FRDC
FISHERIES RESEARCH & DEVELOPMENT CORPORATION

# Implementation workshop:

## Effective adoption of the outcomes from the SESSF Declining Indicators project

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**February 2020**

FRDC Project No **FRDC 20180/077**

ISBN **[978-1-877044-40-3]**

Implementation workshop: effective adoption of the outcomes from the SESSF Declining Indicators project
FRDC 2018/077



This publication (and any information sourced from it) should be attributed to Day, G., Knuckey, I., Corrie, D and Macdonald, B. (2020). *Implementation workshop: effective adoption of the outcomes from the SESSF Declining Indicators project.* Australian Fisheries Management Authority, Canberra.



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In submitting this report, the researcher has agreed to FRDC publishing this material in its edited form.

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# Acknowledgments

The authors would like to thank: the Fisheries Research and Development Corporation (FRDC) for funding the workshop; Kevin Stokes for Chairing the workshop; Cate Coddington (AFMA) and Kehani Manson (AFMA) for organising the workshop; Rich Little (CSIRO); Cathy Dichmont (Cathy Dichmont Consulting); Sandy Morison (Morison Aquatic Sciences); and all workshop attendees and for their assistance and advice.

# Executive Summary

Since the 2006 structural adjustment program, which saw a large reduction in the number of fishing boats in the Southern and Eastern Scalefish and Shark Fishery (SESSF), the fishery has been undergoing a period of substantial change. These changes have included an increased focus on ecosystem based fisheries management, fewer quota species being targeted by fishers, Total Allowable Catches (TACs) for many quota species being significantly under caught and some stocks continuing to decline, or not recovering, despite reduced fishing effort.

These changes have prompted important research, supported by the Fisheries and Research Development Corporation (FRDC), to improve fishery outcomes for the benefit of fishers and the Australian community. This project, incorporating a workshop involving representatives from all SESSF stakeholder groups, has been an important step in identifying, understanding, rationalising and prioritising the outcomes of this recently completed research to best respond to the changes and maximise the benefits of the fishery.

The key outcome of this project is the implementation plan at **Appendix 1** which provides a comprehensive, prioritised list of actions for the SESSF as it transitions to a new harvest strategy framework. The implementation plan also provides a framework for ongoing governance and reporting to ensure the benefits of recent research can be realised.

This project ensured that views of stakeholders were taken into account in the effective adoption of research outcomes. The high level of stakeholder engagement has increased support for pursuing the resultant list of actions.

Fundamental to the transition of the SESSF is the current FRDC project to revise and update the SESSF Harvest Strategy Framework (*Development and evaluation of multi-species harvest strategies in the SESSF* (FRDC 2018-021)). Many of the recommendations from the implementation plan at **Appendix 1** will help inform that project.

**Keywords**

**Southern and Eastern Scalefish and Shark Fishery (SESSF), Fisheries Management, Monitoring and Assessment, Fishery Independent Survey, Harvest Strategies.**

# Introduction

The SESSF is Australia's most valuable multi-gear, multi-species fishery, with gross value of production in 2017-18 of approximately $76 million. It covers almost half of the Australian Fishing Zone from Fraser Island in southern Queensland to Cape Leeuwin in southern Western Australia. The fishery supplies much-loved Australian seafood including flathead, gummy shark, pink ling, blue-eye trevalla and blue grenadier.

The SESSF has been undergoing a period of substantial change. Starting in 2006 with a structural adjustment program that reduced the number of boats in the fishery by around half, this has included:

- greater focus on ecological risk assessment, protected species monitoring and bycatch management
- fishers targeting a smaller number of key economic species
- the TACs for secondary, less important, quota species becoming increasingly under-caught
- some stocks continuing to decline, or not recovering, despite reduced fishing effort
- climate and species productivity changes
- implementation of the recently revised *Commonwealth Fisheries Harvest Strategy Policy 2018* and *Commonwealth Bycatch Policy 2018* which require, amongst other things, the pursuit of maximum economic returns from the fishery as a whole and greater monitoring and management of byproduct and bycatch species.

These changes have prompted important research, supported by FRDC, into monitoring and assessment (*Strategic Review of SESSF Monitoring and Assessment* (FRDC 2014-203)), declining indicators (*Understanding factors influencing under-caught TACs, declining catch rates and failure to recover for many quota species in the SESSF* (FRDC 2016-146)) and the resultant project to revise and update the SESSF Harvest Strategy Framework (*Development and evaluation of multi-species harvest strategies in the SESSF* (FRDC 2018-021)- see Figure 1).

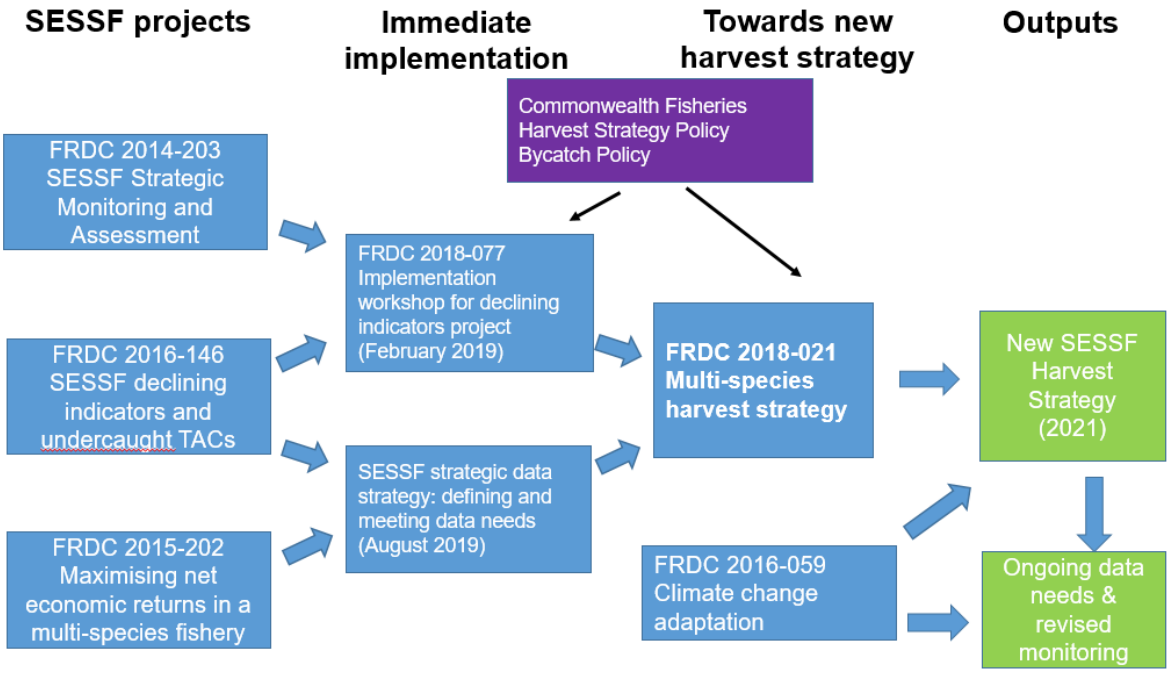


**Figure 1: Research towards revised monitoring and assessment and a new SESSF harvest strategy**

Further projects are investigating the impacts and potential responses to climate change, including: *Decadal scale projection of changes in Australian fisheries stocks under climate change* (FRDC 2016-139); and *Adaptation of Commonwealth fisheries management to climate change* (FRDC 2016-059).

Ultimately this body of work will support the SESSF's transition to a new harvest strategy. To ensure that this transition is made effectively, that the outcomes of available research are clearly identified and prioritised, and to help inform the design of the project *Development and evaluation of multi-species harvest strategies in the SESSF* (FRDC 2018-021), the current project (FRDC 2018-077) centred on an implementation workshop drawing together the expertise of around 40 key stakeholders (Table 1):

**Table 1: Workshop attendees**

| **Sector** | **Attendees** |
|---|---|
| Commercial fishing | Simon Boag, John Jarvis, Tony Lavalle, Neil McDonald, Will Mure, David Stone |
| Recreational fishing | Russell Conway |
| Environmental | Erik Raudzens |
| Fisheries scientists and consultants | Paul Burch, Jemery Day, Cathy Dichmont Malcolm Haddon, Rich Little, Sandy Morison, Andrew Penney, David Smith, Robin Thompson, Geoff Tuck |
| Fisheries economists | Robert Curtotti, Sarah Jennings, David Mosby, Sean Pascoe (dialling in) |
| Fisheries managers | Louise Cathroe, Cate Coddington, Dan Corrie, George Day, Danait Ghebrezgabhier, Ryan Keightley |

| | |
|---|---|
| Fisheries Research and Development Corporation | Carolyn Stewardson |
| Commonwealth Department of Agriculture and ABARES | Liz Claridge, Tony Harman, Fay Helidoniotis, Amara Steven, James Woodhams |
| Commonwealth Department of Environment | James Newman |
| State fisheries | Karina Hall (NSW), Thor Saunders (NT), Veronica Silberschneider (NSW) |

The workshop was held in Ainslie, Australian Capital Territory, on 26-27 February 2019. Workshop attendees identified, scoped and prioritised the key research outcomes from the various SESSF projects with the outcomes captured in the comprehensive implementation plan (**Appendix 1**). The workshop advice also informed discussions at the SESSF Data Strategy meeting held on 27-28 February 2019, and subsequent discussions of the SESSF Resource Assessment Group on 28 February – 1 March 2019 and 22-22 August 2019, with the objective of defining, and devising means to achieve, data and monitoring needs for the fishery. These workshop outcomes will be captured in the SESSF data strategy, part of the comprehensive Fishery Management Strategy which is currently being prepared.

# Objectives

1. Drawing together, evaluating and developing a prioritised list of actions from the SESSF from a number of interrelated projects. Primarily *Understanding factors influencing under-caught TACs, declining catch rates and failure to recover for many quota species in the SESSF* (FRDC 2016-146) and *Strategic Review of SESSF Monitoring and Assessment* (FRDC 2014-203).
2. Informing the project *Development and evaluation of multi-species harvest strategies in the SESSF* (FRDC 2018-021) about key priorities and preferred approaches relevant to the development of a revised harvest strategy.
3. Providing information that will inform a SESSF data needs workshop, to be organised and funded by AFMA, held in February 2019.
4. Effectively communicating agreed priorities for the fishery across industry and broader SESSF stakeholders to promote awareness, understanding and acceptance.

# Method

This project focussed on a stakeholder workshop held on 26-27 February 2019 (the workshop agenda is at **Appendix 2**). Relevant background information was provided to participants before the meeting, including outcomes from the projects *Understanding factors influencing under-caught TACs, declining catch rates and failure to recover for many quota species in the SESSF* (FRDC 2016-146) and *Strategic Review of SESSF Monitoring and Assessment* (FRDC 2014-203). Participants were also presented with details of *Adaptation of Commonwealth fisheries management to climate change* (FRDC 2016-059).

Importantly, to support close links to the development of the new SESSF Harvest Strategy Framework, participants were provided with the background to the project *Development and evaluation of multi-species harvest strategies in the SESSF* (FRDC 2018-021).

The workshop was facilitated by Dr Kevin Stokes, a fisheries science, management and policy consultant with extensive international experience. It was coordinated by Dr Ian Knuckey, who led both the *Understanding factors influencing under-caught TACs, declining catch rates and failure to recover for many quota species in the SESSF* (FRDC 2016-146) and the *Strategic Review of SESSF Monitoring and Assessment* (FRDC 2014-203) projects. The workshop agenda is included at **Appendix 2**.

Dr Richard Little, the *Principal Investigator of Development and evaluation of multi-species harvest strategies in the SESSF* (FRDC 2018-021) attended the workshop along with project team members Simon Boag, Dan Corrie, Dr Jemery Day, Dr Ian Knuckey, Dr Sean Pascoe and Dr Geoff Tuck.

The workshop attendees discussed the current operating environment in the SESSF and, within this context, key outcomes from relevant research. SurveyMonkey real time survey technology was used to elicit priorities from all attendees, along with recommendations on approaches to implementation (see **Appendix 1)**.

During the second half of the workshop the *Development and evaluation of multi-species harvest strategies in the SESSF* (FRDC 2018-021) project was discussed, and relevant actions were rationalised, prioritised and provided to that project team. Dr Little contextualised and scoped these issues in more detail using the surveys and smaller focus groups.

**The projects**

The workshop participants were provided with background information on key projects for implementation in the SESSF. The outcomes most relevant for the implementation workshop are highlighted below.

***SESSF Strategic Review of SESSF Monitoring and Assessment (FRDC 2014-203)***

Workshop participants were provided with the outcomes from *SESSF Strategic Review of SESSF Monitoring and Assessment* which are available here: https://www.frdc.com.au/Archived-Reports/FRDC%20Projects/2014-203-DLD.pdf. The key outcomes raised by *SESSF Strategic Review of SESSF Monitoring and Assessment* relevant to implementation, as captured in **Appendix 1**, were:

- proposed species classification: key commercial, secondary commercial, byproduct and bycatch
- modified assessment tiers: Tier 1 for key commercial; Tier 4 for secondary; Tier 5 or ERA for remainder

- adopting multi-year Total Allowable Catches (and under-caught species assessed less frequently)
- undertaking Management Strategy Evaluation (MSE) testing of the harvest strategy.

***Understanding factors influencing under-caught TACs, declining catch rates and failure to recover for many quota species in the SESSF (FRDC 2016-146)***

Many of the workshop participants had been involved in *Understanding factors influencing under-caught TACs, declining catch rates and failure to recover for many quota species in the SESSF*. The outcomes and recommendations were provided to participants and are available here: https://www.frdc.com.au/Archived-Reports/FRDC%20Projects/2016-146-DLD.pdf as well as being captured in **Appendix 1**.

*Understanding factors influencing under-caught TACs, declining catch rates and failure to recover for many quota species in the SESSF* used a wide range of expertise (business, science, management) available across all facets of fisheries management (sustainability, economics and social) to consider and prioritise the potential range of underlying factors categorised into seven issues: 1) legislative or management impediments; 2) fleet capacity and characteristics; 3) fisher behaviour and vessel operation; 4) climate change and oceanographic conditions; 5) costs of production and changing markets; 6) quota ownership and trading; and, 7) the assessment process.

These seven issues were explored by relevant experts. The findings were presented and discussed at a workshop involving SESSF fishers and other stakeholders. Key issues raised by *Understanding factors influencing under-caught TACs, declining catch rates and failure to recover for many quota species in the SESSF* relevant to implementation were:

- the fishery had shifted to target economic driver species such as blue-eye trevalla, flathead, gummy shark, pink ling and whiting which were close to fully caught
- blue grenadier could be considered a key economic driver species but had been under-caught for operational reasons
- secondary quota species were well under-caught (roughly 70 per cent)
- along with under-caught TACs and despite the reduction in effort, there remain a number of declining indicators in the fishery that may point to significant sub-optimal performance in terms of stock sustainability and fishery profitability. These include declining CPUE for many species and a lack of recovery of several overfished species
- the east coast of Australia has been identified as a climate change 'hot spot' and there are indications that productivity changes are affecting the recovery of some species.

Amongst other recommendations provided in the report, *Understanding factors influencing under-caught TACs, declining catch rates and failure to recover for many quota species in the SESSF* recommended (as summarised in **Appendix 1**):

- including environmental and technological change in Catch Per Unit of Effort (CPUE) analyses and assessments
- exploring potential for new indicators that are relevant to markets and economics. For example, in addition to CPUE to track stock abundance, Dollars Per Unit of Effort ($PUE) may provide additional information if behaviour (e.g. targeting) changes in response to market price changes
- developing a robust method to determine if there has been a productivity change for a species
- updating biological information for SESSF species: life history characteristics etc.

- as progressed by this current project, critically considering the results and recommendations of the four recent SESSF-related projects (FRDC 2014-203, FRDC 2016-139, FRDC 2016-059 and the current project FRDC 2016-146) in light of the recently revised *Commonwealth Fisheries Harvest Strategy Policy* and *Commonwealth Fisheries Bycatch Policy* to inform directions for future management of the SESSF and, in particular, the development and evaluation of multi-species harvest strategies in the SESSF.

***Adaptation of Commonwealth fisheries management to climate change (FRDC 2016-059) and Decadal scale projection of changes in Australian fisheries stocks under climate change (FRDC 2016-139)***

Workshop participants were updated on the progress of the project *Adaptation of Commonwealth fisheries management to climate change* (FRDC 2016-059). This project was addressing how the Commonwealth fisheries management framework would respond to climate change impacts using risk assessment and impact pathway approaches.

It was noted that management flexibility will be a key foundation of the response, with changes in species' distribution, abundance and phenology dependent on their sensitivity to climate change. This, along with ecosystem modelling based on new climate projects, was considered in the project *Decadal scale projection of changes in Australian fisheries stocks under climate change* (FRDC 2016-139). Relevantly, this project recommended that fisheries policy, management and assessment need to integrate the concept of regime shift and extreme events for decision making and there needs to be greater recognition of non-static environmental conditions.

**Commonwealth fisheries policies updates**

Workshop participants noted the recent revisions of the *Commonwealth Fisheries Harvest Strategy Policy* and *Commonwealth Fisheries Bycatch Policy.* A summary of the key points relevant to implementation was provided in the background papers and discussed at the workshop. The revised policy framework was incorporated into both the implementation plan and recommendations made to the project team of *Development and evaluation of multi-species harvest strategies in the SESSF* (FRDC 2018-021). For example:

- all species landed and sold in Commonwealth fisheries are considered commercial species. All commercial species in a fishery are to be categorised as either key commercial (most relevant to the objective of maximising net economic returns) or byproduct
- in multi-species fisheries, managing individual stocks to different target reference points may be necessary to achieve fishery level maximum economic yield
- variability in ocean conditions, due to natural variability, climate change or other factors, can affect the productivity of stocks. Fisheries should seek to account for that variability when developing and implementing harvest strategies
- the development of harvest strategies and the selection of reference points within those harvest strategies need to be realistic with respect to the scale or nature of the fishery and the resources available to manage it
- harvest strategies will be formally tested to assess whether they are highly likely to meet the objective of this policy.

# Results, discussion and conclusion

### *The workshop*

The implementation workshop was successfully held on 26-27 February 2019. It was Chaired by Kevin Cochrane and attended by all key SESSF stakeholder groups including fisheries scientists, Commonwealth and State fishery managers, fisheries economists, representatives from the commercial fishing and recreational fishing sectors, an environment non-governmental organisation, the Fisheries Research and Development Corporation, the Department of Agriculture and the Department of the Environment (attendees are listed in Table 1 above).

The workshop recommendations incorporated real time survey data from participants which included survey questions and free text responses. Survey responses were from the following self-identified groups: fishing / seafood industry (16.67%); fisheries managers (13.89%); fisheries researchers (50%); eNGO (2.78%); and 'other' such as government, independent consultant and economists (16.67%).

Recommendations were made following consideration of the current conditions in the fishery, the revised *Commonwealth Fisheries Harvest Strategy Policy* and *Commonwealth Fisheries Bycatch Policy*, and relevant research projects. Survey results were categorised and prioritised by:

- issue: climate change; data; economics; ecosystem; harvest strategies; and social factors
- group responsible for implementing: AFMA IT Branch; AFMA Management; external project; Resource Assessment Group (RAG); and the Multi-Species Harvest Strategy project.

Priorities identified by workshop participants are included in the implementation plan (**Appendix 1**), with the final implementation priority assigned by the authors after considering relative merits of the different priorities. Some, but not all, survey comments have been included in the implementation plan by the authors where the comment is relevant and can be linked to a specific recommendation. The complete workshop survey results are included at **Appendix 3**.

A key element underlying the discussions was the declining indicators that have been persistent in the fishery: under-caught TACs; declining CPUE; and non-recovering stocks. To assist in capturing some of these issues for participants, Dr Andrew Penney presented a declining indicators options flow chart set out below (Figure 2).

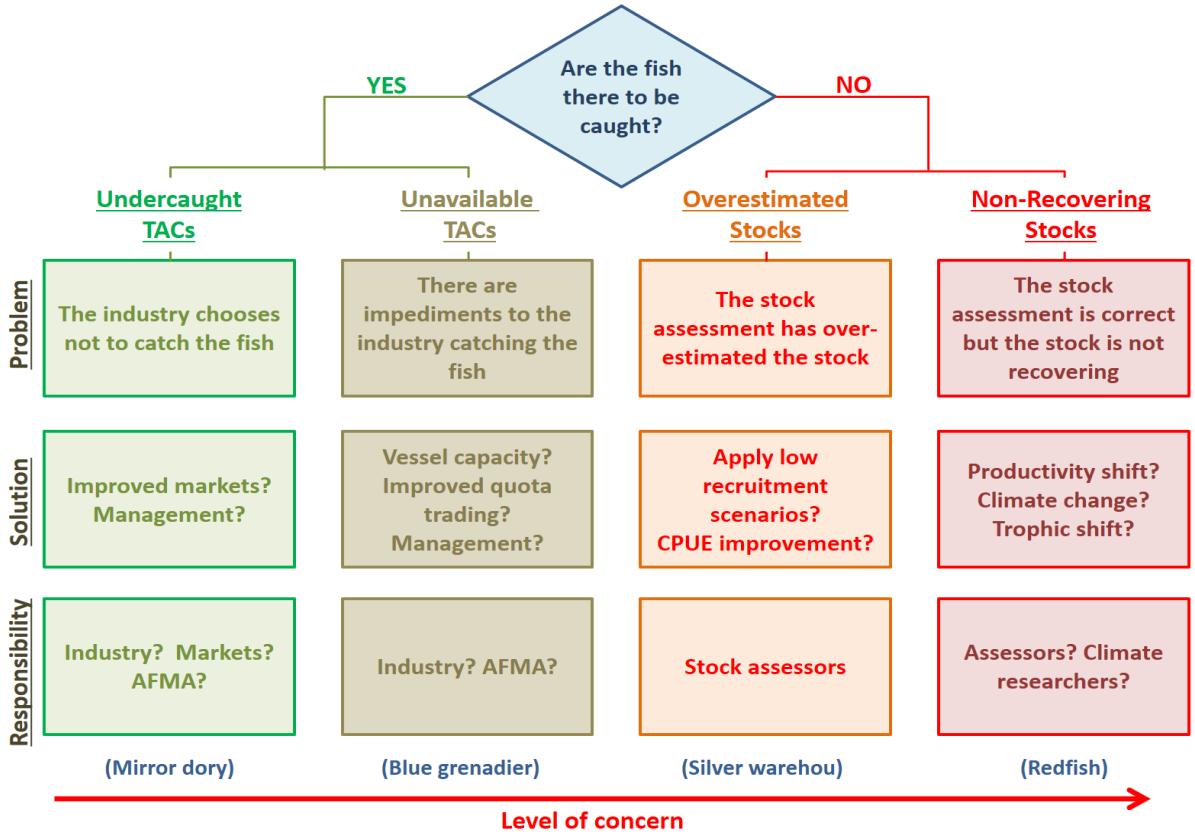


**Figure 2 Declining indicators flow chart (Andrew Penney)**

Many of the recommendations discussed as part of the implementation workshop were directly relevant to the project *Development and evaluation of multi-species harvest strategies in the SESSF* (FRDC 2018-021). The Principal Investigator for this project, Dr Richard Little, used the second half of the workshop to investigate these issues in more detail, including through smaller focus group discussions.

The key outcome of the workshop is the implementation plan at **Appendix 1**. The recommendations relevant to the SESSF data needs workshop were captured in the meeting outcomes as discussed by SESSFRAG available here: https://afma.govcms.gov.au/sites/default/files/sessfrag_february_2019_meeting_minutes.pdf.

### *Governance and reporting*

The AFMA Commission has oversight of implementation plan and, ultimately, the transition of the SESSF to a new Harvest Strategy Framework. Regular reports against the implementation plan are provided to the Commission. This includes:

- current monitoring targets and success in achieving them
- long term monitoring strategy
- progress of the review of the SESSF Harvest Strategy Framework
- interim harvest control rules for species as required, along with the resulting TACs
- database management and related AFMA Information Technology projects: *AFMA E-Fish Project* (FRDC 2018-026); and 'Agency Data Capture'.

Regular project reports outlining progress on implementation will be made available to the SESSF Resource Assessment Group and the South East Management Advisory Committee.

# Extension and Adoption

The key output from this project is the implementation plan, which is the prioritised list of defined actions for the SESSF at **Appendix 1**.

Another fundamentally important outcome of this project was the provision of guidance to the FRDC project *Development and evaluation of multi-species harvest strategies in the SESSF* (FRDC 2018-021). Ultimately, this work, along with the new *Commonwealth Fisheries Harvest Strategy Policy*, should result in a significantly revised stock assessments and Harvest Strategy for the SESSF.

Project outputs will be communicated to AFMA and its associated Resource Assessment Groups and Management Advisory Committees as well as the Department of Agriculture.

Industry and stakeholder communication will form a key part of the continued response to the implementation plan, given the importance of stakeholder awareness and acceptance of the outcome.

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# Appendices

### Appendix 1 – Implementation Plan

### Appendix 2 – Workshop agenda

### Appendix 3 – Workshop survey results

# Appendix 1 – SESSF Implementation Plan

| Terms, abbreviations and acronyms | Meaning |
|---|---|
| CPUE | Catch per unit of effort |
| CTS | Commonwealth Trawl Sector |
| ERA | Ecological Risk Assessment |
| GABT | Great Australian Bight Trawl |
| GHAT | Gillnet, Hook and Trap |
| ISMP | Integrated scientific monitoring (observer) program |
| FMS | Fisheries Management Strategy |
| FRDC | Fisheries Research and Development Corporation |
| HS | Harvest Strategy |
| PBR | Potential Biological Removals |
| RAG | Resource Assessment Group |
| SEMAC | South East Management Advisory Committee |
| SESSF | Southern and Eastern Scalefish and Shark Fishery |
| SFR | Statutory Fishing Rights |
| SMARP | Strategic Monitoring and Assessment Review Project |
| SSIA | Southern Shark Industry Alliance |
| TEP | Threatened, endangered and protected species |

# SESSF monitoring, data, assessment and harvest strategy implementation workplan

| Recommendation (numbered as per the source research report) | Priority based on survey results (Appendix 4) | Status and timeframe | Cost and resourcing | Implementation approach: how and who | Workshop comments and guidance on implementation (survey comments unless otherwise stated) |
|---|---|---|---|---|---|
| **Data** | | | | | |
| SESSFRAG Action Item: ISMP and crew collected biological targets met. | High: key SESSF priority. | On track: SESSFRAG reviewed in August 2019. | Within SESSF budget. | Quarterly ISMP and SSIA reports to RAGs and the AFMA Commission. | 'Data collection underlies all management decisions, this needs to become a priority of SESSFRAG. The first step is to ensure that existing targets are being met.' |
| SMARP 1: Develop integrated data collection plans for each SESSF sector.<br><br>SMARP 7: As part of the development of integrated data collection plans, prevent the collection of duplicate data across multiple data collection systems. | High:<br>SMARP 1 workshop ranked as highest priority related to data and RAG priorities.<br><br>SMARP 7 workshop ranked as medium priority related to data and low priority related to RAG priorities. | On track<br>SESSFRAG advice in August 2019.<br>AFMA Management to finalise FMS data plan chapters.<br>SEMAC to provide advice before AFMA finalisation. | Low cost.<br><br>Within AFMA and SESSF budget. | AFMA to update existing data plans and incorporate into FMS chapters.<br>AFMA e-Fish Project (FRDC 2018-026) aims to create a set of design principles for a data infrastructure capable of linking, integrating and sharing fisher reported data. | Authors: Fishery RAGs have already agreed data plans identifying data sources. This is reviewed annually at SESSFRAG's data meeting.<br><br>'Implementing SMARP #1 should flow through to all others, i.e. what do we need, how do we get it how do we use it?'<br><br>'A common theme that seems to be constant through all the discussions is that SESSF has a data problem, more than assessment, and management decision-making. This seems to be the root of all the concerns.'<br><br>'Work with industry to implement cost effective collection processes.' |
| SMARP 12: Streamline and automate AFMA's data collection, storage, distribution and reporting procedures for all major data sources. | High:<br>Workshop ranked as high priority related to data and highest priority for AFMA's IT area. | On track through AFMA's IT area. | Medium cost.<br><br>Within AFMA budget. | AFMA's Agency Data Capture project aims to better integrate electronic data collection. | 'Better integration and data warehousing to link separate databases but still need to maintain flexibility to include new datasets as they arise.' |
| SMARP 5: Expedite the complete rollout of e-Logbooks and e-CDRs to all vessels in the SESSF fisheries. | High:<br>Workshop ranked as high priority related to data and medium priority for AFMA's IT area. | On track<br>Compulsory e-logs were introduced in the CTS on 1 May 2018 and GHAT on 1 July 2018.<br>E-CDRs being considered in AFMA's Agency Data Capture project. | Medium cost.<br><br>Within AFMA budget. | e-Logbooks are now required in the SESSF. AFMA's Agency Data Capture project aims to better integrate electronic data collection, including investigating the use of e- CDRs. | 'Either provide incentives for their deployment (subsidise) or make them a mandatory requirement (or both).' |
| SMARP 6: Develop and implement agreed, automated data validation and error checks for e-Logbooks and e-CDRs. | High:<br>Workshop ranked as high priority related to data and medium priority for AFMA's IT area. | On track.<br>Compulsory e-logs were introduced in the CTS on 1 May 2018 and GHAT on 1 July 2018.<br>E-CDRs being considered in AFMA's Agency Data Capture project. | Medium cost.<br><br>Within FRDC project budget for e-Fish and AFMA budget for Agency Data Capture. | To be incorporated into AFMA e-Fish Project (FRDC 2018-026) and AFMA's Agency Data Capture project. | 'Rather than develop validation procedures from scratch, review procedures used by other organisations that manage and collate fisheries data (e.g. CCAMLR, AAD, States, NZ). Identify those aspects of the data for which validation is important (it wont be worth correcting everything) and their associated validation rules. Then implement the selected rules in two ways, firstly as a prompt/popup data entry for some rules then for other rules on submission to AFMA.' |

| Recommendation (numbered as per the source research report) | Priority based on survey results (Appendix 4) | Status and timeframe | Cost and resourcing | Implementation approach: how and who | Workshop comments and guidance on implementation (survey comments unless otherwise stated) |
|---|---|---|---|---|---|
| SMARP 20: Develop efficient and automated analysis and reporting of fishery and species indicators, including evaluation of triggers for re-assessment of primary and secondary species. | High:<br>Workshop ranked as highest priority for AFMA Management and medium priority related to data. | TBC<br><br>Subject to progress with AFMA' Agency Data Capture project | Medium cost.<br><br>Within AFMA budget. | Triggers and automation of reporting considered as part of the SESSF FMS implementation (annual FMS report). Can do in OBIEE at the moment but real time report will be supported by Agency Data Capture (long term). | 'Requires collection of adequate amount of data.'<br><br>'Develop algorithms and machine learning techniques to assess large data sets.'<br><br>'Much of this work should be integrated within AFMA IT branch, e-fish and IT strategy.' |
| SMARP 10: Optimise use of the sampling and environmental data collection platform provided by the FIS. | Medium:<br>Workshop ranked as medium priority related to data and RAG priorities. | Pending AFMA decision on the continuation of the FIS program. | While the FIS program is high cost in the year a survey is run, the additional cost for optimising sampling and environmental data collection are low. | Continuation of the FIS program considered by SESSFRAG in August 2019. . | Authors: Contingent on the continuation of the FIS program.<br><br>Survey comments: 'Redesign FIS to answer biological sustainability question - are the fish there? Need to determine current spawning biomasses as absolute priority.'<br><br>'Look at multiple gear types to be used by the FIS and increase intensity of survey lines.'<br><br>'Fund a data design project and employ an external operator (not AFMA) to implement that design (ie collect the data).' |
| SMARP 8: Explore further options for and cost/benefits of industry collected data, including the preparation of protocols to ensure the compatibility and usefulness of industry collected data | Medium:<br>Workshop ranked as medium priority related to data and RAG priorities. | GABT and GHAT have implemented crew collected data programs for biologicals. | Medium cost for programs in the GABT and GHAT. | SESSFRAG considered the utility of crew collected data in the CTS in August 2019. | Authors: Electronic monitoring trial in the CTS during 2018-19 may support future crew collected data. However, given the likely requirements for ongoing observer coverage in the short term for biological and discard data, crew collected data not a priority at this time.<br><br>Authors: Complexity of the CTS data plan means ISMP is currently a more cost-effective option. |
| SMARP 9: Explore methods to improve cost-effective monitoring and recording of bycatch and TEP interactions. | Low:<br>Workshop ranked as low priority related to data and low priority for external priorities. | GHAT has implemented electronic monitoring. Trial complete in the CTS (report pending). | Potentially high cost depending on the level of monitoring. | Considered by SESSFRAG in August 2019 noting AFMA has prioritised monitoring for compliance with seabird arrangements. Electronic monitoring trial in the CTS completed during 2018- 19. Initial results suggest only useful for large TEP interactions. | Authors: The Commonwealth Fisheries Bycatch Policy 2018 provides that:<br>• 'data collection should be sufficiently robust to support appropriate risk assessments, inform effective management options, monitor bycatch interactions and industry compliance and enable assessment of the efficacy of any management measures.'<br>• 'Independent verification of fishing activity supports an effective reporting and monitoring framework. Independent auditing should also be used to provide transparency and public confidence in the performance of self-regulatory initiatives within a fishery.' |
| SMARP 2: Seek opportunities for the cost-effective and regular collection of key economic information for the SESSF. | Medium:<br>Workshop ranked as medium priority in relation to AFMA Management and data. | ABARES surveys are undertaken every two years. Further consideration being given to economic indicators. | Likely low cost. | Referred to FRDC Multi-species Harvest Strategy project (FRDC2018-021). | Authors: Some economic information is captured in ABARES net economic return reports. Also economic indicators are being considered by AFMA's Economics Working Group.<br><br>Survey comments: 'Economic logbooks, better access to market data, quota trading data'<br>'Implement industry economic survey (like [the Northern Prawn Fishery]).' |
| SMARP 11: Develop metadata, including coding descriptions, for all fishery databases, and track changes in coding standards over time. | Low:<br>Workshop ranked as low priority related to data and low priority for AFMA's IT area. | On track through the AFMA e-Fish Project. | Low cost funded through FRDC. | AFMA e-Fish Project (FRDC 2018-026) aims to create a set of design principles for a data infrastructure capable of linking, integrating and sharing fisher reported data. | 'AFMA should have metadata standards already.' |

| Recommendation (numbered as per the source research report) | Priority based on survey results (Appendix 4) | Status and timeframe | Cost and resourcing | Implementation approach: how and who | Workshop comments and guidance on implementation (survey comments unless otherwise stated) |
|---|---|---|---|---|---|
| **Harvest strategies** | | | | | |
| Declining indicators 1: Support research to develop multi-species harvest strategies for the SESSF, particularly for the Commonwealth Trawl Sector.<br>Declining indicators 13: Consider and integrate the results and recommendations of the four recent SESSF-related projects (FRDC 2014-203, FRDC 2016-139, FRDC 2016-059 and the current project FRDC 2016-146) in light of the recently released revised Commonwealth Harvest Strategy Policy and Bycatch Policy to inform directions for future management of the SESSF and, in particular, the development and evaluation of multi-species harvest strategies in the SESSF. | High:<br>Declining indicators 1 workshop ranked as highest priority related to harvest strategies and the Multi-Species Harvest Strategy project.<br>Declining indicators 13 workshop ranked as highest priority related to ecosystem, high priority related to economics and medium priority related to social factors.<br>Workshop ranked as medium priority in relation to the Multi-Species Harvest Strategy project. | On track through the FRDC Multi-species Harvest Strategy project (FRDC2018-021). | High cost funded through FRDC. | Referred to FRDC Multi-species Harvest Strategy project (FRDC2018-021). | 'An additional key priority is risk catch cost so potential harvest decays with the quality or age of data/assessments.'<br>'Recreational fishing is now a component of commonwealth fisheries legislation - we need to determine a new methodology to manage and measure the effects of both recreational and indigenous fishing on fish stocks.'<br>'Develop a recreational fishing harvest strategy separate from the commercial measurement - a measure of the value of the fishing experience rather than economic value of the weight of the captured fish.' |
| SMARP 17: Scenario AO.3 be considered by RAGs, MACs and AFMA as the long-term goal for SESSF monitoring and assessment scheduling with Scenario O.3 adopted in the short term | Medium:<br>SMARP 17/18 workshop ranked as medium priority related to Harvest Strategies and medium priority in relation to Multi-Species Harvest Strategy project. | On track through the FRDC Multi-species Harvest Strategy project (FRDC2018-021). | High cost funded through FRDC. | Referred to FRDC Multi-species Harvest Strategy project (FRDC2018-021).<br>Data needs and options for achieving them considered by SESSFRAG. | 'MSE test this - but also consult widely with assessment providers about the feasibility of ramping up and ramping down every 3 years. This seems like a crazy idea with all sorts of potential mines too step on!' |
| SMARP 18: Conduct MSE on proposed O.3 and AO.3 scenarios for primary and key secondary species. | Medium:<br>SMARP 17/18 workshop ranked as medium priority related to Harvest Strategies and medium priority in relation to the Multi-Species Harvest Strategy project.<br>SMARP 18 workshop ranked as high priority for the Multi-Species Harvest Strategy project and medium priority for harvest strategies. | On track through the FRDC Multi-species Harvest Strategy project (FRDC2018-021). | High cost funded through FRDC. | Referred to FRDC Multi-species Harvest Strategy project (FRDC2018-021). | Authors: The HSP requires that harvest strategies be formally tested to demonstrate that they are highly likely to meet the objectives of the HSP.<br>Survey comments: 'While MSE testing of SMARP options for assessment cycle are needed, really the decision before this should be whether it is even practical from an efficiency and logistics point of view – which would immediately rule it out and not require MSE testing'. |
| SMARP 19: Primary and Secondary quota species with >25% undercatch be assessed less frequently than every three years, or default assessments of such species be deferred until a TAC % catch trigger level of 75% is reached or a maximum of five years | Low:<br>Workshop ranked as low priority related to Harvest Strategies and low priority in relation to | On track through the FRDC Multi-species Harvest Strategy project (FRDC2018-021). | High cost funded through FRDC. | Referred to FRDC Multi-species Harvest Strategy project (FRDC2018-021). | |

| Recommendation (numbered as per the source research report) | Priority based on survey results (Appendix 4) | Status and timeframe | Cost and resourcing | Implementation approach: how and who | Workshop comments and guidance on implementation (survey comments unless otherwise stated) |
|---|---|---|---|---|---|
| has passed since the last assessment. ERAs continue to be conducted every five years. (NB Actual % needs to be agreed by RAG/MAC). | the Multi-Species Harvest Strategy project. | | | | |
| Declining indicators key priority area: interactions / choke species; avoidance / mixed bag targets. | High:<br>One of the key considerations in the multi-species harvest strategy project. | On track through the FRDC Multi-species Harvest Strategy project (FRDC2018-021). | High cost funded through FRDC. | Relevant to FRDC Multi-species Harvest Strategy project (FRDC2018-021). | |
| Declining indicators key priority area: costs of production – fish sale prices and changing markets. | Low:<br><br>Would depend on extent that economics are taken into account in the multi-species harvest strategy project. | On track through the FRDC Multi-species Harvest Strategy project (FRDC2018-021). | High cost funded through FRDC. | May be relevant to FRDC Multi-species Harvest Strategy project (FRDC2018-021). | Authors: Consider setting economic targets for only the key economic driver species in the fishery (recognising that these target species may change over time) |
| **Ecosystem** | | | | | |
| SMARP 15: As a measure of impact on habitats, utilise fishing position information from logbooks and VMS data to determine the fishery footprint and evaluate trends in fishery spatial impact on vulnerable benthic habitats over time. | Medium<br>Workshop ranked as medium priority related to ecosystem and low priority related to RAG priorities. | TBC depending on approach taken for ERA for habitats. | Medium cost to establish fishery footprint using logbooks and VMS. Medium costs to further develop understanding of benthic habitats. | In the longer term, fishery footprint information could be incorporated into ERA relating to benthic impacts, and establish appropriate reference points. | Authors: Recent work by Pitcher et al has provided an estimate of the extent of trawl footprints around Australia using information from logbooks and Vessel Monitoring Systems. A similar approach may indicate if the fishing footprint is changing over time, and could utilise the assemblages maps generated by that project. Members of AFMA's Ecological Risk Assessment technical working group identified this an as area for further consideration. |
| SMARP 14: Re-evaluate the temporal and spatial monitoring requirements to provide adequately reliable estimates of bycatch and TEP interaction levels (and associated CVs around these estimates), noting that these can be rare events | Medium:<br>Workshop ranked as medium priority in relation to RAG priorities and medium priority related to ecosystem. | TBC<br>Requirement for observer monitoring review dependent upon uptake of electronic monitoring. | Low cost to evaluate. Likely high cost to implement. | Relates to SMARP 9.<br><br>SESSFRAG provided advice on monitoring in August 2019.<br>Electronic monitoring trial in the CTS completed during 2018- 19 (report pending). | The Commonwealth Fisheries Bycatch Policy 2018 provides that:<br>• 'data collection should be sufficiently robust to support appropriate risk assessments, inform effective management options, monitor bycatch interactions and industry compliance and enable assessment of the efficacy of any management measures.'<br>• 'Independent verification of fishing activity supports an effective reporting and monitoring framework. Independent auditing should also be used to provide transparency and public confidence in the performance of self-regulatory initiatives within a fishery.' |
| SMARP 13: Determine reliable Potential Biological Removals (PBRs) for key TEP species with which interactions occur in the SESSF, and take these into consideration when designing and implementing TEP management plans | Medium:<br>Workshop ranked as medium priority related to ecosystem and medium priority for AFMA Management. | ERAs have been undertaken. No further action at this stage. | High cost if population estimates for TEPs were to be made. | No further action at this stage. | Authors: ERAs determine high risk species and help assist AFMA prioritise management responses.<br>AFMA's Bycatch Strategy provides guiding principles including:<br>• management responses are proportionate to the conservation status of bycatch species and ERA results<br>• accounting for cumulative impact of Commonwealth fisheries on protected species when making management decisions on mitigation |

| Recommendation (numbered as per the source research report) | Priority based on survey results (Appendix 4) | Status and timeframe | Cost and resourcing | Implementation approach: how and who | Workshop comments and guidance on implementation (survey comments unless otherwise stated) |
|---|---|---|---|---|---|
| | | | | | • appropriate and consistent monitoring and reporting arrangements across fisheries.<br>https://www.afma.gov.au/sites/default/files/uploads/2017/07/Fishery-Management-Paper-Number-15-Final-AFMAs-bycatch-strategy-030717.pdf |
| **Climate change** | | | | | |
| **Identifying and accounting for changes in species distribution, abundance and productivity**<br>Declining indicators 11: Compile available information and develop a feasible and scientifically defensible method to determine the extent of productivity change (positive or negative) for SESSF species, and the implications this has on stock assessments and harvest strategies – including rebuilding plans.<br><br>Declining indicators 10: Develop methods to incorporate the potential impacts of climate change on species distribution, abundance and productivity in both stock assessments and harvest strategies.<br><br>SMARP 16: Time-series or periodic snapshots of relevant data, such as growth changes, are required to evaluate environmentally-driven productivity changes. Periodic environmental integration / synthesis projects will be required to analyse and interpret environmental effects on fisheries.<br>Declining indicators 12: Synthesize and monitor information related to SESSF species life histories, phenology, productivity, distribution and key determinants of major life history events (e.g. spawning, recruitment and migration) | High:<br>Workshop ranked as highest priority related to climate change and highest priority for external projects.<br><br>Declining indicators 10:<br>Workshop ranked as high priority related to climate change, high priority for external projects and low priority in relation to external.<br>Declining indicators 12 and SMARP 16 were both ranked medium priority related to external projects.<br>While the workshop ranked SMARP 16 and Declining indicators 12 as low priority in relation to climate change, the combined ranking is relatively high and relates closely to Declining indicators 11 for determining the extent of species' productivity changes (highest ranking related to climate change | Research priorities identified but work yet to commence. Consolidated approach to be considered. | Likely high cost with resourcing to be confirmed. | Relevant to FRDC Multi-species Harvest Strategy project (FRDC2018-021).<br><br>SERAG has prioritised the need to update species biology information in the fishery research plan. | 'Need to investigate density dependent effects on recruitment as well not just climate effects. The spawning biomasses we are dealing with now are likely reduced'.<br>'Mechanisms and justification for incorporating productivity shift in assessments and HS'<br>'Consolidated approach for environmental/climate change projects. The risk is they're approached separately and lose track.'<br><br>'Work with fishing industry to deploy cost effective climate data devices.'<br><br>'The climate/productivity related recommendations would benefit from a coherent approach and plan.'<br><br>'I think it is time biology and ecology of exploited stocks need to be revisited in light of non-recovering stocks, beyond just climate change effects.' |
| **Climate change – ongoing data collection.**<br>SMARP 3: Determine what, if any, environmental data need to be collected by the fishery to support assessment of the impact of environmental drivers, including climate change, on SESSF stocks.<br>SMARP 4: Investigate options for cost effective collection of fishing related climate / oceanographic data, adequate to support evaluation of environmental drivers on SESSF stocks. | High:<br>Workshop ranked as high priority related to climate change and medium priority in relation to external projects.<br>SMARP 4: Workshop ranked as medium priority related to climate change and low | Coordinated approach to data collection required. | Likely high cost with resourcing to be confirmed. | SESSFRAG to provide advice on monitoring options in August 2019.<br><br>Current graduate industry project investigating the feasibility of industry collecting environmental data.<br><br>Subject to the FIS continuing, environmental data could be collected as part of that program. | Authors: Relates to Declining Indicators 10 (incorporate impacts of climate change into assessments and harvest strategies) and Declining Indicators 11 (determine productivity change and implications for stock assessments and harvest strategies). |

| Recommendation (numbered as per the source research report) | Priority based on survey results (Appendix 4) | Status and timeframe | Cost and resourcing | Implementation approach: how and who | Workshop comments and guidance on implementation (survey comments unless otherwise stated) |
|---|---|---|---|---|---|
| Declining indicators 9: Determine and implement biological and oceanographic data collection processes necessary to detect climate-driven changes in the fishery. | priority for external projects.<br>Declining indicators 9: Workshop ranked as high priority in relation to RAG priorities and medium priority related to climate change. | | | | |
| **Economics and social** | | | | | |
| Declining indicators 7: Explore the potential to develop additional indicators that are relevant to markets and economics and ensure adequate information is collected to support the use of these indicators in assessments and harvest strategies. | Medium:<br>Workshop ranked as highest priority related to economics and low priority related to external projects. | On track through the FRDC Multi-species Harvest Strategy project (FRDC2018-021). | High cost funded through FRDC. | Referred to FRDC Multi-species Harvest Strategy project (FRDC2018-021). | Authors: Several projects looking at multi-species maximum economic return suggest that an informed proxy economic target may be most appropriate for the key economic species, rather than a full bio-economic model (given the costs). |
| Declining indicators 2: Determine what data can be feasibly collected to better understand the links between fisher behaviour, vessel operations and quota ownership/trading, and their impact on the dynamics of the fishery. | Medium:<br>Workshop ranked as high priority related to economics and medium priority in relation to RAG priorities and social factors. | TBC subject to defining objectives. | TBC | AFMA's economic working group developing a standard set of economic indicators in consultation with relevant RAGs. | |
| Declining indicators 3: Investigate options to incorporate key socio-economic factors (the link between fisher behaviour, vessel operations and quota ownership / trading) into future harvest strategies. | Medium:<br>Workshop ranked as highest priority related to social factors, medium priority related to economics and low priority in relation to Multi-Species Harvest Strategy project | On track through the FRDC Multi-species Harvest Strategy project (FRDC2018-021). | High cost funded through FRDC. | Relevant to FRDC Multi-species Harvest Strategy project (FRDC2018-021). | |
| Declining indicators 5: Investigate changes of fishing efficiency in the various SESSF sub-fisheries and the potential inclusion of fishing power time series in CPUE analyses. | Medium:<br>Workshop ranked as high priority related to external priorities, medium priority related to economics and low priority in relation to external projects. | TBC<br>Approach will be informed through the FRDC Multi-species Harvest Strategy. | TBC | TBC | Haddon *et al* 2018 'Improve catch rate standardizations to account for changes in targeting' (FRDC 2012/201) found that insufficient information was collected at the time of adopting new technology such as GPS and sounders such that accounting for such changes in relative fishing power is difficult.<br>'Currently CPUE is the primary index of relative abundance, however, it is challenging to resolve. A better focus may be to investigate fishery independent measure of abundance, noting that it is likely that different measures will be appropriate for different species/fisheries'.<br>'Mechanisms and justification for incorporating productivity shift in assessments and HS'.<br>'The standardisation needs start collecting industry gear data, include environmental variables etc. Cant use vessel ID as a surrogate any more. Also needs to look at economic CPUE and co-capture of species' |
| Declining indicators 4: Explicitly determine under what circumstances under-caught TACs are a 'negative indicator' and when are they not. Consider the merits of using under- | Low:<br>Workshop ranked as medium priority related to economics and RAG priorities and low | No further action at this stage. | N/A | N/A | Authors: AFMA's Economic Working Group is considering appropriate economic indicators for AFMA fisheries. |

| Recommendation (numbered as per the source research report) | Priority based on survey results (Appendix 4) | Status and timeframe | Cost and resourcing | Implementation approach: how and who | Workshop comments and guidance on implementation (survey comments unless otherwise stated) |
|---|---|---|---|---|---|
| caught TACs as an indicator in future harvest strategies. | priority related to ecosystem and social factors. | | | | |
| Declining indicators 8: Develop a '$PUE' indicator or similar to be used as a performance indicator for the fishery. | Low:<br>Workshop ranked as medium priority related to economics and low priority related to RAG priorities. | To be considered by AFMA's Economic Working Group | Low cost. | To be considered by AFMA's Economic Working Group for utility as an economic indicator. | 'Given the objective of maximising economic returns to the Australian community, what does $PUE measure and is it already captured in the ABARES net economic return reports.' |
| **General** | | | | | |
| Declining indicators 6: Based on an investigation of including fishing power as a factor in CPUE (Declining indicators 5), ensure appropriate data is collected in the future to enable fishing power to be included as a factor in CPUE standardisations. | Medium:<br>Workshop ranked as high priority in relation to RAG priorities and low priority related to economics. | TBC<br>Approach will be informed through the FRDC Multi-species Harvest Strategy. | TBC | TBC | Haddon *et al* 2018 'Improve catch rate standardizations to account for changes in targeting' (FRDC 2012/201) found that insufficient information was collected at the time of adopting new technology such as GPS and sounders such that accounting for such changes in relative fishing power is difficult.<br><br>Survey comment: 'I don't support any new work that aims to 'improve' CPUE'. |
| SMARP 21: Major research components should be competitively provided, or should be periodically market-tested to ensure that research services are efficient and cost-effective. | Low:<br>Workshop ranked as low priority related to economics and low priority for AFMA Management. | To be considered as part of the SESSF Annual Research Statement. | Low cost within SESSF budget. | Considered with advice from RAGs and MAC. | |
| SESSFRAG Action Item: AFMA to undertake assurance on data before providing for stock assessments. | High:<br>Accurate data critical for effective monitoring and assessment. | On track through AFMA's Agency Data Capture project | ICT solutions for data 'alerts' / rules for e-logs. Data validation and error checks | Prepare and communicate database change log /metadata (codes etc recommended by SMARP to some extent as part of AFMA's ICT project) | |
| SESSFRAG Action Items: Immediate harvest strategy questions:<br>• What indicators to review when species 'breakout'<br>• Process for accepting new assessments (T5?, PiSeas)<br>• Difficult to assess species<br>• When to reject assessments<br>• How to set TACs if you reject an assessment | High:<br>Critical decision points pending finalisation and implementation of the FRDC Multi-species Harvest Strategy project. | On track<br>SESSFRAG provided advice on August 2019. SESSF Harvest Strategy to be updated for 2020-21 fishing year. | Low – Medium cost within SESSF budget. | SESSFRAG and AFMA Management to advise the AFMA Commission. | |
| SESSFRAG Action Item: Use GHAT discard data in assessments (logbooks or EM)<br>• Fishwell project on piece counts to weight<br>• ABARES comparison of EM to logs<br>• AFMA comparison of observers to EM/Logs (overlapping trips) | High:<br>gummy shark assessment in 2020. | Timing subject to work being undertaken before the gummy shark assessment in 2020. | Medium cost – FRDC funding provided for Fishwell project, ABARES funding for | Fishwell project on investigating and aligning Pirvic, AFMA and CSIRO data | |

| Recommendation (numbered as per the source research report) | Priority based on survey results (Appendix 4) | Status and timeframe | Cost and resourcing | Implementation approach: how and who | Workshop comments and guidance on implementation (survey comments unless otherwise stated) |
|---|---|---|---|---|---|
| | | | comparison of EM to logs, AFMA to fund observers to EM comparison. | | |
| SESSFRAG Action Item: CPUE by metre for the gillnet fishery | High:<br>– critical for the gummy shark assessment in 2019 | CSIRO providing in time for 2020 gummy shark assessment | Medium cost within SESSF budget. | Consider benefits of reviewing ISMP (update Bergh given fishery changes; model based approach?). | |
| SESSFRAG action item: Upload assessments and data reports to the AFMA website | Medium:<br>Important for both researchers and general public. | On track:<br>Key recent documents are available. | Low cost within SESSF budget. | Make the SESSF Management History document more accessible and update website. | |
| Declining indicators key priority area: review area closures and trip limits. | Medium<br>Strategically important to ensure rationale for input controls remains. | Review in the GHAT has commenced. CTS to begin soon. | Medium cost – likely within SESSF budget. | AFMA, RAGs and MACs to undertake an input control review. | Authors: GHAT Simplification project has commenced to reduce unnecessary restrictions and complexity.<br>Regionalisation project (splitting SFRs to match stock structure) has commenced. |

# Appendix 2 – Workshop agenda

Working agenda

Declining indicators implementation and multispecies harvest strategies workshop

26-27 February 2019

Facilitator: Kevin Stokes

Chair: Ian Knuckey

| **26 February 2019** | | | **Reference** | |
|---|---|---|---|---|
| Introduction | 9:00 | Objectives of workshop | | George Day |
| | | Implementation plan for Declining Indicators project | | George Day |
| | | Develop initial set of candidate multi-species harvest strategies | | Rich Little |
| **Background** | | | | |
| CHSP Harvest strategies | 9:15-9:30 | What is a harvest strategy? | Paper 1: Harvest Strategy Policy summary | Ian Knuckey |
| | | Harvest strategies in a multi-species fishery (SESSF) | | |
| | | Objective of harvest strategies | | |
| SMARP project | 9:30-10:00 | Summary of SESSF Strategic Monitoring and Assessment Project (SMARP) | Paper 2: Summary paper | Dan Corrie |
| Declining Indicators project | 10:00-10:30 | Summary of SESSF Declining Indicators project | Paper 3: Summary paper | Ian Knuckey |
| Climate change projects | 10:30-11:00 | Summary of decadal projections of climate change and management adaptation to climate change projects | Paper 4: Summary | Danait Ghebrezgabhier |
| | | | | |

| | | | | |
|---|---|---|---|---|
| Wrapping it all together | 11:30-11:45 | Here's what we're going to do after morning tea. | | Rich Little |
| Implementation | 11:45-12:15 | How are we going to implement<br><br>SMARP + Declining indicator recommendations | Paper 5: Implementation paper | Kevin Stokes and Ian Knuckey |
| | 12:15-13:00 | Sort implementation plans to MSHSP or elsewhere | | |
| | 13:00-14:00 | Lunch | | |
| Multi-species harvest strategies project | 14:00-15:00 | Recommendations from Declining Indicators + SMARP | Paper 6: Summary of Multi-species harvest strategy | Rich Little and Dan Corrie |
| | | Current Harvest Strategy (Status quo) | | |
| | | Example harvest strategies | | |
| Objectives and performance measures for evaluating HSs | 15:00-15:15 | Fishery management objectives, measures, timeframes, and risk tolerances | | Kevin Stokes and Ian Knuckey |
| Elicitation | 15:15-15:30 | Environmental:<br><br>What is important to you in managing the fishery? And how would you measure it? | Individual survey monkey | Kevin Stokes and Ian Knuckey |
| | 15:30-16:00 | Afternoon Tea | | |
| Elicitation | 16:00-17:00 | In depth issue | Break-out Group: Environmental | Kevin Stokes and Ian Knuckey |
| Elicitation | 17:00-17:30 | Wrap-up | | Kevin Stokes and Ian Knuckey |

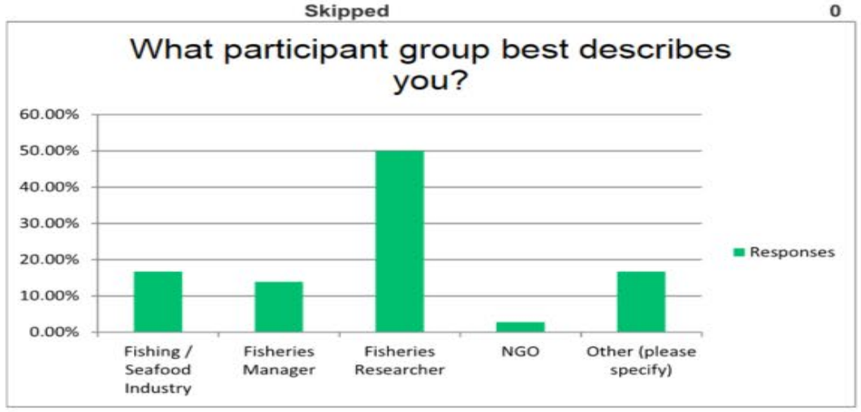
| **27 Feb 2019** | | | | |
|---|---|---|---|---|
| Elicitation | 9:00-9:15 | Re-cap | | Kevin Stokes and Ian Knuckey |
| Elicitation | 9:15-9:30 | Economics:<br><br>What is important to you in managing the fishery? And how would you measure it? | Individual survey monkey | Kevin Stokes and Ian Knuckey |
| Elicitation | 9:30-10:30 | In depth issue | Break-out Group: Economics | Kevin Stokes and Ian Knuckey |
| Elicitation | 10:30-10:45 | Social:<br><br>What is important to you in managing the fishery? And how would you measure it? | Individual survey monkey | Kevin Stokes and Ian Knuckey |
| | 10:45-11:15 | AM tea | | |
| Elicitation | 11:15-12:15 | In depth issue | Break-out Group: Social | Kevin Stokes and Ian Knuckey |
| Elicitation | 12:15-12:30 | Bringing it altogether + Wrap-up | | Kevin Stokes and Ian Knuckey |

## Appendix 3 – Workshop survey results

Declining Indicators and SMARP RecommendationsPrioritised within the group responsible for their implementation

**What participant group best describes you?**

| Answer Choices | | Responses | |
|---|---|---|---|
| Fishing / Seafood Industry | | 16.67% | 6 |
| Fisheries Manager | | 13.89% | 5 |
| Fisheries Researcher | | 50.00% | 18 |
| NGO | | 2.78% | 1 |
| Other (please specify) | | 16.67% | 6 |
| | **Answered** | | **36** |
| | **Skipped** | | **0** |

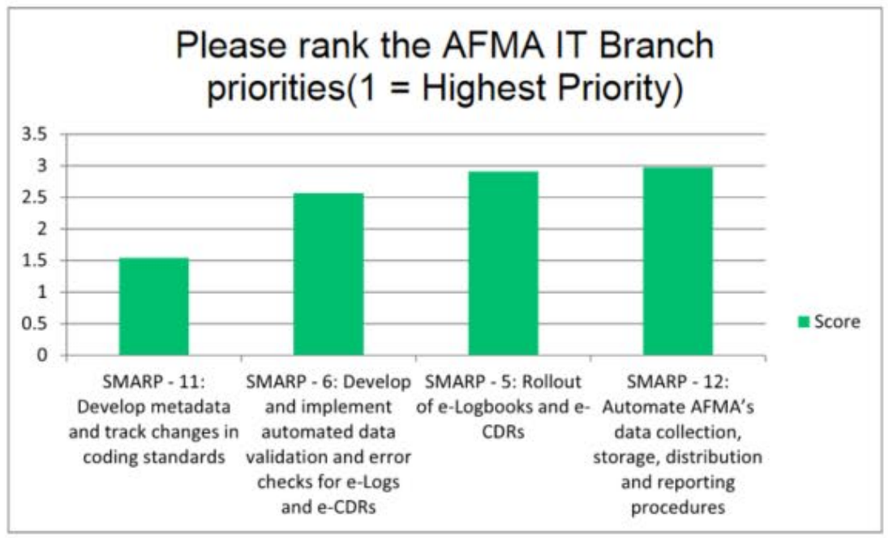



| Respondents | Response Date | Other (please specify) | Tags |
|---|---|---|---|
| 1 | Feb 26 2019 12:08 PM | policy officer | |
| 2 | Feb 26 2019 12:06 PM | Commonwealth Government | |
| 3 | Feb 26 2019 12:04 PM | Government | |
| 4 | Feb 26 2019 12:03 PM | Economist | |
| 5 | Feb 26 2019 12:03 PM | Independent consultant | |
| 6 | Feb 26 2019 07:10 AM | TEST | |

Declining Indicators and SMARP RecommendationsPrioritised within the group responsible for their implementation

**Please rank the AFMA IT Branch priorities(1 = Highest Priority)**

| | 1 | | 2 | | 3 | | 4 | | Total | Score |
|---|---|---|---|---|---|---|---|---|---|---|
| SMARP - 11: Develop metadata and track changes in coding standar | 5.71% | 2 | 5.71% | 2 | 25.71% | 9 | 62.86% | 22 | 35 | 1.54 |
| SMARP - 6: Develop and implement automated data validation and error cl | 5.71% | 2 | 54.29% | 19 | 31.43% | 11 | 8.57% | 3 | 35 | 2.57 |
| SMARP - 5: Rollout of e-Logbooks and e-CDRs | 42.86% | 15 | 22.86% | 8 | 17.14% | 6 | 17.14% | 6 | 35 | 2.91 |
| SMARP - 12: Automate AFMA's data collection, storage, distribution | 45.71% | 16 | 17.14% | 6 | 25.71% | 9 | 11.43% | 4 | 35 | 2.97 |
| | | | | | | | | | **Answered** | 35 |
| | | | | | | | | | **Skipped** | 1 |



Declining Indicators and SMARP RecommendationsPrioritised within the group responsible for their implementation

**How best do you think AFMA IT Branch could best implement your top priority?**

**Answered** 29

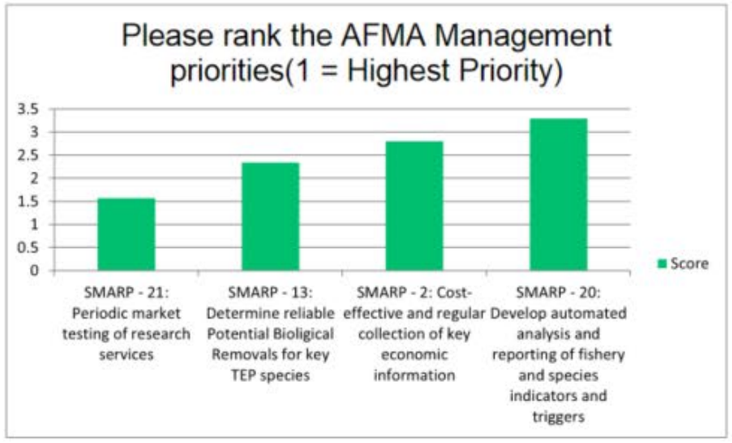
**Skipped** 7

| Respondents | Response Date | | Responses | Tags |
|---|---|---|---|---|
| 1 | Feb 26 2019 | 1 | Not sure. | |
| 2 | Feb 26 2019 | 1 | Better integration and data warehousing to link separate databases but still need to maintain flexibility to include new datasets as they arise they | |
| 3 | Feb 26 2019 | 1 | Rather than develop validation procedures from scratch, review procedures used by other organisations that manage and collate fisheries data (e.g. CCAMLR, AAD, States, NZ). Identify those aspects of the data for which validation is important (it wont be worth correcting everything) and their associated validation rules. Then implement the selected rules in two ways, firstly as a prompt/popup data entry for some rules then for other rules on submission to AFMA | |
| 4 | Feb 26 2019 | 1 | Further collaboration with data users. Progressing well recently | |
| 5 | Feb 26 2019 | 1 | Gain familiarity in manual log books and transition data collection to automated processes | |
| 6 | Feb 26 2019 | 1 | either provide incentives for their deployment (subsidise) or make them a mandatory requirement (or both) | |
| 7 | Feb 26 2019 | 1 | facilitate development of schemas for fisheries without elogs/eCDRs and work with fishery and provider to roll out tech | |
| 8 | Feb 26 2019 | 1 | Provide evidence of efficiency & cost benefits | |
| 9 | Feb 26 2019 | 1 | Ensure they have the capability (appropriate staff) | |
| 10 | Feb 26 2019 | 1 | Look for solutions from other industries that have developed these systems | |
| 11 | Feb 26 2019 | 1 | AFMA should have metadat standards already | |
| 12 | Feb 26 2019 | 1 | Allocate resources to achieve objectives | |
| 13 | Feb 26 2019 | 1 | Appropriate resourcing and engaging with data users to ensure requirements can be addressed as much as possible. | |
| 14 | Feb 26 2019 | 1 | Current E-fish project and IT Strategy | |
| 15 | Feb 26 2019 | 1 | Make eLogs and eCDR mandatory | |
| 16 | Feb 26 2019 | 1 | Consultation with data users | |
| 17 | Feb 26 2019 | 1 | Data warehoue incorporating error corrections, improved extract facilities | |
| 18 | Feb 26 2019 | 1 | Prioritise the activity and expedite education on use | |
| 19 | Feb 26 2019 | 1 | Assess what has been done elsewhere | |
| 20 | Feb 26 2019 | 1 | Na | |
| 21 | Feb 26 2019 | 1 | Nominate John Garvey's successor now and have them work closely with him. Ensure good communication amongst all AFMA's data & IT people and ensure they stay in touch with users of the data. | |
| 22 | Feb 26 2019 | 1 | targeted projects with input from RAGs regarding error checking (underway) | |
| 23 | Feb 26 2019 | 1 | Consult with the industry and develop a data structure that accommodates the industry sectors under one data collection methodology | |
| 24 | Feb 26 2019 | 1 | They are best placed to decide this | |
| 25 | Feb 26 2019 | 1 | Just do it. | |
| 26 | Feb 26 2019 | 1 | Collaboration with other agencies that use use their data and create a standard across all agencies. | |
| 27 | Feb 26 2019 | 1 | I'm not sure about my 2-4. | |
| 28 | Feb 26 2019 | 0 | Dedicated project team (external?) | |
| 29 | Feb 26 2019 | 0 | sss | |

Declining Indicators and SMARP RecommendationsPrioritised within the group responsible for their implementation

**Please rank the AFMA Management priorities(1 = Highest Priority)**

| | 1 | | 2 | | 3 | | 4 | | Total | Score |
|---|---|---|---|---|---|---|---|---|---|---|
| SMARP - 21: Periodic market testing of research services | 5.71% | 2 | 8.57% | 3 | 22.86% | 8 | 62.86% | 22 | 35 | 1.57 |
| SMARP - 13: Determine reliable Potential Bioligical Removals for key TEP species | 14.29% | 5 | 25.71% | 9 | 40.00% | 14 | 20.00% | 7 | 35 | 2.34 |
| SMARP - 2: Cost-effective and regular collection of key economic information | 28.57% | 10 | 34.29% | 12 | 25.71% | 9 | 11.43% | 4 | 35 | 2.8 |
| SMARP - 20: Develop automated analysis and reporting of fishery and species indicators and triggers | 51.43% | 18 | 31.43% | 11 | 11.43% | 4 | 5.71% | 2 | 35 | 3.29 |
| | | | | | | | | | **Answered** | **35** |
| | | | | | | | | | **Skipped** | **1** |



Declining Indicators and SMARP RecommendationsPrioritised within the group responsible for their implementation

**How best do you think AFMA Management could best implement your top priority?**

**Answered** 22

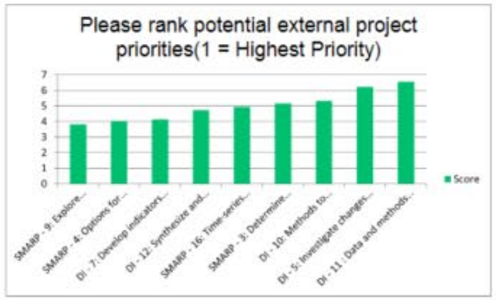
**Skipped** 14

| Respondents | Response Date | Responses | Tags |
|---|---|---|---|
| 1 | Feb 26 2019 | 1 Not certain. May require software development. | |
| 2 | Feb 26 2019 | 1 Better database integration and linkages but still maintain flexibility to include new datasets | |
| 3 | Feb 26 2019 | 1 I've selected (SMARP 20), however, I think you are missing need the collect data suitable to manage these fisheries | |
| 4 | Feb 26 2019 | 1 Develop algorithms and machine learning techniques to assess large data sets. | |
| 5 | Feb 26 2019 | 1 requires collection of adequate amount of data | |
| 6 | Feb 26 2019 | 1 develop operational guidelines with accepted PBRs | |
| 7 | Feb 26 2019 | 1 No idea - probably staff again? | |
| 8 | Feb 26 2019 | 1 Tender research projects, utilise expertise of groups such as RPN | |
| 9 | Feb 26 2019 | 1 13 is important but how implement given EPBC | |
| 10 | Feb 26 2019 | 1 Build the trigger reporting into AFMA's ICT project. | |
| 11 | Feb 26 2019 | 1 economic logbooks, better access to market data, quota trading data | |
| 12 | Feb 26 2019 | 1 Much of this work should be integrated wthin AFMA IT branch, e-fish and IT strategy. | |
| 13 | Feb 26 2019 | 1 Automated analysis is already underway. Easy to do if procedures well defined. Suspect need to define procedures first | |
| 14 | Feb 26 2019 | 1 Improved data collection of TEPs | |
| 15 | Feb 26 2019 | 1 Industry cooperative economic surveys | |
| 16 | Feb 26 2019 | 1 Identify data collection requirements, prioritise collection activities | |
| 17 | Feb 26 2019 | 1 Implement smarter and better integrated systems | |
| 18 | Feb 26 2019 | 1 Just do it. | |
| 19 | Feb 26 2019 | 1 No comment | |
| 20 | Feb 26 2019 | 1 ABARES already do SMARP2. | |
| 21 | Feb 26 2019 | 0 Implement industry economic survey (like NPF) | |
| 22 | Feb 26 2019 | 0 ssss | |

Declining Indicators and SMARP RecommendationsPrioritised within the group responsible for their implementation

**Please rank potential external project priorities(1 = Highest Priority)**

| | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | | 7 | | 8 | | 9 | | Total | Score |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SMARP - 9: Explore methods to improve cost-effective monitoring and recording of bycatch and TEP interactions | 8.57% | 3 | 5.71% | 2 | 0.00% | 0 | 14.29% | 5 | 8.57% | 3 | 5.71% | 2 | 14.29% | 5 | 22.86% | 8 | 20.00% | 7 | 35 | 3.83 |
| SMARP - 4: Options for cost-effective collection of fishing-related climate / oceanographic data | 2.86% | 1 | 8.57% | 3 | 8.57% | 3 | 2.86% | 1 | 11.43% | 4 | 14.29% | 5 | 20.00% | 7 | 25.71% | 9 | 5.71% | 2 | 35 | 4.03 |
| DI - 7: Develop indicators relevant to markets and economics and ensure adequate information is collected | 0.00% | 0 | 11.43% | 4 | 22.86% | 8 | 2.86% | 1 | 8.57% | 3 | 2.86% | 1 | 11.43% | 4 | 17.14% | 6 | 22.86% | 8 | 35 | 4.14 |
| DI - 12: Synthesize and monitor information on species life histories, phenology, productivity and distribution | 2.86% | 1 | 14.29% | 5 | 2.86% | 1 | 17.14% | 6 | 14.29% | 5 | 14.29% | 5 | 17.14% | 6 | 14.29% | 5 | 2.86% | 1 | 35 | 4.74 |
| SMARP - 16: Time-series species productivity data (growth, reproduction etc) to evaluate environmentally-driven productivity changes | 5.71% | 2 | 8.57% | 3 | 14.29% | 5 | 11.43% | 4 | 14.29% | 5 | 20.00% | 7 | 11.43% | 4 | 5.71% | 2 | 8.57% | 3 | 35 | 4.94 |
| SMARP - 3: Determine environmental data needs to support assessment of the impact of climate change, on SESSF stocks | 8.57% | 3 | 14.29% | 5 | 14.29% | 5 | 14.29% | 5 | 11.43% | 4 | 8.57% | 3 | 5.71% | 2 | 8.57% | 3 | 14.29% | 5 | 35 | 5.17 |
| DI - 10: Methods to incorporate impacts of climate change on species distribution, abundance and productivity in assessments and harvest strategies | 11.43% | 4 | 5.71% | 2 | 11.43% | 4 | 17.14% | 6 | 20.00% | 7 | 14.29% | 5 | 11.43% | 4 | 2.86% | 1 | 5.71% | 2 | 35 | 5.34 |
| DI - 5: Investigate changes of fishing efficiencyand the potential inclusion of fishing power time series in CPUE analyses | 37.14% | 13 | 11.43% | 4 | 5.71% | 2 | 8.57% | 3 | 5.71% | 2 | 11.43% | 4 | 5.71% | 2 | 0.00% | 0 | 14.29% | 5 | 35 | 6.23 |
| DI - 11 : Data and methods needed to determine the extent of species' productivity changes (positive or negative), and the implications this has on stock assessments and harvest strategies | 22.86% | 8 | 20.00% | 7 | 20.00% | 7 | 11.43% | 4 | 5.71% | 2 | 8.57% | 3 | 2.86% | 1 | 2.86% | 1 | 5.71% | 2 | 35 | 6.57 |
| | | | | | | | | | | | | | | | | | | | Answered | 35 |
| | | | | | | | | | | | | | | | | | | | Skipped | 1 |



Declining Indicators and SMARP RecommendationsPrioritised within the group responsible for their implementation

**How best do you think an external project could best implement your top priority?**

**Answered** 22

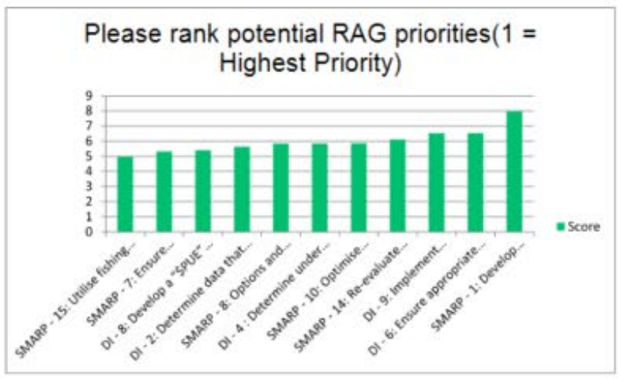
**Skipped** 14

| Respondents | Response Date | | Responses | Tags |
|---|---|---|---|---|
| 1 | Feb 26 2019 | 1 | Not certain. | |
| 2 | Feb 26 2019 | 1 | Need to investigate density dependent effects on recruitment as well not just climate effects. The spawning biomasses we are dealing with now are likely reduced. | |
| 3 | Feb 26 2019 | 1 | Currently CPUE is the primary index of relative abundance, however, it is challenging to resolve. A better focus may be to investigate fishery independent measure of abundance, noting that it is likely that different measures will be appropriate for different species/fisheries | |
| 4 | Feb 26 2019 | 1 | Work with fishing industry to deploy cost effective climate data devices | |
| 5 | Feb 26 2019 | 1 | We need to collect more data. | |
| 6 | Feb 26 2019 | 1 | Ensure appropriate data is collected and resources are available for modelling and analysis | |
| 7 | Feb 26 2019 | 1 | Would need some significant modelling capability to work as a group to conduct scenario testing | |
| 8 | Feb 26 2019 | 1 | Many of these projects could be collapsed into just a few or run concurrently at least. | |
| 9 | Feb 26 2019 | 1 | Priority is: productivity/ climate then fishing power, protected sp. interactions, economics | |
| 10 | Feb 26 2019 | 1 | There are many projects looking at strengthening CPUE standardization, primarily through CSIRO. | |
| 11 | Feb 26 2019 | 1 | The standardisation needs start collecting industry gear data, include environmental variables etc. Cant use vesselID as a surrogate any more. Also needs to look at economic CPUE and co-capture of species | |
| 12 | Feb 26 2019 | 1 | Mechanisms and justification for incorporating productivity shift in assessments and HS | |
| 13 | Feb 26 2019 | 1 | Identify what reporting is desired/required | |
| 14 | Feb 26 2019 | 1 | annual gear survey cross the fishery | |
| 15 | Feb 26 2019 | 1 | consolidated approach for environmental/climate change projects. The risk is they're approached separately and lose track. | |
| 16 | Feb 26 2019 | 1 | a collaborative project with the recreational fishing industry | |
| 17 | Feb 26 2019 | 1 | Complete project to update our knowledge | |
| 18 | Feb 26 2019 | 1 | Workshop to refine a draft proposal? | |
| 19 | Feb 26 2019 | 1 | New ideas - avoiding group think | |
| 20 | Feb 26 2019 | 1 | We need a project driven focus.  AFMA do not have this.  SMARP needs to be externalised to a project company. | |
| 21 | Feb 26 2019 | 0 | Hand pick the project team to undertake it | |
| 22 | Feb 26 2019 | 0 | ggg | |

Declining Indicators and SMARP RecommendationsPrioritised within the group responsible for their implementation

**Please rank potential RAG priorities(1 = Highest Priority)**

| | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | | 7 | | 8 | | 9 | | 10 | | 11 | | Total | Score |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SMARP - 15: Utilise fishing position information from logbooks and VMS to determine the fishery footprint and evaluate impacts on vulnerable benthic habitats | 0.00% | 0 | 5.71% | 2 | 5.71% | 2 | 14.29% | 5 | 8.57% | 3 | 5.71% | 2 | 8.57% | 3 | 14.29% | 5 | 11.43% | 4 | 20.00% | 7 | 5.71% | 2 | 35 | 4.97 |
| SMARP - 7: Ensure integrated data collection plans prevent the collection of duplicate data across multiple systems | 5.71% | 2 | 17.14% | 6 | 0.00% | 0 | 2.86% | 1 | 8.57% | 3 | 8.57% | 3 | 14.29% | 5 | 2.86% | 1 | 11.43% | 4 | 17.14% | 6 | 11.43% | 4 | 35 | 5.31 |
| DI - 8: Develop a "$PUE" indicator or similar to be used as a performance indicator for the fishery | 11.43% | 4 | 2.86% | 1 | 2.86% | 1 | 11.43% | 4 | 8.57% | 3 | 8.57% | 3 | 2.86% | 1 | 20.00% | 7 | 8.57% | 3 | 14.29% | 5 | 8.57% | 3 | 35 | 5.4 |
| DI - 2: Determine data that can explain links between fisher behaviour, vessel operations and quota ownership / trading | 2.86% | 1 | 8.57% | 3 | 11.43% | 4 | 11.43% | 4 | 2.86% | 1 | 14.29% | 5 | 5.71% | 2 | 8.57% | 3 | 20.00% | 7 | 8.57% | 3 | 5.71% | 2 | 35 | 5.63 |
| SMARP - 8: Options and cost/benefits of industry-collected data | 0.00% | 0 | 17.14% | 6 | 14.29% | 5 | 2.86% | 1 | 5.71% | 2 | 11.43% | 4 | 14.29% | 5 | 11.43% | 4 | 2.86% | 1 | 5.71% | 2 | 14.29% | 5 | 35 | 5.83 |
| DI - 4 : Determine under what circumstances under-caught TACs are a "negative indicator" and when are they not and the value of this indicator in future harvest strategies | 2.86% | 1 | 20.00% | 7 | 2.86% | 1 | 2.86% | 1 | 11.43% | 4 | 11.43% | 4 | 17.14% | 6 | 5.71% | 2 | 5.71% | 2 | 8.57% | 3 | 11.43% | 4 | 35 | 5.83 |
| SMARP - 10: Optimise sampling and environmental data collection provided by the FIS | 11.43% | 4 | 2.86% | 1 | 8.57% | 3 | 5.71% | 2 | 8.57% | 3 | 14.29% | 5 | 11.43% | 4 | 11.43% | 4 | 14.29% | 5 | 5.71% | 2 | 5.71% | 2 | 35 | 5.86 |
| SMARP - 14: Re-evaluate spatio-temporal monitoring to provide reliable estimates of bycatch and TEP interaction levels | 5.71% | 2 | 0.00% | 0 | 17.14% | 6 | 17.14% | 6 | 11.43% | 4 | 5.71% | 2 | 11.43% | 4 | 11.43% | 4 | 5.71% | 2 | 8.57% | 3 | 5.71% | 2 | 35 | 6.11 |
| DI - 9: Implement biological and oceanographic data collection processes necessary to detect climate-driven changes | 8.57% | 3 | 5.71% | 2 | 11.43% | 4 | 14.29% | 5 | 22.86% | 8 | 5.71% | 2 | 5.71% | 2 | 5.71% | 2 | 8.57% | 3 | 2.86% | 1 | 8.57% | 3 | 35 | 6.54 |
| DI - 6: Ensure appropriate data is collected in the future to enable fishing power to be included as a factor in CPUE standardisations | 8.57% | 3 | 14.29% | 5 | 20.00% | 7 | 8.57% | 3 | 5.71% | 2 | 11.43% | 4 | 0.00% | 0 | 5.71% | 2 | 2.86% | 1 | 5.71% | 2 | 17.14% | 6 | 35 | 6.54 |
| SMARP - 1: Develop integrated data collection plans for each SESSF sector | 42.86% | 15 | 5.71% | 2 | 5.71% | 2 | 8.57% | 3 | 5.71% | 2 | 2.86% | 1 | 8.57% | 3 | 2.86% | 1 | 8.57% | 3 | 2.86% | 1 | 5.71% | 2 | 35 | 7.97 |
| | | | | | | | | | | | | | | | | | | | | | | | Answer | 35 |
| | | | | | | | | | | | | | | | | | | | | | | | Skippe | 1 |



Declining Indicators and SMARP RecommendationsPrioritised within the group responsible for their implementation

**How best do you think SESSF RAGs could best implement your top priority?**

**Answered** 21

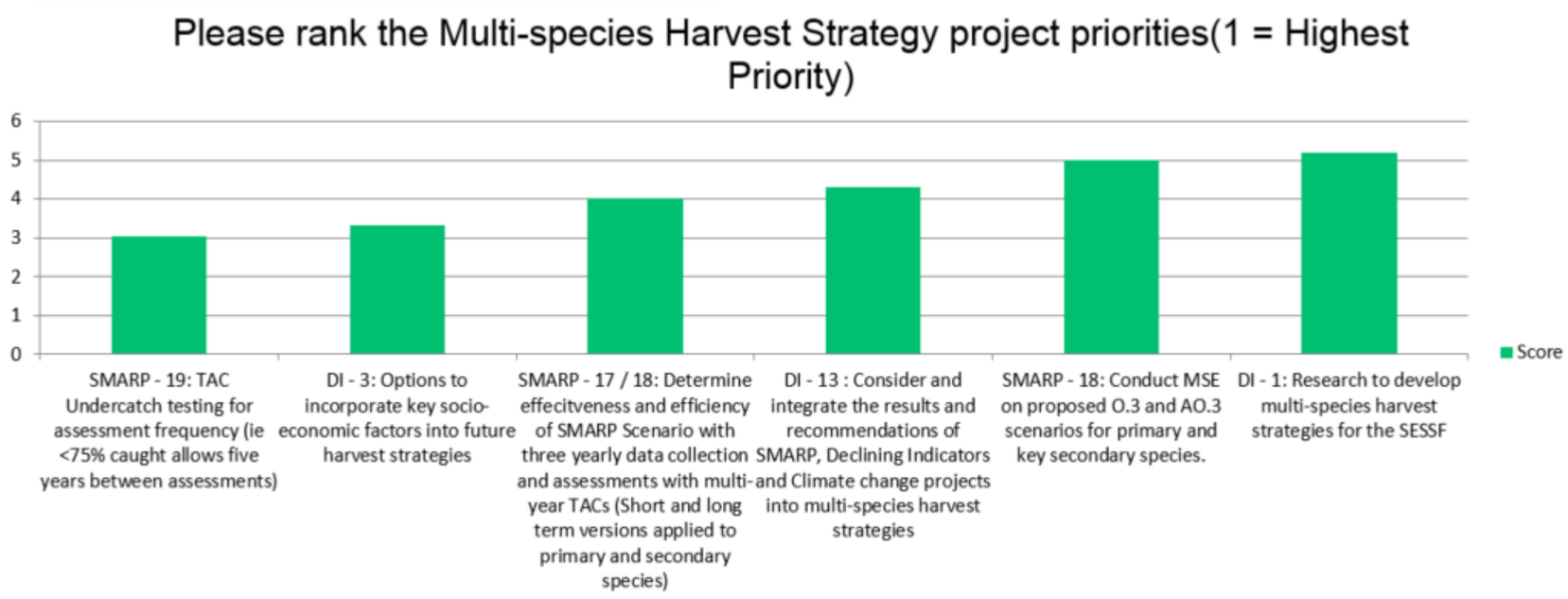
**Skipped** 15

| Respondents | Response Date | Responses | Tags |
|---|---|---|---|
| 1 | Feb 26 2019 | 1 Not certain. | |
| 2 | Feb 26 2019 | 1 Redesign FIS to answer biological sustainability question - are the fish there? Need to determine current spawning biomasses as absolute priority. | |
| 3 | Feb 26 2019 | 1 Data collection underlies all management decisions, this needs to become a priority of SESSFRAG. The first step is to ensure that existing targets are being met. | |
| 4 | Feb 26 2019 | 1 Promote the need for devt of these plans - robust and sufficient data is key to this fishery | |
| 5 | Feb 26 2019 | 1 Work with industry to implement cost effective collection processes | |
| 6 | Feb 26 2019 | 1 appropriate plan and appropriate resources need to be dedicated | |
| 7 | Feb 26 2019 | 1 Start by ensuring targets are metin existing plans. Test how much data is required/optimal for each data type | |
| 8 | Feb 26 2019 | 1 look at multiple gear types to be used by the FIS and increase intensity of survey lines | |
| 9 | Feb 26 2019 | 1 again some that could be collapsed | |
| 10 | Feb 26 2019 | 1 Review data needs and options for achieving them as part of developing the FMS | |
| 11 | Feb 26 2019 | 1 List factors already in standardisation, what should be in and what are possible data surrogates. What has worked elsewhere etc. | |
| 12 | Feb 26 2019 | 1 Spatio-temporally structured ERAs | |
| 13 | Feb 26 2019 | 1 All data collection activities should do the best job possible | |
| 14 | Feb 26 2019 | 1 Schedule of assessment drives when data needs to be collected, plan specifies data collection benchmarks and ensures collection is representative | |
| 15 | Feb 26 2019 | 1 Fund a data design project and employ and external operator (not AFMA) to implement that design (ie collect the data) | |
| 16 | Feb 26 2019 | 1 Implementing SMARP #1 should flow through to all others, i.e. what do we need, how do we get it how do we use it? | |
| 17 | Feb 26 2019 | 1 Support a project that would undertake this evaluation | |
| 18 | Feb 26 2019 | 1 Workshop to refine a draft proposal? | |
| 19 | Feb 26 2019 | 1 No comment | |
| 20 | Feb 26 2019 | 1 AS part of a project run interdependently where RAG contractors are accountable, by being engaged to undertake work. | |
| 21 | Feb 26 2019 | 0 hgf | |

Declining Indicators and SMARP RecommendationsPrioritised within the group responsible for their implementation

**Please rank the Multi-species Harvest Strategy project priorities(1 = Highest Priority)**

| | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | | Total | Score |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SMARP - 19: TAC Undercatch testing for assessment frequency (ie <75% caught allows five years between assessments) | 5.71% | 2 | 2.86% | 1 | 28.57% | 10 | 14.29% | 5 | 48.57% | 17 | 0.00% | 0 | 35 | 3.03 |
| DI - 3: Options to incorporate key socio-economic factors into future harvest strategies | 8.57% | 3 | 14.29% | 5 | 14.29% | 5 | 28.57% | 10 | 31.43% | 11 | 2.86% | 1 | 35 | 3.31 |
| SMARP - 17 / 18: Determine effecitveness and efficiency of SMARP Scenario with three yearly data collection and assessments with multi-year TACs (Short and long term versions applied to primary and secondary species) | 11.43% | 4 | 17.14% | 6 | 34.29% | 12 | 37.14% | 13 | 0.00% | 0 | 0.00% | 0 | 35 | 4.03 |
| DI - 13 : Consider and integrate the results and recommendations of SMARP, Declining Indicators and Climate change projects into multi-species harvest strategies | 11.43% | 4 | 42.86% | 15 | 20.00% | 7 | 17.14% | 6 | 8.57% | 3 | 0.00% | 0 | 35 | 4.31 |
| SMARP - 18: Conduct MSE on proposed O.3 and AO.3 scenarios for primary and key secondary species. | 0.00% | 0 | 100.00% | 1 | 0.00% | 0 | 0.00% | 0 | 0.00% | 0 | 0.00% | 0 | 1 | 5 |
| DI - 1: Research to develop multi-species harvest strategies for the SESSF | 62.86% | 22 | 20.00% | 7 | 2.86% | 1 | 2.86% | 1 | 11.43% | 4 | 0.00% | 0 | 35 | 5.2 |
| | | | | | | | | | | | | | **Answered** | 35 |
| | | | | | | | | | | | | | **Skipped** | 1 |



Declining Indicators and SMARP RecommendationsPrioritised within the group responsible for their implementation

**How best do you think the Multi-species Harvest Strategy Project could best implement your top priority?**

**Answered** 19

**Skipped** 17

| Respondents | Response Date | Responses | Tags |
|---|---|---|---|
| 1 | Feb 26 2019 | 1 Not sure. | |
| 2 | Feb 26 2019 | 1 Review, research and develop options for multi-species harvest strategies | |
| 3 | Feb 26 2019 | 1 Clearly developing multi-species harvest strategies should be the objective of the project. How to do this requires its own workshop | |
| 4 | Feb 26 2019 | 1 Seek advice across international fisheries experience (the project is doing this) | |
| 5 | Feb 26 2019 | 1 Consider implementing past research | |
| 6 | Feb 26 2019 | 1 Build a framework of inputs to assess relative values for assessment | |
| 7 | Feb 26 2019 | 1 MSE test this - but also consult widely with assessment providers about the feasibility of ramping up and ramping down every 3 years. This seems like a crazy idea with all sorts of potential mines too step on! | |
| 8 | Feb 26 2019 | 1 Form a technical panel to implement these outputs into HS development | |
| 9 | Feb 26 2019 | 1 An additional key priority is risk catch cost so potential harvest decays with the quality or age of data/assessments | |
| 10 | Feb 26 2019 | 1 Develop an ideal HS that covers off these projects irrespective of cost | |
| 11 | Feb 26 2019 | 1 There has already been a lot of work undertaken in this space. There are lessons and findings that need to be translated into candidate HCR and then tested for ability to deliver on HSP requirements/objectives | |
| 12 | Feb 26 2019 | 1 5 minutes thought should make it clear that 3 yearly data collection and assessments is a terrible idea | |
| 13 | Feb 26 2019 | 1 Objective of the MSHS project is to design a system that tackles the other priorities here. There will be a flow-on. | |
| 14 | Feb 26 2019 | 1 Develop a recreational fishing harvest strategy separate from the commercial measurement - a measure of the value of the fishing experience rather than economic value of the weight of the captured fish | |
| 15 | Feb 26 2019 | 1 Implement the current project | |
| 16 | Feb 26 2019 | 1 It will need a great deal of luck | |
| 17 | Feb 26 2019 | 1 No comment | |
| 18 | Feb 26 2019 | 1 As part of a larger project run independently. | |
| 19 | Feb 26 2019 | 0 vvvv | |

Declining Indicators and SMARP RecommendationsPrioritised within the group responsible for their implementation

**Do you have other comments, questions or concerns regarding this survey?**

**Answered** **16**

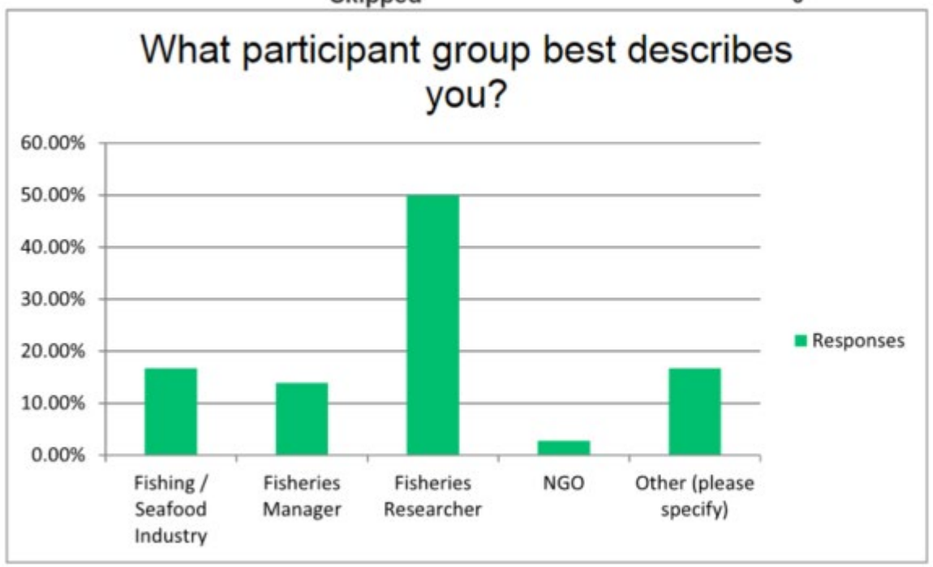
**Skipped** **20**

| Respondents | Response Date | | Responses | Tags |
|---|---|---|---|---|
| 1 | Feb 26 2019 | 1 | Not enough time to consider and write appropriate response. | |
| 2 | Feb 26 2019 | 1 | I think it is time biology and ecology of exploited stocks need to be revisited in light of non-recovering stocks, beyond just climate change effects. | |
| 3 | Feb 26 2019 | 1 | It was difficult to rank the options in all of the questions because there was a mix of options which are relatively inexpensive, straightforward to implement and highly likely to provide modest to moderate improvement to the system (e.g. Data validation) and options that are challenging to undertake, may not work but would provide large improvements to the system (e.g. CPUE effort creep and environmental changes due to climate change) | |
| 4 | Feb 26 2019 | 1 | A common theme that seems to be constant through all the discussions is that SESSF has a data problem, more than assessment, and management decision-making. This seems to be the root of all the concerns. | |
| 5 | Feb 26 2019 | 1 | found it very difficult to answer as asked to trade off across such diverse theme areas eg. climate change research and economic data | |
| 6 | Feb 26 2019 | 1 | Main comment - many priorities/projects could be rolled into fewer and more substantial bodies of work | |
| 7 | Feb 26 2019 | 1 | The climate/productivity related recommendations would benefit from a coherent approach and plan. | |
| 8 | Feb 26 2019 | 1 | No | |
| 9 | Feb 26 2019 | 1 | Many issues have been identified within the survey and not all can be progressed over the same timeframe. Some prioritisation will likely be important. | |
| 10 | Feb 26 2019 | 1 | recreational fishing is now a component of commonwealth fisheries legislation - we need to determine a new methodology to manage and measure the effects of both recreational and indigenous fishing on fish stocks. | |
| 11 | Feb 26 2019 | 1 | Many of the recommendations are being addressed by projects underway. Key to this is keeping track of them and ensuring that the progress of the priority issues are not held up by lack of progress in other areas. i.e. if AFMA don't get the IT issues sorted, it compromises everything else. | |
| 12 | Feb 26 2019 | 1 | My top priority would be to determine the level of sampling by a FIS (or other fishery independent estimate of abundance) would be needed provide adequate inputs for meeting HSP requirements either under with the current HCRs or, preferably, with a more empirical HCR that is tailored to such a source of information. | |
| 13 | Feb 26 2019 | 1 | it was very difficult, not always clear what was being asked | |
| 14 | Feb 26 2019 | 1 | Implementing priority 1 in many cases will be difficult and contingent on what else has been completed. So, how to do it in each case, in this survey, may be of little value. | |
| 15 | Feb 26 2019 | 1 | No | |
| 16 | Feb 26 2019 | 0 | no | |

Declining Indicators and SMARP RecommendationsPrioritised within issue category

**What participant group best describes you?**

| Answer Choices | Responses | |
|---|---|---|
| Fishing / Seafood Industry | 16.67% | 6 |
| Fisheries Manager | 13.89% | 5 |
| Fisheries Researcher | 50.00% | 18 |
| NGO | 2.78% | 1 |
| Other (please specify) | 16.67% | 6 |
| **Answered** | | **36** |
| **Skipped** | | **0** |

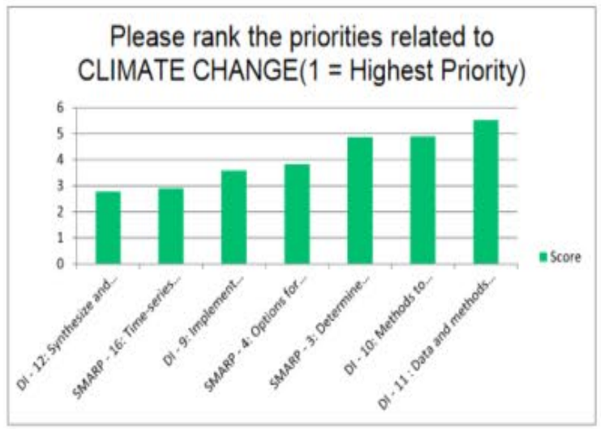



| Respondents | Response Date | Other (please specify) | Tags |
|---|---|---|---|
| 1 | Feb 26 2019 12:47 PM | Government | |
| 2 | Feb 26 2019 12:30 PM | policy officer | |
| 3 | Feb 26 2019 12:25 PM | Govermenr | |
| 4 | Feb 26 2019 12:24 PM | Independent consultant | |
| 5 | Feb 26 2019 12:24 PM | Economist | |
| 6 | Feb 26 2019 07:14 AM | test | |

Declining Indicators and SMARP RecommendationsPrioritised within issue category

**Please rank the priorities related to CLIMATE CHANGE(1 = Highest Priority)**

| | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | | 7 | | N/A | | Total | Score |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DI - 12: Synthesize and monitor information on species life histories, phenol | 3.23% | 1 | 12.90% | 4 | 6.45% | 2 | 3.23% | 1 | 16.13% | 5 | 19.35% | 6 | 35.48% | 11 | 3.23% | 1 | 31 | 2.77 |
| SMARP - 16: Time-series species productivity data (growth, reproduction etc | 3.23% | 1 | 3.23% | 1 | 6.45% | 2 | 16.13% | 5 | 19.35% | 6 | 29.03% | 9 | 16.13% | 5 | 6.45% | 2 | 31 | 2.9 |
| DI - 9: Implement biological and oceanographic data collection processes ne | 6.45% | 2 | 6.45% | 2 | 9.68% | 3 | 25.81% | 8 | 22.58% | 7 | 9.68% | 3 | 12.90% | 4 | 6.45% | 2 | 31 | 3.59 |
| SMARP - 4: Options for cost-effective collection of fishing-related climate / c | 9.68% | 3 | 9.68% | 3 | 16.13% | 5 | 22.58% | 7 | 9.68% | 3 | 6.45% | 2 | 19.35% | 6 | 6.45% | 2 | 31 | 3.83 |
| SMARP - 3: Determine environmental data needs to support assessment of I | 19.35% | 6 | 16.13% | 5 | 25.81% | 8 | 6.45% | 2 | 9.68% | 3 | 9.68% | 3 | 3.23% | 1 | 9.68% | 3 | 31 | 4.86 |
| DI - 10: Methods to incorporate impacts of climate change on species distrit | 25.81% | 8 | 19.35% | 6 | 16.13% | 5 | 9.68% | 3 | 9.68% | 3 | 12.90% | 4 | 3.23% | 1 | 3.23% | 1 | 31 | 4.9 |
| DI - 11 : Data and methods needed to determine the extent of species' prod | 29.03% | 9 | 29.03% | 9 | 16.13% | 5 | 12.90% | 4 | 6.45% | 2 | 3.23% | 1 | 0.00% | 0 | 3.23% | 1 | 31 | 5.53 |
| | | | | | | | | | | | | | | | | | Answered | 31 |
| | | | | | | | | | | | | | | | | | Skipped | 5 |



Declining Indicators and SMARP RecommendationsPrioritised within issue category

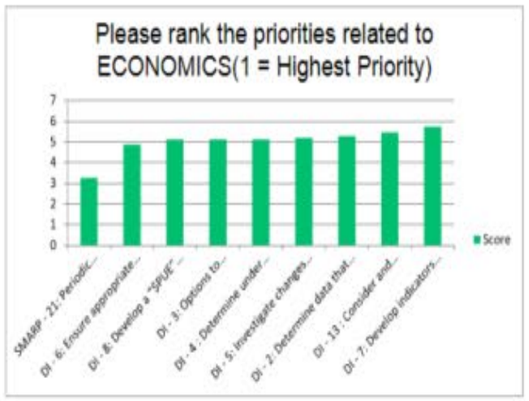
**Please rank the priorities related to DATA(1 = Highest Priority)**

| | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | | 7 | | 8 | | 9 | | 10 | | 11 | | N/A | | Total | Score |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SMARP - 11: Develop metadata and track changes in coding standards | 0.00% | 0 | 3.23% | 1 | 6.45% | 2 | 6.45% | 2 | 0.00% | 0 | 12.90% | 4 | 19.35% | 6 | 3.23% | 1 | 19.35% | 6 | 19.35% | 6 | 9.68% | 3 | 0.00% | 0 | 31 | 4.35 |
| SMARP - 7: Ensure integrated data collection plans prevent the collection | 0.00% | 0 | 9.68% | 3 | 19.35% | 6 | 0.00% | 0 | 0.00% | 0 | 3.23% | 1 | 12.90% | 4 | 12.90% | 4 | 12.90% | 4 | 6.45% | 2 | 16.13% | 5 | 6.45% | 2 | 31 | 5.07 |
| SMARP - 2: Cost-effective and regular collection of key economic informat | 9.68% | 3 | 3.23% | 1 | 6.45% | 2 | 6.45% | 2 | 12.90% | 4 | 6.45% | 2 | 6.45% | 2 | 3.23% | 1 | 16.13% | 5 | 19.35% | 6 | 9.68% | 3 | 0.00% | 0 | 31 | 5.19 |
| SMARP - 9: Explore methods to improve cost-effective monitoring and rec | 6.45% | 2 | 6.45% | 2 | 3.23% | 1 | 12.90% | 4 | 3.23% | 1 | 0.00% | 0 | 22.58% | 7 | 12.90% | 4 | 12.90% | 4 | 12.90% | 4 | 6.45% | 2 | 0.00% | 0 | 31 | 5.26 |
| SMARP - 8: Options and cost/benefits of industry-collected data | 3.23% | 1 | 6.45% | 2 | 6.45% | 2 | 6.45% | 2 | 19.35% | 6 | 9.68% | 3 | 9.68% | 3 | 6.45% | 2 | 12.90% | 4 | 12.90% | 4 | 6.45% | 2 | 0.00% | 0 | 31 | 5.48 |
| SMARP - 10: Optimise sampling and environmental data collection provid | 9.68% | 3 | 9.68% | 3 | 6.45% | 2 | 6.45% | 2 | 12.90% | 4 | 9.68% | 3 | 3.23% | 1 | 12.90% | 4 | 6.45% | 2 | 6.45% | 2 | 16.13% | 5 | 0.00% | 0 | 31 | 5.77 |
| SMARP - 20: Develop automated analysis and reporting of fishery and spe | 3.23% | 1 | 3.23% | 1 | 6.45% | 2 | 22.58% | 7 | 12.90% | 4 | 6.45% | 2 | 12.90% | 4 | 12.90% | 4 | 6.45% | 2 | 6.45% | 2 | 6.45% | 2 | 0.00% | 0 | 31 | 5.9 |
| SMARP - 6: Develop and implement automated data validation and error c | 0.00% | 0 | 3.23% | 1 | 25.81% | 8 | 19.35% | 6 | 16.13% | 5 | 12.90% | 4 | 0.00% | 0 | 9.68% | 3 | 3.23% | 1 | 3.23% | 1 | 6.45% | 2 | 0.00% | 0 | 31 | 6.71 |
| SMARP - 5: Rollout of e-Logbooks and e-CDRs | 12.90% | 4 | 16.13% | 5 | 6.45% | 2 | 12.90% | 4 | 6.45% | 2 | 25.81% | 8 | 3.23% | 1 | 6.45% | 2 | 0.00% | 0 | 6.45% | 2 | 3.23% | 1 | 0.00% | 0 | 31 | 7.23 |
| SMARP - 12: Automate AFMA's data collection, storage, distribution and n | 16.13% | 5 | 22.58% | 7 | 6.45% | 2 | 6.45% | 2 | 12.90% | 4 | 3.23% | 1 | 3.23% | 1 | 16.13% | 5 | 3.23% | 1 | 6.45% | 2 | 3.23% | 1 | 0.00% | 0 | 31 | 7.29 |
| SMARP - 1: Develop integrated data collection plans for each SESSF sector | 38.71% | 12 | 16.13% | 5 | 6.45% | 2 | 0.00% | 0 | 3.23% | 1 | 9.68% | 3 | 6.45% | 2 | 3.23% | 1 | 6.45% | 2 | 0.00% | 0 | 9.68% | 3 | 0.00% | 0 | 31 | 8 |
| | | | | | | | | | | | | | | | | | | | | | | | | | Answered | 31 |
| | | | | | | | | | | | | | | | | | | | | | | | | | Skipped | 5 |

Declining Indicators and SMARP RecommendationsPrioritised within issue category

**Please rank the priorities related to ECONOMICS(1 = Highest Priority)**

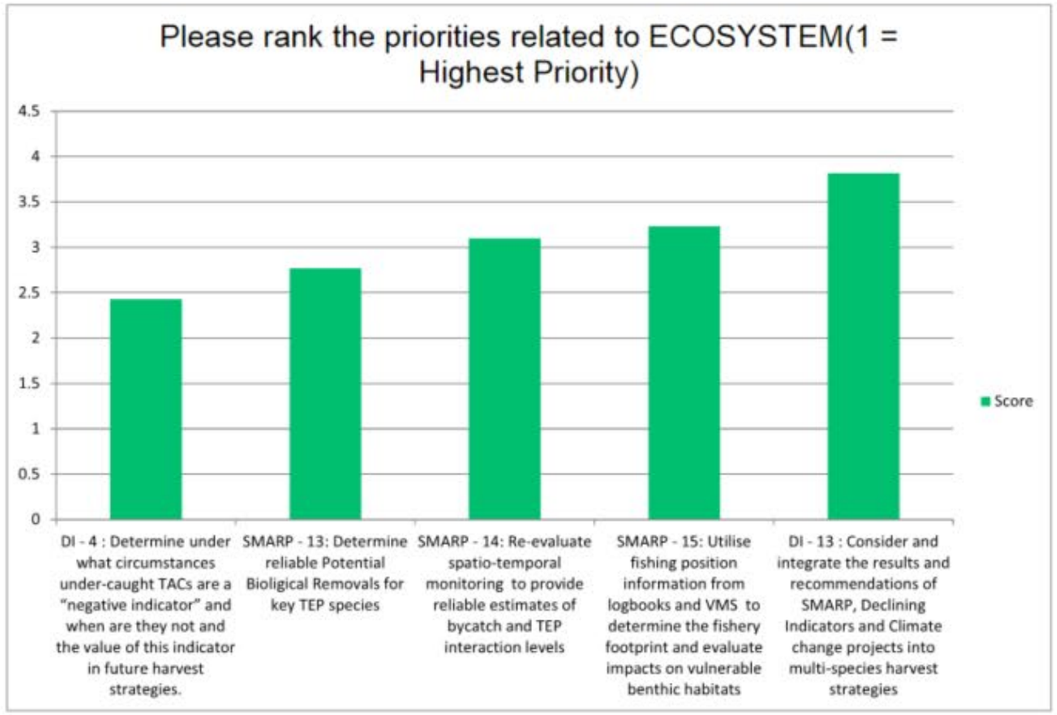
| | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | | 7 | | 8 | | 9 | | N/A | | Total | Score |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SMARP - 21: Periodic market testing of research services | 6.45% | 2 | 6.45% | 2 | 6.45% | 2 | 0.00% | 0 | 6.45% | 2 | 12.90% | 4 | 3.23% | 1 | 19.35% | 6 | 38.71% | 12 | 0.00% | 0 | 31 | 3.26 |
| DI - 6: Ensure appropriate data is collected in the future to enable fishing po | 6.45% | 2 | 12.90% | 4 | 22.58% | 7 | 3.23% | 1 | 9.68% | 3 | 6.45% | 2 | 12.90% | 4 | 9.68% | 3 | 16.13% | 5 | 0.00% | 0 | 31 | 4.87 |
| DI - 8: Develop a "SPUE" indicator or similar to be used as a performance in | 3.23% | 1 | 19.35% | 6 | 0.00% | 0 | 16.13% | 5 | 16.13% | 5 | 22.58% | 7 | 9.68% | 3 | 3.23% | 1 | 6.45% | 2 | 3.23% | 1 | 31 | 5.1 |
| DI - 3: Options to incorporate key socio-economic factors into future harves | 9.68% | 3 | 12.90% | 4 | 12.90% | 4 | 9.68% | 3 | 6.45% | 2 | 25.81% | 8 | 3.23% | 1 | 6.45% | 2 | 12.90% | 4 | 0.00% | 0 | 31 | 5.1 |
| DI - 4 : Determine under what circumstances under-caught TACs are a "neg | 9.68% | 3 | 9.68% | 3 | 12.90% | 4 | 12.90% | 4 | 16.13% | 5 | 6.45% | 2 | 9.68% | 3 | 22.58% | 7 | 0.00% | 0 | 0.00% | 0 | 31 | 5.13 |
| DI - 5: Investigate changes of fishing efficiencyand the potential inclusion of | 16.13% | 5 | 12.90% | 4 | 9.68% | 3 | 9.68% | 3 | 9.68% | 3 | 6.45% | 2 | 12.90% | 4 | 9.68% | 3 | 12.90% | 4 | 0.00% | 0 | 31 | 5.19 |
| DI - 2: Determine data that can explain links between fisher behaviour, vess | 12.90% | 4 | 3.23% | 1 | 12.90% | 4 | 22.58% | 7 | 6.45% | 2 | 12.90% | 4 | 19.35% | 6 | 9.68% | 3 | 0.00% | 0 | 0.00% | 0 | 31 | 5.29 |
| DI - 13 : Consider and integrate the results and recommendations of SMARP | 22.58% | 7 | 3.23% | 1 | 12.90% | 4 | 12.90% | 4 | 9.68% | 3 | 6.45% | 2 | 16.13% | 5 | 9.68% | 3 | 6.45% | 2 | 0.00% | 0 | 31 | 5.45 |
| DI - 7: Develop indicators relevant to markets and economics and ensure ad | 12.90% | 4 | 19.35% | 6 | 9.68% | 3 | 12.90% | 4 | 19.35% | 6 | 0.00% | 0 | 12.90% | 4 | 9.68% | 3 | 3.23% | 1 | 0.00% | 0 | 31 | 5.74 |
| | | | | | | | | | | | | | | | | | | | | Answered | 31 | |
| | | | | | | | | | | | | | | | | | | | | Skipped | 5 | |



Declining Indicators and SMARP RecommendationsPrioritised within issue category

**Please rank the priorities related to ECOSYSTEM(1 = Highest Priority)**

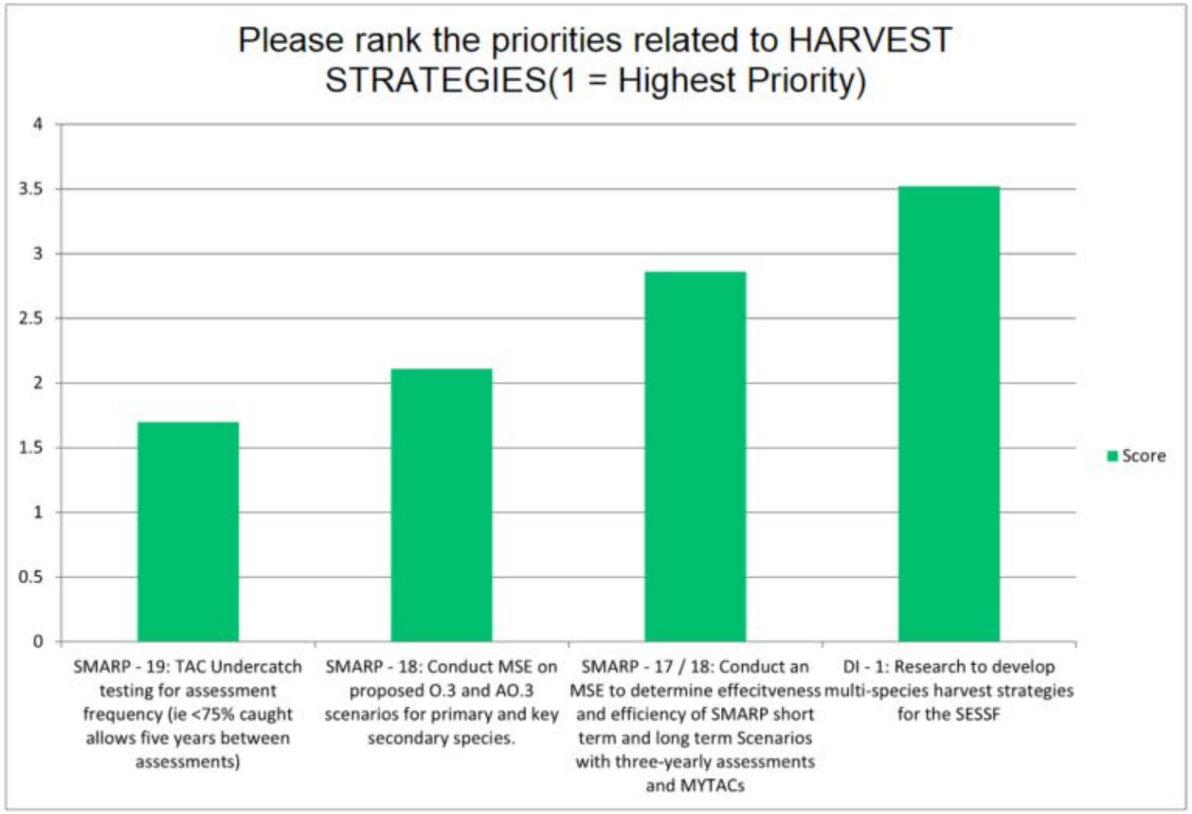
| | 1 | | 2 | | 3 | | 4 | | 5 | | N/A | | Total | Score |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DI - 4 : Determine under what circumstances under-caught TACs are a "neg: | 9.68% | 3 | 19.35% | 6 | 3.23% | 1 | 25.81% | 8 | 32.26% | 10 | 9.68% | 3 | 31 | 2.43 |
| SMARP - 13: Determine reliable Potential Bioligical Removals for key TEP sp | 16.13% | 5 | 19.35% | 6 | 19.35% | 6 | 16.13% | 5 | 29.03% | 9 | 0.00% | 0 | 31 | 2.77 |
| SMARP - 14: Re-evaluate spatio-temporal monitoring to provide reliable e | 16.13% | 5 | 12.90% | 4 | 45.16% | 14 | 16.13% | 5 | 9.68% | 3 | 0.00% | 0 | 31 | 3.1 |
| SMARP - 15: Utilise fishing position information from logbooks and VMS to | 9.68% | 3 | 38.71% | 12 | 22.58% | 7 | 22.58% | 7 | 6.45% | 2 | 0.00% | 0 | 31 | 3.23 |
| DI - 13 : Consider and integrate the results and recommendations of SMARF | 48.39% | 15 | 9.68% | 3 | 9.68% | 3 | 12.90% | 4 | 9.68% | 3 | 9.68% | 3 | 31 | 3.82 |
| | | | | | | | | | | | | | **Answered** | **31** |
| | | | | | | | | | | | | | **Skipped** | **5** |



Declining Indicators and SMARP RecommendationsPrioritised within issue category

**Please rank the priorities related to HARVEST STRATEGIES(1 = Highest Priority)**

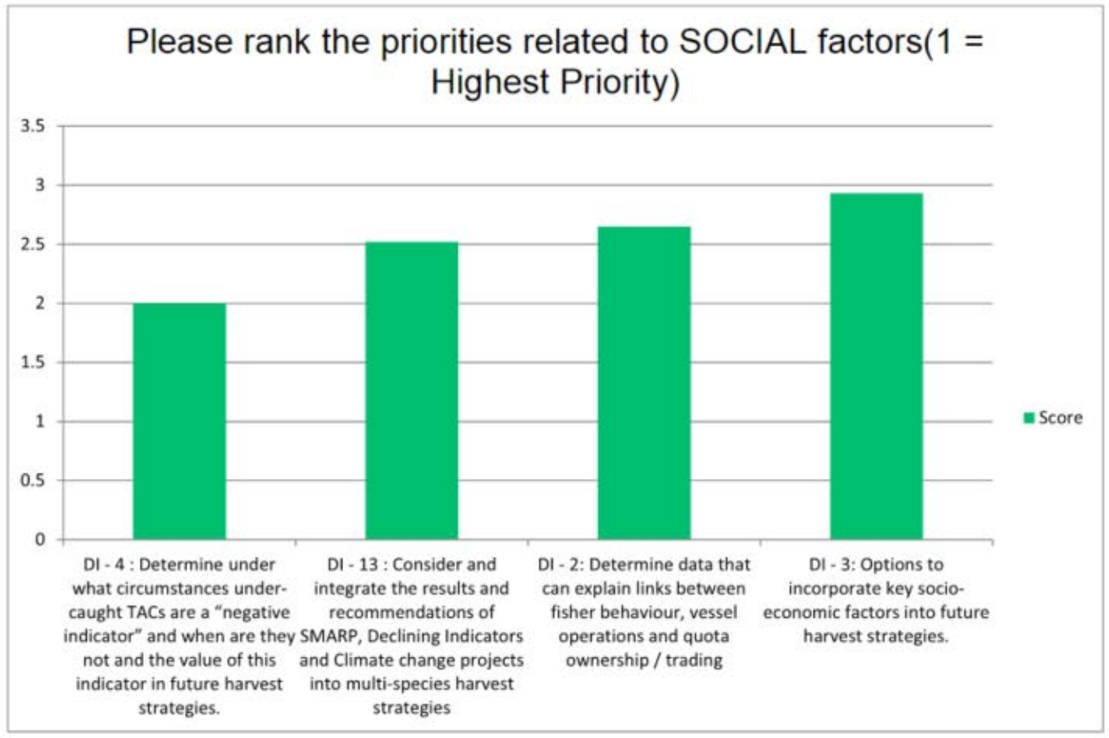
| | 1 | | 2 | | 3 | | 4 | | N/A | | Total | Score |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SMARP - 19: TAC Undercatch testing for assessment frequency (ie <75% cau | 6.45% | 2 | 12.90% | 4 | 22.58% | 7 | 54.84% | 17 | 3.23% | 1 | 31 | 1.7 |
| SMARP - 18: Conduct MSE on proposed O.3 and AO.3 scenarios for primary | 6.45% | 2 | 16.13% | 5 | 48.39% | 15 | 19.35% | 6 | 9.68% | 3 | 31 | 2.11 |
| SMARP - 17 / 18: Conduct an MSE to determine effecitveness and efficiency | 16.13% | 5 | 54.84% | 17 | 9.68% | 3 | 9.68% | 3 | 9.68% | 3 | 31 | 2.86 |
| DI - 1: Research to develop multi-species harvest strategies for the SESSF | 70.97% | 22 | 12.90% | 4 | 12.90% | 4 | 3.23% | 1 | 0.00% | 0 | 31 | 3.52 |
| | | | | | | | | | | | **Answered** | **31** |
| | | | | | | | | | | | **Skipped** | **5** |



Declining Indicators and SMARP RecommendationsPrioritised within issue category

**Please rank the priorities related to SOCIAL factors(1 = Highest Priority)**

| | 1 | | 2 | | 3 | | 4 | | N/A | | Total | Score |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DI - 4 : Determine under what circumstances under-caught TACs are a "nega | 12.90% | 4 | 12.90% | 4 | 29.03% | 9 | 38.71% | 12 | 6.45% | 2 | 31 | 2 |
| DI - 13 : Consider and integrate the results and recommendations of SMARF | 29.03% | 9 | 16.13% | 5 | 22.58% | 7 | 25.81% | 8 | 6.45% | 2 | 31 | 2.52 |
| DI - 2: Determine data that can explain links between fisher behaviour, vess | 19.35% | 6 | 41.94% | 13 | 22.58% | 7 | 16.13% | 5 | 0.00% | 0 | 31 | 2.65 |
| DI - 3: Options to incorporate key socio-economic factors into future harves | 38.71% | 12 | 25.81% | 8 | 19.35% | 6 | 12.90% | 4 | 3.23% | 1 | 31 | 2.93 |
| | | | | | | | | | | **Answered** | | **31** |
| | | | | | | | | | | **Skipped** | | **5** |



Declining Indicators and SMARP RecommendationsPrioritised within issue category

**Do you have other comments, questions or concerns regarding this survey?**

| | |
|---|---|
| **Answered** | **9** |
| **Skipped** | **27** |

| Respondents | Response Date | Responses | Tags |
|---|---|---|---|
| 1 | Feb 26 2019 12:54 PM | No time to complete survey during workshop. | |
| 2 | Feb 26 2019 12:35 PM | While MSE testing of SMARP options for assessment cycle are needed, really the decision before this should be whether it is even practical from an efficiency and logistics point of view - which would immediately rule it out and not require MSE testing. | |
| 3 | Feb 26 2019 12:35 PM | No | |
| 4 | Feb 26 2019 12:33 PM | Introduce a measurement methodology and criteria set for a potential recreational fishing harvest strategy | |
| 5 | Feb 26 2019 12:33 PM | n/a | |
| 6 | Feb 26 2019 12:32 PM | No | |
| 7 | Feb 26 2019 12:32 PM | Some series of questions were stretching my background knowledge | |
| 8 | Feb 26 2019 12:32 PM | The results of this survey should not be over-interpreted as it has been very roughly and quickly done | |
| 9 | Feb 26 2019 12:31 PM | I don't support any new work that aims to 'improve' CPUE. | |