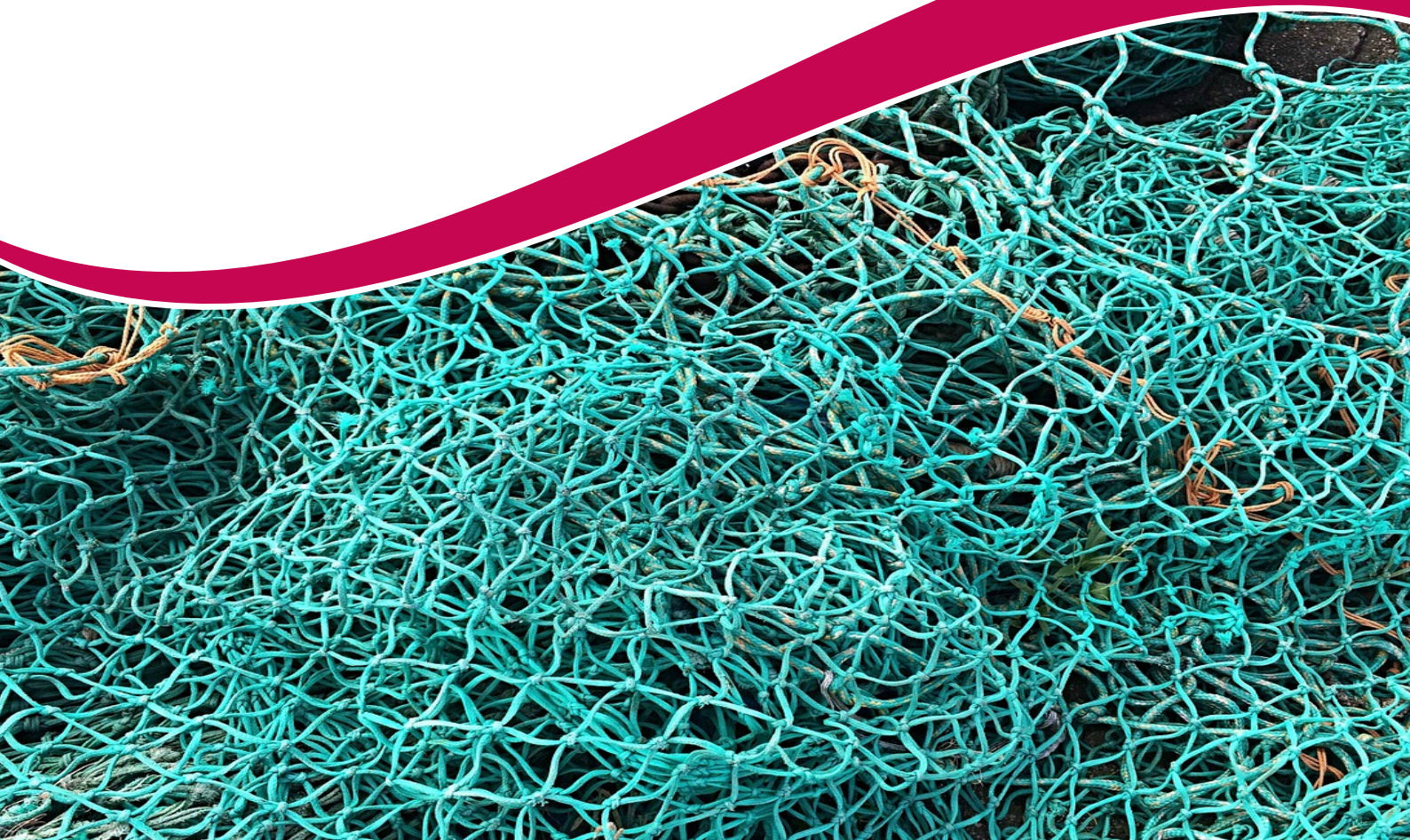
Australian Government

Australian Fisheries Management Authority

Implementing a Multi-Species Harvest Strategy for the Southern and Eastern Scalefish and Shark Fishery (SESSF)

Chapter 2: Transitional arrangements.



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Version	Date	Updates
1.0	30/08/2023	SESSFRAG Data Meeting, Aug 2023
2.0	27/09/2023	Multi-Species Harvest Strategy -Workshop 1

Project overview

Background and description

Climate-driven shifts in ecosystem function, the failure of some stocks to recover from historical overfishing, competition for marine space and economic pressures pose significant challenges for Commonwealth fisheries. For some sectors, these factors have combined to a point where some operators are no longer viable. Fishing fleets and participation are likely to shrink, leaving smaller fleets that will need to be more efficient.

For the Australian Fisheries Management Authority (AFMA), the cost of doing business, ageing information technology and data management systems, increasing stakeholder expectations, and reporting requirements are making it more complex and more expensive to run a Commonwealth Government regulatory agency, especially one of AFMA's size.

AFMA must explore avenues for alternative and more efficient ways of doing business by utilising emerging technologies, reviewing policies and harvest strategies, prompting cross-jurisdictional collaboration, and embracing co-management with industry. In isolation, none of these are insurmountable. The challenge, however, is bringing all these solutions together in a cohesive, strategic, and timely manner for each fishery.

This project will focus on the Southern and Eastern Scalefish and Shark Fishery (SESSF), noting many of the proposed solutions are likely applicable in other Commonwealth fisheries. The SESSF is one of the most complex Commonwealth fisheries, with multiple gear types, species and jurisdictional boundaries; there has also been a considerable focus on climate change adaptation (Fulton, et al., 2023) (Fulton, et al., 2021), strategic reviews of monitoring and assessment approaches (Knuckey, et al., 2017; Knuckey, et al., 2018), application of emerging technologies (Thomson, et al., 2020) and, more recently, structural reform in response to declining stocks and economic pressure.

The current SESSF Harvest Strategy Framework (HSF) (AFMA, 2009) was implemented in 2009 and is supported by a complex monitoring, data collection and stock assessment framework (Bergh, et al., 2009) (AFMA, 2021). The HSF has been adapted over time to respond to changes in the fishery, new stock assessment approaches, to reduce the frequency/cost of species-specific stock assessments, and to reflect policy changes (AFMA, 2022) (AFMA, 2019). It is widely recognised that the current HSF, which involves a single-species approach to achieve the objectives of the *Commonwealth Fisheries Harvest Strategy Policy* (HSP) (DAFF, 2018), needs to be updated to reflect the multi-species nature of the fishery, as well as being adaptive to climate-driven changes in ecosystem status.

The Fisheries Research and Development Corporation (FRDC) Project 'Development and evaluation of multi-species harvest strategies in the SESSF' (MSHS) (FRDC 2018-021) commenced in 2019 and aims to develop and evaluate multi-species harvest strategies, including reference points and decision rules, and evaluate monitoring and assessment options identified in the SESSF Monitoring and Assessment Research Project (SMARP) (Knuckey, et al., 2017). This project will complement the work being undertaken as part of the MSHS project, with a view to both projects delivering a comprehensive harvest strategy for the SESSF, including revised data, monitoring and assessment plans.

Operationalising and implementing a revised HSF in the SESSF will require a phased approach. Discussion papers will be prepared for each of the topics detailed below with a view to seeking advice from relevant Resource Assessment Groups (RAGs), Management Advisory Committees (MACs) and technical workshops.

The topics are not mutually exclusive and will not necessarily be prepared or consulted on in the order presented below.

1. **Fishery Overview:** Characterise the size and dynamics of the fleet, species targeted, policy requirements and capacity to support a revised HSF. This context will be critical as each of the following chapters are prepared.
2. **Transitional Arrangements:** A transition period will be required to move from the current HSF and operating environment (stock assessments, data collection, monitoring etc.) to a new HSF. Initially, this will include 'resetting' the current stock assessment and data analysis schedule to free up and redirect resources towards higher priority monitoring and research, including those required operationalise and maintain a revised multi-species harvest strategy.
3. **Operationalising the preferred Harvest Strategy**: At the completion of the MSHS project (expected in December 2023) options for a multi-species harvest strategy framework (HSF) will be identified. However, this will not include a tailored HSF; rather, concepts that will need to be specified and operationalised. This chapter will effectively build on the recommendations of the MSHS project by identifying which core components can practically be implemented, and what additional work is required to do so. Additionally, this chapter will consider the outputs of relevant research (e.g., dynamic B_0, buffers, SMARP) and determine if, how and when they are incorporated as components of the revised HSF.
4. **Data and Monitoring requirements:** Subject to the form and function of the revised HSF, this chapter will focus on the monitoring and data requirements. Consideration will be given to the most efficient mix of monitoring and data collection programs, striking a balance to ensure the needs of the HSF are met whilst maintaining sufficient monitoring and data collection to meet AFMA's broader objectives to minimise impact on non-commercial species and the environment.

Throughout the consultation process, it will be important to understand the risks or shortcomings associated with the transition to a revised HSF. Each chapter will identify and seek to resolve impacts on reporting requirements, resource constraints, policy gaps, or increased risk/uncertainty in management settings.

This is **Chapter 2 – Transition to a new Harvest Strategy.**

Objective

1. To re-cast the stock assessment and data analysis schedule in the SESSF to reduce cost whilst maintaining a sufficient standard of monitoring and reporting to meet legislative objectives.

Actions

1. Identify criteria and nominate species as either trigger, depleted or multi-year total allowable catch (MYTAC) species.
2. Rationalise and re-cast the SESSF stock assessment and data analysis schedule from 2024.
3. Identify any risks that may arise from the revised scheduling and explore options to resolve or mitigate them.

Introduction

The monitoring, assessment and reporting regime required to support the current SESSF HSF is resource intensive, does not allow for more strategic research priorities to be pursued concurrently, and has constrained a transition to a new HSF approach.

At its May 2022 meeting, the Commission supported deferring or cancelling components of the 'business as usual' monitoring and research plan in the SESSF to redirect research funds to pursue alternative and more strategic research and monitoring priorities. With support from SESSFRAG, approximately $290,000 of research funding was removed or deferred from the 2023-24 research budget to allow for the Close-Kin Mark-Recapture (CKMR) scoping project in the SESSF. This is an important step towards obtaining fishery-independent estimates of stock status in the SESSF.

AFMA must consider an alternative and more efficient approach to monitoring and assessment in the SESSF, including the suite of tools and programs to support it. The data and monitoring required to support a revised HSF will depend on which of the proposed approaches are adopted, however, there are actions that can be taken now, under the existing HSF, to find efficiencies in the monitoring and assessment approach.

The following sections include changes to the timing and frequency of assessment and data processing in the SESSF supported by SESSFRAG at its August 2023 data meeting.

Species groups and triggers

While the Multi-Species Harvest Strategy (MSHS) project is not due to be completed until December 2023, the 'indicator species' and 'trigger species' approaches are likely to be key components of the framework. These are described briefly here:

Indicator Species Approach

The indicator species approach identifies species that are representative of the productivity, value, and vulnerability in a group of species and uses them to track the status of the broader resource, and to trigger management actions. The potential indicator species are identified by selecting the most vulnerable species per category in each of the SESSF sub-fisheries. By placing the focus on monitoring the status on these species, the assumption is that the more robust species are doing as well if not better than these species.

The RBCs of non-indicator species are based on changes to the RBCs of the representative indicator species. For example, where CPUE between tiger flathead (indicator species) and eastern school whiting (non-indicator species) are correlated, the RBC for eastern school whiting would be adjusted based on the proportional change in the tiger flathead RBC.

Trigger Species Approach

The Trigger species approach is similar to the Indicator species approach, in that only key commercial species are assessed regularly. By-product species catches and CPUE are monitored but assessments occur only if breakout conditions are met. Breakout conditions being considered by the project team for byproduct species relate to market conditions, percentage of total allowable catch (TAC) caught, stock status and CPUE trends.

If no breakout rules are met, the TAC is rolled over, but subject to a time buffer so that the annual reduction in TAC over time will eventually trigger an assessment and reset.

Interim approach

While the MSHS is yet to be specified, SESSF agreed to the species groupings and MYTACs outlined below as an interim approach, under the existing HSF, using the same principles likely to be adopted under a revised framework.

For the purpose of scheduling stock assessments and setting TACs, SESSF species have been categorized into three groups based on current stock status (or estimate of fishing mortality - *F*), percentage of TAC caught in 2022-23, and whether they are a commercial species likely to be nominated as indicators or non-indicators under a revised multi-species HSF. These are summarised in Table 1 below, and in the 'SMARP alternative' scenario at **Appendix A**.

Trigger species: Maintain current TAC, set trigger at 75% of current TAC (unless otherwise specified) and monitor available data. Update assessment every 6 years or if triggered.

Criteria

- Stock status is estimated to be above the target reference point (TRP), or $F<F_{MSY}$; and
- TAC is less than 75% caught; and
- Flagged as a non-indicator species under MSHS approach.

Depleted Species: Review available data and set annual bycatch TAC in accordance with rebuilding strategy. Prioritise data collection for relevant species and update metier analyses as required.

Criteria

- Stock status is estimated to be below the limit reference point (LRP).

MYTAC Species: Update stock assessment when scheduled and recommend appropriate MYTAC[1] or nominate as a trigger species.

Criteria

- Stock status is estimated to be between the LRP and TRP; or
- TAC is more than 75% caught; or
- Flagged as a commercial indicator species under MSHS approach.

[1] Using schedule proposed under 'SMARP Alternative' as a starting point.

Table 1 Proposed groupings, triggers, and assessment frequency for SESSF quota species

Group	Species	% TAC Caught	Stock Status	Current Assessment frequency	Proposed assessment frequency	Proposed Trigger	Recommendation
Trigger Species	Blue-eye trevalla (seamount)	0	F<FMSY	1	6	41 t *	
	Alfonsino	0	F<FMSY	1	6	50 t #	
	Oreo smooth (Cascade)	0	>TRP	1	6	50 t #	Maintain current TAC
	Royal red prawn	1	>TRP	3	6	50 t #	Set trigger at 75% of TAC* Or Other amount#
	Gemfish (W)	21	>TRP	3	6	135 t*	
	Ribaldo	24	>TRP	3	6	295 t *	
	Saw shark	25	>TRP	3	6	395 t *	Assess need/capacity for assessment every 6 years or if triggered
	Elephant fish	34	>TRP	3	6	86 t *	
	Ocean perch	49	>TRP	3	6	236 t *	
	Oreo smooth (Other)	21	F<FMSY	1	6	68 t *	
Depleted Species	Orange roughy (A/E)	0	<LRP	1	1		
	Blue warehou	6	<LRP	1	1		
	Orange roughy (W)	20	<LRP	1	1		
	Gemfish (E)	37	<LRP	1	1	Set annual bycatch TAC	
	Orange roughy (S)	45	<LRP	1	1	Prioritise data collection for key species	
	Jackass Morwong (W)	55	>TRP	1	1	Update metier analyses as required	
	Jackass Morwong (E)	55	<LRP	1	1		
	Redfish	58	<LRP	1	1		
	John dory	72	<LRP	1	1		
MYTAC Species	Orange roughy (Cascade)	4	>TRP	N/A	4		
	Bight redfish	22	>TRP	3	4		
	Blue grenadier	33	>TRP	3	4		
	Deepwater shark (W)	33	LRP< <TRP	3	4		
	Deepwater shark (E)	42	LRP< <TRP	3	4		
	Deepwater flathead	50	>TRP	3	4		
	Silver warehou	32	LRP< <TRP	3	4		
	School whiting	40	LRP< <TRP	3	4		
	Pink Ling (W)	59	>TRP	3	4	Update assessment when scheduled	
	Flathead	75	>TRP	3	4	Recommend MYTAC or Nominate as trigger species	
	Mirror dory (E)	67	LRP< <TRP	1	2		
	Mirror Dory (W)	67	LRP< <TRP	1	2		
	Oreo basket	52	LRP< <TRP	3	4		
	Pink ling (E)	59	LRP< <TRP	3	4		
	Silver trevally	58	LRP< <TRP	3	1		
	Gummy shark	92	≥TRP	3	4		
	Blue eye trevalla (Slope)	95	LRP< <TRP	1	2		
	Orange roughy (E)	98	LRP< <TRP	3	4		
	School shark	94	<LRP	3	4		

Stock Assessment Scheduling

The SESSF Strategic Monitoring and Assessment Project (SMARP) (Knuckey, et al., 2017) explored options for alternative monitoring and assessment regimes in the SESSF with a view to finding the most cost-effective approach. The preferred option included maintaining the current 3-year multi-year TAC (MYTAC) and annual collection of fishery-dependent data (logbooks, biologicals, etc) but recommended that all stock assessments and associated data processing (discard estimation, CPUE analyses, ageing, etc.) are carried out every three years (See 'SMARP Scenario' at **Appendix A**). The preferred scenario also included biennial fishery-independent trawl surveys; however, these have since been discontinued.

Under the SMARP scenario, there was no compromise on current data collection and, in the years between assessments, it was proposed that a system of automated data analysis and reporting be conducted by AFMA to ensure that no breakout rules have been triggered, Protected species interactions are monitored and reported, and there has been no major change in the fishery dynamics.

While there was general support for the approach, concerns were raised about the heavy assessment workload required every three years, the rigidity and inability to shift assessments between years if issues were identified with a stock, and the potential for capacity and expertise to be lost due to inactivity in the 'off' years.

AFMA has considered an alternative to the SMARP scenario with a view to achieving similar efficiencies and has compared it to the status quo and the preferred SMARP scenario. Each of the scenarios, including estimated costs, benefits, and risks, are provided at **Appendix A** to highlight the trade-offs.

> Status Quo: Maintains the current stock assessment schedule and annual data processing.
>
> SMARP: Establishes 3-year MYTACs for all species with assessments and data processing every third year.
>
> SMARP Alternative: Establishes 2 or 4-year MYTACs, with data processing every second year and discard estimation every four years. Assessments that do not require standardised CPUE are completed in years where logbook data is not processed.

Under each scenario, the stock assessment and consultation schedules are 'reset' from 2026. Each scenario also includes a proposal to reduce the number of stock assessments and data processing by undertaking only critical assessments in 2024 and 2025 and removing any assessments from 2025 that require CPUE standardisations. There would be no processing of AFMA data, CPUE standardisations or provision of catch and discard reports in 2025. These are detailed below and under 'SMARP Alternative' at **Appendix A**.

The proposed changes to the 2024 and 2025 stock assessment schedule are also detailed below and under the 'SMARP Alternative' scenario at **Appendix A**.

Postpone

Orange Roughy (East) from 2024 to 2025: The 2023 biomass survey was postponed to 2024 due to logistical issues. Standardised CPUE is not required for the Orange Roughy stock assessment, so postponing to 2025 will allow for a biomass survey in 2024 without compromising the 'SMARP Alternative' plan.

Bight Redfish & Tiger Flathead from 2025 to 2026: The risk of postponing the stock assessments is low as both stocks are assessed as being at or above the target reference point and the RBCs are either under caught (Bight Redfish) or constrained (Flathead).

Promote

Blue Grenadier from 2025 to 2024: Allows for Orange Roughy to be postponed (i.e., swapped) and will be supported by an additional two years of acoustic survey data since the 2022 stock assessment was completed.

Partial Update

Silver Warehou in 2024: Under the 'SMARP Alternative' schedule this assessment will be fully updated in 2026. The 2021 assessment implemented a low recruitment scenario and recommended a 3-Year MYTAC of 350 t, of which 124 t (35%) was taken in 2022-23.

Cancel

Ocean Perch, Saw Shark and Gemfish (W): These species have been identified as trigger species and will only be subject to assessment if triggers are met.

Jackass Morwong and John Dory: Both stocks are assessed as overfished. Management measures are likely to have undermined inputs to the stock assessment, and updated assessments are unlikely to substantively change the current management approach. Resources should focus on alternative assessment approaches.

Mirror Dory, Blue-eye Trevalla (Slope) in 2024: Both species are currently assessed on an annual basis. Subject to outcomes of the 2023 stock assessments, these species are proposed to move to 2-Year MYTACs.

Risks, benefits, and sensitivities

While the proposed approach represents significant annual savings, none of the approaches, including the 'status quo' are without their risks or shortfalls. The relative cost savings, benefits and risks are summarised at Table 1 and discussed in detail below.

Based on current costs of undertaking stock assessments and data analyses, this approach is expected to free up around $500k of research budget over the 2024/25 and 2025/26 financial years, and $280k annually from 2026 that could be redirected towards more strategic priorities and establishing automated reporting processes to meet the requirements in the 'off' years.

Table 2 Cost savings (from 2026), benefits and risks associated with the 'SMARP' and 'SMARP Alternative' scenarios relative to the status quo.

	Status Quo	SMARP	SMARP Alternative
	$5.56M	$5.32M	$5.29M
		-$0.25M	-$0.28M
Settings			
MYTAC	3-Year	3-Year	2/4-Year
Assessments	Annual	1 On : 2 Off (all sectors)	RAG Specific
Data analysis	Annual	1 On : 2 Off (all sectors)	1 On : 1 Off
Monitoring	Annual	Annual	Annual
RAG Cycle[2]	Annual	1 On : 2 Off	RAG specific
Costs ($M)			
Assessments	$0.29	**$0.26**	**$0.20**
Data analysis	$0.45	**$0.25**	**$0.29**
Monitoring	$1.88	$1.88	$1.88
RAG/MACs	$0.23	**$0.21**	**$0.20**
Management	$2.72	$2.72	$2.72
PROS	Provides flexibility to shift assessments between years. Data analyses every year for monitoring purposes. Maintains corporate knowledge and understanding of stock assessment process.	2025 free to establish automated reporting to support future HSF. Strategic priorities/research can be pursued in 'off' years. Provides some flexibility to shift assessments between years. Maintains current MYTAC for most species.	2025 free to establish automated reporting to support future HSF. Strategic priorities/research can be pursued in 'off' years. Provides some flexibility to shift assessments between years. Biggest annual cost savings.
CONS	Based on existing HSF. Expensive and resource intensive.	'On' year is resource intensive. Risk losing capacity during 'off' years (AFMA/CSIRO/RAGs). No flexibility to shift assessments between years. Data analysis unavailable 2/3 years.[3]	Longer MYTACS = increase risk/uncertainty. Less flexibility to shift assessments between years. Data analysis unavailable 1/2 years.[3]

Flexibility

While best endeavours are taken to plan for stock assessments, it is often the case that stock assessments are brought forward, postponed, or even cancelled to allow for higher priority stock assessments or research priorities to be undertaken. The status quo and SMARP Alternative approach provide flexibility to

[2] For stock assessment purposes. RAGs will still be held on 'off' years to address other priorities.
[3] AFMA to automate certain components of the data review process.

move assessments between years where required. However, the SMARP approach requires that all assessments be completed every three years, with no processing of data in interim years. This approach would not allow for stock assessments to be shifted between years.

Monitoring

A key requirement of the existing HSF, and a proposed component of the revised multi-species HSF, is to monitor fishery indicator data (not to be confused with indicator *species*) between assessment years for species managed under multi-year TACs or without regular assessments. Over time, this has evolved from monitoring species-specific breakout rules (e.g., CPUE trends, length frequency distributions) to now using a decision tree support tool that asks a series of high-level questions (e.g., stock status, % TAC caught) to identify species or stocks that require management intervention between assessments. If a species is identified as needing closer scrutiny of the indicator data, a working group is convened to review the available data. If the working group resolves that management intervention is required, advice is sought from the relevant advisory committee.

Under the SMARP and SMARP Alternative scenarios, data processing, and therefor provision of standardised CPUE, discard estimates, and data summaries, will not be available in the 'off' years. A key recommendation from the SMARP project was that AFMA automate components of the data summaries to support a review of fishery indicator data in 'off' years.

At this stage, AFMA do not have the capacity to produce standardised CPUE reports or to apply the methodology to estimate discards, particularly without having processed the logbook data. However, a simpler summary of species-specific information such as stock status, catch, biological data and sampling coverage can be produced. AFMA has drafted an example of what can be automated and presented to the relevant RAGs during the 'off' years (See **Attachment B** to Agenda Item 9). It is important to consider how this AFMA report compares to CSIRO reports of the same year, noting that the data cleaning process currently employed by CSIRO would not be a component of the AFMA process.

Under each of the proposed schedules, there would be years without up-to-date standardised CPUE or discard estimates. Below, we explore the implications of only having this information available every second year.

Standardised CPUE

Notwithstanding the issues related to fishery-dependent data, CPUE is a key input and the primary indicator of abundance for most quota species in the SESSF. Currently, CPUE standardisations are updated on an annual basis and used in stock assessments, or as an indicator of stock abundance for species without assessments in that year.

Under the proposed SMARP Alternative scenario, CPUE standardisations are completed every second year when stock assessment that rely on CPUE are scheduled. Stock assessments for orange roughy are scheduled for the 'off' years as these assessments[4] do not rely on CPUE data. The school shark CKMR model has similar data and biological parameter requirements to those of a conventional stock assessment model but does not require CPUE (or any other index of relative abundance) (Thomson, et al., 2020).

Standardised CPUE data will not be available in the 'off' years to support the current MYTAC review process - described in the document Monitoring MYTAC species in the SESSF. Each year, MYTAC species are assessed against a series of questions designed to highlight species which might require further scrutiny by

[4] Assessment options for non-eastern orange roughy stocks to be discussed at SESSFRAG 30-31 August 2023.

the relevant RAG between scheduled assessments. The first step is informed by readily available information such as total catch, stock status, and which year of the agreed MYTAC the stock is in. When a species has been flagged as requiring further scrutiny, fishery indicator data is reviewed before deciding whether RAG advice is required. Fishery indicator data may include:

- catch per unit effort (CPUE),
- total fishing mortality (from total catches, discards, catches in other fisheries or jurisdictions),
- size and age structure, or
- economic factors (for species under calculated economic target reference points).

In most cases, the long-term trend is more informative than a single CPUE point. Where a CPUE point is not available for the year in which a species is flagged under the MYTAC review process, other indicator data, including longer-term CPUE trends, recent geometric CPUE, or length frequency information can be reviewed.

Discards

Currently, discards are calculated each year using the Bergh (2009) method and are derived from observed discards and logbook data. AFMA use model-derived discard estimates for species with Tier 1 assessments. For other species, a four-year weighted average is used to predict the following years discards and is deducted from the Recommended Biological Catch along with other sources of mortality, including state catch and any research catch allowance (RCA), to determine a Total Allowable Catch (TAC). Discards are also one of the fishery indicators considered under the MYTAC review process described above.

The Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES) also use discard estimates (model-derived and 'Bergh' estimates) to inform the annual status determination for SESSF-managed species.

To understand the implications of updating discards estimates at different intervals, four different methods have been retrospectively compared for five species where the Bergh method is used to estimate discards:

1. **Current approach:** Estimates are updated annually, and a four-year weighted average is deducted from the RBC.
2. **Annual updates:** Estimates are updated annually but averages are not applied. The most recent year's estimate is deducted from the RBC
3. **Two-year updates:** Estimates are updated biennially, and a four-year weighted average is deducted from the RBC for the next two years.
4. **Four-year updates:** Estimates are updated every four years, and a four-year weighted average is deducted from the RBC for the next four years.

The results of a retrospective analysis, applied to five example species/groups using the four methods described above, and historical discard estimates from 2003-2022, is provided at Figure 1. The cumulative discard estimates for each species/group over the same period is then presented at Figure 2, with the difference between the two-year and four-year updates and the current approach provided at Figure 3.

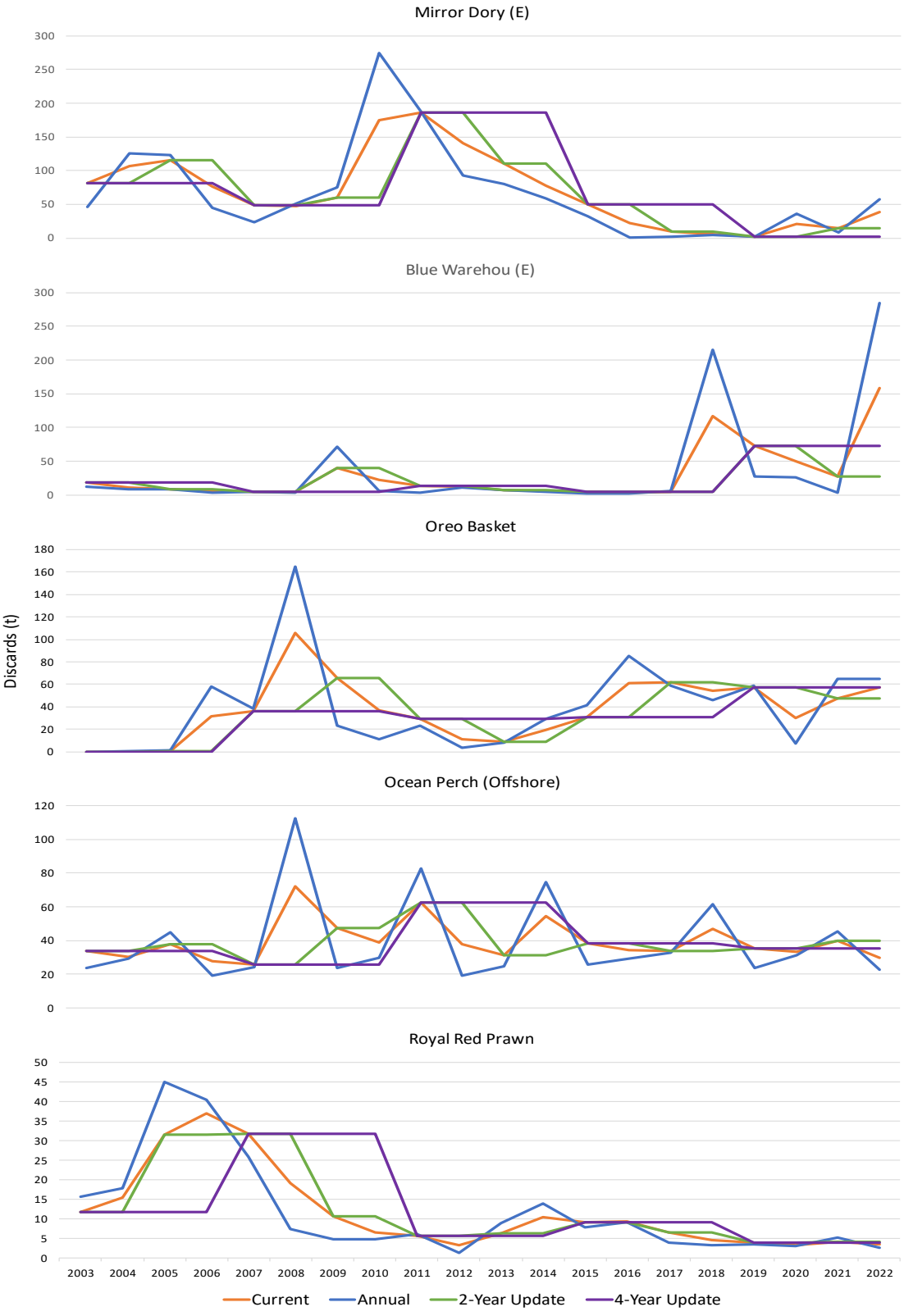

Figure 1 Time series of discard estimates derived using alternate years of available data

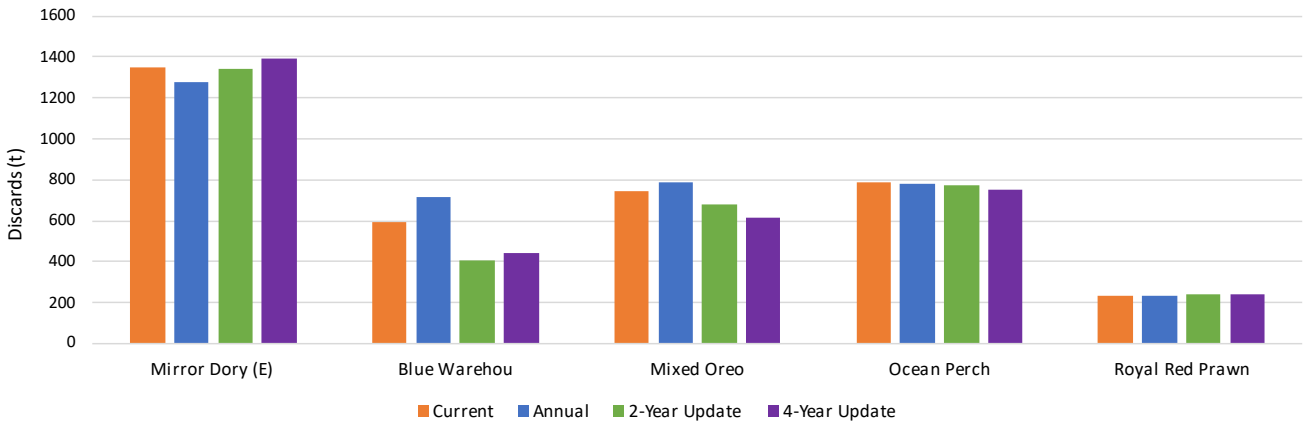

Figure 2 Cumulative discard estimates for the period 2003-2022 using alternate methods

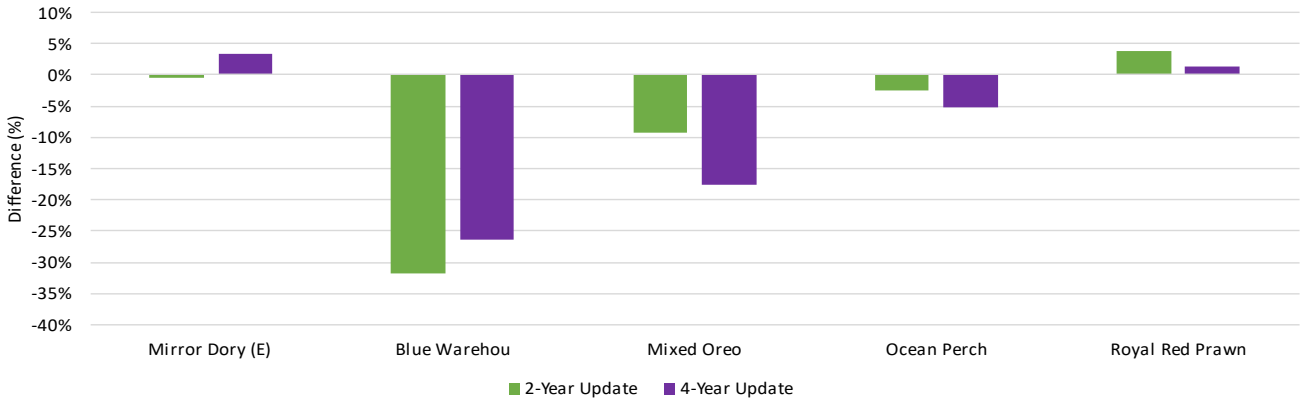

Figure 2 Comparison of cumulative discards for the period 2003-2022 using the 2-Year and 4-Year methods with the current approach.

With the exception of blue warehou, which is subject to large inter-annual variation in discard estimates, application of the '2-Year Update' approach results in less than a 10% difference in cumulative discards compared to the current approach, whereas application of the '4-Year Update' approach results in less than a 18% difference over the 2003-2021 period.

Accounting for risk under 4-Year MYTACs

Quota species in the SESSF were initially assessed on an annual basis. In 2010, the AFMA Commission agreed to the use of certain criteria and principles to set TACs across multiple years, as outlined in the current Harvest Strategy Framework. This approach was a means to reduce overall costs and time pressure on the management framework. Most species are currently managed under a 3-year MYTAC.

The proposal to transition from 3-year MYTACs to 4-year MYTACs under the revised assessment schedule comes with a level of risk. A project is currently underway to explore time-induced discount factors to mitigate the risk associated with increasing uncertainty with prolonged periods between stock assessments. In the meantime, it is important to understand the potential risks associated with extending the existing MYTACs for each species in the SESSF, and whether this risk needs to be mitigated while a more formal approach is developed.

While discounting TACs to account for longer MYTACs could be considered for some species, this is unlikely to have a material impact on catches. Of the 34 species/stocks for which TACs were determined during the 2022-23 SESSF season, twenty-one were less than 50% caught, nine were 50-75% caught, and only four were more than 75% caught; Blue-eye Trevalla, Eastern Orange Roughy, Gummy Shark and School Shark (Figure 4).

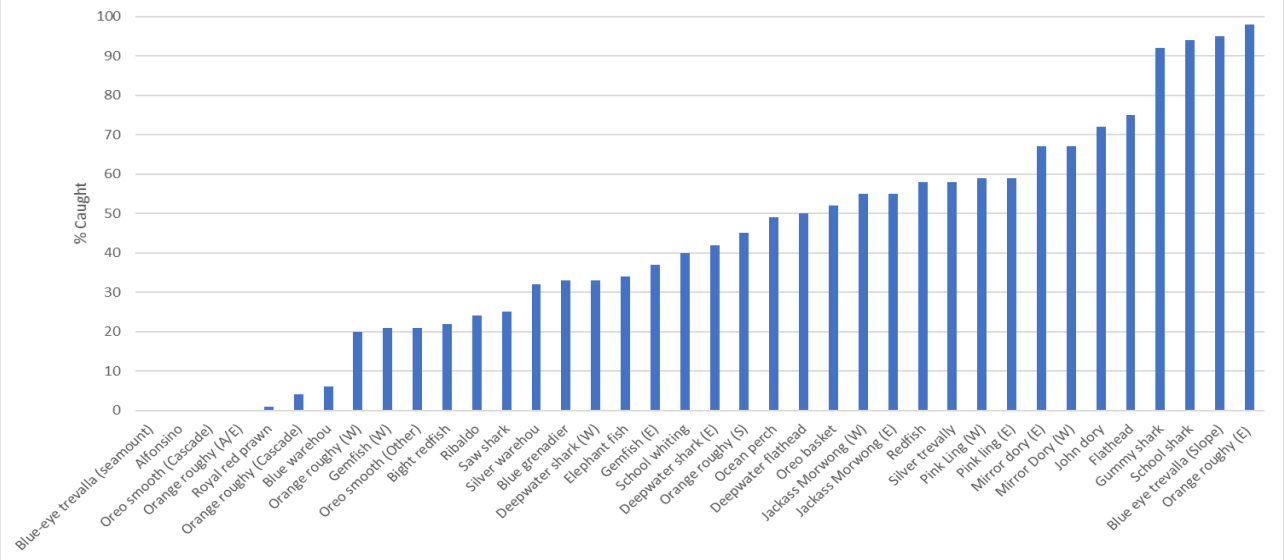

Figure 3 Percentage of 2022-23 TACs caught for SESSF quota species

Of the four species with TACs more than 75% caught, three are unlikely to benefit from or require the application of a discount factor. The School Shark TAC is based on unavoidable catch when targeting gummy shark, so a discount is unlikely to reduce total mortality; the Orange Roughy TAC is based on Markov Chain Monte Carlo (MCMC) projections that show the risk of exceeding the LRP is very low, particularly for such a long-lived species; and Blue-eye Trevalla is flagged as a species to be managed under a 2-Year MYTAC.

SESSFRAG Recommendations

SESSFRAG agreed to the following[5]:

1. Adopt species grouping criteria and triggers detailed at Table 1 as an interim approach until the MSHS approach is formalised. Trigger species currently scheduled for 'weight of evidence' update in 2023[6] will not be undertaken.
2. Implement the 'SMARP Alternative' stock assessment and data analysis scenario, including:
    a. proposed changes to 2024 and 2025 assessments and data processing requirements[7],
    b. reset the stock assessment schedule from 2026 based on 2 or 4-year MYTACs,
    c. undertake CPUE standardisation biennially from 2024,
    d. update discard estimates every four years from 2024 and apply a weighted average for the purpose of calculating TACs, and

[5] Minutes from the August 2023 Data meeting - https://www.afma.gov.au/fisheries-committees/southern-and-eastern-scalefish-and-shark-fishery-resource-assessment-group

[6] Smooth Oreo (Cascade), Smooth Oreo (non-Cascade), Elephant fish, and Alfonsino.

[7] Blue grenadier Tier 1 assessment to remain in 2025. Approach to silver warehou 'partial update' to be discussed at SERAG 2023.

e. consider the need for discounted RBCs in the context of recent catches and overall risk on a case-by-case basis.

In doing so, SESSFRAG noted:

- The SMARP Alternative schedule is supported subject to other processes playing out, including the review of the Commonwealth Harvest Strategy Policy, implementing the MSHS, and consideration of dynamic reference points and application of discount factors.
- Application of discount factors should not be ad-hoc. A set of guiding principles should be developed to ensure consistent application across RAGs and species. This is being considered as part of the CSIRO project.

Status Quo

RAG	Area	Component	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
GABRAG		Bight redfish			1			1			1			1			1
		Deepwater flathead	1			1			1			1			1		
		Orange roughy - Albany & Esperance			3			3			3			3			3
SERAG	Shelf	Flathead			1			1			1			1			1
		School whiting		1			1			1			1			1	
		Mirror dory	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
		Ocean perch		4			4			4			4			4	
		Jackass morwong		1													
		Blue warehou															
		John dory			3												
		Redfish															
		Silver trevally	4														
	Slope	Blue grenadier			1			1			1			1			1
		Pink ling		1			1			1			1			1	
		Silver warehou		1			1			1			1			1	
		Blue eye trevalla (Slope)	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
		Royal red prawn		4			4			4			4			4	
		Blue-eye trwevalla (seamount)		5			5			5			5			5	
		Alfonsino	WOE	WOE	WOE	WOE	WOE	WOE	WOE	WOE	WOE	WOE	WOE	WOE	WOE	WOE	WOE
		Ribaldo	4				4			4			4			4	
		Gemfish - west			4			4			4			4			4
		Gemfish - east															
	Deep	Orange roughy - east		1			1			1			1			1	
		Orange roughy - Cascade Plateau	WOE	WOE	3	WOE	WOE	WOE	WOE	WOE	WOE	WOE	WOE	WOE	WOE	WOE	WOE
		Oreo basket		4			4			4			4			4	
		Deepwater shark east	4			4			4			4			4		
		Deepwater shark west	4			4			4			4			4		
		Oreo smooth - cascade	WOE	WOE	3	WOE	WOE	WOE	WOE	WOE	WOE	WOE	WOE	WOE	WOE	WOE	WOE
		Oreo smooth - other	WOE	WOE	WOE	WOE	WOE	WOE	WOE	WOE	WOE	WOE	WOE	WOE	WOE	WOE	WOE
		Orange roughy - South															
		Orange roughy - west															
SharkRAG		Gummy shark	1			1			1			1			1		
		School shark		1			1			1			1			1	
		Saw shark		4		4			4			4			4		
		Elephant fish	WOE			WOE			WOE			WOE			WOE		
RAG	**Area**	**Species**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	**2036**	**2036**
Data Analyses		Data Processing	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		CPUE	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		Disc	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		Data Sum	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		Catch Sum	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		Ageing	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Annual bycatch TAC - Metier Analyses as required - Assessment as required (if possible)

SMARP

RAG	Area	Species	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
GABRAG		Bight redfish			→	1			1			1			1		
		Deepwater flathead	1			1			1			1			1		
		Orange roughy - Albany & Esperance			3				3			3			3		
SERAG	Shelf	Flathead			→				1			1			1		
		School whiting		1		1			1			1			1		
		Mirror dory	4	4	4	4			4			4			4		
		Ocean perch		4		4			4			4			4		
		Jackass morwong		1													
		Blue warehou															
		John dory		3													
		Redfish															
		Silver trevally	4														
		Annual bycatch TAC - Metier Analyses as required - Assessment as required (if possible)															
	Slope	Blue grenadier		1	←	1			1			1			1		
		Pink ling		1		1			1			1			1		
		Silver warehou		Update		1			1			1			1		
		Blue eye trevalla (Slope)	4	4	4	4			4			4			4		
		Royal red prawn				4			4			4			4		
		Blue-eye trwevalla (seamount)				5			5			5			5		
		Alfonsino	WOE			WOE			WOE			WOE			WOE		
		Ribaldo	4			4			4			4			4		
		Gemfish - west			4				4			4			4		
		Gemfish - east															
		Annual bycatch TAC - Metier Analyses as required - Assessment as required (if possible)															
	Deep	Orange roughy - east		→	1				1			1			1		
		Orange roughy - Cascade Plateau	WOE		3				3			3			3		
		Oreo basket		4		4			4			4			4		
		Deepwater shark east	4			4			4			4			4		
		Deepwater shark west	4			4			4			4			4		
		Oreo smooth - cascade	WOE		3	WOE			WOE			WOE			WOE		
		Oreo smooth - other	WOE			WOE			WOE			WOE			WOE		
		Orange roughy - South															
		Orange roughy - west															
		Annual bycatch TAC - Metier Analyses as required - Assessment as required (if possible)															
SharkRAG		Gummy shark	1			1			1			1			1		
		School shark		1		1			1			1			1		
		Saw shark		4		4			4			4			4		
		Elephant fish	WOE			WOE			WOE			WOE			WOE		
RAG	Area	Species	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
Data Analyses		Data Processing	1	1		1			1			1			1		
		CPUE Standardisations	1	1		1			1			1			1		
		Discard Estimation	1	1		1			1			1			1		
		Data Summary	1	1		1			1			1			1		
		Catch Summary	1	1		1			1			1			1		
		Ageing	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

SMARP Alternative

RAG	Area	Species	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
GABRAG		Bight redfish			→	1				1				1			
		Deepwater flathead	1					1				1				1	
		Orange roughy - Albany & Esperance			3				3				3				
SERAG	Shelf	Flathead			→	1				1				1			
		School whiting		1		1		Update		1		Update		1		Update	
		Mirror dory	4	4	4	4		4		4		4		4		4	
		Ocean perch		4													
		Jackass morwong		1													
		Blue warehou															
		John dory		3													
		Redfish															
		Silver trevally	4														
	Slope	Blue grenadier		1	←			1				1				1	
		Pink ling		1				1				1				1	
		Silver warehou		Update		1		1				1				1	
		Blue eye trevalla (Slope)	4	4	4	4		4		4		4		4		4	
		Royal red prawn	4					4				4				4	
		Blue-eye trwevalla (seamount)															
		Alfonsino	WOE														
		Ribaldo	4														
		Gemfish - west			4												
		Gemfish - east															
	Deep	Orange roughy - east		→	1		Update				1				1		
		Orange roughy - Cascade Plateau	WOE		3						3				3		
		Oreo basket		4				4				4				4	
		Deepwater shark east	4														
		Deepwater shark west	4														
		Oreo smooth - cascade	WOE		3												
		Oreo smooth - other	WOE														
		Orange roughy - South															
		Orange roughy - west															
SharkRAG		Gummy shark	1			1				1				1			
		School shark		1			1				1				1		
		Saw shark		4													
		Elephant fish	WOE														
RAG	Area	Species	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
Data Analyses		Data Processing	1	1		1		1		1		1		1		1	
		CPUE Standardisations	1	1		1		1		1		1		1		1	
		Discard Estimation	1	1				1				1				1	
		Data Summary	1	1		1		1		1		1		1		1	
		Catch Summary	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		Ageing	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Trigger

Annual bycatch TAC - Metier Analyses as required - Assessment as required (if possible)

Trigger

Annual bycatch TAC - Metier Analyses as required - Assessment as required (if possible)

TBC

Trigger

Annual bycatch TAC - Metier Analyses as required - Assessment as required (if possible)

Trigger

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