

# 2024 ESD risk assessment of the South Australian Marine Scalefish Fishery

2024



Government  
of South Australia

Department of Primary  
Industries and Regions

# 2024 ESD risk assessment of the South Australian Marine Scalefish Fishery

Information current as of July 2024

© Government of South Australia 2024

## Disclaimer

Department of Primary Industries and Regions and its employees do not warrant or make any representation regarding the use, or results of the use, of the information contained herein as regards to its correctness, accuracy, reliability and currency or otherwise. Department of Primary Industries and Regions and its employees expressly disclaim all liability or responsibility to any person using the information or advice.

## All Enquiries

Department of Primary Industries and Regions  
2 Hamra Avenue  
WEST BEACH SA 5024  
T 08 8207 5332  
[www.pir.sa.gov.au/fisheries](http://www.pir.sa.gov.au/fisheries)

# Contents

|                                                                               |    |
|-------------------------------------------------------------------------------|----|
| List of abbreviations and acronyms.....                                       | 4  |
| Introduction .....                                                            | 6  |
| Background.....                                                               | 6  |
| Method .....                                                                  | 10 |
| Risk assessment results .....                                                 | 12 |
| Retained species .....                                                        | 12 |
| Primary / Management Tier 1 species .....                                     | 13 |
| Secondary and tertiary species - Management Tier 2/Tier 3.....                | 36 |
| Non-retained species .....                                                    | 51 |
| Threatened, endangered and protected species.....                             | 52 |
| General ecosystem impacts of fishing .....                                    | 56 |
| Community impacts .....                                                       | 59 |
| Asset value .....                                                             | 61 |
| Governance .....                                                              | 63 |
| Management plan .....                                                         | 63 |
| Legal framework – regulations / conditions / determinations.....              | 64 |
| External factors affecting performance of the fishery .....                   | 71 |
| Ecological impacts on the fishery – biophysical environment.....              | 71 |
| Impacts of other drivers – economic .....                                     | 73 |
| Risk treatment report .....                                                   | 76 |
| References.....                                                               | 81 |
| Appendix A – Aquatic resources prescribed for the fishery.....                | 85 |
| Appendix B – Stock status 2019 to 2021/22 .....                               | 87 |
| Appendix C - Recent management changes.....                                   | 88 |
| Appendix D – Proposed tiered management framework.....                        | 89 |
| Appendix E - Draft goals and objectives for replacement management plan ..... | 90 |
| Appendix F – Stakeholder input .....                                          | 91 |
| Appendix G – Focus of workshop .....                                          | 92 |
| Appendix H: Consequence and likelihood tables used .....                      | 97 |

# List of abbreviations and acronyms

|                   |                                                                              |
|-------------------|------------------------------------------------------------------------------|
| Act               | <i>Fisheries Management Act 2007</i>                                         |
| ASL               | Australian Sea Lion                                                          |
| AVG               | Abalone viral ganglioneuritis                                                |
| B <sub>40</sub>   | 40% of unfished biomass                                                      |
| BCF               | Blue Crab Fishery                                                            |
| B <sub>LIM</sub>  | Biomass limit reference point                                                |
| B <sub>TARG</sub> | Biomass target reference point                                               |
| B <sub>MSY</sub>  | Biomass associated with fishing at MSY                                       |
| B <sub>TRIG</sub> | Biomass trigger reference point                                              |
| CPUE              | Catch Per Unit Effort                                                        |
| CRIS              | Cost Recovery Implementation Statement                                       |
| DCCEEW            | Commonwealth Department of Climate Change, Energy, the Environment and Water |
| DEPM              | Daily Egg Production Method                                                  |
| ESD               | Ecologically Sustainable Development                                         |
| FRDC              | Fisheries Research and Development Corporation                               |
| HSF               | Harvest Strategy Framework                                                   |
| GSV               | Gulf St Vincent                                                              |
| GSVFZ             | Gulf St Vincent and Kangaroo Is Fishing Zone                                 |
| GSP               | Gross State Productivity                                                     |
| KGW               | King George Whiting                                                          |
| ITQ               | Individual Transferable Quota                                                |
| LML               | Legal Minimum Length                                                         |
| LMN               | Large Mesh Net (gillnet)                                                     |
| LTRP              | Lower trigger reference point                                                |
| MFA               | Marine Fishers Association                                                   |
| MSY               | Maximum Sustainable Yield                                                    |
| MSF               | Marine Scalefish Fishery                                                     |
| MSFMAC            | Marine Scalefish Fishery Management Advisory Committee                       |
| NSG               | Northern Spencer Gulf                                                        |
| PIRSA             | Department of Primary Industries and Regions                                 |
| RBC               | Recommended Biological Catch                                                 |
| SARDI             | South Australian Research and Development Institute                          |
| SAPFA             | South Australian Professional Fishers Association                            |
| SEFZ              | South East Fishing Zone                                                      |
| SG                | Spencer Gulf                                                                 |
| SGFZ              | Spencer Gulf Fishing Zone                                                    |
| SSG               | Southern Spencer Gulf                                                        |
| TAC               | Total Allowable Catch                                                        |
| TACC              | Total Allowable Commercial Catch                                             |

## OFFICIAL

|      |                                              |
|------|----------------------------------------------|
| TARC | Total Allowable Recreational Catch           |
| TEPS | Threatened, Endangered and Protected Species |
| TMF  | Tiered Management Framework                  |
| WVS  | Western Victoria Stock                       |
| WC   | West Coast                                   |
| WCFZ | West Coast Fishing Zone                      |

## Introduction

A ten-year Management Plan for the South Australian Commercial Marine Scalefish Fishery (MSF) (Management Plan) came into effect on 1 October 2013 and was extended until 30 June 2025. This Management Plan was informed by an Ecologically Sustainable Development (ESD) Risk Assessment of the MSF undertaken in 2011 (PIRSA 2011).

On 20 October 2021, following the finalisation of key policy decisions and structural changes, the former Minister for Primary Industries and Regional Development approved the review of the Management Plan for the purpose of determining whether the management plan should be amended, replaced or reinstated without amendment. The outcome of the review was to replace the Management Plan, and the Minister requested the Department of Primary Industries and Regions (PIRSA) develop a draft replacement Management Plan for this purpose with feedback from the Marine Scalefish Fishery Management Advisory Committee (MSFMAC).

The risks required for consideration in preparing a management plan for a fishery under section 43(2) of the *Fisheries Management Act 2007* (the Act) are:

1. identify the impacts or potential impacts of the fishery on its associated ecosystem or ecosystems, including impacts on non-target species of fish or other aquatic resources; and
2. identify any ecological factors that could have an impact on the performance of the fishery; and
3. Set out strategies to address the most serious risks.

To efficiently meet its ESD accountabilities under both State and Commonwealth legislation, PIRSA Fisheries and Aquaculture adopts the '*National ESD Reporting Framework for Fisheries*' developed by Fletcher et al. (2002) to provide a consistent way to implement and assess fisheries with respect to the principles of ESD in Australia.

This document is intended as a full ESD risk assessment that considers new information relevant to risks to and from the MSF that has become available since the 2011 Risk Assessment.

This risk assessment report has been developed to inform the development of the replacement Management Plan.

## Background

The commercial MSF is a multi-species, multi-gear fishery. The fishery provides for the commercial harvest of over 60 species of commercially available marine aquatic resources in South Australia. The fishery includes all South Australian coastal waters including gulfs, bays and estuaries (excluding the Coorong estuary) from the Western Australian border to the Victorian border (Figure 1).

The MSF is a valuable social and economic contributor to South Australian communities. Commercially caught 'scalefish' is a food source for South Australians and interstate consumers and the availability of fresh seafood contributes to regional tourism and provides health benefits to consumers. The fishery contributes to the economies of many South Australian coastal communities. The fishery is also an important part of South Australia's heritage and contemporary culture, particularly for regional coastal communities.



Figure 1: Area of the commercial Marine Scalefish Fishery

Access to the fishery is complex with eight separate commercial fisheries having some level of access to marine scalefish species. In addition to MSF licence holders, licence holders from the Miscellaneous Fishery, the Northern and Southern Zone Rock Lobster fisheries, the Lakes and Coorong Fishery, the three prawn fisheries, and the Blue Crab Fishery, all have some level of access. Access varies from the ability to retain some species taken as bycatch (prawn fisheries), to bait only (Blue Crab Fishery), to relatively open access for holders of an MSF licence. Some Australian Fisheries Management Authority (AFMA) issued permits provide a level of access to certain species in Coastal Waters of South Australia. Many species taken in the MSF are also accessed by recreational fishers (PIRSA 2023).

With the exception of the take of quota managed species, Blue Swimmer Crabs, Rock Crabs and Spider Crabs, there are no zones to restrict where an MSF licence holder can operate. A licence holder may choose to operate in any or all waters open to the fishery, which excludes permanent or temporal spatial closures, gear restrictions or marine parks closures.

The fishery has a diverse range of gear types and fishing methods which have been developed to target the broad range of permitted species within the fishery. There are 25 different gear types that are registered on MSF licences, in addition to hand collection, handlines and rod and lines, which do not require registration. The dominant gear types are handlines, longline, haul nets, mesh nets and squid jigs.

There are over 60 species of marine 'scalefish' taken commercially. Aquatic resources taken by the MSF are described in Appendix A. Stock status of assessed stocks in 2021/22 are described in Appendix B.

The majority of fishing effort is concentrated on four primary species; King George Whiting, Southern Garfish, Snapper and Southern Calamari. Over the last 20 years (to 2021/22), these species have typically accounted for over 60% of the total annual fishery production (by weight), yet in recent years, the proportion of annual catch from secondary and tertiary species has increased. The four primary species accounted for approximately 32% of the total fishery production (by weight) and 70% of the total fishery value in 2021/22. The majority of catches for three of these primary species comes from Spencer Gulf and Gulf St Vincent, with the exception being King George Whiting where areas west of Spencer Gulf have historically accounted for over 40% of the total commercial catch.

## Management Updates since 2011

The management of the MSF has undergone significant change since 2011 as outlined in Appendix C. Of most significance, South Australia's transformative reform of the commercial MSF on 1 July 2021, with the goal of strengthening the long-term financial and ecological sustainability of the industry.

Key elements of the reform included:

- Establishment of four fishing zones – West Coast Fishing Zone (WCFZ), Spencer Gulf Fishing Zone (SGFZ), Gulf St Vincent and Kangaroo Island Fishing Zone (GSVFZ), and South East Fishing Zone (SEFZ) (Figure 1).
- Establishment of individual transferable quota (ITQ) and total allowable commercial catch (TACC) management for Tier 1 stocks of King George Whiting (KGW), Snapper, Southern Garfish and Southern Calamari for the MSF and the Rock Lobster fisheries.
- Separation of the commercial taking of Vongole and Sardine from the MSF and the creation of the new fisheries under their own regulations.
- Removal of 100 MSF licences through the Voluntary Licence Surrender Program.

The reform also developed a Tiered Management Framework (TMF) for the MSF. The TMF is a simple decision-making framework to guide the management strategy and science needs of species in the fishery. The TMF suggests a management tier for each of the main stocks/species in the fishery based on various scored criteria, including stock status; their importance to the recreational, indigenous and commercial fishing sectors; target levels; and their vulnerability to overfishing (Smart et al. 2022). Under the framework, Management Tier 1 stocks represent the top tier of management with TACCs which can be unitized with ITQs and require quantitative analyses. Management Tier 3 is the lowest of the framework and includes management of stocks via input controls and assessments using fishery dependent performance indicators. The management tier associated with each of the MSF species are provided in Appendix D.



Figure 2: Fishing zones and Marine Fishing Areas in the Marine Scalefish Fishery

## Recent Catches and Value

The total annual catch of the MSF in 2021/22 was 1,851 tonnes (t) with the four primary species comprising 636 t. The catch is therefore dominated by secondary species followed by primary and then tertiary species (Smart et al. 2023).

In 2021/22, the total MSF related contribution to Gross State Productivity (GSP) in South Australia was \$32.8 million, including \$13.1 million generated by fishing directly, \$2.3 million generated by downstream activities (transport, processing, retailing, etc.) and \$17.4 million generated in other sectors (input suppliers to the fishing industry) (BDO EconSearch 2023).<sup>1</sup>

## Draft Harvest Strategy Framework

A draft Harvest Strategy Framework (HSF) is currently being prepared for the MSF for inclusion in the replacement Management Plan and will, therefore, be in place by 1 July 2025. The objectives of the draft HSF are to:

- ensure that target species are biologically sustainable; and
- support economic and social benefits to the community; and to
- contribute to cost-effective management.

The HSF will describe the performance indicators that will be used for measuring the status of stocks, plus how these indicators and their associated reference points and decision rules will be used. The reference points define the preferred stock status (target reference point) and what are undesirable levels (limit reference point). The draft HSF reference points are:

- Biomass limit reference point ( $B_{LIM}$ ) is 20% of the unfished biomass, or proxy, denoted as  $B_{20}$ . The appropriate fishing mortality reference point is  $F_{LIM}$ .
- Biomass target reference point ( $B_{TARG}$ ) is 50% of the unfished biomass, or proxy, denoted as  $B_{50}$ . The appropriate fishing mortality reference point is  $F_{50}$ .
- Trigger reference point ( $B_{TRIG}$ ) is 40% of the unfished biomass, or its proxy ( $B_{40}$ ).

The species covered by the HSF include all main species taken by the fishery, including the assessed Management Tier 1, Tier 2 and Tier 3 species as outlined in the TMF (Appendix D). Catches from all commercial sectors, plus those taken by the recreational, charter boat and Aboriginal traditional sectors are included in determining overall fishing mortality, where data are available.

Management Tier 1 species (i.e., Snapper, King George Whiting, Southern Garfish and Southern Calamari) are to be maintained, on average, at the biomass target,  $B_{TARG}$ . Management Tier 2 and Tier 3 species are to be maintained as close to the biomass target reference point (or proxy) as practicable. All Management Tier 1, Tier 2 and Tier 3 species are to be maintained above their biomass limit reference point ( $B_{LIM}$ ) at least 90 per cent of the time and the biomass of stocks is to be increasing away from the limit reference point. For many species in the MSF, it is not possible to estimate actual biomass and/or fishing mortality levels. For these species, empirical indicators will be used together with suitable proxies for the reference points.

---

<sup>1</sup> This was the published data available at the time of the workshop. Shortly after the workshop, the following information was published - In 2022/23, total MSF related contribution to GSP in SA was \$40.8 million, \$14.6 million generated by fishing directly, \$4.5 million generated by downstream activities and \$21.7 million generated in other sectors of the state economy (BDO EconSearch 2024).

A multi-category approach to deal with different levels of information and uncertainty in assessments of stocks is proposed in the HSF. The different categories reflect increasing uncertainty with stock status and ways to reduce the risks associated with this uncertainty.

## Method

The scope of this ESD Risk Assessment includes:

- Commercial fishing in the South Australian commercial MSF and other South Australian commercial fisheries with access to MSF species, under the current management arrangements in the area of the fishery.
- Assessment of potential impacts from the MSF, or on the fishery, within the next five years, and that are within PIRSA's or the fishing industry's ability to influence.

The process and steps undertaken to complete the risk assessment are outlined below (further details are presented in the Appendices and References).

1. Draft goals and objectives were updated in advance of a Risk Assessment workshop in consultation with the peak industry bodies for the MSF (Appendix E).
2. New information including published information, management arrangements and recent stock assessment outcomes were collated that related to the risks identified in the 2011 Risk Assessment.
3. An ESD Risk Assessment workshop was conducted over two days with representatives of key stakeholder groups facilitated by an independent facilitator. Participants of the Risk Assessment Workshop and contributors to the report are detailed in Appendix F.
4. Workshop participants considered all risks previously identified in the 2011 Risk Assessment and any new issues and agreed on priority issues to focus on during the workshop (Appendix G).
5. Participants agreed risk ratings that were assigned as a 'negligible' or 'low' in 2011, for which there was no new information of significance, were considered to be same risk rating in the updated risk assessment.
6. Workshop participants completed risk assessments using consequence and likelihood matrices provided in Appendix H and as summarised in Tables 1 and 2 below.
7. Several risks from the 2011 assessment fell outside of the scope of this assessment and are not included in this report (e.g., wider user access such as: desalination, shipping channels, wind farms, rocket launching, mining and development including resource extraction).
8. Where more than one plausible consequence was identified for a particular matter, a plausibility table has been included detailing the available lines of evidence and plausible options considered.
9. Where multiple plausible combinations of consequence and likelihood were identified, the combination with the highest risk score was adopted.
10. A Risk Treatment Report including operational objectives, indicators, data required, performance measures and management strategies/actions for components with risk ranked as moderate or higher has been prepared (Section 4) and included in ESD Risk Assessment report .

## OFFICIAL

The 'National ESD Reporting Framework for Fisheries' as developed by Fletcher et al. (2002) and Fletcher (2014) was used as the basis to assess the risks for general ecosystem impacts and external impacts on industry. Amended and simplified risk matrix, consequence and likelihood tables were used, consistent with other recent fisheries ESD risk assessments undertaken by PIRSA (Appendix H) and summarised in Tables 1 and 2 below.

Table 2: Risk matrix of consequence and likelihood (see Appendix H for more details).

| Consequence × Likelihood Risk Matrix |              | Likelihood     |                |              |            |
|--------------------------------------|--------------|----------------|----------------|--------------|------------|
|                                      |              | Remote (1)     | Unlikely (2)   | Possible (3) | Likely (4) |
| Consequence                          | Minor (1)    | Negligible (1) | Negligible (2) | Low (3)      | Low (4)    |
|                                      | Moderate (2) | Negligible (2) | Low (4)        | Medium (6)   | Medium (8) |
|                                      | High (3)     | Low (3)        | Medium (6)     | High (9)     | High (12)  |
|                                      | Major (4)    | Low (4)        | Medium (8)     | High (12)    | High (16)  |

Table 1: Risk categories and reporting requirements

| Risk Category | Risk Values | Management Response                       | Reporting Requirements    |
|---------------|-------------|-------------------------------------------|---------------------------|
| Negligible    | 0-2         | None                                      | Brief Justification       |
| Low           | 3-4         | No Specific Management                    | Full Justification Report |
| Medium        | 6-8         | Specific Management/<br>Monitoring Needed | Full Performance Report   |
| High          | 9-16        | Increased Management<br>Activities Needed | Full Performance Report   |

# Risk assessment results

## Retained species

**Draft Objective** - Total catch and effort is maintained at sustainable levels

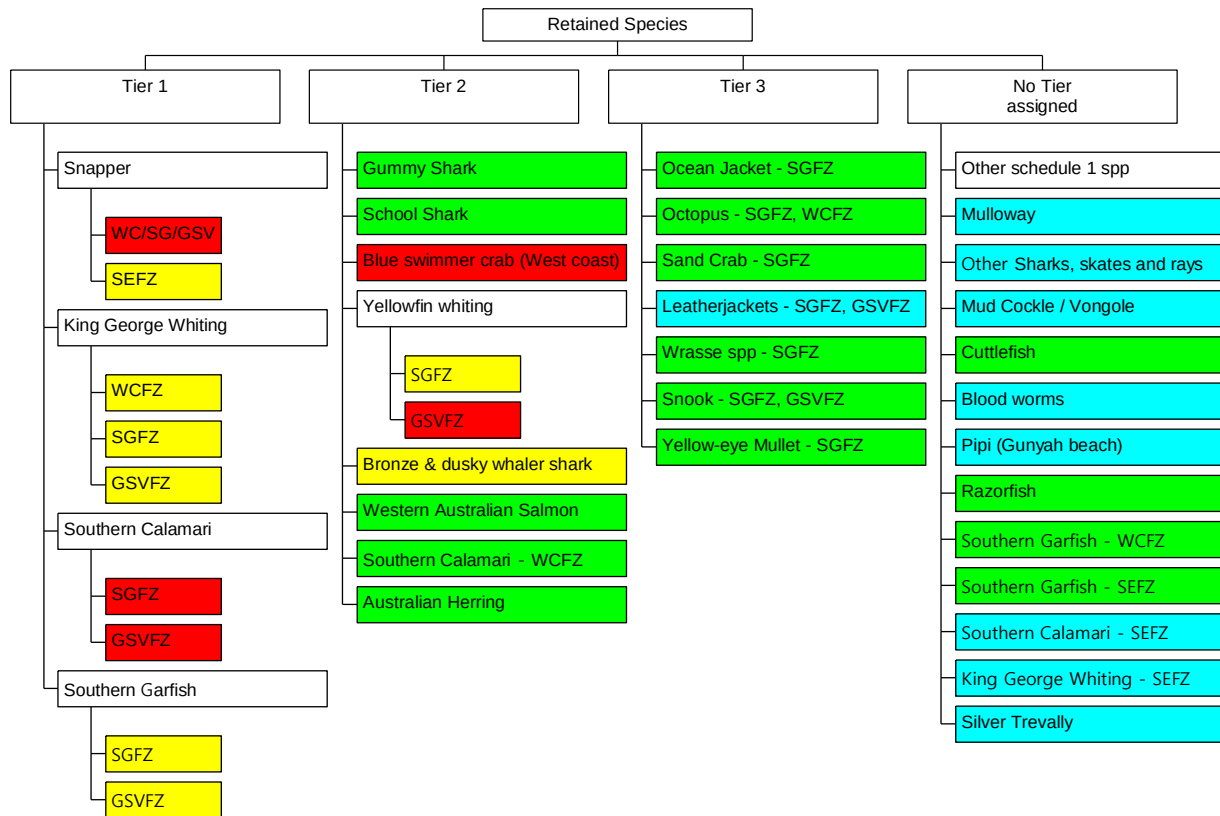


Figure 3. Component tree for retained species as grouped according to their assigned management tier as outlined in Appendix D. Colours reflect negligible, low, medium and high risks as assigned in 2024.

Based on the draft objective, the relevant consequence levels used for assessing retained species were either the Target Species Levels (for all Management Tier 1 species) and/or the Bycatch Levels for Management Tier 2, Tier 3 and species with no Management Tier assigned species (Appendix H).

Risks rated as Low or Negligible in the 2011 risk assessment were carried forward unless there was significant new information to consider.

The acceptable consequence levels are based on maintaining the biomass at least above the limit/trigger level in considering the objective to maintain sustainable levels of stock.

### Overarching factors

In considering the risks to total catch and effort being maintained at sustainable levels over the coming five years, the workshop participants noted two key overarching management changes or pending changes:

1. The reforms to the fishery implemented in 2021

2. Development of a new HSF expected to be implemented from 30 June 2025 in the replacement Management Plan.

Only species/stocks that were actively assessed by the workshop in 2024 are discussed below noting the agreement to carry-over risk ratings assigned as Low or Negligible risk in the 2011 assessment, unless there was new information or arrangements that warranted discussion. Relevant carried-over risk ratings from 2011 have been included in the retained component tree for completeness (Figure 3).

Retained species have been discussed and grouped according to their assigned management tier (i.e., Management Tier 1, 2, 3 or unassigned as outlined in Appendix D).

## Primary / Management Tier 1 species

### King George Whiting

#### New information

- Assessment of the South Australian MSF in 2021/22 (Smart et al. 2023).
- Management Tier 1 stock summaries (PIRSA 2024).
- Survey of Recreational Fishing in South Australia 2021-22 (Beckmann et al. 2023).
- King George Whiting spawning dynamics in South Australia's southern Gulfs (Drew et al. 2020).
- Spawning sources, movement patterns, and nursery area replenishment of spawning populations of King George Whiting in south-eastern Australia – closing the life history loop (Jenkins et al. 2016).
- Using a biophysical model to investigate connectivity between spawning ground and nursery areas of King George Whiting in South Australia's gulfs (Rogers et al. 2020).

#### Management Changes / New Arrangements

- In December 2016, the legal minimum length for King George Whiting for all sectors was increased in the waters of the SGFZ (East of Cape Carnot), GSVFZ and SEFZ from 31 cm to 32 cm whilst the Legal Minimum Length (LML) of 30 cm was retained in the waters west of Cape Carnot.
- A statewide reduction in the recreational bag limit from 12 to 10 legal size fish per person with the boat limit reduced from 36 to 30 fish per boat.
- A possession limit of either 72 fish or 10 kg of fillets or, if both fish and fillets are in possession, up to 36 fish and up to 5 kg of fillets.
- From 1 July 2021, commercial take of King George Whiting have been subject to a TACC set each year in the GSVFZ and SGFZ and commercial allocated as ITQ.
- From 1 July 2021, the take of King George Whiting in the WCFZ has been subject to a commercial catch cap.
- The take of King George Whiting in the SEFZ remains limited only by input controls.

King George Whiting is the largest species of the family Sillaginidae and occur across southern Australia. They have a complex life history that varies across life stages and habitats. Adult fish reside on offshore reefs where spawning occurs in winter. Their eggs are advected and settle into inshore nursery areas within protected bays. Juvenile fish grow and remain in these nursery areas until age three when they move to offshore spawning areas to join the adult stock. King George Whiting can live as old as 22 years old but have moderate growth rates despite their reasonably old longevity (Smart et al. 2023).

King George Whiting are caught using several different gear types, with handlines being the most dominant. Large fisheries exist in three fishing zones where they are targeted by recreational and commercial fishers. Only minor catches are taken in the South East. They are the second most economically valuable species to the commercial MSF and remain one of the primary target species in the fishery.

King George Whiting is also the most retained recreational species by weight, with an estimated 305 t recorded in the latest recreational fishing survey for 2021/22 (Beckmann et al 2023) which was higher than the total commercial catch for the same period.

King George Whiting were classified as Sustainable in all assessed fishing zones for 2021/22. Consideration of additional commercial catch and effort data for 2022/23 does not indicate any stock concerns (PIRSA 2024).

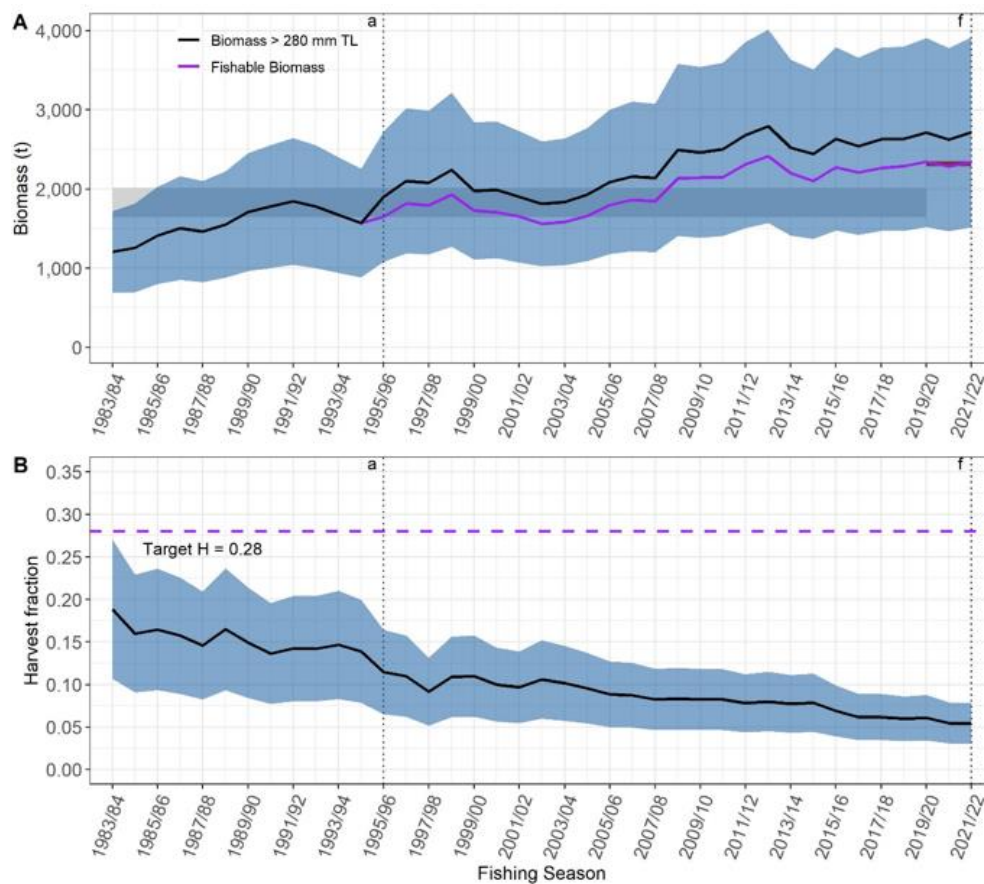


Figure 4. Biomass and harvest fraction for King George Whiting in the **WCFZ** (Smart et al. 2023)

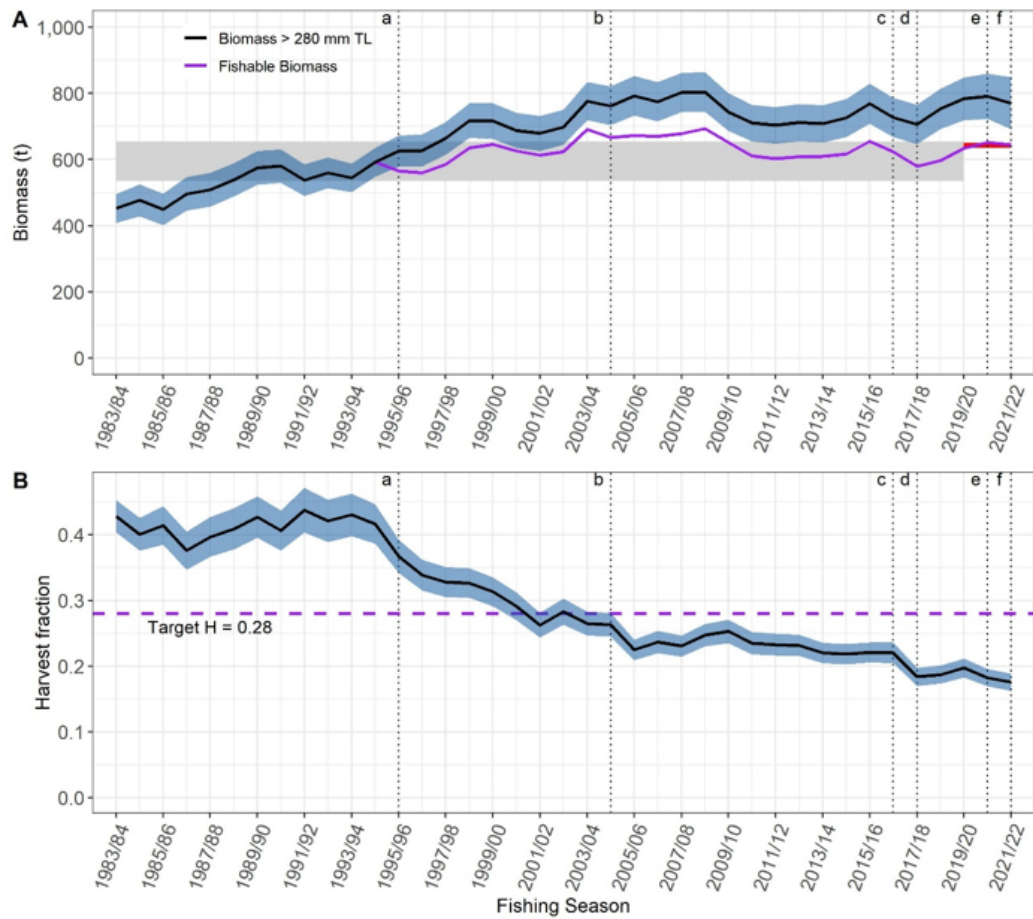


Figure 5. Biomass and harvest fraction for King George Whiting in the GSVFZ (Smart et al. 2023)

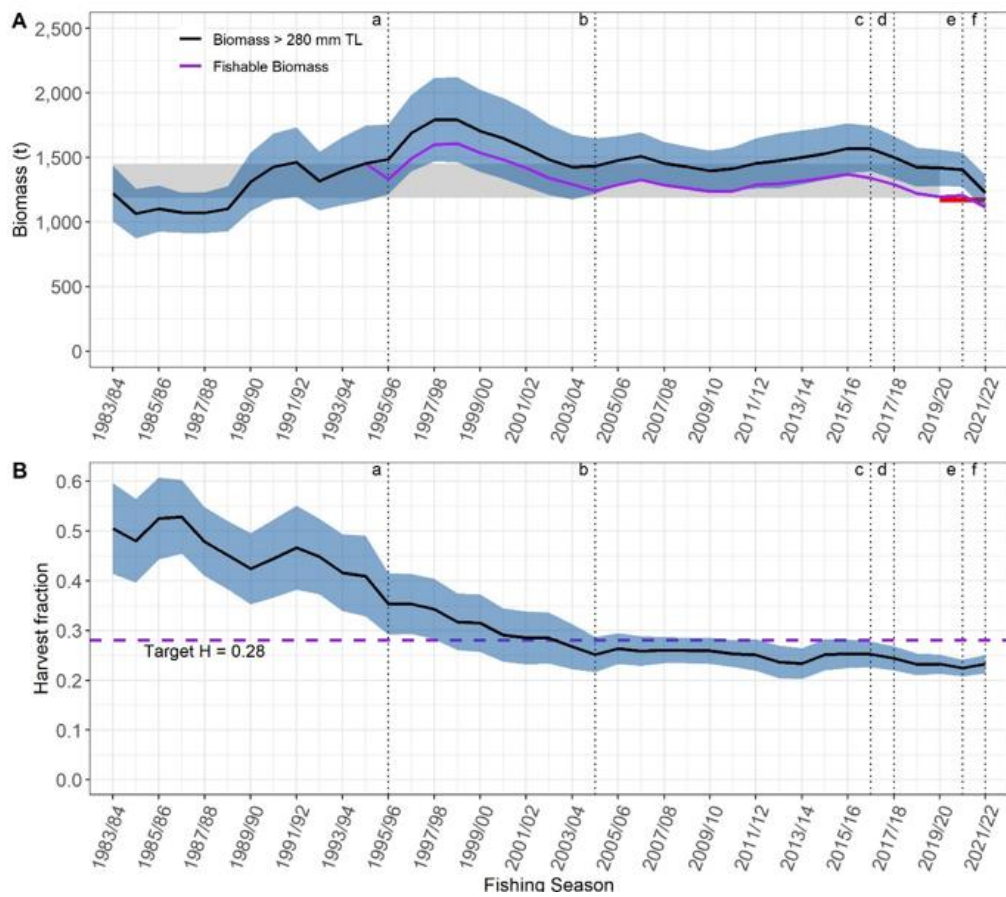


Figure 6. Biomass and harvest fraction for King George Whiting in the SGFZ (Smart et al. 2023)

### West Coast Fishing Zone – Management Tier 1

All available evidence indicates the King George Whiting stock in the WCFZ is healthy, and that recent catch and effort have remained at sustainable levels. There have been no discernible differences in annual age structures to indicate overfishing; standardised Catch Per Unit of Effort (CPUE) indicates a stable index of abundance and the WhitEst model demonstrated that biomass and annual recruitment were high while recent harvest fractions were low (Fig. 4). The WCFZ stock was classified as sustainable (Smart et al. 2023). Consideration of additional catch and effort data for 2022/23 does not indicate any stock concerns (PIRSA 2024).

### Spencer Gulf Fishing Zone – Management Tier 1

Slight declines in biomass have occurred in recent years due to reduced recruitment since 2013 in the SGFZ. Declining commercial catches have maintained a low harvest fraction and the lower trigger reference point (LTRP)<sup>2</sup> for biomass > 280 mm TL has not been breached. The LTRP for fishable biomass was breached in 2021/22, although this was in part due to the redefinition of fishable biomass that occurred through increases to LML. Raw and standardised CPUE demonstrate strong fishery performance and do not suggest any concerns with stock health (Fig. 5). As such, the SGFZ stock was classified as sustainable.

### Gulf St Vincent and Kangaroo Island Fishing Zone – Management Tier 1

Since 2016/17, all available indicators for this fishing zone have been positive. Commercial catch and effort have reduced, both raw and standardised CPUE have increased, and no identifiable concerns in age and length structures have been detected. As a result, stable recruitment and low harvest fractions have resulted in relatively high and stable biomass over recent fishing seasons (Fig. 6). The GSVFZ stock was classified as sustainable.

### South East Fishing Zone – No Management Tier assigned

The take of King George Whiting in the SEFZ remains negligible with less than five fishers reporting catch in each of the MSF Map Codes within the SEFZ. As fewer than five fishers have reported catches, the catch data cannot be displayed for confidentiality purposes.

### Current Assessment Program

- Weekly length and age structures collected through market sampling in Adelaide.
- Ongoing monitoring of fisheries statistics and stock status published annually.
- Recreational data collected every five to seven years through State-wide recreational survey.
- Application of a length-and-age-structured population model (WhitEst).
- No information is available for Aboriginal/Traditional fishing.

### **King George Whiting – West Coast Fishing Zone – 2024 Risk Rating**

Workshop participants noted the WCFZ King George Whiting stock has been managed at a fishing zone level since 1 July 2021 with an annual commercial catch cap set. The stock has remained classified as

---

<sup>2</sup> Under the 2013 Management Plan, the biomass trigger reference point is +/- 10% of previous 3 year average

## OFFICIAL

Sustainable for several years and it was likely that the biomass was at least above the draft biomass trigger level ( $B_{40}$ ). While there was some uncertainty regarding the biomass estimates in this region as the adult spawning stock was considered to be outside the footprint of the fishing effort. SARDI stock assessments suggested the WC stock had been lightly exploited for several years and therefore it was possible that it may be above the target level. There was no evidence consistent with the stock being below the threshold or that it would approach this level over the next five years.

It was noted there was a potential Fisheries Research and Development Corporation (FRDC) project being considered to further investigate the status of this stock.

The workshop discussed each of the lines of evidence and considered only Consequence Levels 1 and 2 and their associated likelihoods were plausible.

| KGW – WCFZ                                                                                                                                                                                                                                                                                                                                                                                                                | Target species consequence level |    |    |    |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|----|----|----|
| Lines of Evidence                                                                                                                                                                                                                                                                                                                                                                                                         | 1                                | 2  | 3  | 4  |
| <b>Catch and Catch rate</b> – All recent data are consistent with stock being at or above sustainable levels.<br><b>Biomass estimate</b> – Some uncertainty regarding the biomass estimate. It was possible that biomass was underestimated and may be above the target level<br><b>Stock status</b> – Ongoing Sustainable stock status<br><b>Management</b> – Pending HSF expected to maintain sustainable exploitation. | ✓                                | ✓  | X  | X  |
| Likelihood                                                                                                                                                                                                                                                                                                                                                                                                                | L3                               | L3 | na | na |
| Risk Score                                                                                                                                                                                                                                                                                                                                                                                                                | 3                                | 6  |    |    |

Legend - ✓ Consistent with lines of evidence; X – not consistent with lines of evidence

After considering all the lines of evidence, the workshop agreed the plausible combination with the highest risk score be adopted. Consequence score of (2) and Likelihood score of (3). **Risk rating (6) MEDIUM.**

### King George Whiting – Gulf St Vincent/Kangaroo Island Fishing Zone – 2024 Risk Rating

The GSVFZ King George Whiting stock has been managed at a fishing zone level since 1 July 2021. The stock was classified as Sustainable. Biomass estimates had stabilised over the last several years. It was considered likely that management arrangements were enabling fishing of higher proportions of spawning stock in this zone compared with the WCFZ. The recreational catch may also increase due to population growth and shifts in fishing effort away from Snapper to KGW. The uncertainty in the assessment was also generated from uncertainty in the estimate of recreational catch. GSV had exhibited more of a flat line for the biomass estimate. The pending new HSF with RBCs that would apply to all sectors was expected to assist maintaining sustainable status.

While based on the lines of evidence it was considered likely that this stock would remain in the range between the target and threshold over the coming five years, given the uncertainties it was considered plausible, but with very low probabilities, that the stock could range above and below these levels.

The workshop discussed each of the lines of evidence and considered that only Consequence levels 1, 2 and 3 and their likelihoods were plausible.

| KGW – GSVFZ                                                                                                                                                                                                                                                                                                                                                                                                       | Target species consequence level |   |   |   |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|---|---|---|
| Lines of Evidence                                                                                                                                                                                                                                                                                                                                                                                                 | 1                                | 2 | 3 | 4 |
| <b>Biomass estimate</b> – biomass estimates have stabilised over the last several years<br><b>Stock status</b> – Ongoing Sustainable stock status<br><b>Recreational catch levels and diverted catch</b> – High levels of recreational catch and potential diversion of effort from Snapper and increase possible due to population growth.<br><b>Management</b> – draft HSF will come into effect within 5 years | ✓                                | ✓ | ✓ | X |
| Likelihood                                                                                                                                                                                                                                                                                                                                                                                                        | 2                                | 4 | 1 |   |
| Risk Score                                                                                                                                                                                                                                                                                                                                                                                                        | 2                                | 8 | 3 |   |

After considering all the lines of evidence, the workshop agreed the most appropriate combination was a Consequence score of (2) and Likelihood score of (4). The **risk rating** was therefore **MEDIUM**.

### King George Whiting – Spencer Gulf Fishing Zone – 2024 Risk Rating

The SGFZ King George Whiting stock has been managed at a fishing zone level since 1 July 2021. The stock continues to be classified as Sustainable. Recreational Snapper fishing effort may have been diverted to KGW and increased recreational catch due to population increases are possible. Given there has been a recent declining trend in biomass estimate it was considered plausible that the SGFZ biomass may, within 5 years, fall below the draft biomass trigger, however the pending HSF was expected to mitigate this risk and maintain the biomass in the sustainable range.

The workshop discussed each of the lines of evidence and considered that only Consequences levels 2 and 3 and their likelihoods were plausible.

| KGW – SGFZ                                                                                                                                                                                                                                                                                                                                      | Target species consequence level |   |   |   |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|---|---|---|
| Lines of Evidence                                                                                                                                                                                                                                                                                                                               | 1                                | 2 | 3 | 4 |
| <b>Biomass estimate</b> – stable / declining biomass in recent years<br><b>Stock status</b> – Ongoing Sustainable stock status<br><b>Recreational catch levels and diverted catch</b> – High levels of recreational catch and potential diversion of effort from Snapper.<br><b>Management</b> – draft HSF will come into effect within 5 years | X                                | ✓ | ✓ | X |
| Likelihood                                                                                                                                                                                                                                                                                                                                      |                                  | 4 | 2 |   |
| Risk Score                                                                                                                                                                                                                                                                                                                                      |                                  | 8 | 6 |   |

After considering all the lines of evidence, the workshop agreed the most appropriate combination was a Consequence score of (2) and Likelihood score of (4). The **risk rating** was therefore **MEDIUM**.

## Snapper

### New Information

- Assessment of the South Australian MSF in 2021/22 (Smart et al. 2023).
- Management Tier 1 stock summaries (PIRSA 2024).
- Survey of Recreational Fishing in South Australia 2021-22 (Beckmann et al. 2023).

## OFFICIAL

- PIRSA website – Post Release Survival of Snapper - [Teaching better ways to safely release Snapper - PIRSA](#)
- Snapper (*Chrysophrys auratus*) Stock Assessment Report 2022 (Drew et al. 2022).
- "Insights into movement behaviour of snapper (*Chrysophrys auratus*, Sparidae) from a large acoustic array" (Fowler et al. 2017).
- The influence of fish movement on regional fishery production and stock structure for South Australia's Snapper (*Chrysophrys auratus*) fishery (Fowler 2016).
- A synthesis of fishery and biological information for Snapper (*Chrysophrys auratus*) in South Australia (Fowler 2023).

Snapper are a large-bodied, demersal teleost of the Sparidae family. They have a broad distribution through temperate and sub-tropical waters of the Indo-Pacific region and in Australia are distributed from the north coast of WA extending around the southern coastline, across to Tas and up to northern QLD (Kailola et al. 1993). They inhabit a diverse range of habitats extending from shallow bays and estuaries to the continental shelf edge (1–200 m depth). South Australia has three stocks: SG/WC, GSV/KI, and SE (part of the Western Victoria Stock – WVS). Snapper is a long-lived species (up to 36 years) and mature at 3–4 years of age at a fork length (FL) of 25–35 cm (Smart et al. 2023).

Snapper is an important target species for recreational and commercial fishers. Commercial catches were historically highest in the Spencer Gulf (SG) where handlines were the dominant gear. In the early 2000s, declining catches occurred in the SG as catches increased in the GSV. During this time, longlines became the dominant gear.

### Management Changes / Arrangements since 2011

- Snapper netting prohibited.
- Various seasonal and spatial closures applied temporarily for all sectors.
- Snapper trip limits for commercial fishers (period of several years between 2012 to 2019).
- Fishing for Snapper prohibited in all State waters from 1 November 2019 except for the SEFZ. This fishery closure was originally to remain in effect until 1 February 2023 (Drew et al., 2022), the closure was extended to 30 June 2026.
- From 1 July 2021, Snapper moved to TACC and ITQ management in all four fishing zones (noting currently 0 t TACC in all zones except the SEFZ).
- Since 2020, the Snapper fishery in the SEFZ has been managed with a total allowable catch (TAC) divided into a TACC and a total allowable recreational catch (TARC). The TACs in the SEFZ have been based on an RBC derived from a harvest fraction of a modelled estimate of fishable biomass. In 2023/24, the TAC was increased from 48 t to 70 t due to an increasing biomass and record high recruitment in Port Phillip Bay that is expected to increase biomass in the SEFZ.
- A Snapper Recovery Plan is to be developed prior to consideration of re-opening closed areas.

### WCFZ and SGFZ – Management Tier 1

A total fishing closure implemented from November 2019 after depleted stock status from the 2022 stock assessment (Drew et al., 2022). During 2012 to 2013, the status of the SG/WC stock, was transitional

depleting (Fowler et al. 2020). This status reflected the significant and continued declines in commercial catches and CPUE for both Northern Spencer Gulf and Southern Spencer Gulf (NSG and SSG). From 2012, a raft of management interventions was implemented to curtail the declining trends. In the assessment in 2018, the status of this stock was further downgraded to 'depleted', reflecting that commercial fishery statistics to 2017 remained at historically low levels (Steer et al. 2018a). The declines in fishery productivity and stock status primarily reflected poor recruitment throughout the 2000s, which indicated that recruitment had become impaired. A total fishery closure was implemented for this stock in November 2019, no evidence of improvements in biomass or recruitment were identified in the 2022 stock assessment, and this stock retained its depleted status, and the fishing closure was extended to June 2026.

#### GSV/KI FZ – Management Tier 1

A total fishing closure was initially implemented for the GSV/KI stock from November 2019 through to February 2023. In 2020, the status of the GSV/KI stock was changed from 'depleting' to 'depleted' (Fowler et al. 2020). This reflected the declines in estimates of spawning biomass, model estimated fishable biomass, poor recruitment since 2009 and persistent high targeted catch and effort. No evidence of improvements in biomass or recruitment were identified in the 2022 stock assessment and as a result this stock retained its depleted status, and the total fishing closure was extended from February 2023 to June 2026.

#### SEFZ – Management Tier 1

Catch and effort in the South East is largely influenced by the recruitment strength in Port Phillip Bay (VIC), and subsequent growth, mortality, movement and, ultimately, availability of Snapper in the South East at ~5 years of age when they generally reach the LML of 38 cm. Substantial increases in annual fishery catches, effort, and CPUE occurred between 2008/09 and 2011/12, which then declined through to 2015/16 and remained at low levels to 2019. Catches then increased in 2019, likely due to a small amount of effort transferred from the two closed Snapper stocks from November 2019. Catches from 2019/20 onwards in the SEFZ have been constrained by TACs. CPUE was the highest on record from 2020/21–2021/22 (Fig. 7.)

In 2016, 2018 and 2021/22 (Drew et al. 2022), the WVS was classified as 'sustainable'. The annual recruitment survey showed that over the 30 years to 2022 the 2018-year class was the largest recorded and the 2022-year class the third highest on record.

Consideration of additional catch and effort data for 2022/23 does not indicate any stock concerns; however, stock status is determined by the Victorian Fisheries Authority since the South East regional population represents the western extremity of the WVS. Given the record high recruitment index (for age 0+ juveniles) recorded in Port Phillip Bay in 2018 followed by another recruitment pulse in 2022, there is some anticipation that these strong year classes might be reflected in South East catches from 2023/24 onward (PIRSA 2024).

#### **Current Assessment Program**

- Weekly length and age structures collected through market sampling in Adelaide.
- Fishery-dependent sampling of length and age structures during fishery closures.
- Annual examination of commercial fishery statistics.
- Recreational data collected every five to seven years through State-wide recreational survey.

- Fishery independent estimates of biomass estimated using the Daily Egg Production Method (DEPM).
- Application of a length-and-age-structured population model (SnapEst).
- No information is available for Aboriginal/Traditional fishing.

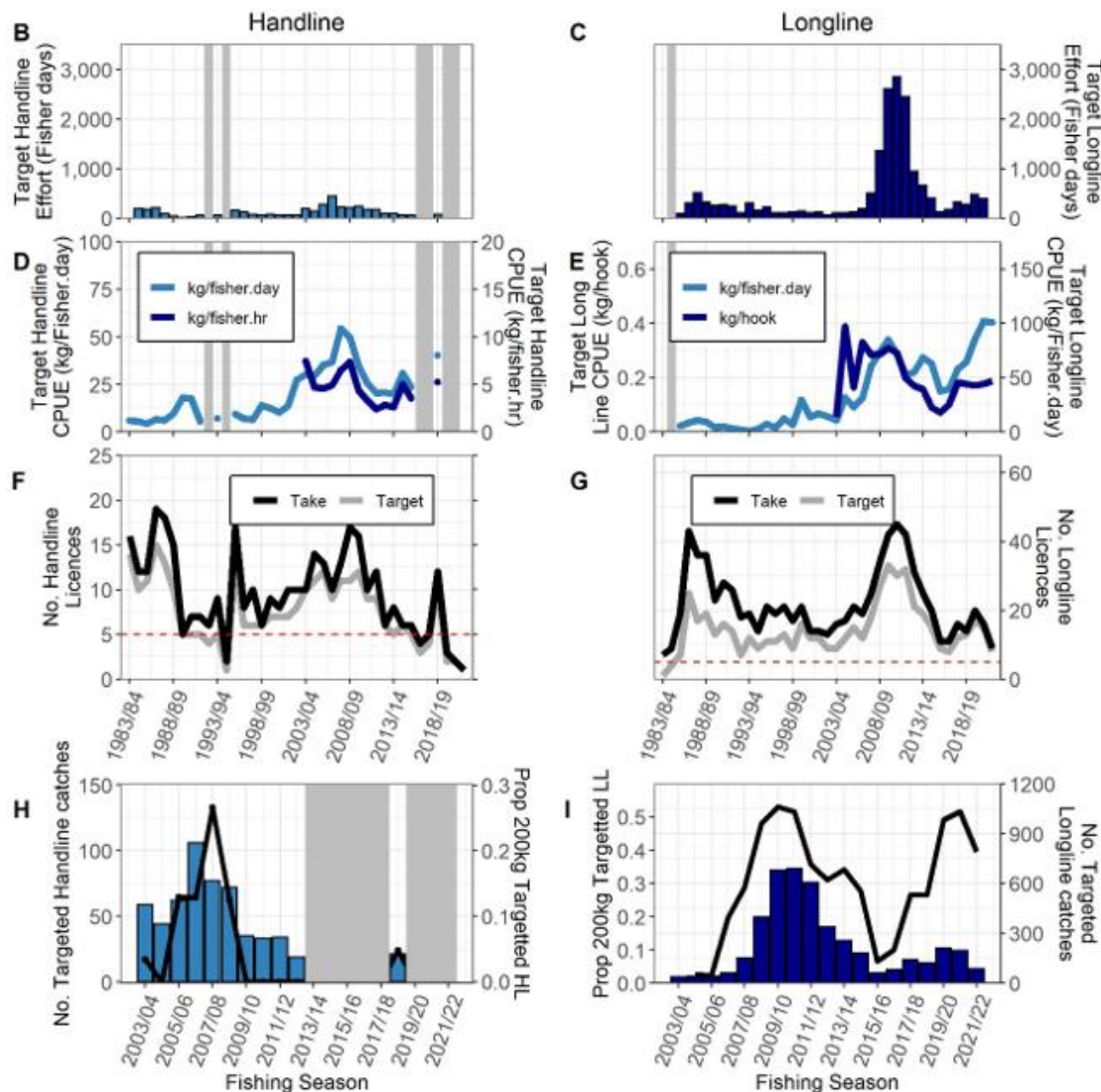


Figure 7. Key fishery statistics used to inform the status of Snapper in the SEFZ. Long-term trends in (A) total catch by gear and sector; targeted effort, handline (B) and longline (C); targeted CPUE metrics handline (D) and longline (E); number of licence holders taking and targeting Snapper for handlines (F) and longlines (G); number of daily catches and Proportion of targeted catches > 200kg for handlines (H) and longlines (I); A red dashed line in panel F and G represents the number of licences where data becomes confidential. Grey shading represents a fishing season where one or more gear types are confidential and are not included on the panel (Smart et al. 2023).

### Snapper – WCFZ, SGFZ and GSVFZ – 2024 Risk Rating

It was noted that the fishery is closed until 30 June 2026 and the stock remains classified as Depleted. The closure had arrested the decline; however, abundance remained at low levels. Snapper are slow growing with low recruitment. A recovery plan will be developed prior to the fishery reopening with clear reference points and ongoing monitoring to determine recovery. There is a history, in these zones of low recruitment and while it is not yet possible to identify whether the stock is recovering it is expected that there will be some improvement in the biomass in the next five years. There has been some evidence of

## OFFICIAL

recruitment, and it was noted that most of the mortality has been removed through the closure therefore it is plausible, but with a low probability that the stock may recover above to sustainable within 5 years. A significant research program has commenced and will improve available information on Snapper and address key research priorities. Given the management arrangements in place and some evidence of recruitment it was not considered plausible that the stock would decline further in this period. The next stock assessment will be delivered in November 2025.

The workshop discussed each of the lines of evidence and considered only Consequence levels 2 and 3 and their likelihoods were plausible.

| Snapper – SGFZ, WCFZ, GSVFZ                                                                                                                                                                                                                                                                                                                                                                                                                                           | Target species consequence level |   |   |   |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|---|---|---|
| Lines of Evidence                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 1                                | 2 | 3 | 4 |
| <b>Biomass estimate</b> – Fishery currently closed. Expect to see some improvement in biomass over 5 years.<br><b>Stock Status</b> – Depleted status, not able to identify whether stocks are recovering. Some evidence of recruitment<br><b>Recreational catch levels</b> – Fishery currently closed<br><b>Management</b> – Fishery currently closed. Recovery Plan to be developed. 3-year Snapper Science Program has commenced to address key research priorities | X                                | ✓ | ✓ | X |
| Likelihood                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                  | 1 | 3 |   |
| Risk Score                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                  |   | 9 |   |

After considering all the lines of evidence, the workshop agreed the plausible combination with the highest risk score be adopted: Consequence score (3) and Likelihood score (3). **Risk rating HIGH.**

### Snapper – Western Victoria stock – SEFZ – 2024 Risk Rating

This stock has been classified as sustainable for several years. There is a high level of biomass and evidence of good recruitment over regular intervals over the past 10 years. Stock is expected to remain sustainable. It was noted that there was good recruitment in 2018 and 2022 which resulted in an increased TAC for the SEFZ in 2023/24 and 2024/25. Therefore, it is possible that the stock was above the target level.

The stock is managed through a commercial TACC and recreational TARC. Length and age data and recruitment surveys all suggest that the stock is in a good position. There was no evidence that suggested the stock was below the threshold level.

The workshop discussed each of the lines of evidence and considered that only Consequences 1 and 2 and their likelihoods were plausible.

| Snapper – SEFZ                                                                                                                                                                                                                                                                                               | Target species consequence level |   |   |   |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|---|---|---|
| Lines of Evidence                                                                                                                                                                                                                                                                                            | 1                                | 2 | 3 | 4 |
| <b>Biomass</b> – high level of biomass<br><b>Stock Status</b> – continues to be classified as Sustainable<br><b>Recruitment</b> – evidence of good recruitment over regular intervals<br><b>Management</b> – TAC (TACC +TARC) and pending HSF was expected to maintain SE component of WVS at target biomass | ✓                                | ✓ | X | X |
| Likelihood                                                                                                                                                                                                                                                                                                   | 3                                | 4 |   |   |
| Risk Score                                                                                                                                                                                                                                                                                                   | 3                                | 8 |   |   |

After considering all the lines of evidence, the workshop agreed the plausible combination with the highest risk score be adopted. Consequence score (2) and Likelihood score (4). **Risk rating MEDIUM.**

## Southern Garfish

### New Information

- Assessment of the South Australian MSF in 2021/22 (Smart et al. 2023).
- Management Tier 1 stock summaries (PIRSA 2024).
- Survey of Recreational Fishing in South Australia 2021-22 (Beckmann et al. 2023).
- Do commercial fishery data reflect stock status in South Australia's Southern Garfish fisheries? (Fowler 2019).
- Assessing the effects of female size and age on the reproductive output of southern Garfish, *Hyporhamphus melanochir* (Giannoni 2013).
- Spatial variation in shape of otoliths for southern garfish *Hyporhamphus melanochir*—Contribution to stock structure (Steer and Fowler 2015).
- Stock discrimination of Southern Garfish (*Hyporhamphus melanochir*) by stable isotope ratio analysis of otolith aragonite (Steer et al. 2010).
- Southern Garfish (*Hyporhamphus melanochir*) Fishery (Steer et al. 2015).

Southern Garfish is a productive, fast-growing species that is endemic to southern Australia. They form large schools in shallow, inshore marine waters and their abundance are associated with seagrass beds. They are particularly abundant in South Australia's northern gulfs.

They are classified as Management Tier 1 in GSVFZ and Management Tier 3 in the WCFZ and SEFZ. The last stock assessment was conducted in 2022 and included data to 2020 (Smart et al. 2022b).

Southern Garfish fishing predominantly occurs in the two gulf zones with biomass being highest in the northern region of each gulf. Haul nets are the dominant commercial gear type. However, due to extensive netting restrictions, dab nets are the dominant gear types in the southern gulfs and WC fishing zone where smaller catches occur.

### Management Changes / New Arrangements since 2011

- Various temporal and spatial closures between 2012 and 2020 in the gulfs.
- Several increases to haul net pocket mesh size between 2013 and 2019 with minimum mesh size increase from 30 mm to 36 mm. In 2021, the haul net pocket mesh size was maintained at 36 mm for the GSVFZ and SGFZ but reduced to 32 mm in all other areas.
- Increase in the LML from 23 cm to 25 cm in 2015.
- In 2016, the recreational bag and boat limit of Southern Garfish was halved from 60 and 180 fish, respectively, to 30 and 90 fish.
- From 1 July 2021, Garfish TACC and ITQ in the two gulf fishing zones introduced.

- In 2021, the seasonal closures was removed and LML was reversed to 23 cm total length to reduce discarding from the larger mesh size in the gulf zones.

#### SGFZ – Management Tier 1

A recovering status was assigned in the 2020 stock assessment as harvest fractions had been reduced through effective fisheries management and biomass was stable and within the limit reference points. However, there remained signs of recruitment impairment. The fishery statistics for 2021/22 do not indicate concerns with the stock that may have arisen since the last full stock assessment. Therefore, a recovering status was maintained for 2021/22. Consideration of additional catch and effort data for 2022/23 does not indicate any stock concerns; rather the CPUE indices suggest abundance has returned to a long-term average following a period of recovery, and which is consistent with the latest estimates and trajectory for fishable biomass (PIRSA 2024).

#### GSVFZ – Management Tier 1

A recovering status was assigned in the 2020 stock assessment as biomass had increased to above the LTRP<sup>3</sup> and harvest fractions had been reduced through effective management. However, there remained signs of recruitment impairment. The fishery statistics for 2021/22 do not indicate any concern with the stock that may have arisen since the last full stock assessment. Therefore, a recovering status has maintained in 2021/22. Consideration of additional catch and effort data for 2022/23 does not indicate any stock concerns; rather the CPUE indices suggest abundance has returned to above the long-term average following a period of recovery, and which is consistent with the latest estimates and trajectory for fishable biomass. The provisional draft 2022/23 assessment report indicates an improved status to Sustainable.

#### WCFZ

Southern Garfish fishing is limited in the WCFZ due to broad spatial netting closures which limits the haul net sector. Annual catches of Southern Garfish in the WCFZ have typically been less than 5 t since the 2005 net licence buy back scheme. Stock status classified as Negligible as inadequate information exists to determine stock status.

#### SEFZ

Negligible amounts of catch occur in the SEFZ and the limited amount of fishing effort prevents data from being presented in most fishing seasons due to confidentiality. There have never been any indications of overfishing that could have caused the stock decline or recruitment impairment to occur. Therefore, the stock status classification of sustainable was retained. Stock status classified as Negligible as inadequate information exists to determine stock status.

#### **Current Assessment Program**

- Weekly length and age structures collected through market sampling in Adelaide.
- Annual examination of commercial fishery statistics.
- Recreational data collected every five to seven years through State-wide recreational survey.
- Application of a length-and-age-structured population model (GarEst).

---

<sup>3</sup> Under the 2013 Management Plan, the biomass trigger reference point is +/- 10% of previous 3 year average

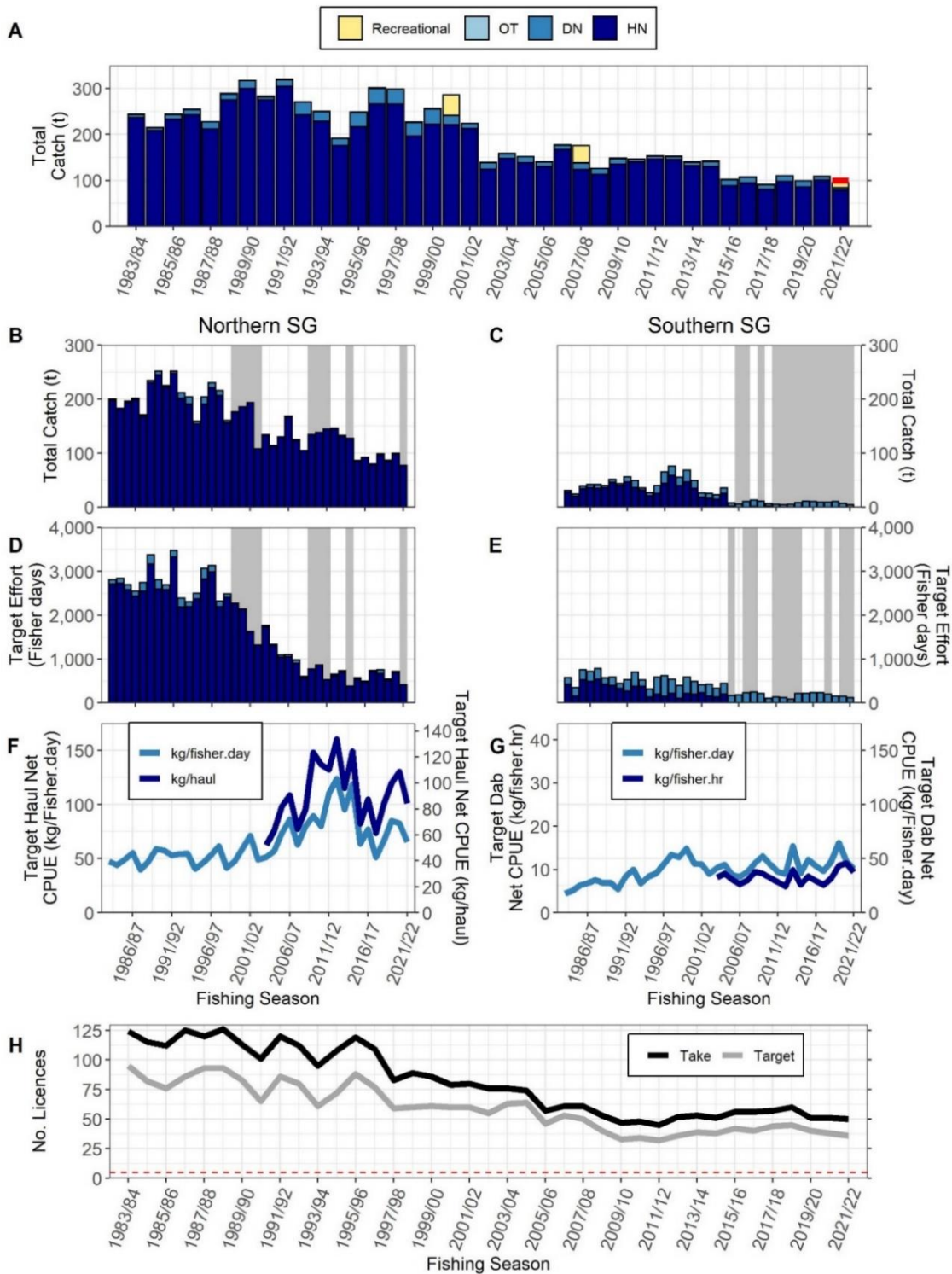


Figure 8. Key fishery statistics used to inform the status of Southern Garfish in the **SGFZ**. Long-term trends in (A) total catch by gear and sector; targeted haul net catch in NSG (B) and targeted dab net catch in SSG (C); targeted haul net effort in NSG (D) and targeted dab net effort in SSG (E); targeted haul net CPUE by fisher day and number of hauls in NSG (F) targeted dab net CPUE by fisher day and fisher hours in SSG (G); and (H) the number of active licences taking and targeting the species. Error bars on the 2021/22 recreational catch estimate (A) represent the standard error from that survey. The red line indicates the 2021/22 TACC. A dashed line in panel H represents the number of licences where data becomes confidential. Grey shading represents a fishing season where one or more gear types are confidential and are not included on the panel (Smart et al. 2023).

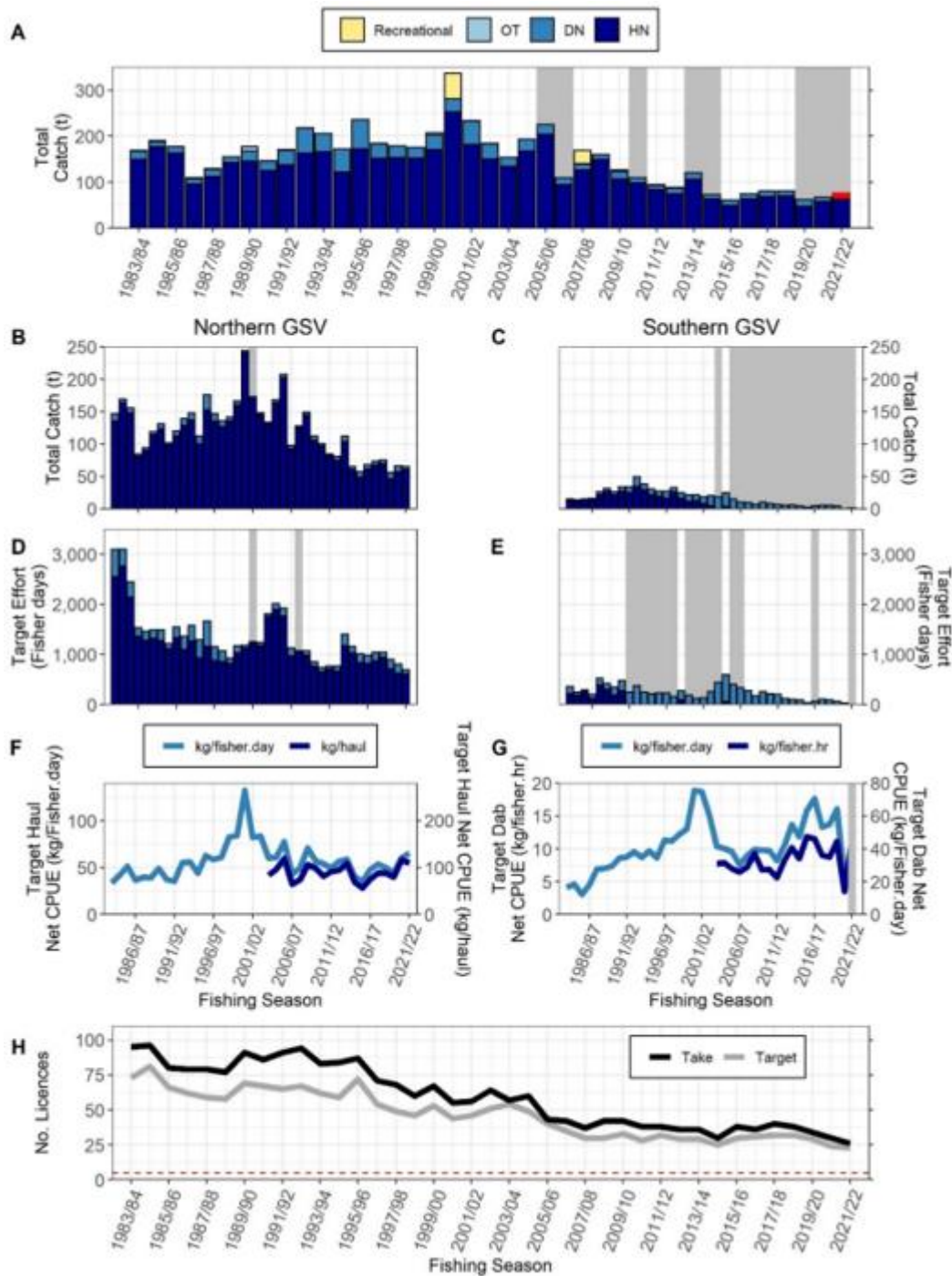


Figure 9. Key fishery statistics used to inform the status of Southern Garfish in the GSVFZ. Long-term trends in (A) total catch by gear and sector; targeted haul net catch in NGSV (B) and targeted dab net catch in SGSV (C); targeted haul net effort in NGSV (D) and targeted dab net effort in SGSV (E); targeted haul net CPUE by fisher day and number of hauls in NGSV (F) targeted dab net CPUE by fisher day and fisher hours in SGSV (G); and (H) the number of active licences taking and targeting the species. Error bars on the 2021/22 recreational catch estimate (A) represent the standard error from that survey. The red line indicates the 2021/22 TACC. A red dashed line in panel H represents the number of licences where data becomes confidential. Grey shading represents a fishing season where one or more gear types are confidential and are not included on the panel (Smart et al. 2023).

### SGFZ – Southern Garfish – 2024 Risk Rating

The stock has been classified as recovering since 2020 and this status has been maintained in 2022/23. Trajectory of stock performance has been positive and was expected to follow that trajectory over the next five years (Fig. 8). A TACC is in place and new recreational bag, boat limits and LML arrangements have been implemented. The stock was close to its threshold/biomass trigger and displaying an upward trend (PIRSA 2024). Combined with the amended management regime it was considered likely within the next five years stock would recover above the threshold level, but it was still plausible that it could remain below this level

It is noted there is currently a skewed sex ratio of (3 female:1 male) in the commercial harvest and there was a potential opportunity to balance the sex ratio of retained catch by considering removal of the restriction on netting in waters greater than 5 m in depth. This matter had recently emerged as a research priority (PIRSA 2024).

The workshop discussed each of the lines of evidence and considered that only Consequence Levels 2 and 3 and their associated likelihoods were plausible.

| Stock Name – Southern Garfish - SGFZ                                                                                                                                                                                                                                                                                                                                                                                                | Target species consequence level |   |   |   |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|---|---|---|
| Lines of Evidence                                                                                                                                                                                                                                                                                                                                                                                                                   | 1                                | 2 | 3 | 4 |
| <b>Biomass</b> – Trajectory of stock performance is positive<br><b>Stock Status</b> – Recovering, noting stock is close to threshold<br><b>Sex Ratio</b> – Investigation of skewed sex ration to be prioritised<br><b>CPUE trend</b> – Trajectory of stock performance is positive and expected to follow that trajectory over next five years<br><b>Management</b> – pending HSF expected to recover/maintain stock towards target | X                                | ✓ | ✓ | X |
| Likelihood                                                                                                                                                                                                                                                                                                                                                                                                                          |                                  | 4 | 2 |   |
| Risk Score                                                                                                                                                                                                                                                                                                                                                                                                                          |                                  | 8 | 6 |   |

After considering all the lines of evidence, the workshop agreed the plausible combination with the highest risk score be adopted: Consequence score (2) and Likelihood score (4). **Risk rating MEDIUM.**

### GSVFZ – Southern Garfish – 2024 Risk Rating

The stock was classified as recovering in 2021/22 and SARDI expect the stock to be classified as sustainable in the next stock assessment for 2022/23 (in prep). It was noted stock performance was on a positive trajectory and was expected to continue to improve under current management arrangements (Fig. 9). In addition, the pending HSF was expected to maintain the stock at the target biomass, it was considered plausible for the stock to continue to increase and be above the target level within five years if exploitation remains at current level.

The workshop discussed each of the lines of evidence and considered that only Consequences 1 and 2 and their likelihoods were plausible.

| Stock Name                                                                                                                                                                                                                                                                                                    | Target species consequence level |   |   |   |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|---|---|---|
| Lines of Evidence                                                                                                                                                                                                                                                                                             | 1                                | 2 | 3 | 4 |
| <b>Biomass</b> – Stock on positive trajectory and with current management in place it is expected to continue to improve.<br><b>Stock Status</b> – Stock status will move from Recovering to Sustainable in 2022/23 Stock Assessment report.<br><b>Management</b> – Pending new HSF aims to maintain stock at | ✓                                | ✓ | X | X |

|                       |   |   |  |  |
|-----------------------|---|---|--|--|
| <i>target biomass</i> |   |   |  |  |
| Likelihood            | 2 | 4 |  |  |
| Risk Score            | 2 | 8 |  |  |

After considering all the lines of evidence, the workshop agreed the plausible combination with the highest risk score be adopted: Consequence score (2) and Likelihood score (4). **Risk rating MEDIUM.**

### SEFZ – Southern Garfish – 2024 Risk Rating

Commercial catch has remained less than 10 t over a long period of time. Capacity to fish continued to be limited due to available launch locations, weather, tide and swell conditions of the Limestone Coast. Generally, less than five fishers recorded catch each year. Recreational catch data were considered unreliable for this area/species. No TACC was in place or considered necessary at this time as a Management Tier 3 species. It was therefore considered that given the very low catch levels the stock was most likely to be above the target level but given the uncertainties in the assessment it was just plausible it could be below this level but not below the threshold.

The workshop discussed each of the lines of evidence and considered that only Consequences 1 and 2 and their likelihoods were plausible.

| <b>Southern Garfish - SEFZ</b>                                                                  | <b>Target species consequence level</b> |   |   |   |
|-------------------------------------------------------------------------------------------------|-----------------------------------------|---|---|---|
| Lines of Evidence                                                                               | 1                                       | 2 | 3 | 4 |
| <i><b>Recreational catch data</b> – considered unreliable for this area and species</i>         |                                         |   |   |   |
| <i><b>Effort</b> – Generally less than five fishers record catch each year</i>                  |                                         |   |   |   |
| <i><b>Capacity to fish</b> – Limited due to weather/swell conditions of the Limestone Coast</i> | ✓                                       | ✓ | X | X |
| <i><b>Total catch</b> – Remains low – below 10 t for a long period of time</i>                  |                                         |   |   |   |
| <i><b>Management</b> - Pending new HSF aims to maintain stock at target biomass</i>             |                                         |   |   |   |
| Likelihood                                                                                      | 3                                       | 1 |   |   |
| Risk Score                                                                                      | 3                                       | 2 |   |   |

After considering all the lines of evidence, the workshop agreed the plausible combination with the highest risk score be adopted: Consequence score (1) and Likelihood score (3). **Risk rating LOW.**

### WCFZ – Southern Garfish – 2024 Risk Rating

Netting closures implemented in 2005 removed substantial haul net fishing effort for Southern Garfish in the WCFZ. There has been a lower level of catch compared to historically levels taken as a result of this management change. A TACC is not in place nor is it anticipated to be needed given the low level of exploitation as a Management Tier 3 species.

Given this information the workshop participants agreed a Consequence score of (1) and Likelihood score of (3). **Risk rating LOW.**

## Southern Calamari

### New Information

- Assessment of the South Australian MSF in 2021/22 (Smart et al. 2023).

- Management Tier 1 stock summaries (PIRSA 2024).
- Survey of Recreational Fishing in South Australia 2021-22 (Beckmann et al. 2023).
- FRDC project 2021-118 commenced March 2024 – ‘Developing a cost-effective stock assessment program for Southern Calamari fisheries’ (due November 2026).

Southern Calamari are endemic to southern Australia and New Zealand waters. It has rapid growth and a sub-annual lifespan. Adults and juveniles are found in shallow inshore waters while sub-adults are found in offshore areas to depths of <70 m. A single biological stock exists across southern Australia although population dynamics can occur at finer, regional scales.

Southern Calamari are caught predominantly in the gulf zones, as well as the WCFZ where catches have been lower. In 2021/22, squid jigs accounted for 79% of the MSF catch and 21% taken by haul nets. State-wide catch and CPUE have been increasing through time as Southern Calamari have achieved higher market prices and therefore fishers have transitioned away from catching Southern Calamari for bait. In 2021/22, Southern Calamari was the second most economically important species to the MSF.

All three prawn fisheries can commercially harvest Southern Calamari as by-product within specified allocations. The total state-wide commercial catch of Southern Calamari inclusive of the prawn fisheries by-product was 322 t in 2021/22 whilst the recreational catch was 220 t (Beckman et al. 2023). The total MSF catch was 278 t ranking it the second highest among MSF species in 2021/22.

Southern Calamari has the least certain abundance estimates of all the Management Tier 1 species. As Southern Calamari are short-lived and highly productive, it is thought that their populations are resilient to fishing. However, this has recently been challenged as the Tasmanian stock is currently classified as ‘Depleting’, and fishers have expressed concerns about stock health in South Australia. This suggests that Southern Calamari may not be as tolerant to high levels of fishing as previously thought and that methods to assess their population status need development. Furthermore, cephalopod population dynamics are influenced by prevailing environmental conditions, obfuscating the impact of fishing, and causing management complications. In South Australia, stock assessments are required to provide TACC setting advice for the SGFZ and GSVFZ. The development of quantitative assessment methods for Southern Calamari would benefit several Australian fisheries, particularly the MSF. To address these needs FRDC project 2021-118 ‘Developing a cost-effective stock assessment program for Southern Calamari fisheries’ commenced in March 2024.

### **Management Changes / Arrangements since 2011**

- Recreational bag and boat limit (15 per person and 45 per boat with 3 or more fishers) in place since 1995.
- All sectors limited to two rods or lines per person with one additional teaser line allowed.
- Southern Calamari TACC and ITQ management implemented in the SGFZ and GSVFZ from 1 July 2021.

### **SGFZ – Management Tier 1**

The TACC in 2021/22 was under-caught by 53 t (26%) in 2021/22 likely linked to a recent reduction in fishing effort likely in response to the recent reform of the fishery and the new operating conditions for licence holders including ITQ trading. Stable CPUE for NSG and an increase in SSG for 2021/22 indicated that there are no sustainability concerns that can be detected from the data available (Fig. 10). The MSFMAC discussed reports of declining catch rates in the southern western Spencer Gulf and

noted it was unclear how these concerns may or may not represent health of the wider stock. There were several possible causes for declines in catch rates in the region including water quality, nutrient load, predation from salmon, weather patterns or other environmental or anthropogenic factors. The MSFMAC noted required information to separate fishing impacts from other impacts were not available and noted monitoring of catch per fisher hour rather than fisher day, and a need to look at catch and effort data at a finer spatial scale may be useful. Environmental drivers to recruitment were being considered as part of a 3-year FRDC project to establish a new stock assessment program for Southern Calamari stocks which commenced in March 2024 (PIRSA 2024).

#### GSVFZ – Management Tier 1

The TACC in 2021/22 was under caught by 44 t (27%) in 2021/22 which is linked to a record low level of fishing effort. Declines in catch and effort were likely associated to be responses to the recent reform of the fishery and the new operating conditions for licence holders. Stable CPUE with modest increases in 2021/22 across both northern and southern GSV indicate that there are no sustainability concerns that can be detected from the data available (Fig. 11).

#### WCFZ – Management Tier 2

The total MSF catch in 2021/22 was 9 t and equal to the 10-year average in the WCFZ, but lower than historical catches up to 30 t. Generally, there appears to be no discernible upward or downward trend in Southern Calamari catch statistics for the WCFZ, suggesting the fishery is in a period of relative stability (Fig. 12). The fishery statistics do not indicate any stock declines in 2021/22 and there are no sustainability concerns detected from the data available (Smart et al. 2023).

#### SEFZ – no Management tier assigned

Negligible amounts of catch occur in the SEFZ and the limited amount of fishing effort prevents data from being presented in most fishing seasons due to confidentiality. There have never been any indications of overfishing that could cause stock decline or recruitment impairment to occur. Given that catches have never exceeded 5 t, a negligible stock status was assigned (Smart et al. 2023).

### **Current Assessment Program**

- No formal stock assessment.
- Annual examination of commercial fishery statistics.
- Recreational data collected every five to seven years through State-wide recreational survey.

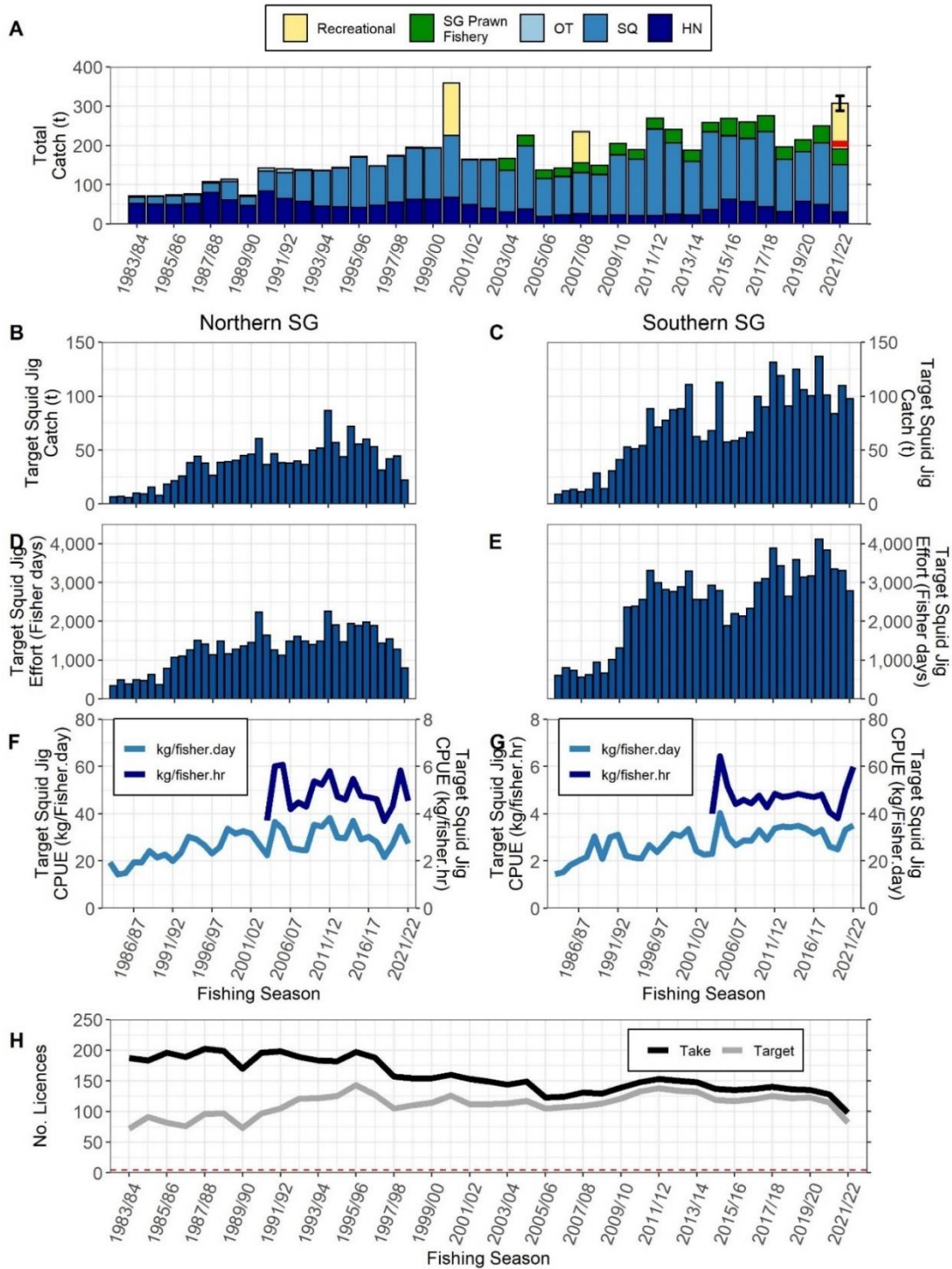


Figure 10. Key fishery statistics used to inform the status of Southern Calamari in the SGFZ. Long-term trends in (A) total catch by gear and sector; targeted squid jig catch in NSG (B) and SSG (C); targeted squid jig effort in NSG (D) and SSG (E); targeted squid jig CPUE by fisher day and fisher hour in NSG (F) and SSG (G); and (H) the number of active licences taking and targeting the species. Error bars on the 2021/22 recreational catch estimate (A) represent the standard error from that survey. The red line indicates the 2021/22 TACC. A red dashed line in panel H represents the number of licences where data becomes confidential (Smart et al. 2023).

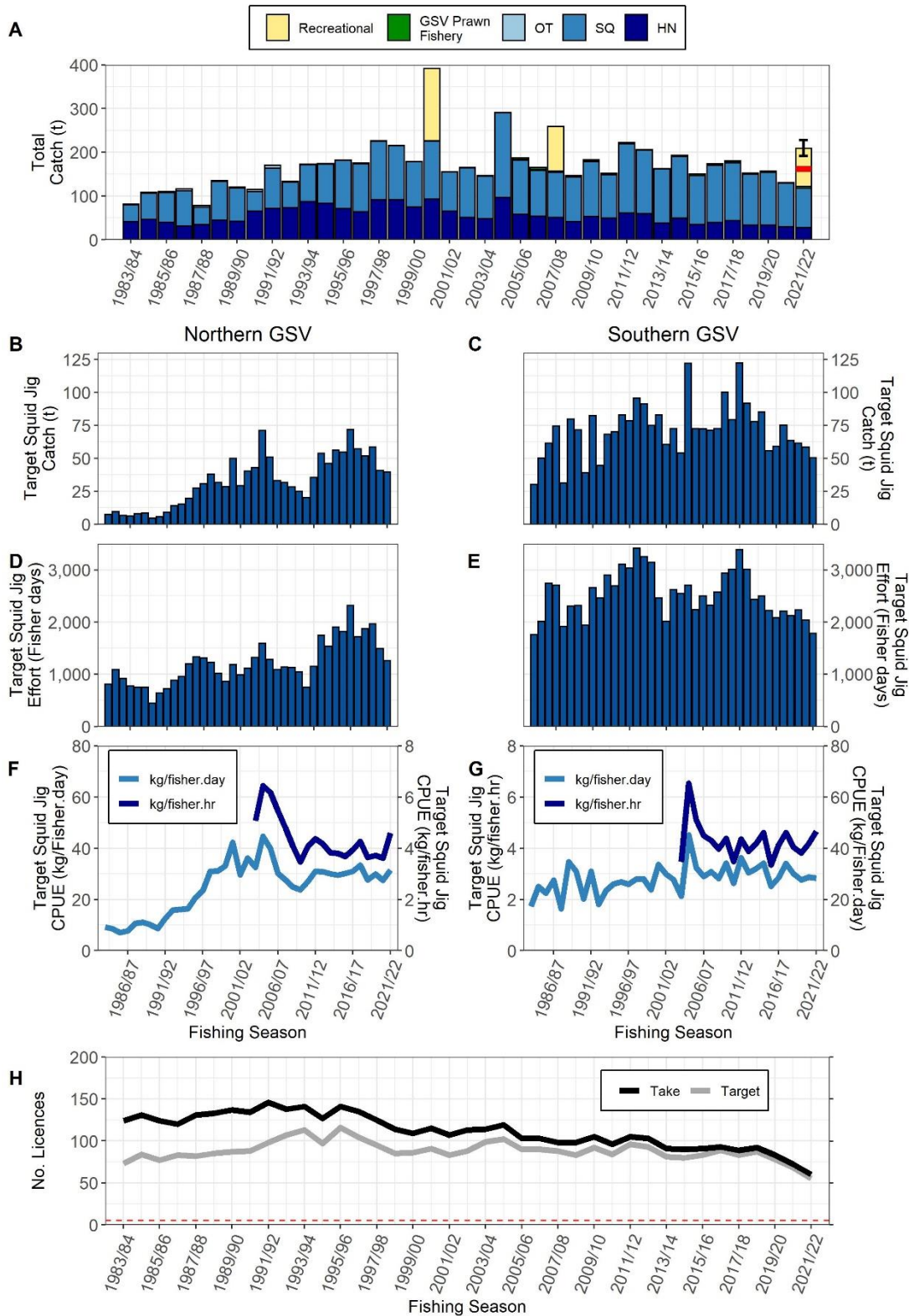


Figure 11. Key fishery statistics used to inform the status of Southern Calamari in the **GSVFZ**. Long-term trends in (A) total catch by gear and sector; targeted squid jig catch in NGSV (B) and SGSV (C); targeted squid jig effort in NGSV (D) and SGSV (E); targeted squid jig CPUE by fisher day and fisher hour in NGSV (F) and SGSV (G); and (H) the number of active licences taking and targeting the species. Error bars on the 2021/22 recreational catch estimate (A) represent the standard error from that survey. The red line indicates the 2021/22 TACC. A red dashed line in panel H represents the number of licences where data becomes confidential (Smart et al. 2023).

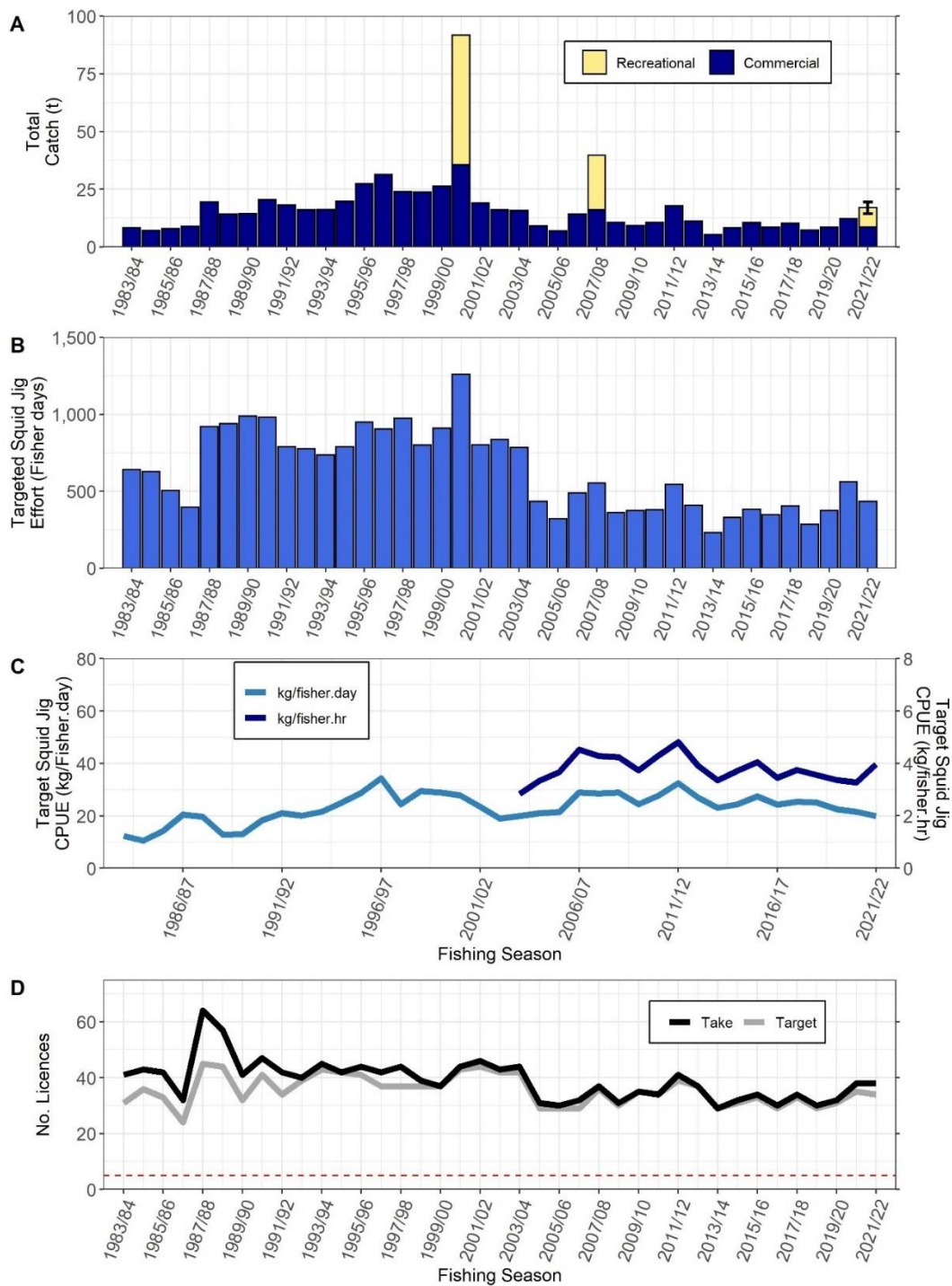


Figure 12. Key fishery statistics used to inform the status of Southern Calamari in the **WCFZ**. Long-term trends in (A) total catch by sector; targeted squid jig effort (B); targeted squid jig CPUE by fisher day and fisher hour (C) and the number of active licences taking and targeting the species. Error bars on the 2021/22 recreational catch estimate (A) represent the standard error from that survey. A red dashed line in panel D represents the number of licences where data becomes confidential (Smart et al. 2023).

### SGFZ – Southern Calamari – 2024 Risk Rating

It was noted that while the stock is classified as Sustainable, some stakeholders have expressed concerns about south western gulf catch rates. There was some concern the stock assessment was not consistent with the catch rates of some fishers, and this may represent some form of localised depletion. Fishers have noted lower catch rates in southern Spencer Gulf area in particular Recreational catches of Southern Calamari were also significant adding to uncertainty in abundance estimates. Effort displacement to Calamari as a result of Snapper closures was also a concern. It has been recognized the assessment method needs to improve for this species, and it was noted that an FRDC project has already commenced to develop a suitable assessment method. The stock is also a bycatch species for the Spencer Gulf Prawn Fishery. While the current assessment suggested the stock was sustainable, given the above, it was considered possible that the stock may be below the threshold level.

The workshop discussed each of the lines of evidence and considered that only Consequences 2 and 3 and their likelihoods were plausible.

| Southern Calamari – Spencer Gulf Fishing Zone                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Target species consequence level |   |   |   |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|---|---|---|
| Lines of Evidence                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 1                                | 2 | 3 | 4 |
| <b>Catch</b> – catches under TAC by 26%<br><b>Biomass</b> – Least certain tier 1 species in terms of abundance estimates. New 3 yr FRDC project commenced<br><b>Stock Status</b> – Classified as sustainable<br><b>Recruitment</b> – Least certain tier 1 species in terms of abundance estimates. Identified need for reliable assessment method<br><b>CPUE trend</b> – some concerns about catch rates in the SW Gulf area.<br><b>Management</b> – Pending new HSF aims to maintain stock at target biomass | X                                | ✓ | ✓ | X |
| Likelihood                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                  | 3 | 3 |   |
| Risk Score                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                  | 6 | 9 |   |

After considering all the lines of evidence, the workshop agreed the plausible combination with the highest risk score be adopted: Consequence score (3) Likelihood score (3). **Risk rating HIGH.**

### GSVFZ – Southern Calamari – 2024 Risk Rating

Southern Calamari was classified as Sustainable in the GSVFZ. There was some anecdotal information suggesting a reduction in commercial catch rates in the Northern Gulf however reported commercial catch and effort data for 2022/23 did not indicate stock concerns. Assessment method needs to improve and an FRDC project had commenced to develop a suitable assessment method. The stock is targeted by jig fishing with some haul net effort. The Gulf St Vincent Prawn Fishery retain some Southern Calamari as bycatch during prawn trawl net fishing. Southern Calamari remain the least certain Management Tier 1 species in terms of the estimate of abundance.

The workshop discussed each of following lines of evidence and considered that only consequence levels 2 and 3 and their likelihoods were plausible.

| Southern Calamari – GSV/KI Fishing Zone | Target Species Consequence level |   |   |   |
|-----------------------------------------|----------------------------------|---|---|---|
| Lines of Evidence                       | 1                                | 2 | 3 | 4 |

## OFFICIAL

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |   |   |          |   |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|----------|---|
| <b>Catch</b> – TACC under caught by 27%.<br><b>Biomass</b> – Least certain tier 1 species in terms of abundance estimates, current estimate close to the threshold level. New 3 yr FRDC project commenced<br><b>Stock Status</b> – Classified as sustainable<br><b>CPUE trend</b> – While reported CPUE was stable or increasing, there were some concerns from industry about a drop in catch rates in some gulf areas.<br><b>Management</b> – Pending new HSF aims to maintain stock at target biomass | X | ✓ | ✓        | X |
| Likelihood                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |   | 3 | <b>3</b> |   |
| Risk Score                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |   | 6 | <b>9</b> |   |

After considering all the lines of evidence, the workshop agreed the plausible combination with the highest risk score be adopted: Consequence score (3) and Likelihood score (3). **Risk rating HIGH.**

### WCFZ – Southern Calamari – 2024 Risk Rating

The WCFZ Southern Calamari fishery is a squid jig fishery. In many years less than five licences reported taking this species. The catch has been an average of 10 t in the last 10 to 20 years. Catch rates appear stable. Catch has been constrained to inshore bays over a long period. The West Coast Prawn Fishery and the Great Australian Bight Trawl Fishery has access to Southern Calamari as byproduct. Catch has been at a lower level than earlier times in the history of the fishery. Therefore, it is most likely the stock is currently above the target level. As calamari prices have increased noticeably in the past 12 years and continued consideration of efficiency improvements for the fishery could impact effort on non-quota species of higher value, it was plausible that an increase in catches over the coming period could generate a decline in stock under the target level and require re-assessment.

The workshop discussed each of the lines of evidence and considered that only Consequences 1 and 2 and their likelihoods were plausible.

| Southern Calamari – West Coast Fishing Zone (WCFZ)                                                                                                                                                                                                                                                                                                                                                                                                                                           | Target species consequence level |   |   |   |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|---|---|---|
| Lines of Evidence                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 1                                | 2 | 3 | 4 |
| <b>Biomass</b> – Least certain tier 1 species in terms of abundance estimates. Identified need for reliable assessment method<br><b>Stock Status</b> – Classified as sustainable<br><b>Total Catch</b> - has been on average 10t over past 10-20 years<br><b>CPUE</b> - stable<br><b>Spatial spread of stock</b> – fishing is predominately in 4 or 5 bay areas with some component of the stock not fished.<br><b>Management</b> - Pending new HSF aims to maintain stock at target biomass | ✓                                | ✓ | X | X |
| Likelihood                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <b>4</b>                         | 2 |   |   |
| Risk Score                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <b>4</b>                         | 4 |   |   |

After considering all the lines of evidence, the workshop agreed the plausible combination with the highest risk score be adopted: Consequence score (1) and Likelihood score (4). **Risk rating LOW.**

### SEFZ – Southern Calamari – 2024 Risk Rating

Noting that there have only been negligible reported catches of Southern Calamari in the SEFZ over a substantial number of years, including many years where less than five licence holders reported taking

Southern Calamari, the workshop agreed that there was only a remote chance of a measurable impact on this stock. Consequence score (1) and a Likelihood score (1). **Risk rating NEGLIGIBLE.**

## Secondary and tertiary species - Management Tier 2/Tier 3

### Blue Swimmer Crab (West of 135° E)

#### New Information

- Assessment of the South Australian MSF in 2021/22 (Smart et al. 2023).
- Survey of Recreational Fishing in South Australia 2021-22 (Beckmann et al. 2023).
- Blue Crab (*Portunus armatus*) Fishery 2020/21 – Assessment Report – (Beckmann/Hooper 2022).

Distributed in a wide range of inshore habitats to a depth of at least 50 m in near-shore, bays and estuaries in Australia and New Zealand. Highly mobile, short-lived, fast-growing, highly fecund species of Portunid crab. Maximum size ~200 mm carapace width, maximum age ~three years, reach sexual maturity between 70 - 90 mm.

Reproduction and growth during warmer months (shallow inshore waters), reduced activity during colder months (adults move to deeper, offshore waters). Spawning occurs for three to four months over summer/autumn. Separate sub-populations within SG, GSV and WC.

Assessment of stock status for Blue Crab is undertaken at the management unit level (West Coast - WC), while the Spencer Gulf and WC stocks are assessed for the Blue Crab Fishery (BCF) (Beckmann and Hooper 2022). This risk assessment only applies to Blue Crab in the WCFZ, however information regarding the Gulf fisheries has been provided for reference.

Blue Swimmer Crab was classified as Sustainable in the WCFZ for 2021/22 (Smart et al. 2023).

MSF licences are permitted to take Blue Crabs on the WC of South Australia (west of longitude 135°E). Endorsed MSF licence holders can operate in the BCF in the Gulfs, but only where they have Blue Crab quota endorsed on their licence. Currently, only one MSF licence has BCF quota.

MSF operators mostly use hoop/drop nets (lift nets) or dab nets, BCF fishers use specialised crab pots (only in the Blue Crab Quota Zones in the Gulfs), recreational fishers mostly use hoop/drop nets or handheld rakes. Following 1996/97 the majority of Blue Crab catches have been caught by the BCF in the two gulf zones where stocks have been classified as Sustainable for several years. In the Spencer Gulf, total average BCF catch over the last decade (2012/13 – 2021/22) was 375.8 t/yr, with 2021/22 being 326 t. For the same period, CPUE remained relatively stable, with a mean of 524 kg/boat/day. In the GSV, total catch has averaged 210 t/yr, with 195 t taken in 2021/22. CPUE has fluctuated between 349 kg/boat/day in 2009/10 to a maximum of 573 kg/boat/day in 2019/20, before declining to 389 kg/boat/day in 2021/22 (Beckmann and Hooper 2023).

The remaining MSF Blue Crab catch predominantly occurs in the WCFZ.

Blue Crab in the WCFZ are assigned Management Tier 2 under the TMF.

Recreational catch of Blue Crab in the WCFZ was estimated to be 14.44 t in 2021/22 (with high standard error) (Beckmann et al. 2023).

### **Management Changes / Arrangements since 2011**

- LML 110 mm CW, females with external eggs are protected.
- Spatial and temporal commercial closures in the Gulfs.
- Gear endorsement limits on MSF licences.
- Recreational fishers have a combined Sand/Blue Crab bag and boat limit of 20 and 60 crabs, respectively.
- Reform of MSF in 2021 including removal of 100 MSF licences (a third).
- Addition of a single definition for hoop and drop nets (a 'lift net') in 2023, providing fishers with flexibility to use either a hoop or drop net.

### **Current Assessment Program**

- Annual examination of commercial fishery statistics and application of a Catch-MSY model.
- Recreational data collected every five to seven years through State-wide recreational survey (noting catch of interstate visitors not included).

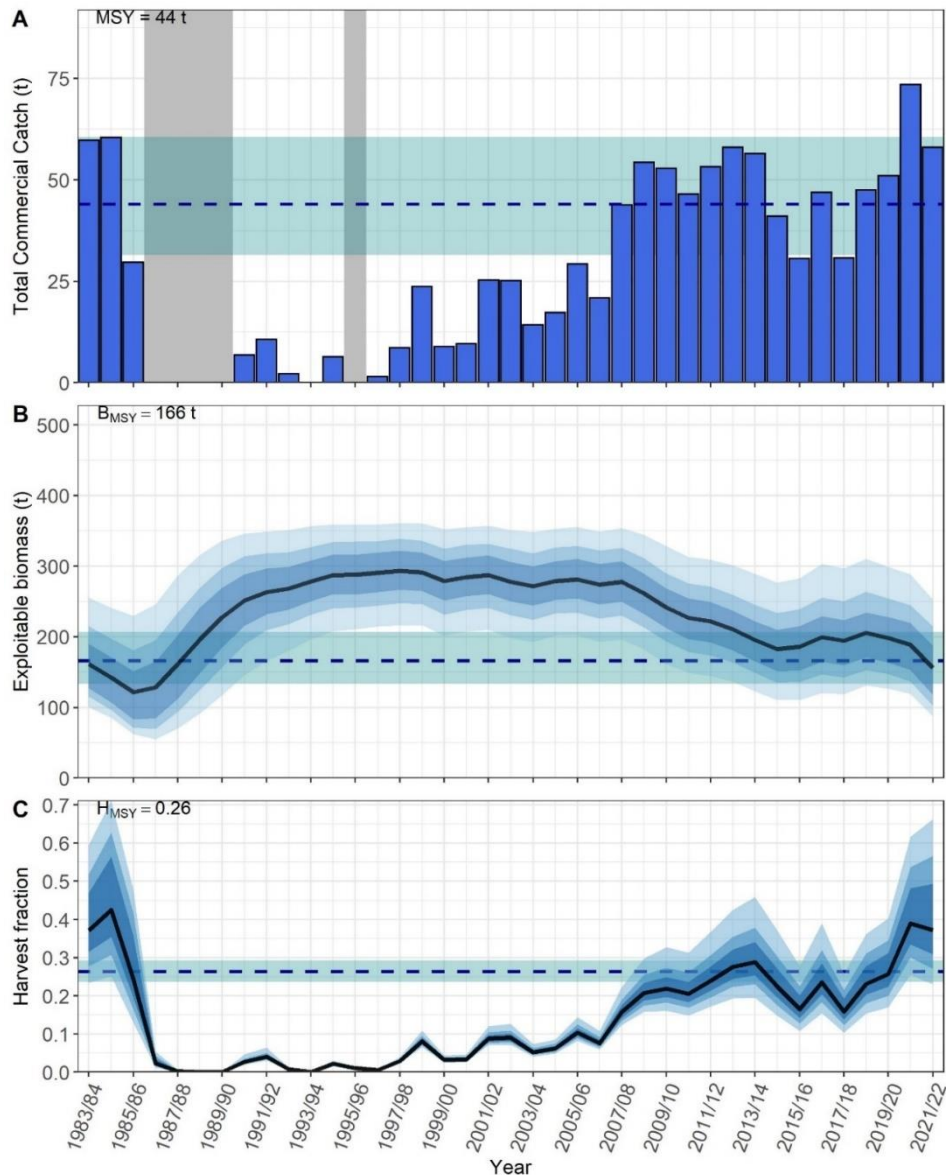


Figure 13. Outputs of the cMSY model for Blue Crab in the WCFZ that include (A) the annual commercial catch (B) time series of exploitable biomass (black solid line) with 50th, 75th and 95th percentiles (blue shading that goes from darker to lighter shades, respectively) and (C) the annual harvest fraction (H) (black line) with 50th, 75th and 95th percentiles (blue shading that goes from darker to lighter shades, respectively). Each panel displays its respective value relating to MSY (dark blue dashed line) and its 95th percentiles (blue shading). Grey shading on panel A represents a fishing season where the commercial catch was confidential and cannot be included on the panel (Smart et al. 2023).

### Blue Swimmer Crab – West Coast – 2024 Risk Rating (Target species consequence table)

The workshop noted Blue Crab on the WC had been classified as sustainable for several years. It is taken from small, isolated bays of the WC. The catch-only analysis suggested a commercial Maximum Sustainable Yield (MSY) of approximately 40t (Fig. 13). Between 2018 to 2021, total catch had exceeded this amount but the catch had reduced in 2022/23 to 29 t (PIRSA pers comm. 2024).

CPUE had been stable at about 60 kg / fisher day. The 2023 implementation of a consolidated hoop/drop net definition for the fishery (i.e., a 'lift net') and increasing use of multiple licences from one boat had potential to increase catches. A range extension for this species, resulting from changing mean surface temperature was possible over a longer period of time. The workshop noted, as a Management Tier 2 species, TACC and ITQ arrangements would not apply for this species.

The workshop discussed each of the lines of evidence and considered that only Consequence Levels 2 and 3 and their associated likelihoods were plausible.

| Blue Crab – West Coast                                                                                                                                                                                                                                                                                                                                                                                               | Target species consequence level |   |          |   |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|---|----------|---|
| Lines of Evidence                                                                                                                                                                                                                                                                                                                                                                                                    | 1                                | 2 | 3        | 4 |
| <b>Catch</b> – catches exceeded estimated MSY for 2018-2021 but below MSY in 2022/23<br><b>Biomass</b> – Catch MSY model suggest stock was below target in 2021/22.<br><b>Stock Status</b> – classified as Sustainable<br><b>Recruitment</b> – short lived species<br><b>CPUE trend</b> – catch rates stable<br><b>Management</b> – Pending new HSF aims to maintain stock as close to biomass target as practicable | X                                | ✓ | ✓        | X |
| Likelihood                                                                                                                                                                                                                                                                                                                                                                                                           |                                  | 3 | <b>3</b> |   |
| Risk Score                                                                                                                                                                                                                                                                                                                                                                                                           |                                  | 6 | <b>9</b> |   |

After considering all the lines of evidence, the workshop agreed the plausible combination with the highest risk score be adopted: Consequence score (3) and Likelihood score (3). **Risk rating HIGH.**

## Yellowfin Whiting

### New Information

- Assessment of the South Australian MSF in 2021/22 (Smart et al. 2023).
- Survey of Recreational Fishing in South Australia 2021-22 (Beckmann et al. 2023).
- MSFMAC Chair's Report - Meeting of 9 and 10 June 2024 (PIRSA 2024).

Yellowfin Whiting are endemic to Southern Australia and occur in shallow, tidal creeks and coastal sand flats with the highest abundances in the northern gulfs. There are two stocks in each of the GSVFZ and SGFZ.

Yellowfin Whiting are caught in the northern region of both gulf zones. Catch and effort is largest in the SGFZ where the majority of fishing occurs through haul netting. There is a mix of gears used in the GSVFZ with both haul and set nets used. Haul netting effort remains higher than set net effort in GSVFZ.

### Management Changes / Arrangements since 2011

- LML 240 mm for all sectors.
- Recreational Bag limit 20 per person or 60 per boat with three or more people fishing.
- Commercial gear restrictions – net length, mesh size, extensive spatial closures and temporal restrictions that apply to use of nets.
- Reform of MSF in 2021 including removal of 1/3 of licenses (100 MSF licences).
- Marine parks buyback of seven MSF net licences in 2023/24.

### GSVFZ – Management Tier 2

Commercial catch statistics and raw CPUE do not indicate a stock decline. However, low levels of species-specific targeting complicates assessing raw CPUE as Yellowfin Whiting are commonly caught in mixed species catches. The current assessment estimated a standardised CPUE index to investigate

the status of this stock (Fig. 14). Both new lines of evidence independently demonstrated a recent stock decline which has stabilised in recent years. This evidence, along with reports from commercial and recreational fishers indicates that the Yellowfin Whiting stock in the GSVFZ has declined but is now stable based on current commercial catch levels. A sustainable status has been assigned to this stock based on recent low levels of catch. However, it was noted that the population remains low, and that rebuilding should be closely monitored.

#### SGFZ – Management Tier 2

Several lines of evidence suggest that Yellowfin Whiting in the SGFZ has a high biomass and is being fished at sustainable levels. Raw catch and effort statistics as well as a standardised CPUE index demonstrate stable levels of catch and effort and increasing CPUE. Modeling indicates biomass is above  $B_{MSY}$  and that harvest levels has not exceeded harvest at MSY (Fig. 15). On this basis, a sustainable status has been assigned.

Yellowfin Whiting were not defined or assessed at the WCFZ or SEFZ level

#### **Current Assessment Program**

- Catch-MSY model.
- Standardised CPUE index.
- Annual examination of commercial fishery statistics.
- Recreational data collected every approximately five years through State-wide recreational survey.

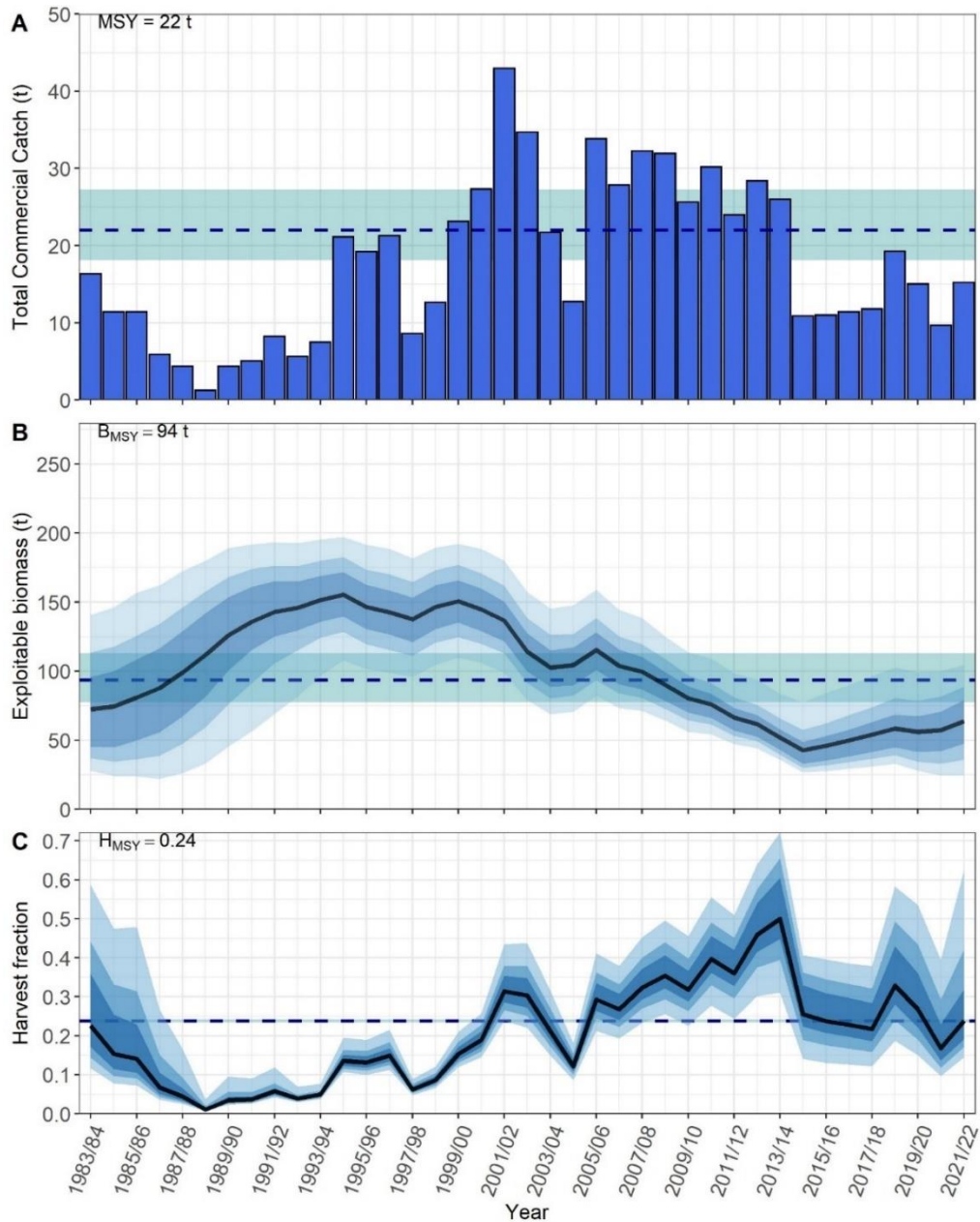


Figure 14. Outputs of the cMSY model for Yellowfin Whiting in the GSVFZ that include (A) the annual commercial catch (B) time series of exploitable biomass (black solid line) with 50th, 75th and 95th percentiles (blue shading that goes from darker to lighter shades, respectively) and (C) the annual harvest fraction (H) (black line) with 50th, 75th and 95th percentiles (blue shading that goes from darker to lighter shades, respectively). Each panel displays its respective value relating to MSY (dark blue dashed line) and its 95th percentiles (blue shading). Grey shading on panel A represents a fishing season where the commercial catch was confidential and cannot be included on the panel (Smart et al. 2023).

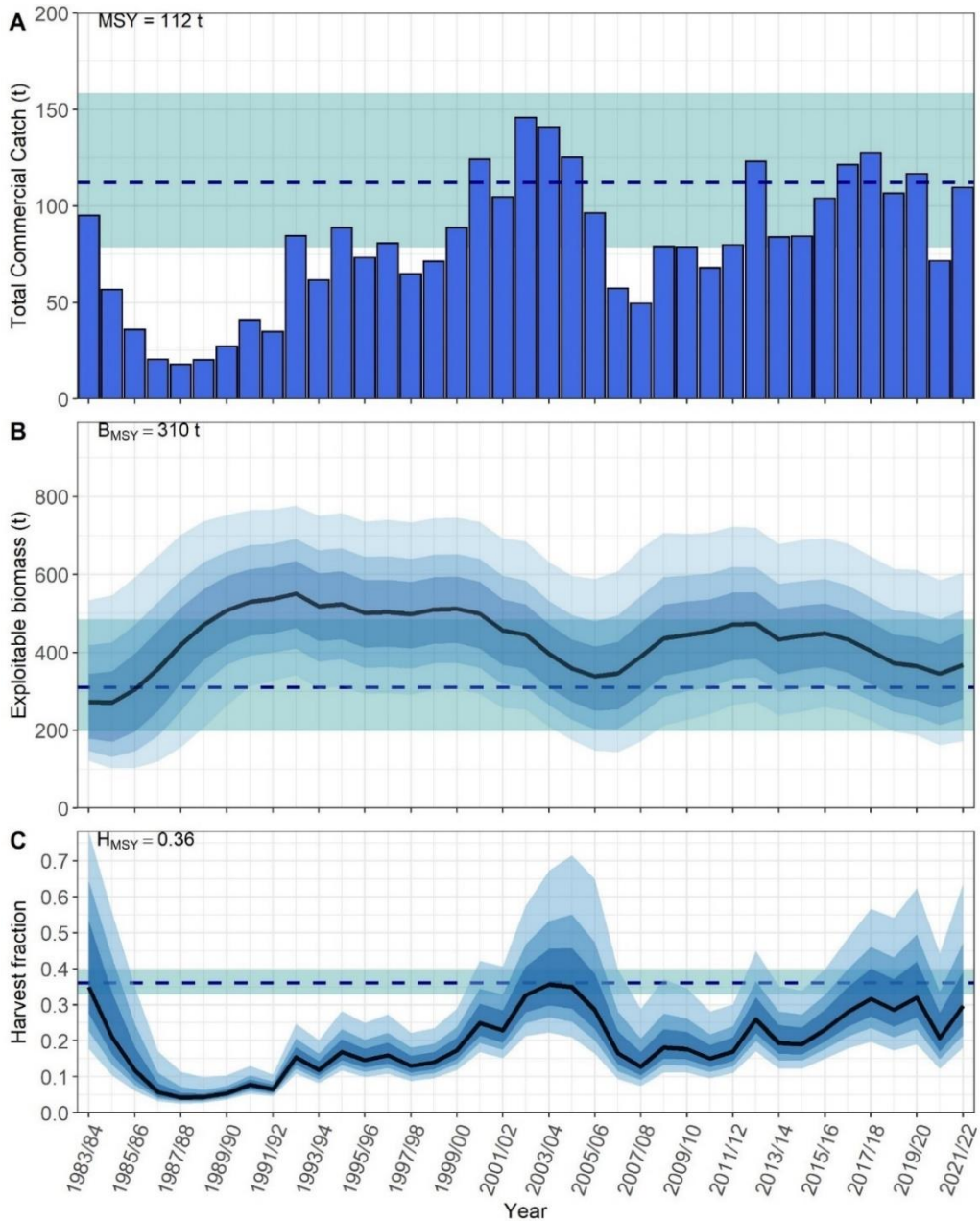


Figure 15. Outputs of the cMSY model for Yellowfin Whiting in the SGFZ that include (A) the annual commercial catch (B) time series of exploitable biomass (black solid line) with 50th, 75th and 95th percentiles (blue shading that goes from darker to lighter shades, respectively) and (C) the annual harvest fraction (H) (black line) with 50th, 75th and 95th percentiles (blue shading that goes from darker to lighter shades, respectively). Each panel displays its respective value relating to MSY (dark blue dashed line) and its 95th percentiles (blue shading). Grey shading on panel A represents a fishing season where the commercial catch was confidential and cannot be included on the panel (Smart et al. 2023).

### Yellowfin Whiting – Spencer Gulf Fishing Zone – 2024 Risk Rating (Target species consequence table)

Yellowfin Whiting had been classified as Sustainable in the SGFZ for several years. Increasing CPUE trend and catch history suggested the stock and biomass are healthy and it is at least above the threshold, and it is plausible it is above the target level. Noting the development of a draft HSF is underway for inclusion in the replacement Management Plan.

The workshop discussed the following lines of evidence considered that only Consequence levels 1 and 2 and associated likelihoods were plausible.

| Yellowfin Whiting – Spencer Gulf                                                                                                                                                                                                                                                                              | Target species consequence level |   |   |   |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|---|---|---|
| Lines of Evidence                                                                                                                                                                                                                                                                                             | 1                                | 2 | 3 | 4 |
| <b>Catch</b> – Stable catch levels<br><b>Biomass</b> – $cMSY$ model indicates biomass above $B_{MSY}$<br><b>Stock Status</b> – classified as Sustainable<br><b>CPUE trend</b> – CPUE increasing trend<br><b>Management</b> – Pending new HSF aims to maintain stock as close to biomass target as practicable | ✓                                | ✓ | X | X |
| Likelihood                                                                                                                                                                                                                                                                                                    | 1                                | 4 |   |   |
| Risk Score                                                                                                                                                                                                                                                                                                    | 1                                | 8 |   |   |

After considering all the lines of evidence, the workshop agreed the plausible combination with the highest risk score be adopted: Consequence score (2) and Likelihood score (4). **Risk rating MEDIUM.**

### Yellowfin Whiting – Gulf St Vincent/Kangaroo Island Fishing Zone – 2024 Risk Rating (Target species consequence table)

Yellowfin Whiting in the GSVFZ are classified as Sustainable however concerns around localised depletion have been expressed by some stakeholders. Current catches were low from a historical context. Catches have fluctuated over a long period of time but appear to have hit a trough. Standardised CPUE shows an increasing trend to 2008/09 and then a decline and stabilisation from 2013/14 (Fig. 14). Management options were being considered to support stock rebuilding, including: an increase to the LML and/or a seasonal closure. The latest catch-MSY assessment suggested the stock was above the draft biomass limit but below the trigger level. An estimated MSY was 22 t and recent annual catches had been well below this, and the modelled biomass was trending upwards. The workshop considered the recent (2023/24) marine parks buyback of 7 active MSF net licences would assist in reducing commercial effort on the yellowfin biomass in the GSVFZ. The new HSF was expected to support increases in biomass in the next 5 years.

The workshop discussed the following lines of evidence considered that only Consequences levels of 2 and 3 and associated likelihoods were plausible.

| Yellowfin Whiting – Gulf St Vincent / Kangaroo Island Fishing Zone                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Target species consequence level |   |   |   |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|---|---|---|
| Lines of Evidence                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 1                                | 2 | 3 | 4 |
| <b>Catch</b> – For past several years catches have been low and the predicted MSY of 22t has not been reached in terms of total commercial catch<br><b>Biomass</b> – c-MSY assessment indicates stock above limit but below threshold<br><b>Stock Status</b> – last classified as Sustainable however concerns exist regarding localised depletion and status requires review<br><b>CPUE trend</b> stable at a low level<br><b>Management</b> – Pending new HSF aims to maintain stock as close to biomass target as practicable | X                                | ✓ | ✓ | X |
| Likelihood                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                  | 3 | 3 |   |
| Risk Score                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                  | 6 | 9 |   |

After considering all the lines of evidence, the workshop agreed the plausible combination with the highest risk score be adopted: Consequence score (3) and Likelihood score (3). **Risk rating HIGH.**

## Whaler Sharks

### New Information

- Assessment of the South Australian MSF in 2021/22 (Smart et al. 2023).
- Survey of Recreational Fishing in South Australia 2021-22 (Beckmann et al. 2023).
- MSFMAC Chairs Report - Meeting of 9 and 10 June 2024 (PIRSA 2024).
- Reform of MSF in 2021 including removal of 100 MSF licences (a third).
- Commonwealth Government Declaration of an approved Wildlife Trade Operation – Marine Scalefish Fishery (DCCEEW 2023)

Two species of Whaler Sharks, the Bronze Whaler (*Carcharhinus brachyurus*) and the Dusky Shark (*C. obscurus*) are taken in the MSF. Bronze Whalers are distributed through the warm temperate waters of southern Australia, from Geraldton in WA through to the QLD/NSW state boarder. The population is panmictic and considered as a single biological stock. Dusky Sharks are broadly distributed through all Australian tropical to warm temperate coastal and continental shelf waters, and the population is considered the eastern component of the Western Australian biological stock.

Whaler Sharks are a Management Tier 2 species in all fishing zones except the SEFZ where catches are negligible. In recent years, Whaler Sharks have been targeted with floating and demersal longlines during spring-autumn in WC, SG and GSV waters. Recreational fishers target whaler sharks for both consumption and as a trophy fish from boats and shore-based fishing.

Bronze and Dusky Whalers are not separately reported on catch and effort returns submitted by fishers. As part of the development of the electronic catch and effort reporting system, the reporting of these species will transition to species level enabling quantification of catch composition in future years.

Whalers Sharks are classified as undefined.

### **Management Changes / Arrangements since 2011**

- Reform of MSF in 2021 including removal of 100 licences.
- No size limits for commercial and recreational fishers.
- MSF gear restrictions relevant to Whaler Sharks include daily hook limit of 400 hooks in all State waters, maximum leader diameter of 2 mm in conjunction with a 12/0 or bigger hook, and 150 mm minimum mesh size for nets.
- Recreational fishing regulations for Whaler Sharks (both species) include a daily bag limit of one shark per fisher and a daily boat limit of three sharks.
- Recreational gear restrictions include the use of wire trace of 2 mm or greater and fishing hook size greater than 12/0.
- Spatial and gear restrictions are in place along the Adelaide coastline between 5:00 and 21:00 for targeting sharks.
- Department of Climate Change, Energy, the Environment and Water (DCCEEW) export approval conditions require species level of reporting from December 2024.

### **Current Assessment Program**

- Annual examination of commercial fishery statistics.
- Recreational data collected every five to seven years through State-wide recreational survey.

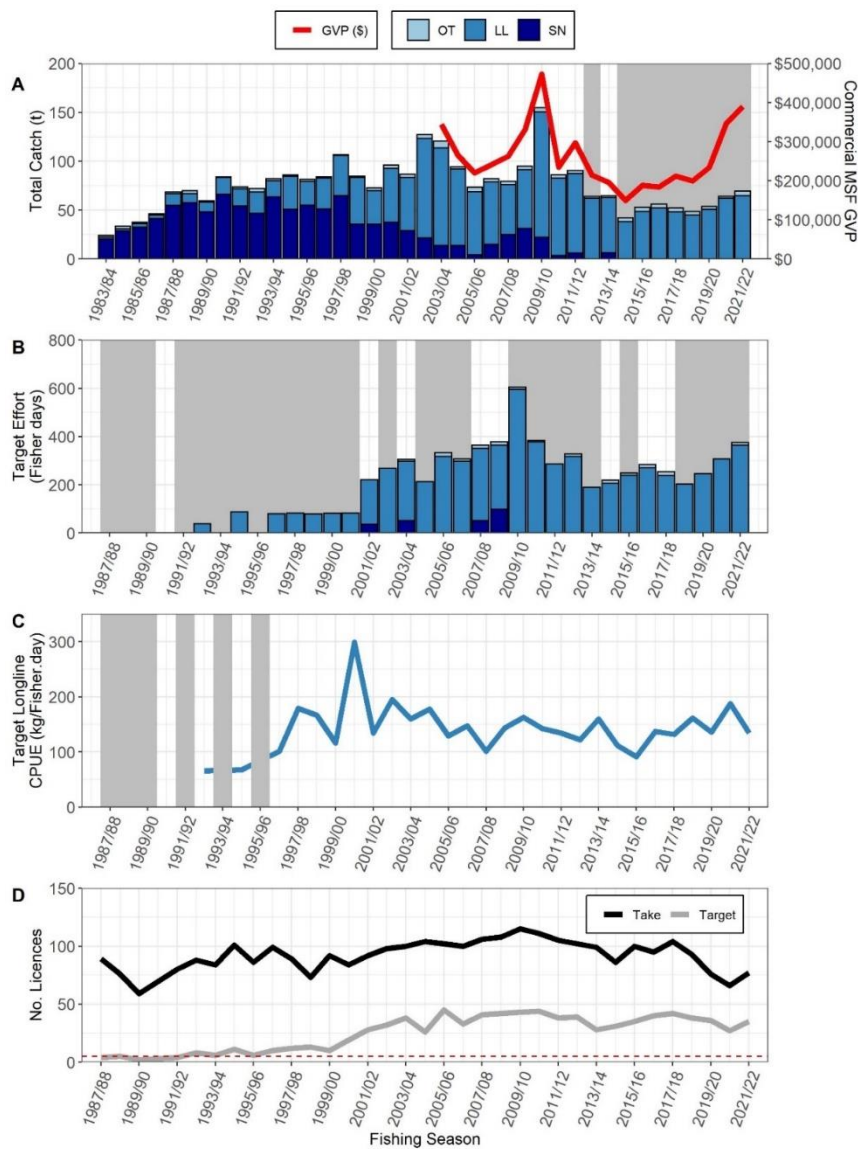


Figure 16: Long-term trends in State-wide estimates for Whaler Sharks of (A) total catch for longlines, set nets and all other gear types, estimated recreational catch and gross production value; (B) target effort for longlines, set nets and all other gear types; (C) target CPUE for longlines; and (D) the number of active licence holders taking or targeting the species. A red dashed line in panel D represents the number of licences where data becomes confidential. Grey shading represents a fishing season where one or more gear types are confidential and are not included on a panel (Smart et al. 2023).

### Whaler Sharks – 2024 Risk Rating (Target species consequence table)

Whalers Sharks are classified as undefined in the MSF. Catch composition between Dusky Whalers and Bronze Whalers is not known as they are not separated catch data report forms noting that the current transition to e-logs will allow for separate species level reporting. Catches over the past 20 years have ranged between 50 t and 100 t with the catch rate (kg/hook) over this period having remained at a fairly high level (Fig. 16). The number of licences targeting these species historically has remained consistent. Previous assessment modelling for Bronze Whaler suggested catches in the order of 80 t could be sustained, and total catches (for both species) has only exceeded this level once. It was noted that expected species level reporting will support future assessments.

Given this information the workshop assigned Consequence score (2) and Likelihood score (4). **Risk rating MEDIUM.**

## Ocean Jacket

### New Information

- Reform of MSF in 2021 including removal of 100 MSF licences.
- Assessment of the South Australian MSF in 2021/22 (Smart et al. 2023).
- Survey of Recreational Fishing in South Australia 2021-22 (Beckmann et al. 2023).
- ESD risk assessment for 'lesser known' species to facilitate structural reform of South Australia's commercial Marine Scalefish Fishery (Fowler et al. 2020).

Ocean Jacket is a dichromatic species that is fast-growing and short-lived. They are the largest species of leatherjacket of southern Australia, distributed across southern Australian coastal and continental shelf waters, from the central WA coast to the central QLD coast. The stock structure throughout its distribution is currently unknown.

Ocean Jackets are assigned Management Tier 3 in the SGFZ and are not assigned a Management Tier in other zones due to negligible catches. They are predominantly targeted by commercial fishers using species-specific baited fish traps in offshore waters of the SGFZ and to a lesser extent WCFZ. There are a total of four licences with 20 Ocean Jacket Traps each, that can fish in waters greater than 60 m depth. In 2021/22, Ocean Jackets represented the third highest catch by species for the MSF at 254 t, representing a significant increase from 2018/19 when total catch was 127.5 t (Smart et al. 2023) (Fig. 17). Increased catch may be considered in reassignment of Tiers for this species under the TMF. In 2020, Ocean Jackets were identified as a lesser-known species with a low risk associated with increased catch (Fowler et al. 2020).

There is negligible targeting by recreational fishers.

Ocean Jacket were classified in 2021/22 as Sustainable state-wide.

### Current Assessment Program

- Annual examination of commercial fishery statistics.
- Recreational data collected every five to seven years through State-wide recreational survey.

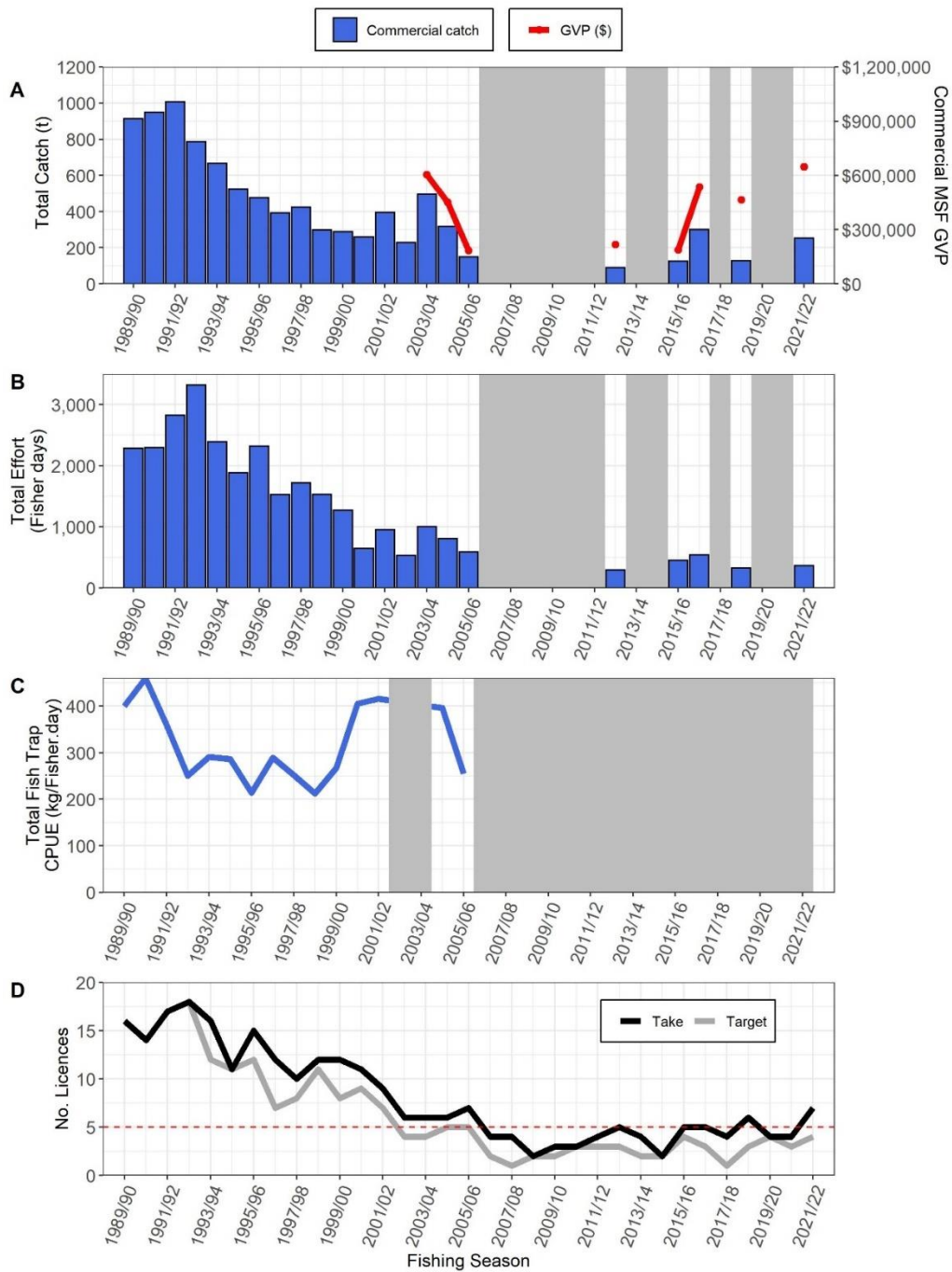


Figure 17: Long-term trends in State-wide estimates for Ocean Jacket of (A) total catch for all commercial gears and gross production value; (B) total commercial effort; (C) total CPUE for fish traps; and (D) the number of active licence holders taking or targeting the species. A red dashed line in panel D represents the number of licences where data becomes confidential. Grey shading represents a fishing season where one or more gear types are confidential and are not included on a panel (Smart et al. 2023).

### Ocean Jackets – 2024 Risk Rating (Target species consequence table)

Ocean Jackets are known to be a significant byproduct of the Commonwealth Great Australian Bight Trawl Fishery. This species was identified as an under-utilized species where there was opportunity to increase production. A current project being undertaken by the Eyre Peninsula Ocean Jacket Fishing Cluster is intending to increase catch and processing capabilities for the species.

## OFFICIAL

The workshop discussed the following lines of evidence considered the Consequence levels of 1 and 2 and associated likelihoods were plausible.

| Stock Name – Ocean Leather Jackets                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Target species consequence level |   |   |   |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|---|---|---|
| Lines of Evidence                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 1                                | 2 | 3 | 4 |
| <b>Total Catch</b> – Maximum capacity of devices in the fishery is low as only four licences are endorsed with fishing devices to target the species<br><b>Stock Status</b> – Classified as Sustainable<br><b>Catch</b> – historically low catch for a long time, and recent moderate catches indicate the stock is likely over the TRP.<br><b>Localised</b> – fishing limited to a few localised areas and likelihood of impact on whole MSF stock is low<br><b>Management</b> – Pending new HSF aims to maintain stock as close to biomass target as practicable | ✓                                | ✓ | X | X |
| Likelihood                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 4                                | 1 |   |   |
| Risk Score                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 4                                | 2 |   |   |

After considering all the lines of evidence, the workshop agreed the plausible combination with the highest risk score be adopted: Consequence score (1) and Likelihood score (4). **Risk rating LOW.**

## Pipi (outside of the Coorong)/ Razorfish / Mud Cockles

### New Information

- Harvestable biomass in the South Australian Vongole Fishery (*Katelysia spp*) (Ferguson et al 2022) [https://pir.sa.gov.au/data/assets/pdf\\_file/0004/420709/vongole\\_stock\\_assessment\\_2022.pdf](https://pir.sa.gov.au/data/assets/pdf_file/0004/420709/vongole_stock_assessment_2022.pdf)
- Vongole harvest strategy (PIRSA 2024) [https://pir.sa.gov.au/data/assets/pdf\\_file/0007/466504/vongole-harvest-strategy.pdf](https://pir.sa.gov.au/data/assets/pdf_file/0007/466504/vongole-harvest-strategy.pdf)

### Management Changes / Arrangements since 2011

- Reform of MSF in 2021 including separation of Vongole from the MSF with the constitution of the stand-alone Vongole Fishery; and removal of 100 MSF licences.
- The Port River Vongole Fishing Zone has been closed since 2011/12 due to low biomass.
- Vongole can only be taken by MSF who do not hold Vongole quota holders for bait purposes with a maximum daily amount of 10 kg.
- Outside the Coorong, up to 10 kg of Pipi may be taken per day for use as bait for fishing activities undertaken under the licence.
- Up to 10 kg of other Cockle species can be taken by MSF licences per day.
- Razorfish can only be taken for bait purposes. No more than 50 Razorfish per licence holder / agent can be taken per day exception the WCFZ (west of 136 degrees East) where less than 150 razorfish (for bait) may be taken over a three-day period.
- None of these bivalve species have been assigned a management Tier in the MSF.

Vongole

Vongole were last assessed in the Coffin Bay Vongole Fishing Zone, West Coast Vongole Fishing Zone and Port River Vongole Fishing Zone for the 2021/22 year. Subsequent to this, annual SARDI advice notes have been provided to PIRSA to advise on the commercial TACCs for the Vongole Fishery. In 2022, Vongole were classified as Sustainable in the Coffin Bay and West Coast Vongole Fishing Zones, and Depleted in the Port River where the fishery has remained closed since 2011/12.

Reflecting the separation of the Vongole Fishery from the MSF in 2021, a dedicated harvest strategy has been developed to guide setting of TACC for the Coffin Bay Zone and WC Zone of the fishery. The Port River Zone of the fishery has not been incorporated as this Zone has not been closed for a number of years. The purpose of the harvest strategy is to ensure that Vongole Fishery is fished on a sustainable basis and maintained above target reference points in the respective fishing zones (PIRSA 2024).

Stock for Pipi (outside of the Coorong), Razorfish and other cockle species are not assessed.

### **Pipi / Razorfish / Vongole – 2024 Risk Rating (Bycatch species consequence table)**

The 2024 Risk Assessment workshop noted that Pipi, Razorfish and Vongole were rated in 2011 as a Medium Risk, however noting the management changes agreed the following risk scoring:

- Consequence score for **Razorfish** (1) and the Likelihood (4). **risk rating LOW**.
- Given the Vongole Fishery has been separated from the MSF and the MSF is limited to 10 kg per day of any species of **Mud Cockle** a **NEGLIGIBLE** risk was assigned.
- Given the Pipi Fishery is managed separate to the MSF, and MSF licences can only take Pipi pursuant to a Pipi quota allocation or as bait, a **NEGLIGIBLE** risk was assigned.

## Non-retained species

**Broad Objective** - Minimise interaction with discarded bycatch species, in particular threatened, endangered and protected species.

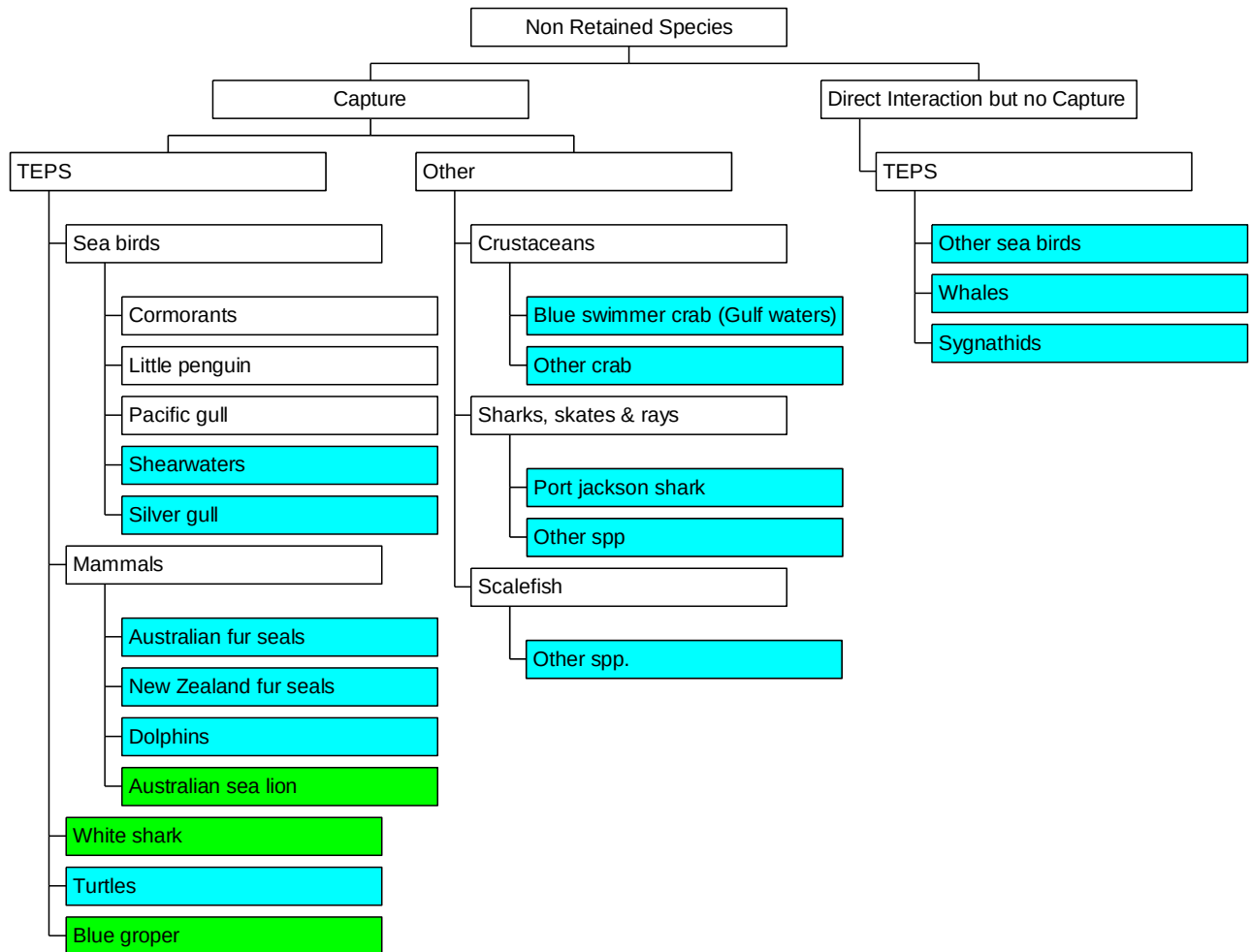


Figure 18. Component tree for retained non-species.

Risks rated as Low or Negligible in the 2011 risk assessment were carried forward unless there was significant new information to consider. Colours reflect negligible, low, medium and high risks as assigned in 2024.

## Threatened, endangered and protected species

There are a number of threatened, endangered and protected species (TEPS) listed under State and/or Australian Government legislation. These species are not permitted to be taken and must be released immediately if accidental capture occurs, in addition all interactions with TEPS must be reported by commercial fishers.

All licence holders in South Australian commercial fisheries are required to record interactions with TEPS using a 'wildlife interaction' logbook, which are then provided to SARDI. As part of wider digital transformation work being undertaken by PIRSA, electronic catch and effort reporting, including TEPS interactions, is being introduced in 2024.

All assessments in this section used the protected species consequence levels (Appendix H).

### Australian Sea Lion

#### New Information

- Wildlife Interaction Reporting across South Australian Fisheries 2022/23 – Advice Note – SARDI. Available at: [https://pir.sa.gov.au/\\_data/assets/pdf\\_file/0005/467699/Protected\\_species\\_interaction\\_reported\\_in\\_SA\\_managed\\_fisheries\\_2022-23.pdf](https://pir.sa.gov.au/_data/assets/pdf_file/0005/467699/Protected_species_interaction_reported_in_SA_managed_fisheries_2022-23.pdf)
- Operational interactions with TEPS in SA Managed Fisheries Data Summary : 2007/8 – 2016/17 (Mackay 2018) [https://www.pir.sa.gov.au/\\_data/assets/pdf\\_file/0005/333149/Operational\\_Interactions\\_with\\_Threatened\\_Endangered\\_or\\_Protected\\_Species\\_in\\_South\\_Australian\\_Managed\\_Fisheries\\_Data\\_Summary\\_200708\\_-\\_201617.pdf](https://www.pir.sa.gov.au/_data/assets/pdf_file/0005/333149/Operational_Interactions_with_Threatened_Endangered_or_Protected_Species_in_South_Australian_Managed_Fisheries_Data_Summary_200708_-_201617.pdf)
- Recovery Plan for the Australian Sea Lion (2013) <https://www.dcceew.gov.au/sites/default/files/documents/neophoca-cinerea-recovery-plan.pdf>
- Assessment of the impacts of seal populations on the seafood industry in South Australia. FRDC – 2013-011 (Goldsworthy et al. 2019)
- *Neophoca cinerea* (Australian Sea Lion) Conservation Advice – DCCEEW – 2020. Available at: [Conservation Advice Neophoca cinerea Australian Sea Lion \(environment.gov.au\)](https://www.environment.gov.au/conservation/advice/neophoca-cinerea-australian-sea-lion)
- Declaration of an approved Wildlife Trade Operation approval – Marine Scalefish Fishery – (DCCEEW –12 December 2023)
- Several other academic papers relating to ASL have been published in recent years, yet only the most relevant publications have been included above.

#### Management Changes / Arrangements since 2011

- Reform of MSF in 2021 including removal of 100 MSF licences.
- Assessment of the South Australian MSF in 2021/22 (Smart et al. 2023).
- Implementation of new Marine Protected Areas in 2014, including several of importance to ASL (BDO EconSearch 2018) - <https://cdn.environment.sa.gov.au/marineparks/docs/BDO-EconSearch-report.pdf>

- Mandatory reporting of TEPS interactions and planned transition to electronic reporting in 2024.
- Effort trigger limits for large mesh gillnets (LMN) were introduced in 2016. Areas identified as being high risk for Australian sea lion interactions are designated 'high-risk zones'. The fishery's effort trigger limits are engaged when LMN are used for a number of days within a single high-risk zone. Fishers are required to submit reports to PIRSA before a fishing trip using an LMN.
- Fish Trap entrance sizes are sufficiently small to prevent the entrapment of ASL.

Australian Sea Lion (*Neophoca cinerea*)(ASL) can be captured in gear used within the commercial MSF, particularly LMN. ASL are:

- Listed as Endangered globally (IUCN Red List)
- Listed as Endangered in Australia (EPBC Act 1999)
- Listed as Vulnerable in South Australia (National Parks and Wildlife Act 1972).

Goldsworthy et al. (2009) published a report to the Australian Government Department of the Environment, Water, Heritage and the Arts (DEWHA) detailing the risks to the ASL populations from a variety of natural and anthropogenic factors, including LMN used in the MSF. The elevated concern for the viability of ASL populations relates to their unique population structuring and low reproduction rates. It is estimated that even slightly elevated levels of mortality through fishing pressure may result in a quasi-extinction of some sub-populations (Goldsworthy et al. 2007).

With the loss of School Shark and Gummy Shark as target species in 2000 (when it moved to a Commonwealth managed species), LMN effort has declined dramatically in the MSF, and the MSF is considered to be a lesser risk compared to other fisheries using LMN.

In recent years there has been minimal use of LMN in the MSF with less than 10 days of fishing conducted each year and reporting requirements in place to allow the monitoring of LMN use in high risk areas for Australian Sea Lions. No triggers have been breached with regard to these high risk areas, and no interactions with ASL have been recorded in the last decade.

### **Australian Sea Lions – 2024 Risk Rating**

The workshop noted:

- No reported interactions with ASL in the MSF over the last decade;
- The effort trigger limits for LMN have been in place since 2016 and no breaches had occurred;
- The introduction of marine parks in 2014 providing additional protection for ASL from anthropogenic impacts.

The fishery does not currently require a vessel monitoring system (VMS) and relies on fishery-dependent reporting for monitoring LMN effort in high-risk zones. To address uncertainties regarding the level of fishing effort and reporting, conditions have been placed on the Part 13A of the EPBC Act, export approval for this fishery requiring the implementation of VMS (including geofencing around sea lion colonies), noting the implementation of VMS is still in consideration by the Minister and electronic logbooks by December 2024 to facilitate improved reporting of interactions in the fishery. By June 2026, PIRSA must also review the fishery's reporting framework to demonstrate that protected species interaction data are accurate. The potential implementation of VMS could further validate locational use of LMN. PIRSA will continue to maintain reporting and mitigation measures which are aligned with EPBC accreditation for the fishery.

ASL sub-populations are genetically distinct in each area resulting in the impact of small numbers of mortalities results in consequence to the stock (sub-population) being high. Travel distance of pups is high. Fish Trap entrance sizes are sufficiently small to prevent the entrapment of juvenile ASL. It was noted a new national ASL recovery plan was being developed and a national risk assessment was being undertaken to inform this plan.

The workshop agreed to maintain the current (2011) risk rating pending release of a comprehensive risk assessment being undertaken by the Commonwealth government.

Given this information the workshop assigned a Consequence score (4) and Likelihood score (1). **Risk rating LOW.**

## White Shark

### New Information

- Reform of MSF in 2021 including removal of 100 MSF licences.
- Assessment of the South Australian MSF in 2021/22 (Smart et al. 2023).
- Wildlife Interaction Reporting across South Australian Fisheries 2022/23 – Advice Note – SARDI. Available at:  
[https://pir.sa.gov.au/data/assets/pdf\\_file/0005/467699/Protected\\_species\\_interaction\\_reported\\_in\\_SA\\_managed\\_fisheries\\_2022-23.pdf](https://pir.sa.gov.au/data/assets/pdf_file/0005/467699/Protected_species_interaction_reported_in_SA_managed_fisheries_2022-23.pdf)
- Operational interactions with TEPS in SA Managed Fisheries Data Summary : 2007/8 – 2016/17 (Mackay 2018)  
[https://www.pir.sa.gov.au/data/assets/pdf\\_file/0005/333149/Operational\\_Interactions\\_with\\_Threatened\\_Endangered\\_or\\_Protected\\_Species\\_in\\_South\\_Australian\\_Managed\\_Fisheries\\_Data\\_Summary\\_200708\\_-\\_201617.pdf](https://www.pir.sa.gov.au/data/assets/pdf_file/0005/333149/Operational_Interactions_with_Threatened_Endangered_or_Protected_Species_in_South_Australian_Managed_Fisheries_Data_Summary_200708_-_201617.pdf)
- Recovery Plan for the White Shark (*Carcharodon carcharias*) (DSEWPC 2013)  
<https://www.dcceew.gov.au/sites/default/files/documents/white-shark.pdf>
- Application of tracking technologies to understand space-time explicit patterns of movement, residency and habitat use of pelagic sharks in Spencer Gulf: resolving overlaps with key community activities and marine industries. FRDC 2014-020 (2018 Rogers and Drew).
- Shark Futures – A report card for Australia's sharks and rays (Simpfendorfer et al. 2019).
- Commonwealth Scientific and Industrial Research Organisation (CSIRO) White Shark Population Estimate. <https://www.csiro.au/en/research/animals/marine-life/Sharks/Can-white-shark-numbers-be-estimated>
- DCCEEW – Declaration of an approved Wildlife Trade Operation approval – Marine Scalefish Fishery – 12 December 2023.

White Shark (*Carcharodon carcharias*) are distributed throughout temperate and sub-tropical regions in both northern and southern hemispheres. However, it appears to be relatively scarce compared to most other widely distributed species, being most frequently reported from South Africa, the Great Australian Bight, northern California and north eastern United States (Last and Stevens, 1994).

Significant measures have been taken to ensure the conservation of White Shark worldwide and are fully protected in Australia. The White Shark is listed on Appendix II on the Convention on International Trade

in Endangered Species of Fauna and Flora (CITES), which aims to prevent the highly lucrative illegal trade in White Shark products such as teeth, jaws and fins. In 2002, White Shark was listed on Appendices I and II of the Convention on Migratory Species (CMS). Furthermore, a recovery plan for this species was implemented in 2002 in accordance with the guidelines for recovery plans under the EPBC Act. This recovery plan is currently being reviewed and the new plan will be released shortly.

Reported interactions with White Sharks in the MSF are rare, and usually in association with longline or netting activities. The majority of interactions do not result in capture and animals are released alive; however, a very small number of mortalities have been recorded in the past - 5 between June 2008 and June 2023.

It is an offence, under section 71 of the Act to take, injure, damage or otherwise harm an aquatic resource of a protected species which includes White Sharks.

### **White Shark - 2024 Risk Rating**

The Workshop noted the MSF Snapper fishery had been closed from November 2019 to June 2026 in all areas except the SEFZ, reducing the risk of interactions between longline fishing for Snapper and White Sharks. A low number of interactions have been reported historically. A significant reduction in the use of LMN had also been observed.

Given this information the workshop assigned a Consequence score (1) and Likelihood score (3). **Risk rating LOW.**

# General ecosystem impacts of fishing

**Broad objective** - Minimise Fishery impacts on the habitat and wider ecosystem

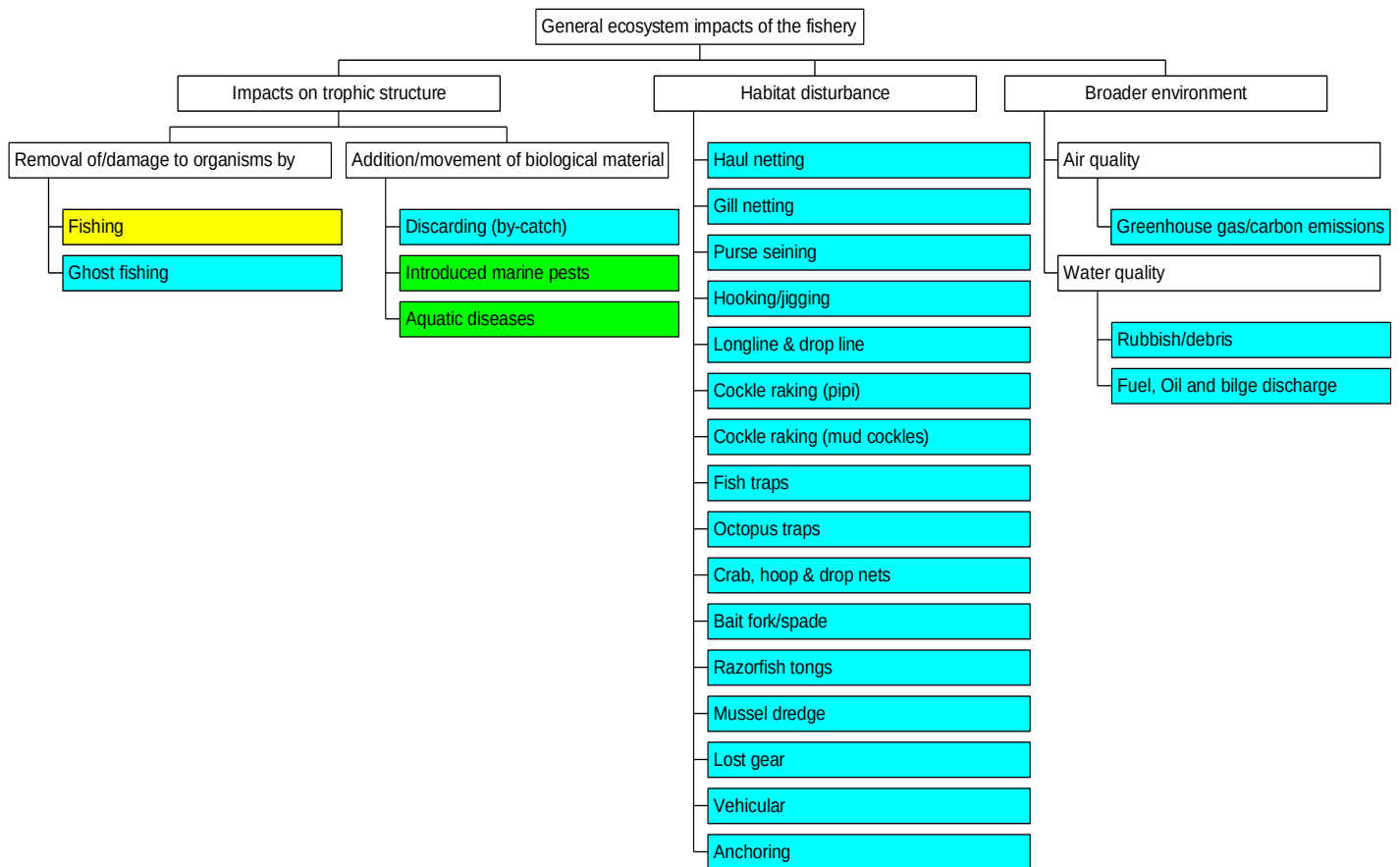


Figure 19. Component tree for general ecosystem impacts of fishing. Colours reflect negligible, low, medium and high risks as assigned in 2024.

Risks rated as Low or Negligible in the 2011 risk assessment were carried forward unless there was significant new information to consider.

## Impacts on trophic structure - removal of / damage to organisms by fishing

### New Information

- Reform of MSF in 2021 including removal of 100 MSF licences.
- Assessment of the South Australian MSF in 2021/22 (Smart et al. 2023).
- Establishing ecosystem-based management for the South Australian Sardine Fishery: developing ecological performance indicators and reference points to assess the need for ecological allocations (Goldsworthy et al. 2011).
- Review of impacts of localised depletion of small pelagic fishes on predators and ecosystems (Rogers et al. 2013).
- Spencer Gulf research initiative: Development of an ecosystem model for fisheries and aquaculture

(Gillanders et al. 2015).

- A trophic model for Gulf St Vincent: Balancing exploitation of three fisheries in an EBFM framework (Goldsworthy et al. 2017).
- Socio-ecological assessment of the ecosystems, industries and communities of Spencer Gulf: 'Gulfview' interactive platform (Bailleul and Ward 2019).
- Potential social, economic and ecological indicators for integrated ecosystem assessment of Spencer Gulf (Tanner et al. 2019).

Given the diverse set of fishing methods and extensive areas of operation, a large range of species are taken by the MSF from top order predators to filter feeding bivalves. The catch composition taken by the fishery in each region represents a reasonable reflection of the underlaying ecosystem structure. Any major change in the ecosystem would, therefore, be reflected in the composition of the overall catch.

It is acknowledged the biomass of target species and some non-target species have been reduced due to fishing pressure, but there has been no major change observed in the overall species composition recorded except where fisheries management measures have been implemented (e.g., introduction of new devices, additional of species or restrictions and closures).

### **Removal / Damage organisms – Fishing – 2024 Risk Rating (Ecosystem structure consequence levels)**

The workshop noted that following the reform of the MSF in 2021, catch and effort had reduced to historic low levels. It was also noted that as the biomass of some species had been reduced, this would be consistent with C2 level of impact on the ecosystem because there was no evidence that there had been any major shifts in overall catch composition generated from the loss of any major component species that would be consistent with C3 (*Maximum acceptable level of change to the environment or ecosystem structure with no material change in function*). Similarly, there was no evidence of fishing down the food web, or evidence of the loss of a keystone species consistent with C4 (*different species/groups now the major targets of capture or surveys*). It was therefore not considered plausible that there had been large ecosystem shifts generated from fishing.

Given this information the workshop assigned a Consequence score (2) and Likelihood score (4). **Risk rating MEDIUM.**

### **Addition / movement of biological material - introduction of marine pests / aquatic diseases**

The likelihood of fishing vessels introducing or translocating marine pests or aquatic diseases is low; however, the spatially unrestricted nature of the fishery posed a heightened risk. The use of imported bait was noted in 2011 as a potential risk.

- New Information Molecular surveys for priority marine pests in 2021-22 for Thevenard, Port Lincoln, Port Giles, Klein Point, Port Adelaide, South Australia, and Portland, Victoria (Wiltshire et al. 2022).
- Recreational vessel networks reveal potential hot spots for marine pest introduction and spread (Hilliam et al. 2024).
- The assessment and management of marine pest risks posed by shipping: the Australian and New Zealand experience (Hayes et al. 2019).

There have been detections of Wakame (Japanese seaweed) as of August 2023 which are now considered established but are yet to be detected in other locations (to our knowledge). The species is listed as an Australian Priority Marine Pest. Impacts on fisheries and vice-versa in other Australian states are not well known. Pacific Oyster Mortality Syndrome, Abalone viral ganglioneuritis (AVG) and Wakame detections have been identified and response plans put in place to minimise the risk of translocation.

**Introduced pests / aquatic diseases / Biosecurity - 2024 Risk Rating (Ecosystem structure consequence levels)**

Emergency response plans and a dedicated Biosecurity division within PIRSA are in place to respond to reports of introduced pests, aquatic diseases and other biosecurity risks. PIRSA has demonstrated a sound ability to respond to incursions. It was noted that other unknown disease or pests could come into consideration but are not yet known. Whilst the consequence of an outbreak of a disease could be catastrophic, the workshop considered this was unlikely.

Given this information the workshop assigned a Consequence score (4) and Likelihood score (1). **Risk rating LOW.**

# Community impacts

## Broad objectives

*Allocations provide for optimum utilisation and equitable distribution*

*An economically efficient Fishery that is socially and culturally valued*

*Improve economic efficiencies and financial returns within the constraints of sustainability imperatives*

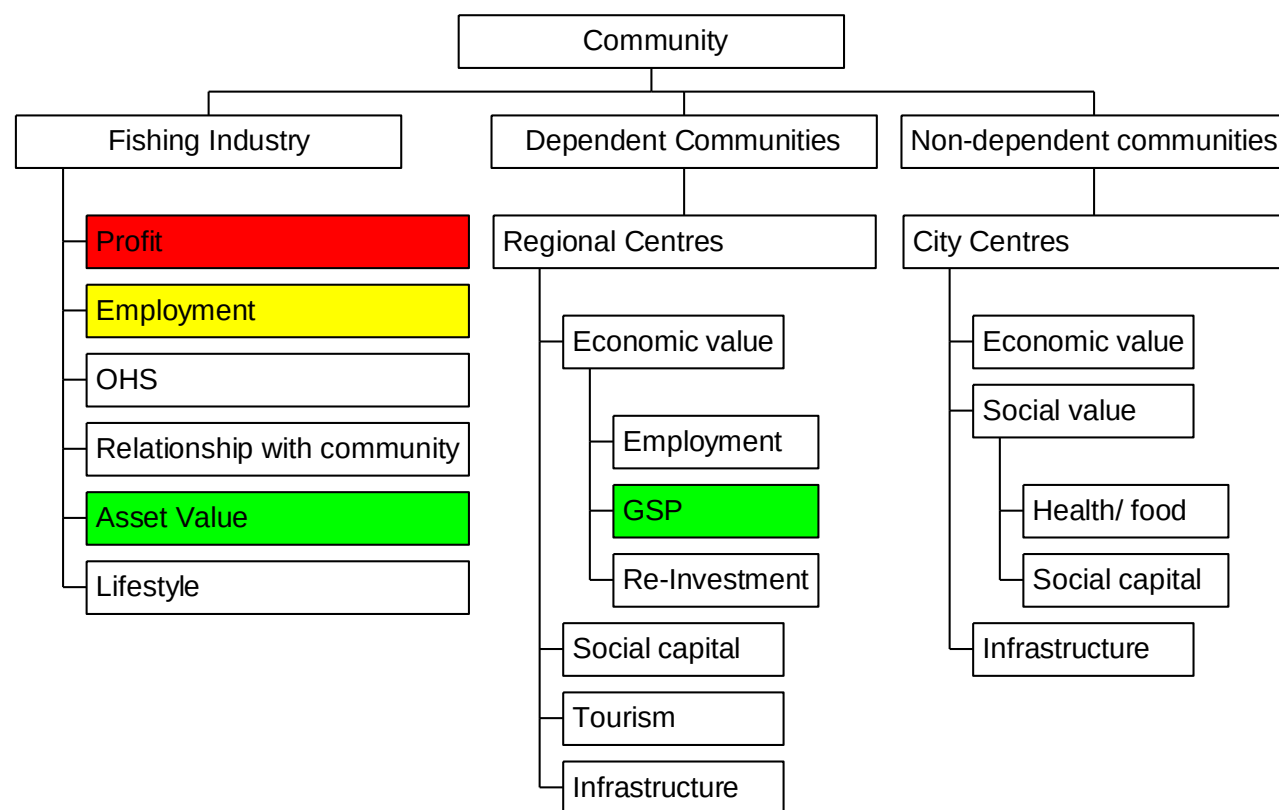


Figure 20. Component tree for community impacts. Colours reflect negligible, low, medium and high risks as assigned in 2024.

Where they remained in the scope of the 2024 assessment, the risks rated as Low or Negligible in the 2011 risk assessment were carried forward unless there was significant new information to consider.

## Fishing industry - profit

### New Information

- Economic and Social Indicators for the South Australian Marine Scalefish Fishery 2021/22 – BDO EconSearch – 12 July 2023 MSF\_Final\_230712.pdf (bdo.com.au)
- Australian Fisheries and Aquaculture Statistics 2022. Available at: [Fisheries and aquaculture statistics 2022 - DAFF \(agriculture.gov.au\)](https://www.daff.gov.au/fisheries-and-aquaculture-statistics-2022)

Profit is of primary importance to licence holders and is one of the key factors affecting the viability of the fishery. BDO EconSearch Pty Ltd conducts annual detailed analyses of the economic status of the MSF. There are a number of ways to measure profitability within the fishery, two measures are provided here: boat business profit and profit at full equity.

The 2021/22 Economic Indicators report for the MSF represented the first full year of economic and social indicators for the Fishery following the Reform of the Fishery. There was a declining trend in employment, expenditure and community support activities. Declining trends were also observed in economic indicators and licence value however an increasing trend in real profit at full equity was observed. There was an increasing trend in real licence value but decreased livelihood opportunity as the cost of entry to the fishery increased relative to the returns in 2020/21 and 2021/22.

Table 3. Summary of key economic indicators 2018/19 to 2021/22 (BDO EconSearch 2023).

| Indicator                        | 2018/19   | 2019/20   | 2020/21   | 2021/22   |
|----------------------------------|-----------|-----------|-----------|-----------|
| Catch                            | 2,032t    | 2,067t    | 1,618t    | 1,851t    |
| GVP                              | \$21.5m   | \$20.8m   | \$19.1m   | \$20.7m   |
| Active licences (no.)            | 276       | 269       | 241       | 191       |
| Fee/licence                      | \$6,708   | \$5,270   | \$3,948   | \$3,440   |
| Fee/GVP                          | 13.8%     | 14.3%     | 15.2%     | 12.3%     |
| Return on fishing gear and equip | 6.2%      | 7.6%      | 12.1%     | 6.1%      |
| Return on total capital          | 2.9%      | 3.2%      | 4.8%      | 1.6%      |
| Licence Value <sup>a</sup>       | \$207,437 | \$228,624 | \$240,492 | \$556,749 |
| Gross state product (GSP)        | \$40.3m   | \$42.2m   | \$39.1m   | \$32.8m   |
| Employment                       | 482 fte   | 484 fte   | 469 fte   | 275 fte   |
| NER                              | -\$5.1m   | -\$4.1m   | -\$1.8m   | \$0.7m    |
| NER/GVP                          | -23%      | -20%      | -9%       | 3%        |

<sup>a</sup> This table presents estimates in real 2021/22 dollars (excluding catch, active licences and employment).

<sup>b</sup> Licence value for 2021/22 includes the value of quota (\$355,103).

### Profit - 2024 ESD Risk Assessment (Economic consequence levels)

Profit is of primary importance to licence holders and is one of the key factors affecting the viability of the Fishery. Information from the 2021/22 BDO Econsearch report for the MSF was considered, and it was noted that the 2022/23 report has not yet been finalised.<sup>4</sup>

It was noted that the MSF reform and ongoing red tape reduction measures continue to be a consideration for improving operational efficiency for the fleet. It was confirmed that PIRSA and SARDI have commenced recruitment for a Fisheries Management Officer and Senior Research Officer to prioritise and progress key proposals in 2024/25. These measures could result in increased operating efficiencies and profitability. It was acknowledged the fishery is still in a transition period post quota implementation/Reform.

The 2024/25 incoming fee structure may impact profitability, in particular for those fishers holding large volumes of quota and species of lower market value (e.g. Southern Garfish). Individual licence fee costs to these MSF licences are likely to increase. It is likely that the 2024/25 BDO Econsearch report will provide updated data on the impact of the new licence fee structure on profitability. It was noted profit considers all factors, not just licence and quota fees and that many costs are outside of the control of the fishing industry or PIRSA. Cost to catch, in particular for Southern Garfish will impact profitability and it was noted supply and demand can impact on the market price for many MSF species. The increasing

<sup>4</sup> The latest published Economic and Social Indicator reports for the MSF are available from the PIRSA website at: [https://pir.sa.gov.au/primary\\_industry/commercial\\_fishing/commercial\\_fisheries/marine\\_scalefish\\_fishery](https://pir.sa.gov.au/primary_industry/commercial_fishing/commercial_fisheries/marine_scalefish_fishery)

value of Southern Calamari was noted. A stable or reduction in profitability trend was considered possible. The draft HSF includes a step up/step down transition phase to mitigate impacts on the fishery were large changes in TACCs may be necessary.

The workshop discussed the following lines of evidence and considered a Consequence level of 2 and 3 and associated likelihoods were plausible.

| Profit – Fishing Industry                                                                                                                                                                                                                                                                                                                              | Economic consequence levels |   |   |   |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|---|---|---|
| Lines of Evidence                                                                                                                                                                                                                                                                                                                                      | 1                           | 2 | 3 | 4 |
| <b>External Factors</b> – external factors such as power, fuel and freight costs may impact profitability<br><b>Management Fees</b> – anticipated changes in management fee structure may result in higher costs for large volume quota holders<br><b>Fee Review</b> – future changes to quota fee and cost structure may change profitability impacts | X                           | ✓ | ✓ | X |
| Likelihood                                                                                                                                                                                                                                                                                                                                             |                             | 3 | 3 |   |
| Risk Score                                                                                                                                                                                                                                                                                                                                             |                             | 6 | 9 |   |

After considering all the lines of evidence, the workshop agreed the plausible combination with the highest risk score be adopted: Consequence score (3) and Likelihood score (3) **Risk rating HIGH**.

## Asset value

### New Information

- Economic and Social Indicators for the South Australian Marine Scalefish Fishery 2021/22 – BDO EconSearch – 12 July 2023 [MSF\\_Final\\_230712.pdf \(bdo.com.au\)](#).
- Australian Fisheries and Aquaculture Statistics 2022. Available at: [Fisheries and aquaculture statistics 2022 - DAFF \(agriculture.gov.au\)](#).

The importance of maintaining the value of assets was rated highly by the industry. Assets may include fishery licences, quota entitlements held on the licence, vessels, businesses, gear, etc. For many fishers, their assets are their 'superannuation fund'.

The average value of quota entitlements per licence (\$355,000 in 2021/22) was based on the average quota holding and value for each key species in each region based on the fishers' own estimates provided in the 2023 survey following the implementation of quota for four species from 1 July 2021.

There was a level of uncertainty about the value of licences as an asset highlighted by workshop participants.

A report on the economic performance of the fishery is produced annually. The report provides measures of profitability; however, no targets are set out in the current management plan other than a limit reference point of 'a declining trend in annual return on investment over a three-year period'.

### Asset Value - 2024 Risk Rating (Economic consequence levels)

There was a level of uncertainty around licence fees, quotas, new HSF that may impact the future value of licences. Noting 2021/22 reflected the 1st year of the implemented reform and considering the trend prior to 2021/22. Potential return to pre-reform asset value was noted.

Given this information the workshop assigned a Consequence score (1) and Likelihood score (3). **Risk Rating LOW.**

## Economic value – contribution to Gross State Product and Gross Regional Profit

### New Information

- Economic and Social Indicators for the South Australian Marine Scalefish Fishery 2021/22 – BDO EconSearch – 12 July 2023 [MSF\\_Final\\_230712.pdf \(bdo.com.au\)](#).
- Australian Fisheries and Aquaculture Statistics 2022. Available at: [Fisheries and aquaculture statistics 2022 - DAFF \(agriculture.gov.au\)](#).

Contribution to GSP is measured as value of output less the cost of goods and services (including imports) used in producing the output. In 2021/22, total marine scalefish fishing industry related contribution to GSP in South Australia was \$32.8 million, \$13.1 million generated by fishing directly, \$2.3 million generated by downstream activities and \$17.4 million generated in other sectors of the state economy.

As with employment, the economic impact on the loss of the MSF to regional centers would be greater in small regional towns such as Port Wakefield and Streaky Bay than it would be in larger centers like Port Lincoln.

A report on the economic performance of the fishery is produced annually. The report provides measures of contribution to GSP, including breakdown by regions; however, no targets are set out in the current management plan other than a limit reference point of 'a declining trend in annual return on investment over a three year period'.

### 2024 ESD RA Outcome (Economic consequence levels)

Low levels of catch following the reform of the fishery was noted. A goal of the reform was to increase profitability. There was a slight decline in GSP in 2022/23, this decline was detectable but there was no real impact described.

Given this information the workshop assigned a Consequence score of (1) Likelihood score (2). **Risk Rating LOW.**

# Governance

**Broad Objective** – Cost-effective and participative co-management of the Fishery

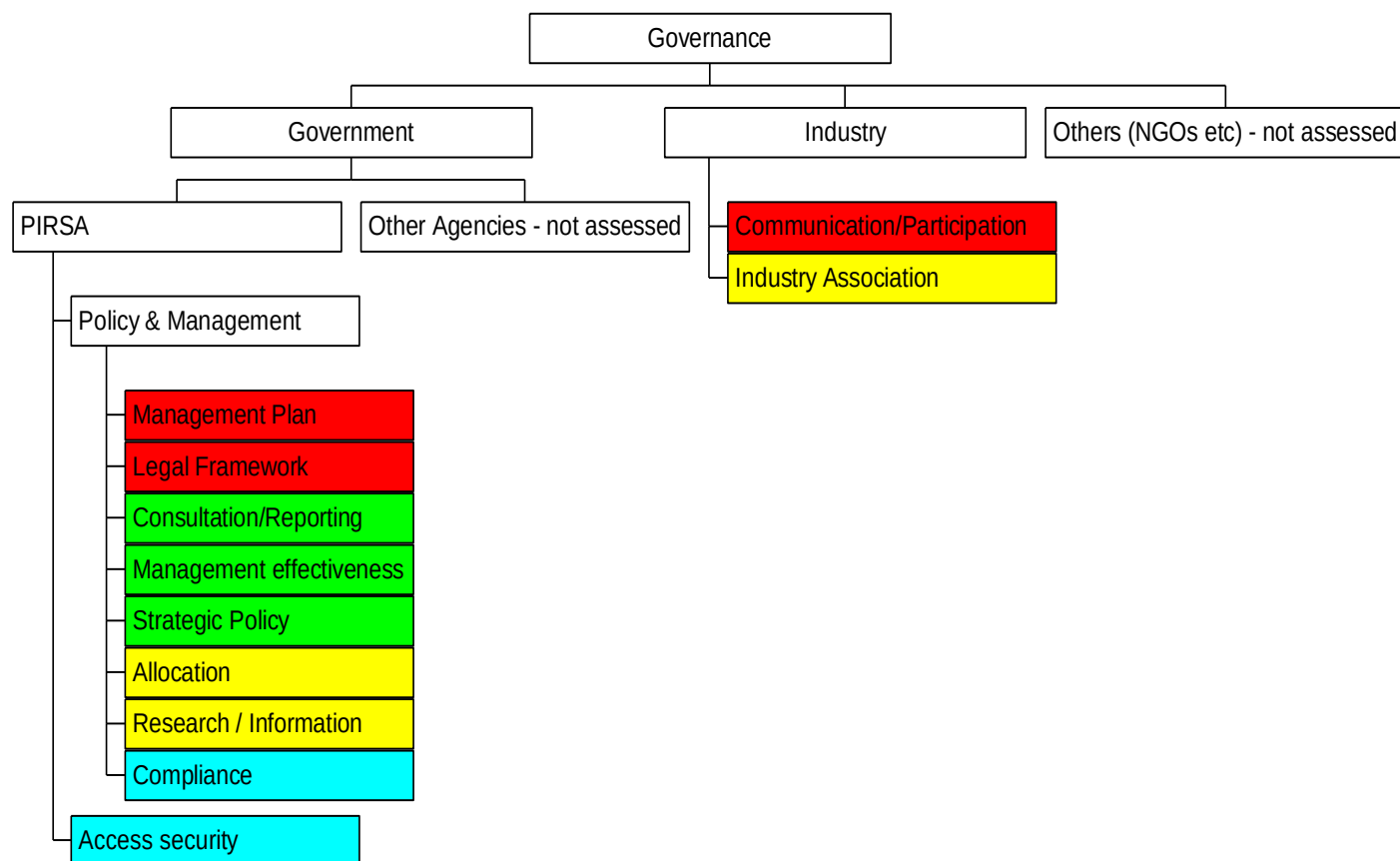


Figure 21. Component tree for governance. Colours reflect negligible, low, medium and high risks as assigned in 2024.

Where they remained in the scope of the 2024 assessment, the risks rated as Low or Negligible in the 2011 risk assessment were carried forward unless there was significant new information to consider.

The risks under this section were assessed against the Governance consequence levels (Appendix H).

## Management plan

The Act sets out the legal requirements for a Management Plan. The Management Plan for the South Australian Commercial Marine Scalefish Fishery came into effect in 2011 and was recently extended until 30 June 2025. A replacement Management Plan is being developed including a new Harvest Strategy Framework and Implementation Plan. The Act requires that fishery management plans explicitly allocate resource shares to the commercial, recreational and Aboriginal traditional sectors of the fishery.

### New Information

- Notice of intention to prepare a management plan for the South Australian commercial marine scalefish fishery (PIRSA 2024).
- MSFMAC Chair's Report - Meeting of 9 and 10 June 2024 (PIRSA 2024).

The new management plan is a key requirement for the fishery to provide a framework for the sustainable management of the resource and to give certainty to the industry about how future

management decisions will be made. It will also outline the allocation of resources to the various sectors and prescribe a way of managing these shares into the future. The replacement management plan will include a Harvest Strategy Framework and will be supported by an implementation plan allowing for greater flexibility and advancement in managing the resources of the MSF.

### Management Plan - 2024 Risk Rating

A review report for the current Management Plan was completed and it recommended that a replacement Management Plan be developed, noting that substantial changes to the fishery have occurred over the last decade. The current Management Plan was extended to 30 June 2025. Development of the replacement management plan is well underway with a draft HSF being refined. Recent management changes include introduction of output controls for four key species. Within five years it is expected that the new Management Plan in effect and appropriately guiding management of the fishery to achieve the objectives for the fishery included in the management plan.

The workshop discussed the following lines of evidence considered the Consequence levels of 1 and 3 and their associated likelihoods were plausible.

| Management Plan                                                                                                                                                                                                                                                  | Governance consequence level  |   |             |   |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|---|-------------|---|
| Lines of Evidence                                                                                                                                                                                                                                                | 1                             | 2 | 3           | 4 |
| <b>Current (2013) Management Plan</b> – many of the harvest strategies within the current plan have expired, catch set on 5-year average in interim<br><b>Draft Harvest Strategy Framework</b> – draft framework well progressed and on track for new MP in 2025 | ✓                             | X | ✓           | X |
| Likelihood                                                                                                                                                                                                                                                       | 4                             |   | 3           |   |
| Risk Score                                                                                                                                                                                                                                                       | 4 New HSF & MP being prepared |   | 9 2013 plan |   |

After considering all the lines of evidence including information about the draft Management Plan/HSF, the workshop agreed the plausible combination with the highest risk score be adopted. Consequence score (3) and Likelihood score (3). **Risk rating HIGH.**

## Legal framework – regulations / conditions / determinations

The MSF is managed by a number of legislative frameworks including;

- The *Fisheries Management Act 2007*
- The *Fisheries Management (General) Regulations 2017*
- The *Fisheries Management (Marine Scalefish Fishery) Regulations 2017*
- Ministerial determinations
- Ministerial exemptions
- Licence conditions

## New Information

- Economic and Social Indicators for the South Australian Marine Scalefish Fishery 2021/22 (BDO EconSearch 2023). Available at: [South Australian Commercial Fisheries and Aquaculture Reports - BDO.](#)
- Cost Recovery Implementation Statement for the Marine Scalefish Fishery – PIRSA 2023/24. Available at: [Cost Recovery Implementation Statement for the Marine Scalefish Fishery 1 July 2023 to 30 June 2024 \(pir.sa.gov.au\).](#)

A Cost Recovery Implementation Statement (CRIS) for the MSF sets out the services provided by PIRSA and SARDI each financial year. The CRIS is reviewed in consultation with industry representatives and updated annually.

## Legal Framework – Regulations/Determinations/Conditions – 2024 Risk Rating

Red Tape Reduction measures will likely seek to make amendments to regulations to improve efficiencies. Optimisation and economic viability are objects of the Act and there is a framework in place to support those objectives. Maintaining sustainable stocks as a priority object of the Act. Implementation of output controls and consideration of future need for individual species level input controls are anticipated with development of the replacement Management Plan.

Considering these planned next steps for the regulation of the fishery in the next five years, the workshop agreed to rank this component Consequence score (3) and Likelihood score (3) **Risk rating HIGH.**

## PIRSA: consultation and reporting

### New Information

- Economic and Social Indicators for the South Australian Marine Scalefish Fishery 2021/22 (BDO EconSearch 2023). Available at: [South Australian Commercial Fisheries and Aquaculture Reports - BDO.](#)
- Cost Recovery Implementation Statement for the Marine Scalefish Fishery – PIRSA 2023/24. Available at: [Cost Recovery Implementation Statement for the Marine Scalefish Fishery 1 July 2023 to 30 June 2024 \(pir.sa.gov.au\).](#)
- Notice to Commercial Fishers - [New tab \(pir.sa.gov.au\).](#)

PIRSA works closely with the recognised industry bodies, the Marine Fishers Association (MFA) and South Australian Professional Fishers Association (SAPFA) and other industry bodies to consult and discuss matters pertaining to the MSF. Notices are sent to all commercial Licence holders to advise of management changes, considerations and upcoming points of interest. Fishers are able to access their commercial licence and quota balances on line through the myPIRSA portal. PIRSA holds a number of meetings with industry representatives each year to discuss and consult on matters impacting the MSF. The MSFMAC provides a formal mechanism for consultation with industry representatives and includes two Industry Representatives of the MSF.

The MFA and SAPFA are actively engaged with PIRSA on a wide range of matters for current and future consideration.

## PIRSA – Consultation and Reporting - 2024 Risk Rating

Given this information considered the workshop agreed to rank this component Consequence score (2) and Likelihood score (2) **Risk rating was (4) LOW.**

## Management effectiveness

### New Information

- Economic and Social Indicators for the South Australian Marine Scalefish Fishery 2021/22 (BDO EconSearch 2023). Available at: [South Australian Commercial Fisheries and Aquaculture Reports - BDO.](#)
- Cost Recovery Implementation Statement for the Marine Scalefish Fishery – PIRSA 2023/24. Available at: [Cost Recovery Implementation Statement for the Marine Scalefish Fishery 1 July 2023 to 30 June 2024 \(pir.sa.gov.au\).](#)
- Notice to Commercial Fishers - [New tab \(pir.sa.gov.au\).](#)
- MSFMAC meeting papers - [The Marine Scalefish Fishery Management Advisory Committee - PIRSA.](#)

### Management Effectiveness – 2024 Risk Rating

It was noted that management has been effective in maintaining and constraining most species appropriately. Where effective constraining of catch has not occurred, recovery plans are either in place or being developed. Most stocks in the MSF are classified as sustainable with a small number classified as recovering and two stocks classified as depleted and closed.

Given this information the workshop agreed to rank this component Consequence score (1) and Likelihood score of (3). **Risk rating LOW.**

## Strategic policy

Within PIRSA there are a number of strategic Policies in place relating to the MSF including the Allocation Policy, Policy for Managing Under-Catch and Over-Catch in South Australian Fisheries, Fisheries and Aquaculture Cost Recovery Policy, Policy for Co-management of Fisheries in South Australia, and the South Australian Fisheries Harvest Strategy Policy.

### New Information

- Policy for Co-management of Fisheries in South Australia – 2013. Available at: [Co-management policy.pdf \(pir.sa.gov.au\).](#)
- Allocation Policy – September 2023. Available at: [Allocation Policy: Allocation of access to fisheries resources between fishing sectors \(pir.sa.gov.au\).](#)
- Policy Paper – Managing Under-Catch and Over-Catch in South Australian Fisheries 2021. Available at: [Policy-Paper-Managing-under-catch-and-over-catch-in-South-Australian-fisheries.pdf \(pir.sa.gov.au\).](#)

- PIRSA Fisheries and Aquaculture Cost Recovery Framework 2022. Available at: [Fisheries and aquaculture cost recovery framework \(pir.sa.gov.au\)](https://pir.sa.gov.au/fisheries-and-aquaculture-cost-recovery-framework).
- Harvest Strategy Policy  
[https://pir.sa.gov.au/ data/assets/pdf file/0020/267230/Harvest strategy policy DECEMBER 2015.pdf](https://pir.sa.gov.au/data/assets/pdf_file/0020/267230/Harvest_strategy_policy_DECEMBER_2015.pdf).

### Strategic Policy – 2024 Risk Rating

Within PIRSA there are strategic policies in place and resources capable of updating Management Plans, Regulations and completing other strategic policy development. Resourcing for the MSF is outlined in the annual Cost Recovery Implementation Statement and includes (but is not limited to) the General Manager of the Fisheries Management Unit, Manager of Community Fisheries, and Fishery Manager for the MSF.

Given this information the workshop agreed to rank this component Consequence score (1) and Likelihood score (3) **Risk rating LOW**.

## Allocation

### New Information

- Allocation Policy – September 2023. Available at: [Allocation Policy: Allocation of access to fisheries resources between fishing sectors \(pir.sa.gov.au\)](https://pir.sa.gov.au/allocation-policy).

The Act sets out that a Management Plan must specify the share of aquatic resources to be allocated to each fishing sector under the plan and prescribe a method or establish an open and transparent process for determining the method, for adjusting allocations of aquatic resources between the different fishing sectors during the term of the plan.

The Management Plan sets out sector level allocations for a number of Primary and Secondary MSF Species. The Allocation Policy sets the processes associated with making, reviewing and reallocation.

### Allocation – 2024 Risk Rating

Generally, species have been kept within their sector allocations and there are systems in place to monitor allocations including the recreational fishing survey and commercial catch and effort returns. There are processes in place to monitor, review and address trends and changes in catches and the Allocation Policy describes those processes. Under the proposed draft Harvest Strategy Framework, it is intended that sector catches are maintained to their respective shares of the RBC for a stock or management unit. It was noted that delays in estimating / accessing sector catch data increased the risk of allocations not being appropriately managed. The next Recreational Fishing Survey is a few years away.

Given this information the workshop assigned a Consequence score of (3) and Likelihood score of (2) therefore the **risk rating was (6) MEDIUM**.

## Research / information

### New information

## OFFICIAL

- Economic and Social Indicators for the South Australian Marine Scalefish Fishery 2021/22 (BDO EconSearch 2023). Available at: [South Australian Commercial Fisheries and Aquaculture Reports - BDO.](#)
- Cost Recovery Implementation Statement for the Marine Scalefish Fishery – PIRSA 2023/24. Available at: [Cost Recovery Implementation Statement for the Marine Scalefish Fishery 1 July 2023 to 30 June 2024 \(pir.sa.gov.au\).](#)

Research priorities are described in the Cost Recovery Implementation Statement each financial year for the MSF and include costing of these priorities. A report on the outcomes delivered for each year, is published. Significant information is provided through the Snapper Hub and Snapper Science Working Group to ensure all stakeholders have available up to date information on the progress of Snapper initiatives.

### Research / Information – 2024 Risk Rating

It was noted that there are sufficient resources and information for the fishery to operate effectively. An Annual Stock assessment report is delivered each year and includes dedicated research outcomes and assessment for key species. There is an identified opportunity to adopt a tiered framework within the draft Harvest Strategy Framework for the replacement Management Plan. It is the role of MSFMAC to identify issues impacting the MSF and make recommendations on actions and opportunities to address these issues. The CRIS identifies priorities and key deliverables each year. It was recognised that there are a large number of species within the MSF and the cost of delivery remains a constraining factor on what can/is delivered and timeframes of delivery.

Given this information the workshop agreed to rank this component Consequence score (2) and Likelihood score (4). **Risk rating MEDIUM.**

## Compliance

### New information

- Cost Recovery Implementation Statement for the Marine Scalefish Fishery – PIRSA 2023/24. Available at: [Cost Recovery Implementation Statement for the Marine Scalefish Fishery 1 July 2023 to 30 June 2024 \(pir.sa.gov.au\).](#)

Six monthly and end of year Compliance Reports are provided to the two peak industry bodies for the MSF. These reports deliver statistical information about number of interactions by month, time spent on Education, Deterrence and Enforcement activities, outcomes of offences and offences by risk category and interactions by Risk and Interactions by Initiative.

Cost Recovery Implementation Statement (CRIS) stakeholder meetings are held in advance of each year to refine and update the Compliance Plan for the Fishery.

### Compliance – 2024 Risk Rating

CRIS, Annual Plan, 6 monthly and yearly compliance reports are delivered. The Compliance Risk Assessment is under review. Electronic reporting has seen a significant improvement in reporting accuracy. Sufficient education, deterrent and enforcement program in place. Compliance resources located in all relevant MSF hot spots. It was considered that the Compliance program was effective.

Given this information the workshop agreed to rank this component Consequence score (1) and Likelihood score (2) **Risk rating NEGLIGIBLE.**

## Access security (for industry)

Security of access to the entitlement that a fisher holds remains a consideration for the MSF.

### New information

- Licences now issued for a 10-year term (scope of Management Plan).
- Allocation Policy – September 2023. Available at: [Allocation Policy: Allocation of access to fisheries resources between fishing sectors \(pir.sa.gov.au\)](https://pir.sa.gov.au/resources-between-fishing-sectors).

### Access Security (not spatial access) – 2024 Risk Rating

It was noted that PIRSA deals with the scope of an entitlement through the provision of fishing licences for a period of 10 years (term of the Management Plan). The Management Plan provides a level of security of access and sets out allocations to Sectors which can be reviewed, and actions taken. It was noted that there was some impact on access as a result of the Snapper closure and through the implementation of TACC's and access to species with a TACC is now limited to those holding quota. With the new licence fee structure, industry reported that quota had for several fishers felt like a financial burden / risk as opposed to providing access security. MSF is represented by two peak industry bodies who are able to lobby and represent the fishery on access security matters and there is MSF representation on the MSFMAC with similar opportunities to discuss and put forward considerations relating to access security.

The workshop considered this information and agreed to rank this component Consequence score (1) and Likelihood score (1). **Risk rating NEGLIGIBLE.**

## Communication / participation (industry and industry associations)

There are two recognised peak industry bodies for the MSF being the MFA and SAPFA and Co-Management services agreements are in place for the provision of these services.

### New Information

- Policy for the Co-management of Fisheries in South Australia. Available at: [Co-management policy.pdf \(pir.sa.gov.au\)](https://pir.sa.gov.au/co-management-policy.pdf).
- Cost Recovery Implementation Statement for the Marine Scalefish Fishery – PIRSA 2023/24. Available at: [Cost Recovery Implementation Statement for the Marine Scalefish Fishery 1 July 2023 to 30 June 2024 \(pir.sa.gov.au\)](https://pir.sa.gov.au/cost-recovery-implementation-statement-for-the-marine-scalefish-fishery-1-july-2023-to-30-june-2024).

### Communication / participation (industry and industry associations) - 2024 Risk Rating

There are two peak industry bodies for the MSF and several other industry bodies participating in consultation and communication regarding the MSF. Each peak industry body has a Chair and or Executive Officer and formal processes in place. It is important that these associations are engaged with members on issues and that the collective views of industry are represented. Consultation fatigue is noted as a barrier to engagement. Response rates to surveys and polls can be around 40%. Mental

## OFFICIAL

wellbeing of fishery appears to be low. Continued dialogue by industry bodies has been maintained with PIRSA. There has been a period of significant change within representative bodies.

Given this information the workshop agreed to rank this component Consequence score (3) and Likelihood score (4). **Risk rating HIGH.**

# External factors affecting performance of the fishery

**Broad objective** - Management is responsive to external impacts on the ecosystem

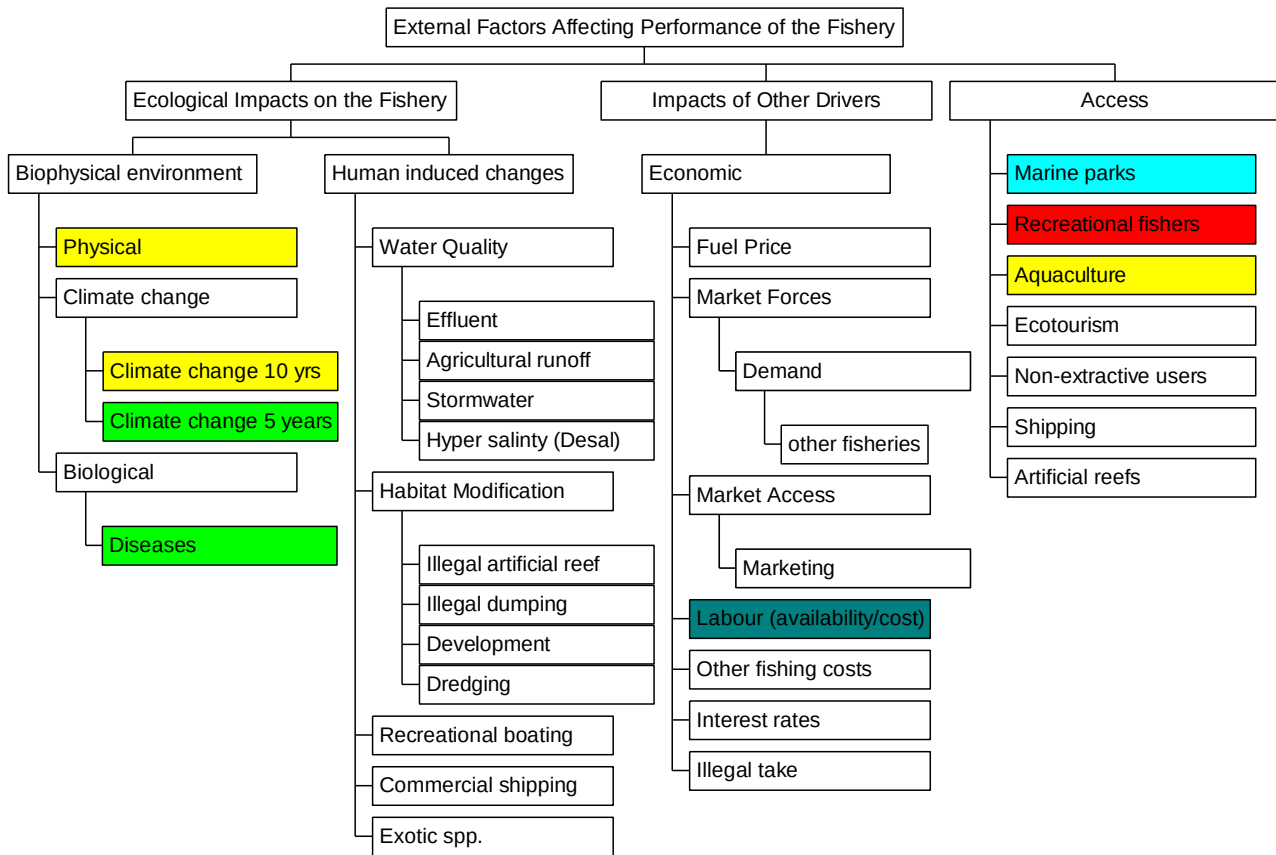


Figure 22. Component tree for external factors affecting performance of the fishery. Colours reflect negligible, low, medium and high risks as assigned in 2024.

Where they remained in the scope of the 2024 assessment, the risks rated as Low or Negligible in the 2011 risk assessment were carried forward unless there was significant new information to consider.

## Ecological impacts on the fishery – biophysical environment

### Physical – climate change - assessed within 5 years and 10 years

#### New information:

- Climate State of the Environment Report (EPA 2018). Available at: [State of the Environment reporting | EPA.](#)
- Regional projection for Southern Australia (CSIRO 2021). Available at: [CSIRO.](#)

## OFFICIAL

- Decadal scale projection of changes in Australian fisheries stocks under climate change (Fulton et al 2018).
- Guide to climate projections for risk assessment and planning in South Australia 2022 (DEW 2022).

By 2030, mean sea surface temperatures are projected to increase by 0.5°C at Port Adelaide, Victor Harbor and Portland (Victoria) and by 0.6°C at Thevenard. Ocean pH is projected to decrease by 0.08 units (i.e., become more acidic). Salinity is projected to decrease by between 0.02 and 0.07 g/kg compared to baseline concentrations. South Australia faces increasing impacts associated with rising sea surface temperatures and acidity including:

- changes in nutrient cycling in marine waters
- adverse impacts on the condition and extent of suitable habitat for coastal fisheries
- adverse impacts on shell-forming organisms including molluscs, crustaceans and foraminifera
- adverse impacts on fisheries, aquaculture and tourism.

### Climate Change – within the next 5 years – 2024 Risk Rating (Ecosystem structure consequence levels)

Some minor changes expected within 5 years within each ecosystem however those changes may remain within historical ranges. The changes observed may not require a major change to management of those fish stocks. It was considered that adverse events could have a significant impact in a discrete area (for example Marine Heat Wave events).

The workshop discussed the following lines of evidence and considered Consequence levels 1-4 and associated likelihoods were plausible.

| Climate Change – within the next 5 years                                                                                              | Ecosystem structure consequence levels |   |   |   |
|---------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|---|---|---|
| Lines of Evidence                                                                                                                     | 1                                      | 2 | 3 | 4 |
| <b>Stock monitoring</b> – key MSF stocks are monitored and assessed on a yearly basis                                                 |                                        |   |   |   |
| <b>Management arrangements</b> – in place that can sufficiently address these changes                                                 | ✓                                      | ✓ | ✓ | ✓ |
| <b>Impact on species</b> – impact on different species may vary and be positive or negative depending on biology and habitat factors. |                                        |   |   |   |
| Likelihood                                                                                                                            | 4                                      | 3 | 2 | 1 |
| Risk Score                                                                                                                            | 4                                      | 6 | 6 | 4 |

After considering all the lines of evidence, the workshop agreed the plausible combination with the highest risk score be adopted. Consequence score (3) and Likelihood score (2). **Risk rating MEDIUM.**

### Climate Change – within the next 10 years – 2024 Risk Rating

There was consideration of whether monitoring systems and management arrangements in place are sufficient to address these changes. Annual monitoring of key species, through the Stock Assessment Report will allow for detection of trends in catch and effort.

For a 10-year scope, the workshop considered Consequences levels of 2-4 and associated likelihoods were plausible.

| Climate Change – within the next 10 years                                                                                             | Ecosystem structure consequence levels |   |   |   |
|---------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|---|---|---|
| Lines of Evidence                                                                                                                     | 1                                      | 2 | 3 | 4 |
| <b>Stock monitoring</b> – key MSF stocks are monitored and assessed on a yearly basis                                                 | X                                      | ✓ | ✓ | ✓ |
| <b>Management arrangements</b> – in place that can sufficiently address these changes                                                 |                                        |   |   |   |
| <b>Impact on species</b> – impact on different species may vary and be positive or negative depending on biology and habitat factors. |                                        |   |   |   |
| Likelihood                                                                                                                            |                                        | 4 | 3 | 2 |
| Risk Score                                                                                                                            |                                        | 8 | 9 | 8 |

After considering all the lines of evidence, the workshop agreed the plausible combination with the highest risk score be adopted for 10-year scope. Consequence score (3) and likelihood score (3). **Risk rating HIGH.**

## Biological – diseases

### New Information

- Nil

### Biological – Diseases - 2024 Risk Rating (Ecosystem structure consequence levels)

The potential exists for an outbreak of a translocated disease at any time that may damage the commercial fishery. A PIRSA pest and disease reporting framework was well established through the Fishwatch call line, and PIRSA Biosecurity was experienced at responding such threats. Historically there have not been any major disease outbreaks to impact on the MSF other than Sardine herpes virus.

Given this information the workshop agreed to rank this component Consequence score (3) and Likelihood score (1). **Risk rating LOW.**

## Impacts of other drivers – economic

### Labour (availability / cost), interest rates and other fishing costs

### New Information

- Economic and Social Indicators for the South Australian Marine Scalefish Fishery 2021/22 (BDO EconSearch 2023). Available at: [South Australian Commercial Fisheries and Aquaculture Reports - BDO.](#)

Increasing costs are a key concern for industry. Like many other fishery sectors in South Australia, the MSF is competing with other industries (such as mining) to attract and retain employees. Interest rates are an issue faced by most small businesses, and the MSF is no exception. Whilst comparatively the MSF has lower startup costs than many other fisheries, costs are still significant. The costs of fishing are

a constant pressure and are likely to continue increasing. Licence fees were also identified by industry members as a key concern.

### Labour – 2024 Risk Rating

There is increasing difficulty for the MSF sector in finding and retaining seasonal labour and it is believed to be a common issue across fishing jurisdictions. The Fish Processing sector is also reporting increasing difficulty in finding and retaining fish processing staff. This issue was of high importance to the fishing industry yet was beyond the remit of PIRSA under the Act and was not risk assessed.

## Marine Park access

### New information

- South Australia's marine parks – 5-year status report 2012-2017. Available at: [data.environment.sa.gov.au/Content/Publications/South-Australias-Marine-Parks-5-year-Status-Report-2012-2017.pdf](https://data.environment.sa.gov.au/Content/Publications/South-Australias-Marine-Parks-5-year-Status-Report-2012-2017.pdf).
- A report to Department for Environment and Water. Environmental, Social and Economic Values of Marine Park Sanctuary Zones (2018). Available at: <https://cdn.environment.sa.gov.au/marineparks/docs/BDO-EconSearch-report.pdf>.

Marine Parks help conserve marine habitats and the marine species that live within and rely on these habitats. There are a number of State and Commonwealth Marine Parks prescribed within the footprint of the South Australian Marine Scalefish Fishery. Many of these Marine Parks include Sanctuary Zones where no fishing can occur.

### Marine Park Access – 2024 Risk Rating (Economic consequence level)

There could be potential for loss of important fishing areas through Marine Park development and implementation. Marine Park sanctuary zones have significantly reduced fishing areas in some key locations for the MSF over the past 10 years, however, following a recent government review and subsequent changes there were unlikely to be any further changes to marine parks in the coming five years.

Given this information the workshop agreed to rank this component Consequence score (1) and Likelihood score (1). **Risk rating NEGLIGIBLE.**

## Wider user access

Industry expressed concern regarding increased access from wider users of waters used by the MSF including desalination, shipping channels, wind farms, rocket launching, mining and development including resource extraction. Whilst it was acknowledged these were important issues that can impact upon the MSF, the workshop noted these issues were largely beyond the remit of PIRSA or the fishing industry and were not risk assessed.

## Recreational fishers

### New Information

- Survey of Recreational Fishing in South Australia 2021-22 (Beckmann et al. 2023).

## OFFICIAL

- National Social and Economic Survey of Recreational Fishers 2019 FRDC 2018-161. (Moore et al. 2023).
- Media Releases – PIRSA [Alerts, News & Events - PIRSA](#).

The South Australian recreational fishing sector consists of a large diverse group of people whose participation and interest in the fishery varies greatly. Industry members acknowledge that there is a need to share the fish between sectors and that the Act provides for greater access security in regard to species allocation.

The 2021/22 Recreational Fishing Survey indicated that more than 356,708 South Australians participated in recreational fishing in the 12 months prior to March 2021. During the 2021/22 survey period recreational fishers were estimated to have participated in 1,305,323 fisher days with an average of 4.4 days per fisher. Overall, during the 2021-22 survey period, the number of fishers was 29% higher than 2013-14 and 9% higher than 2000/01.

### **Recreational Fishers - 2024 Risk Rating (Economic consequence level)**

It was noted that formal sector allocations are in place for some MSF species under the current Management Plan.

It was acknowledged that commercial fisher's ability to net can be compromised by the presence of recreational fishers necessitating commercial fishers travelling further to get to areas without a potential conflict. There is known competition for area and catch between sectors at key coastal locations. The need to protect corporate knowledge impacts commercial fishers' ability to fish on best weather days and weekends. Participants considered there was potential for reduced access to marine scalefish species or fishing grounds due to the recreational sector.

Given this information the workshop agreed to rank this component Consequence score (3) and Likelihood score (3). **Risk rating HIGH.**

## Aquaculture

Aquaculture is a significant industry in South Australia. Aquaculture leases preclude commercial fishers from fishing within their boundaries without the approval of the lease holder. Aquaculture is seen as an important industry, particularly in regional SA, generating employment and downstream benefits and new opportunities are regularly being considered and explored. Aquaculture leases such as oyster racks and fish pens reduce the areas available to fish by MSF licence holders.

### **New Information**

- ZONING IN: South Australian Aquaculture Report 2023. Available at: [Zoning In: South Australian Aquaculture Report 2023 \(pir.sa.gov.au\)](#).

### **Aquaculture – 2024 Risk Rating (Economic consequence level)**

The reduced access for MSF fishers in the coastal bays of South Australia resulting from the presence of aquaculture leases was noted. The Aquaculture sector has had a 10% increase in productivity between 2020/21 and 2021/22 and participants considered it was reasonably probable that the footprint of the Aquaculture sector would continue to grow given the Aquaculture Zone Plans and opportunity for additional leases within specific zones.

Given this information the workshop agreed to rank this component Consequence score (2) and Likelihood score (4). **Risk rating MEDIUM.**

## Risk treatment report

Table 4. Overview table of the 2024 risk ratings and associated performance measures and management strategies for the Marine Scalefish Fishery

| Issue                                                                      | 2024 Risk Rating | Objective Developed                                                                                                   | Indicator Measure                                                                                                                                                                                               | Performance Measure | Current Performance                            | Management Strategies / Actions                                                                                                                                                                                                                       |
|----------------------------------------------------------------------------|------------------|-----------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>RETAINED SPECIES</b>                                                    |                  |                                                                                                                       |                                                                                                                                                                                                                 |                     |                                                |                                                                                                                                                                                                                                                       |
| King George Whiting - West Coast Fishing Zone (WCFZ)                       | <b>Medium</b>    | Yes - MSF resources are harvested within biologically sustainable limits - in accordance with performance indicators. | Annual examination of commercial fishery statistics, Length/Age Structure, CPUE, Recreational catch data (5-7 yrs), WhitEst.                                                                                    | Yes                 | Acceptable                                     | Manage fishery under new Management Plan, Harvest Strategy Framework and maintain annual assessment of fishery (and improve assessments where appropriate).                                                                                           |
| King George Whiting - Gulf St Vincent/Kangaroo Island Fishing Zone (GSVFZ) | <b>Medium</b>    | Yes - MSF resources are harvested within biologically sustainable limits - in accordance with performance indicators. | Annual examination of commercial fishery statistics, Length/Age Structure, CPUE, Recreational catch data (5-7 yrs), WhitEst.                                                                                    | Yes                 | Acceptable                                     | Manage fishery under new Management Plan, Harvest Strategy Framework and maintain annual assessment of fishery (and improve assessments where appropriate).                                                                                           |
| King George Whiting - Spencer Gulf Fishing Zone (SGFZ)                     | <b>Medium</b>    | Yes - MSF resources are harvested within biologically sustainable limits - in accordance with performance indicators. | Annual examination of commercial fishery statistics, Length/Age Structure, CPUE, Recreational catch data (5-7 yrs), WhitEst.                                                                                    | Yes                 | Acceptable                                     | Manage fishery under new Management Plan, Harvest Strategy Framework and maintain annual assessment of fishery (and improve assessments where appropriate).                                                                                           |
|                                                                            |                  |                                                                                                                       |                                                                                                                                                                                                                 |                     |                                                |                                                                                                                                                                                                                                                       |
| Snapper SGFZ, WCFZ and GSVFZ                                               | <b>High</b>      | Yes - MSF resources are harvested within biologically sustainable limits - in accordance with performance indicators. | Sampling of Length/Age Structure, CPUE, SnapEst, fishery independent estimates of biomass using DEPM. Development of Recovery Plan                                                                              | Yes                 | Acceptable - Fishery closed until 30 June 2026 | Fishery closed until 30 June 2026. Develop recovery plan, Manage fishery under new Management Plan, Harvest Strategy Framework and maintain annual assessment of fishery (and improve assessments where appropriate). Deliver Snapper science program |
| Snapper South East Fishing Zone (SEFZ)                                     | <b>Medium</b>    | Yes - MSF resources are harvested within biologically sustainable limits - in accordance with performance indicators. | Annual examination of commercial fishery statistics, fishery-dependent sampling of Length/Age Structure, CPUE, Recreational catch data (5-7 yrs), SnapEst, fishery independent estimates of biomass using DEPM. | Yes                 | Acceptable                                     | Manage fishery under new Management Plan, Harvest Strategy Framework and maintain annual assessment of fishery (and improve assessments where appropriate). Deliver Snapper science program                                                           |

**OFFICIAL**

| Issue                     | 2024 Risk Rating | Objective Developed                                                                                                   | Indicator Measure                                                                                                                   | Performance Measure | Current Performance | Management Strategies / Actions                                                                                                                                                           |
|---------------------------|------------------|-----------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|---------------------|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Southern Garfish - GSVFZ  | Medium           | Yes - MSF resources are harvested within biologically sustainable limits - in accordance with performance indicators. | Annual examination of commercial fishery statistics, length/age structure, recreational catch data (5-7 yrs), GarEst                | Yes                 | Acceptable          | Manage fishery under new Management Plan, Harvest Strategy Framework and maintain annual assessment of fishery and improve assessments where appropriate). Research to address sex ratios |
| Southern Calamari - SGFZ  | High             | Yes - MSF resources are harvested within biologically sustainable limits - in accordance with performance indicators. | Annual examination of commercial fishery statistics, recreational catch data (5-7 years),                                           | Yes                 | Acceptable          | Manage fishery under new Management Plan, Harvest Strategy Framework and improve stock assessment of fishery.                                                                             |
| Southern Calamari - GSVFZ | High             | Yes - MSF resources are harvested within biologically sustainable limits - in accordance with performance indicators. | Annual examination of commercial fishery statistics, recreational catch data (5-7 years).                                           | Yes                 | Acceptable          | Manage fishery under new Management Plan, Harvest Strategy Framework and improve stock assessment of fishery.                                                                             |
| Blue Swimmer Crab (WC)    | High             | Yes - MSF resources are harvested within biologically sustainable limits - in accordance with performance indicators. | Catch -MSY model, annual examination of commercial fishing statistics, recreational catch data (5-7 years)                          | Yes                 | Acceptable          | Manage fishery under new Management Plan, Harvest Strategy Framework and maintain annual assessment of fishery.                                                                           |
| Yellowfin Whiting - SGFZ  | Medium           | Yes - MSF resources are harvested within biologically sustainable limits - in accordance with performance indicators. | Catch -MSY model, standardised CPUE index, annual examination of commercial fishing statistics, recreational catch data (5-7 years) | Yes                 | Acceptable          | Manage fishery under new Management Plan, Harvest Strategy Framework and maintain annual assessment of fishery.                                                                           |
| Yellowfin Whiting - GSVFZ | Medium           | Yes - MSF resources are harvested within biologically sustainable limits - in accordance with performance indicators. | Catch -MSY model, standardised CPUE index, annual examination of commercial fishing statistics, recreational catch data (5-7 years) | Yes                 | Acceptable          | Manage fishery under new Management Plan, Harvest Strategy Framework and maintain annual assessment of fishery.                                                                           |
| Whaler Sharks             | Medium           | Yes - MSF resources are harvested within                                                                              | Annual examination of commercial fishery statistics,                                                                                | No                  | Acceptable          | Manage fishery under new Management Plan, Harvest Strategy Framework and                                                                                                                  |

# OFFICIAL

| Issue                                                       | 2024 Risk Rating | Objective Developed                                                                                                                                                                                                       | Indicator Measure                                                                                   | Performance Measure                               | Current Performance | Management Strategies / Actions                                                                                                                                                                                |
|-------------------------------------------------------------|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|---------------------------------------------------|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                             |                  | biologically sustainable limits - in accordance with performance indicators.                                                                                                                                              | recreational catch data (5-7 years)                                                                 |                                                   |                     | maintain annual assessment of fishery. Species specific reporting.                                                                                                                                             |
| <b>GENERAL ECOSYSTEM IMPACTS</b>                            |                  |                                                                                                                                                                                                                           |                                                                                                     |                                                   |                     |                                                                                                                                                                                                                |
| Removal of / damage to organisms by fishing                 | Medium           | Minimise fishery impacts on habitat and wider ecosystem                                                                                                                                                                   | Continue current fisheries dependent monitoring of target, non-target, bycatch and byproduct.       |                                                   | Acceptable          | Maintain current management practices as described in the relevant Management Plans                                                                                                                            |
| <b>COMMUNITY</b>                                            |                  |                                                                                                                                                                                                                           |                                                                                                     |                                                   |                     |                                                                                                                                                                                                                |
| Fishing Industry - Profit                                   | High             | An economically efficient Fishery that is socially and culturally valued<br><br>Improve economic efficiencies and financial returns with the constraints of sustainability imperatives                                    | Annual examination of BDO Econsearch Report on Economic performance of Fishery                      | Return on investment                              | Acceptable          | Implement red tape reduction proposals where appropriate and monitor economic performance.<br><br>Actions implemented where appropriate as per <a href="#">Government response to the Cost Recovery Review</a> |
| <b>GOVERNANCE</b>                                           |                  |                                                                                                                                                                                                                           |                                                                                                     |                                                   |                     |                                                                                                                                                                                                                |
| Management Plan                                             | High             | Provide cost effective and efficient management of the Fishery, in line with the government's cost recovery policy.<br><br>Ensure appropriate mechanisms for fishery involvement in the development of management advice. | Maintain co-management arrangements between PIRSA and Industry.<br><br>Maintain functions of MSFMAC | New Management Plan adopted                       | Acceptable          | Finalise HSF and replacement Management Plan                                                                                                                                                                   |
| Legal Framework - Regulations / Conditions / Determinations | High             | Provide cost effective and efficient management of the Fishery, in line with the government's cost recovery policy.                                                                                                       | Maintain co-management arrangements between PIRSA and Industry.<br><br>Maintain functions of MSFMAC | Management arrangements amended where appropriate | Acceptable          | Implement cost effective and efficient management through co-management frameworks                                                                                                                             |

# OFFICIAL

| Issue                                                            | 2024 Risk Rating | Objective Developed                                                                                                                                                                                                       | Indicator Measure                                                                                | Performance Measure                                                      | Current Performance                                                           | Management Strategies / Actions                                                                                                        |
|------------------------------------------------------------------|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|-------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
|                                                                  |                  | Ensure appropriate mechanisms for fishery involvement in the development of management advice.                                                                                                                            |                                                                                                  |                                                                          |                                                                               |                                                                                                                                        |
| Allocation                                                       | Medium           | Allocations provide for optimum utilisation and equitable distribution                                                                                                                                                    | Maintain co-management arrangements between PIRSA and Industry. Maintain functions of MSFMAC     | Monitor allocations as per Allocation Policy                             | Acceptable                                                                    | Monitor and review allocations consistent with the Allocation Policy.                                                                  |
| Research / Information                                           | Medium           | Provide cost effective and efficient management of the Fishery, in line with the government's cost recovery policy.<br><br>Ensure appropriate mechanisms for fishery involvement in the development of management advice. | Maintain CRIS plan and reports between SARDI, PIRSA and Industry                                 |                                                                          | Acceptable                                                                    | Actions implemented where appropriate as per <a href="#">Government response to the Cost Recovery Review</a>                           |
| Communication /participation (industry and industry association) | High             | Ensure appropriate mechanisms for fishery involvement in the development of management advice.                                                                                                                            | Influenced by factors outside of PIRSA's control. Continue with current monitoring and reporting | TBC                                                                      | TBC                                                                           | Maintain current management practices as described in the relevant management plans and co-management agreements.                      |
| <b>EXTERNAL FACTORS AFFECTING PERFORMANCE OF THE FISHERY</b>     |                  |                                                                                                                                                                                                                           |                                                                                                  |                                                                          |                                                                               |                                                                                                                                        |
| Physical - Climate Change - within 5 years                       | Medium           | Management is responsive to external impacts on the ecosystem                                                                                                                                                             | Influenced by factors outside of PIRSA's control. Continue with current monitoring and reporting | Apparent changes in climate or water quality within the fishing grounds. | Mitigation measures considered where performance of the fishery is considered | Mitigation measures are considered where performance of the fishery or a species is considered to have been impacted by climate change |

OFFICIAL

| Issue                          | 2024 Risk Rating | Objective Developed                                           | Indicator Measure                             | Performance Measure                                                                                                   | Current Performance                                        | Management Strategies / Actions                                                                                                                                                                                                                                                                                                                                                                                                                         |
|--------------------------------|------------------|---------------------------------------------------------------|-----------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                |                  |                                                               |                                               |                                                                                                                       | to have been impacted by water quality / climatic changes. |                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Recreational Fishers / fishing | High             | Management is responsive to external impacts on the ecosystem | Recreational fishing survey (every 5-7 years) | Recreational fishing survey results analysed against allocations and the RBC when results are available and reliable. | Acceptable                                                 | Recreational catch and effort is monitored through the Recreational Fishing Survey which is conducted every 5 years. Results from the survey are considered in terms of RBCs and allocation breaches. Management actions are taken where needed. Implement new HSF and manage sectors to their regional shares of the RBC. Consider results from FRDC project investigating feasibility of app reporting for the recreational sector.                   |
| Aquaculture                    | Medium           | Management is responsive to external impacts on the ecosystem | N/A                                           | N/A                                                                                                                   | Acceptable                                                 | PIRSA Aquaculture division is responsible for the management of aquaculture in South Australia. Where policies are drafted or updated and new aquaculture licences are considered, they consult with the public, aquaculture industry and other stakeholders. Public consultation is a legal requirement of the Aquaculture Act 2001 to inform decision-making processes and maximise benefits to the community from the state's aquaculture resources. |

## References

Australian Bureau of Agriculture and Resource Economics and Sciences. (2023). Australian Fisheries and Aquaculture Statistics 2022 – Available at: [Fisheries and aquaculture statistics 2022 - DAFF \(agriculture.gov.au\)](https://www.daff.gov.au/fisheries-and-aquaculture-statistics-2022)

Bailleul, F. and Ward, T.M. (2019). Socio-ecological assessment of the ecosystems, industries and communities of Spencer Gulf: 'Gulfview' interactive platform (PDF 3.1 MB). Goyder Institute for Water Research Technical Report Series No. 19/02.

BDO EconSearch. (2018). A report to Department for Environment and Water. Environmental, Social and Economic Values of Marine Park Sanctuary Zones. Available at: <https://cdn.environment.sa.gov.au/marineparks/docs/BDO-EconSearch-report.pdf>

BDO EconSearch. (2023). Economic and Social Indicators for the South Australian Marine Scalefish Fishery 2021/22 (BDO EconSearch 2023). Available at: [South Australian Commercial Fisheries and Aquaculture Reports - BDO](#)

BDO EconSearch. (2023). [Economic and Social Indicators for the South Australian Marine Scalefish Fishery 2022/23 \(BDO EconSearch 2024\)](#). Available at: [South Australian Commercial Fisheries and Aquaculture Reports - BDO](#)

Beckman, C.L. and Hooper, G.E. (2022). Blue Crab (*Portunus armatus*) Fishery 2020/21 – Fishery Assessment Report to PIRSA Fisheries and Aquaculture. Available at: [Blue Crab \(Portunus armatus\) Fishery 2020/21. Fishery Assessment Report to PIRSA Fisheries and Aquaculture](#)

Beckmann, C.L., Durante, L.M., Graba-Landry, A., Stark, K.E. and Tracey, S.R. (2023). Survey of Recreational Fishing in South Australia 2021-22. Available at: [Recreational fishing survey - PIRSA](#) Beckmann et al.2023.

Commonwealth Scientific and Industrial Research Organisation. (2021). Regional projection for Southern Australia. Available at: [CSIRO](#)

Department of Climate Change, Energy, the Environment and Water (DCCEEW). (2023). Declaration of an approved Wildlife Trade Operation approval – Marine Scalefish Fishery – 12 December 2023. Available at: [South Australian Marine Scalefish Fishery - DCCEEW](#)

Department of Climate Change, Energy, the Environment and Water (DCCEEW). (2020). Neophoca cinerea (Australian Sea Lion) Conservation Advice. Available at: [Conservation Advice Neophoca cinerea Australian Sea Lion \(environment.gov.au\)](#)

Department for Environment and Water (DEW). (2022). Guide to climate projections for risk assessment and planning in South Australia 2022. Available at: [Guide to climate projections for risk assessment and planning in South Australia 2022.pdf \(environment.sa.gov.au\)](#)

Department of Environment, Water and Natural Resources (DEW) (2017). South Australia's marine parks 5-year status report 2012-2017. Available at: [South-Australias-Marine-Parks-5-year-Status-Report-2012-2017.pdf \(environment.sa.gov.au\)](#)

Department of Primary Industries and Regions (PIRSA) (2023). Allocation Policy. Available at: [Allocation Policy: Allocation of access to fisheries resources between fishing sectors \(pir.sa.gov.au\)](#)

Department of Primary Industries and Regions (PIRSA). (2023/24). Cost Recovery Implementation Statement for the Marine Scalefish Fishery. Available at: [Cost Recovery Implementation Statement for the Marine Scalefish Fishery 1 July 2023 to 30 June 2024 \(pir.sa.gov.au\)](#)

## OFFICIAL

Department of Primary Industries and Regions (PIRSA). (2015). Ecologically Sustainable Development Risk Assessment for Recreational Fishing in South Australia. Available at: [pir.sa.gov.au](http://pir.sa.gov.au)

Department of Primary Industries and Regions (PIRSA) (2015). Harvest Strategy Policy [https://pir.sa.gov.au/ data/assets/pdf file/0020/267230/Harvest strategy policy DECEMBER 2015.pdf](https://pir.sa.gov.au/data/assets/pdf_file/0020/267230/Harvest_strategy_policy_DECEMBER_2015.pdf)

Department of Primary Industries and Regions (PIRSA). (2022). Management Plan for the South Australian Commercial Lakes and Coorong Fishery. Available at: [https://pir.sa.gov.au/ data/assets/pdf file/0016/12742/commercial-lakes-and-coorong-fishery-management-plan-march-2022.pdf](https://pir.sa.gov.au/data/assets/pdf_file/0016/12742/commercial-lakes-and-coorong-fishery-management-plan-march-2022.pdf)

Department of Primary Industries and Regions (PIRSA). (2021-2024). MSFMAC Chairs Reports – Meetings 10 December 2021 through to 18 March 2024. The Marine Scalefish Fishery Management Advisory Committee. Available at: [The Marine Scalefish Fishery Management Advisory Committee - PIRSA](#)

Department of Primary Industries and Regions (PIRSA) (2021-2024). Notices to Commercial Fishers – Available at: [New tab \(pir.sa.gov.au\)](#)

Department of Primary Industries and Regions (PIRSA) (2022). PIRSA Fisheries and Aquaculture Cost Recovery Framework. Available at: [Fisheries and aquaculture cost recovery framework \(pir.sa.gov.au\)](#)

Department of Primary Industries and Regions (PIRSA) (2013). Policy for Co-management of Fisheries in South Australia. Available at: [Co-management policy.pdf \(pir.sa.gov.au\)](#)

Department of Primary Industries and Regions (PIRSA) (2021). Policy Paper – Managing Under-Catch and Over-Catch in South Australian Fisheries. Available at: [Policy-Paper-Managing-under-catch-and-over-catch-in-South-Australian-fisheries.pdf \(pir.sa.gov.au\)](#)

Department of Primary Industries and Regions (PIRSA). (2023). ZONING IN: South Australian Aquaculture Report 2023 Zoning In: South Australian Aquaculture Report 2023 Available at: [pir.sa.gov.au](http://pir.sa.gov.au).

Department of Sustainability, Environment, Water, Population and Communities. (2013). Issues Paper for the White Shark (*Carcharodon carcharias*). Available at: [Issues Paper for the Australian Sea Lion\(Neophoca cinerea\) \(dcceew.gov.au\)](#)

Drew, M. J., T. A. Rogers, R. McGarvey, J. Feenstra, D. Matthews, J. Matthews, J. Earl, J. Smart, C. Noell and A. J. Fowler (2022). Snapper (*Chrysophrys auratus*) Stock Assessment Report 2022. Report to PIRSA Fisheries and Aquaculture South Australian Research and Development Institute (Aquatic Sciences), Adelaide. SARDI Publication No. F2007/000523-7. SARDI Research Report Series No. 1155. 178pp.

Earl, J. (2023). Assessment of the South Australian Lakes and Coorong Fishery in 2021–22. Report to PIRSA Fisheries and Aquaculture (PDF 5.5 MB). South Australian Research and Development Institute (Aquatic Sciences), Adelaide. SARDI Publication No. F2020/000208-4. SARDI Research Report Series No. 1176. 94 pp

Environment Protection Authority. (2018). Climate State of the Environment Report. Available at: [14003 soer2018 print-summary cover.pdf \(epa.sa.gov.au\)](#)

Ferguson, G., Heldt, K., Stobart, B. and Mayfield, S. (2022). Harvestable biomass in the South Australian Vongole Fishery (*Katelysia* spp) Available at: [https://pir.sa.gov.au/ data/assets/pdf file/0004/420709/vongole stock assessment 2022.pdf](https://pir.sa.gov.au/data/assets/pdf_file/0004/420709/vongole_stock_assessment_2022.pdf)

Fowler A.J. (2019). Do commercial fishery data reflect stock status in South Australia's Southern Garfish fisheries? FRDC project 2015/018. Final Report.

Fowler, A.J. (2023). A synthesis of fishery and biological information for Snapper (*Chrysophrys auratus*) in South Australia (PDF 33.1 MB). South Australian Research and Development Institute

(Aquatic and Livestock Sciences), Adelaide. SARDI Publication No. F2023/000382-1. SARDI Research Report Series No. 1206. 381 pp.

Fowler, A.J., Rogers, P.J. and Smart, J.J. (2020). ESD risk assessment for 'lesser known' species to facilitate structural reform of South Australia's commercial Marine Scalefish Fishery. Available at: [ESD risk assessment for under-utilised species to facilitate structural reform of South Australia's commercial Marine Scalefish Fishery | FRDC](#)

Fulton, Elizabeth; Hobday, AJ; Pethybridge, H; Blanchard, Julia; Bulman, C; Butler, I; et al. (2018). Decadal scale projection of changes in Australian fisheries stocks under climate change. University of Tasmania. Report. <https://hdl.handle.net/102.100.100/495556> Fowler, A. J. (2019).

Goldsworthy, S. and Kirkwood, R. (2024). Wildlife Interaction Reporting across South Australian Fisheries 2021/22 – Advice Note to Executive Director, PIRSA Fisheries and Aquaculture.

Goldsworthy, S.D., Bailleul, F., Nursey-Bray, M., Mackay, A., Oxley, A., Reinhold, S-L., and Shaughnessy, P.D. South Australian Research and Development Institute (Aquatic Sciences), 2019, Assessment of the impacts of seal populations on the seafood industry in South Australia (PDF 11.7 MB), Adelaide, June.

Goldsworthy, S.D., Loo, M., Fowler, A., Steer, M. and Noell, C. (2017). A trophic model for Gulf St Vincent: Balancing exploitation of three fisheries in an EBFM framework (PDF 5.2 MB). South Australian Research and Development Institute (Aquatic Sciences), Adelaide. 110 pp.

Goldsworthy, S.D., Page, B., Rogers, P. and Ward, T. (2011). Establishing ecosystem-based management for the South Australian Sardine Fishery: developing ecological performance indicators and reference points to assess the need for ecological allocations (PDF 3.0 MB). Final Report to the Fisheries Research and Development Corporation. South Australian Research and Development Institute (Aquatic Sciences), Adelaide. SARDI Publication No. F2010/000863-1. SARDI Research Report Series No. 529. 173pp.

Giannoni, A. (2013). "Assessing the effects of female size and age on the reproductive output of southern Garfish, *Hyporhamphus melanochir*. Honours Thesis, University of Adelaide."

Gillanders, BM, S Goldsworthy, TAA Prowse, M Doubell, J Middleton, P Rogers, JE Tanner, NA Clisby, C James, J Luick, P van Ruth, CJA Bradshaw, TM Ward (2015) Spencer Gulf research initiative: Development of an ecosystem model for fisheries and aquaculture. University of Adelaide and SARDI Aquatic Sciences, Adelaide. CC BY 3. Report to the FRDC Project 2001/205.

Hanamseth, R. (2024). South Australian Charter Boat Fishery 2022–23 Data Summary. Final Report to PIRSA Fisheries and Aquaculture (PDF 1.9 MB). South Australian Research and Development Institute (Aquatic and Livestock Sciences), Adelaide. SARDI Publication No. F2007/000847-7. SARDI Research Report Series No. 1210. 19 pp.

Hayes, K.R., Inglis, G.J. and Barry, S.C (2019). The assessment and management of marine pest risks posed by shipping: the Australian and New Zealand experience.

Hilliam, K., Tremi, E.A., Stevenson, S. and Floeri, O. (2024). Recreational vessel networks reveal potential hot spots for marine pest introduction and spread.

Jenkins, G.P., Hamer, P.A., Kent, J.A., Kemp, J., Sherman, C and Fowler, A.J. (2016). Spawning sources, movement patterns, and nursery area replenishment of spawning populations of King George Whiting in south-eastern Australia – closing the life history loop 2016. FRDC Project Number 2011/017.

Moore, A., Schirmer, J., Magnusson, A., Hinten, K., Galeano, G., Woodshams, D., Wright, J., Maloney, D. and Dix, A. (2023). National Social and Economic Survey of Recreational Fishers 2019 FRDC 2018-161

Rogers, P. J., Earl, J. and Ivey, A. (2013). Review of impacts of localised depletion of small pelagic fishes on predators and ecosystems. Final Report to the Department of the Environment and the Expert Panel (PDF 816.8 KB). South Australian Research and Development Institute (Aquatic Sciences), Adelaide. SARDI Publication No. F2013/000613-1. SARDI Research Report Series No. 852. 44pp.

Rogers, T.A. and Drew, M.J. (2018). Application of tracking technologies to understand space-time explicit patterns of movement, residency and habitat use of pelagic sharks in Spencer Gulf: resolving overlaps with key community activities and marine industries. Fisheries Research and Development Corporation and South Australian Research and Development Institute (Aquatic and Livestock Sciences), Adelaide, Project No. 2014-02.

Rogers, T.A., Rodriguez, A.R., Fowler, A.J. and Doubell, M. (2020). Using a biophysical model to investigate connectivity between spawning ground and nursery areas of King George Whiting (*Sillaginodes punctatus*) in South Australia's gulfs.

Sarakinis, K.G. and Earl, J. Assessment of the South Australian Lakes and Coorong Fishery in 2021–22 (2023). Report to PIRSA Fisheries and Aquaculture. Available at: [Assessment of the South Australian Lakes and Coorong Fishery in 2022/23. Report to PIRSA Fisheries and Aquaculture](#)

Smart, JJ., McGarvey, R., Feenstra, J., Drew, M.J., Earl, J., Durant, L., Beckmann, C.L., Matthews, D., Matthews, JM., Mark, K., Bussell, J., Davey, J., Tsolos, A., and Noell, C. (2023). Assessment of the South Australian Marine Scalefish Fishery in 2021/22, Adelaide. Available at: [Assessment of the South Australian Marine Scalefish Fishery in 2021/22. Report to PIRSA Fisheries and Aquaculture](#)

Smart, JJ., Steer, M., Bailleul, F., Hall, D., Knuckey, I., Magnusson, A., Morison, J., Presser, J and Schirmer, J. (2022). Informing the structural reform of South Australia's Marine Scalefish Fishery. FRDC project 2017-014 – Available at: <https://www.frdc.com.au/sites/default/files/products/2017-014-DLD.pdf>

Steer, M. A. and A. J. Fowler (2015). "Spatial variation in shape of otoliths for southern garfish *Hyporhamphus melanochir*—Contribution to stock structure". Marine Biology Research 11(5): 504-515.

Steer, M. A., G. P. Halverson, A. J. Fowler and B. M. Gillanders (2010). "Stock discrimination of Southern Garfish (*Hyporhamphus melanochir*) by stable isotope ratio analysis of otolith aragonite." Environmental biology of fishes 89(3): 369-381.

Steer, M. A., McGarvey, R., Carroll, J., Jackson, W. B., Lloyd, M. and Feenstra, J.E. (2016). Southern Garfish (*Hyporhamphus melanochir*) Fishery. Fishery Assessment Report to PIRSA Fisheries and Aquaculture. South Australian Research and Development Institute (Aquatic Sciences), Adelaide. F2007/000720-4. SARDI Research Report Series No. 891. 75pp."

Tanner, J.E., Bailleul, F., Bryars, S., Doubell, M., Foster, N., Gaylard, S., Gillanders, B.M., Goldsworthy, S., Huveneers, C., James, C., Jones, A.R., Maher, J., Nursey-Bray, M., van Ruth, P. and Ward, T.M. (2019). Potential social, economic and ecological indicators for integrated ecosystem assessment of Spencer Gulf. Goyder Institute for Water Research Technical Report Series No. 19/32.

Wiltshire, K.H., Giblot-Ducray, D. and Deveney, M.R. (2022). Molecular surveys for priority marine pests in 2021-22 for Thevenard, Port Lincoln, Port Giles, Klein Point, Port Adelaide, South Australia, and Portland, Victoria. Report to the Department of Agriculture, Fisheries and Forestry. South Australian Research and Development Institute (Aquatic Sciences), Adelaide. SARDI Publication No. F2022/000236-1. SARDI Research Report Series No. 1147. 75pp.

# Appendix A – Aquatic resources prescribed for the fishery

Permitted species for the MSF as provided in the *Fisheries Management (Marine Scalefish Fishery) Regulations 2017*

## Schedule 1—Aquatic resources prescribed for Marine Scalefish Fishery

### Part 1—Aquatic resources prescribed for the purposes of regulation 4(2)(a)

#### Anguilliformes

Conger Eel (Family Congridae)

#### Annelids

Beachworm (Class Polychaeta)

Bloodworm (Class Polychaeta)

Tubeworm (Class Polychaeta)

#### Crustaceans

Blue Crab (Portunus armatus)

Rock Crab (Nectocarcinus integrifrons)

Sand Crab (Ovalipes spp)

Spider Crab (Family Majidae)

Velvet Crab (Nectocarcinus tuberculatus)

#### Molluscs

Southern Calamari (Sepioteuthis australis)

Cockle

Cuttlefish (Sepia spp)

Mussel (Mytilus spp)

Octopus (Octopus spp)

Oyster (Family Ostreidae)

Pipi (Donax spp)

Scallop (Family Pectinidae)

Gould's Squid (Notodarus gouldi)

#### Scalefish

Barracouta (Thyrsites atun)

Black Bream (Acanthopagrus butcheri)

Cod of all marine species (Family Moridae)

Dory (Family Zeidae)

Flathead (Family Platycephalidae)

Flounder (Family Bothidae or Pleuronectidae)

Southern Garfish (Hyporhamphus melanochir)

Bluespotted Goatfish (Upeneichthys vlamingii)

Australian Herring (Arripis georgianus)

Yellowtail Kingfish (Seriola lalandi)

Knifejaw (Oplegnathus woodwardi)

Leatherjacket (Family Monacanthidae)

Pink Ling (Genypterus blacodes)

Blue Mackerel (Scomber australasicus)

Common Jack Mackerel (Trachurus declivis)

Morwong (Family Cheilodactylidae)

Mullet of all species (Family Mugilidae)

Mulloway (Argyrosomus japonicus)

Redfish (Centroberyx affinis)

Bight Redfish (Centroberyx gerrardi)

West Australian Salmon (Arripis truttaceus)

Sergeant Baker (Latropiscis purpurissatus)

Snapper (Chrysophrys auratus)

Snook (*Sphyraena novaehollandiae*)  
Southern Sole (*Aseraggodes haackeanus*)  
Sea Sweep (*Scorpiis aequipinnis*)  
Silver Drummer (*Kyphosus sydneyanus*)  
Swallowtail (*Centroberyx lineatus*)  
Blue-eye Trevalla (*Hyperoglyphe antarctica*)  
Trevally (*Carangidae* spp)  
Western Striped Grunter (*Pelates octolineatus*)  
Whiting (Family *Sillaginidae*)  
Blue Weed-Whiting (*Haletta semifasciata*)  
Wrasse (Family *Labridae*) (other than Western Blue Groper (*Achoerodus gouldii*))

**Sharks**

Rays of all species (Class *Elasmobranchii*)  
Shark of all species (Class *Elasmobranchii*) other than White Shark (*Carcharodon carcharias*)  
Skate of all species (Class *Elasmobranchii*)

**Part 2—Aquatic resources prescribed for the purposes of regulation 4(2)(b)**

**Molluscs**

Razorfish (*Pinna bicolor*)  
Vongole

**Scalefish**

Australian Anchovy (*Engraulis australis*)  
Maray (*Etrumeus teres*)  
Australian Sardine (*Sardinops sagax*)  
Blue Sprat (*Spratelloides robustus*)  
Sandy Sprat (*Hyperlophus vittatus*)

## Appendix B – Stock status 2019 to 2021/22

Table B1. MSF Stock status and indicators summary table (Smart et al. 2023)



| SPECIES             | STOCK  | 2019                 | STATUS<br>2020       | 2021/22      | INDICATORS                          |
|---------------------|--------|----------------------|----------------------|--------------|-------------------------------------|
| KING GEORGE WHITING | WC     | Sustainable*         | Sustainable*         | Sustainable  | Catch, CPUE, age structure, biomass |
|                     | SG     | Sustainable*         | Sustainable*         | Sustainable  | Catch, CPUE, age structure, biomass |
|                     | GSV/KI | Sustainable          | Sustainable          | Sustainable  | Catch, CPUE, age structure, biomass |
| SNAPPER             | SG/WC  | Depleted*            | Depleted*            | Depleted*    | Catch & Effort                      |
|                     | GSV    | Depleting*           | Depleted*            | Depleted*    | Catch & Effort                      |
|                     | WV     | Sustainable*         | Sustainable*         | Sustainable* | Catch & Effort                      |
| SOUTHERN GARFISH    | WC     | Sustainable          | Sustainable          | Sustainable  | Catch & Effort                      |
|                     | SG     | Recovering* (NSG)    | Recovering* (NSG)    | Recovering   | Catch & Effort                      |
|                     |        | Sustainable* (SSG)   | Sustainable* (SSG)   |              | Catch & Effort                      |
|                     | GSV/KI | Depleted* (NGSV)     | Recovering* (NGSV)   | Recovering   | Catch & Effort                      |
|                     |        | Sustainable* (SGSV)  | Sustainable* (SGSV)  |              | Catch & Effort                      |
|                     | SE     | Sustainable          | Sustainable          | Sustainable  | Total Catch                         |
| SOUTHERN CALAMARI   | WC     | Sustainable* (STATE) | Sustainable* (STATE) | Sustainable  | Catch & Effort                      |
|                     | SG     |                      |                      | Sustainable  | Catch & Effort                      |
|                     | GSV/KI |                      |                      | Sustainable  | Catch & Effort                      |
|                     | SE     |                      |                      | Negligible   | Total Catch                         |
| YELLOWFIN WHITING   | SG     | Sustainable          | Sustainable          | Sustainable  | Catch & Effort                      |
|                     | GSV/KI | Sustainable          | Sustainable          | Sustainable  | Catch & Effort                      |
| BLUE CRABS          | WC     | Sustainable (MSF)    | Sustainable (MSF)    | Sustainable  | Catch & Effort                      |
| WA SALMON           | STATE  | Sustainable          | Sustainable          | Sustainable  | Catch & Effort                      |
| AUST. HERRING       | STATE  | Sustainable          | Sustainable          | Sustainable  | Catch & Effort                      |
| WHALER SHARKS       | STATE  | Undefined            | Undefined            | Undefined    | Limited data                        |
| SNOOK               | STATE  | Sustainable          | Sustainable          | Sustainable  | Catch & Effort                      |
| SAND CRABS          | STATE  | Sustainable          | Sustainable          | Sustainable  | Catch & Effort                      |
| YELLOWEYE MULLET    | MSF    | Sustainable          | Sustainable          | Sustainable  | Catch & Effort                      |
| MULLOWAY            | MSF    | Sustainable          | Sustainable          | Sustainable  | Catch & Effort                      |
| OCEAN JACKETS       | STATE  | Sustainable          | Sustainable          | Sustainable  | Catch & Effort                      |
| BLUE-THROAT WRASSE  | STATE  | Sustainable          | Sustainable          | Sustainable  | Catch & Effort                      |
| SILVER TREVALLY     | STATE  | Sustainable          | Sustainable          | Sustainable  | Catch & Effort                      |
| LEATHERJACKETS      | STATE  | Undefined            | Undefined            | Undefined    | Limited data                        |
| RAYs & SKATES       | STATE  | Undefined            | Undefined            | Undefined    | Limited data                        |
| CUTTLEFISH          | STATE  | Sustainable          | Sustainable          | Sustainable  | Catch & Effort                      |
| BLACK BREAM         | MSF    | Sustainable          | Sustainable          | Sustainable  | Total Catch                         |

## Appendix C - Recent management changes

| Year               | Management Arrangement                                                                                                                                                                                                                                                                    |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2012               | Seasonal Closure Southern Garfish introduced Spencer Gulf/Gulf St Vincent.                                                                                                                                                                                                                |
| 2012               | Extension of Snapper Closure and introduction of daily catch limits and restriction on the number of hooks to be used in the gulfs.                                                                                                                                                       |
|                    | Marine Parks – implemented                                                                                                                                                                                                                                                                |
| 2014               | State-wide Snapper Closure 1 November 2014 to 15 December 2014                                                                                                                                                                                                                            |
| 2014               | Garfish size limit increase from 23cm to 25 cm from 2 September 2014                                                                                                                                                                                                                      |
| 2015               | Garfish size limit increase from 25 cm to 26 cm from 6 August 2015                                                                                                                                                                                                                        |
| 2015               | Temporary closures implemented in Spencer Gulf and Gulf St Vincent to address concerns with stock status of Garfish                                                                                                                                                                       |
| 2016               | Introduction of Wrasse slot limit                                                                                                                                                                                                                                                         |
| 2017 / 2018 / 2019 | Implementation of spawning spatial closures for King George Whiting.                                                                                                                                                                                                                      |
| 2018               | Implementation of legislative changes limiting licence transfers in the MSF to one transfer in every 5 years from 15 January 2018                                                                                                                                                         |
| 2018               | Reduction of bycatch limit for School and Gummy shark from 10 to 5 on a fishing trip of one day or less and 10 on a multi-day trip. Landing report introduced to monitor take of School and Gummy shark.                                                                                  |
| 2018 / 2019        | Temporary gear restrictions implemented in waters of Spencer Gulf and Gulf St Vincent Region – reduction from 400 hooks to 200 hooks on set lines when Snapper are on board a registered boat over long weekends                                                                          |
| 2019               | Total ban of Snapper fishing in the waters of the West Coast, Spencer Gulf and Gulf St Vincent regions from 1 November 2019 to 31 January 2023.                                                                                                                                           |
| 2020               | Restricted Snapper fishing permitted - SEFZ - 1 February to 31 October 2020                                                                                                                                                                                                               |
|                    | Stage 1 – MSF Reform – proposed Management zones prepared, indicative TACC's for priority fish stocks considered, indicative priority species identified to be managed under ITQ.                                                                                                         |
|                    | Stage 2 – MSF Reform – proposed ITQ method released, co-management arrangements for the fishery, tiered management framework information, process to identify and consider amendments to regulations/conditions                                                                           |
|                    | MSF Reform - Voluntary surrender of 100 licences funded by government.                                                                                                                                                                                                                    |
| 2021               | Stage 3 – MSF Reform – Introduction of ITQ's for Snapper, King George Whiting, Southern Garfish and Southern Calamari with Olympic quota for King George Whiting in West Coast Fishing Zone Implementation of electronic reporting from 1 July 2021 – Catch and Disposal Records (CDR's). |
| 2021               | 1 July 2021 – Separation of the Sardine and Vongole Fisheries from the MSF                                                                                                                                                                                                                |
| 2021               | Conclusion of Southern Garfish arrangements (temporary increased MLL of 25 cm and temporary closed areas (Gulf St Vincent and Spencer Gulf)                                                                                                                                               |
| 2021               | Establishment of Marine Scalefish Fishery Management Advisory Committee                                                                                                                                                                                                                   |
| 2022               | Snapper closure in West Coast, Spencer Gulf and Gulf St Vincent/KI fishing zones extended until 30 June 2026                                                                                                                                                                              |
| 2022               | Reduction of KGW catch cap in West Coast Fishing Zone from 473t to 183t                                                                                                                                                                                                                   |
| 2022/23            | Surrender of 7 MSF licences through Marine Park amendments                                                                                                                                                                                                                                |
| 2023               | Notice of intent to prepare a new Management Plan                                                                                                                                                                                                                                         |
| 2023               | Permanent cuttlefish closure from 1 May 2023 waters of Upper Spencer Gulf                                                                                                                                                                                                                 |
| 2023               | 2013 Management Plan extended until 30 June 2025                                                                                                                                                                                                                                          |
| 2025               | Pending – Replacement Management Plan and Harvest Strategy Framework                                                                                                                                                                                                                      |

Table C1. Key management changes in the MSF since 2011

## Appendix D – Proposed tiered management framework

The TMF is a simple decision-making framework to guide the management strategy and science needs of species in the fishery. The TMF suggests a management tier for each of the main stocks/species in the fishery based on various scored criteria, including stock status; their importance to the recreational, indigenous and commercial fishing sectors; target levels; and their vulnerability to overfishing (Smart et al. 2022). Under the framework, Management Tier1 stocks represent the top tier of management with TACCs which can be unitized with ITQs and require quantitative analyses. Management Tier 3 is the lowest level of the framework and includes management of stocks via input controls and assessments using fishery dependent performance indicators.

Table D1. The draft Tiered management Framework for the MSF (Smart et al. 2022).

| Species                   | Zone   | Tiered Management Indicators |                                     |                       |                 |                               |                         | Total Score | Tier   |
|---------------------------|--------|------------------------------|-------------------------------------|-----------------------|-----------------|-------------------------------|-------------------------|-------------|--------|
|                           |        | Stock Status                 | Aboriginal/ Traditional Importance* | Commercial Importance | Management Need | Level of Commercial Targeting | Recreational Importance |             |        |
| Southern Garfish          | GSV/KI | 3                            | 1                                   | 3                     | 3               | 3                             | 3                       | 16          | Tier 1 |
| Snapper                   | GSV/KI | 3                            | 1                                   | 3                     | 3               | 3                             | 3                       | 16          | Tier 1 |
| Snapper                   | SG     | 3                            | 1                                   | 2                     | 3               | 3                             | 3                       | 15          | Tier 1 |
| Southern Garfish          | SG     | 2                            | 1                                   | 3                     | 3               | 2                             | 3                       | 14          | Tier 1 |
| Snapper                   | SE     | 1                            | 1                                   | 3                     | 3               | 3                             | 3                       | 14          | Tier 1 |
| Southern Calamari         | SG     | 1                            | 1                                   | 3                     | 3               | 3                             | 3                       | 14          | Tier 1 |
| King George Whiting       | GSV/KI | 1                            | 1                                   | 2                     | 3               | 3                             | 3                       | 13          | Tier 1 |
| King George Whiting       | SG     | 1                            | 1                                   | 2                     | 3               | 3                             | 3                       | 13          | Tier 1 |
| Snapper                   | WC     | 3                            | 1                                   | 1                     | 3               | 3                             | 2                       | 13          | Tier 1 |
| Southern Calamari         | GSV/KI | 1                            | 1                                   | 3                     | 2               | 3                             | 3                       | 13          | Tier 1 |
| King George Whiting       | WC     | 1                            | 1                                   | 3                     | 1               | 3                             | 3                       | 12          | Tier 1 |
| Blue Crab                 | WC     | 1                            | 1                                   | 3                     | 1               | 3                             | 2                       | 11          | Tier 2 |
| Southern Calamari         | WC     | 1                            | 1                                   | 1                     | 2               | 3                             | 3                       | 11          | Tier 2 |
| Yellowfin Whiting         | SG     | 1                            | 1                                   | 3                     | 2               | 2                             | 2                       | 11          | Tier 2 |
| Australian Herring        | GSV/KI | 1                            | 1                                   | 1                     | 3               | 1                             | 3                       | 10          | Tier 2 |
| Australian Herring        | SG     | 1                            | 1                                   | 1                     | 3               | 1                             | 3                       | 10          | Tier 2 |
| Western Australian Salmon | GSV/KI | 1                            | 1                                   | 1                     | 2               | 3                             | 2                       | 10          | Tier 2 |
| Western Australian Salmon | SG     | 1                            | 1                                   | 1                     | 2               | 3                             | 2                       | 10          | Tier 2 |
| Whaler Sharks             | GSV/KI | 1                            | 1                                   | 1                     | 2               | 3                             | 1                       | 9           | Tier 2 |
| Whaler Sharks             | SG     | 1                            | 1                                   | 1                     | 2               | 3                             | 1                       | 9           | Tier 2 |
| Whaler Sharks             | WC     | 1                            | 1                                   | 1                     | 2               | 3                             | 1                       | 9           | Tier 2 |
| Yellowfin Whiting         | GSV/KI | 1                            | 1                                   | 1                     | 2               | 2                             | 2                       | 9           | Tier 2 |
| Ocean Jacket              | SG     | 1                            | 1                                   | 1                     | 1               | 3                             | 1                       | 8           | Tier 3 |
| Octopus                   | SG     | 1                            | 1                                   | 1                     | 1               | 3                             | 1                       | 8           | Tier 3 |
| Octopus                   | WC     | 1                            | 1                                   | 1                     | 1               | 3                             | 1                       | 8           | Tier 3 |
| Sand Crab                 | SG     | 1                            | 1                                   | 1                     | 1               | 3                             | 1                       | 8           | Tier 3 |
| Leather Jacket            | GSV/KI | 1                            | 1                                   | 1                     | 1               | 1                             | 2                       | 7           | Tier 3 |
| Leather Jacket            | SG     | 1                            | 1                                   | 1                     | 1               | 1                             | 2                       | 7           | Tier 3 |
| Blue Throat Wrasse        | SG     | 1                            | 1                                   | 1                     | 1               | 2                             | 1                       | 7           | Tier 3 |
| Snook                     | GSV/KI | 1                            | 1                                   | 1                     | 1               | 1                             | 2                       | 7           | Tier 3 |
| Snook                     | SG     | 1                            | 1                                   | 1                     | 1               | 1                             | 2                       | 7           | Tier 3 |
| Yellow-Eye Mullet         | SG     | 1                            | 1                                   | 1                     | 1               | 1                             | 2                       | 7           | Tier 3 |

## Appendix E - Draft goals and objectives for replacement management plan

**Goal 1** - Marine Scalefish Fishery resources are harvested within biologically sustainable limits

### Objectives

- 1(a) Total Catch and effort is maintained at sustainable levels
- 1(b) Monitor the biological performance of the fishery and ensure the collection of Fishery and biological data.

**Goal 2** - Optimum utilisation and equitable distribution of the Marine Scalefish Fishery resources

### Objectives

- 2(a) Allocations provide for optimum utilisation and equitable distribution
- 2(b) An economically efficient Fishery that is socially and culturally valued
- 2(c) Improve economic efficiencies and financial returns within the constraints of sustainability imperatives.
- 2(d) Fishery Management is responsive to external impacts on the Fishery

**Goal 3** - Minimise impacts on the ecosystem

### Objectives

- 3(a) Minimise Fishery impacts on bycatch species
- 3(b) Minimise Fishery impacts on the habitat and wider ecosystem
- 3(c) Management is responsive to external impacts on the ecosystem
- 3(d) Minimise interaction with discarded bycatch species, in particular threatened, endangered and protected species.

**Goal 4** - Cost effective and participative co-management of the Fishery

### Objectives

- 4(a) Provide cost-effective and efficient management of the Fishery, in line with the government's cost recovery policy
- 4(b) Ensure appropriate mechanisms for fishery involvement in the development of management advice
- 4(c) Maximise stewardship of fisheries resources
- 4(d) Effective compliance program for the Fishery

## Appendix F – Stakeholder input

Risk Assessment Workshop of 26 June 2024 attendee's and contributors to RA report:

- Dr Rick Fletcher (Independent Chair)
- Ben Barnes (SAPFA)
- Pat Tripodi (MFA)
- Dr Paul Rogers (MFA)
- Keith Rowling (CBASA)
- Asher Deszery (RecFish SA)
- Dr Simon Bryars (DEW)
- Dr Craig Noell (SARDI)
- Dr Annabel Jones (PIRSA)
- Sam Stone (PIRSA)
- Yolande Markey (PIRSA)
- Jordan Lear (PIRSA)
- Dr Jason Earl (SARDI)

Additional information and comments on the 2024 risk assessment were invited from the Conservation Council of South Australia by written submission. Comments provided were considered in the final document.

## Appendix G – Focus of workshop

Table G1 – proposed risks to be focus of RA Workshop

|                                            | ESD RA For the MSF          |                      |                     |                    |                     |                                             |                       |
|--------------------------------------------|-----------------------------|----------------------|---------------------|--------------------|---------------------|---------------------------------------------|-----------------------|
|                                            | Issue                       | 2011 Risk / Priority | Objective Developed | Indicator Measured | Performance Measure | Tier (1, 2 or 3) or n/a if not assigned yet | Focus of workshop Y/N |
| <b>Component</b>                           | <b>RETAINED SPECIES</b>     |                      |                     |                    |                     |                                             |                       |
| Management Tier 1                          | Snapper                     | H                    | Yes                 | Yes                | Yes                 | 1<br>(all zones)                            | Y                     |
|                                            | King George Whiting         | L                    | Yes                 | Yes                | Yes                 | 1<br>(except SEFZ)                          | Y                     |
|                                            | Southern Calamari           | L                    | Yes                 | Yes                | Yes                 | 1<br>(except WC/SEFZ)                       | Y                     |
|                                            | Southern Garfish            | H                    | Yes                 | Yes                | Yes                 | 1<br>(except WC/SEFZ)                       | Y                     |
| Management Tier 2                          | Yellowfin Whiting           | L                    | Yes                 | Yes                | Yes                 | 2<br>(SGFZ/GSVFZ)                           | Y                     |
|                                            | Australian Herring          | L                    | Yes                 | Yes                | Yes                 | 2                                           | N                     |
|                                            | Bronze & Dusky Whaler Shark | M                    | Yes                 | Yes                | Yes                 | 2                                           | Y                     |
|                                            | Blue swimmer crab (WC)      | L                    | Yes                 | No                 | No                  | 2                                           | Y                     |
|                                            | Australian Salmon           | L                    | Yes                 | Yes                | Yes                 | 2                                           | N                     |
| Management Tier 3                          | Ocean jackets               | L                    | Yes                 | Yes                | Yes                 | 3                                           | Y                     |
|                                            | Snook                       | L                    | Yes                 | Yes                | Yes                 | 3                                           | N                     |
|                                            | Sand Crab                   | L                    | Yes                 | Yes                | Yes                 | 3                                           | N                     |
|                                            | Yellow-eye Mullet           | L                    | Yes                 | Yes                | Yes                 | 3                                           | N                     |
|                                            | Wrasse spp (parrotfish)     | L                    | Yes                 | Yes                | Yes                 | 3                                           | N                     |
|                                            | Leatherjacket spp           | N                    | Yes                 | Yes                | Yes                 | 3                                           | N                     |
|                                            | Octopus                     | L                    | Yes                 | Yes                | Yes                 | 3                                           | N                     |
| Other permitted species, bait species etc. | Bloodworms                  | L                    | Yes                 | Yes                | No                  | n/a                                         | N                     |
|                                            | Pipi (Gunyah beach)         | M                    | Yes                 | Yes                | No                  | n/a                                         | Y                     |
|                                            | Razorfish                   | M                    | Yes                 | Yes                | No                  | Bycatch only                                | Y                     |
|                                            | Mud cockles                 | M                    | Yes                 | Yes                | Yes                 | n/a                                         | Y                     |
|                                            | Cuttlefish                  | L                    | Yes                 | Yes                | Yes                 | n/a                                         | N                     |
|                                            | Gummy Shark                 | L                    | Yes                 | Yes                | Yes                 | Bycatch only                                | N                     |
|                                            | School Shark                | L                    | Yes                 | No                 | No                  | n/a                                         | N                     |

OFFICIAL

|                                                                            |                                             |   |     |     |     |     |                   |
|----------------------------------------------------------------------------|---------------------------------------------|---|-----|-----|-----|-----|-------------------|
|                                                                            | Whiskery Shark                              | L | Yes | No  | No  | n/a | N                 |
|                                                                            | Broadnose Shark                             | L | Yes | No  | No  | n/a | N                 |
|                                                                            | Red Mullet                                  | N | Yes | No  | No  | n/a | N                 |
|                                                                            | Western Striped Grunter                     | N | Yes | Yes | Yes | n/a | N                 |
|                                                                            | Trevally                                    | N | Yes | Yes | Yes | n/a | N                 |
|                                                                            | Flathead                                    | N | Yes | No  | No  | n/a | N                 |
|                                                                            | Mulloway                                    | N | Yes | No  | No  | n/a | N                 |
|                                                                            | Other schedule 1 spp                        | N | Yes | No  | No  | n/a | N                 |
|                                                                            | Non-schedule 1 spp                          | N | Yes | No  | No  | N/A | N                 |
| <b>Component</b>                                                           | <b>NON RETAINED SPECIES</b>                 |   |     |     |     |     |                   |
| Birds                                                                      | Cormorants                                  | N | Yes | Yes | No  |     | N                 |
|                                                                            | Little penguin                              | N | Yes | Yes | No  |     | N                 |
|                                                                            | Pacific gull                                | N | Yes | Yes | No  |     | N                 |
|                                                                            | Shearwater                                  | N | Yes | Yes | No  |     | N                 |
|                                                                            | Silver gull                                 | N | Yes | Yes | No  |     | N                 |
|                                                                            | Other sea birds                             | N | Yes | Yes | No  |     | N                 |
| TEPS                                                                       | New Zealand fur seal                        | N | Yes | Yes | No  |     | N                 |
|                                                                            | Dolphins                                    | N | Yes | Yes | No  |     | N                 |
|                                                                            | Australian sea lion                         | M | Yes | Yes | No  |     | Y                 |
|                                                                            | White Shark                                 | M | Yes | Yes | No  |     | Y                 |
|                                                                            | Whales                                      | L | Yes | Yes | No  |     | N                 |
| Sharks/Scalefish and Crabs                                                 | Port Jackson Shark                          | N | Yes | No  | No  |     | N                 |
|                                                                            | Other shark spp                             | N | Yes | No  | No  |     | N                 |
|                                                                            | Other scalefish spp                         | N | Yes | No  | No  |     | N                 |
|                                                                            | Other crab spp                              | N | Yes | No  | No  |     | N                 |
|                                                                            | Western Blue Groper                         | L | Yes | No  | No  |     | N                 |
|                                                                            | Blue Swimmer Crab (gulf waters)             | N | Yes | No  | No  |     | N                 |
| <b>Component</b>                                                           | <b>GENERAL ECOSYSTEM IMPACTS OF FISHING</b> |   |     |     |     |     |                   |
| Impacts on trophic structure - Removal of / damage to organisms by fishing | Fishing – Marine                            | M | Yes | No  | N/A |     | Y                 |
|                                                                            | Ghost fishing                               | N | Yes | No  | N/A |     | N                 |
| Impacts on trophic structure - Addition /                                  | Discarding (bycatch)                        | N | Yes | No  | N/A |     | N -trophic impact |
|                                                                            | Introduced marine pests / aquatic diseases  | M | Yes | No  | N/A |     | Y                 |

OFFICIAL

|                                 |                                                                                                                                                                                    |   |     |     |     |  |   |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|-----|-----|-----|--|---|
| movement of biological material |                                                                                                                                                                                    |   |     |     |     |  |   |
| Habitat disturbance             | Habitat disturbance – Haul netting, cockle raking, bait fork/spade, razorfish tongs                                                                                                | L | Yes | No  | N/A |  | N |
|                                 | Habitat disturbance – gill netting, purse seining, hooking/jigging, longline & drop lining, cockle raking (pipi), fish traps, octopus traps, crab, hoop & drop nets, mussel dredge | N | Yes | No  | N/A |  | N |
|                                 | Habitat disturbance – lost gear                                                                                                                                                    | N | Yes | No  | N/A |  | N |
|                                 | Habitat disturbance – vehicular                                                                                                                                                    | L | Yes | No  | N/A |  | N |
|                                 | Habitat disturbance – anchoring                                                                                                                                                    | L | Yes | No  | N/A |  | N |
|                                 |                                                                                                                                                                                    |   |     |     |     |  |   |
| Broader environment             | Air quality – Greenhouse gas / carbon emissions                                                                                                                                    | N | Yes | No  | N/A |  | N |
|                                 | Water quality – Rubbish / debris                                                                                                                                                   | N | Yes | No  | N/A |  | N |
|                                 | Water quality – Fuel, oil and bilge discharge                                                                                                                                      | N | Yes | No  | N/A |  | N |
| Component                       | COMMUNITY                                                                                                                                                                          |   |     |     |     |  |   |
| Fishing Industry                | Profit (fishing industry)                                                                                                                                                          | H | Yes | Yes | Yes |  | Y |
|                                 | Employment                                                                                                                                                                         | M | Yes | Yes | Yes |  | N |
|                                 | OHS&W                                                                                                                                                                              | M | Yes | Yes | Yes |  | N |
|                                 | GRP and GSP                                                                                                                                                                        | L | Yes | No  | No  |  | Y |
|                                 | Asset value                                                                                                                                                                        | H | Yes | Yes | Yes |  | Y |
|                                 | Lifestyle                                                                                                                                                                          | M | Yes | No  | No  |  | N |
|                                 | Relationship with community                                                                                                                                                        | H | Yes | Yes | Yes |  | N |
| Regional Centres                | Employment (regional centres)                                                                                                                                                      | M | Yes | No  | No  |  | N |
|                                 | Re-Investment (regional)                                                                                                                                                           | M | Yes | No  | No  |  | N |
|                                 | Social capital (regional)                                                                                                                                                          | M | Yes | No  | No  |  | N |
|                                 | Tourism (regional)                                                                                                                                                                 | L | Yes | No  | No  |  | N |
|                                 | Infrastructure (regional)                                                                                                                                                          | L | Yes | No  | No  |  | N |
| City Centres                    | Economic value (city)                                                                                                                                                              | N | Yes | No  | No  |  | N |
|                                 | Health / food (city)                                                                                                                                                               | L | Yes | No  | No  |  | N |
|                                 | Social capital (city)                                                                                                                                                              | L | Yes | No  | No  |  | N |
|                                 | Infrastructure (city)                                                                                                                                                              | N | Yes | No  | No  |  | N |
| Component                       | GOVERNANCE                                                                                                                                                                         |   |     |     |     |  |   |
| PIRSA                           | Minister                                                                                                                                                                           | H | Yes | No  | No  |  | N |
|                                 | Management plan                                                                                                                                                                    | H | Yes | No  | No  |  | Y |
|                                 | Allocation                                                                                                                                                                         | H | Yes | No  | No  |  | Y |
|                                 | Consultation                                                                                                                                                                       | M | Yes | No  | No  |  | Y |

OFFICIAL

|                         |                                        |   |     |    |    |  |   |
|-------------------------|----------------------------------------|---|-----|----|----|--|---|
|                         | Management effectiveness (PIRSA)       | H | Yes | No | No |  | Y |
|                         | Resources (PIRSA)                      | H | Yes | No | No |  | Y |
|                         | Strategic policy (PIRSA)               | H | Yes | No | No |  | Y |
|                         | Research / information (PIRSA)         | H | Yes | No | No |  | Y |
|                         | Compliance (PIRSA)                     | H | Yes | No | No |  | Y |
|                         | Legal framework (PIRSA)                | M | Yes | No | No |  | Y |
|                         | Consultation (PIRSA)                   | H | Yes | No | No |  | Y |
|                         | Reporting (PIRSA)                      | H | Yes | No | No |  | N |
| Industry                | Access security                        | H | Yes | No | No |  | Y |
|                         | Codes of Conduct (Industry)            | H | Yes | No | No |  | N |
|                         | Communication/participation (Industry) | H | Yes | No | No |  | Y |
|                         | Industry association                   | H | Yes | No | No |  | Y |
|                         | Marine park issues                     | H | Yes | No | No |  | N |
|                         | Owner operator                         | M | Yes | No | No |  | Y |
| Other Agencies          | SA Govt: DENR                          | H | Yes | No | No |  | N |
|                         | Aust Govt: SEWPaC                      | M | Yes | No | No |  | N |
|                         | AFMA/DAFF                              | L | Yes | No | No |  | N |
|                         | DTEI                                   | M | Yes | No | No |  | N |
|                         | FRDC                                   | L | Yes | No | No |  | N |
| Other (NGO's etc)       | Conservation Organisations             | H | Yes | No | No |  | N |
|                         | RecFish SA                             | M | Yes | No | No |  | N |
|                         | Other NGO's                            | M | Yes | No | No |  | N |
| <b>Component</b>        | <b>External Impacts</b>                |   |     |    |    |  |   |
| Biophysical environment | Physical                               | E | Yes | No | No |  | Y |
|                         | Climate change                         | N | Yes | No | No |  | Y |
|                         | Diseases                               | H | Yes | No | No |  | Y |
| Human induced changes   | Effluent                               | M | Yes | No | No |  | N |
|                         | Agricultural runoff                    | L | Yes | No | No |  | N |
|                         | Stormwater                             | L | Yes | No | No |  | N |
|                         | Hyper salinity (desalination)          | L | Yes | No | No |  | N |
|                         | Illegal artificial reef                | L | Yes | No | No |  | N |
|                         | Illegal dumping                        | L | Yes | No | No |  | N |
|                         | Development                            | L | Yes | No | No |  | N |
|                         | Dredging                               | L | Yes | No | No |  | N |
|                         | Recreational boating                   | L | Yes | No | No |  | N |
|                         | Commercial shipping                    | L | Yes | No | No |  | N |
|                         | Exotic species                         | M | Yes | No | No |  | N |
| Impact of Other Drivers | Fuel price                             | H | Yes | No | No |  | N |
|                         | Marketing                              | M | Yes | No | No |  | N |
|                         | Labour (availability/cost)             | M | Yes | No | No |  | N |

OFFICIAL

|                             |                                 |   |     |    |    |  |   |
|-----------------------------|---------------------------------|---|-----|----|----|--|---|
|                             | Other fishing costs             | M | Yes | No | No |  | N |
|                             | Interest rates                  | M | Yes | No | No |  | N |
|                             | Other fisheries (market demand) | M | Yes | No | No |  | N |
|                             | Illegal take                    | H | Yes | No | No |  | N |
| Access                      | Marine parks (access)           | H | Yes | No | No |  | N |
|                             | Recreational fishers            | H | Yes | No | No |  | Y |
|                             | Aquaculture                     | L | Yes | No | No |  | Y |
|                             | Eco-tourism                     | N | Yes | No | No |  | N |
|                             | Non-extractive users            | N | Yes | No | No |  | N |
|                             | Shipping                        | L | Yes | No | No |  | N |
|                             | Artificial reefs                | N | Yes | No | No |  | N |
| <b>Aboriginal community</b> |                                 |   |     |    |    |  |   |
| Yet to be undertaken        |                                 |   |     |    |    |  |   |

## Appendix H: Consequence and likelihood tables used

Table H1. Consequence levels applied for various risk assessment categories

|                     | Minor (1)                                                                                                                            | Moderate (2)                                                                                                      | High (3)                                                                                                                                 | Major (4)                                                                                                                                                                                              |
|---------------------|--------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Target Species      | Fishing impacts not detectable or at minor levels of depletion. Spawning biomass > Target level                                      | Fishery operating at maximum acceptable level of depletion. Spawning biomass <Target level but >Threshold level   | Stock has been reduced to unacceptable levels but still not effecting recruitment<br>Spawning biomass <Threshold level but > limit level | Level of stock depletion is affecting or will affect future average recruitment levels<br>Spawning biomass < Limit Level                                                                               |
| Bycatch Species     | Species assessed elsewhere. Or, take is small and area of capture is small compared to known distribution (< 20%).                   | Relative area of, or susceptibility to capture is less than 50% and not a vulnerable life history.                | N/A<br>Above acceptable level of impact. Once a consequence reaches this point it should be examined using target species table.         | N/A                                                                                                                                                                                                    |
| Protected Species   | Few individuals directly impacted in most years, level of capture/interaction is well below that which will generate public concern. | Level of capture is the maximum that will not impact on recovery or cause unacceptable public concern.            | Recovery may be affected and/or some clear, but short-term public concern will be generated.                                             | Recover times are clearly being impacted and/or public concern is widespread.                                                                                                                          |
| Ecosystem Structure | Measurable but minor changes to the environment or ecosystem structure but no measurable change to function.                         | Maximum acceptable level of change to the environment or ecosystem structure with no material change in function. | Ecosystem function altered to an unacceptable level with some function or major components now missing and/or new species are prevalent. | Long-term, significant impact with an extreme change to both ecosystem structure and function; different dynamics now occur with different species/groups now the major targets of capture or surveys. |

OFFICIAL

|                      | Minor (1)                                                                                            | Moderate (2)                                                                                                                  | High (3)                                                                                                                   | Major (4)                                                                                                      |
|----------------------|------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|
| Habitat              | Measurable impacts very localised. Area directly affected below maximum accepted.                    | Maximum acceptable level of impact to habitat with no long-term impacts on region-wide habitat dynamics                       | Above acceptable level of loss/impact with region wide dynamics or related systems may begin to be impacted                | Level of habitat loss clearly generating region wide effects on dynamics and related systems                   |
| Economic             | A small, measurable but temporary impact on the economic pathways for the industry or the community. | Some level of reduction for a major fishery or a large reduction in a small fishery that the community is not dependent upon. | Major sector decline and economic generation with clear flow on effects to the community.                                  | Permanent and widespread collapse of economic activity for industry and the community including possible debts |
| Social Structures    | Impacts may be measurable but minimal concerns                                                       | Clear impacts but no local communities threatened or social dislocations                                                      | Major impacts on social structures, at least at a local level                                                              | Impacts occurring at a broader (regional) level or severe local impacts.                                       |
| Food Security        | Food security important but no impacts observed.                                                     | Direct impacts on food resources but not to the point where these are threatened                                              | Significant and long term (> weeks) impacts on food for a community. Likely to lead to health problems                     | Severe ongoing reductions in food resources leading to starvation, abandonment of region or requiring aid      |
| Social Amenity       | Temporary or minor additional stakeholder restrictions or loss of expectations                       | Ongoing restrictions or decrease in expectations                                                                              | Long term suspension or restriction of expectations in some key activities                                                 | Permanent loss of all expectations in key activities                                                           |
| Reputation and Image | Low negative impact, low news profile                                                                | Some public embarrassment, moderate news profile, minor Ministerial involvement                                               | High public embarrassment, high impact & news profile, Third Party actions, public and significant Ministerial involvement | Extreme public embarrassment, prolonged news coverage. Third Party actions/enquiry, government censure.        |
| OHS                  | First Aid only                                                                                       | Minor medical treatment required, visit to doctor's surgery. Less than a week off work.                                       | Hospitalisation and/or intensive and extended treatment period required for recovery                                       | Serious or extensive injuries /disease/ permanent disability or death                                          |

## OFFICIAL

|                                          | Minor (1)                                                                                                                                         | Moderate (2)                                                                                                                                                                             | High (3)                                                                                                                                                                                        | Major (4)                                                                                                                                                                |
|------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Operational effectiveness                | Minor element of one key deliverable unable to be achieved on time.                                                                               | Significant delay but achievement of key deliverables                                                                                                                                    | Non-achievement of more than one key deliverable or major delay to entire strategic directive.                                                                                                  | Non-achievement of an entire strategic directive                                                                                                                         |
| Community (social structure and culture) | Impacts may be measurable but minimal concerns                                                                                                    | Clear impacts but no local communities threatened or social dislocations                                                                                                                 | Major impacts at least at a local level, with disruptions now evident                                                                                                                           | Impacts occurring at a broader (regional) level and severe local impacts.                                                                                                |
| Governance                               | Minor issues or gaps associated with one or two components of the system with minimal 'impacts' on efficiency or delivery of management outcomes. | There are clearly identified issues or gaps with a few components that is still capable of meeting most management objectives. Preferable but not essential to address in the short term | Major issues or gaps in one or two components that are either ineffective or inefficient in delivery of some of the agreed management objectives. Needs to be addressed as soon as practicable. | Significant gaps or issues with most of the governance system which is not capable of delivering most of the agreed management objectives. Must be addressed immediately |

Table H2. Likelihood levels applied

| Level        | Descriptor                                                                                                                                              |
|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| Remote (1)   | The consequence has never been heard of in these circumstances, but it is not impossible within the timeframe (Probability <5%).                        |
| Unlikely (2) | The consequence is not expected to occur in the time frame but it has been known to occur elsewhere under special circumstances (Probability 5 - <20%). |
| Possible (3) | Evidence to suggest this consequence level is possible and may occur in some circumstances within the timeframe (Probability 20 - <50%).                |
| Likely (4)   | A particular consequence level is expected to occur in the timeframe (Probability ≥50%).                                                                |