

Based on the available information, the members of the FCWG unanimously agreed that Freshwater Catfish warrants continued protection in the lower River Murray in South

Australia. Furthermore, the group provided feedback to inform future co-management through the Freshwater Catfish Case study. Feedback included the following:

- Opportunities were missed to capture of a large number of people at peak holiday times such as Easter, and long weekends.
- Recreational fishing events were held too early in the fishing season.
- Possibilities of tying in the events with other recreational fishing events
- The need for a champion to maintain and carry enthusiasm for events
- The fishing events were too structured and restrictive.

A by-product of this case study is a population status report *Population dynamics and status of Freshwater Catfish (Tandanus tandanus) in the lower River Murray, South Australia* (Ye *et al.* 2015) prepared by SARDI.

Integration of information into other recreational fishing events

Further opportunities to engage with recreational fishers occurred during 2015 and 2016 to support Murray Cod stocking pre-assessment, and another project being undertaken by SARDI entitled "*Integrating fisher-derived and fishery-independent survey data to better understand and manage the Murray Cod fishery in the Murray-Darling Basin*" (FRDC 2013/022).

These included seven fishing events, throughout 2015 and 2016. These fishing events, reinforced the following points learned from Phase 2:

- Running recreational fishing events through established fishing clubs and associations is an efficient way of collecting data.
- Running recreational fishing events through established fishing clubs also helps with relationship building and gaining trust and support from the community.
- Through the established network with the recreational fishing community, diary records collated by selected fishers may provide a long-term catch/effort data source to complement fishery-independent research data, to support management.

It is planned that the data collected through these Murray Cod fishing events will be integrated to an inland waters fish monitoring database, which could be used for future assessment of inland fishery (e.g. Murray Cod status and fishery assessment, stocking assessment, comparison of fishery-dependent and research monitoring methods). This

assessment information will underpin the co-management of inland fishery in South Australia, particularly in the Murray-Darling Basin region. This outcome demonstrates the importance of effective engagement to facilitate collection of recreational fishing data for fisheries such as Murray Cod.

Recreational data collection will be a component of any research or monitoring program which is included in a proposed legacy document for this project for the management of native fish in South Australia. In addition to research (and monitoring) this legacy document will aim to incorporate a co-management approach regarding securing funding, management measures and ultimately some triggers allowing for fishing for Murray Cod by recreational fishers in the future.

Phase 3: Development of a future co-management model for inland fishing

Survey results

Due to time constraints the online survey was only available for recreational fishers to complete over a two-week period. However, during this time 545 people answered questions through the survey with a 86% completion rate.

The majority of respondents were aged 50 or over, with only one in ten being younger than 30 years of age. Males (97% of respondents) dominated the survey responses with the level of fishing varying. For example, one in six respondents had not fished in the lower River Murray with over a third fishing for more than five times a year and one in five fishing greater than ten times a year.

When asked about motivation for fishing in the lower River Murray, half the respondents indicated catching a feed, relaxing and spending time with friends and enjoying the outdoors were important to them. Of the individual responses catching a feed had a lower response rate to the other items.

Knowledge and perception of fishing in the lower River Murray

Respondents were asked a series of questions regarding their fishing experiences and perceptions with regards to fishing for native fish. Over 60% of respondents had never caught a Murray Cod, with 10% catching more than ten of these fish. This aligns closely to the level of fishing activity of respondents. When asked about why fishing for Golden Perch (*Macquaria ambigua*) was currently good, over 80% indicating previous reductions in

commercial fishing, good water flow, better environmental management and improving habitat, or a combination of all these factors being the reason for this. There was a general

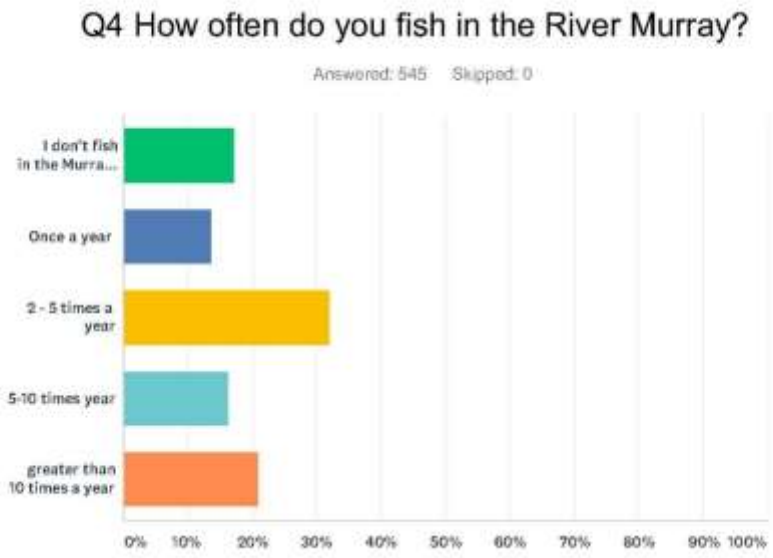

Figure 8: Fishing activity of respondents in the River Murray (Appendix 2).

agreement that the number of fish in the lower River Murray was increasing, although this response was dominated by Carp (*Cyprinus carpio*) and Golden Perch numbers.

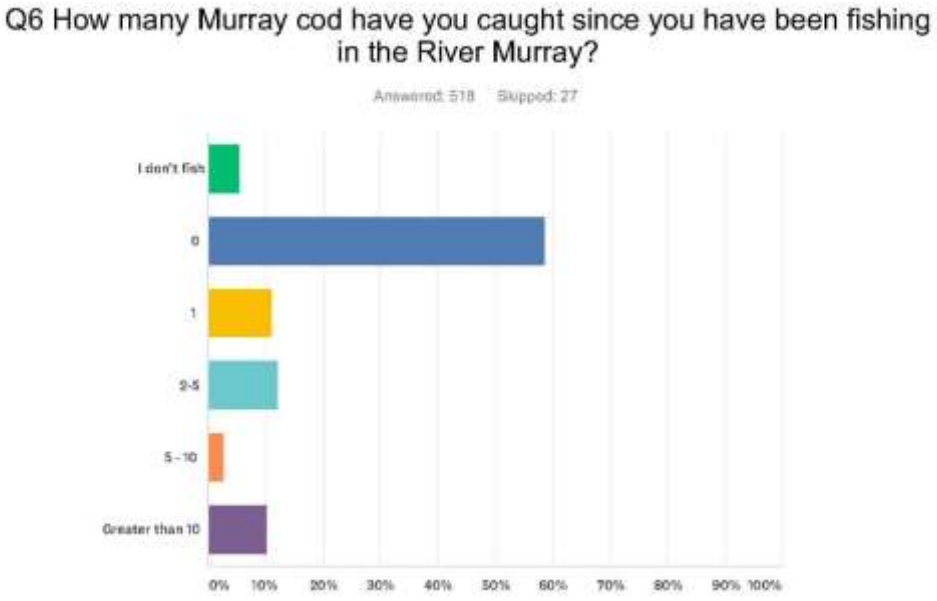

Figure 9: Catch of Murray Cod by respondents (Appendix 2)

Murray Cod Stock Enhancement Program

The majority of survey participants were aware of Murray Cod fingerlings had been released into the lower River Murray in 2016/17. Although around 20% believed there appeared to be more small Murray Cod, the majority indicated it would take some time for this release of fingerlings to result in increased stock levels of this species. This latter view was more likely given the small size of the fingerlings released and the fact that they were only likely to enter the fishery after a period of three to four years. There was support for the Murray Cod stocking program and an investment of money from between $500,000 to $1M per annum, although views were mixed on if the community or government should manage future stocking events.

When asked if respondents would support the establishment of a River Murray Fishing Permit to raise community funds to support a restocking program, four in five respondents indicated their support. Government grants, funding, voluntary donations and corporate sponsorship were all strongly supported as other means of funding for an ongoing Murray Cod Stock Enhancement Program.

National Carp Control Program

Respondents had a high level of awareness of the proposal to release a Carp herpes virus which may reduce the population numbers of Carp. The majority of the respondents answered positively when asked if they supported this initiative, although one in three were unsure. Only one in twenty respondents thought no benefit would come from removing Carp from the Murray River, with a strong belief that water quality, ecosystems and fishing would improve if this occurred. There was lower interest in community involvement in planning the release of the Carp virus, a mixed response regarding the community role in education and majority support in community involvement in the clean-up and any monitoring and evaluation of the success of the virus release.

Co-management of recreational fishing in the lower River Murray

Over 93% of respondents thought the community and government should have a key role to play in management of recreational fishing in the lower River Murray, with strong support for community involvement in monitoring, education, undertaking stocking activities and habitat enhancement work. Just over a third of respondents (160 people in total) indicated they would be prepared to participate in a daytime workshop in the Riverland to further investigate a lower River Murray recreational fishing co-management framework. These

respondents were asked to provide full details and addresses to signify their intent of which 84 respondents did so. This result provided confidence that the workshop was likely to be well attended and a decision was made to proceed with invitations extended to positive respondents to attend a workshop.

Of the 84 invitees only six agreed to attend the planned workshop and subsequently it was cancelled. Contact with invitees revealed that many felt that they were too busy to attend the workshop given its timing close to Christmas. The respondents indicated that a more convenient time would be later in the summer while nearly 50% of people indicated that they were no longer available to participate in the workshop. Based on this information, the workshop was rescheduled for 7 March 2018 and invitations were extended only to those that had confirmed they remained interested in the project. In total, 37 invitations were sent to attend the workshop with invitations provided one month prior to the meeting.

Eighteen positive and four negative responses to the invitation were received. Despite the low response it was agreed that there were sufficient number of positive respondents to proceed with the workshop and that with the inclusion of staff from PIRSA and SARDI that the workshop would deliver the required outcomes.

Outputs from the workshop

The workshop discussion noted the role of key recreational fishing associations in the management of the fishery including in stocking activities and a position on introducing a recreational fishing permit/licence to support any development in the lower River Murray recreational fishery. These discussions noted that at the time of the workshop there was no commercial fishing activity in the River Murray for native fish, therefore co-management was effectively between the recreational fishing sector, community and government. There was a consensus reached at the workshop that management of the fishery requires all relevant fishing sectors to work in partnership, with specific sectors taking the lead on certain issues. For example, recreational fishing organisations could play an important role in administration of a recreational Murray River fishing permit as per the Victorian model[1].

[1] Information on the Victorian Recreational Fishing Grants can be found at https://vfa.vic.gov.au/recreational-fishing/recreational-fishing-grants-program/licence-fees-at-work/licence-fees-at-work-2017-18

Research and Monitoring

Research discussion highlighted the need for regular stock assessments specific for the River Murray fish species but also the role that the community can play in data collection to support these assessments. The introduction of angler log books for a dedicated group of anglers was considered reasonable to provide important fishery-dependant recreational fishing data, and was considered by the community and sector as a better option than multiple or single fishing events. Monitoring of the success of the 2016/17 Murray Cod stocking, or any future stocking or habitat initiative was considered a critical need.

Possible co-management model

The participants at the workshop were keen to have input through a River Murray Recreational Fishing Co-management Committee, perhaps established as a sub-committee of an existing recognised recreational fishing association. A need to develop an inland fishery management plan that focuses on development opportunities specific for the fishery prioritising critical on-ground projects was identified as important.

Participants were asked to consider the roles that each of the sectors could play in a sustainable lower River Murray recreational fishery which prompted consensus that management of the fishery requires that all sectors work in partnership and that specific sectors should take the lead on certain issues. These results are shown in Table 1.

Table 1: Outputs from co-management workshop of sector roles

	Policy	Management	Compliance	Funding	Research	Publicity, Promo, Education	Represen-tation	On-Ground works
Government	✓	✓	✓	✓	✓	✓		✓
Community and recreational fishers	✓	✓	✓	✓	✓	✓	✓	✓
Business				✓		✓		✓

✓ - Lead

✓ - Support

The workshop then focussed on identifying actions for the key elements identified in Table 1 of Funding, Management and On-ground works. The key outcomes from discussions of these elements are summarised in Table 2

Table 2: Actions for Funding, Management and On-ground works.

	Actions supported
Funding	• Inland or general recreational fishing licence should be managed at arm's length from Government. • Government match funding from a recreational fishing licence • Corporate sponsorship for on-ground activities and events • Crowd source funding for on-ground works
Management	• Structure of formal management system is critical • There was a need to develop an inland fishery management plan that focuses on development opportunities for the fishery and prioritises critical on-ground projects. • Community input should be via a River Murray Recfishing Co-management Committee responsible for defining the management of the fishery including research and funding opportunities. Perhaps as a sub-committee of a recognised, existing recreational fishing association. It is critical that funding is sourced to enable a meaningful management forum • It is critical that established fishing associations are funded to lead co-management.
On-ground works	• Murray Cod stocking is the highest priority on-ground action • Fish, Water Flow and Habitat projects were all supported • Require proper input from scientists for development and implementation • Funding should be sourced from many areas.

The recreational fishing sector plan to use this information to propose future co-management arrangements. Many of the aims for this project link closely to actions contained in a strategic plan for recreational fishing in South Australia that was developed by RecFish SA. Additionally, information on co-management and consultative arrangements has been integrated into the recently finalised management plan for recreational fishing in South Australia (PIRSA 2017).

A summary of the online survey and co-management workshop outcomes are provided at Appendix 2

Discussion and conclusions

Review of national recreational fisheries co-management

Successfully involving stakeholders in recreational fisheries management and science can be challenging. Success means that a representative range of views are included and considered in decision making, and that those involved feel positive about the experience. The results of the survey on national recreational fisheries co-management models provide insight into the considerations needed in designing processes for involving recreational fishing stakeholders. In particular, they point to a requirement to consider the needs of people in different age groups, with different levels of fishing activity, and who have different personality types, when providing opportunities for stakeholders to get involved.

To achieve success in engagement of recreational fishers in co-management models, it is essential to have in place good political support and management flexibility, and to provide meaningful opportunities for stakeholders to get involved in having a say on fishing. Irrespective of how participatory the process is, it must be transparent and fair, and ideally feedback should be provided to stakeholders about the outcomes of the process. The survey results show that people who get involved in having a say using more intensive methods, such as being a member of a committee or collecting data in citizen science programmes also report the greatest benefits from their involvement.

Other ways of getting involved have fewer benefits and more drawbacks for participants, although these can be addressed through ensuring best practice approaches to the design and conduct of activities such as surveys, forum discussions, public meetings and submission processes.

Despite fishers reporting greater benefits from more intensive forms of involvement, few people wanted to be involved in this way. Instead, most prefer getting involved via surveys or discussion forums, despite these not having all the same positive benefits of more ‘participatory’ processes. This needs to be carefully considered when deciding on how to involve recreational fishers in fisheries management and citizen science activities.

Ideally, processes for involving fishers should provide mechanisms by which all fishers can have input at the level they desire. Overall, the results of the study support that fisheries stakeholders often want to get involved in having a say, but that a shift is needed to using

non-traditional consultation methods – such as surveys and online forums – and perhaps less emphasis given to traditional consultation methods of submissions and public meetings. While traditional methods should continue to be part of the range of methods used to involve fishers, providing a wider range of opportunities will ensure better representation of fishers.

Development of a future co-management model for inland fishing

The online survey tool, Survey Monkey, used in combination with Campaign Monitor proved to be a simple and cost-effective way to engage with recreational fishers and solicit a high response to the survey. Social media and established networks for increasing exposure of survey are also considered to have impacted positively on the response rate. Many recreational fishers who are members of an existing recreational fishing organisation have previously been asked to participate in surveys using Survey Monkey and were therefore likely to be familiar with its use. This may account for the high response rate (545 respondents) and completion rates (86%) for the survey.

Not all comments from participants were positive about the survey with some expressing their concern that the answer options were too limited and prescriptive and limited respondents on their choices of responses. While Survey Monkey provides the function to allow respondents to provide further narrative, this option was not exercised in the survey due to resource limitations.

The combination of the online survey and the workshop provided useful insights into the issues that the recreational fishing community considers important for the lower River Murray recreational fishery.

The survey provided a means to better understand participant's views on the fishery in the lower River Murray, the management issues important to them and the system of management that they considered may be applied to the fishery. These responses provided the foundation for the design of the co-management workshop which focussed predominantly on establishing a framework for co-management of the River Murray recreational fishery.

The strong response to the survey and the high completion rate demonstrate that recreational fishers are willing to share their opinions. However, consistent with the findings of phase 1 of the co-management project, the online survey revealed people were less

willing to become involved in active management. This is further evidenced by substantial disengagement from the project when respondents were invited to attend a co-management workshop. The success of the eventual workshop event was enabled through targeted dialogue with interested participants to maximise the opportunity for people to attend.

The overall results from the online survey and the workshop show that the community has very strong opinions on the key management issues for the lower River Murray recreational fishery and how government and communities should work together to achieve the best possible outcomes.

The absence of commercial fishing interests in the lower River Murray provides an opportunity for the recreational fishing sector, community and Government to work in partnership to aim to achieve a vibrant recreational fishery in the area. The outcomes from the online survey and workshop about the lower River Murray recreational fishery can assist in formulating potential co-management bodies, like the proposed River Murray Recreational Fishing Co-management Committee. Such committees could be formed to facilitate community and stakeholder input into research and funding opportunities.

It is noteworthy that multiple options for the further development of recreational fishing were identified, including the possibility of recreational fishers funding on-ground works through a recreational permit or licence system, crowd sourcing or through corporate sponsorship. Identification of these options highlight a theme of the community wanting to be included (or have the ultimate say) in decision making of how the funds are used, with some level of independence from Government if the funds are raised by recreational fishers.

The structure of any co-management committee is also an important consideration in the level of trust the Government, community and stakeholders have in the role that committee plays in management and research prioritisation. As a committee or organisation moves down the continuum of co-management, the PIRSA Co-Management Policy places an emphasis on active leadership, financial security, the independence of a chairperson and monitoring and auditing mechanisms. Another important consideration is the existence of minimal conflict with other stakeholder groups and/or clear mechanisms or capacity to address conflict. As already indicated, the lack of commercial fishing interests in the lower River Murray assists in meeting the requirements in this case.

Another key output of the workshop is the proposal to develop a lower River Murray (or inland fishery) recreational fishing management plan that focusses on development

opportunities for the fishery and prioritises critical on-ground projects and the role stakeholders play in implementation of these projects and proposed management plan.

Much of the on-ground works which were proposed at the workshop are common to many native fishery discussions that occur in the lower River Murray. These activities include: stocking of native fish; projects that promote flow regimes and water conditions that are suitable for native fish; habitat enhancement including snags, fish hotels and connectivity.

Implications

The findings of this research project highlight the potential benefits and costs of meaningful engagement of stakeholders in facilitating co-management frameworks and achieve fisheries management objectives (Table 3). However, the success of engagement activities that form the basis of these co-management arrangements require careful consideration of the demographics of the stakeholders to be consulted with respect to interest, age, fishing avidity and involvement in established relevant organisations. The various engagement activities assessed in this project all have benefits and costs for participants as summarised in Figure 10. Ideally, processes for involving fishers should provide mechanisms by which all fishers can have input at the level they desire. Overall, the results of the study support that fisheries stakeholders often want to get involved in having a say, but that a shift is needed to using non-traditional consultation. While traditional methods should continue to be part of the range of methods used to involve fishers, providing a wider range of opportunities will ensure better representation of fishers and consideration of participants needs should be included in designing more time-intensive activities to address the challenges to engagement identified in this project.

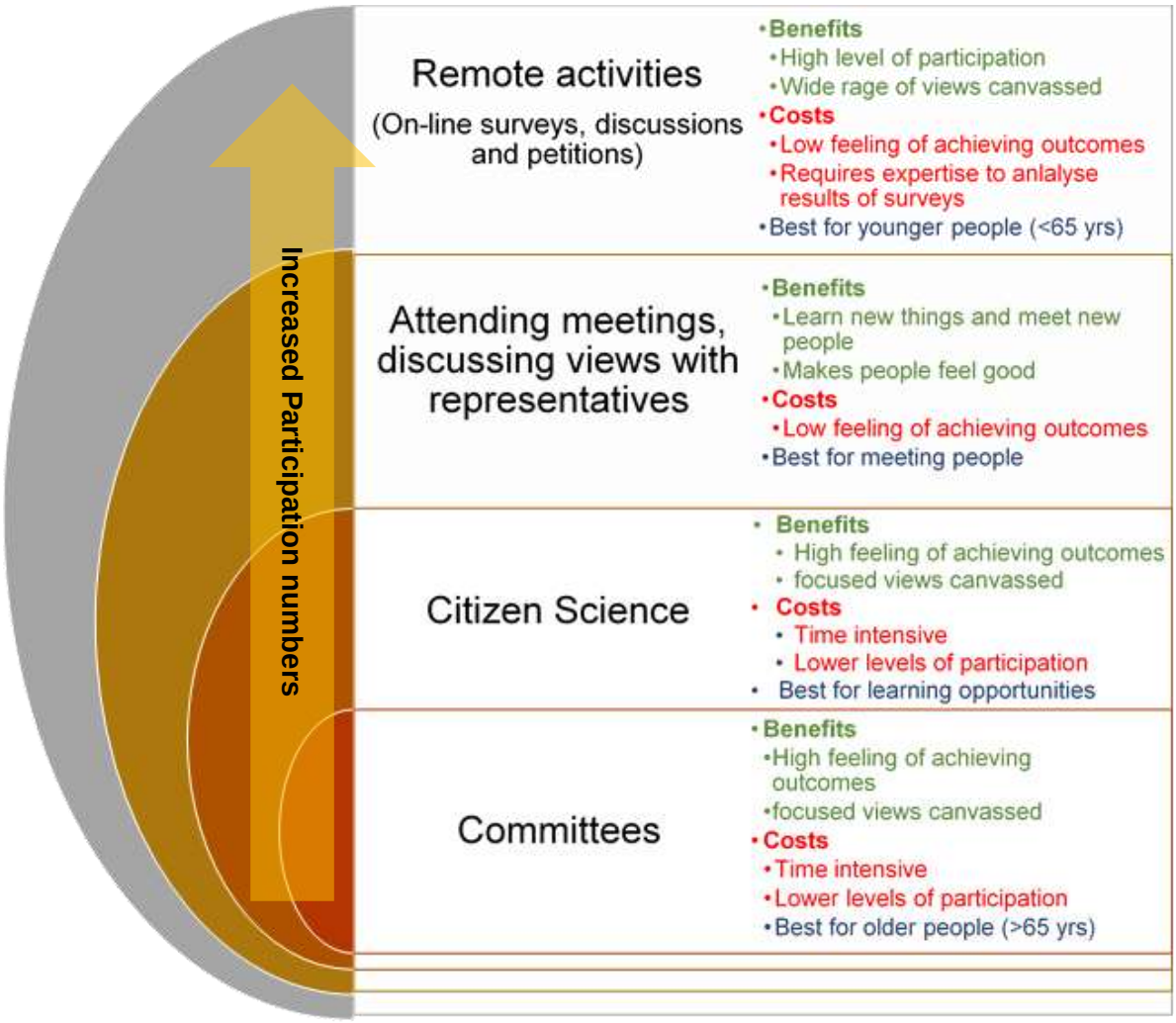

Figure 10: Summary of costs and benefits of engagement activities

Recommendations

It is recommended that development of a co-management framework that effectively integrates recreational fishers, consider the following steps.

1) Consider the issue/s that have arisen and/or need to be addressed through a co-management framework
2) Consider the stakeholders that may be impacted by the identified issue/s. Are there one sector, or many sectors.
3) What do you know about the sectors identified including stakeholder demographics age, geographic location, education, personality traits etc. and the resources that are available to those stakeholders to engage in a co-management process? For example, are there established representative groups available.
4) Consider what activities need to be undertaken to meet the objectives of the co-management framework. Do you need to collate data, inform stakeholders or both? If collating data, is this collating stakeholder views, or collecting fishery data.
5) Consider a range of activities that may meet the required outcomes
6) Consider opportunities to address identified challenges to activities to maximise effective outcomes (refer to Table 3)

These steps are summarised in Table 3 and Figure 11

Table 3: Summary of engagement activity performance

Considerations	Committee	Citizen Science	Attending meetings or taking to representatives	Remote Activities (online surveys, discussion & petitions	Considerations
Outcomes to be achieved from engagement					
Canvas wide range of views	X	X	✓	✓✓	Assessment methods required to effectively distil views collected
Canvas focused range of views	✓	X			May on identify views of avid fishers
Learning opportunity	✓	✓✓	✓		
Develop relationships			✓	X X	
Resources available					
Time required (participant)	X	X	✓	✓	
Resources required	X	X	✓	X / ✓	Expertise may be required to develop an effective online survey, however limited resources is required of participants.
Participation					
Numbers of people participating	X	X	✓	✓✓	Participation numbers can be improved through planning to optimise opportunities for people to participate, such as timing and location of holding meetings or conducting a survey.
Participant satisfaction	✓✓	✓	X	X	

Participant Demographics					
Older participants	✓		✓		
Younger participants	X	✓	X	✓	
Considerations for improving outcomes					
	• Develop committee structures that support canvasing wide range of Constituent views • Support and develop committee governance structures to promote efficiencies	• Deliver science information in easy to understand formats • Provide feedback to participants on outcomes	• Ensure transparency on the intended outcomes of meetings • Provide feedback to participants on outcomes	• Deliver information in easy to understand formats	

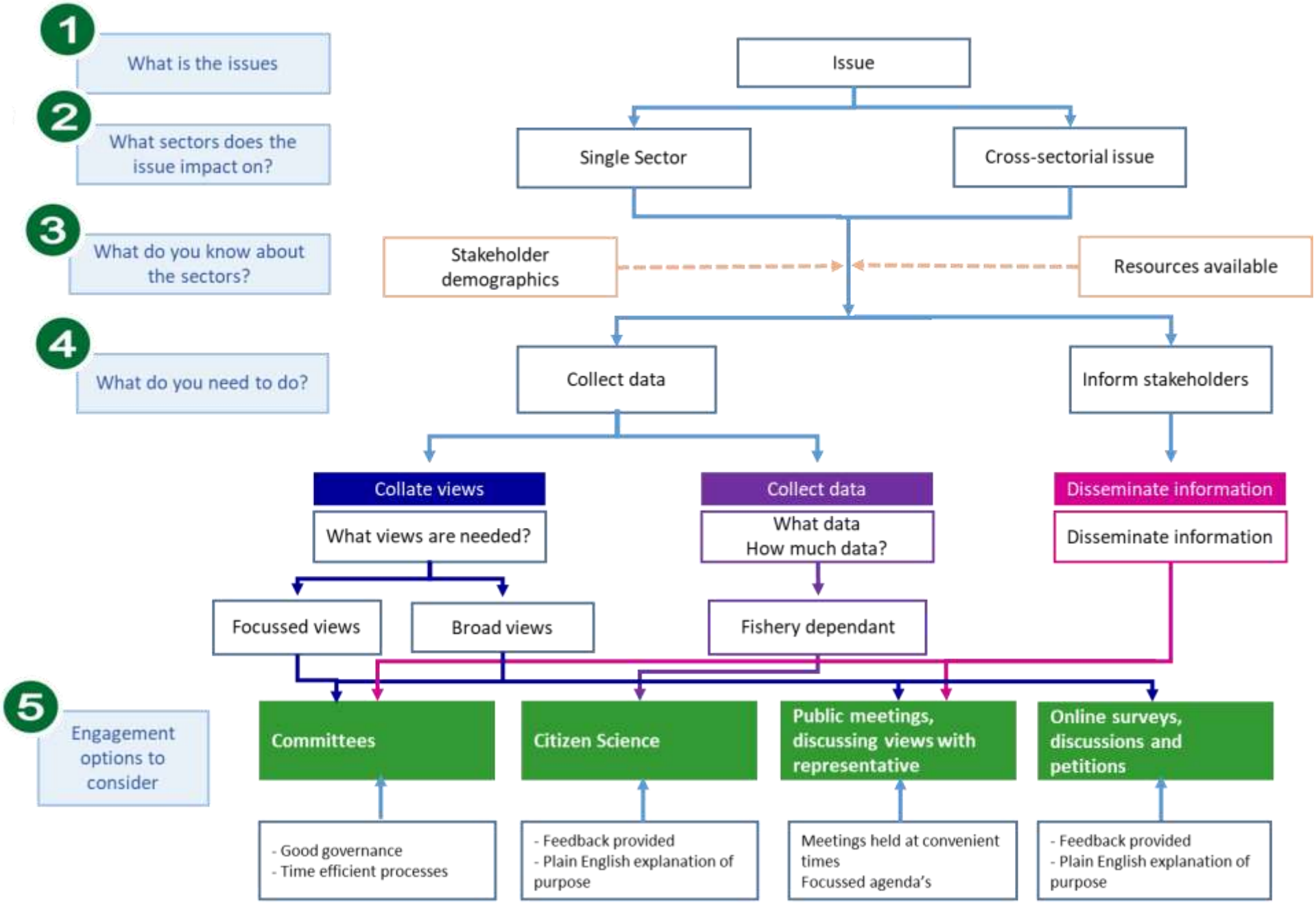

Figure 11: Summary of co-management development integrating stakeholder engagement

Extension and Adoption

As an example of the adoption of the results from this research project, a potential framework for a co-management arrangement between Government and the recreational fishing sector in South Australia was developed. Development of this framework utilised the steps recommended in the

Recommendations section as summarised in Table 3 and Figure 11.

Development of a co-management framework for the recreational fishing sector in South Australia

Step 1: Identification of issue/s

Clear advice on recreational fishing issues is needed to improve decision-making in respect to recreational fisheries management in South Australia.

To improve dialogue and communication between recreational fishers and the Government the following potential goals for a co-management framework are identified:

- Increase recreational fishing sectors responsibility and participation in the administration and governance of South Australia's recreational fisheries.
- Provide advice to government on issues relevant to the recreational fishing sector, including regional issues, and review/develop management plans as required
- Disseminate policy information relevant to the fishery
- Participate in development of strategic planning for the recreational fishing sector as required

Step 2: Stakeholders to be involved

Recreational fishing in South Australia encompasses a wide range of fish species and regions. In some cases, management decisions relate to a fish species or area that is solely related to the recreational fishing sector. For example, the Murray Cod fishery in the lower Murray River is currently a recreational only fishery with the current closure of the commercial fishery. In other cases, through formal shares of allocation of fishery resources, recreational fishers share the resource with other sectors such as commercial fisheries and decision making requires consideration of views from bot sectors. Management arrangements related to King George Whiting in South Australia is a good example of a shared resource.

Step 3: What is known about the recreational fishing sector

An estimated 277,000 South Australian recreational fishers were identified in the most recent recreational fishing survey undertaken in 2013/14 (Giri and Hall 2015). This survey indicated that fishers were distributed widely across the state with highest participation

rates in rural areas such as Eyre Peninsula. The greatest number of fishers were males in the age group 45-59 years (Giri and Hall 2015).

Current resources available to the recreational sector include:

- Established recreational fishing organisations such as Recfish Central, South Australian Fishing Alliance, Recfish SA and FishinSA and the South Australian Minister's Recreational Fishing Advisory Council (MRFAC[2]).
- Established online recreational fishing platforms developed by fishing organisations such as Facebook pages.
- Established Government consultation resources such as YourSAy (https://yoursay.sa.gov.au/about).
- Established commercial fishing advisory committees that include recreational fishing members eg Rock Lobster Fisheries Management Advisory Committee
- PIRSA Recreational Fisheries Manager

Step 4: Key activities

The broad engagement activities that may be considered to meet the objectives includes

- Collating stakeholder views
- Disseminate relevant policy information
- Some fishery-dependant data may be required for specific research projects

Step 5: Engagement options to be considered

Identify one established committee to be recognised as the peak advisory committee for recreational fishing issues. The terms of reference should be established to focus operations of this committee to high level policy issues and refer fishery specific issues to an existing, recognised advisory committee that includes a recreational fishing member if one exists.

Governance arrangements for the committee should provide for a high level of transparency in respect to appointment, representation and expertise to ensure the

[2] The SA MRFAC was being established at the time of finalising this report. Information about the Council may be found at https://yoursay.sa.gov.au/decisions/ministers-recreational-fishing-advisory-council/consultation-paper

acceptance of the committee's advice by its constituents is maximised. Terms of reference and operational procedures should be made publically available.

Identification of broad stakeholder views of matters important to recreational fishers to be canvassed through:

- online platforms (YourSAy or similar) and/or
- through members of the advisory committee discussing issues with constituents

Meetings of the committee should be kept to a minimum (numbers of meetings held and meeting duration) by being focussed to relevant issues. Meetings should be held at central locations, and allow for remote attendance through electronic telecommunication technologies (teleconferencing, videoconferencing).

The committee may also be utilised for disseminating information to recreational fishers, and/or advising on effective methods for dissemination of such information. Forums for consideration to achieve this may include social media (including existing platforms that reach recreational fishers).

The following potential roles and responsibilities for a co-management framework for recreational fishers to carry out the identified activities are proposed:

Co Management Service	**Responsibility**
1. Administrative support for a recognised peak recreational fishing advisory committee	Government
2. Operational support for a recognised peak recreational fishing advisory committee through attendance at meetings and provision of expertise	Recreational Fishing members of recognised peak recreational fishing advisory committee
3. Consult with recreational fishers on policy and other initiatives related to the administration of the *Fisheries Management Act 2007* (the Act)	Recreational Fishing members of recognised peak recreational fishing advisory committee
4. Advise Government on policy, initiatives, and plans related to administration of the Act	Recognised peak recreational fishing advisory committee
5. Consider supporting research activities where they would directly inform decisions	All members of the peak recreational fishing advisory committee

6. Communicate policy outcomes advised by the peak recreational fishing advisory committee to recreational fishing constituents	Recreational Fishing members of recognised peak recreational fishing advisory committee and Government

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Project materials developed

1: Information sheet developed for the online survey related to Phase 1 - *Getting involved in fisheries management and science: results of a survey of recreational fishers*

Getting involved in fisheries management and science

Information Sheet

This document provides information for people who participate in the survey on '*Getting involved in fisheries management and science*'. This survey is part of the '*Beyond engagement: moving towards aco-management model*' research project.

What is the purpose of the study?

Recent years have seen growing interest in more closely involving a range of stakeholders in fisheries management. Across Australia, many fisheries have implemented some form of consultation, collaborative discussions, or co-management. However, little is known about how well or poorly these arrangements are working, or how getting involved in fisheries management and science processes affects the people involved. This study is reviewing the experiences of people who have taken part in fisheries management processes through any type of consultation, public meeting, submissions, committees or other forms of participation, to find out what works well and what doesn't, and make recommendations to improve practices.

Who is undertaking and funding the study?

The study is being undertaken by Dr Jacki Schirmer at the Centre for Research and Action in Public Health of the University of Canberra. The research is funded by the Fisheries Research and Development Corporation, as part of a broader project led by Primary Industries and Regions South Australia (PIRSA) Fisheries and Aquaculture.

Why have you been asked to participate in the study?

Anyone with an interest in fishing and fisheries is invited to take, whether or not they have had direct involvement in fisheries management and science.

What will I be asked to do if I participate in the study?

You will be asked to complete an online survey that asks you about your views on getting involved fisheries management processes. The survey will take approximately 20 minutes to complete, and a maximum of 30 minutes if you have been highly involved in fisheries management and science processes in the past.

Voluntary participation

Participation in this research is entirely voluntary. You may withdraw from the research project at any time prior to publication of data, including withdrawal of consent for use of any of the data you have provided, or withdrawal of consent to use some or part of the data. If you request to withdraw data, we will securely destroy the relevant data.

Privacy and confidentiality issues

The researchers will ensure that your data remains confidential, as far as the law allows. We will not report your name. We will not report information such as the name of particular fisheries or regions without your prior written permission, if this presents a likelihood that you could be identified.

Only Dr Jacki Schirmer will have access to individual survey returns. Your survey data will be stored at the University of Canberra. Completed survey forms, and any data stored on CDs or other disk drives, will be stored in locked cabinets and/or offices. Electronic data will be stored in password protected hard drives

How will results of the study be reported?

The results of the study will be published as publicly available reports and in journal papers. The survey includes an option for you to let us know if you wish to be sent a summary of findings when we complete our analysis, as does the consent form for the semi-structured interviews.

Ethics

This survey has been conducted in accordance with the National Statement on Ethical Conduct in Human Research, and has been approved by the University of Canberra's Human Research Ethics Committee (HREC). If you have any queries related to ethics issues, you can contact the project researchers (contact details provided below). Alternatively you can contact the University of Canberra's HREC at: The Secretary, Human Research Ethics Committee Research Office, Room 1D88, University of Canberra, ACT, 2601. Tel: (02) 6201 5220 E-mail: humanethicscommittee@canberra.edu.au

Contacts

If you have further questions about this project, please contact Dr Jacki Schirmer on (02) 6201 2785, 1800 981 499, or jacki.schirmer@canberra.edu.au

Postal address: Centre for Research and Action in Public Health, University of Canberra, Bruce, ACT, 2617

2: Recfish SA Facebook page promoting online survey related to Part 3 - *Beyond Engagement - Moving towards a Co- Management Model for Recreational Fishing in South Australia - Community Workshop*

3: *Population dynamics and status of freshwater catfish (Tandanus tandanus) in the lower River Murray, South Australia.* Available at http://www.pir.sa.gov.au/__data/assets/pdf_file/0004/268951/No_841_Population_dynamics_and_status_of_freshwater_catfish_Tandanus_tandanus_in_the_lower_River_Murray,_South_Australia._Report_to_PIRSA_Fisheries_and_Aquaculture.pdf

Appendices

Appendix 1 Getting involved in fisheries management and science: results of a survey of recreational fishers

Getting involved in fisheries management and science: results of a survey of recreational fishers

Report prepared for the project Beyond Engagement: moving towards a co-management model for recreational fishing in South Australia

December 2014

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Contents

Executive Summary

Background

This report presents the results of Stage 1 of the project Beyond engagement: moving towards a co-management model for recreational fishing in South Australia. The Beyond engagement project as a whole is focused on identifying, documenting and evaluating fisheries co-management models for recreational fishing across Australia, drawing on existing experience in the recreational and commercial fishing sectors. Co-management has many benefits when it is successful for both the fishery and stakeholders. However, it can be challenging to achieve successful co-management.

The first stage of the Beyond engagement project focused on identifying the factors that potentially influence the success or effectiveness of co-management strategies through a brief review of literature, interviews with recreational fisheries managers and representatives of recreational fishing organisations, and a survey of recreational fishing stakeholders across Australia.

To achieve this, a broad definition of 'co-management' was used, in which co-management was defined as including any form of including stakeholders in discussions and/or management about recreational fisheries management and science. As co-management is often defined more narrowly than this, the terms 'having a say', 'involvement' and 'participation' are used interchangeably to refer to processes of stakeholders having communication and interaction about recreational fisheries management and science.

Key findings from previous studies

Available literature on stakeholder involvement in fisheries tends to focus more on the commercial sector, with very limited studies on stakeholder participation processes in recreational fishing across the world. A review of the literature available suggested multiple factors are important in achieving successful involvement of stakeholders in recreational fisheries management and science, including:

- Past relationships between stakeholders, which affect ability of these stakeholders to work constructively together. Successful processes are those which build trust between stakeholders, for example between fisheries managers and fishers
- Setting clear goals and objectives for participatory processes helps stakeholders function effectively in these processes
- Institutional support and provision of resources
- Effective processes for communicating existing knowledge (scientific, local and other forms), and for generating new knowledge (e.g. through citizen science initiatives). Difficulty understanding or communicating science is a common challenge to successful participatory processes noted in the literature
- Building the capacity and skills of stakeholders to get involved successfully
- Ensuring fair process and fair outcomes of participatory processes, including ensuring all stakeholders who should be included are given the opportunity to take part
- Use of the optimum methods for involving stakeholders, which allow them to have a say in the way they find best for them. This may range from providing the opportunity for stakeholders to complete a short survey through to holding public meetings, or establishing an advisory committee, to name just a few
- Where co-management approaches involving direct stakeholder management of aspects of a fishery are introduced, a substantial literature has identified conditions that enable

success. These include ensuring appropriate institutional settings (including property or use rights),

using facilitators/chairs of committees, targeting the right geographic scale and scope of activity; clearly defining who is able to be involved; strong leadership; investing in capacity building and ensuring conflict resolution mechanisms exist.

Methods

Data was collected for this study via (i) qualitative interviews and (ii) a survey. Qualitative interviews were conducted with 9 people who were experts in recreational fisheries management in Australia and in stakeholder involvement. The 9 were fisheries managers, representatives of recreational fishing organisations, or had roles in research or other sectors in which they took part in processes such as citizen science. They were asked to discuss their experiences with co-management, focusing on what had worked well and poorly in their experiences of co-management, and what could be done to improve processes of involving stakeholders in fisheries management and science. The results of the interviews were principally used to help design the survey.

The survey of recreational fishing stakeholders was designed based on results of the literature review and interviews with experts, and pilot tested with recreational fishing stakeholders before being launched. It asked a range of questions about stakeholder experience with getting involved in having a say about fisheries issues, and about their fishing, and their skills and capacity for getting involved. The survey was conducted from April to May 2014. It was open to any person with an interest in recreational fishing in Australia. It could be completed online or on paper, and was promoted via recreational fishing websites, email lists, clubs and organisations in Australia, as well as to recreational fisheries managers, and to key stakeholder groups known to get involved in discussing recreational fisheries management. A total of 381 valid survey responses were received. Not all of the 381 answered every question on the survey. Of the 381 participants, the large majority (379) were recreational fishers; 57% were members of recreational fishing organisations; 29% were office holders in a recreational fishing organisation such as a fishing club; 13% worked for a recreational fishing organisation or had done so in the past; and 15 respondents were or had recently been recreational fisheries managers, representing a large proportion of recreational fisheries managers in Australia.

Results – recreational fisheries expert interviews

Interviewees discussed multiple issues related to stakeholder involvement in fisheries management and science. First, they were asked to define what they considered co-management to be. It was typically described as any process of involving a wider range of people in fisheries management, and sharing responsibility with these stakeholders. The benefits of co-management were described as building a sense of stewardship of the resource by stakeholders; empowering a broader range of stakeholders to care for that resource; reducing conflict between stakeholders; reducing risk to government; and ensuring everyone gets to have a say rather than only highly vocal stakeholders.

Interviewees were asked what things help and hinder the success of efforts to involve stakeholders in fisheries management and science. The following key themes were identified:

- Supporting recreational fishing organisations to consult and represent views of recreational fishers can be successful if the organisation has adequate resources to fully consult fishers
- Political buy-in, adequate resourcing, effective leadership and good governance, as well as the ability to learn from (and accept) failure were critical to fostering genuine involvement in recreational fishing
- A common challenge was achieving genuine representativeness in stakeholder consultation processes, with many feeling that it those claiming to represent fishers often only represent a sub-set of recreational fishers
- Culture change is needed in fisheries management agencies and representative organisations in order to shift to more use of participatory processes
- Flexibility in fisheries management is needed if stakeholder involvement is to result in successful

change, with several experiencing difficulties when opportunities identified by stakeholders could not be implemented under current regulatory regimes, or could only be implemented with a substantial delay. Because of this, some had shifted to focusing on achieving change in fisher behaviour rather than formal changes to fisheries management

- Barriers to successfully involving stakeholders included lack of skills and capacity, difficulty clearly communicating scientific information, lack of scientific data, lack of adequate time, lack of political buy-in, stakeholder burnout, poor relationships between stakeholders, and lack of flexibility in fisheries management
- Citizen science was viewed as having many potential benefits, whereas some methods of involvement such as public meetings were often ineffective.
- Use of online and social media approaches to engagement was of growing interest
- It was easier to achieve successful stakeholder involvement in some issues compared to others

Results – survey

The survey respondents were predominantly recreational fishers, some of whom also had roles in fishing-related organisations or businesses. The sample was focused on those with an interest in getting involved in recreational fishing management and science, and as such as not representative of the broader recreational fishing community, many of whom do not wish to get involved in 'having a say' about fisheries management and science.

The analysis focused on identifying (i) how fishers prefer to be involved in fishing and (ii) which types of fishers have different preferences. The following characteristics were focused on when analysing whether there were differences between different types of fishers: age, personality traits (specifically, whether a person is introverted or extroverted, open to new experiences, or conscientious), wellbeing, formal educational attainment, involvement in recreational fishing organisations, type of fishing a person does, a person's satisfaction with their fishing, and fishing avidity (measured based on the number of days a person fished in the last year, and their total expenditure on fishing). While it would also be preferable to identify if there are differences by gender, cultural background, and whether a person is Aboriginal or Torres Strait Islander, the sample achieved did not include enough women, people from diverse cultural backgrounds, or Aboriginal or Torres Strait Islander, to enable this type of analysis. These are important gaps that should be examined in future studies. Geographic location of the respondent made little difference to views and as such was not included in the analysis.

Who gets involved?

The general awareness and interest of recreational fishers in 'having a say' about fisheries management was first examined, by asking survey participants whether they agreed or disagreed with a series of questions about getting involved in fishing. The majority of survey participants were interested in having their views represented to fisheries managers by people who represent fishers in their region (for example, staff of recreational fishing representative organisations). However, a substantial proportion did not know how to contact the people who represent the interests of fishers in the region. Fewer than half were actively involved in having a say on fisheries management. These results will not be representative of all fishers, as they are the views of those who chose to participate in the survey, a group in which people interested in having a say about fishing are highly likely to be over-represented. The finding that even amongst recreational fishers who are highly motivated to get involved, less than half are actively involved, suggests there may be

substantial potential to increase opportunities for those who have an interest to get more actively involved.

Younger people were less likely to be involved in having a say, less likely to know who fishing representatives were or how to contact them, and less likely to feel a need to contact people who represent fishers. People were more likely to be involved in having a say and interested in doing so if they had personality characteristics of an extrovert (meaning someone who enjoys engaging in interactions with others), and of someone who is open to new experiences; and if they were a member of a recreational fishing organisation.

What topics do stakeholders get involved in?

People's willingness to get involved in fisheries management is likely to vary depending on what issue they are having a say about. To better understand how the topic or issue affects willingness to have a say, survey participants were asked whether they had ever been involved in having a say on any of a number of topics common to recreational fisheries management. The topics recreational fishers had most commonly had some involvement in previously were commenting on proposed changes to catch or size limits, Marine Parks, and changes to fishing seasons or areas. A smaller proportion had experiencing getting involved in ongoing management of a particular fishery or species, proposed changes to regulations on fishing gear, or in processes involving allocation resources between the commercial, recreational and Indigenous fishing sectors.

The topics on which survey participants felt they were most likely to get involved in future were Marine Parks, changes to fishing seasons or areas, and changes to catch or size limits. They were least likely to get involved in collecting scientific data to inform fisheries management and resource allocation processes.

How do people get involved?

A critical question for getting involved is identifying what ways people prefer to have a say on fishing. The most common methods survey participants had been involved in fisheries management and science in the past were through online discussion forums, signing petitions, and completing surveys. The least common were getting involved in committees, writing letters, or collecting fishing related data. The 'traditional' consultation methods of public meetings, talking to fisheries representatives or making submissions were between these two extremes. Different types of fisheries had significantly differing preferences for getting involved in different methods. While most methods of participating were principally used by avid fishers who were members of fishing organisations, and who were often also extroverts, an exception was online forums, which were used by almost all types of fishers irrespective of their fishing avidity. Older fishers preferred traditional consultation mechanisms such as attending public meetings, while younger fishers preferred mechanisms such as online forums.

Having identified how fishers have been involved in the past, and on what topics, the next part of the survey asked participants to evaluate the costs and benefits of getting involved in different ways. Participants who had indicated they had previously used specific methods to get involved in having a say were asked their views on what worked well and poorly about getting involved in that way.
The methods rated most highly as a good way of getting involved were collecting scientific data and being part of a committee, while submitting views via submissions, petitions or online forums were most likely to be rated a poor method of getting involved, and least likely to be rated a good method.

Committees were rated better than most other methods of involvement for being able to contribute views, learning new things, meeting people and improving relationships, having views heard,

generating new ideas, achieving positive change, receiving feedback, and making people feel good. They were poorer in terms of the time involved.

Collecting scientific data was good for learning opportunities it provides, meeting people, and making people feel good and to a lesser extent for getting feedback and achieving positive change (although on the latter two it was not rated as highly as being a member of a committee).

Discussing views with recreational fishing representatives was rated as good for learning new things, meeting people, and making people feel good, but rated poorly in terms of receiving feedback or achieving action and outcomes, with few feeling it led to change.

Submitting views via submissions, petitions or forums was rated as poorer than most other methods in terms of receiving feedback, feeling that a person's views were heard, new ideas were generated or action taken.

Attending meetings was good for meeting new people, but rated poorly in terms of achieving action or outcomes, receiving feedback on outcomes, and feeling able to contribute views; it was also rated relatively poorly in relation to emotions with participants somewhat more likely to feel frustrated or stressed and less likely to feel good as a result of attending a meeting compared to some other methods.

Irrespective of the method used, people who said that getting involved was 'good overall' were much more likely to say that getting involved made them feel good, improved relationships, let them be heard, and generated new ideas and action. Those who found having a say (for any method) 'bad overall' were much more likely to report feeling frustrated, stressed, to feel their views were not heard, and to feel that it was hard to get involved.

What things are most important when having a say?

In addition to identifying what the costs and benefits of getting involved are, it is important to understand what things stakeholders value most about having a say. To help identify this, survey participants were asked how important it was to ensure that (i) everyone who is directly affected by a fisheries management issue has a change to have a say about it, (ii) there is clear explanation of the fisheries science involved in the issue, (iii) they receive feedback about how their input is used, and (iv) everyone who is interested gets a chance to have a say even if they are not directly affected by the issue. While all four of these were considered important objectives by a majority of survey participants, ensuring those directly affected are able to have a say, and that there is clear explanation of the fisheries science, were rated by most participants as being more important than receiving feedback and ensure everyone with an interest has a say.

Preferences for future involvement

Finally, survey participants were asked what ways they would prefer to get involved in fisheries management in future. This provided an opportunity for them to identify whether they would like to get involved via methods they have not had opportunity to use in the past. Across all respondents the most preferred methods were having a say via competing a short survey, participating in online discussion forums, or signing a petition, even though these methods of involvement were not rated as having as many benefits as some other types of involvement. The least preferred methods were becoming a member of a committee, writing a submission or letter, or attending a public meeting. This suggests that, despite committee members reporting high benefits from participating in committees, a majority of fishers prefer being able to have a say via methods that involve a smaller commitment of time and effort, and which do not necessarily involve face to face interaction.

Discussion and conclusions

Successfully involving stakeholders in recreational fisheries management and science can be challenging. Success means that a representative range of views are included and considered in decision making, and that those involved feel positive about the experience. The results of this survey provide insight into the considerations needed in designing processes for involving recreational fishing stakeholders. In particular, they point to a need to consider the needs of people in different age groups, with different levels of fishing activity, and who have different personality types, when providing opportunities to get involved.

To achieve this, it is essential to have in place good political support and management flexibility, and to provide meaningful opportunities for stakeholders to get involved in having a say on fishing. Irrespective of how participatory the process is, it must be transparent and fair, and ideally feedback should be provided to stakeholders about the outcomes of the process. The survey results show that people who get involved in having a say using more intensive methods, such as being a member of a committee or collecting data in citizen science programmes also report the greatest benefits from their involvement. Other ways of getting involved have fewer benefits and more drawbacks for participants, although these can be addressed through ensuring best practice approaches to the design and conduct of things such as surveys, forum discussions, public meetings and submission processes. However, despite fishers reporting greater benefits from more intensive forms of involvement, few want to be involved in this way. Instead, most prefer getting involved via surveys or discussion forums, despite these not having all the same positive benefits of more 'participatory' processes. This needs to be carefully considered when deciding on how to involve fishers in fisheries management and science. Ideally, processes for involving fishers should provide mechanisms by which all fishers can have input at the level they desire. Overall, the results of the study support that fisheries stakeholders often want to get involved in having a say, but that a shift is needed to using non-traditional consultation methods – such as surveys and online forums – and perhaps less emphasis given to traditional consultation methods of submissions and public meetings. While traditional methods should continue to be part of the range of methods used to involve fishers, providing a wider range of opportunities will ensure better representation of fishers.

Background

This document reports on the findings of Stage 1 of the project Beyond engagement: moving towards a co-management model for recreational fishing in South Australia.

There is growing interest in enabling co-management of recreational fisheries. Fisheries management across Australia relies on maximising the benefits to the community of a limited naturally renewable fisheries resource. Co-management frameworks have been developed and evaluated in the commercial sector, but there has been limited attention directed towards the recreational sector.

Co-management is argued to have many benefits when it is implemented successfully: stakeholders feel able to have input into processes and know their voices and views were heard and responded to; have greater trust in the processes used in, and outcomes of, fisheries management; and the process ensures management processes are informed by the knowledge and views of all stakeholders, resulting in improved management. These come together to improve the social licence to operate of fisheries management.

However, to achieve all these things co-management must work successfully. Co-management approaches by their nature require fisheries stakeholders to commit time and effort to participating in fisheries management processes. There are many potential barriers to successful co-management (widely documented in recent reviews), and a diverse range of suggested approaches to best practice design of co-management systems. A review of co-management of fisheries in Australia (FRDC 2008) highlighted three key considerations: the need for leadership from fishing sectors and government to initiate and drive co-management; to clearly define expectations and objectives of fishing sectors and government to help achieve aims; and for investment of time and resources to establish arrangements. Despite this and other reviews, there remains limited empirical evidence identifying whether the practices hypothesised to work best for co-management actually work in practice (FRDC 2008). Despite the growing interest in co-management, and implementation of various forms of consultation, collaborative discussions, or co-management in Australian fisheries, little is known about how well or poorly these arrangements are working, or how getting involved in fisheries management and science processes affects the people involved.

In South Australia PIRSA Fisheries and Aquaculture have introduced a policy to support co-management to guide its uptake in the state, and there are examples of co-management in the commercial sector (Spencer Gulf Prawn Fishery) already in place. PIRSA Fisheries & Aquaculture has also focussed its attention on engaging more comprehensively with the recreational fishing sector as a means of fostering recreational fisheries in South Australia. Effective engagement is the first step to co-management, and in 2010/11 an engagement project was undertaken by PIRSA seeking to understand what recreational fishing means to people and what future they want for their sector. Discussions generated consistent themes and issues of concern to recreational fishers, including sustainable fishing, ongoing access, funding and leadership, governance, education and promotion of the sector. Recreational fishing in South Australia is impacted by many factors that have been highlighted as barriers to co-management in this and many other jurisdictions. These include too few individuals being asked to do too much, a lack of funding to support development of the sector and a high workload in regards to management reviews and processes in relation to commercial and recreational fishing.

A structured approach to recreational sector co-management is required to facilitate ongoing meaningful engagement with the sector, and also to translate the success of recent engagement

efforts into an ongoing and enduring co-management approach for the recreational sector. Similarly, at a national scale the national development strategy for recreational fishing released in 2011 includes some focus on increasing successful engagement in the sector.

The Beyond engagement project as a whole is focused on identifying, documenting and evaluating fisheries co-management models for recreational fishing across Australia, drawing on existing experience in the recreational and commercial fishing sectors. The findings will be used to develop an appropriate and effective co-management model for recreational fishing in South Australia. The broader lessons from the project will be applicable across Australia.

The first stage of the Beyond engagement project focused on reviewing key literature and interviewing recreational fishing stakeholders, followed by conducting a survey of recreational fishing stakeholders to identify the factors that potentially influence the success or effectiveness of co-management strategies.

While the project as a whole focuses on co-management, in this first stage of the project the focus was on all types of involvement in fisheries management and science, including methods as diverse as consultation, public meeting, submissions, committees or taking part in a survey. Subsequent stages of the Beyond engagement project will draw on information from Stage 1 to develop case study application of co-management to recreational fishing in South Australia, using a case study of the Freshwater Catfish.

This report has five sections. First, a brief discussion of the meaning of terms such as involvement, engagement and co-management is provided, to give context to the report. This is followed by a brief review of the growing interest in involvement in fisheries management and science, and current knowledge on the most effective methods for achieving fisher involvement. The methods used in Stage 1 are described, focusing in particular on the methods used to survey stakeholders. The results section focuses on understanding which types of fishers prefer different types of involvement in fishing, and on identifying the most important design factors to ensure successful involvement of stakeholders. The discussion and conclusions then draw out key lessons for Stage 1, focusing on how to design strategies that enable successful involvement of stakeholders in recreational fisheries management and science.

Defining co-management and other forms of involvement in fisheries management and science

It is important to define terms such as 'co-management', 'consultation', 'participation', 'community engagement', and the many others used to refer to processes by which people interested in fisheries management can influence that management. In many cases these terms are used in an overlapping way, rather than having distinct definitions.

The literature on community engagement commonly uses the idea of a continuum to represent the different ways people may become engaged or involved in activities such as recreational fisheries management, and this provides a useful way to understand the differing types of consultation/ co-management/ community engagement/participation that may occur in fisheries management. One of the most commonly used is the International Association for Public Participation's (IAP2) 'public participation spectrum', shown in Figure 1. This spectrum highlights that people may get involved in recreational fisheries management in a large number of ways, ranging from passive methods (for example, signing up to a mailing list to receive information), through to collaborative and empowering approaches in which stakeholders are directly involved in developing and making recommendations on fisheries management issues. Between these two extremes are some of the more common methods used to seek input from stakeholders, such as consultation processes in which stakeholders are asked to make submissions, and involving stakeholders in workshops, meetings or committees. Each of these levels of involvement is valid in some circumstances: the challenge is ensuring that the opportunities for involvement provided match the desires, skills and needs of recreational fishing stakeholders.

	INFORM	CONSULT	INVOLVE	COLLABORATE	EMPOWER
PUBLIC PARTICIPATION GOAL	To provide the public with balanced and objective information to assist them in understanding the problems, alternatives and/or solutions.	To obtain public feedback on analysis, alternatives and/or decision.	To work directly with the public throughout the process to ensure that public issues and concerns are consistently understood and considered.	To partner with the public in each aspect of the decision including the development of alternatives and the identification of the preferred solution.	To place final decision-making in the hands of the public.
PROMISE TO THE PUBLIC	We will keep you informed.	We will keep you informed, listen to and acknowledge concerns and provide feedback on how public input influenced the decision.	We will work with you to ensure that your concerns and issues are directly reflected in the alternatives developed and provide feedback on how public input influenced the decision.	We will look to you for direct advice and innovation in formulating solutions and incorporate your advise and recommendations into the decisions to the maximum extent possible.	We will implement what you decide.
EXAMPLE TOOLS	• Fact sheets • Websites • Open houses	• Public comment • Focus groups • Surveys • Public meetings	• Workshops • Deliberate polling	• Citizen Advisory committees • Consensus-building • Participatory decision-making	• Citizen juries • Ballots • Delegated decisions

Figure 1 The IAP2 public participation spectrum[1]

[1] Copyright: International Association for Public Participation www.iap2.org; reproduced with permission

This report focuses on all types of involvement in fisheries management, including all parts of the spectrum represented in Figure 1. While the focus of the overall project this report forms part of is on co-management, which is often considered to only include those forms of involvement that devolve some decision making responsibility to stakeholder (the collaborative and empowering areas on the IAP2 spectrum), co-management is also often used to refer to other types of involvement that do not involve devolution of responsibility to stakeholders. In the first stage of the project it was considered essential to evaluate whether and what types of involvement fisheries stakeholders wish to have in recreational fisheries management, rather than to assume stakeholder which to have decision making responsibilities given to them. In fact, recent work has questioned the values implied by spectrums such as those of IAP2, querying whether it is appropriate to suggest that some levels of involvement – such as those shown at the far right of the IAP2 spectrum - are somehow 'better' than those at the left (Cornwall 2008), or involve greater power or control being delegated to citizens. In reality, these critics argue, each level of involvement may be appropriate in different circumstances, and attention needs to be paid to the needs and desires of those who are being involved, rather than assuming that processes that involve only 'lower' levels of the spectrum are in some ways failing to achieve the goals of a good participatory process (Hayward et al. 2004; Tritter and McCallum 2006).

Therefore, rather than assume that particular types or levels of involvement are 'better' than others, it is critical to assess what type of participation best suits different situations, and what method of involvement is preferred by stakeholders. Focusing on understanding the desires and capabilities of recreational fishing stakeholders enables design of appropriate opportunities for involvement that are targeted to the level and type of involvement that best suits different stakeholders. For the remainder of this report the term co-management is not used; instead, the report focuses on identifying how recreational fishing stakeholders wish to 'have a say' or 'get involved' in fisheries management. 'Having a say' or 'getting involved' can mean anything from receiving information through to becoming a member of a committee that is involved in decision making. The terms participation and engagement are also used interchangeably with the terms 'having a say' and involvement.

What is successful engagement in fisheries management and science?

Interest in enabling stakeholder involvement in recreational fisheries management and science has increased rapidly in recent decades. Despite this, there remains a relatively small literature that focuses on how to design successful involvement of stakeholders in fisheries management and science, particularly in recreational fisheries.

We reviewed key literature to identify what previous work has identified about the factors that help achieve successful stakeholder involvement in fisheries management processes, and the factors that need to be considered when designing processes intended to provide opportunities for a range of stakeholders to have meaningful involvement in fisheries management. The findings from this review are summarised in this section, and are organised into a series of common themes identified in the literature. These include the context in which involvement occurs, the design of that involvement, and the outcomes of that involvement. The topics broadly follow the 'IBEFish' framework which was developed for use in evaluating environmental conflicts originally, and subsequently applied evaluating stakeholder participation in fisheries management in a number of studies (Varjopuro et al. 2008). The IBEFish framework suggests that participation in fisheries management should be evaluated based on how successful it is in achieving the following (Varjopuro et al 2008):

- Information management, including integrating different sources of information and dealing with uncertainty

- Legitimacy, including ensuring inclusion and representation, clear rules, and accountability
- Positive social dynamics including achieving respectful relationships, empowering stakeholders, facilitating learning, and achieving policy uptake
- Cost-effectiveness, of both the process and its outcomes.

Context matters

The context in which a process of involving stakeholders in fisheries management is implemented will affects its chances of succeeding. Key contextual factors include the historical relationships between stakeholders; the fisheries management history; and the broader culture and location in which fisheries management and stakeholder discussions are occurring. The literature review suggested that historical relationships between stakeholders and fisheries managers; the problem or management topic on which stakeholders are to be involved; and the level of institutional support provided, are particularly important.

Relationships

Past relationships between stakeholders have obvious potential to influence the success of attempts to involve stakeholders in having a say on fisheries management. A history of poor relationships involving ongoing conflict will make it more difficult to achieve successful involvement, with greater thought needed to designing involvement processes to specifically overcome this past conflict. Conversely, positive past relationships will likely assist in achieving successful involvement.

Specific relationship issues identified in the fisheries sector in previous studies include:

- Fear that management changes will limit fishing opportunities. This fear can result in fishers choosing not to participate in having a say on fisheries management due to their lack of trust that the process will lead to positive outcomes for their fishing, and their fear that it will lead to negative change (Kleiven et al. 2013)
- Long histories of conflict or antagonism between recreational fishers and those in other sectors (e.g. commercial fishers), or fisheries managers (Kleiven et al. 2013)
- Lack of trust in the process and its outcomes (Berghöfer et al. 2008), for example lack of trust that fisheries managers will use information or input provided by recreational fishers in a way that recreational fishers would approve of, and fear that negative outcomes may result from having a say in fisheries management (Kleiven et al. 2013)

Articulating objectives

Chuenpagdee and Jentoft (2007) identified that participatory processes in fisheries are more likely to succeed if they involve a well-identified problem (for example specific types of conflict between fishers, or identification of illegal fishing) which then leads to the process having clear and easily specified objectives. Similarly, Rodwell et al. 2014) identified that having clear objectives was a positive outcome of co-management processes in English fisheries. In Australia, an example of this in practice is the Murray Cod Fishery Management Group, which is reported to have succeeded in achieving collaboration between a wide range of stakeholders and leveraging increased investment into Murray Cod related programs; this occurred in part due to having a cohesive, shared and clearly articulated objective that was itself developed collaboratively (Barwick et al. 2014). Stöhr et al. (2014) also identified that a real or perceived crisis could trigger motivation for stakeholders to collaborate successfully together on fisheries issues, suggesting that successful processes need clear motivations for stakeholders to become involved.

Institutional support and resourcing

Institutional support is critical to successfully involving stakeholders in fisheries management: if decision makers in fisheries management (for example, the relevant government minister) are not committed to the idea of stakeholder involvement, then that involvement is unlikely to result in successful outcomes. Institutional settings within which fisheries operate are often complex and

thus achieving institutional support may be complex, particularly where fisheries are regulated or managed via multiple authorities or jurisdictions (see for example Berghöfer et al. 2008; Mikalsen and Jentoft 2008; Rodwell et al. 2014). In cases where getting stakeholders involved in fishing involves devolution of power to local stakeholders, institutional support is particularly critical (Nielsen et al. 2004).

Having adequate resources to support stakeholder involvement in fisheries is another important prerequisite, and this is a particular area where institutional support can be critical: lack of adequate resources including funding, staff and capacity in terms of skills and knowledge has been identified as a barrier to successful co-management in previous studies examining fisheries (Berghöfer et al. 2008; Rodwell et al. 2014).

Design of the process

A supportive environment is not enough on its own to enable successful involvement of stakeholders in fisheries management; it requires good design of a process combined with a supportive context to produce successful outcomes. Successful outcomes here means achieving genuine stakeholder input via a process that stakeholders believe was fair, ensuring stakeholders are supported so they are able to continue participating and do not experience stakeholder burnout (also called 'participation fatigue'), and achieving outcomes that support ongoing successful and sustainable fisheries management. A large number of factors related to the process for involving stakeholders will affect its success. These include issues around sharing knowledge; building capacity and skills; ensuring fair process and outcomes; and selecting the methods that work best for stakeholder involvement.

Knowledge

Critical to successful processes is enabling shared learning and decision making that takes into account multiple sources of knowledge on what are complex problems (Berghöfer et al. 2008). A key challenge is addressing conflicting perspectives about the scientific evidence on the fishery. For example, Kearney (2002) documents how the Victorian Co-management Council reviewed scientific evidence and engaged in stakeholder dialogue to aim to achieve a shared perspective between recreational fishers, commercial fishers, Indigenous fishers and environmental groups who had previously been in conflict, highlighting the importance of addressing conflicting views about scientific evidence and its interpretation.

Local knowledge

Local knowledge is a recurring theme in literature on successful participatory processes, both in fisheries management and in other sectors. Ensuring that those seeking to design processes to enable stakeholders to have a say understand locally specific circumstances is critical to designing successful processes (Chuenpagdee and Jentoft 2007). A specific objective of many stakeholder participatory processes is to combine locally specific knowledge with broader scientific knowledge, and an emerging literature is gradually making recommendations on how to successfully combine the strengths of these different types of knowledge while addressing their respective weaknesses (see for example Schirmer 2013).

Access to scientific data

One of the most common challenges to achieving successful stakeholder involvement in fisheries management is accessing and understanding scientific data on fisheries. The challenge here can be both inability to successfully communicate that data in a way that makes it accessible and understandable to all stakeholders, and a lack of availability of data.

One of the most commonly discussed issues in the fisheries literature on stakeholder involvement is the challenge of building stakeholders' capacity to access and understand scientific data on fisheries

management issues. For example, Kleiven et al. (2013, p. 235) identified that across eleven case studies of stakeholder involvement in recreational fishing, a common barrier to collaboration was 'a lack of rigorous scientific information transfer from scientists to fishers and managers … and fishers' suspicion of science'. Rodwell et al. (2014, p. 279) similarly identified that in England, a key challenge to fisheries co-management was 'a need for improved communication and education regarding both fisheries and environmental issues to ensure better informed decision making'.

A lack of available data is a common challenge, and this extends beyond simply a lack of data on ecological aspects of fishing: as pointed out by Arlinghaus et al. (2013), there is a lack of research on fisher behaviour and how this links to fishery outcomes that needs to be addressed.

In recent years, the use of non-traditional data sets collected by fishers or others has been an area of growing interest to those seeking to fill gaps in scientific knowledge. 'Citizen science' initiatives are expanding rapidly in the fisheries sector. For example in Australia, the Murray Cod Fishery Management Group has initiated a monitoring program to assess the status of Murray Cod 'using angler-derived information alongside fishery-independent data sources' (Barwick et al. 2014, p. 79). Common challenges that emerge when developing citizen science initiatives include ensuring the data collected are of high quality data and can be validated, with multiple studies devoted to identifying how to use citizen science techniques in different fisheries situations with scientific rigour (e.g. Davies et al. 2012; Bodilis et al. 2014). When citizen science is successful, its benefits go beyond improving scientific knowledge to include things like increasing the knowledge of fishers and their capacity to care for fisheries resources, and improving relationships between fisheries managers and fishers, amongst others (e.g. Gledhill et al. 2014).

Capacity and skills

Stakeholder involvement that is successful has some common elements. A recent study comparing two cases of fisher participation in fisheries management, in Sweden and Poland, found that both succeeded due to 'a combination of respected leadership, skilled mediation and a strong focus on deliberative approaches and the creation of respectful dialogue' (Stöhr et al. 2014, p. 1). This highlights the role of skilled professionals in designing and facilitating stakeholder involvement processes, irrespective of whether they involve 'traditional' consultation methods such as submissions, through to co-management via methods such as stakeholder committees.

More broadly, this highlights the importance to success of building the capacity of different stakeholders to successfully get involved in having a say on fisheries management. Many stakeholders will have limited or no prior experience in fisheries management, and may be unfamiliar with the science, management of the fishery, or with how participatory processes work. Investing in building stakeholder capacity is often necessary to achieve success, but is often overlooked in participatory processes. This was discussed by Triantafillos et al. (2014) who identified that a key social objective of fisheries management should be to ensure stakeholders involved in processes such as advisory committees have the skills and resources they need to participate effectively.

Fairness and justice

A critical factor influencing the success of involving stakeholders is the perceptions these stakeholders have of the fairness and justice of both the process and its outcomes. In recent years a growing body of research has focused on the need to ensure procedural (process) and distributive (outcome) justice when conducting processes intended to achieve an agreed outcome about resource management issues as diverse as sharing water, windfarm establishment on agricultural land, and fisheries management (see for example Gross 2007).

A critical aspect of fairness and justice is ensuring all relevant stakeholders are able to get involved in the process. However, as articulated by Mikalsen and Jentoft (2008):

In practice, there are limits to participation as the number of self-declared stakeholders may well exceed the number of representatives that can be included – given the need for efficient decision making. In fisheries management, it is generally accepted that user groups – fishers, fish processors, traders – should be involved in management. The controversial issue is who else should participate. (p. 171)

Translated into a recreational fishing context, this highlights the need to carefully consider who will be encouraged to get involved in fisheries management – and if anyone will not be. Depending on the decisions made, processes may be criticised if they are perceived to unfairly exclude some stakeholders, an issue that has arisen in some fisheries co-management processes (see for example Nielsen et al. 2004). Mikalsen and Jentoft (2001) used stakeholder theory to analyse which fisheries stakeholders were more or less legitimate based on the urgency of their interest, their power, and their perceived legitimacy related to the fisheries issue being discussed. They identified fishers, fish processors, fisheries managers and fishing enforcement officers, fisheries scientists and those who jobs depend on fishing as definitive stakeholders (who are typically included in all processes); Indigenous people, environmental groups and local communities as expectant stakeholders (wishing to be involved but sometimes not viewed by others as legitimate or having power), and a range of latent stakeholders such as the general public, media, local government, banks, consumers, tourism industries etc. While stakeholders vary depending on the specific fishery issue, this gives a sense of approaches used in fisheries management to consider stakeholder inclusion.

Justice and fairness goes beyond ensuring inclusion of stakeholders to ensuring their voices are heard and responded to, and people are more likely to be satisfied with having 'had a say' if they feel they were listened to as part of that process (Gross 2007).

Selecting the right methods for involving stakeholders

Surprisingly little is discussed in the fisheries literature regarding what specific mechanisms are best to use to involve stakeholders in fisheries management. Whereas many guides to public participation in other sectors present long lists of methods and mechanisms, and provide specific guidance on methods ranging from conducting a public meeting or submission process through to designing a stakeholder management committee, this type of information has not been produced for the recreational fisheries sector. Examples in other sectors include guides to engaging communities in the forestry sector (Dare et al. 2011), mining (Harvey and Brereton 2005) and windfarm sector as well as in sustainability sectors more generally (Vajda 2012). This means that, despite widespread use of methods such as public meetings, surveys, submission processes, and advisory committees in the fisheries sector, there is a gap in specific knowledge of the challenges and opportunities these methods present for stakeholder involvement, a gap this report begins to fill.

There is an exception to this gap: at the co-management end of the participatory spectrum, there is a rich literature on experiences of using differing forms of co-management in different fisheries and jurisdictions. These tend to focus on the challenges inherent in devolving power and responsibility to stakeholder groups when shifting to co-management of a fishery (e.g. Pomeroy and Berkes 1997). For example, Hughey et al. (2000) describes formal structures used in fisheries co-management in New Zealand, including the use of incorporated entities to implement fisheries self-management which occurred in tandem with introduction of quota based systems in that country. They identified the need for clear allocation of rights and responsibilities when shifting to a self-management or co-

management system. Similarly, Pomeroy and Berkes (1997) provide multiple case studies of co-management in fisheries across the world, and identify a need to clearly articulate the role of government and the roles and responsibilities that are to be devolved (and to whom) and which will remain with government. These studies did not, however, examine the minutiae of specific engagement methods used within these co-management groups to achieve stakeholder cooperation.

Reviews and studies by Pomeroy et al. (2001) and Yandle (2003) produced lists of conditions that commonly influence the success of formal co-management arrangements established in the fisheries sector. The following were the conditions that commonly affected the success of fisheries co-management attempts. Many of these overlap with the broader factors affecting the success of any type of involvement, be it co-management or less 'participatory' forms of having a say on fisheries management:

- Enabling institutional settings, including legislative and regulatory support, particularly in the form of property rights or use rights
- Use of external change agents to facilitate the process, for example as mediators, chairs or facilitators of co-management initiatives
- Ensuring co-management arrangements are design to an appropriate geographic scale and have defined boundaries, meaning there is a good fit between the management responsibilities and the scale and boundaries of the stakeholders charged with co-management
- Clear definition of membership, and participation of those stakeholders; including representation and support of stakeholders who have more difficulty gaining access
- Strong leadership
- Clear mechanisms for accountability, and appropriate enforcement mechanisms
- Conflict resolution mechanisms
- Investment in capacity building to ensure those involved in co-management have the skills and resources to successfully enact it

While co-management is typically limited to commercial fisheries, proposals have been made for the establishment of 'angling management organisations' in the recreational sector that are assigned rights to a share of a fishery resources together with having some aspects of fisheries management devolved to the group (Sutinen and Johnston 2003).

Methods

To achieve the objectives of Phase 1 of the Beyond engagement project, a literature review was first conducted to identify key learnings in the broader literature about successfully engaging recreational fishers in fisheries management and science. Findings of this review were presented in the previous section. This was followed by two stages of data collection:

- Interviews with recreational fisheries managers
- Survey of recreational fishing stakeholders.

These are described below.

Fisheries manager interviews

Interviews were conducted with nine Australian recreational fisheries managers and experts, to ask them about aspects of co-management that work well or poorly, based on their experiences with co-management. The principal purpose of these was to further inform design of the subsequent survey of recreational fishing stakeholders.

The interviewees were chosen through identifying a list of 22 recreational fisheries managers, representatives and experts in Australia. Managers were chosen because they had experience of day-to-day fisheries management, which includes involving stakeholders in fisheries management discussions. Representatives were representatives of recreational fishing organisations who typically had extensive experience of being involved in consultative or participatory processes related to recreational fishing. Experts (who often had prior experience as managers or representatives) were typically involved in recreational fishing research or management at a national scale, and could comment on overall trends in involving stakeholders in fisheries management.

The 22 were contacted by email and invited to take part in an interview. Of the 22, 14 responded, and nine were ultimately interviewed. The total number interviewed was determined based on when 'saturation' was reached in which no new insights were emerging in interviews. This was achieved at the point of nine interviews. The remaining five people who had given permission to be interviewed were given the option of choosing to still have an interview, and decided not to do so either due to lack of mutually suitable times for interview, or deciding they would be unlikely to contribute additional or new insight beyond those that others had contributed.

The topics discussed in the phone interviews, each of which lasted 30-60 minutes, were:

- How do you define co-management?
- What types of experiences have you had with co-management?
- What's working well and poorly in the different types of co-management you have experience of?
- Is co-management working better/worse for some stakeholders, issues, or regions?
- What could be done to improve co-management?
- Who should be included in the forthcoming survey on co-management?

Interviews were not recorded, but extensive notes were typed by the interviewer during and immediately post each interview. The interviews were analysed to identify common themes, which were then used to inform design of the questionnaire.

Survey of recreational fishing stakeholders

The principal data collected in Stage 1 was collected via a survey of recreational fishing stakeholders in Australia. The survey's objective was to better understand the preferences of different stakeholders for getting involved in recreational fisheries management. The section below describes

how the questionnaire was designed, the sampling strategy, the sample achieved, and the data analysis techniques used.

Questionnaire design

The questionnaire was designed based on the findings of the literature review and interviews with recreational fishing stakeholders, and is shown in Appendix 2. The core topics asked about were:

- Types of interest in recreational fishing (e.g. recreational fisher, traditional fisher, member of fishing club)
- Recreational fishing activities: this included questions about number of days fished, history of fishing, satisfaction with fishing, fishing expenditure, types of fishing e.g. line, net or trapping, fishing platforms used e.g. land based or boat, and involvement in activities such as charter fishing and sports fishing competitions
- Level of interest in being involved in having a say on fisheries management, and perceived importance of providing opportunities to have a say
- Extent and types of past involvement in 'having a say' on fisheries management, including:
    - Methods of involvement e.g. signing a petition, collecting fishing related data, participating in discussion forums or public meetings, attending meetings, making submissions, completing surveys, or being a member of a recreational fishing committee. These types of involvement were defined based on common types of involvement offered to recreational fishing stakeholders in Australia in the last decade, identified through the interviews with recreational fishing experts
    - Topics on which they had chosen to 'have a say', e.g. Marine Parks, proposed changes to fishing seasons or areas, changes to catch or size limits, changes to regulations, resource allocation, fisheries management
- Rating of effectiveness of different methods they had experience with when 'having a say', including:
    - Positive aspects: Did this way of getting involved enable them to achieve positive outcomes such as being able to contribute views and ideas, learn new things, improve relationships, improve fisheries management, improve scientific knowledge
    - Negative aspects: Did this way of getting involved have negative aspects such as being difficult to participate in, taking too much time, being complex, increasing disagreement, or failing to achieve an outcome
- Personal preferences for level and type of involvement in fisheries management and science in the future
- Socio-demographic and personality questions to assist in identifying if different types of people prefer different ways of being involved in recreational fisheries management and science, e.g. gender, age, wellbeing, education.

The draft survey instrument was pilot tested by five people: three recreational fishers with limited past involvement in fisheries management or science, and two fisheries managers. The survey was revised based on the results of the pilot test, and the final version then distributed.

Recruiting survey participants

The survey was conducted during April and May 2014. It was open to any person with an interest in recreational fishing in Australia, whether or not they personally were a recreational fisher. The survey was designed with both an online version (hosted using Qualtrics software) and a paper version. The survey was promoted using recreational fishing networks, with notices distributed to these networks by email, and placed on websites with an interest in recreational fishing. Initial emails were sent to approximately 120 recreational fishing organisations and interest groups, who were identified based on a review of publicly available information (largely internet-based) on recreational fishing in Australia, and notices were directly posted on approximately 15 websites, with a small number of other fishing websites choosing to also post notices based on the emails they received (the exact number of these is not known). As recipients were encouraged to forward the email to others, and many emails were sent to organisations rather than individuals, it is not known how many people in total received emails informing them of the survey and inviting them to take part, or viewed a notice on a website.

Participants were encouraged to participate in the survey via the notices. A prize draw was also offered to encourage participation, with five $100 shopping gift cards offered in a random prize draw.

Ethics approval to conduct the survey and the interviews was applied for and received from the University of Canberra Human Research Ethics Committee.

Survey sample achieved

A total of 381 valid survey responses were received. Not all of the 381 answered every question on the survey. Of the 381 participants, the large majority (379) were recreational fishers; 57% were members of recreational fishing organisations; 29% were office holders in a recreational fishing organisation such as a fishing club; 13% worked for a recreational fishing organisation or had done so in the past; and 15 respondents were or had recently been recreational fisheries managers, representing a large proportion of recreational fisheries managers in Australia.

Only three were also commercial fishers, one was a traditional fisher, and one was a commercial fisheries manager: separate results are not reported for any of these (all of whom were also recreational fishers), as there were too few to be able to report results and maintain the confidentiality of these participants. Their views are therefore reported as part of the views of recreational fishers more broadly.

The goal of this survey was not to achieve a representative sample of recreational fisheries stakeholders, something which would require different survey recruitment methods to those used. Rather, it was to achieve a diverse sample that included adequate numbers of people from different types of key groups, to enable analysis of whether those groups had different preferences and needs regarding getting involved in fishing. The characteristics of the sample achieved are described in the first part of the results, including identifying gaps in knowledge remaining due to limited numbers of some types of stakeholders participating in the survey.

Data analysis

Data were analysed using Microsoft Excel and the Statistical Package for Social Sciences (SPSS). The majority of analysis involved descriptive analyses; where bivariate and multivariate statistical analysis was used, the specific tests used are described when results of those tests are presented.

Results – interviews with recreational fisheries stakeholders

The nine interviews conducted with recreational fisheries managers, representatives and experts were principally intended to inform design of the subsequent survey of recreational fisheries stakeholders. A brief summary is provided here of key themes that emerged in response to each of the topics discussed in the interviews: defining co-management; what works well and poorly to engage stakeholders in recreational fisheries management; and what could be done to improve this involvement in recreational fishing in Australia. Interviewees were also asked to describe their specific experiences of co-management in order to facilitate discussion in the interviews; these specific experiences are not described here, in order to ensure confidentiality of participants.

No specific quotes are presented from interviews, as interviews were not audio recorded but rather were recorded through extensive notes typed during and immediately after the interview.

How do you define co-management?

First, interviewees were asked to define co-management from their own perspectives. This helped identify how broadly Stage 1 of the project should define this term, and led to the decision to examine all types of involvement in recreational fisheries management. Key points made in interviews included that co-management is:

- Involving a wider range of people in fisheries management beyond managers; this involvement was variously described as having potential to be on any points of the participation spectrum shown in Figure 1. More specific descriptions included:
  - Multiple stakeholders working towards a common goal and sharing the responsibility of getting to that goal. Sharing responsibility can involve varying levels of direct involvement – one person may contribute by writing a letter with their views on an issue, and another by participating in regular data collection for the fishery, both of which can be meaningful
  - Any activity that involves 'having a seat at the table' – which could mean anything from having your views represented at that table by others, to being actively personally involved in decision making processes
  - An activity that needs to be designed specifically to address issues, meaning that rather than have generic involvement in fisheries management, it often works best to have involvement designed to focus on a specific geographic area (for example a particular bay, river area, or designated marine area that is of interest to a particular group of stakeholders), or to examine a specific issue (for example, local conflict between commercial and recreational fishers). Some interviewees specifically felt that designing processes to engage stakeholders worked best, or was only effective, at local scales; others did not express this view
  - Some felt co-management involves devolution of control to stakeholders, even when those stakeholders do not have direct decision making power. Simply by enabling other views a part in the process of decision making requires some reduction in direct control by current decision makers
  - Three interviewees noted that there were regulatory limits to co-management that need to be recognised in a project such as this one, with many jurisdictions not allowing stakeholders to directly make decisions regarding fisheries management
- The benefits of co-management were described as including building a sense of stewardship of the resource by stakeholders; empowering a broader range of stakeholders to care for that resource; reducing conflict between stakeholders; reducing risk to government from critics by being able to demonstrate broader stakeholder acceptance and buy-in to decisions; reducing the influence of 'squeaky wheels' – meaning stakeholders who are highly vocal but not necessarily

representative of the broader range of views about the issue under discussion; and increasing influence of stakeholder organisations in management

How do you make involvement work well (and what makes it fail)?

Interviewees had diverse perceptions regarding what works well to facilitate involvement in recreational fishing. Comments included the following:

- Appoint advocates: supporting (and often resourcing) recreational fishing organisations to facilitate involvement by stakeholders in fisheries management was believed by several interviewees to be highly effective. This model involves resources to organisations, and requiring them to then use best practice approaches to involving stakeholders, ranging from running consultation forums to conducting surveys of the general public, was highly effective and ensured the organisation could then act as an advocate in fisheries management processes.

Some felt this was most effective when recreational fishing organisations were provided access to funding, for example from recreational fishing licence fees, which they then had power to distribute to achieve recreational fishing goals subject to having appropriate processes for identifying spending priorities and reporting back on use of funds

- Political buy-in: Almost all interviewees commented that fostering genuine involvement in recreational fishing required government support, specifically political support. Without political will, and a commitment by the government of the day to listening to and acting on the information that emerges from processes of involving stakeholders, efforts to involve those stakeholders tend to result in disillusionment and in lack of willingness to continue being involved.
- Resourcing: Stakeholder involvement was successful when there was adequate resourcing.

Some interviewees had experienced failure of involvement when a large number of stakeholders were forced to compete for a small amount of resource to achieve their desired outcomes – this led to conflict between stakeholders. Lack of resourcing for peak organisations to participate in management processes was also a commonly managed constraint, and this led several to suggest that successful involvement was contingent on adequate resourcing as well as building capacity of stakeholders to be involved

- Representation: Almost all interviewees discussed the challenge of achieving true representation of views, pointing to difficulties in achieving high attendance at meetings, or high participation in surveys. Ways of addressing this included having recreational fishing licences include a check box asking the fisher if they wanted to receive information when there were opportunities to get involved (either from a peak organisation or the fisheries management agency). This helped broaden the ability of both managers and representative organisations to reach recreational fishers of all types and ensure they were hearing a broader range of views.

Vested interests were described as a challenge to achieving representation of all points of view, with several commenting that they had experienced difficulties with 'established' advocates for recreational fishing issues who were unwilling or unable to make room for a wider range of views to be expressed and acted upon, or who claimed to represent these views when in fact they didn't – referred to by two as 'old boys clubs' of recreational fishers who claimed to represent broader views but did not in fact do so. This led to a need for clarify in identifying which people represent particular interests. In particular, encouraging younger fishers to become involved, and women, was described as difficult.

- Governance: Getting people involved, whether through a peak organisation or directly engaging with a management agency, requires good governance and transparency, to ensure the building and maintenance of trust by those people who are getting involved, and maintain their willingness to be involved
- Cultural barriers: Some felt that one of the biggest challenges to achieving more involvement in fisheries management by a wider range of stakeholders was the need to achieve culture change

in government agencies and recreational fishing organisations. This was expressed in varying ways; some felt management agencies needed to have more openness to a wider range of views; others felt a paradigm shift was required for representative organisations, in which they shifted from 'throwing rocks' to working constructively with managers.

- Leadership: Leaders who could successfully bring together different stakeholders and facilitate their involvement were critical to improving the success of attempts to involve stakeholders, with most interviewees citing this as a critical area. Two interviewees specifically felt that these leaders needed to be provided improved support to reduce risk of them burning out
- Flexibility: A key challenge identified by five interviewees was that lack of flexibility in fisheries management meant some solutions or ideas suggested via processes of citizen involvement could not ultimately be implemented. Increasing flexibility can enable greater benefit to be achieved. For example, regulatory limitations reduced ability to respond rapidly to the consequences of extreme weather events, to give one example cited by an interviewee; another said that results of citizen science projects he was involved in had failed to make a difference due to the long decision making timeframes of government, and that more rapid responsiveness was required for success and to avoid disillusionment amongst those who were involved.

Overcoming this required governments of the day to cede decision making control to fisheries managers, and managers in turn to either provide decision making influence to stakeholders, or to ensure rapid response to those stakeholder's views

- Capacity building: A lack of skills and capacity was viewed as an important barrier to successfully involving stakeholders. Building skills and capacity both for those who facilitate processes that encourage stakeholder involvement, and for stakeholders who want to get involved, was essential to successful involvement. This required building capacity of those groups who are often unheard in current consultation processes such as Aboriginal and Torres Strait Islanders, women, and younger fishers. Capacity building was strongly linked to resourcing. Capacity building also included specific training of stakeholder to conduct activities such as scientific data collection, which led to them being able to be more involved, and to improve knowledge and stewardship simultaneously
- Citizen science projects were described as a key mechanism for improving education, knowledge, and increasing available data on key issues. This was viewed as a key way of increasing stewardship of recreational fisheries
- Scientific communication: Communication of scientific knowledge needs to improve to enable stakeholders to understand the science and therefore have more meaningful input. Difficulties with interpreting and communicating scientific data were cited by many interviewees as an important barrier to meaningful involvement in fisheries processes. One interviewee felt it was critical to ensure all people had access to the same information to prevent a view that some data was being withheld from particular groups, and to facilitate understanding of how and why decisions were being made based on scientific data. Sharing information with all increased trust
- Scientific data: A lack of scientific data was also cited as a barrier to involvement, and some also felt that existing data was not used as effectively as it could be (in addition to not being communicated effectively in many circumstances)
- Facilitating ownership: Successful processes of stakeholder involvement were those that results in a sense of ownership and stewardship of the resource, which then led to positive outcomes for that resource. This required ensuring that the process of involvement provided genuine opportunities to make a difference, rather than being tokenistic
- Time: Successful involvement required having adequate time for dialogue and to develop genuine discussion and input. However, in some circumstances managers felt they could not wait long periods of time as they needed to make rapid decisions in order to protect the fisheries resource.
- Methods of involvement: Some methods of getting involved were described as often being unsuccessful or as generating more conflict between stakeholders, such as public meetings in

which some stakeholders felt unable to speak or outnumbered. Three interviewees commented that they felt traditional structures used for involving stakeholders were increasingly ineffective, with a need to shift to use of new platforms (including, but not limited to, social media) and methods for engaging stakeholders, particularly younger recreational fishers. Virtual organisations and networks were more effective for these interviewees than traditional organisational structures such as formal advisory committees

- Burnout: Burnout of stakeholders involved in fisheries management was a key challenge. Burnout, through placing too much demand on too few volunteers, led to those people reducing their involvement, and to loss of the knowledge, skills and capacity they built up, resulting in increasing cost as new stakeholders had to build the same capacity
- Feedback: An essential part of successful involvement was providing feedback to stakeholders on how their involvement had made a difference, according to two interviewees
- Building relationships and overcoming past history: Successful involvement was more likely to occur when stakeholders had high trust; and required more investment of time and effort when there was a history of difficult relationships and conflict. Without good relationships, actions such as collection of data and good communication of it will not be successful in building trust and buy-in from all stakeholders, no matter the quality of that data or communication
- Focus on issues amenable to involvement: Two interviewees felt that successful involvement occurred when that involvement focused on the right aspects of fisheries management. Issues such as compliance were not appropriate for stakeholder involvement in their experience, whereas collection of data, sitting on advisory groups and participating in other ways was more successful. Some suggested that co-management and other forms of involvement were most successful when they involved a single sector (eg recreational fishers but not also commercial and Aboriginal fishing sectors), and a definable geographic region, whereas multi-sector issues were harder to address successfully using stakeholder involvement. One felt that achieving success in involvement in issues involving competing sectors required those sectors to first be willing to talk constructively with each other instead of using the opportunity to be involved to further their specific interests at the expense of other's.
- Coping with failure: Two interviewees said a key ingredient to success was being able to respond constructively to failed attempts to successfully involve stakeholders. Being able to learn from failure without fearing that the failure will result in loss of funding or resources is important to being able to improve practice, and requires political buy-in. They felt that implementing more processes of involvement successfully required recognising that not all issues will be solved rapidly through these processes, but that the benefits of greater involvement outweighed the costs of the failures or difficulties experienced
- Behaviour change: One interviewee felt that involving stakeholders worked best when it aimed to achieve behaviour change by those stakeholders, rather than to convince governments to implement change, as it was simpler and quicker to achieve change in stakeholder behaviour than to achieve change in formal systems of management

Results – survey of recreational fisheries stakeholders

The results of the survey of recreational fisheries stakeholders are described in the following sections. These results focus on six areas:

- Survey respondents. This section examines the types of people who participated in the survey, and identifies key groups who may have differing preferences for getting involved in fisheries management. Subsequent sections then analyse whether preferences for involvement vary for each of these types of respondents
- Who gets involved? This section examines which types of fisheries stakeholders (i) want to be involved in fisheries management and (ii) have previously been involved.
- What topics do stakeholders get involved in? This section identifies which recreational fishing topics stakeholders were most likely to choose to get involved in. This helps identify which management issues it is easier to get stakeholders involved in, and which are harder to encourage involvement in
- How do people get involved? This section identifies the ways people prefer to get involved, for example through being a member of a committee, completing a survey, participating in scientific data collection, or making a submission
- Costs and benefits of getting involved. This section examines the experiences survey respondents had with different methods of getting involved, focusing on what aspects of each approach to getting involved worked well and poorly, and what factors appear most influential in making getting involved an overall rewarding versus unrewarding experience
- Preferences for future involvement. The final part of the results analyses the ways survey participants said they would prefer to be involved in fisheries management in future.

Survey respondents

The people who participated in the survey were predominantly recreational fishers. Some of these recreational fishers were also office holders in recreational fishing organisations, or had a job in a fishing-related business; a small number were fisheries managers. However, the dominant characteristic was participation in recreational fishing, and so the results of the survey were analysed for recreational fishers. Where appropriate, different views expressed by specific groups, such as fisheries managers, are commented on; this is only done where they expressed different views to other survey respondents.

To help guide analysis, the first step was to identify what distinct groups might need to be analysed to identify if they have different capacity, skills, needs and preferences for getting involved in recreational fishing. Based on the literature review and interviews with recreational fisheries managers, representatives and experts, a list of the characteristics that may potentially influence whether, when and how a person chooses to become involved in having a say on recreational fisheries management was developed. The characteristics of the survey respondents were then examined to identify whether there was a high enough sample of each group to be able to analyse their preferences for getting involved in recreational fishing.

Table 1 summarises these key characteristics, focusing on sociodemographic characteristics and fishing characteristics. Socio-demographic characteristics such as a person's age, gender, cultural background, personality traits, geographic location, and health and wellbeing may all influence how they prefer to get involved, something documented both in existing literature and discussed by interviewees. The survey respondents did not include enough female respondents, or enough people from different cultural backgrounds, to enable analysis of these two characteristics, and this should be a priority area for future work. However, all other sociodemographic characteristics were able to be analysed. The nature of a recreational fisher's fishing activities may also influence

whether and how they want to get involved. While the literature does not examine this in detail, interviewees suggested that people who fish in different ways might have differing preferences for getting involved in fisheries management processes. Aspects that may have an influence are (i) how avid a fisher the person is, with some interviewees feeling that those fishers who choose to get involved are largely those who fish more often than the average fisher; (ii) how satisfied a person is with their fishing, with interviewees suggesting that dissatisfied fishers sometimes are motivated to get involved to try to address what they view as unfair fishing policy or management; (iii) the type of fishing a person does, and (iv) whether a person is a member of one or more recreational fishing organisations such as fishing clubs. All these aspects were asked about as part of the survey, and could be analysed.

In each of the following sections, different aspects of fishers' preferences and experiences with getting involved in fisheries management are examined. For each, overall results of preferences are presented, followed by analysis of whether fishers with different characteristics – for example, fishers of different ages, or who undertake saltwater versus freshwater fishing – have different preferences or experiences.

Table 1 Socio-demographic and recreational fishing characteristics hypothesised to influence a person's preferences and capacity to get involved in recreational fisheries management

Socio-demographic/ recreational fishing characteristic	Why might this characteristic affect how a person wants to get involved?	Survey sample	Is this characteristic included in analysis of survey results?
Age	Participation in recreational fishing by younger people has been noted to be declining in previous Australian studies (Jones 2009), and they have been identified as having different motivations for fishing compared to older people (Schirmer et al. 2014). The different profile of recreational fishing activity suggests that people of different ages may also have differing preferences for getting involved in fishing.	The survey sample was composed of a range of age groups, with 9.4% aged under 30, 46.5% aged 30-49, 35.7% aged 50-64, and 8.4% aged 65 or older. While this was an under-sampling of younger people (typical in many surveys), it was possible to compare age groups when analysing results	Yes
Gender	Men and women often have different communication styles and preferences for getting involved.	Only 12 (4.0%) of survey respondents were female. This is not a sufficient sample to enable statistically meaningful comparison of male versus female respondents.	No
Aboriginal and Torres Strait Islanders	Aboriginal and Torres Strait Islander people are likely to have differing preferences and capacity to get involved. This is being examined in other FRDC funded projects, and resources available for this project did not enable specific consultation with these groups. Survey participants were asked if they were of Aboriginal or Torres Strait Island origin	Only 5 (1.7%) of survey respondents were Aboriginal or Torres Strait Islanders. This was expected, as the survey was not promoted intensively to these groups, which would be needed to obtain a larger sample. This is not a sufficient sample to enable statistically meaningful comparison of Aboriginal and Torres Strait Islanders and other respondents In future studies, a focus on understanding these groups should be a priority.	No
Other cultural origin	Australia has a diverse population, and many people were born in other countries. Interviewees suggested that it is often difficult to involve people from diverse cultural backgrounds in fisheries management. Survey respondents were asked if they were of Aboriginal or Torres Strait Islander origin (discussed above), born in Australia but not Aboriginal or Torres Strait Islander, born overseas in an English speaking country, or born overseas in a non-English speaking country.	The large majority of respondents (86.3%) were Australian born residents not of Aboriginal or Torres Strait Islander origin. 10.0% were born overseas in an English-speaking country, and 2.0% born overseas in non-English speaking countries. As initial analysis revealed no significant differences between those born in English speaking countries versus in Australia, cultural original was not analysed. In future studies, achieving a higher sample of recreational fishers from a non-English speaking background should be a priority.	No

Socio-demographic/ recreational fishing characteristic	Why might this characteristic affect how a person wants to get involved?	Survey sample	Is this characteristic included in analysis of survey results?
Geographic location	Some interviewees suggested that differing regulations and policy environments in different Australian states and territories may lead to variation in how people choose to get involved. Survey participants were asked which states and territories they fished in.	A sample of respondents was obtained that fished in every state and territory: ACT (7.4% of respondents fished), NSW (52.9%), NT (7.7%), QLD (32.6%), SA (13.7%), TAS (14.9%), VIC (24.9%), WA (13.4%). The total adds up to 100% as some respondents fished in more than one state or territory. Initial analysis, however, identified little difference between people who fished in different states; those differences that were identified were also related to other characteristics (such as the age of a person or whether they were a member of a fishing organisation), and so state was not used as an analysis variable as it was not clear that state-based differences were contributing to variation seen in the sample.	No
Personality traits	A person's personality traits can influence how they prefer to get involved: for example, an introverted person may prefer to complete an anonymous survey, whereas an extrovert may prefer to attend meetings in person.	Participants were asked the extent to which they agreed with the following statements. Each acts as a measure of different personality traits: □ I see myself as reserved, quiet (extraversion) – almost 40% of respondents agreed with this □ I see myself as open to new experiences, complex (openness to experience) – 71% agreed with this □ I see myself as dependable, self-disciplined (conscientiousness) – 80% agreed with this	Yes
Wellbeing	A person's overall wellbeing may influence their capacity and willingness to get involved in recreational fisheries management processes.	Wellbeing was measured using the 'global life satisfaction' measure which asks people to rate, on a scale of 0 to 10, how satisfied they are with their life as a whole. This is a widely used and validated measure. The sample were typical of the Australian population with wellbeing averaging 7 on the scale, but with diversity in the scores of individual people.	Yes
Education	The level of formal education a person has completed may be associated with differences in how a person prefers to get involved: for example, those with higher levels of formal education may be more comfortable engaging with complex scientific data and writing formal submissions compared to those who had limited formal education	Participants were asked whether they had completed high school. Of participants, 67.2% had completed high school and 32.8% had not. Participants were also asked if they had completed post-school qualifications such as certificates or degrees; however initial analysis identified no significant differences by level of post-school qualification.	Yes

Socio-demographic/ recreational fishing characteristic	Why might this characteristic affect how a person wants to get involved?	Survey sample	Is this characteristic included in analysis of survey results?
Fishing avidity	The enthusiasm a person has for fishing can influence how likely they are to get involved in recreational fishing management processes. Fishing enthusiasm can be measured in multiple ways. In this survey, one key way of examining it was through examining fishing avidity, or the number of days a person fishes each year, and expenditure on fishing.	Respondents were asked how many days they had fished in the last year. Figure 2 shows the distribution of responses: the sample was skewed towards those who were avid fishers and fished more than 31 days per year, but did include a number of less avid fishers, enabling comparison of their involvement preferences to the preferences of more avid fishers. Expenditure on fishing was less varied and therefore did not provide substantial differences on which to compare fishers (Figure 3).	Yes
Satisfaction with fishing	A person may be motivated to get involved in recreational fishing management processes by either having a very satisfying or unsatisfying experience of fishing, and interviewees gave examples of both. It was therefore considered possible that a person's overall satisfaction with their fishing may influence whether and how they choose to get involved.	Survey participants were asked to rate how satisfied they were with their recreational fishing overall (Figure 4). Most were satisfied or very satisfied, but there were almost 30% who were unsatisfied, or neither satisfied or unsatisfied, with their fishing. This enabled comparison of the preferences of people who were more or less satisfied with their fishing.	Yes
Type of recreational fishing	The type of fishing a person is involved in may influence how they wish to get involved.	Participants were asked detailed questions about what types of fishing they were involved in, including whether they fished in saltwater, freshwater, charter fishing, competition fishing, boat fishing, onshore fishing, or other methods such as spearfishing (Figures 5 to 7). As a majority of fishers took part in both boat and onshore fishing, this was not a useful distinction. The analysis therefore focused on identifying any differences between saltwater, freshwater, charter and competition fishers	Yes
Involvement in recreational fishing organisations	People who are already involved in recreational fishing organisations may be more likely to get involved in activities such as public meetings, making submissions etc, according to interviewees.	Survey participants were asked if they were a member of any recreational fishing organisations, and the roles they held in those organisations. 57% were members of recreational fishing organisations; 29% were office holders in a recreational fishing organisation such as a fishing club; 13% worked for a recreational fishing organisation or had done so in the past. 43% had had no involvement with recreational fishing organisations	Yes

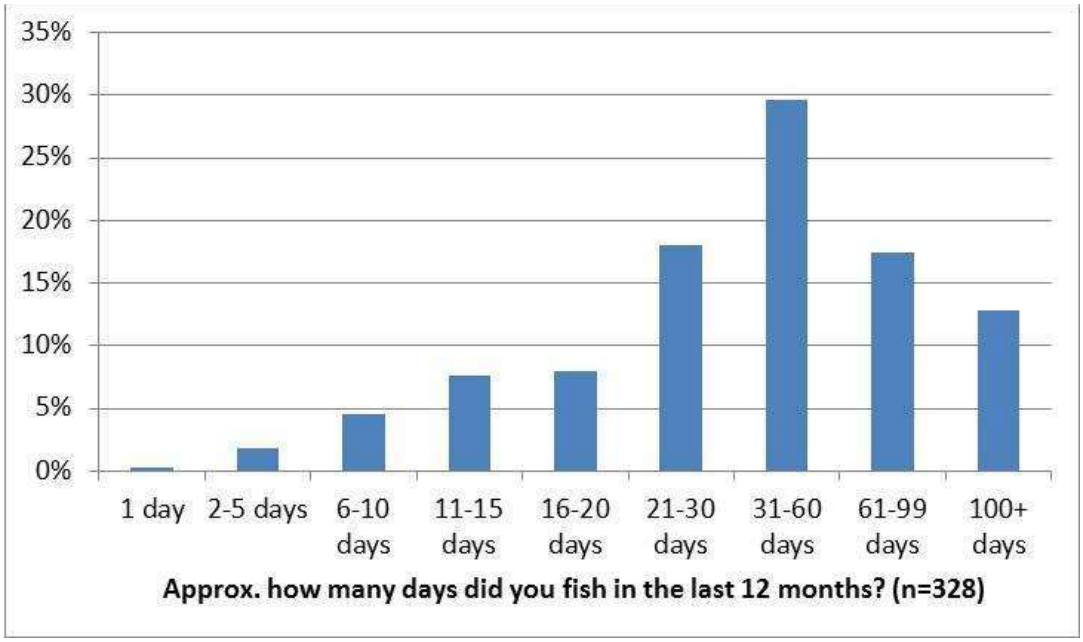

Figure 2 Fishing avidity: number of days survey participants had fished in previous 12 months

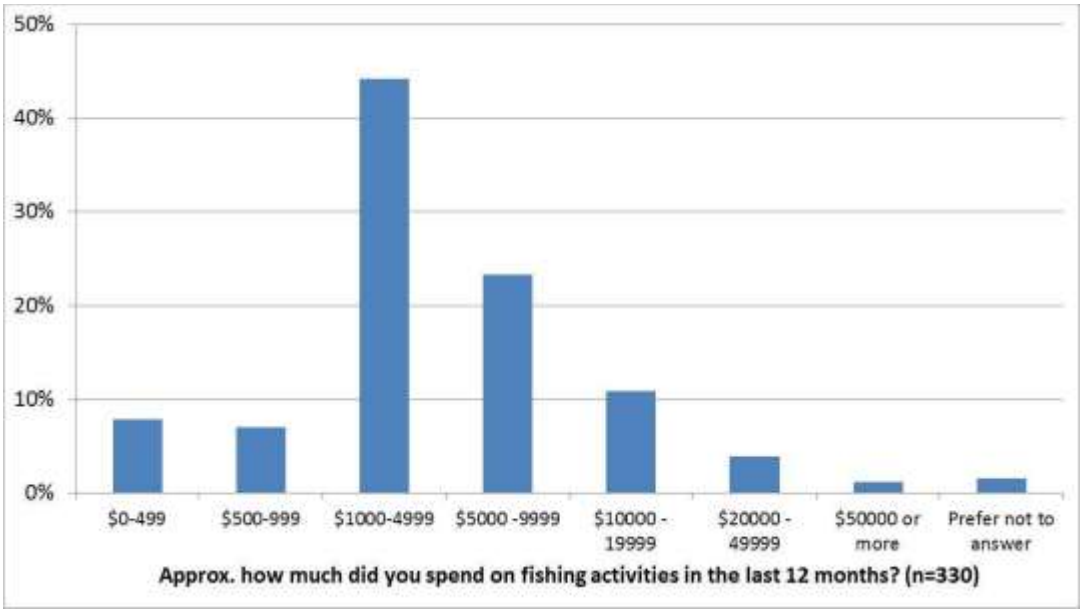

Figure 3 Expenditure on fishing activities in the last 12 months

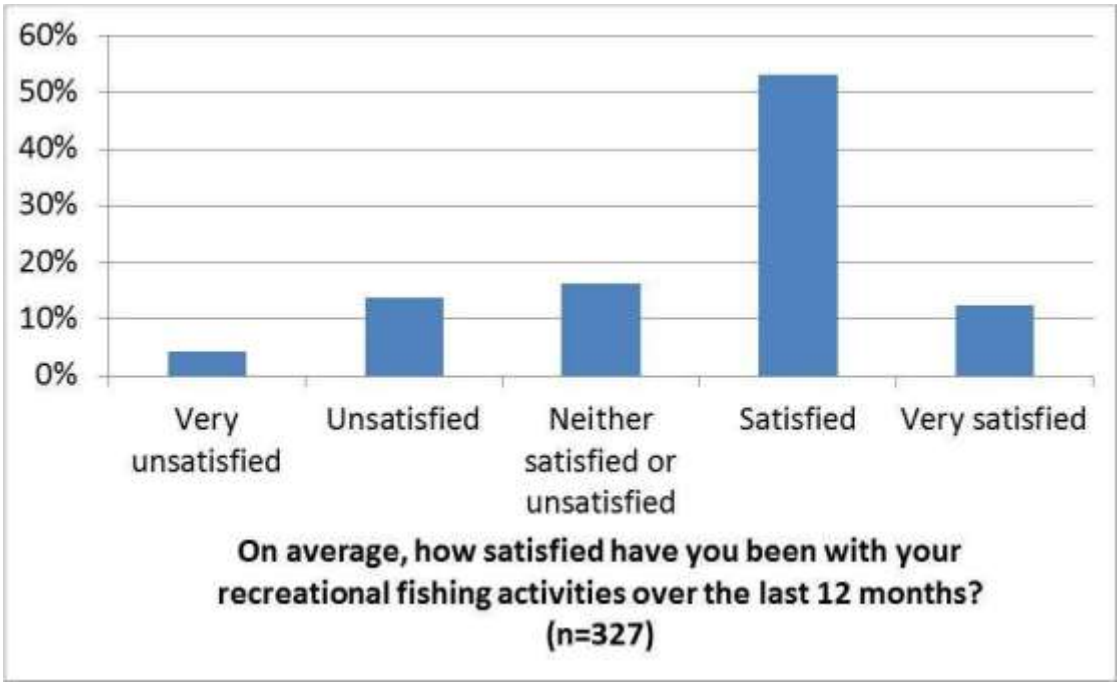

Figure 4 Satisfaction of survey respondents with their recreational fishing

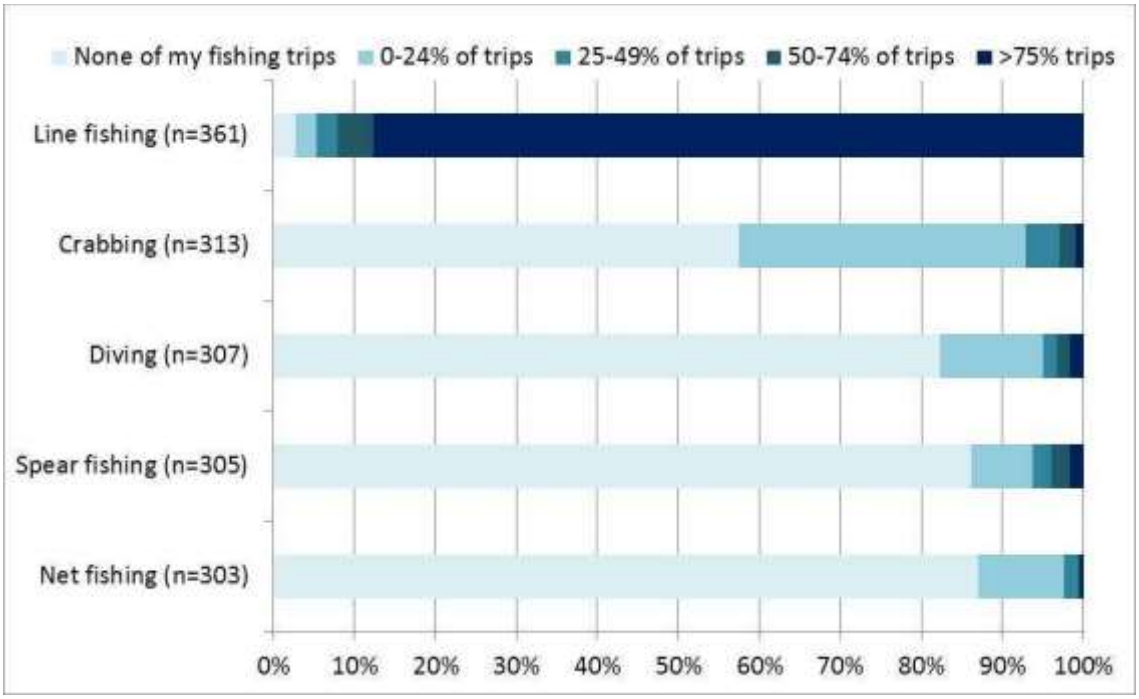

Figure 5 Recreational fishing activities: fishing methods used

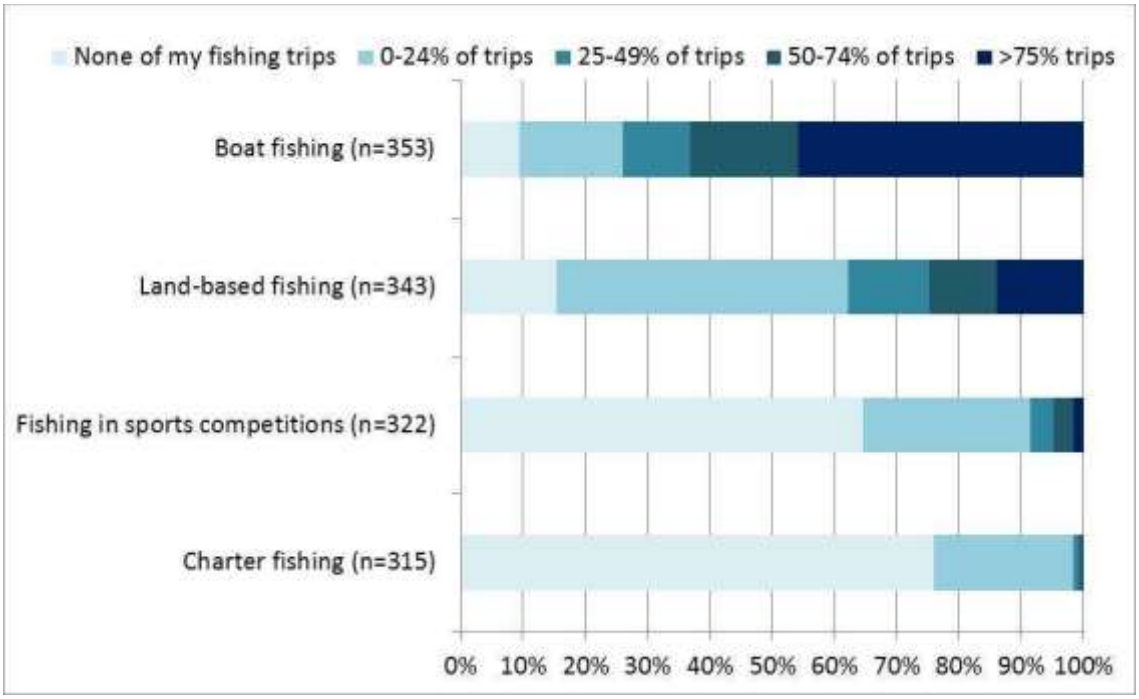

Figure 6 Recreational fishing activities: fishing platforms and activities

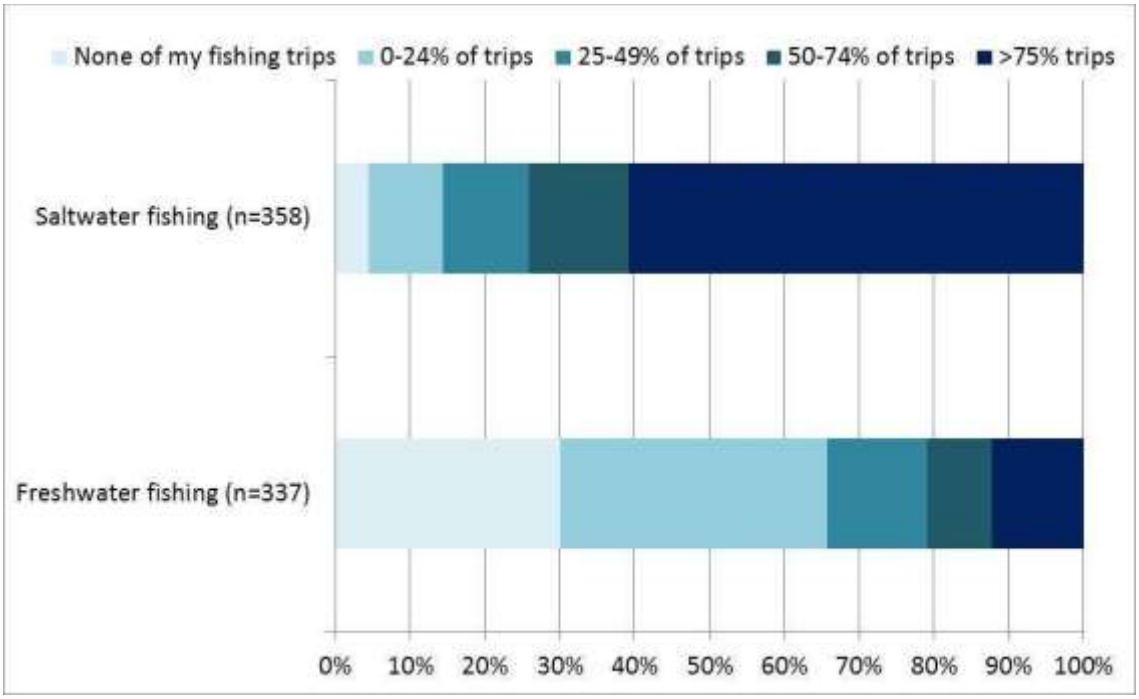

Figure 7 Recreational fishing activities: saltwater and freshwater fishing

Who gets involved?

The general awareness and interest of recreational fishers in 'having a say' about fisheries management was first examined, by asking survey participants whether they agreed or disagreed with a series of questions about getting involved in fishing. Figure 8 shows responses to these questions. The majority of survey participants were interested in having their views represented to fisheries managers by people who represent fishers in their region (for example, staff of recreational fishing representative organisations). However, a substantial proportion did not know how to contact the people who represent the interests of fishers in the region, or even who these people were. Fewer than half were actively involved in having a say on fisheries management. These results will not be representative of all fishers, as they are the views of those who chose to participate in the survey, a group in which people interested in having a say about fishing are highly likely to be over-represented. The finding that even amongst recreational fishers who are highly motivated to get involved, less than half are actively involved, suggests there may be substantial space to improve opportunities for involvement to enable those who have an active interest to get more actively involved.

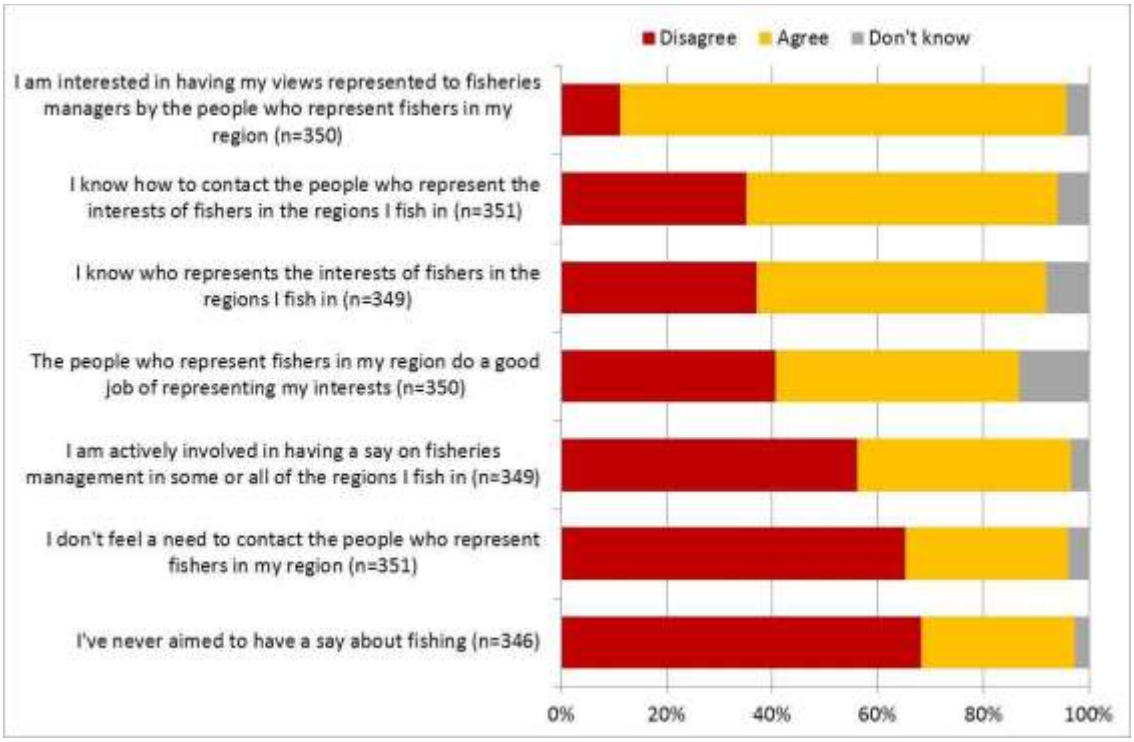

Figure 8 General awareness of and interest in having a say on recreational fishing – all survey respondents

Some types of people are more and less interested in and involved in having a say on recreational fishing. Table 2 shows results of statistical tests identifying whether each characteristic was significantly related to how a person felt about getting involved in fishing. The table includes explanation of the tests and statistics, but the simplest way to interpret it based on shading of the cells: where a cell is shaded, it means there was a significant relationship between that characteristic and the way a person felt about having a say on recreational fishing.

Key findings:

- Age: Younger people were less likely to be involved in having a say, less likely to know who fishing representatives were or how to contact them, and less likely to feel a need to contact people who represent fishers (Figure 9)

- Extroversion: People who were more introverted were less likely to be currently involved in having a say or to be interested in having a say
- Openness: People who were more open to new experience were more likely to be both actively involved currently, and interested in being involved, as well as to know who representatives were and how to contact them
- Members of recreational fishing organisations were more likely to be both actively involved currently, and interested in being involved, as well as to know who representatives were and how to contact them. Those who were office bearers or workers were particularly likely to be actively involved in having a say and interested in doing so (Figure 10)
- Fishers involved in sports competition fishing, and in freshwater fishing, were more likely than others to be actively involved in having a say
- Expenditure: People who reported spending higher amounts on recreational fishing were more likely to say they were interested in having their views represented and less satisfied with the representation provided by current recreational fishing representatives, compared to those who spent less. They were not more likely to be actively involved in having a say, however.
- Several characteristics were not associated with different views or levels of involvement in having a say: a person's level of formal education, conscientiousness, fishing avidity, involvement in charter fishing or saltwater fishing, and overall wellbeing, were not consistently or strongly associated with their views on involvement.

Table 2 Association between interest and involvement in having a say, and socio-demographic and fishing characteristics of survey respondents

Socio-demographic or fishing characteristic	Bivariate test used	n	I am actively involved in having a say on fisheries management in some or all of the regions I fish in	I've never aimed to have a say about fishing	I know who represents the interests of fishers in the regions I fish in	I know how to contact the people who represent the interests of fishers in the regions I fish in	The people who represent fishers in my region do a good job of representing my interests	I am interested in having my viewed represented to fisheries managers by the people who represent fishers in my region	I don't feel a need to contact the people who represent fishers in my region
Age	Sp (rs, p)[1]	273	0.087, 0.152	-0.192**, 0.001	0.201**, 0.001	0.235**, <0.000	0.121, 0.059	0.149*, 0.014	-0.145*, 0.017
Wellbeing	Sp (rs, p)[1]	284	-0.028, 0.638	-0.008, 0.897	0.063, 0.304	0.106, 0.077	0.003, 0.962	0.027, 0.648	-0.060, 0.310
Extroversion	Sp (rs, p)[1]	282	-0.266**, 0.000	0.242**, <0.000	-0.127*, 0.038	0.151*, 0.013	-0.079, 0.215	-0.117, 0.052	0.173**, 0.004
Openness	Sp (rs, p)[1]	281	0.220**, <0.000	-0.193**, 0.001	0.172**, 0.005	0.169**, 0.005	0.028, 0.655	0.272**, <0.000	-0.160**, 0.007
Member of rec fishing org'n	KW (H, p)[2]	297	29.1**, <0.000	18.5**, <0.000	5.4*. 0.020	4.2*, 0.040	2.6, 0.107	14.9**, <0.000	27.9**, <0.000
Fishing avidity	Sp (rs, p)[1]	302	0.051, 0.379	0.029, 0.619	0.054, 0.355	0.050, 0.392	-0.085, 0.158	0.101, 0.079	-0.115*, 0.046
Charter fisher	KW (H, p)[2]	289	0.85, 0.357	1.0, 0.306	0.003, 0.959	0.011, 0.918	2.2, 0.139	1.8, 0.179	3.4, 0.066
Competition fisher	KW (H, p)[2]	294	12.78**, <0.000	4.53*, 0.033	3.49, 0.062	6.50*, 0.011	0.02, 0.898	13.14**, <0.000	6.98**, 0.008
Saltwater fisher	KW (H, p)[2]	322	0.83, 0.364	2.51, 0.113	0.007, 0.934	0.536, 0.464	2.55, 0.110	0.637, 0.425	1.23, 0.267
Satisfaction with fishing	Sp (rs, p)[1]	301	0.002, 0.968	0.029, 0.619	0.072, 0.221	0.081, 0.164	0.106, 0.079	-0.038, 0.513	-0.064, 0.268
Expenditure on fishing	Sp (rs, p)[1]	304	0.004, 0.946	-0.085, 0.138	0.005, 0.937	0.028, 0.625	-0.172**, 0.004	0.136*, 0.018	-0.129*, 0.025

[1] Sp refers to the Spearman's r correlation test. The figures indicate the size of the r_s statistic, and the probability value (p-value) respectively. Significant values are flagged with * indicating significance at the 0.05 level and ** significance at the 0.01 level

[2]KW refers to the Kruskal Wallis H test. The figures indicate the size of the H statistic, and the probability value (p-value) respectively. Significant values are flagged with * indicating significance at the 0.05 level and ** significance at the 0.01 level Note:

Significant results are shaded in grey to highlight them.

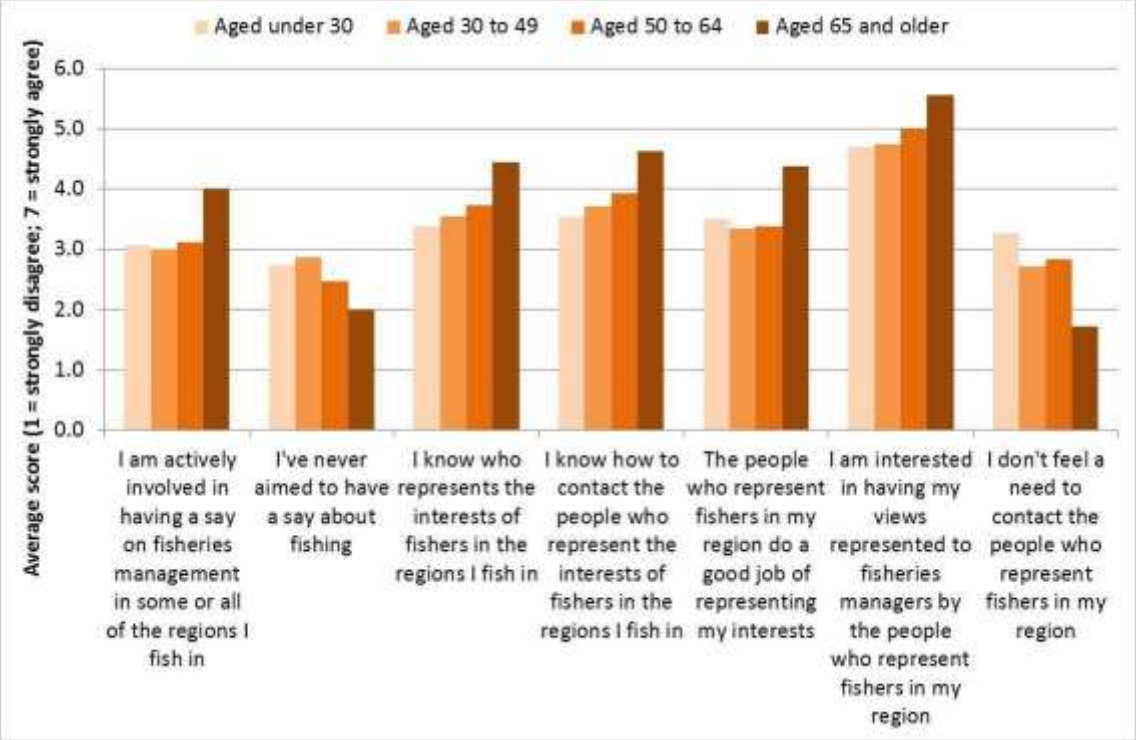

Figure 9 General awareness of and interest in having a say on recreational fishing – by age group

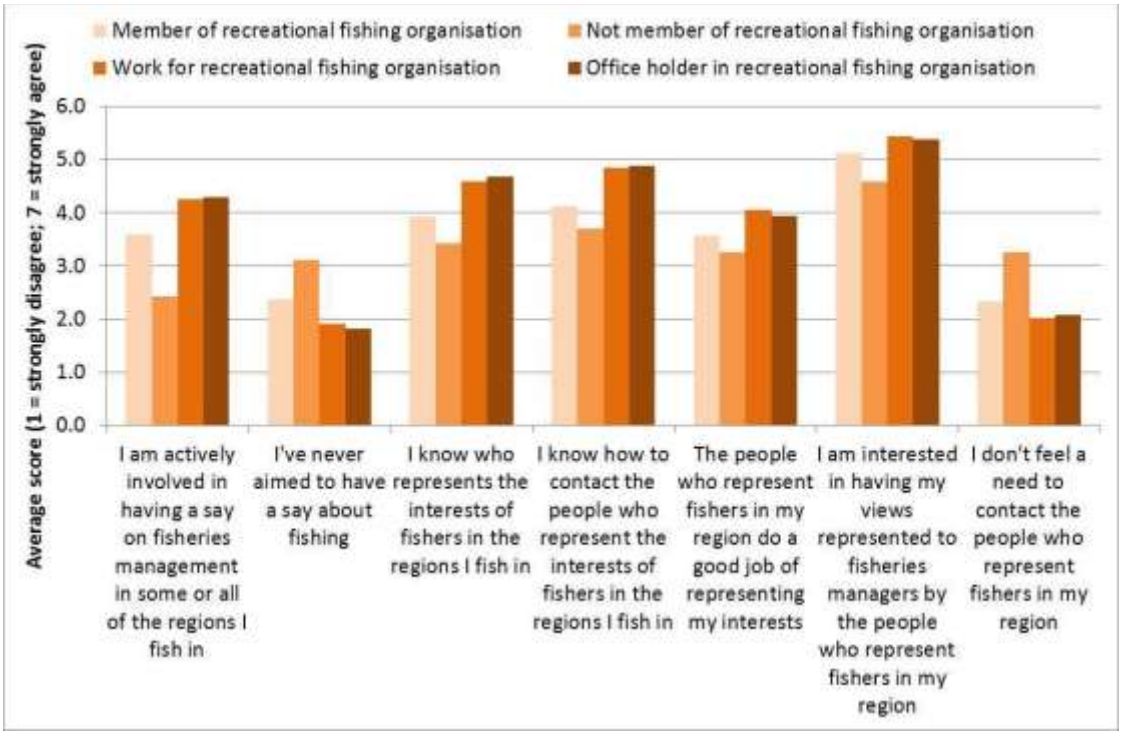

Figure 10 General awareness of and interest in having a say on recreational fishing – by involvement in recreationalfishing organisations

What topics do stakeholders get involved in?

People's willingness to get involved in fisheries management is likely to vary depending on what issue they are having a say about. To better understand how the topic or issue affects willingness to have a say, survey participants were asked whether they had ever been involved in having a say on any of a number of topics common to recreational fisheries management, shown in Figure 11. The topics recreational fishers had most commonly had some involvement in previously were commenting on proposed changes to catch or size limits, Marine Parks, and changes to fishing seasons or areas. A smaller proportion had experiencing getting involved in ongoing management of a particular fishery or species, proposed changes to regulations on fishing gear, or in processes involving allocation resources between the commercial, recreational and Indigenous fishing sectors. The methods by which fishers were involved (e.g. petitions, submissions, getting involved via a committee) varied a little by topic, as can be seen in Figure 12, but similarities were greater than differences.

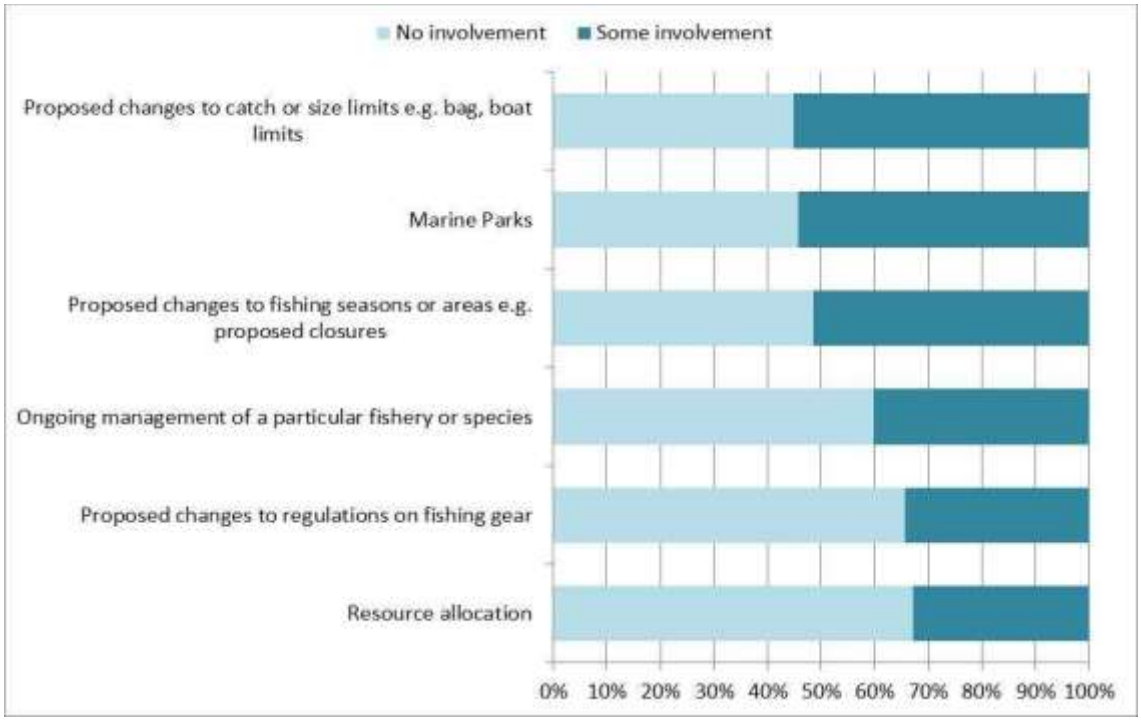

Figure 11 Topics on which survey participants had previously 'had a say'

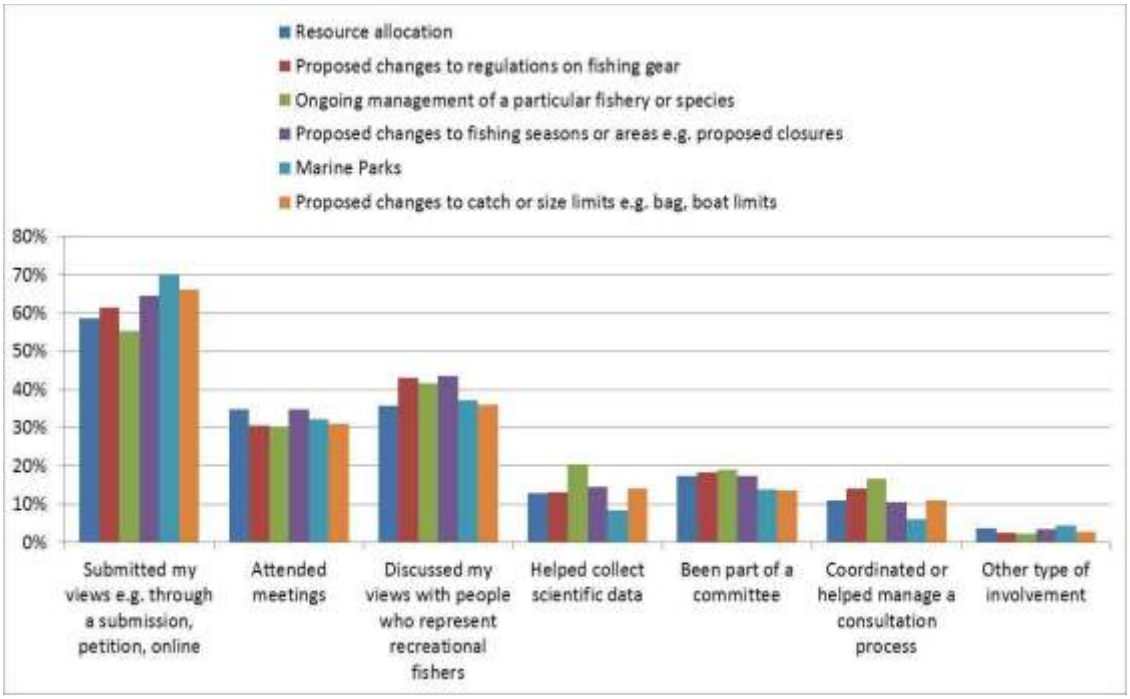

Figure 12 Methods survey respondents had used previously to 'have a say' on different topics

Survey participants were then asked what topics they would be likely to have a say on in the future. This question was asked to identify preferences for involvement, something that isn't identifiable by asking about past involvement as it is likely that, in their previous experience, they have not had opportunity to have a say on some topics. As can be seen in Figure 13, the topics on which survey participants were most likely to get involved in future were Marine Parks, changes to fishing seasons or areas, and changes to catch or size limits; they were least likely to get involved in collecting scientific data to inform fisheries management and resource allocation processes.

When examined by socio-demographic characteristic, some clear associations were identified (Table 3):

- People who were extroverts, open to new experiences, conscientious, members of recreational fishing organisations, competition fishers, more regular fishers, and who had higher expenditure on fishing, were more likely than other fishers to be interested in getting involved in having a say on fishing in the future irrespective of the topic involved
- A person's age or education was not associated with differing willingness to get involved in having a say on any topic
- Saltwater fishers were more likely than those who purely fished freshwater to be interested in having a say on Marine Parks in future
- Freshwater fishers were more likely than others to want to get involved in collecting scientific data, ongoing management, and changes to fishing seasons or areas
- Charter fishers were more likely than others to want to get involved in discussion about Marine Parks and resource allocation between sectors.

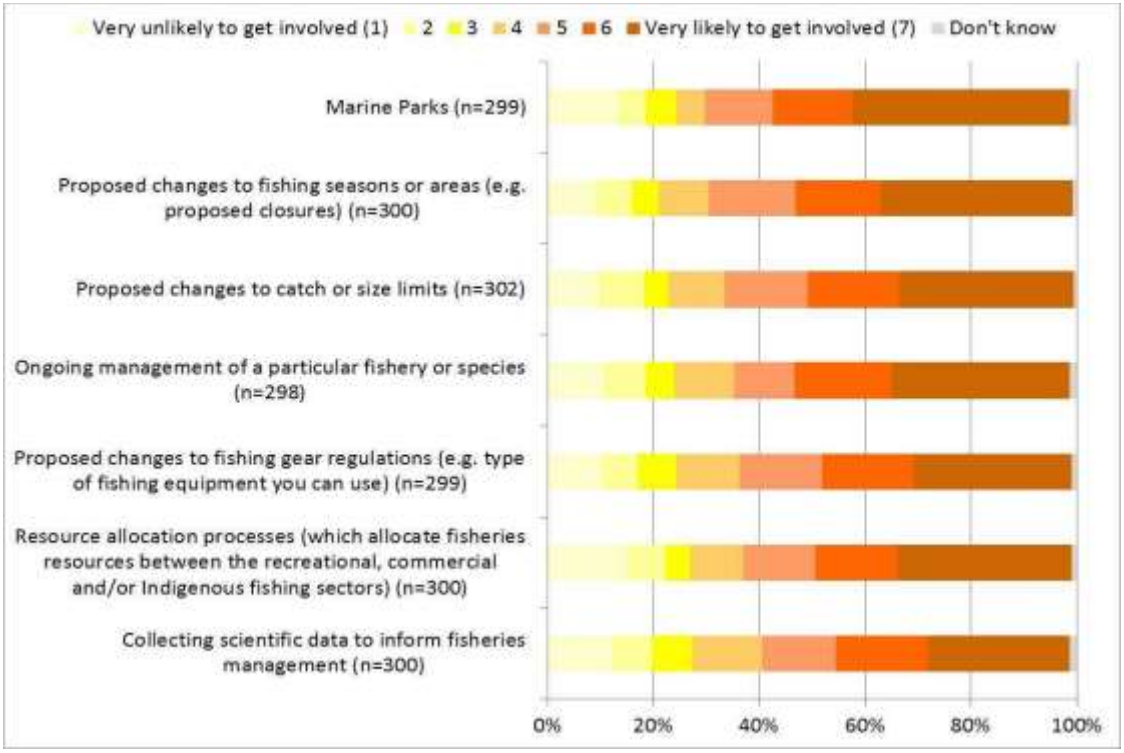

Figure 13 Likelihood of survey participants choosing to have a say on different topics in the future

Table 3 Association between (i) interest in getting involved in having a say on different topics, and (ii) socio-demographic and fishing characteristics of survey respondents

Socio-demographic or fishing characteristic	Bivariate test used	n	Marine Parks	Proposed changes to fishing seasons or areas	Resource allocation processes	Proposed changes to catch or size limits	Proposed changes to fishing gear regulations	Ongoing management of a particular fishery or species	Collecting scientific data to inform fisheries management
Age	Sp (rs, p)[1]	285	0.060, 0.313	0.115, 0.053	0.054, 0.369	0.125*, 0.036	0.110, 0.065	0.039, 0.514	-0.055, 0.359
Wellbeing	Sp (rs, p)[1]	296	0.117*, 0.045	0.160**, 0.006	0.066, 0.259	0.064, 0.271	0.071, 0.222	0.076, 0.192	0.005, 0.933
Extroversion	Sp (rs, p)[1]	295	-0.194**, 0.001	-0.251**, <0.000	-0.220**, <0.000	-0.262**, <0.000	-0.265**, <0.000	-0.249**, <0.000	-0.154**, <0.000
Openness	Sp (rs, p)[1]	294	0.210**, <0.000	0.247**, <0.000	0.285**, <0.000	0.281**, <0.000	0.233**, <0.000	0.338**, <0.000	0.244**, <0.000
Conscientious-ness	Sp (rs, p)[1]	295	0.280**, <0.000	0.261**, <0.000	0.285**, <0.000	0.267**, <0.000	0.264**, <0.000	0.220**, <0.000	0.147*, <0.000
Formal education	Sp (rs, p)[1]	297	0.018, 0.753	0.024, 0.676	-0.049, 0.404	-0.021, 0.717	-0.008, 0.888	-0.003, 0.954	0.25, 0.662
Member of rec fishing org'n	KW (H, p)[2]	290	20.542**, <0.000	18.068**, <0.000	13.368**, <0.000	22.135**, <0.000	17.970**, <0.000	18.034**, <0.000	7.930**, 0.005
Fishing avidity	Sp (rs, p)[1]	275	0.116, 0.055	0.145*, 0.016	0.190**, 0.002	0.156**, 0.010	0.115, 0.056	0.151*, 0.013	0.130*, 0.031
Charter fisher	KW (H, p)[2]	296	8.565**, 0.003	2.122, 0.145	7.012**, 0.008	3.609, 0.057	1.598, 0.206	3.095, 0.079	0.354, 0.552
Competition fisher	KW (H, p)[2]	298	13.075**, <0.000	13.263**, <0.000	16.410**, <0.000	21.188**, <0.000	15.634**, <0.000	13.224**, <0.000	16.211**, <0.000
Saltwater fisher	KW (H, p)[2]	332	5.123*, 0.024	0.382, 0.537	0.448, 0.503	0.512, 0.474	0.840, 0.359	1.717, 0.190	1.056, 0.304
Freshwater fisher	KW (H, p)[2]	317	2.388, 0.122	6.851**, 0.009	2.826, 0.093	5.194*, 0.023	1.937, 0.164	11.456**, 0.001	17.086**, <0.000
Satisfaction with fishing	Sp (rs, p)[1]	273	-0.008, 0.897	-0.112, 0.066	-0.002, 0.974	-0.113, 0.063	-0.111, 0.068	-0.088, 0.149	0.047, 0.442
Expenditure on fishing	Sp (rs, p)[1]	276	0.250**, <0.000	0.166**, 0.006	0.223**, <0.000	0.150*, 0.013	0.112, 0.062	0.179**, 0.003	0.144*, 0.017

[1] Sp refers to the Spearman's r correlation test. The figures indicate the size of the r_s statistic, and the probability value (p-value) respectively. Significant values are flagged with * indicating significance at the 0.05 level and ** significance at the 0.01 level

[2]KW refers to the Kruskal Wallis H test. The figures indicate the size of the H statistic, and the probability value (p-value) respectively. Significant values are flagged with * indicating significance at the 0.05 level and ** significance at the 0.01 level Note:

Significant results are shaded in grey to highlight them.

How do people get involved?

A critical question for getting involved is identifying what ways people prefer to have a say on fishing. To understand this, survey participants were asked how they had in the past had their say about fishing, discussed in this section; about their experience of the pros and cons of each method (discussed in the following section); and about their preferred methods for future involvement (discussed in the final part of the results).

The most common methods of getting involved in the past were online discussion forums, signing petitions, and completing surveys. The least common were getting involved in committees, writing letters, or collecting fishing related data. The 'traditional' consultation methods of public meetings, talking to fisheries representatives or making submissions were between these two extremes.

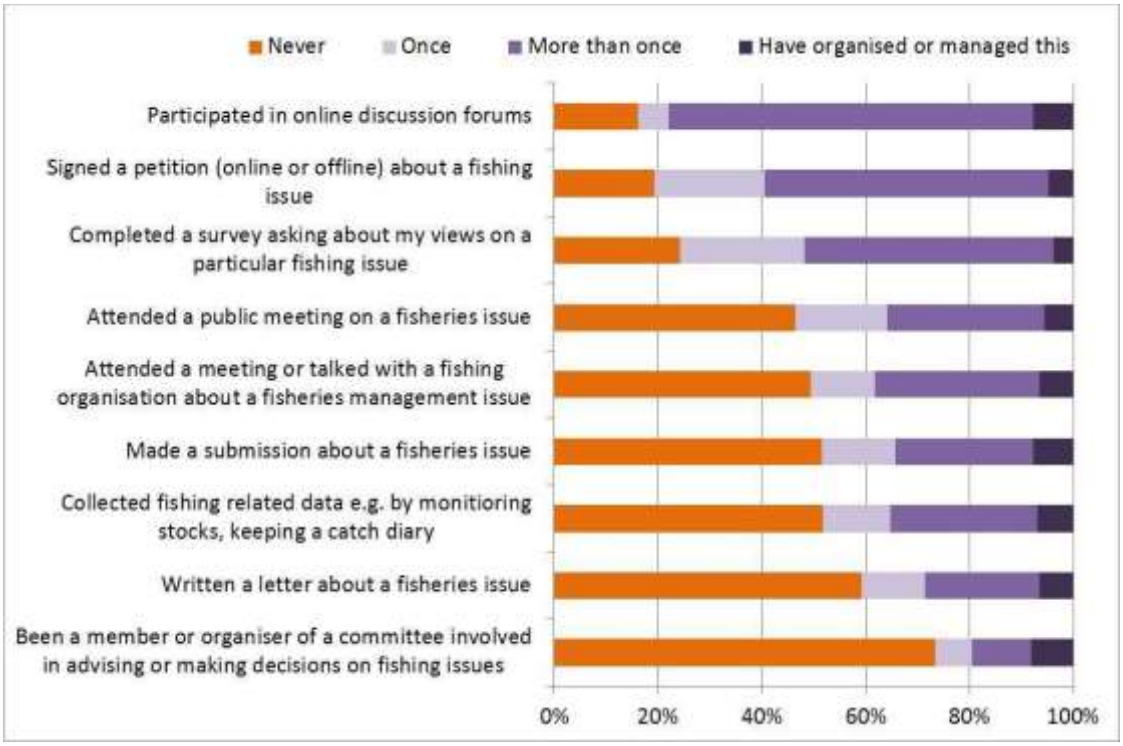

Figure 14 Methods survey respondents had used in the past to have a say about fishing

People who had used different methods for getting involved also had differing sociodemographic characteristics (Table 4):

- Collected fishing related data: People who had done this reported significantly higher levels of wellbeing and openness to new experience compared to those who had not collected fishing related data, and were also more likely to be a member of a recreational fishing organisation, to fish often, to participate in sports fishing competitions, and to report higher than average expenditure on fishing
- Signed a petition: Many people were likely to sign petitions; those who were significantly more likely to have done so in the past were people who were open to new experiences, members of recreational fishing organisations, avid fishers who spent high amounts of fishing, and charter and sports competition fishers
- Participated in an online forum: Unlike most other methods of getting involved, non-avid fishers, and fishers who were not members of recreational fishing organisations, were just as likely as avid fishers and members of organisations to participate in online forums. Younger fishers were

more likely than older fishers to have participated in these forums, as were charter and sports competition fishers, extroverts, and those who spent higher amounts of money on fishing

- Attended a public meeting: Older fishers, who were extroverts and open to new experiences, who were members of fishing organisations, and who were avid fishers (fishing more often, spending more, and often participating in competition or charter fishing) were more likely than younger fishers, introverts, and less avid fishers to attend public meetings
- Talk to or meet with recreational fishing representatives: People who had done this had similar characteristics to those who had attended public meetings, with two exceptions: they also had higher than average wellbeing, and they did not fish more often than those who hadn't spoken to recreational fishing representatives
- Made a submission: Older people who were extroverts, open to new experience, conscientious, members of recreational fishing organisations and who spent more than average on fishing were more likely than others to have made submissions, as were sports competition fishers
- Completed a survey: People who had completed a survey were similar to those who had made submissions in most respects, with one important difference: they were not more likely to be extroverted. This means that surveys provide opportunities for people who are more introverted to have a say on fishing issues, whereas most other methods of having a say are more likely to be used by extroverts
- Written a letter: People who had written a letter had similar characteristics to those who had made a submission
- Been a member of a committee or advisory group: Fishers were more likely to report having been a member of a committee or advisory group in the past if they were older, extroverted, open to new experiences, a member of a recreational fishing organisations, or a competition fisher.

Overall, a person's age (Figure 15), their membership of fishing organisations (Figure 16), their fishing avidity (Figure 17), the type of fishing they did (Figure 18) and their overall personality orientation were all good predictors of the likelihood of taking part in different methods of getting involved in having a say.

Table 4 Association between (i) methods by which respondents had previously had a say on fishing, and (ii) socio-demographic and fishing characteristics of survey respondents

Socio-demographic or fishing characteristic	Bivariate test used	n	Collected fishing related data	Signed a petition	Participated in an online forum	Attended a public meeting	Talked to/ met representatives of recreational fishing organisation	Made a submission	Completed a survey	Written a letter	Been a member of a committee	Other
Age	KW (H, p)[1]	286	.032, 0.858	1.27, 0.260	6.16*, 0.013	8.44**, 0.004	8.78**, 0.003	17.53**, <0.000	6.12*, 0.013	18.55**, <0.000	18.74**, <0.000	5.66*, 0.017
Wellbeing	KW (H, p)[1]	297	6.07*, 0.014	1.31, 0.253	1.35, 0.246	1.41, 0.235	4.09*, 0.043	1.83, 0.176	1.19, 0.275	2.49, 0.114	2.39, 0.122	0.01, 0.922
Extroversion	KW (H, p)[1]	295	3.687, 0.055	0.624, 0.430	5.989*, 0.014	5.514*, 0.019	12.588**, <0.000	7.739**, 0.005	1.246, 0.264	7.053**, 0.008	7.402**, 0.007	2.110, 0.146
Openness	KW (H, p)[1]	294	6.040*, 0.014	4.072*, 0.044	1.109, 0.292	10.586**, 0.001	10.211**, <0.000	9.383**, 0.002	11.463**, 0.001	7.745**, 0.005	5.110*, 0.024	1.351, 0.245
Conscientious-ness	KW (H, p)[1]	295	1.643, 0.200	1.003, 0.317	2.590, 0.108	0.900, 0.343	1.293, 0.256	14.180**, <0.000	5.695*, 0.017	7.044**, 0.008	2.639, 0.104	3.513, 0.061
Formal education	KW (H, p)[1]	299	0.003, 0.958	0.079, 0.778	0.020, 0.889	0.116, 0.734	1.38, 0.240	0.959, 0.327	1.78, 0.182	0.497, 0.481	0.641, 0.423	0.016, 0.899
Member of rec fishing org'n	P.Chi[2]	290	8.522**, 0.004	12.341**, <0.000	2.172, 0.141	39.161**, <0.000	32.244**, <0.000	25.025**, <0.000	8.124**, 0.004	14.578**, <0.000	20.707**, <0.000	4.791*, 0.029
Fishing avidity	KW (H, p)[1]	311	3.831*, 0.050	5.963*, 0.017	3.880*, 0.049	1.50, 0.221	0.303, 0.582	1.078, 0.299	1.370, 0.242	0.623, 0.430	1.279, 0.258	0.165, 0.685
Charter fisher	P.Chi[2]	296	0.075, 0.784	4.815*, 0.028	4.874*, 0.027	7.186**, 0.007	0.818, 1.750, 0.186	0.366	3.737, 0.053	0.277, 0.599	1.078, 0.299	0.995, 0.318
Competition fisher	P.Chi[2]	298	11.333**, 0.001	19.467**, <0.000	10.246**, 0.001	23.534**, <0.000	15.854**, <0.000	26.844**, <0.000	14.034**, <0.000	15.425**, <0.000	5.666*, 0.017	0.706, 0.401
Saltwater fisher	P.Chi[2]	332	0.014, 0.907	2.995, 0.084	2.029, 0.154	0.016, 0.898	1.246, 0.264	0.130, 0.719	0.504, 0.478	1.777, 0.182	1.017, 0.313	1.412, 0.235
Freshwater fisher	P.Chi[2]	317	3.274, 0.070	1.275, 0.259	5.608*, 0.018	5.837*, 0.016	6.023*, 0.014	1.715, 0.190	8.036**, 0.005	2.711, 0.100	0.660, 0.417	0.181, 0.671
Satisfaction with fishing	KW (H, p)[1]	310	0.004, 0.953	0.014, 0.907	3.575, 0.059	0.002, 0.964	0.180, 0.671	0.332, 0.564	1.416, 0.234	2.583, 0.108	0.852, 0.356	0.857, 0.355
Expenditure on fishing	KW (H, p)[1]	313	5.387*, 0.020	14.464**, <0.000	7.006**, 0.008	9.885**, 0.002	3.896*, 0.048	7.895**, 0.005	5.397*, 0.020	9.610**, 0.002	2.248, 0.134	0.290, 0.590

[1]KW refers to the Kruskal Wallis H test. The figures indicate the size of the H statistic, and the probability value (p-value) respectively. Significant values are flagged with * indicating significance at the 0.05 level and ** significance at the 0.01 level

[2] P.Chi refers to the Pearsons chi square test. The figures indicate the size of the chi square statistic, and the probability value (p-value) respectively. Significant values are flagged with * indicating significance at the 0.05 level and ** significance at the 0.01 level Note:

Significant results are shaded in grey to highlight them.

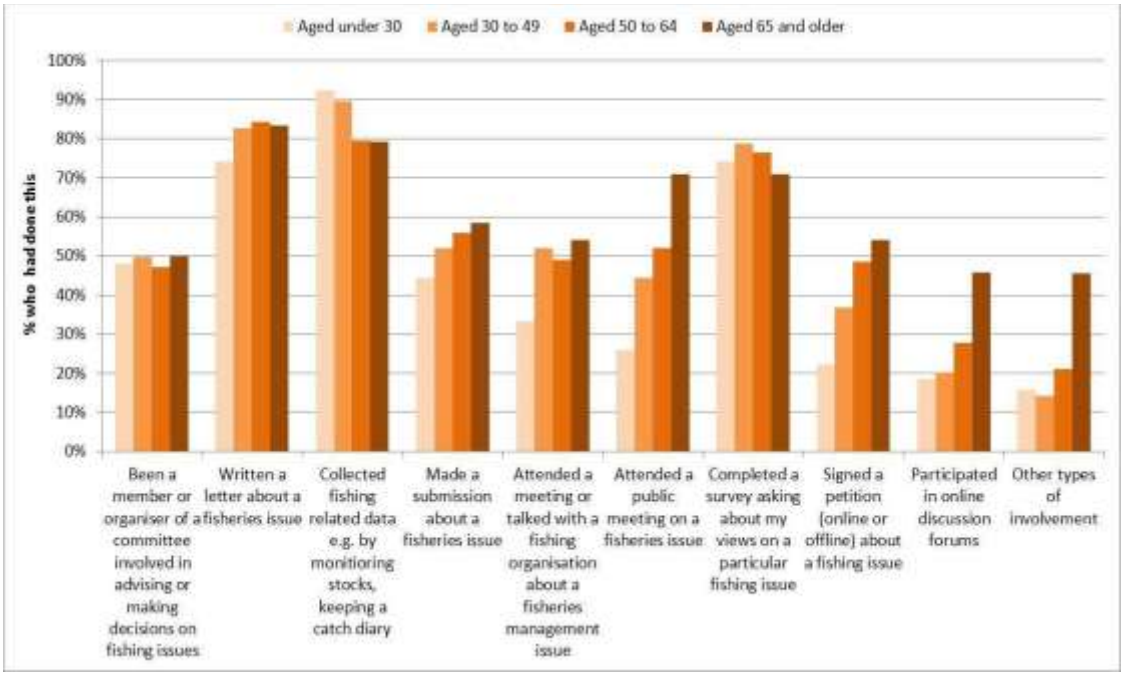

Figure 15 Proportion of people in different age groups who had used different methods to have a say about recreational fishing

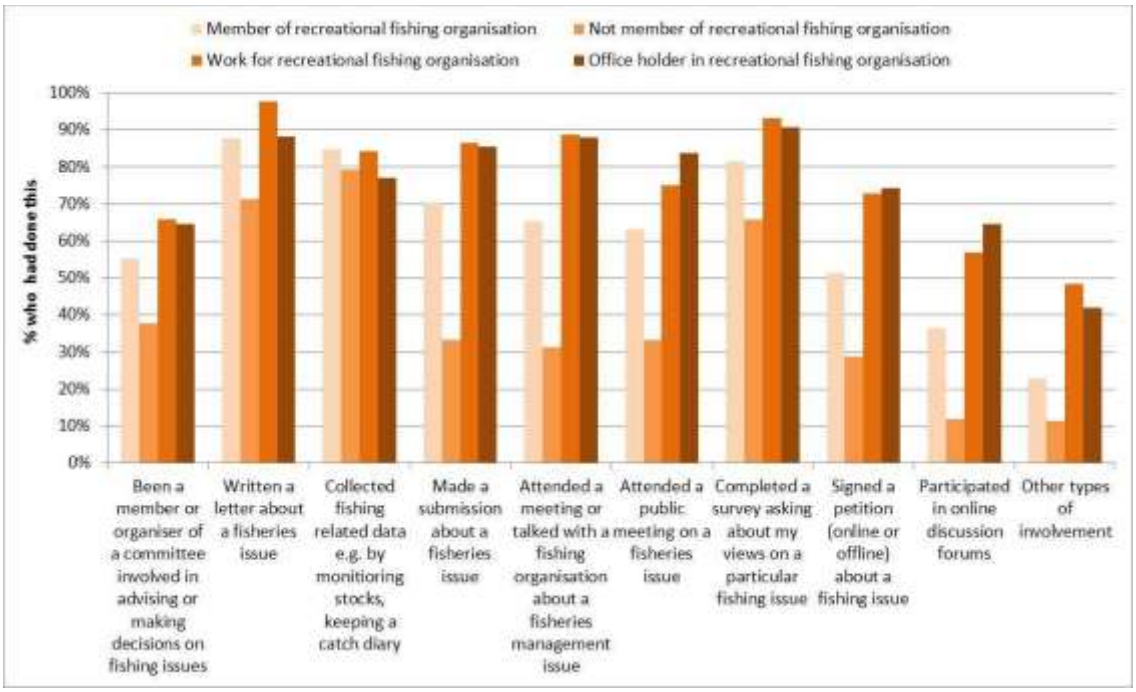

Figure 16 Membership of recreational fishing organisations and use of different methods to have a say aboutrecreational fishing

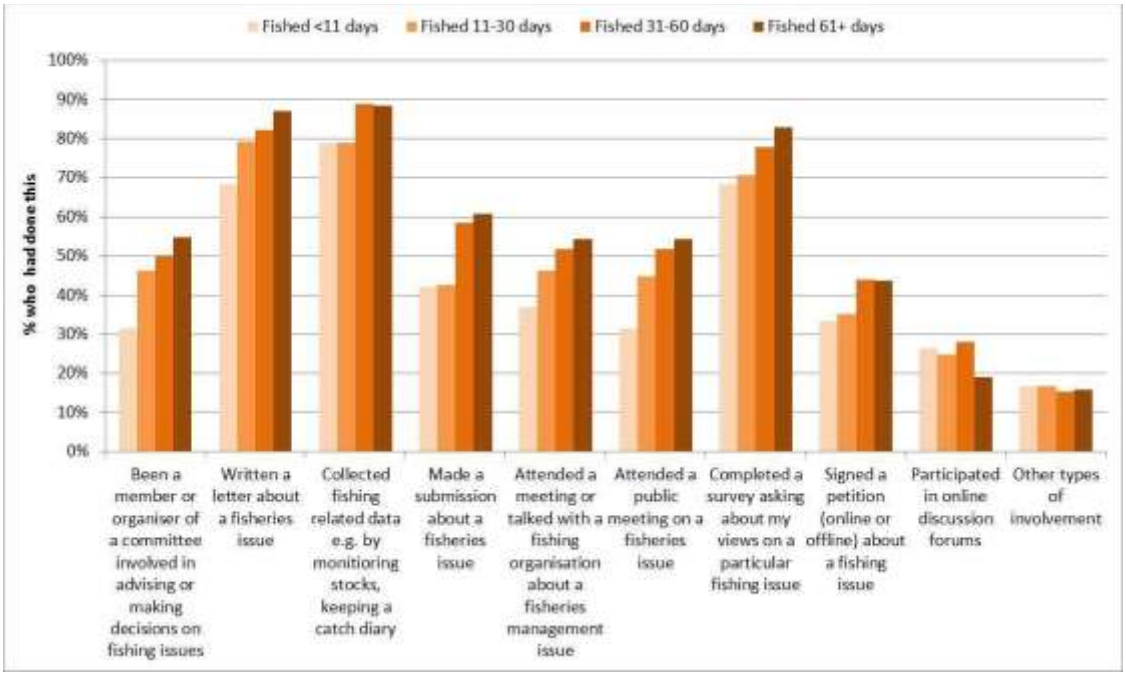

Figure 17 Number of days fished and use of different methods to have a say about recreational fishing

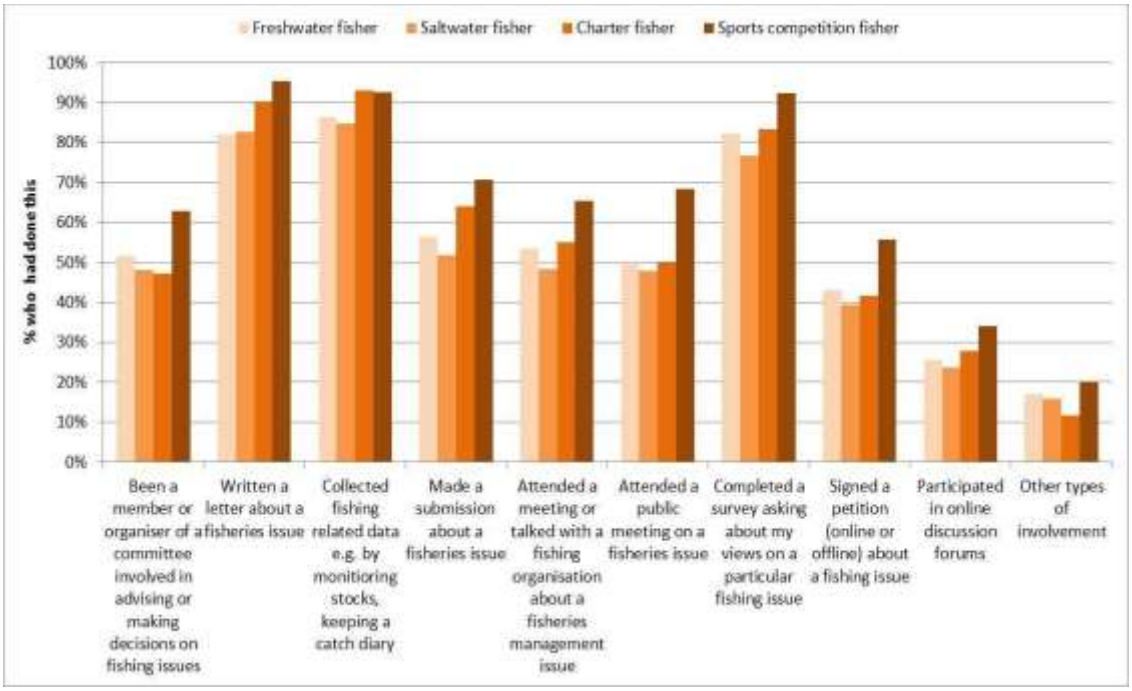

Figure 18 Type of fishing and use of different methods to have a say about recreational fishing

Costs and benefits of getting involved

Having identified how fishers have been involved in the past, and on what topics, the next part of the survey asked participants to evaluate the costs and benefits of getting involved in different ways. Participants who had indicated they had previously used specific methods to get involved in having a say were asked their views on what worked well and poorly about getting involved in that way.

Because only small numbers of survey respondents had recently used some ways of getting involved, it was not possible to analyse responses by sociodemographic characteristics. Instead, the analysis focused on identifying what proportion of people who had recently used each method of getting involved agreed or disagreed with a series of statements about the benefits and costs of getting involved that way.

It is important to note that this analysis has limitations: because respondents had been involved in many different processes, and the reasons each individual involvement was good or bad could not be fully assessed, it isn't possible to tell if their ratings of each method are a result of the method itself, or of the competence of the people who they were interacting with when having a say. The methods asked about were compressed into five broad categories, to reduce the amount of time required to answer the survey, which means people were answering about a range of methods rather than being able to identify the specifics of how they were involved. Despite these limitations, there were clear and common trends that suggest there are pros and cons of using different methods that go beyond the competence of the people involved in coordinating opportunities for stakeholder involvement in fishing issues.

Respondents were asked if they felt that, overall, getting involved using a particular method was a good or bad way of getting involved in fisheries management (Figure 19). The methods rated most highly as a good way of getting involved were collecting scientific data and being part of a committee, while submitting views via submissions, petitions or online forums were most likely to be rated a poor method of getting involved, and least likely to be rated a good method.

Figures 20 to 27 show how survey respondents rated different methods for getting involved. Each methods had differing areas in which it was rated highly and poorly:

- Committees were rated better than most other methods of involvement for being able to contribute views, learning new things, meeting people and improving relationships, having views heard, generating new ideas, achieving positive change, receiving feedback, and making people feel good. They were poorer in terms of the time involved.
- Collecting scientific data was good for learning opportunities it provides, meeting people, and making people feel good and to a lesser extent for getting feedback and achieving positive change (although on the latter two it was not rated as highly as being a member of a committee).
- Discussing views with recreational fishing representatives was rated as good for learning new things, meeting people, and making people feel good, but rated poorly in terms of receiving feedback or achieving action and outcomes, with few feeling it led to change
- Submitting views via submissions, petitions or forums was rated as poorer than most other methods in terms of receiving feedback, feeling that a person's views were heard, new ideas were generated or action taken.
- Attending meetings was good for meeting new people, but rated poorly in terms of achieving action or outcomes, receiving feedback on outcomes, and feeling able to contribute views; it was also rated relatively poorly in relation to emotions with participants somewhat more likely to feel frustrated or stressed and less likely to feel good as a result of attending a meeting compared to some other methods.

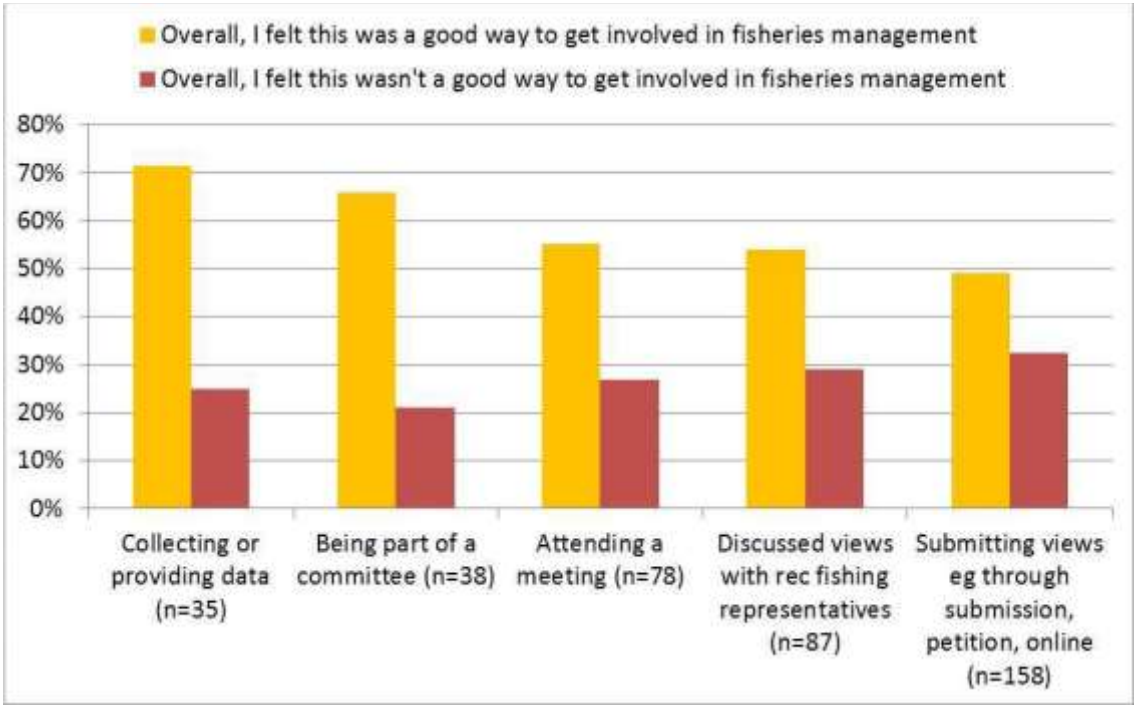

Figure 19 Overall rating of utility of getting involved using different methods (% of respondents who agreed with statement)

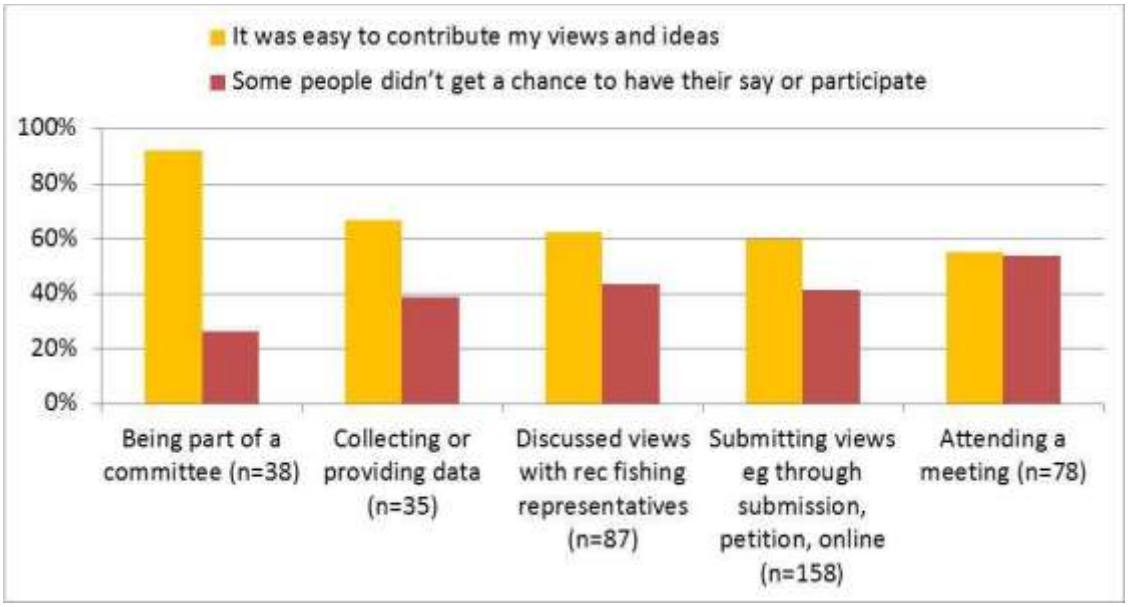

Figure 20 Ability to contribute views and ideas using different methods (% of respondents who agreed with statement)

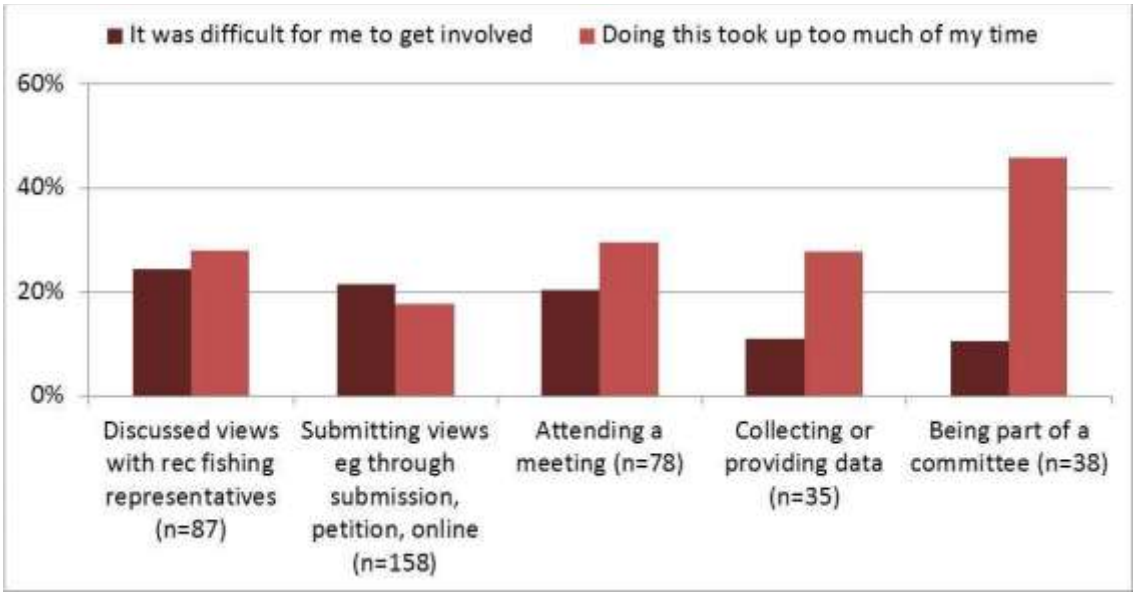

Figure 21 Ability to get involved using different methods (% of respondents who agreed with statement)

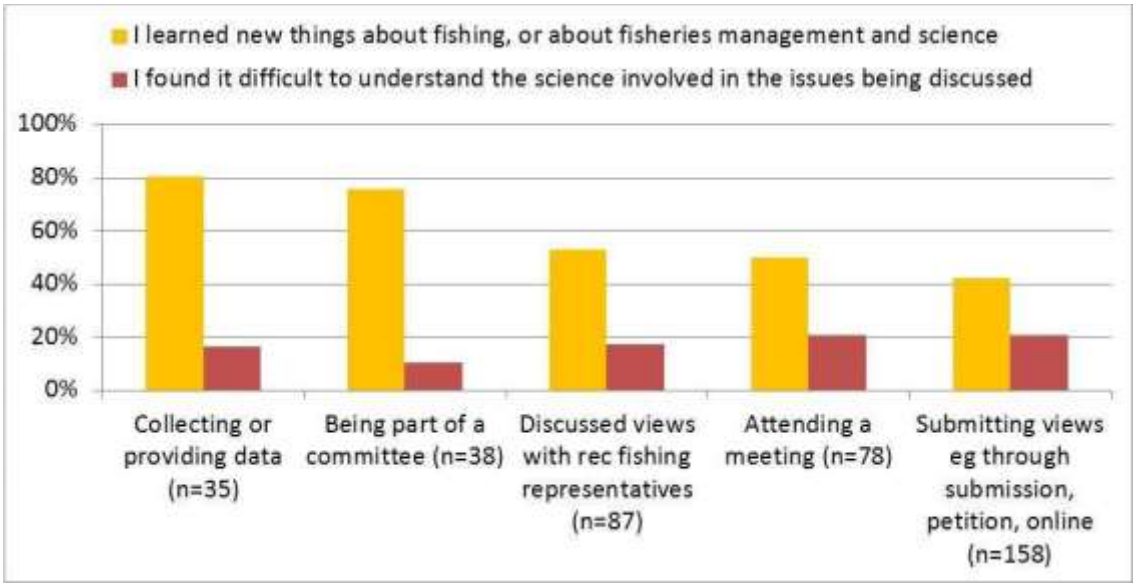

Figure 22 Learning opportunities about fisheries science when using different methods (% of respondents who agreedwith statement)

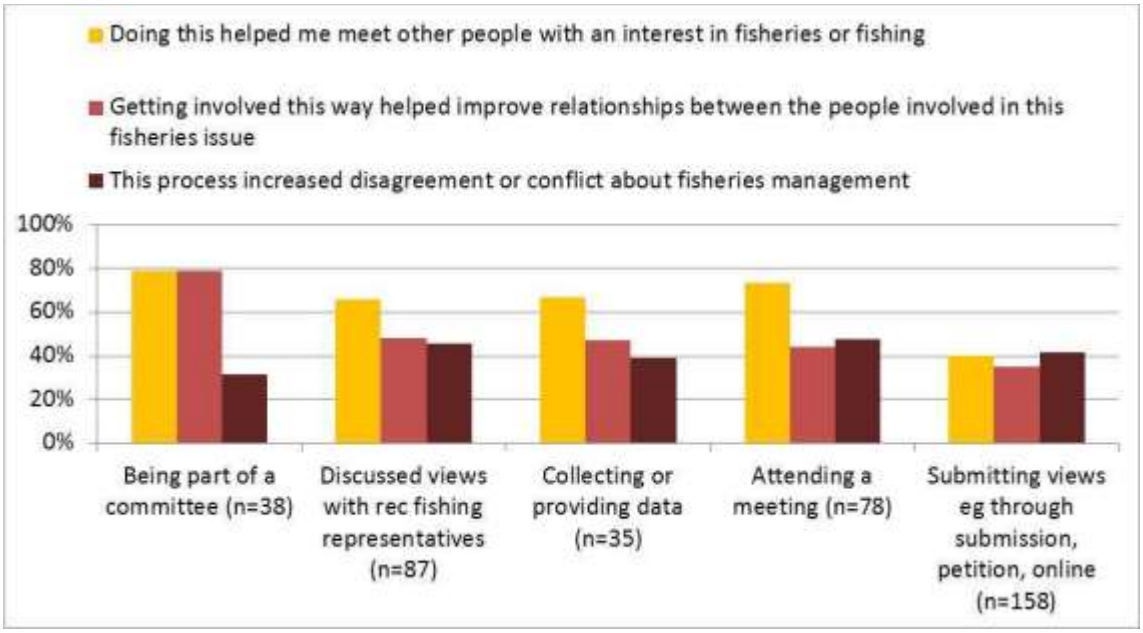

Figure 23 Effect of different methods on social relationships (% of respondents who agreed with statement)

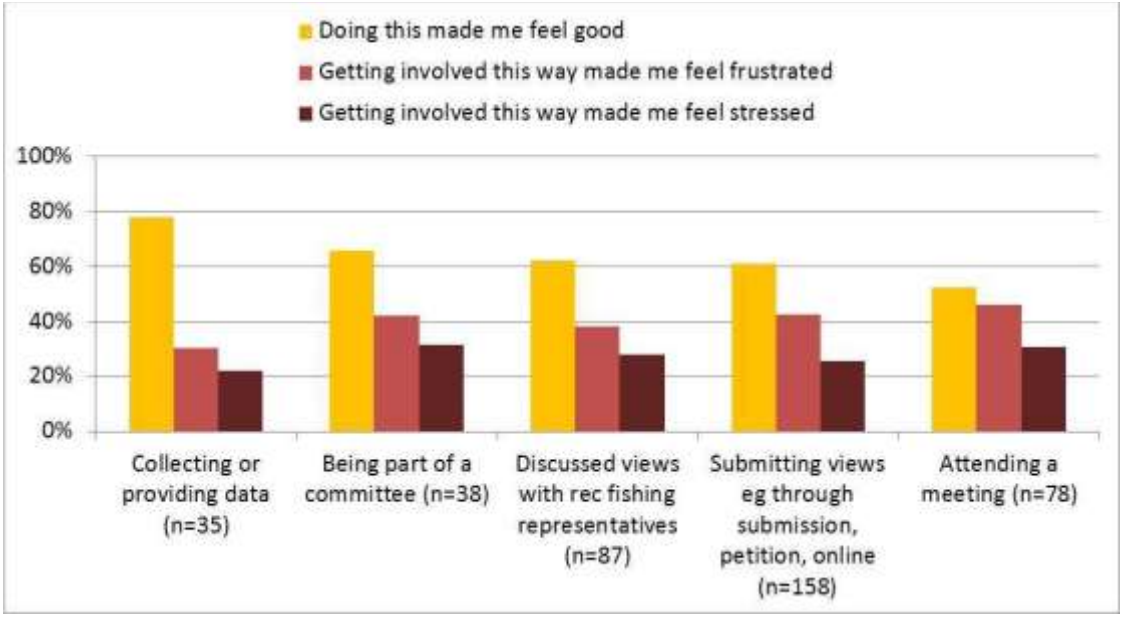

Figure 24 Emotional outcomes of getting involved in different ways (% of respondents who agreed with statement)

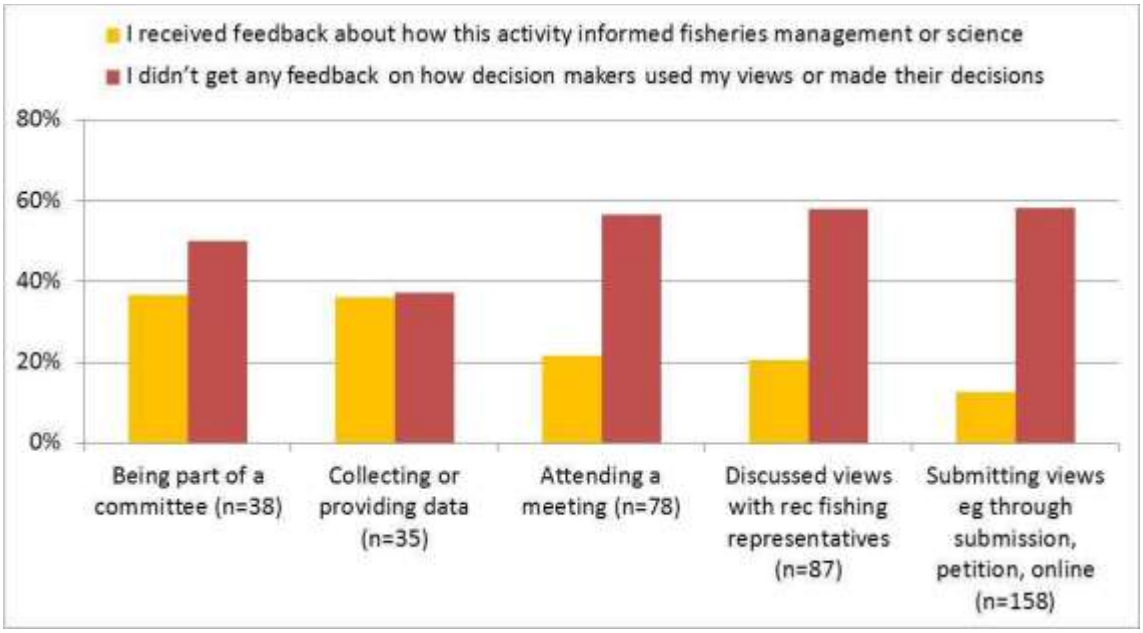

Figure 25 Feedback received on outcomes using different methods (% of respondents who agreed with statement)

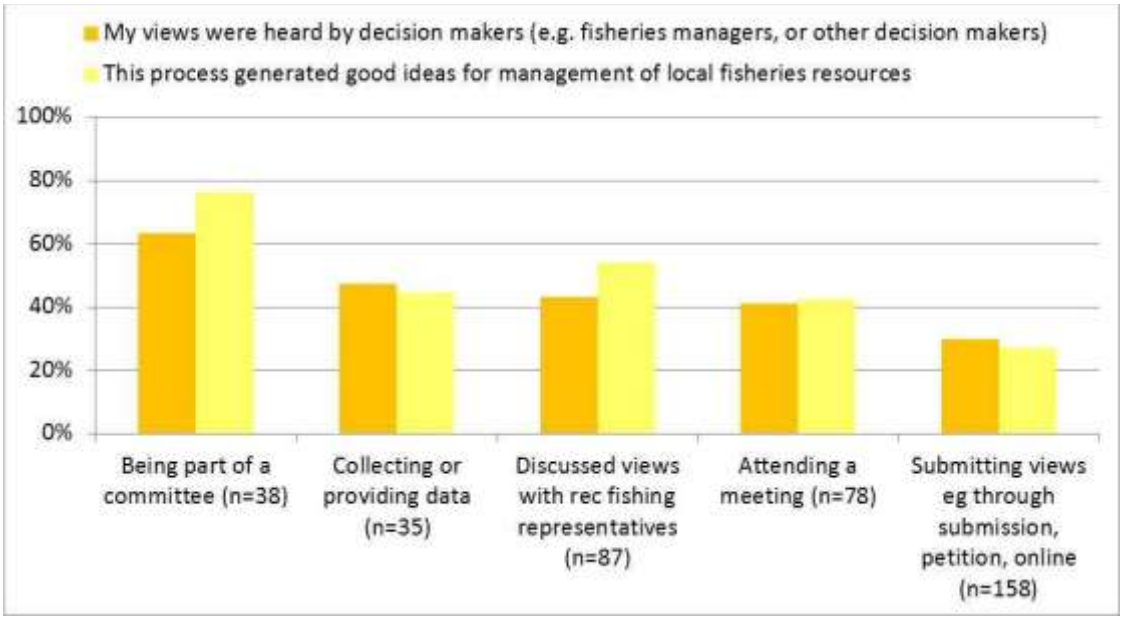

Figure 26 Ideas and views generated when using different methods (% of respondents who agreed with statement)

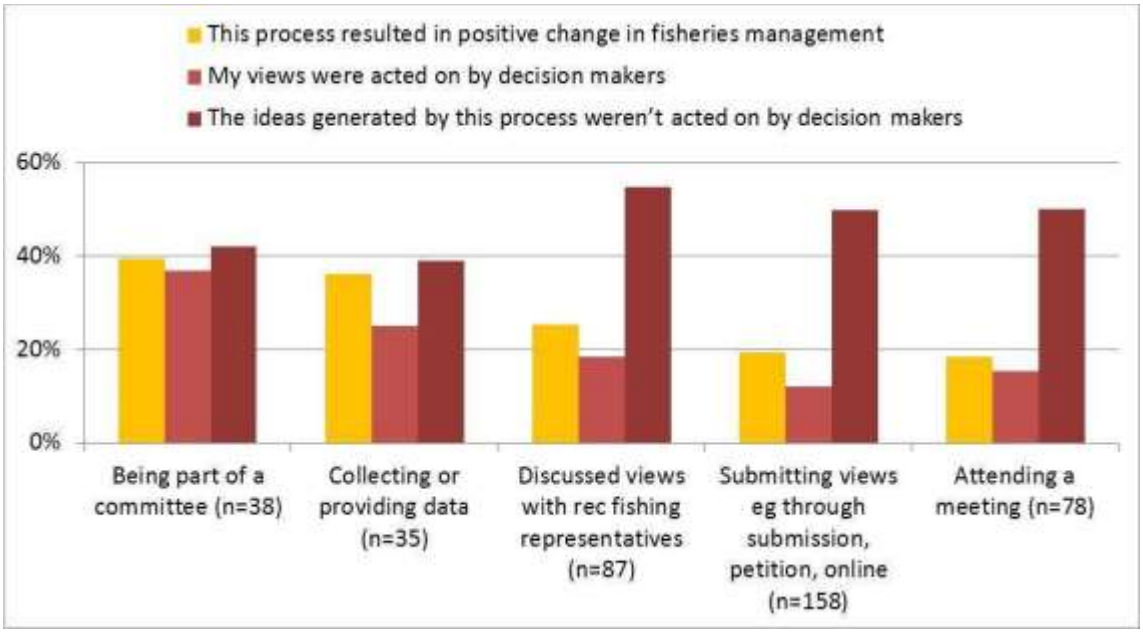

Figure 27 Outcomes achieved when using different methods (% of respondents who agreed with statement)

To better understand what characteristics a process of getting involved should have if it is to be rated as 'overall, a good way to get involved', statistical analysis was undertaken of the strength of correlation between how much participants agreed that their most recent experienced of getting involved each way was 'overall, a good way to get involved' and their rating of its pros and cons as shown in Figures 20 to 27, as well as the correlation between their level of agreement that 'overall, this wasn't a good way to get involved' and the differing characteristics of the experience. This helps identify what specific characteristics really matter when designing opportunities for stakeholder involvement in recreational fisheries management.

Irrespective of the method used, people who said that getting involved was 'good overall' were much more likely to say that getting involved made them feel good, improved relationships, let them be heard, and generated new ideas and action (Figure 28). Those who found having a say (for any method) 'bad overall' were much more likely to report feeling frustrated, stressed, to feel their views were not heard, and to feel that it was hard to get involved (Figure 29).

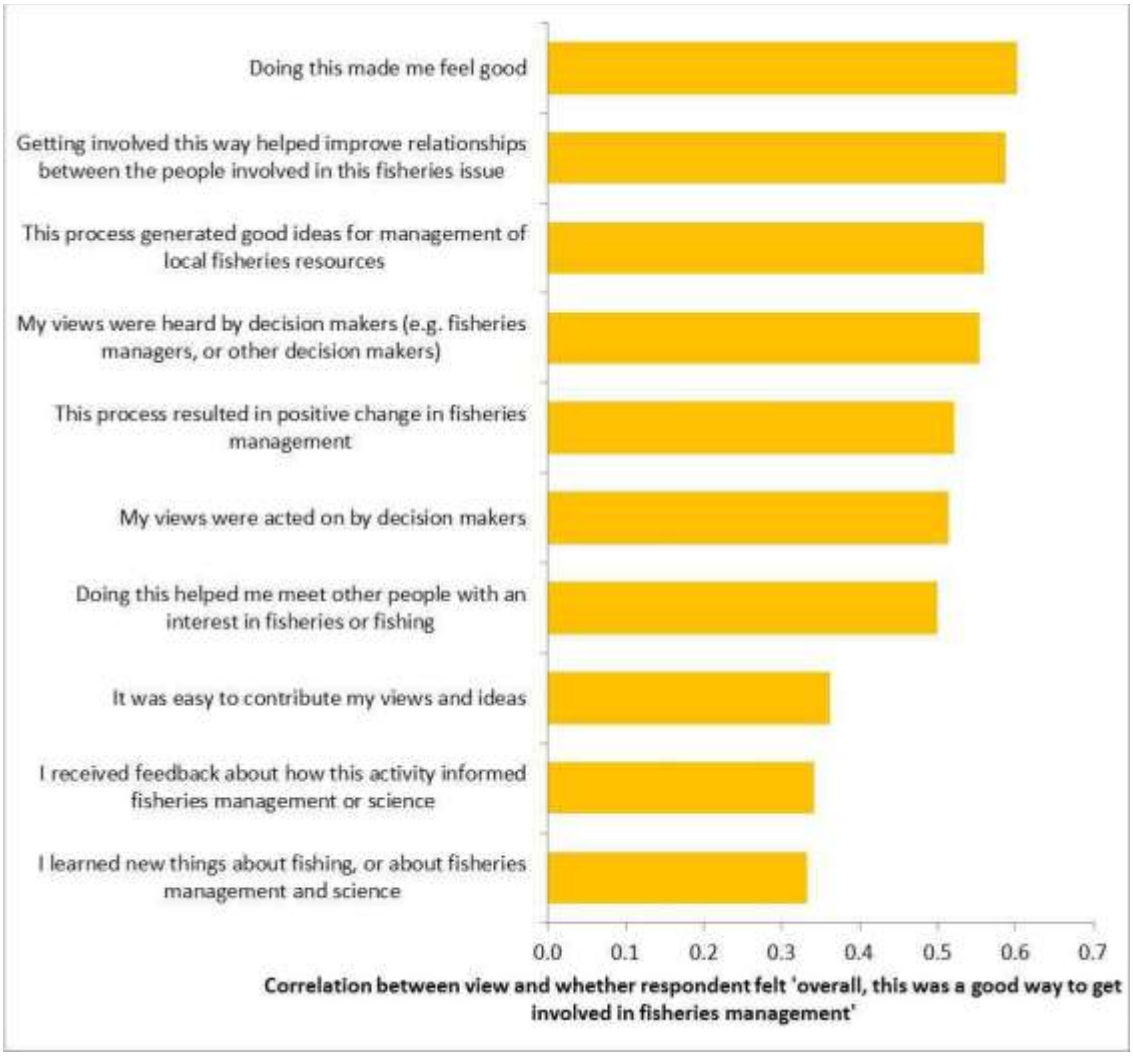

Figure 28 Strength of association of different factors with overall rating of whether respondent had a positiveexperience of getting involved

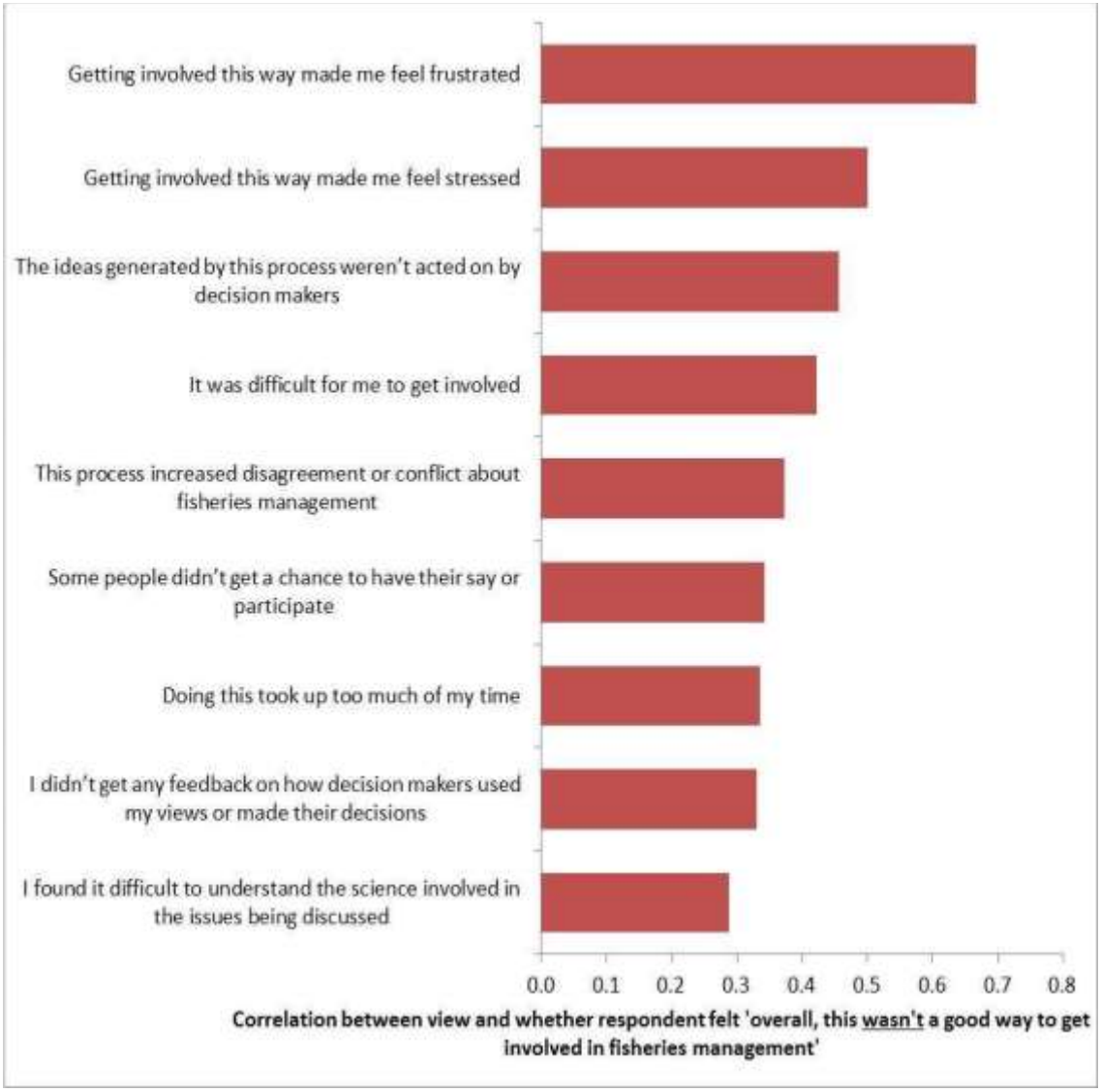

Figure 29 Strength of association of different factors with overall rating of whether respondent had a negativeexperience of getting involved

What things are most important when having a say?

In addition to identifying what the costs and benefits of getting involved are, it is important to understand what things stakeholders value most about having a say. To help identify this, survey participants were asked how important it was to ensure that (i) everyone who is directly affected by a fisheries management issue has a change to have a say about it, (ii) there is clear explanation of the fisheries science involved in the issue, (iii) they receive feedback about how their input is used, and (iv) everyone who is interested gets a chance to have a say even if they are not directly affected by the issue. While all four of these were considered important objectives by a majority of survey participants (Figure 30), ensuring those directly affected are able to have a say, and that there is clear explanation of the fisheries science, were rated by most participants as being more important than receiving feedback and ensure everyone with an interest has a say.

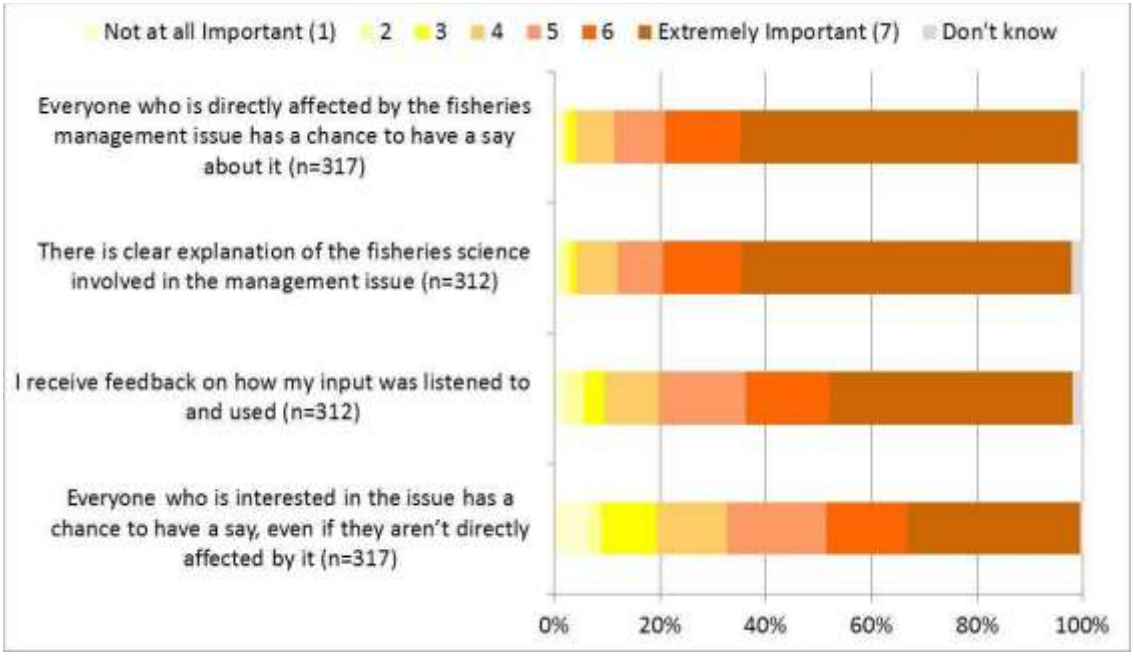

Figure 30 Importance of ensuring different outcomes when designing processes for involving stakeholders, as rated bysurvey respondents

While most respondents found all four aspects of involvement highly important, some found each aspect more important than others (Table 5):

- Ensuring directly affected people can have a say was particularly important to older fishers, people who were members of fishing organisations, those who were open to new experiences and conscientious, and those who reported lower levels of satisfaction with their fishing
- Ensuring clear explanation of fisheries science was particularly important to those who had higher levels of formal education and to freshwater fishers
- Ensuring participants receive feedback was particularly important to those who were members of fishing organisations, to sports competition and freshwater fishers, and to those who were open to new experiences and conscientious
- Ensuring all interested people can have a say was particularly important to older fishers and to those who reported being open to new experiences.

Table 5 Association between (i) importance of ensuring different outcomes when having a say, and (ii) socio-demographic and fishing characteristics of survey respondents

Socio-demographic or fishing characteristic	Bivariate test used	n	Everyone who is directly affected by the fisheries management issue has a chance to have a say about it	I receive feedback on how my input was listened to and used	Everyone who is interested in the issue has a chance to have a say, even if they aren't directly affected by it	There is clear explanation of the fisheries science involved in the management issue
Age	Sp (rs, p)[1]	285	0.187**, 0.001	0.051, 0.395	0.145*, 0.015	0.034, 0.567
Wellbeing	Sp (rs, p)[1]	297	0.088, 0.132	0.086, 0.140	0.106, 0.070	0.064, 0.268
Extroversion	Sp (rs, p)[1]	295	0.015, 0.795	-0.038, 0.518	0.009, 0.879	-0.013, 0.822
Openness	Sp (rs, p)[1]	294	0.126*, 0.030	0.149*, 0.010	0.171**, 0.003	0.056, 0.335
Conscientiousness	Sp (rs, p)[1]	295	0.134*, 0.022	0.215**, <0.000	0.094, 0.110	0.083, 0.153
Formal education	Sp (rs, p)[1]	297	-0.018, 0.763	-0.050, 0.392	0.031, 0.593	0.142*, 0.014
Member of rec fishing org'n	KW (H, p)[2]	290	11.187**, 0.001	10.670**, 0.001	0.868, 0.351	0.006, 0.937
Fishing avidity	Sp (rs, p)[1]	287	0.087, 0.141	0.058, 0.327	-0.022, 0.711	0.004, 0.945
Charter fisher	KW (H, p)[2]	296	0.445, 0.505	1.528, 0.216	0.064, 0.800	0.004, 0.951
Competition fisher	KW (H, p)[2]	298	3.178, 0.075	4.157*. 0.041	1.174, 0.279	2.555, 0.110
Saltwater fisher	KW (H, p)[2]	332	0.304, 0.582	0.751, 0.386	4.193*, 0.041	0.107, 0.744
Freshwater fisher	KW (H, p)[2]	317	1.973, 0.160	3.871*, 0.049	5.023*, 0.025	5.852*, 0.016
Satisfaction with fishing	Sp (rs, p)[1]	285	-0.185**, 0.002	-0.093, 0.115	-0.113, 0.058	-0.043, 0.468
Expenditure on fishing	Sp (rs, p)[1]	276	0.090, 0.129	0.057, 0.338	-0.003, 0.957	-.024, 0.689

[1] Sp refers to the Spearman's r correlation test. The figures indicate the size of the r_s statistic, and the probability value (p-value) respectively. Significant values are flagged with * indicating significance at the 0.05 level and ** significance at the 0.01 level

[2]KW refers to the Kruskal Wallis H test. The figures indicate the size of the H statistic, and the probability value (p-value) respectively. Significant values are flagged with * indicating significance at the 0.05 level and ** significance at the 0.01 level Note:

Significant results are shaded in grey to highlight them.

Preferences for future involvement

Finally, survey participants were asked what ways they would prefer to get involved in fisheries management in future. This provided an opportunity for them to identify whether they would like to get involved via methods they have not had opportunity to use in the past. As can be seen in Figure 31, across all respondents the most preferred methods were having a say via competing a short survey, participating in online discussion forums, or signing a petition, even though these methods of involvement were not rated as having as many benefits as some other types of involvement. The least preferred methods were becoming a member of a committee, writing a submission or letter, or attending a public meeting. This suggests that, despite committee members reporting high benefits from participating in committees, a majority of fishers prefer being able to have a say via methods that involve a smaller commitment of time and effort, and which do not necessarily involve face to face interaction.

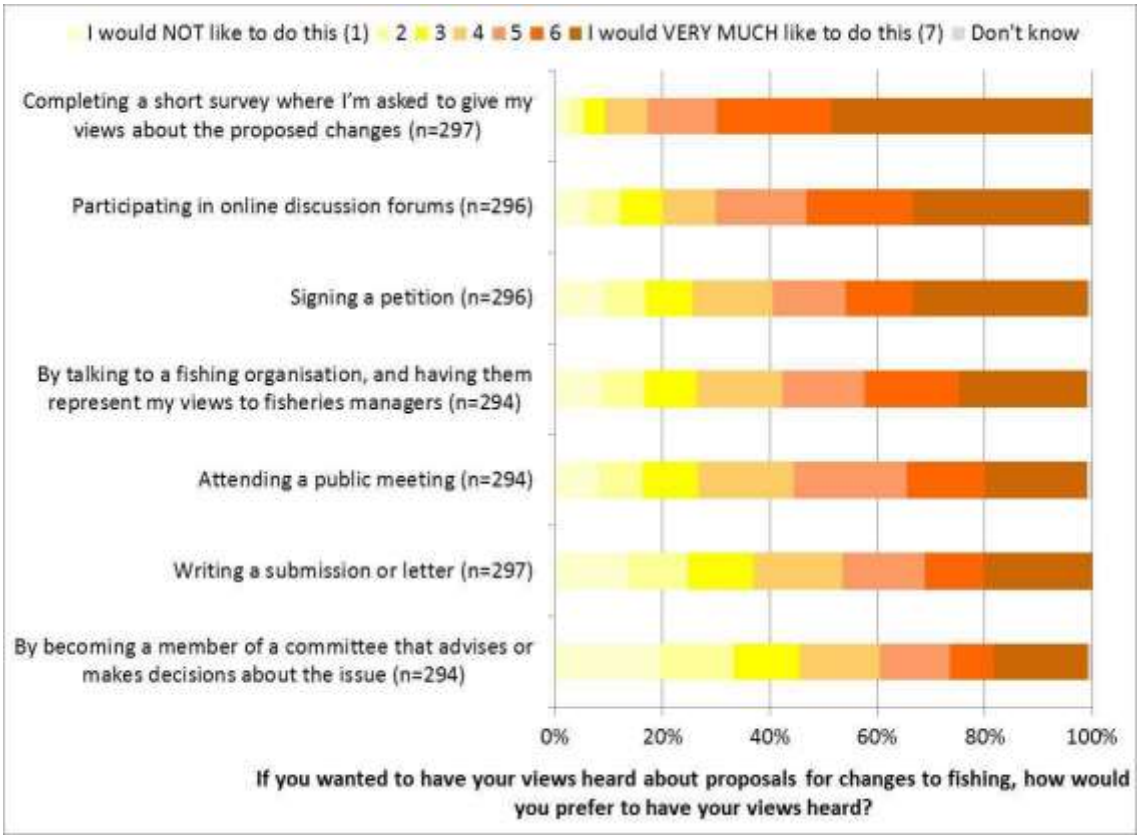

Figure 31 Preferred methods for getting involved in fisheries management in future

When examined by sociodemographic characteristics:

- Short surveys were particularly preferred by older people (Figure 32) with higher wellbeing, who were open to new experiences and conscientious, and by those who reported lower satisfaction with their fishing
- Public meetings were particularly preferred by older people who were extroverts and open to new experiences, members of recreational fishing organisations (Figure 33), to competition fishers, freshwater fishers and people who spent a higher than average amount on fishing
- Petitions were preferred by those with higher wellbeing, who were avid fishers who fished many days (Figure 34), spent a lot on fishing and were members of recreational fishing organisations

- Online forums were preferred by those who reported have an extroverted and open to new experience personality (Figure 35), by competition fishers, and by those who spent more on fishing. Interestingly, the age of a person did not make a significant difference, with older fishers as likely as younger fishers to be interested in using online forums
- Consulting with recreational fishing representatives was preferred by older people with higher wellbeing who were members of fishing organisations, and who had personality characteristics indicative of openness to new experience and conscientiousness, as well as by competition fishers and those who spent higher amounts on fishing
- Writing submissions or letters was preferred by older people who were extroverts, open to new experience and conscientious, by members of recreational fishing organisations, competition fishers, and avid fishers (who fished high numbers of days and had high fishing expenditure)
- Being a member of a committee was preferred by people who were extroverts, open to new experience and conscientious, who were members of fishing organisations, as well as by competition fishers and those with higher expenditure on fishing

Table 6 Association b etween (i) preferred methods of having a say about fisheries management, and (ii) socio-demographic and fishing characteristics of survey respondents

Socio-demographic or fishing characteristic	Bivariate test used	n	Completing a short survey	Signing a petition	Participating in online discussion forums	Attending a public meeting	Talking to a fishing organisation, and having them represent views to fisheries managers	Writing a submission or letter	Becoming a member of a committee that advises or makes decisions about the issue	Other types of involvement
Age	Sp (rs, p)[1]	285	0.188**, 0.002	0.092, 0.125	-0.033, 0.588	0.161**, 0.007	0.149*, 0.012	0.188**, 0.002	0.049, 0.415	0.000, 0.996
Wellbeing	Sp (rs, p)[1]	296	0.143*, 0.014	0.147*, 0.012	-0.030, 0.607	0.089, 0.130	0.127*, 0.031	0.056, 0.337	0.054, 0.360	-0.013, 0.875
Extroversion	Sp (rs, p)[1]	295	-0.067, 0.253	-0.099, 0.092	-0.143*, 0.015	-0.199**, 0.001	-0.078, 0.186	-0.232**, <0.000	-0.259**, <0.000	-0.106, 0.185
Openness	Sp (rs, p)[1]	289	0.162**, 0.006	0.100, 0.088	0.180**, 0.002	0.306**, <0.000	0.250**, <0.000	0.284**, <0.000	0.367**, <0.000	0.089, 0.267
Conscientiousness	Sp (rs, p)[1]	290	0.183**, 0.002	0.097, 0.100	0.020, 0.729	0.102, 0.083	0.151**, 0.010	0.132*, 0.024	0.172**, 0.003	-0.099, 0.212
Formal education	Sp (rs, p)[1]	297	0.018, 0.759	-0.051, 0.380	0.002, 0.971	-0.010, 0.863	0.022, 0.708	0.115, 0.050	0.086, 0.144	-0.031, 0.698
Member of rec fishing org'n	KW (H, p)[2]	290	0.200, 0.655	4.313*, 0.038	3.157, 0.076	23.894**, <0.000	26.936**, <0.000	29.172**, <0.000	27.842**, <0.000	4.784*, 0.029
Fishing avidity	Sp (rs, p)[1]	275	0.044, 0.473	0.165**, 0.006	0.119, 0.052	0.176**, 0.004	0.110, 0.070	0.122*, 0.045	0.116, 0.057	0.123, 0.141
Charter fisher	KW (H, p)[2]	296	0.024, 0.878	4.965*, 0.026	3.069, 0.080	2.613, 0.106	1.957, 0.162	0.038, 0.845	4.984*, 0.026	1.736, 0.188
Competition fisher	KW (H, p)[2]	298	0.131, 0.717	1.491, 0.222	6.951**, 0.008	16.391**, <0.000	12.852**, <0.000	16.433**, <0.000	22.151**, <0.000	2.914, 0.088
Saltwater fisher	KW (H, p)[2]	332	0.136, 0.713	1.454, 0.228	0.254, 0.615	0.009, 0.923	3.144, 0.076	0.107, 0.743	1.039, 0.308	0.000, 0.985
Freshwater fisher	KW (H, p)[2]	317	0.844, 0.358	1.148, 0.284	1.551, 0.213	9.980**, 0.002	1.293, 0.255	0.951, 0.329	11.757**, 0.001	0.003, 0.955
Satisfaction with fishing	Sp (rs, p)[1]	273	-0.149*, 0.015	-0.024, 0.700	0.061, 0.316	0.099, 0.105	-0.006, 0.925	-0.069, 0.262	-0.002, 0.980	-0.095, 0.258
Expenditure on fishing	Sp (rs, p)[1]	272	0.017, 0.779	0.122*. 0.044	0.138*, 0.023	0.181**, 0.003	0.168**, 0.006	0.150*, 0.014	0.186**, 0.002	0.160, 0.056

[1] Sp refers to the Spearman's r correlation test. The figures indicate the size of the r_s statistic, and the probability value (p-value) respectively. Significant values are flagged with * indicating significance at the 0.05 level and ** significance at the 0.01 level

[2]KW refers to the Kruskal Wallis H test. The figures indicate the size of the H statistic, and the probability value (p-value) respectively. Significant values are flagged with * indicating significance at the 0.05 level and ** significance at the 0.01 level

Note: Significant results are shaded in grey to highlight them.

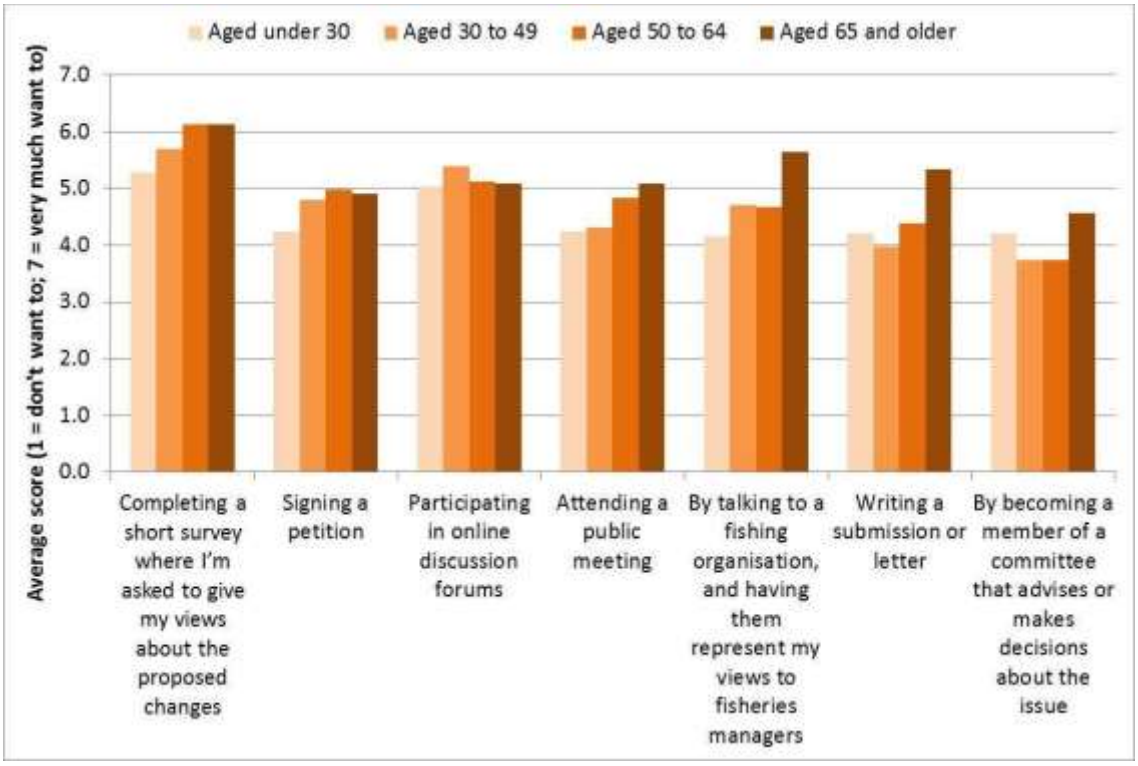

Figure 32 Preferred methods of involvement – by age group

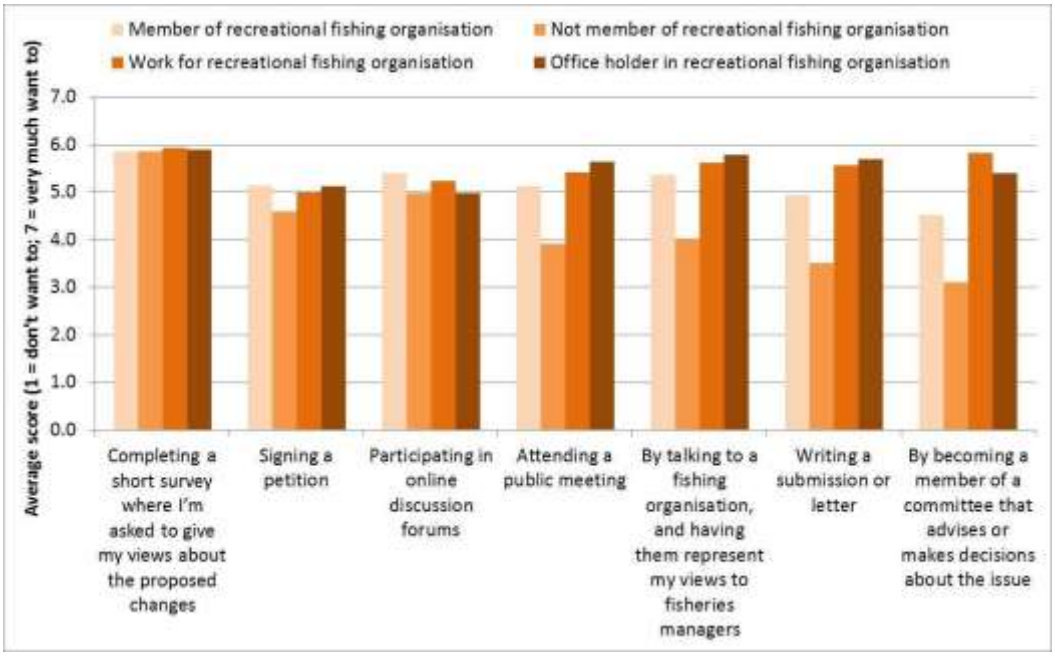

Figure 33 Preferred methods of involvement – by involvement in recreational fishing organisation

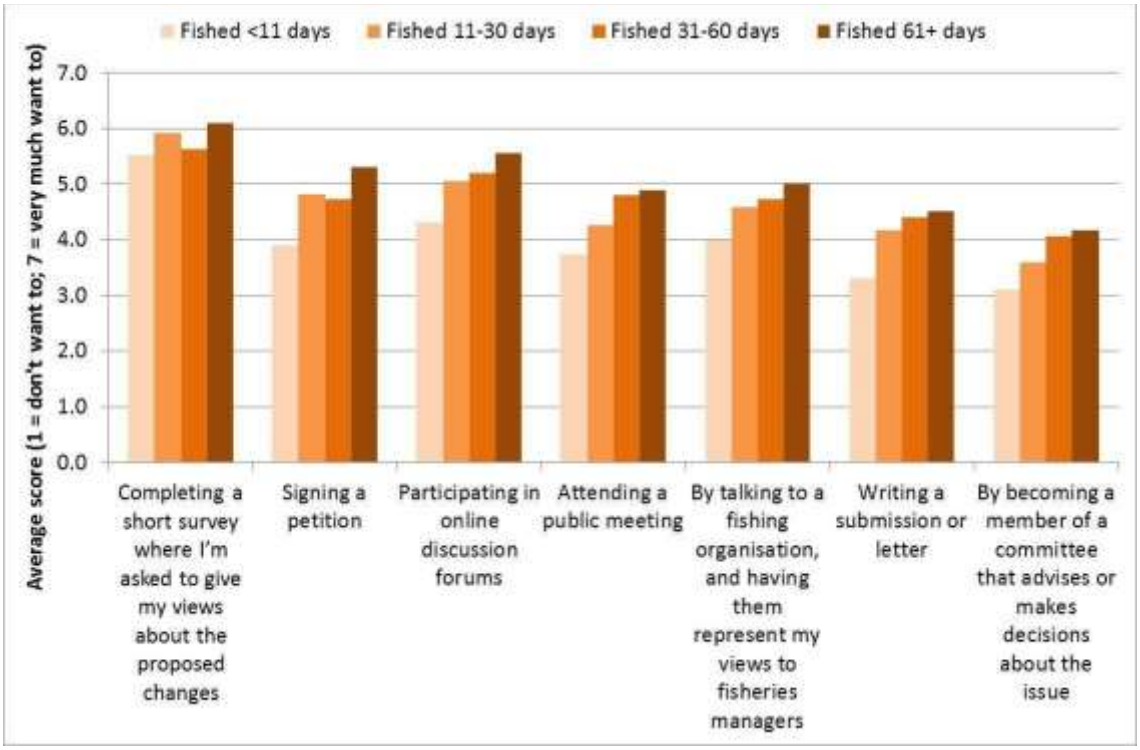

Figure 34 Preferred methods of involvement – by fishing avidity

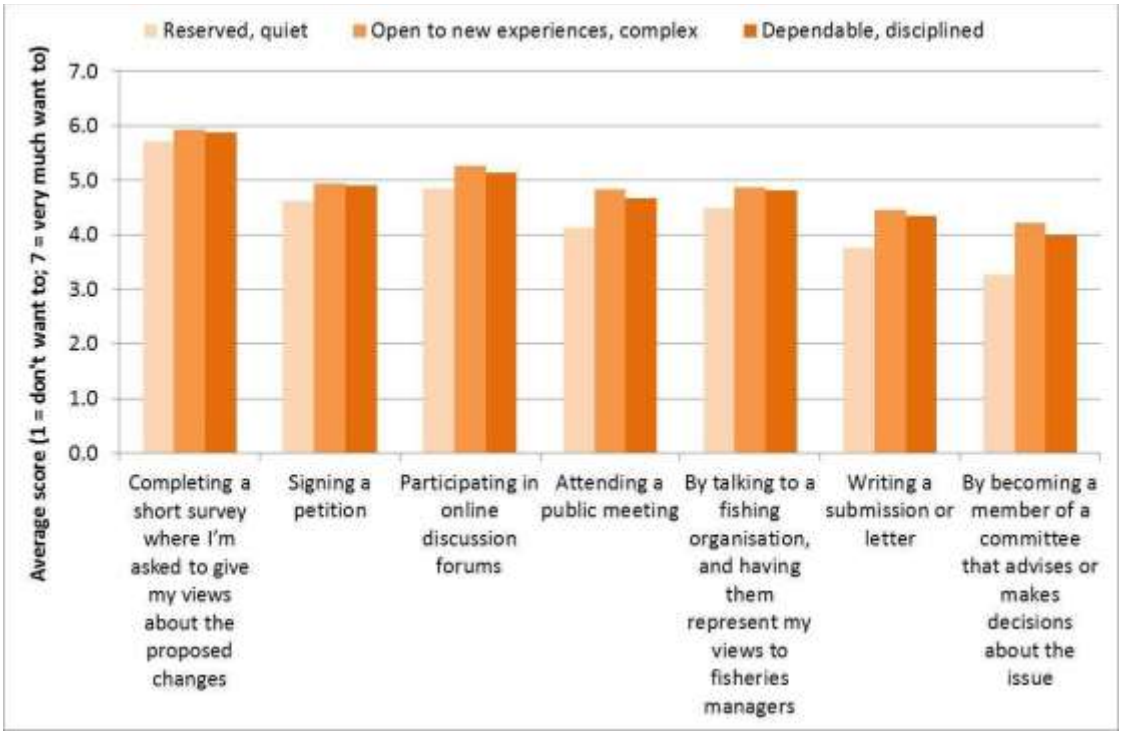

Figure 35 Preferred methods of involvement – by personality type

Discussion and conclusions

Successfully involving stakeholders in recreational fisheries management and science can be challenging. Success means that a representative range of views are included and considered in decision making, and that those involved feel positive about the experience. The results of this survey provide insight into the considerations needed in designing processes for involving recreational fishing stakeholders. In particular, they point to a need to consider the needs of people in different age groups, with different levels of fishing activity, and who have different personality types, when providing opportunities to get involved.

To achieve this, the first critical aspect is having in place good political support and management flexibility. These issues were identified as important in the literature, interviews with fisheries experts, and in the survey – where participants were much more likely to feel positive about their involvement in fisheries issues if they felt their involvement led to achieving change and that their views were listened to by decision makers. Both these things require strong support within the broader fisheries management system for both listening to and acting on the ideas and views brought forward from stakeholders as part of participatory processes.

If political support and management flexibility exist, then it is critical to focus on providing meaningful opportunities for stakeholders to get involved in having a say on fishing. Irrespective of how participatory the process is, it must be transparent and fair, and ideally feedback should be provided to stakeholders about the outcomes of the process.

The survey results show that people who get involved in having a say using more intensive methods, such as being a member of a committee or collecting data in citizen science programmes also report the greatest benefits from their involvement. Other ways of getting involved have fewer benefits and more drawbacks for participants, although these can be addressed through ensuring best practice approaches to the design and conduct of things such as surveys, forum discussions, public meetings and submission processes. However, despite fishers reporting greater benefits from more intensive forms of involvement, few want to be involved in this way. Instead, most prefer getting involved via surveys or discussion forums, despite these not having all the same positive benefits of more 'participatory' processes. This needs to be carefully considered when deciding on how to involve fishers in fisheries management and science.

Ideally, processes for involving fishers should provide mechanisms by which all fishers can have input at the level they desire. The majority should be offered opportunities to get involved via surveys, discussion forums, which provide opportunities for people with a broader range of personality types of get involved. Enthusiastic fishers – those who fish more days, spend more on fishing, and are already members of fishing organisations - are more likely to get involved in any kind of opportunity to have a say: perhaps the biggest challenge is finding opportunities that are attractive to less avid fishers who make up the large majority of fishers, but whose views are underrepresented in many discussions about the future of fishing. Short surveys and online forums were the methods most attractive to these less avid fishers, whereas more traditional methods of consultation are preferred often by older fishers, those who are extroverted, and more enthusiastic fishers. These more enthusiastic fishers should be provided opportunities to get involved via committees, citizen science etc, but these methods should ideally be paired with other methods that ensure the views of the large majority of fishers who are less regularly engaged in fishing can be adequately represented.

Overall, the results of the study support that fisheries stakeholders often want to get involved in having a say, but that a shift is needed to using non-traditional consultation methods – such as surveys and online forums – and perhaps less emphasis should be given to traditional consultation methods of submissions and public meetings. While traditional methods should continue to be part

of the range of methods used to involve fishers, providing a wider range of opportunities will ensure better representation of fishers. This wider range of methods can be used by either fisheries management agencies directly, or by recreational fishing organisations.

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Appendices

Getting involved in fisheries management and science

Information Sheet

This document provides information for people who participate in the survey on 'Getting involved in fisheries management and science'. This survey is part of the 'Beyond engagement: moving towards aco-management model' research project.

What is the purpose of the study?

Recent years have seen growing interest in more closely involving a range of stakeholders in fisheries management. Across Australia, many fisheries have implemented some form of consultation, collaborative discussions, or co-management. However, little is known about how well or poorly these arrangements are working, or how getting involved in fisheries management and science processes affects the people involved. This study is reviewing the experiences of people who have taken part in fisheries management processes through any type of consultation, public meeting, submissions, committees or other forms of participation, to find out what works well and what doesn't, and make recommendations to improve practices.

Who is undertaking and funding the study?

The study is being undertaken by Dr Jacki Schirmer at the Centre for Research and Action in Public Health of the University of Canberra. The research is funded by the Fisheries Research and Development Corporation, as part of a broader project led by Primary Industries and Regions South Australia (PIRSA) Fisheries and Aquaculture.

Why have you been asked to participate in the study?

Anyone with an interest in fishing and fisheries is invited to take, whether or not they have had direct involvement in fisheries management and science.

What will I be asked to do if I participate in the study?

You will be asked to complete an online survey that asks you about your views on getting involved fisheries management processes. The survey will take approximately 20 minutes to complete, and a maximum of 30 minutes if you have been highly involved in fisheries management and science processes in the past.

Voluntary participation

Participation in this research is entirely voluntary. You may withdraw from the research project at any time prior to publication of data, including withdrawal of consent for use of any of the data you have provided, or withdrawal of consent to use some or part of the data. If you request to withdraw data, we will securely destroy the relevant data.

Privacy and confidentiality issues

The researchers will ensure that your data remains confidential, as far as the law allows. We will not report your name. We will not report information such as the name of particular fisheries or regions without your prior written permission, if this presents a likelihood that you could be identified.
Only Dr Jacki Schirmer will have access to individual survey returns. Your survey data will be stored at the University of Canberra. Completed survey forms, and any data stored on CDs or other disk drives, will be stored in locked cabinets and/or offices. Electronic data will be stored in password protected hard drives.

How will results of the study be reported?

The results of the study will be published as publicly available reports and in journal papers. The survey includes an option for you to let us know if you wish to be sent a summary of findings when we complete our analysis, as does the consent form for the semi-structured interviews.

Ethics

This survey has been conducted in accordance with the National Statement on Ethical Conduct in Human Research, and has been approved by the University of Canberra's Human Research Ethics Committee (HREC). If you have any queries related to ethics issues, you can contact the project researchers (contact details provided below). Alternatively you can contact the University of Canberra's HREC at: The Secretary, Human Research Ethics Committee Research Office, Room 1D88, University of Canberra, ACT, 2601. Tel: (02) 6201 5220 E-mail: humanethicscommittee@canberra.edu.au

Contacts

If you have further questions about this project, please contact Dr Jacki Schirmer on (02) 6201 2785, 1800 981 499, or jacki.schirmer@canberra.edu.au

Postal address: Centre for Research and Action in Public Health, University of Canberra, Bruce, ACT, 2617

Getting involved in fisheries management and science

Thank you for your participation in this survey – we appreciate your time and effort. If you need assistance completing the survey, or have any questions, please call us on **1800 981 499**. The accompanying information sheet tells you more about the survey, including how we ensure your response is kept confidential and anonymous. When you've completed the survey, just post it back to us in the pre-paid envelope provided.
The survey usually takes 15-20 minutes to complete. If you've had a lot of involvement in fisheries management processes in the past it may take up to 30 minutes.
Note: While the survey looks long, some questions won't apply to you and you'll be able to skip them.

PART 1: YOUR INVOLVEMENT IN FISHING AND FISHERIES

First, we'd like to know the different ways you are involved with fishing and fisheries.

1a. Which of the following apply to you?	**Yes**	**No**
I am a recreational fisher (even if you haven't fished recently)	○	○
I am a commercial fisher	○	○
I am a traditional fisher, who fishes according to Aboriginal or Torres Strait Islander cultural traditions	○	○
I am a member of a recreational fishing club or organisation	○	○
I work for a recreational fishing club or organisation, or have done in the past	○	○
I am an office holder in a recreational fishing club/organisation, or have been in the past (e.g. president, member of the executive committee)	○	○
I'm a member of, or work for, an organisation that seeks to have a say on fisheries issues other than those listed above	○	○
None of these	○	○

1b. IF you indicated above that you ... *Please fill in the questions below that apply to you*	
... are a **commercial fisher**, which fisheries have you operated in?	
... are a **traditional fisher**, what region or regions do you do your fishing in? If you feel comfortable describing them, please also describe the types of customary/traditional fishing you do. *Please include as much detail as you wish to.*	
... have **worked for a recreational fishing club or organisation**, what recreational fishing clubs/organisations are you currently involved with?	

1g. How many of your fishing trips in the last year involved the following types of fishing? *Note: you may do some of these things simultaneously - for example, line fishing from a boat - but please answer for each thing listed even if you do it at the same time as one of the other things listed.*				
Indicate how often you did each of the types of fishing listed below.	**None of my fishing trips**	**<25% of my fishing trips**	**25-50% of my fishing trips**	**50-74% of my fishing trips**
Line fishing	○	○	○	○
Net fishing	○	○	○	○
Spear fishing	○	○	○	○
Crabbing	○	○	○	○
Diving	○	○	○	○
Boat fishing	○	○	○	○
Land-based fishing (e.g. jetty, beach)	○	○	○	○
Freshwater fishing	○	○	○	○
Saltwater fishing	○	○	○	○
Charter fishing	○	○	○	○
Fishing in sports competitions	○	○	○	○
Other types of fishing not listed	○	○	○	○

If you are involved in any type of fishing, e.g. recreational, commercial or customary/traditional fishing, please answer the questions below. *If you do not fish, go to question 1k.*

1h. Where do you fish?	○ Australia ○ Overseas
1i. If you fish in Australia, which Australian states and/or territories do you fish in?	○ Australian Capital Territory ○ New South Wales ○ Northern Territory ○ Queensland ○ South Australia ○ Tasmania ○ Victoria ○ Western Australia
1j. If you fish Overseas, which is the main country you fish in?	

In many jurisdictions, fisher's views are represented by representatives of fishing organisations. We'd like to know how you feel about how your views are represented at the moment.

1k. Indicate how much you agree or disagree with each statement.	**Strongly DISAGREE** ①	②	③	④	⑤	⑥	**Strongly AGREE** ⑦	**Don't know**
I am actively involved in having a say on fisheries management in some or all of the regions I fish in	○	○	○	○	○	○	○	○
I've never aimed to have a say about fishing	○	○	○	○	○	○	○	○
I know who represents the interests of fishers in the regions I fish in	○	○	○	○	○	○	○	○
I know how to contact the people who represent the interests of fishers in the regions I fish in	○	○	○	○	○	○	○	○
The people who represent fishers in my region do a good job of representing my interests	○	○	○	○	○	○	○	○
I am interested in having my views represented to fisheries managers by the people who represent fishers in my region	○	○	○	○	○	○	○	○

I don't feel a need to contact the people who represent fishers in my region	○ ○ ○ ○ ○ ○ ○ ○

PART 2: GETTING INVOLVED IN FISHERIES MANAGEMENT, SCIENCE AND DECISION-MAKING

2a. Have you used any of the following methods to get involved in fisheries management, science or decision-making in the last five years?

Indicate how often you have used each of these things listed below.	I have never done this	I have done this once	I have done this more than once	I have organised or managed this
Collected fishing related data e.g. by monitoring stocks, keeping a catch diary	○	○	○	○
Signed a petition (online or offline) about a fishing issue	○	○	○	○
Participated in online discussion forums	○	○	○	○
Attended a public meeting on a fisheries issue	○	○	○	○
Attended a meeting or talked with a fishing organisation about a fisheries management issue	○	○	○	○
Made a submission about a fisheries issue (whether it is to a fisheries management agency, fishing organisation, or other organisation)	○	○	○	○
Completed a survey asking about my views on a particular fishing issue	○	○	○	○
Written a letter about a fisheries issue	○	○	○	○
Been a member or organiser of a committee involved in advising or making decisions on fishing issues	○	○	○	○
Other types of involvement. *Please specify below, see question 2b.*	○	○	○	○

2b. If you ticked 'other types of involvement' above, please describe them:

_____
_____
_____
_____
_____

We would like to find out about the ways you've been involved in different types of discussion and action around fisheries management and science.
Below is a list of different types of fishing-related topics and issues people often get involved in. Please indicate if you have been involved in or had a say on any of these topics using any of the methods listed.

2c. Have been involved in or had a say on any of these topics using any of the methods listed?

Indicate how you have been involved in the topics listed below.	I haven't had a say/been involved in discussions on this topic	Submitted my views e.g. through a submission, petition, online	Attended meetings	Discussed my views with people who represent recreational fishers	Helped collect scientific data	Been part of a committee	Coordinated or helped manage a consultation process	Other type of involvement
Marine Parks	○	○	○	○	○	○	○	○
Proposed changes to fishing seasons or areas e.g. proposed closures	○	○	○	○	○	○	○	○
Proposed changes to catch or size limits e.g. bag, boat limits	○	○	○	○	○	○	○	○
Proposed changes to regulations on fishing gear	○	○	○	○	○	○	○	○
Resource allocation e.g. allocation of quotas or catch between recreational, commercial and/or Indigenous fishing sectors	○	○	○	○	○	○	○	○
Ongoing management of a particular fishery or species	○	○	○	○	○	○	○	○
Other fisheries related issues. *Please describe below, see question 2d.*	○	○	○	○	○	○	○	○

2d. If you ticked 'other fisheries related issues' above, please describe them:

_____

_____

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Think about the most recent time you got involved in, or had a say about any of the topics listed above. The following questions ask you to identify the method you used to have a say, and the positive and negative aspects of using that method.

2e. What was the most recent method you used to get involved in, or have a say about one of the fisheries-related science issues listed above? *Please tick one method only.*

I haven't had any type involvement	Submitted my views e.g. through a submission, petition, online	Attended meetings	Discussed my views with people who represent recreational fishers	Helped collect scientific data	Been part of a committee	Coordinated or helped manage a consultation process	Other type of involve-ment
○	○	○	○	○	○	○	○

To what extent do you agree or disagree with the following statements about the things that might have worked well and poorly in the method you selected in question 2e?

2f. Did this method have any of the following positive aspects?

Indicate how much you agree or disagree with each statement.	Strongly DISAGREE ①	②	③	④	⑤	⑥	Strongly AGREE ⑦	Don't know
It was easy to contribute my views and ideas	○	○	○	○	○	○	○	○
I learned new things about fishing, or about fisheries management and science	○	○	○	○	○	○	○	○
Getting involved this way helped improve relationships between the people involved in this fisheries issue	○	○	○	○	○	○	○	○
My views were heard by decision makers (e.g. fisheries managers, or other decision makers)	○	○	○	○	○	○	○	○
My views were acted on by decision makers	○	○	○	○	○	○	○	○
This process generated good ideas for management of local fisheries resources	○	○	○	○	○	○	○	○
This process resulted in positive change in fisheries management	○	○	○	○	○	○	○	○
I received feedback about how this activity informed fisheries management or science	○	○	○	○	○	○	○	○
Doing this helped me meet other people with an interest in fisheries or fishing	○	○	○	○	○	○	○	○
Doing this made me feel good	○	○	○	○	○	○	○	○
Overall, I felt this was a good way to get involved in fisheries management	○	○	○	○	○	○	○	○

2g. Did this method have any of the following negative aspects? *Indicate how much you agree or disagree with each statement.*	Strongly DISAGREE ①	②	③	④	⑤	⑥	Strongly AGREE ⑦	Don't know
It was difficult for me to get involved	○	○	○	○	○	○	○	○
Some people didn't get a chance to have their say or participate	○	○	○	○	○	○	○	○
Doing this took up too much of my time	○	○	○	○	○	○	○	○
I found it difficult to understand the science involved in the issues being discussed	○	○	○	○	○	○	○	○
This process increased disagreement or conflict about fisheries management	○	○	○	○	○	○	○	○
The ideas generated by this process weren't acted on by decision makers	○	○	○	○	○	○	○	○
I didn't get any feedback on how decision makers used my views or made their decisions	○	○	○	○	○	○	○	○
Getting involved this way made me feel frustrated	○	○	○	○	○	○	○	○
Getting involved this way made me feel stressed	○	○	○	○	○	○	○	○
Overall, I felt this wasn't a good way to get involved in fisheries management	○	○	○	○	○	○	○	○

2h. When you think about getting involved in fisheries management in general, how important is it that the following happens? *Indicate how important you think each statement is.*	Not at all Important ①	②	③	④	⑤	⑥	Extremely Important ⑦	Don't know
Everyone who is directly affected by the fisheries management issue has a chance to have a say about it	○	○	○	○	○	○	○	○
I receive feedback on how my input was listened to and used	○	○	○	○	○	○	○	○
Everyone who is interested in the issue has a chance to have a say, even if they aren't directly affected by it	○	○	○	○	○	○	○	○
There is clear explanation of the fisheries science involved in the management issue	○	○	○	○	○	○	○	○

How would you most like to get involved in fisheries management and science in future? Not everyone wants to have a say or get involved in fisheries issues. We would like to get a better idea of where you think it is most important to get involved, and how you prefer to get involved.

2i. How likely are you to get involved in having a say about the following fisheries management issues?

Indicate how likely or unlikely you are to have a say about the following.	Very UNLIKELY ①	②	③	④	⑤	⑥	Very LIKELY ⑦	Don't know
Marine Parks	○	○	○	○	○	○	○	○
Proposed changes to fishing seasons or areas (e.g. proposed closures)	○	○	○	○	○	○	○	○
Resource allocation processes (which allocate fisheries resources between the recreational, commercial and/or Indigenous fishing sectors)	○	○	○	○	○	○	○	○
Proposed changes to catch or size limits	○	○	○	○	○	○	○	○
Proposed changes to fishing gear regulations (e.g. type of fishing equipment you can use)	○	○	○	○	○	○	○	○
Ongoing management of a particular fishery or species	○	○	○	○	○	○	○	○
Collecting scientific data to inform fisheries management	○	○	○	○	○	○	○	○

2j. Please describe any other types of fisheries management issues that you might get involved in

_____

_____

_____

2k. If you wanted to have your views heard about proposals for changes to fishing rules and regulations (e.g. area closures, seasons, catch or size limits), how would you prefer to have your views heard?

Indicate how much you would or would not like to do the following	I would NOT like to do this ①	②	③	④	⑤	⑥	I would VERY MUCH like to do this ⑦	Don't know
Completing a short survey where I'm asked to give my views about the proposed changes	○	○	○	○	○	○	○	○
Signing a petition	○	○	○	○	○	○	○	○
Participating in online discussion forums	○	○	○	○	○	○	○	○
Attending a public meeting	○	○	○	○	○	○	○	○
By talking to a fishing organisation, and having them represent my views to fisheries managers	○	○	○	○	○	○	○	○
Writing a submission or letter	○	○	○	○	○	○	○	○
By becoming a member of a committee that advises or makes decisions about the issue	○	○	○	○	○	○	○	○
Other types of involvement. ***Please describe in space provide on the next page***	○	○	○	○	○	○	○	○

2l. If you would like to take part in 'other types of involvement', please describe these types of involvement

_____

_____

_____

2m. Sometimes the way we prefer to get involved in things like fisheries management depends on our own way of doing things.

What are you like?

Indicate how much you agree or disagree with each statement.	Strongly DISAGREE ①	②	③	④	⑤	⑥	Strongly AGREE ⑦	Don't know
I see myself as reserved, quiet	○	○	○	○	○	○	○	○
I see myself as open to new experiences, complex	○	○	○	○	○	○	○	○
I see myself as dependable, self-disciplined	○	○	○	○	○	○	○	○

PART 3: YOUR WELLBEING

Sometimes your ability to take part in fisheries management will depend on your health and wellbeing, and it may also have an effect on your health and wellbeing. To help us get a better understanding of this, we ask a few general questions about your overall wellbeing.

3a. How would you rate your general health? *Select one.*

○ Excellent ○ Very good ○ Good ○ Fair ○ Poor

3b. Thinking about your own life and personal circumstances, how satisfied are you with the following?

	Very DISSATISFIED ①	②	③	④	⑤	⑥	Very SATISFIED ⑦
Your life as a whole	○	○	○	○	○	○	○
Your standard of living	○	○	○	○	○	○	○
Your health	○	○	○	○	○	○	○
What you are currently achieving in life	○	○	○	○	○	○	○
Your personal relationships	○	○	○	○	○	○	○
Feeling part of your community	○	○	○	○	○	○	○
Your future security	○	○	○	○	○	○	○
How safe you feel	○	○	○	○	○	○	○

If you are feeling distressed or need assistance, you can contact the following services for assistance, 24 hours a day: Beyond Blue – 1300 22 4636 or Lifeline – 13 11 14.

PART 4: A BIT ABOUT YOU

Finally, we'd like to know a bit about you. This information helps us understand if the ways people can get involved in fisheries management depend on things like their stage of life or occupation.

4a. Are you... *Select one.*	◯ Female ◯ Male ◯ Prefer not to answer
4b. Are you... *Select one.*	◯ Indigenous-Australian ◯ Australian-born (non-Indigenous) ◯ Born overseas (English speaking) ◯ Born overseas (non-English speaking)
4c. Which best describes your current living situation? *Select one.*	◯ Living as a couple, no children <15 years at home ◯ Living as a couple, with 1 or more children aged < 15 at home ◯ Single parent, with 1 or more children aged < 15 at home ◯ Living alone ◯ Other
4d. What is the highest level of high school you completed? *Select one.*	◯ Did not go to high school ◯ Year 8 or below ◯ Year 9 or equivalent ◯ Year 10 or equivalent ◯ Year 11 or equivalent ◯ Year 12 or equivalent
4e. Do you have any of the following post-school qualifications? *Select all that apply.*	☐ Certificate I or II ☐ Certificate III or IV e.g. trade certificate or apprenticeship ☐ Associate or advanced diploma ☐ Graduate diploma or graduate certificate (from a university) ☐ University undergraduate degree e.g. a Bachelor degree ☐ Postgraduate degree e.g. Masters, PhD
4f. How old are you?	_____ years

Thank you for completing the survey.

If you would like to enter the prize draw, be told when results of the study are available, or participate in future research, please complete the information below.

Do you want to participate in future research? *If you tick yes, we'll let you know when opportunities come up, but you're under no obligation to take part in them*	◯ Yes ◯ No
Do you want to be entered in the prize draw for one of five $100 gift vouchers?*	◯ Yes ◯ No
Do you want to be notified when results of the study are available?	◯ Yes ◯ No

If you ticked 'yes' to any of the questions above, please provide your contact details below.
We will not pass your contact details to any other organisation, and these details will be stored separately to your survey response.

Name:		
Email address:		
Postal address *This is only required if you wish to enter the prize draw; see terms and conditions below*	**Street:**	
	Town/ suburb:	
	State:	
	Postcode:	☐☐☐☐

***Prize draw terms & conditions:** Winners will have their choice of a Coles-Myer, WISH or Flight Centre gift voucher. Prize draw terms and conditions: Entry into the lottery is determined by the completion of the survey 'Getting involved in fisheries co-management and science.' Everyone who completes the survey will be eligible to enter the prize draw for one of 5 gift vouchers, worth $100 each. Winners will have their choice of a Flight Centre voucher, Coles-Myer or WISH giftcard. Entries for this competition open on April 2nd and close May 4th 2014. The prize draw will happen on May 5th at the Centre for Research and Action in Public Health, Building 22, University of Canberra, University Drive South, Bruce, ACT, 2617. The winner will be notified by May 12th 2014 and listed in The Australian newspaper on May 19th 2014. Minimum age is 18 years. Survey promoter: University of Canberra. Contact agent: Dr Jacki Schirmer, Senior Research Fellow, University of Canberra, Building 22, University Drive South, Bruce ACT 2617 ABN 81 633 873 422. Phone 1800 981 499.

Appendix 2 RecFish SA co-management report

Beyond Engagement

Moving towards a Co-Management Model for Recreational Fishing in South Australia

Community Workshop

Report to PIRSA Fisheries and Aquaculture

May 2018

Overview

This report is submitted to the Department for Primary Industries and Resources South Australia (PIRSA) Fisheries and Aquaculture as a chapter of the larger project entitled Beyond Engagement: Moving Towards a Co-Management Model for Recreational Fishing in South Australia.

Scope

Undertake an online attitudinal survey on recreational fishers regarding management options, funding models, research requirements and development opportunities for Murray Cod in the SA River Murray

1. Undertake a workshop with the support of PIRSA in the Riverland to provide feedback on the online surveys and gather more information on management options, funding models, research requirements and development opportunities for Murray Cod in the SA River Murray
2. Support PIRSA in developing an appropriate co-management model for Murray Cod in the SA River Murray
3. Support the drafting of a final report for the FRDC project
4. Support in finalising the report and assisting with extension to the SA recreational fishing public

1 On-Line Survey

Recfish SA undertook an online attitudinal survey of recreational fishers regarding management options, funding models, research requirements and development opportunities for Murray Cod in the SA River Murray. The on-line survey was conducted through the online tool 'Survey Monkey' and was promoted to the public through the RecFish SA Facebook page and directly to RecFish SA members through Campaign Monitor. The survey asked a series of general and specific questions relating to the management of the Murray cod fishery in the River Murray (see Appendix for survey questions).

1.1 Engagement

Figure 1 summarises the performance of the Facebook post for the survey and shows that 50 people accessed the survey through Facebook (link clicks)

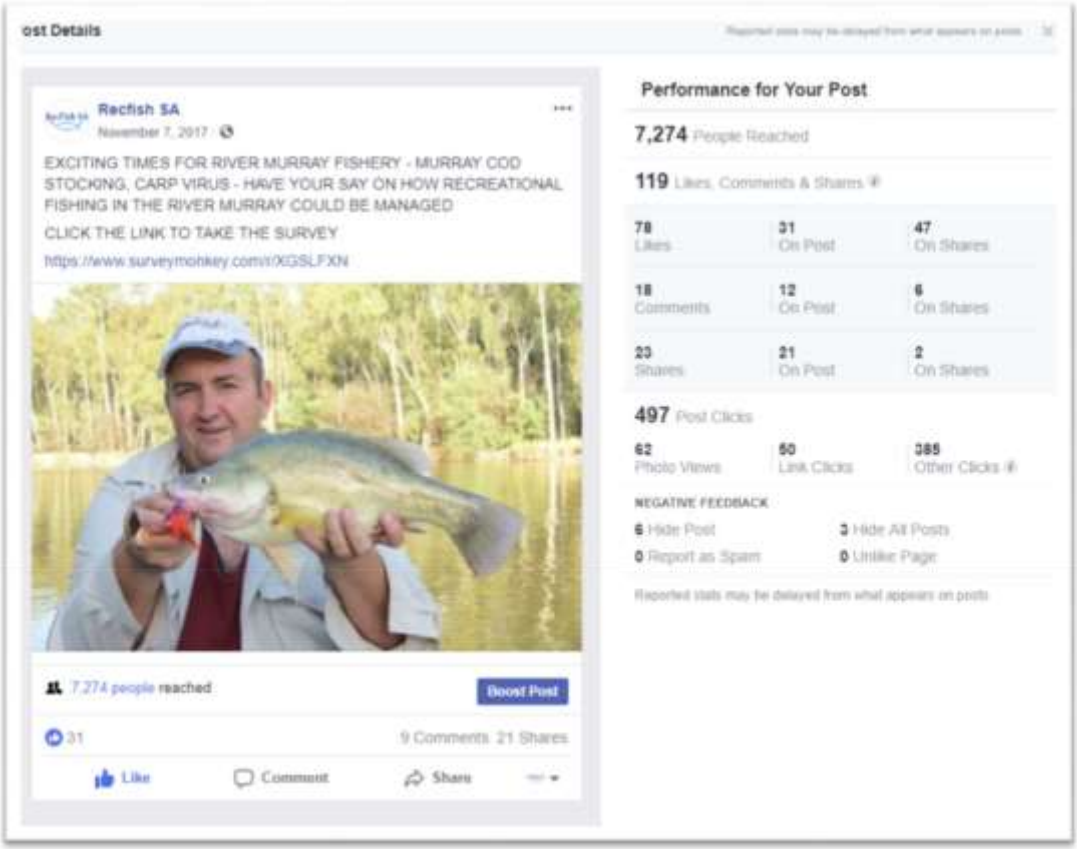

Figure 1: Facebook statistics for Online Survey

Campaign Monitor was used to direct the survey to 1266 RecFish SA members (figure 2).

Figure 2: Page sent to RecFish SA members directing them to the survey.

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Performance figures for the campaign are shown in Figure 3

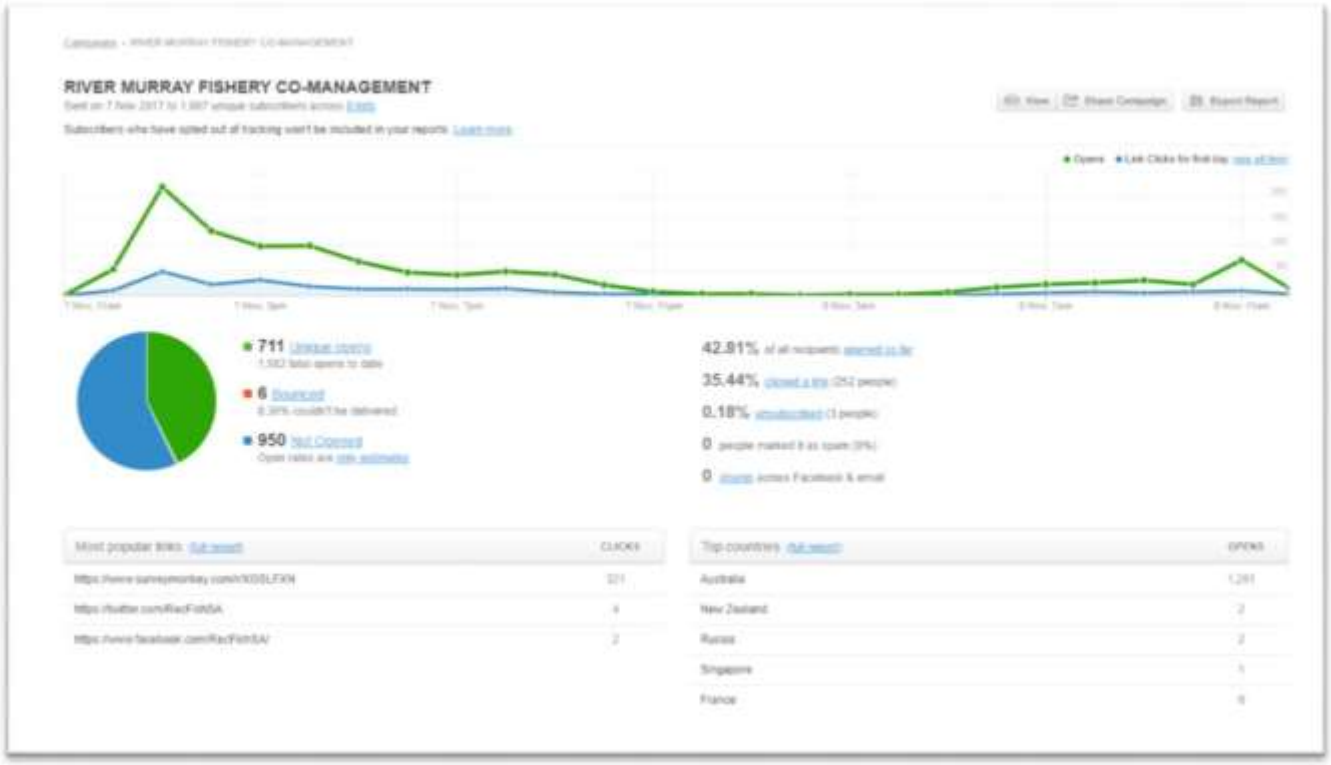


Figure 3: Campaign Monitor statistics for Online Survey

1.2 Survey Results

The full survey results are shown in Appendix A.

In all, 546 people started the survey with a completion rate of 86% with respondents spend an averagetime of 7 minutes completing the survey.

Survey highlights include

1.2.1 Most people taking the survey (303/519) had never caught a Murray cod
1.2.2 84.97% of respondents believe that the fishing for Golden perch is very good
1.2.3 Murray cod stocking is supported by 99.21% of respondents
1.2.4 Ongoing Murray cod stocking programs should be managed by the community
1.2.5 80.28% of respondents would support the introduction of a recreational fishing licence to raise funds for Murray cod stocking
1.2.6 59% of people support the release of the Carp herpes virus while 30% are unsure
1.2.7 92.9% of respondents believe that a co-management approach should be applied to the River Murray fishery and that the community should play the greatest role in monitoring, stocking, education and habitat enhancement.

1.3 Co-management Workshop

Question 22 of the survey asked respondents if they were willing to participate in a co-management workshop for the River Murray fishery (see below). In response, 155 respondents (33%) agreed to participate. Respondents were asked to provide full details and addresses to signify their intent of which only 84 did so.

Over coming months, further consultation will be taken on developing a co-management approach of the recreational fishery in the River Murray; would you be prepared to participate in a workshop about this issue? (Please note that the workshop is likely to be held during work hours in the Riverland).

This result provided confidence that the workshop was likely to be well attended and a decision was made to proceed with invitation positive respondents to attend a workshop in the Riverland (see figure 4).

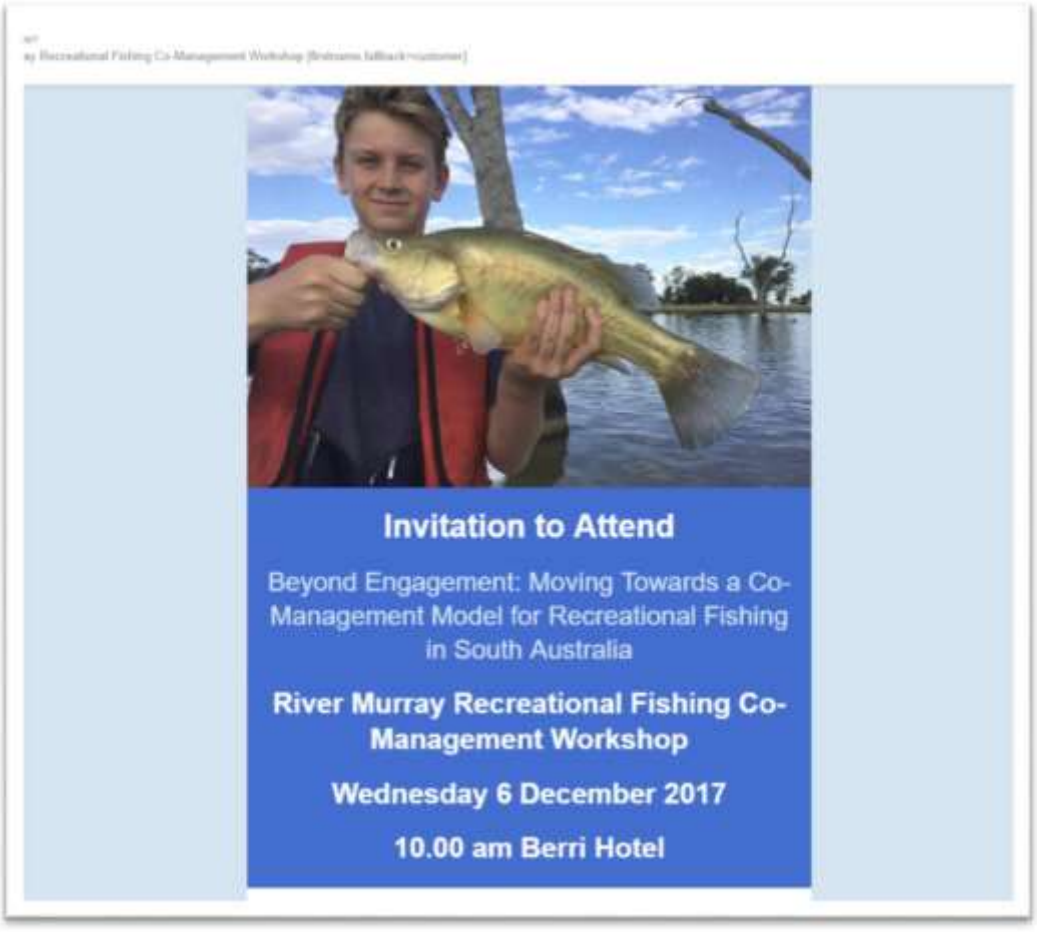


Figure 4: Invitation to River Murray Recreational Fishing Co-management workshop

Invitees were asked to RSVP within two weeks of the invitation.

The invitation was opened by 63 people from which only 6 agreed to attend the meeting. Subsequently, the meeting was cancelled. Contact with invitees revealed that many felt that they weretoo busy to attend the workshop given that it was so close to Christmas and that a more convenient time would be later in the summer while nearly 50% of people indicated that they were no longer available to participate in the workshop. Consequently, the workshop was rescheduled for 7 March 2018 and this time, invitations were extended only to those that had confirmed that they remained interested in the project. In all, 37 invitations were sent 1 month before the workshop.

Eighteen positive and four negative responses to the invitation were received by RecFish SA, while Campaign Monitor statistics show that 15 invitations were not opened by recipients.

Despite the low response it was agreed that there were suffieicnt number so positive respondents to proceed with the workshop and that with the inclusion of staff from PIRSA Fisheries that the workshop would deliver the required outcomes.

1.3.1 Workshop Proceedings

- Significant discussion on the role of RecFish SA in the management of the fishery including role played in stocking and position on introducing a recreational fishing licence.
- General support for an RFL provided it was not solely administered by Gov. and that rec fishers played a role in its management and government co-contributed with matching funds. Example of Victorian Fisheries Authority model and policy acknowledged as the model that would be preferred in SA.
- Research discussion highlighted the need for regular stock assessments but also the role that the community can play in data collection.
- Introduction of angler log books for a dedicated group of anglers was considered reasonable to assist in stock assessments. Considered a better option than single events.
- Monitoring of the success of stocking was considered a critical need.

Participants were asked to consider the roles that each of the sectors could play in a sustainable River Murray Fishery which prompted consensus that management of the fishery requires that all sectors work in partnership and that specific sectors should take the lead on certain issues. These results are shown in Table 1

Table 1 Potential roles for each sector in a sustainable River Murray Fishery

	Policy	Management	Compliance	Funding	Research	Publicity, Promo, Education	Represent	On-Ground works
Gov.	✓	✓	✓	✓	✓	✓		✓
Comm	✓	✓	✓	✓	✓	✓	✓	✓
Bus				✓		✓		✓

✓ – Lead

✓ – Support

The workshop then focussed on identifying actions for the key elements of Funding, Management and On-ground works.

Table 2: Action supported at the workshop

	Actions supported
Funding	☐ Inland or general recreational fishing licence managed at arm's length from Gov. RecFish SA must strongly represent this to new govt. after 17 March election ☐ Gov. matches funding from licence ☐ Corporate sponsorship of on-ground activities and events ☐ Crowd source funding for on-ground works
Management	☐ Structure of formal management system is critical ☐ Need to develop an inland fishery management plan that focuses on development opportunities for the fishery and prioritises critical on-ground projects. ☐ Community input should be via a River Murray Recfishing Co-management Committee which should be responsible for defining the management of the fishery including research and funding opportunities. Perhaps as a sub-committee of RecFish SA. ☐ Critical that funding is sourced to enable a meaningful management forum ☐ Critical that Recfish SA is funded to lead.
On-ground works	☐ Murray cod stocking program is the highest priority on-ground action ☐ Fish, Flow and Habitat projects are all supported ☐ Require proper input from scientists for development and implementation ☐ Funding sourced from many areas.

1.4 Discussion

The online survey tool, Survey Monkey, used in combination with Campaign Monitor proved to be a simple and cost-effective way to engage with recreational fishers and solicit a high response to the survey. Most members of RecFish SA have previously been asked to participate in surveys using Survey Monkey and are likely to be familiar with its use. This may account for the high response and completion rates for the survey.

Not all comments from participants were positive about the survey with some expressing their concern that the answer options were too limited and prescriptive and did not allow respondents to expand on their choices. While Survey Monkey provides the function to allow respondents to provide further narrative, this option was not exercised in the survey due to resource limitations.

The combination of the online survey and the workshop provided useful insights into the issues that the recreational fishing community considers important for the River Murray Fishery.

The survey provided a means to better understand stakeholder opinions on the status of the fishery, the important management issues and the system of management that may be applied to the fishery. These responses to these questions provided the foundation for the design of the Co-management workshop which focussed predominantly on establishing a framework for Co-management of the River Murray fishery.

The strong response to the survey (546) and the high completion rate (86%) show that recreational fishers are willing to share their opinions on the status of the River Murray fishery and how it can be managed to achieve community objectives. However, as may be expected, Q22 revealed people were less willing to become involved in active management. This is further evidenced by substantial disengagement from the project when respondents were invited to attend the co-management workshop.

The results from the survey and the workshop show that the community shares very strong opinions on the key management issues for the River Murray fishery and how government and communities should work together to achieve the best possible outcomes.

The continuation of a Murray cod stocking program supported by a recreational fishing licence are the management actions most supported by the community and should form a critical component of any Co-management system for the River Murray.

Appendices

Appendix A: Results of online survey

Recreational Fishing in the River Murray

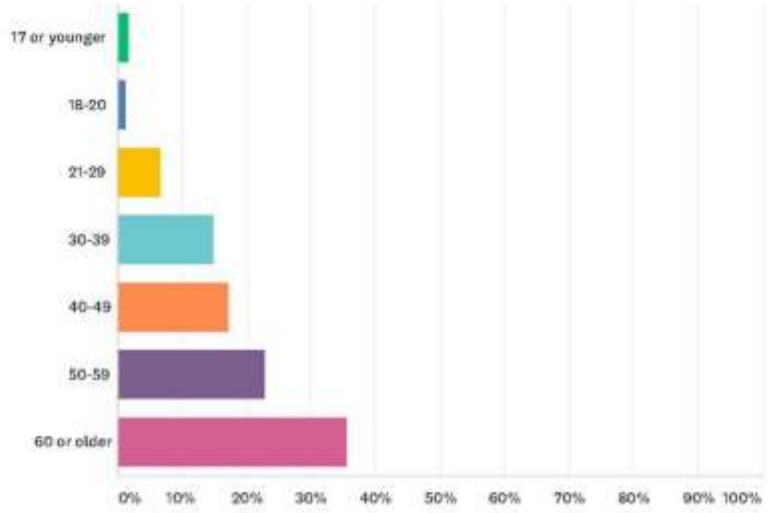
Q1 What is your postcode?

Answered: 545 Skipped: 0

Recreational Fishing in the River Murray

Q2 What age are you?

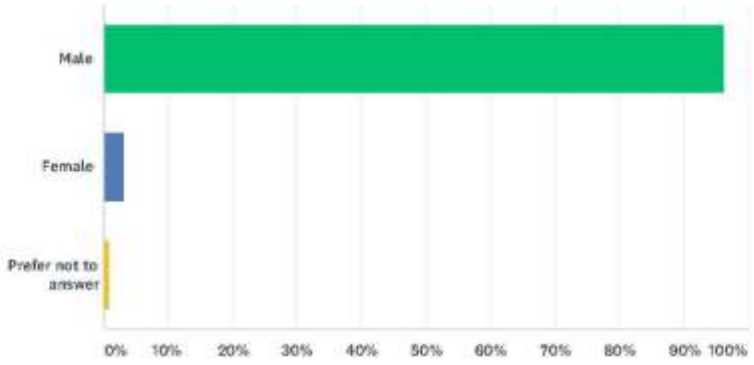
Answered: 545 Skipped: 0



ANSWER CHOICES	RESPONSES	
17 or younger	1.65%	9
18-20	1.28%	7
21-29	6.79%	37
30-39	14.86%	81
40-49	17.06%	93
50-59	22.75%	124
60 or older	35.60%	194
TOTAL		545

Q3 Are you

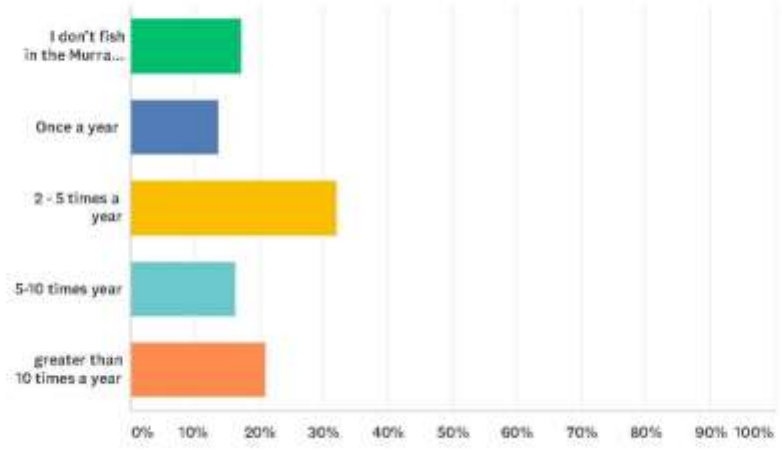
Answered: 545 Skipped: 0



ANSWER CHOICES	RESPONSES	
Male	96.15%	524
Female	3.12%	17
Prefer not to answer	0.73%	4
TOTAL		545

Q4 How often do you fish in the River Murray?

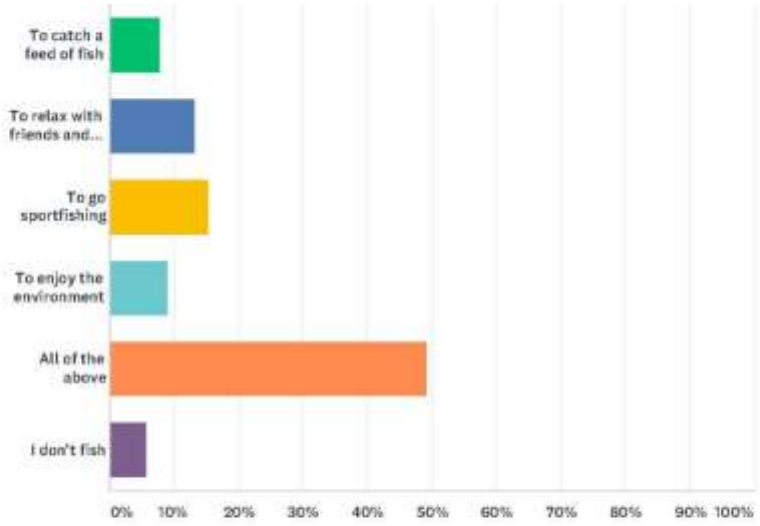
Answered: 545 Skipped: 0



ANSWER CHOICES	RESPONSES	
I don't fish in the Murray but I'm interested in its management	17.25%	94
Once a year	13.58%	74
2 - 5 times a year	31.93%	174
5-10 times year	16.33%	89
greater than 10 times a year	20.92%	114
TOTAL		545

Q5 What is your main motivation for fishing in The River Murray?

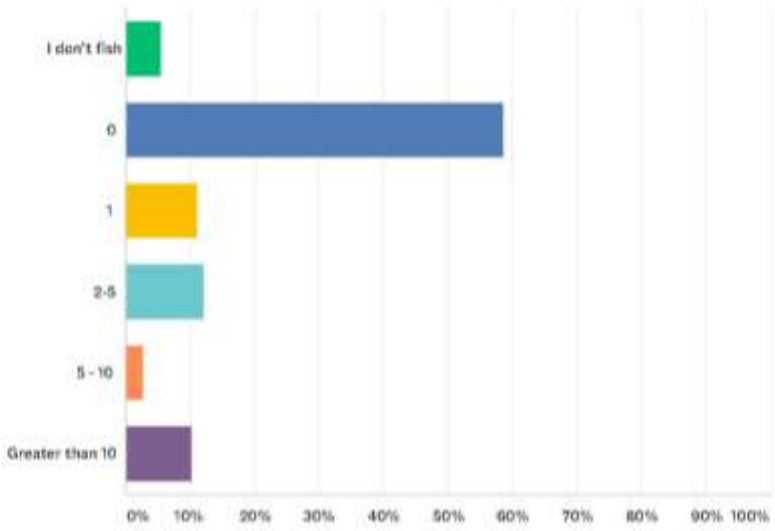
Answered: 518 Skipped: 27



ANSWER CHOICES	RESPONSES	
To catch a feed of fish	7.72%	40
To relax with friends and family	13.13%	68
To go sportfishing	15.25%	79
To enjoy the environment	9.07%	47
All of the above	49.23%	255
I don't fish	5.60%	29
TOTAL		518

Q6 How many Murray cod have you caught since you have been fishing in the River Murray?

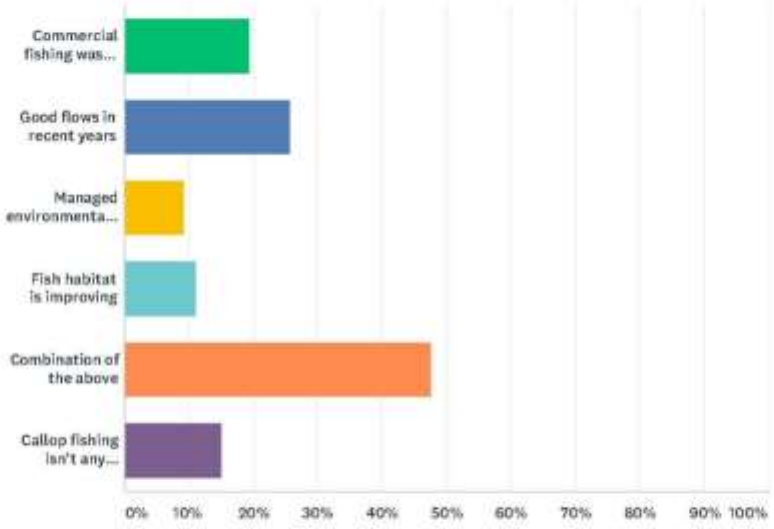
Answered: 518 Skipped: 27



ANSWER CHOICES	RESPONSES	
I don't fish	5.41%	28
0	58.49%	303
1	11.00%	57
2-5	12.16%	63
5 - 10	2.70%	14
Greater than 10	10.23%	53
TOTAL		518

Q7 Many people believe that the fishing for Golden perch (Callop) is very good at the moment, why do you believe this is the case?

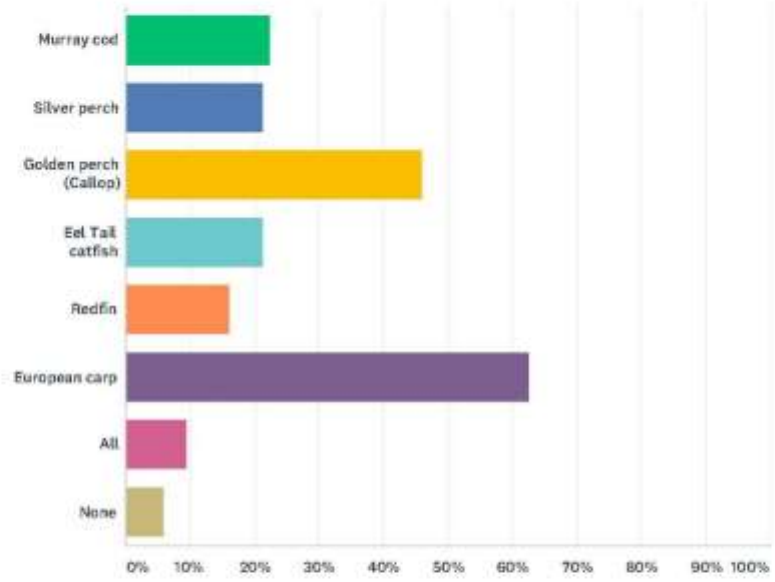
Answered: 518 Skipped: 27



ANSWER CHOICES	RESPONSES	
Commercial fishing was removed from the River Murray	19.50%	101
Good flows in recent years	25.68%	133
Managed environmental flows have been used to promote fish breeding	9.27%	48
Fish habitat is improving	11.00%	57
Combination of the above	47.68%	247
Callop fishing isn't any better	15.06%	78
Total Respondents: 518		

Q8 Which of the following species do you believe are increasing in numbers (you may select as many as you wish)?

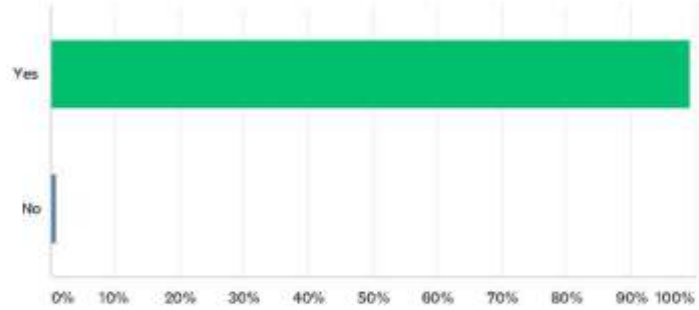
Answered: 518 Skipped: 27



ANSWER CHOICES	RESPONSES	
Murray cod	22.39%	116
Silver perch	21.43%	111
Golden perch (Callop)	45.95%	238
Eel Tail catfish	21.43%	111
Redfin	16.02%	83
European carp	62.55%	324
All	9.46%	49
None	5.79%	30
Total Respondents: 518		

Q9 In the past 18 months, 143,000 Murray cod fingerlings have been stocked into the River Murray, do you support this?

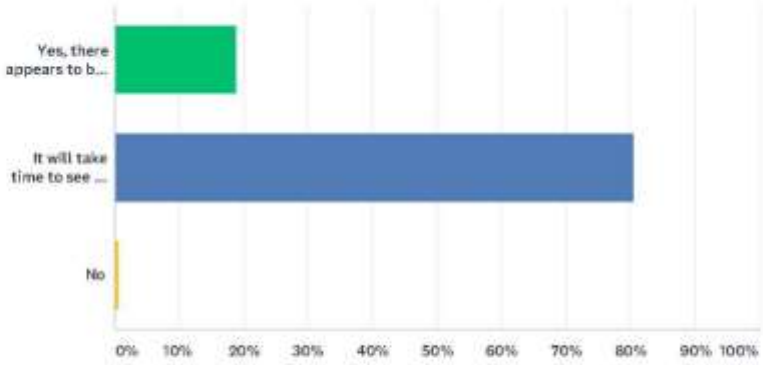
Answered: 506 Skipped: 39



ANSWER CHOICES	RESPONSES	
Yes	99.21%	502
No	0.79%	4
TOTAL		506

Q10 Do you believe that the stocking project is producing positive results?

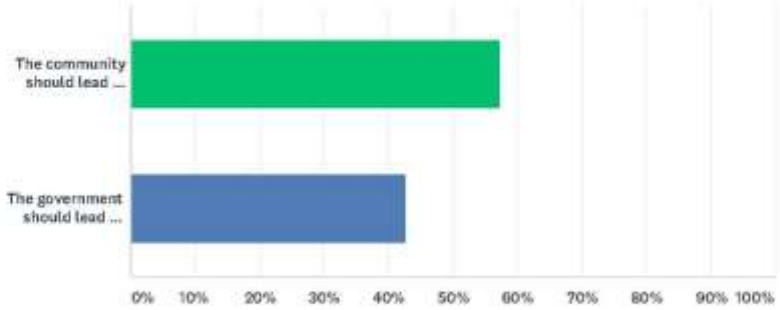
Answered: 506 Skipped: 39



ANSWER CHOICES	RESPONSES	
Yes, there appears to be more small Murray cod in the River Murray	18.77%	95
It will take time to see the results	80.63%	408
No	0.59%	3
TOTAL		506

Q11 If a long term Murray cod stocking program were established, how do you think it should be managed?

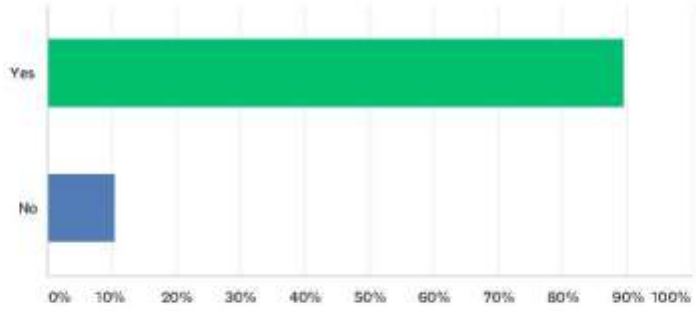
Answered: 506 Skipped: 39



ANSWER CHOICES	RESPONSES	
The community should lead it with government support	57.31%	290
The government should load it with community support	42.69%	216
TOTAL		506

Q12 A long term Murray cod stocking program is estimated to cost a minimum of $500,000/year and up to $1.0 million/year to stock 350,000 - 500,000 fish, do you think that spending this amount of money is justified to restore stocks of Murray cod?

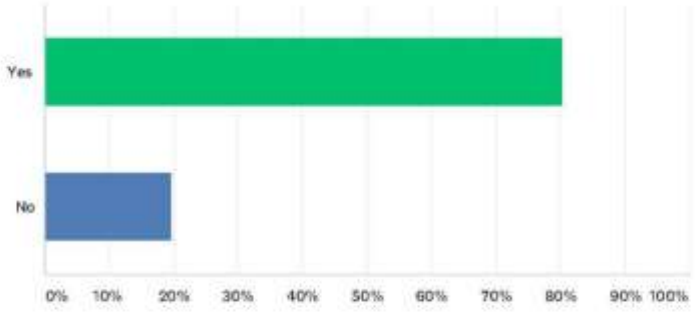
Answered: 506 Skipped: 39



ANSWER CHOICES	RESPONSES	
Yes	89.53%	453
No	10.47%	53
TOTAL		506

Q13 Implementing a Murray cod stocking program is likely to require an investment of money from the recreational fishing community and may require the establishment of a River Murray fishing permit to raise the necessary funds - would you support this?

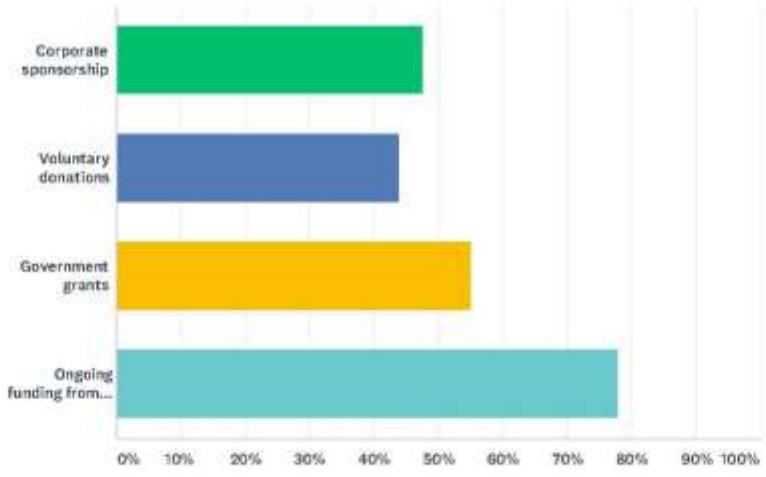
Answered: 506 Skipped: 39



ANSWER CHOICES	RESPONSES	
Yes	80.24%	406
No	19.76%	100
TOTAL		506

Q14 What other means of funding could be used for a stocking project?

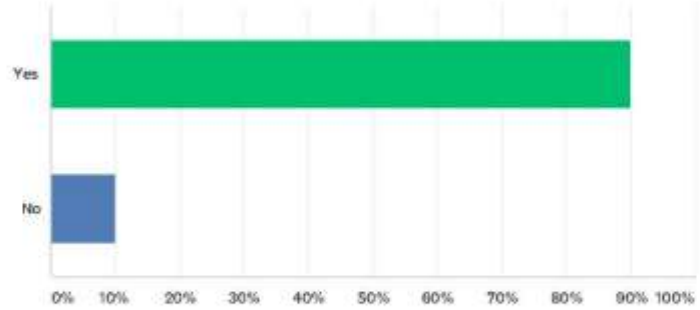
Answered: 506 Skipped: 39



ANSWER CHOICES	RESPONSES	
Corporate sponsorship	47.43%	240
Voluntary donations	43.87%	222
Government grants	54.94%	278
Ongoing funding from the government	77.87%	394
Total Respondents: 506		

Q15 Have you heard about the Carp virus which has the potential to dramatically reduce European carp populations in the River Murray?

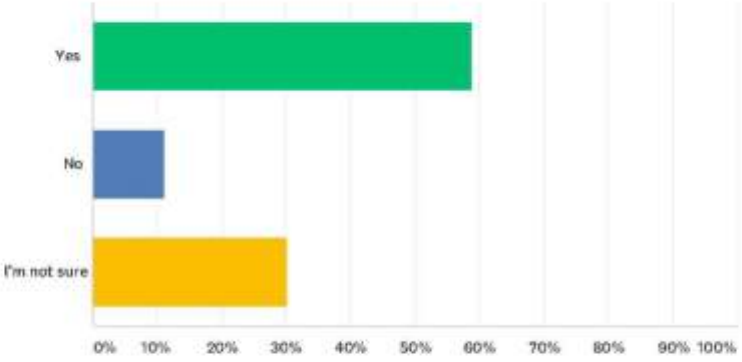
Answered: 492 Skipped: 53



ANSWER CHOICES	RESPONSES	
Yes	90.04%	443
No	9.96%	49
TOTAL		492

Q16 Do you support the use of this virus to reduce carp numbers?

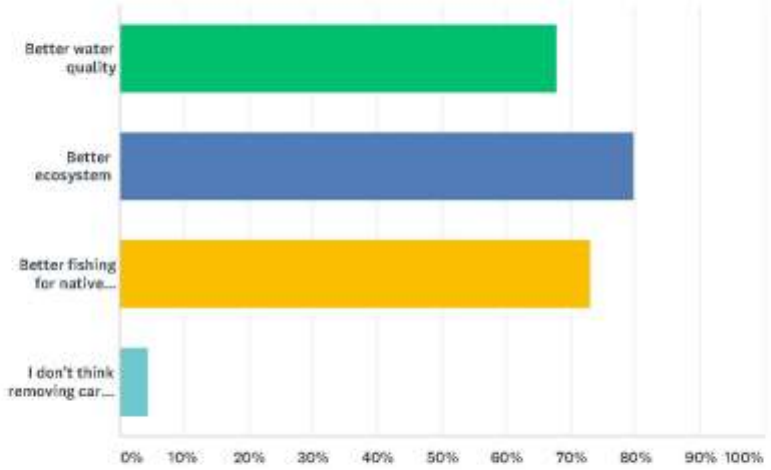
Answered: 491 Skipped: 54



ANSWER CHOICES	RESPONSES	
Yes	58.86%	289
No	11.00%	54
I'm not sure	30.14%	148
TOTAL		491

Q17 What do you believe would be the major benefits from removing carp from the River Murray

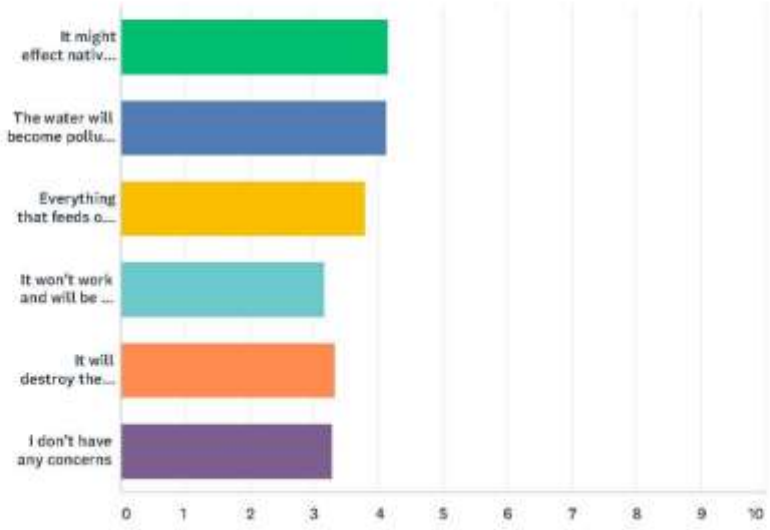
Answered: 492 Skipped: 53



ANSWER CHOICES	RESPONSES	
Better water quality	67.89%	334
Better ecosystem	79.67%	392
Better fishing for native species	72.97%	359
I don't think removing carp will provide any benefit	4.47%	22
Total Respondents: 492		

Q18 Rank your concerns about releasing the Carp virus into our native waterways?

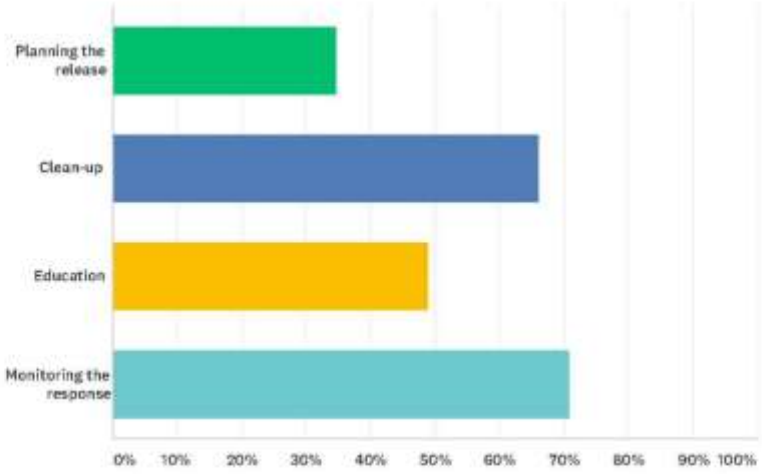
Answered: 473 Skipped: 72



	1	2	3	4	5	6	TOTAL	SCORE
It might effect native species	33.79% 99	20.14% 59	10.92% 32	9.90% 29	12.29% 36	12.97% 38	293	4.14
The water will become polluted by dead carp	24.07% 78	29.63% 96	15.74% 51	8.33% 27	8.95% 29	13.27% 43	324	4.12
Everything that feeds on carp (e.g. birds) will be detrimentally effected.	7.95% 24	22.52% 68	33.44% 101	18.87% 57	9.93% 30	7.28% 22	302	3.78
It won't work and will be a waste of money	10.55% 29	12.36% 34	17.09% 47	22.55% 62	17.82% 49	19.64% 54	275	3.16
It will destroy the commercial carp fishery in the Lower Lakes	19.12% 61	9.40% 30	12.54% 40	16.93% 54	27.90% 89	14.11% 45	319	3.33
I don't have any concerns	29.04% 97	5.09% 17	11.98% 40	9.28% 31	7.78% 26	36.83% 123	334	3.28

Q19 If the carp virus was to be released, what role should the community play in the project?

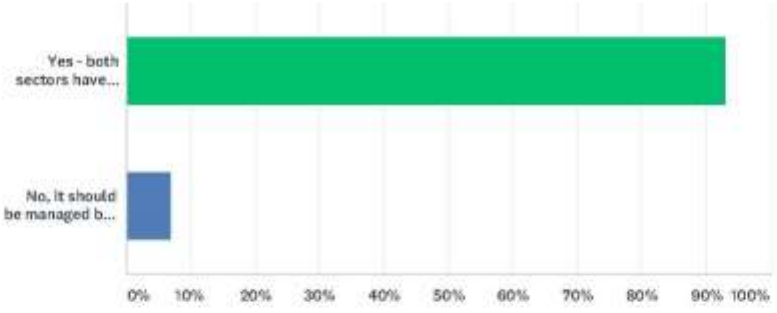
Answered: 483 Skipped: 62



ANSWER CHOICES	RESPONSES	
Planning the release	34.78%	168
Clean-up	66.05%	319
Education	48.86%	236
Monitoring the response	71.01%	343
Total Respondents: 483		

Q20 Co-management is about the community and government sharing responsibility for managing natural resources, do you think that this policy is applicable to the management of recreational fishing in the River Murray?

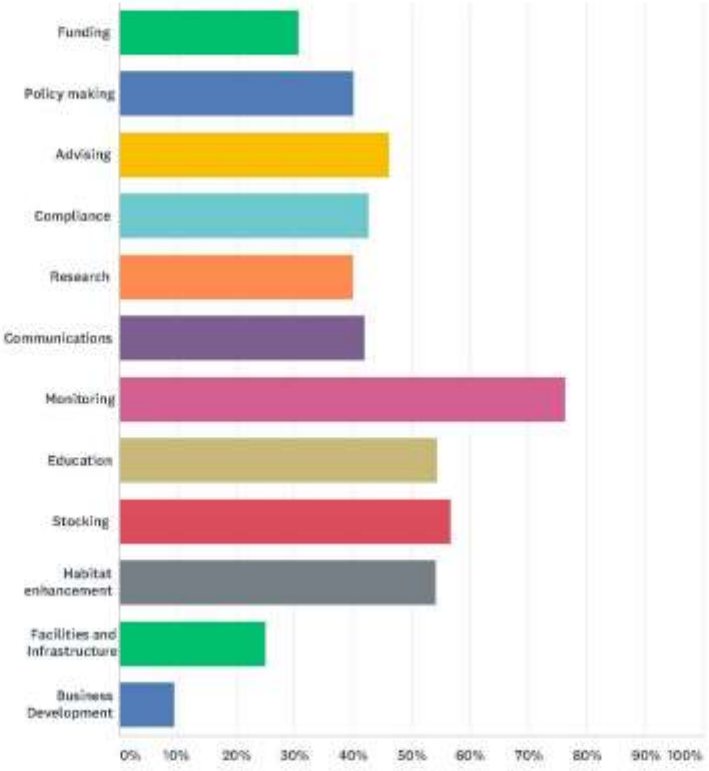
Answered: 478 Skipped: 67



ANSWER CHOICES	RESPONSES	
Yes - both sectors have a key role to play in management	93.10%	445
No, it should be managed by government	6.90%	33
TOTAL		478

Q21 A collaborative co-management system requires that both the community and government make meaningful contributions to achieving recreational fishery objectives; in which of the following elements do you think the community can add the greatest value? (pick five)

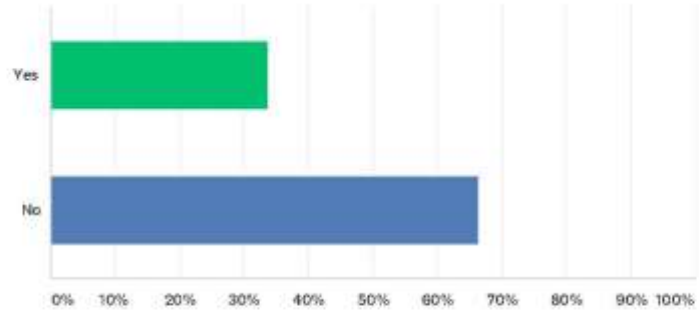
Answered: 478 Skipped: 67



ANSWER CHOICES	RESPONSES	
Funding	30.75%	147
Policy making	40.17%	192
Advising	46.23%	221
Compliance	42.68%	204
Research	39.96%	191
Communications	42.05%	201
Monitoring	76.36%	365
Education	54.39%	260
Stocking	56.69%	271
Habitat enhancement	54.18%	259
Facilities and Infrastructure	25.10%	120
Business Development	9.41%	45
Total Respondents: 478		

Q22 Over coming months, further consultation will be taken on developing a co-management approach of the recreational fishery in the River Murray; would you be prepared to participate in a workshop about this issue? (Please note that the workshop is likely to be held during work hours in the Riverland).

Answered: 475 Skipped: 70



ANSWER CHOICES	RESPONSES	
Yes	33.68%	160
No	66.32%	315
TOTAL		475

Q23 If you answered Yes to Question 22, please provide your name and email address in the box below.

Answered: 154 Skipped: 391

Appendix B: Invitation to River Murray Recreational Fishing Co-Management Workshop

Beyond Engagement: Moving Towards a Co-Management Model for Recreational Fishing in South Australia

An invitation to you and your friends to attend....

River Murray Recreational Fishing Co-Management Workshop

Wednesday 7 March 2017

6 - 8 pm Berri Hotel

RecFish SA, the Peak Body for Recreational Fishing in SA thanks you for contributing to our survey on how recreational fishing in the River Murray can be managed and appreciates your interest in attending this important community workshop.

The aim of workshop is to idenify the ways in which the community to can play a greater role in the management of recreational fishing in the River Murray including

- Fish stocking programs
- Rules and regulations
- Funding
- Habitat restoration
- Education

The outputs from the workshop will be used to develop an approach to co-managing recreational fishing which will be submitted to government for further development. Important components of the Co-management system will include approaches to consultation, research, community monitoring and stocking.

RSVP

Please RSVP to RecFish SA at oa@recfishsa.org.au indicating the number attendees by cob 28 February 2018.

CONTACT

For further information, please contact Danny Simpson, Executive Director RecFish SA (details below)
Mob. 0400 774 447 | ed@recfishsa.org.au

Appendix C: Agenda - River Murray Recreational Fishing Co-Management Workshop

PRIMARY INDUSTRIES & REGIONS SA PIRSA

RecFish SA

FRDC

Beyond Engagement: Moving Towards a Co-Management Model for Recreational Fishing in South Australia

River Murray Recreational Fishing Co-Management Workshop
Wednesday 7 March 2017
6.00 pm Berri Resort Hotel

Agenda

1.	Welcome	6.00 pm
2.	What are we hoping to achieve?	6.05
3.	What is Co-Management?	6.10
4.	Survey Results	6.25
5.	What does Co-management look like for the River Murray?	6.45
	a. Governance	
	b. Communities	
	c. Resources/Management	
	d. Approach	
6.	Priority Setting	7.15
7.	Next Steps	7.45
8.	Close	8.00

Appendix 3 Research staff

Keith Rowling PI, PIRSA Fisheries and Aquaculture

Jacki Schirmer CI, University of Canberra

Danny Simpson CI, RecFish SA

Qifeng Ye CI, SARDI Aquatic Sciences

Appendix 4 Intellectual Property

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Government of South Australia

Primary Industries and Regions SA