2021 review of the ESD risk assessment of the South Australian Gulf St Vincent Prawn Fishery

2021

Government of South Australia
Department of Primary Industries and Regions

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Information current as of 22 December 2021

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Contents

Background

A five-year Management Plan for the South Australian Commercial Gulf St Vincent Prawn Fishery (GSVPF) came into effect on 1 July 2017 and expires on 30 June 2022. The Minister for Primary Industries and Regional Development approved a review of this management plan on 24 February 2021 for the purpose of determining whether the management plan should be amended, replaced or reinstated without amendment. The outcome of this review was to replace this management plan, and the Minister requested, the Department of Primary Industries and Regions (PIRSA) to develop a draft management plan for this purpose with feedback provided by the Gulf St Vincent Prawn Fishery Management Advisory Committee (GSVPFMAC).

Section 43(2) of the *Fisheries Management Act 2007* requires a management plan for a fishery to:

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.

The '2016 ESD risk assessment of South Australia's Gulf St Vincent Prawn Fishery (GSVPF)' provided a comprehensive analysis of the impacts and potential impacts of the fishing activity, as well as identifying ecological factors that could impact on the performance of the fishery. This risk assessment informed the development of the 2017 management plan of the fishery.

This document updates the 2016 ESD risk assessment for the GSVPF through consideration of new information relevant to risks to and from the GSVPF that has become available since the 2016 assessment. New information was considered, and if that new information would change the ratings of risks identified in the 2016 assessment, a new risk assessment was conducted. In addition, where a new risk was identified this risk was included. Only those risks required for a management plan under the *Fisheries Management Act 200*7 were reviewed and updated in this 2021 review.

Method

Consistent with requirements for risks identified in management plans under the Act, this updated risk assessment only considers and reports on the impacts or potential impacts of the fishery on its associated ecosystem or ecosystems, and ecological factors that could have an impact on the performance of the fishery. All other components of the 2016 risk assessment were not reviewed or updated and are not included in this document.

This ESD risk assessment of the GSVPF used the national ESD reporting framework for all components with PSA (Level 2 of the ERAEF) informing risk ratings for the species components where applicable.

An initial review was conducted internally between PIRSA and SARDI to collate new information and consider changes to risk ratings that account for the new information. A draft risk assessment was presented to the Gulf St Vincent Prawn Fishery Management Advisory Committee (GSVPFMAC)[1] on 1 December 2021 with risk ratings updated where new information was provided. An updated draft of the 2021 risk assessment review will be provided to other stakeholders[2] in December 2021. These stakeholders are requested to provide feedback to the draft document. PIRSA will take this feedback into account in finalising this document.

National ESD Reporting Framework for Fisheries

The '*National ESD Reporting Framework for Fisheries*' developed by Fletcher et al. (2002) was used to assess the risks for general ecosystem impacts and external impacts on industry. The method used to assess risks with this framework are described in the 'ESD Risk Assessment of South Australia's Gulf St Vincent Prawn Fishery' (PIRSA 2016).

Productivity and Susceptibility Analysis (PSA)

The 2016 risk assessment for the GSVPF utilised outcomes for the species components for the Spencer Gulf Prawn Fishery (SGPF) in the absence of specific by-catch survey information from the GSVPF. The risk outcomes for these components were informed from a PSA report of individual target, by-product, discard and TEP species recorded from a 2007 SGPF trawl by-catch survey (Currie et al. 2009).
The PSA approach assumes the risk to an ecological component will depend on:

1. the productivity of the species, which will determine the rate at which it can recover after potential depletion or damage by fishing activity; and
2. the extent of the impact due to the fishing activity, which will be determined by the susceptibility of the species to the fishing operations of the fishery.

PSA in this assessment was considered as a screening process to identify species that are at potential risk and require further consideration.

An update to this PSA analysis undertaken for the SGPF in 2019 was available to inform this 2021 risk assessment for the GSVPF including:

- Species identified in a 2013 SGPF by-catch survey (Burnell et al. 2015);
- EPBC Act-listed and cetacean species reported in interactions with the SGPF between 2014 and 2019;
- Revised PSA scores, where applicable, for 2007 bycatch survey species previously assessed as high or medium risk.

For specific information on the PSA method applied, refer to pages 28 to 31 of the '2014 ESD risk assessment for the Spencer Gulf Prawn Fishery' (PIRSA 2014).

The 2014 PSA was updated (from a previous assessment of 195 species caught on a SGPF by-catch survey in 2007) to assess an additional 18 species including 16 species identified on a 2013 SGPF by-catch survey (including 1 EPBC Act-listed species), and another 1 listed species and 1 cetacean species of conservation interest reported to have been involved in an interaction with the SGPF based on logbook data. PSA of the additional 17 species identified 1 species assessed as high risk, 12 species as moderate risk and 4 species as low risk.

[1] The GSVPFMAC is the recognised advisory body to Government regarding management of the GSVPF. The GSVPMAC membership includes an independent chair, and independent scientist, two industry members, PIRSA and SARDI.
[2] External Stakeholders include Conservation Council of South Australia and the Department for Environment and Water.

Risk Ratings

From the consequence and likelihood scores, the overall risk value was calculated (i.e. risk = consequence x likelihood). The calculated risk values were then linked to one of the colour-coded risk categories, the relationship for which is illustrated by a risk matrix (see Table 1).

Table 1: Risk matrix of consequence and likelihood, the numbers in the cells indicate the risk value, and the colours indicate risk categories

		Consequence Level				
Likelihood Levels		Negligible	Minor	Moderate	Major	Extreme
		0	1	2	3	4
Negligible	0	0	0	0	0	0
Remote	1	0	1	2	3	4
Unlikely	2	0	2	4	6	8
Possible	3	0	3	6	9	12
Likely	4	0	4	8	12	16

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

Results

Retained Species

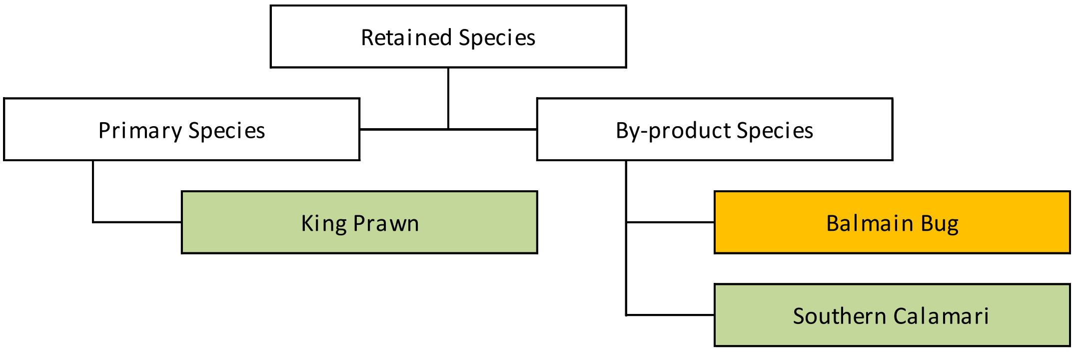
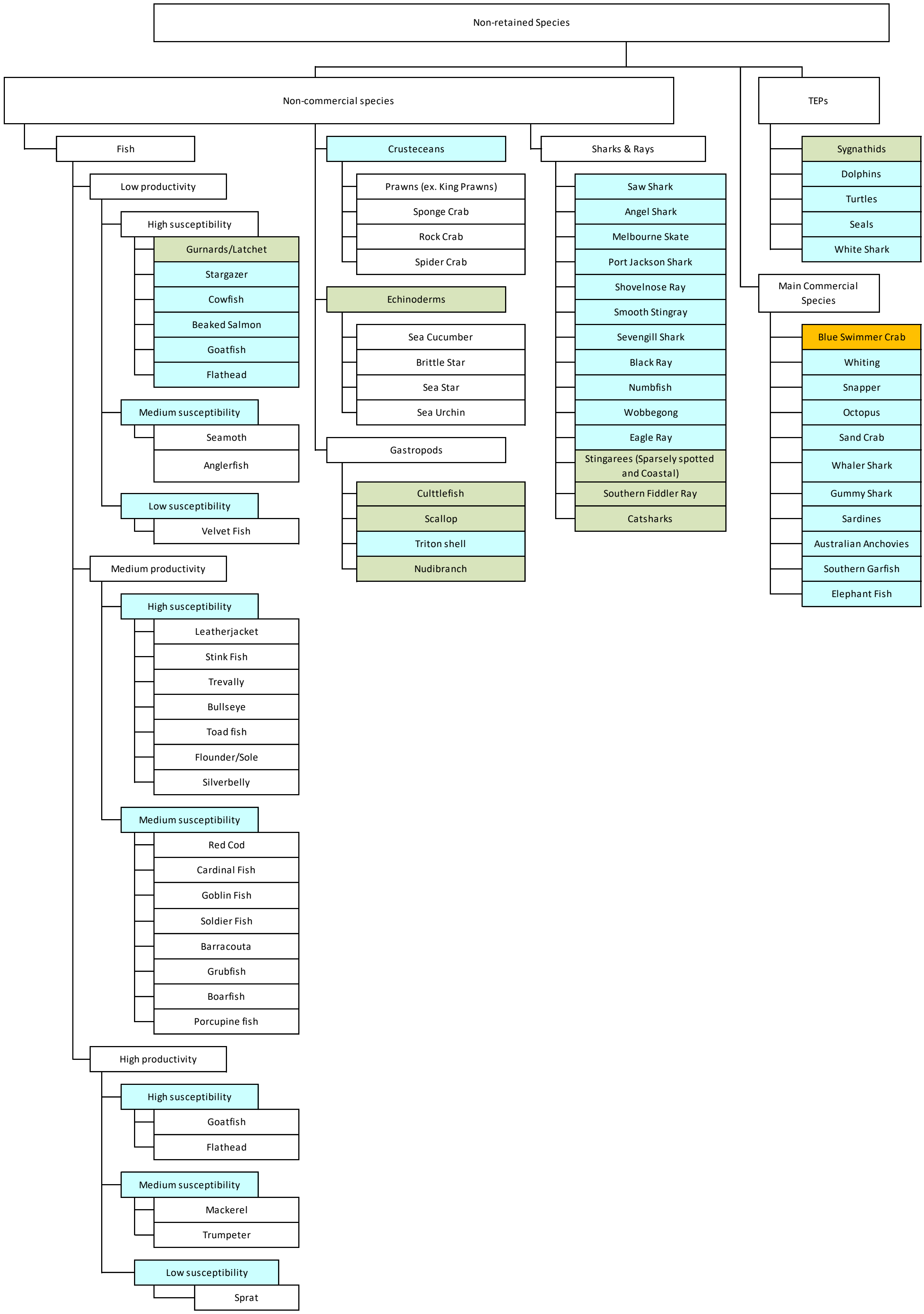


Table 2: Risk Assessment outcomes for retained species

Component	Objective	Risk Rating	Reasoning
Primary species			
King Prawn	Maintain biomass at sustainable stock status over the next 5 years	Consequence 2 Liklihood 2 Risk score 4 Low	• The most recent stock assessment report for the fishery (McLeay and Hooper 2020) classifies the stock as sustainable. • Bioeconomic modelling outcomes undertaken by SARDI indicate the GSVPF King Prawn stock has never been reduced to biomass estimates less than 60% B_0 over the last 25 years (SARDI in preparation) • An independent review of the bioeconomic modelling for this fishery was reviewed by Prof Tony Smith and found to adequately model the fishery.
By-product species			
Balmain Bug	Maintain biomass at sustainable stock status over the next 5 years	Consequence 3 Liklihood 2 Risk score 6 Moderate	• No new information was available for this species • Susceptible to localised depletion • Minimal movement • Localised levels of reproduction and recruitment • Low productivity, long lived • High post capture survival • Taken as by-catch in the GSVPF • Take of Balmain Bug is reported on unload reports and monitored by PIRSA and has been stable • Stock biomass of Balmain Bug in GSV is unknown • Overall catch of Balmain Bug by all SA Prawn Fisheries has been monitored and overall harvest has resulted in a negligible status (not exceeded 5t averge per year) (SAFS report).

Southern Calamari		Consequence 1 Likelihood 3 Risk score 3 **Low**	• The most recent stock status report for the Marine Scalefish Fishery (Steer 2018) classifies the stock as sustainable. • No significant change over last 8 years for Calamari bycatch • Performance indicators for the GSV Calamari stock is included in the management plan for the Marine Scalefish Fishery. • Allocation of calamari to GSVPF is 4.5%. Noted GSVPF exceeded its allocation in 2016/2017/2018 but haven't breached the identified triggers. • High distribution • Serial spawner • Short life span

Non-Retained Species



Considered updated PSA for Spencer Gulf Prawn Fishery (SGPF), including new species included in that analysis (Table 8). Reasons for 2021 risk rating are provided in Table 3.

The following information detailed in the previous assessment was considered unchanged in this review of the assessment.

> *"GSVPF handling practices, including the use of a hopper system was considered highly important in reducing the post capture mortality of all non-retained species. It has been shown hoppers can contribute significantly to improving short-term bycatch survival. They produce less mortality due to their mode of operation and enable the discard of bycatch back to sea in the shortest turn-around time. A greater number and diversity of animals appeared to survive (Dell et al. 2003). The use of the T90 cod end and the bycatch reduction devices were introduced in March 2012. FRDC project 2009/069 showed with the adoption of the new gear technologies the bycatch in the fishery will potentially be significantly reduced (Dixon et al. 2012)"*

Table 3: 2021 : Risk Assessment outcomes for non-retained species

Component	Objective	Risk Rating	Reasoning
Fish - Low Productivity – High susceptibility			
gurnards/ latchets	Maintain appropriate levels of biomass of by-catch species to minimise any significant impact on their dynamics in the next 5 years	Gurnard Perch C2xL2 (4) Low Other Species C1xL1 Negligible	SGPF- PSA updated increased risk for Gulf Gurnard Perch. Gulf Gurnard Perch considered high risk in SGPF risk assessment Considered new PSA for gurnards and latchets, consdering change to PSA score for Gulf Gurnard Perch changed risk ratings for this species to consequence level 2 noting hoppers and T90 significantly reduce bycatch mortality. Risk rating for other species remained unchanged.
stargazer		C1L2 Negligible	No new information. Risk rating retained
cowfish		C1L2 Negligible	No new information. Risk rating retained
beaked salmon		C1L1 Negligible	No new information. Risk rating retained
Low Productivity – Medium susceptibility			
seamoth		C1L1 Negligible	No new information. Risk rating retained
anglerfish		C1L1 Negligible	No new information. Risk rating retained
velvet fish		C1L1 Negligible	No new information. Risk rating retained
Medium Productivity – High susceptibility			
leatherjacket		C1L1 Negligible	No new information. Risk rating retained
stink fish		C1L1 Negligible	No new information. Risk rating retained

high susceptibility - trevally		C1L1 Negligible	No new information. Risk rating retained
bulls eye		C1L1 Negligible	No new information. Risk rating retained
toad fish		C1L1 Negligible	SGPF- PSA updated reduced risk. Considered new PSA outcomes did not change risk. Risk rating retained.
flounder/ sole		C1L1 Negligible	No new information. Risk rating retained
silverbelly		C1L1 Negligible	No new information. Risk rating retained
Medium Productivity – Medium susceptibility			
red cod		C1L1 Negligible	No new information. Risk rating retained
cardinal fish		C1L1 Negligible	No new information. Risk rating retained
goblin fish		C1L1 Negligible	No new information. Risk rating retained
solider fish		C1L1 Negligible	No new information. Risk rating retained
barracouta		C1L1 Negligible	No new information. Risk rating retained
grub fish		C1L1 Negligible	No new information. Risk rating retained
boarfish		C0(0) Negligible	No new information. Risk rating retained
porcupine fish		C0(0) Negligible	No new information. Risk rating retained
High Productivity – High susceptibility			
goat fish		C2L1(2) Negligible	Minimal catch compared to stock
flathead		C2L1(2) Negligible	Minimal catch compared to stock
High productivity – medium susceptibility – all		C1L1(1) Negligible	Minimal catch compared to stock
High productivity – low susceptibility – all		C0(0) Negligible	Minimal catch compared to stock
Crustaceans			
Prawns (excluding King Prawn)	Maintain appropriate levels of biomass of by-catch species to minimise any significant impact on their dynamics in the next 5 years	C0(0) Negligible	T90 cod end Hopper system High survival
Sponge Crabs		C0(0) Negligible	Hopper system High survival BRD grid
Rock Crabs		C0(0) Negligible	Hopper system High survival
Masked burrowing Crab		C1L1 (1)	Hopper system

		Negligible	Survival post capture mortality = 3 SGPF PSA RA indicates moderate risk Limited data but same as last assessment. Considered new information did not change the risk rating score.
Spider Crabs		C0(0) Negligible	Hopper system High survival BRD grid
Echinoderms			
Sea cucumber	Maintain appropriate levels of biomass of by-catch species to minimise any significant impact on their dynamics in the next 5 years	Low	No new information. Risk rating retained
Brittle star		Low	No new information. Risk rating retained
Sea Star		Low	No new information. Risk rating retained
Sea urchin		Low	No new information. Risk rating retained
Gastropods-			
Cuttlefish	Maintain appropriate levels of biomass of by-catch species to minimise any significant impact on their dynamics in the next 5 years	Low	No new information. Risk rating retained
Scallop		Low	Limited information to assess High survival SGPF PSA outcome reduced to low risk for Queen Scallop. Risk rating retained
Triton		C0(0) Negligible	High survival No new information. Risk rating retained
Nudibranch		Low	High survival T90 cod end No new information. Risk rating retained
Sharks & Rays			
Saw Shark	Maintain appropriate levels of biomass of by-catch species to minimise any significant impact on their dynamics in the next 5 years	C0(0) Negligible	Found from Eyre on the Great Australian Bight to Narooma to 110 m (Last & Stevens 2009) Bycatch reduction grid limits catches No new information. Risk rating retained
Southern Fiddler Ray		C1L4(4) Low	Found from eastern Bass Strait to Lancelin from 30 to 205 m (Last & Stevens 2009) Bycatch reduction device limits catch No new information. Risk rating retained
Stingarees (sparsley spotted and coastal)		C2L2(4) Low	Sparsely spotted - Due to problem identifying stingarees species were grouped together

			Widely distributed on the continental shelf off southern Australia from Crowdy Head to Lancelin (Last & Steven 2009) Bycatch reduction device may limit catches Coastal - Found off South Australia only between Ceduna and Beachport, depths 20 – 50 m (Last & Steven 2009) Updated SGPF PSA indicated reduced risk for Sparsely spotted stingaree and Coastal stingaree Bycatch reduction device may limit catches Considered new information did not change the risk rating score. Remain as a Low risk
Angel Shark		C0(0) Negligible	Bycatch reduction grid limits catches No new information. Risk rating retained
Melbourne Skate		C0(0) Negligible	Mainly found on the continental shelf between Sydney and Albany, to 345 m (last & Stevens 2009) Bycatch reduction grid limits catches No new information. Risk rating retained
Port Jackson Shark		C0(0) Negligible	Bycatch reduction grid limits catches High survivability No new information. Risk rating retained
Catsharks (Rusty and Gulf)		C1L3(3) Low	Rusty - Found from Gabo Island to Albany (south coast of Australia only), from 5 to 150 m (Last & Stevens 2009), therefore in prawn trawling depth range Bycatch reduction device may limit catches Bycatch reduction device may limit catches No new information. Risk rating retained
Shovelnose Ray		C0(0) Negligible	Found from Kent Islands to Port Headland to 125 m (Last & Stevens 2009). Bycatch reduction grid limits catch No new information. Risk rating retained
Smooth Stingray		C0(0) Negligible	Found in Australia, New Zealand and southern Africa.

			Bycatch reduction grid limits catch No new information. Risk rating retained
Sevengill Shark		C0(0) Negligible	Found temperate waters across south Atlantic, Pacific and Indian oceans Bycatch reduction grid limits catch No new information. Risk rating retained
Black Ray		C0(0) Negligible	Found in Australia, northern New Zealand and south-eastern Africa. In Australia found from Moreton Island to the North West Shelf to 360 m (Last & Stevens 2009) Bycatch reduction grid limits catch No new information. Risk rating retained
Numbfish		C0(0) Negligible	Found from Coffs Harbour to the Great Australian Bight and is found in ranges of depths from shore to 640 m (Last & Stevens 2009) Bycatch reduction grid may limit catch No new information. Risk rating retained
Wobbegong		C0(0) Negligible	Numerous species with various distribution ranges, none soley found off South Australia Bycatch reduction grid limits catch No new information. Risk rating retained
Eagle Ray		C0(0) Negligible	Found from Jurien Bay to Moreton Bay from shore to 130 m (Last and Stevens 2009) Bycatch reduction grid limits catch No new information. Risk rating retained
TEPS			
Sygnathids	Maintain appropriate levels of biomass of by-catch species to minimise any significant impact on their dynamics in the next 5 years	C2L2(4) Low	T90 cod end may increase escapement *Stigmatopora narinosa* and *Vanacampus vercoi* have smallest distribution; Gulf St Vincent, Spencer Gulf, Investigator Strait and Backstairs Passage (Sheperd et al 2008) No new information for GSV. Risk rating retained GSVPF bycatch report can provide further information on the species

Dolphins		C0(0) Negligible	Bycatch reduction grid limits catch. Updated SGPF PSA includes Common Bottlenose dolphins as high. No reports of interactions between the GSVPF and dolphins in recent years through Wildlife Interaction Logbook reports to 2019/20. Risk rating for dolphins retained. No new information. Risk rating retained
Turtle		C0(0) Negligible	Bycatch reduction grid limits catch No new information. Risk rating retained
Seals		C0(0) Negligible	Bycatch reduction grid limits catch No new information. Risk rating retained
White Shark		C0(0) Negligible	Bycatch reduction grid limits catch No new information. Risk rating retained
Main Commercial Species			
Blue Swimmer Crab	Maintain appropriate levels of biomass of by-catch species to minimise any significant impact on their dynamics in the next 5 years	C2L3(6) Moderate	Stock Status monitored by Blue Crab Fishery GSV stock sustainable –Beckmann & Hooper (2021) Bycatch reduction grid Good post capture survival Risk rating retained
Whiting		C1L1(1) Negligible	Stock status monitored by the MSF (Steer 2020) King George GSV/KI stock – Sustainable King George State wide: • commercial catch 2013 = 293t • recreational catch 2007/08 = 234t Minimal capture in GSVPF compared to other sectors Risk rating retained
Snapper		C1L1(1) Negligible	Stock Status monitored in MSF (Steer 2020) GSV stock status depleting Minimal catch compared to stock Bycatch reduction grid Risk rating retained
Octopus		C1L1(1) Negligible	Minimal catch compared to stock Minimal overlap of main stock Good post capture survival Risk rating retained
Sand Crab		C1L1(1) Negligible	Stock Status monitored in MSF Minimal catch compared to stock

			BRD grid High survival Risk rating retained
Whaler Shark		C0(0) Negligible	Stock Status monitored by MSF (Steer 2020) Bycatch reduction grid limits catch Minimal catch compared to stock Risk rating retained
Gummy Shark		C0(0) Negligible	Stock Status monitored in MSF (Steer 2020) Sustainable stock status Minimal catch compared to stock Bycatch reduction grid limits catchRisk rating retained
Sardines		C0(0) Negligible	Updated SGPF PSA indicted higher risk. Stock Status monitored by Sardine Fishery Sustainable stock(Ward et al 2020) TACC = 38,000 t Minimal catch compared to stock Risk rating retained
Elephant fish		C0(0) Negligible	Stock Status monitored by Commonwealth (Gillnet, Hook and Trap Fishery) Sustainable stock Commonwealth TACC = 109 t (considers State landings) Minimal catch compared to stock Bycatch reduction grid limits catch Risk rating retained
Anchovies		C0(0) Negligible	TACC = 1000 t (a long term sustainable TACC) Minimal catch compared to stock Risk rating retained
Garfish		C0(0) Negligible	Stock Status monitored by MSF (Steer 2020) North GSV stock status depleted Sth GSV stock status sustainable Minimal catch compared to stock Risk rating retained

Ecosystem effects

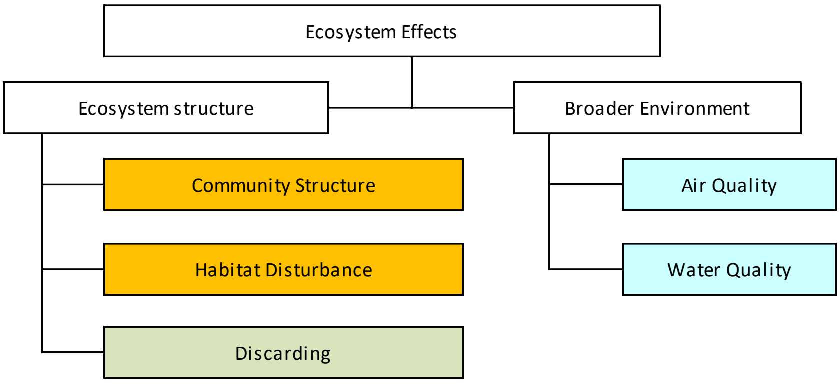


Table 4: : Risk Assessment outcomes for ecosystem effects

Component	Objective	Risk Rating	Reasoning
Ecosystem structure			
Community Structure	Maintain any extent of ecosystem impacts from the fishing activity to within acceptable levels during the next five years	C2L4(8) Moderate	Limited effort (fishing nights) Approximately 5 vessels now fishing Trawl on sand beds Trawled area where prawns are found are also inhabited by scavengers It is suspected that a significant amount of bycatch is consumed by scavengers Impact of fishing is sustainable as long there is a control on effort or similar One type of sea grass bed, if nominated under EPBC Act may need to be revisited Risk Rating retained
Habitat Disturbance		C2L4(8) Moderate	Some damage has already been done on trawled areas. Trawl on sand beds + Limited effort(fishing nights) One type of sea grass bed, if nominated under EPBC Act may need to be revisited Risk rating retained
Discarding		C1L4(4) Low	Driving scavenger community Relative to other prawn fisheries, this fishery does not have a large discard rate BRD grid and T90 reduces bycatch Risk rating retained
Broader environment			
Air quality	Maintain any extent of ecosystem impacts from the fishing activity to within acceptable levels during the next five years	C0(0) Negligible	Vessels surveyed 5 boats with limited effort now operating in the fishery Risk rating retained
Water quality		C0(0) Negligible	5 boats with limited effort now operating in the fishery Risk rating retained

External Factors impacting on the fishery

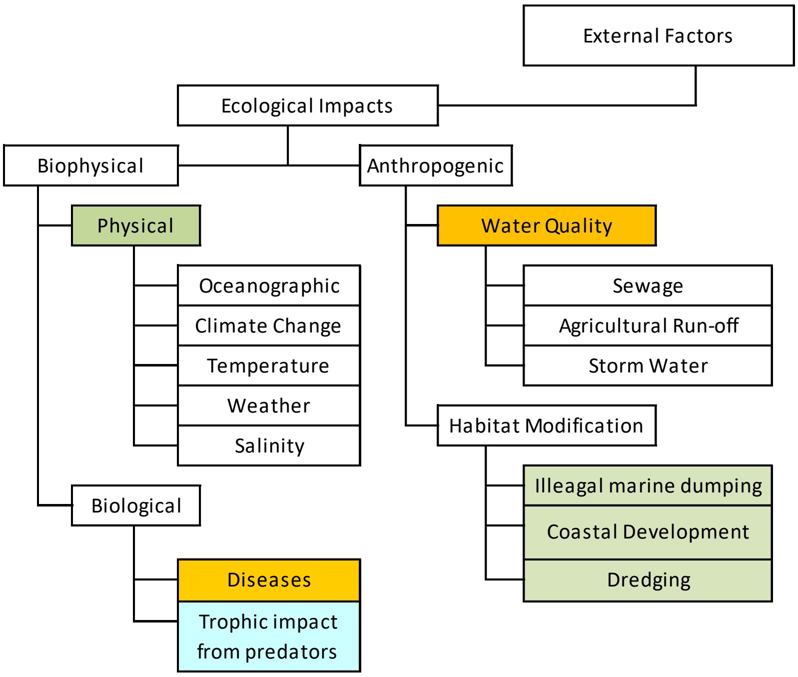


Table 5: : Risk Assessment outcomes for ecological impacts on the fishery

Component	Risk Rating	Reasoning
Biophysical - Physical	Low	Climate change – risk of impacts on bioregions (implications in terms of temp, weather and acidity/PH) CSIRO Oceans & Atmosphere – Regional Projection for Southern Australia (from the CSIRO-BOM State of Environment reporting, the CSIRO-BOM 2015 East Coast and Southern Slopes Cluster Report and the Marine Heatwaves Tracker
Biophysical – Biological - Disease	Consequence 3, likelihood 2 = Moderate	Current research Exotic disease risk Biosecurity plans Has been an outbreak of White Spot disease in QLD since the last assessment. No documented cases in GSV. POMS outbreak could reduce available fishing area through implementation of closed areas.
Biological – impact of predators on King Prawn stocks	Consequence 2, Likelihood 1 = Negligible	Goldsworthy et.al. *A trophic model for Gulf St Vincent – Balancing exploitation of three fisheries in an EBFM framework (2017).* Trophic level impact of increase in snapper stocks – in the north – crabs were the diet in the south of the gulf – prawns were the diet. Noting advice from SARDI that the Goldsworthy report indicates a low impact of snapper.

Anthropogenic – Water quality	Based on documented information, considered the worst impact from water quality issues impacting on the fishery was moderate (C2) as the impacts were likely to localized to small areas of the coastal areas and the likelihood is level possible (L3) resulting in a moderate risk Moderate	Fresh water input into ecosystem could impact mangroves and seagrass which is an important habitat for juvenile prawns. Risk of losing nursery habitat Bolivar Sewerage Treatment plant Desalination plant. Independent reports on water quality and infauna studies adjacent to the desalination plan indicates natural variations in water quality respond to seasonal, tidal and general environmental (e.g. weather) processes (Cheshire 2014) and infaunal communities are most likely affected by the spatial, and temporal variation of benthic habitats, rather than by the brine discharge from the desalination plant (Ditman et al 2017). Boliver High Salinity Sewage Treatmant Plan has been in operation since 2004. Discharge into the St Kilda outfall channel downstream of the outlet Weir No.1. It mixes with the Bolivar wastewater lagoon discharge and the combined flow is released into coastal waters north of Bolivar. The volume of discharges has been dramatically reduced in the last 10 years. Mangrove dieback reported in 2020/21 was localized
Anthropogenic – Habitat modification – Illegal marine dumping	Consequence level 1, Likelihood is level 3 Low	Large amount of illeagal and legal (dredge spoil) dumping Causing access issues and trawl net damage
Anthropogenic – Habitat modification – Coastal development and industrial land use	Consequence level 1, Likelihood is level 3 = Low	Impact of hypersaline run off on important mangrove habitats for juvenile prawns Noted mangrove dieback reported in 2020 was localized
Anthropogenic – Habitat modification – Dredging	Consequence level 1, Likelihood is level 3 possible = Low	Dredging spoil has been placed in the GSV within the last few years. Dredging spoil is planned to be placed in the GSV again re: Port River dredging. If dredging occurs in the next five years this could have a negative impact on prawn habitat (reduced area) and reduce productivity at the dumping area. Noted dredge spoil is dumped in a localised area, therefore impact on fishery is considered to be not across whole area of the fishery.

Risk Evaluation

A total of 64 issues associated with the South Australian GSVPF relevant to ecological components were scored for risk across four component trees: retained species, non-retained species, general ecosystem and external factors. The majority of issues were evaluated as moderate, low or negligible risk.

Table 6: Summary of risk ratings

Component Trees	High	Moderate	Low	Negligible	Total
Retained Species		1	2	0	3
Non-retained species		1	9	39	49
General Ecosystem		2	1	2	5
External Factors		2	4	1	7
Total	0	6	16	42	64

Performance reports

Table 7: Performance Report for High and Moderate Risks

Component	Risk/Issue	Description	Risk/ Importance	Objective	Strategies
Retained species	Balmain Bug	The risk of maintaining the biomass at a sustainable level	Moderate	Maintain biomass at sustainable stock status	Monitor harvest of Balmain Bugs
Non-retained species	Blue Swimmer Crab	The risk of fishery impacting on the biomass of by-catch species	Moderate	Maintain appropriate levels of biomass of by-catch species to minimise any significant impact on their dynamics	Monitor stock status of Blue Swimmer Crabs in GSV in assessment reports from commercial Blue Swimmer Crab Fishery
Ecosystem effects	Ecosystem structure, community structure	The risk of fishery impacting on the ecosystem	Moderate	Fishery impacts on benthic habitat and associated species communities are minimised	Monitor trawl effort in the fishery
	Ecosystem structure, habitat disturbance		Moderate		
External Factors	Biological – Disease	The risk of external factors impacting on the performance of the fishery	Moderate		Maintain communications with Biosecurity SA
	Anthropogenic, water quality		Moderate		Communicate with EPA where required

References

Cheshire A. (2014). Review of water quality profile monitoring licence conditions for the Adelaide Desalination Plant, June 2014. Report 6 in a series prepared for AdelaideAqua Pty Ltd by Science to Manage Uncertainty. pp: 12.

Currie, D. R., Dixon, C. D., Roberts, S. D., Hooper, G. E., Sorokin, S. J. & Ward, T. M. (2009). Fishery-independent by-catch survey to inform risk assessment of the Spencer Gulf Prawn Trawl Fishery. Report to PIRSA Fisheries. South Australian Research and Development Institute (Aquatic Sciences), Adelaide. SARDI Publication No. F2009/000369-1. SARDI Research Report Series No. 390.

Dittmann S., Baring R., Jessup-Case H., Lam O. (2017) Adelaide Aqua Desalination Plant; Infauna Survey 2017. Final Report December 2017, Flinders University, Adelaide

Dixon, C.D., Hooper, G.E and Burch, P. (2012). Gulf St Vincent Prawn, *Penaeus (Melicertus) latisulcatu*s, Fishery 2010/11. Fishery Assessment Report to PIRSA Fisheries and Aquaculture. South Australian Research and Development Institute (Aquatic Sciences), Adelaide. SARDI Publication No. F2007/000782-5. SARDI Research Report Series No. 631. 112pp.

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

McLeay, L.J. and Hooper, G. E. (2020). Gulf St Vincent Prawn *Penaeus* (*Melicertus*) *latisulcatus* Fishery 2019/20. South Australian Research and Development Institute (Aquatic Sciences), Adelaide. SARDI Publication No. F2007/000782-10. SARDI Research Report Series No. 1073. 44p.

PIRSA (2016). Ecologically Sustainable Development Risk Assessment of South Australia's Gulf St Vincent Prawn Fishery. Department of Primary Industries and Regional Development

Steer, M.A., Fowler, A.J., Rogers, P.J., Bailleul, F., Earl J., Matthews, D., Drew, M. and Tsolos, A. (2020). Assessment of the South Australian Marine Scalefish Fishery in 2018. South Australian Research and Development Institute (Aquatic Sciences), Adelaide. SARDI Publication No. F2017/000427-3. SARDI Research Report Series No. 1049

Beckmann, C. L. and Hooper, G. E. (2021). Blue Crab (*Portunus armatus*) Fishery 2019/20. South Australian Research and Development Institute (Aquatic Sciences), Adelaide. SARDI Publication No. F2007/000729-17. SARDI Research Report Series No. 1096. 52pp.

Appendices

Appendix 1: PSA Analysis

Table 8: Updated: Spencer Gulf PSA. Updated scores for productivity and susceptibility components are highlighted. Changes to risk categories since the 2014 PSA are indicated by arrows. Additional species added to the PSA are at the end of the table

						Productivity Scores [1-3]								Susceptibility Scores [1-3]									
ERA Species ID	Species type	Scientific name	Common name	Family name	Role in fishery	Average age at maturity	Average max age	Fecundity	Average max size	Average size at maturity	Reproductive strategy	Trophic level	Total Productivity (average)	Availability	Encounterability	Selectivity	Post-capture mortality	Total (multiplicative)	PSA Score	MSC PSA-derived score	Risk Category Name	MSC scoring guidepost	Change in risk
6	Teleost	*Neoplatycephalus aurimaculatus*	Toothy Flathead	Platycephalidae	DI	1	2	1	1	1	1	3	1.43	2	3	3	3	2.33	2.73	77	Med	60-79	
11	Invertebrate	*Nototodarus gouldi*	Gould's Squid	Ommastrephidae	DI	1	1	2	1	1	2	2	1.43	2	3	3	3	2.33	2.73	77	Med	60-79	
13	Teleost	*Repomucenus calcaratus*	Spotted Dragonet	Callionymidae	DI	1	1	3	1	1	1	3	1.57	3	3	3	3	3.00	3.39	50	High	<60	
18	Teleost	*Thamnaconus degeni*	Bluefin Leatherjacket	Monacanthidae	DI	1	1	1	1	1	2	3	1.43	3	3	3	3	3.00	3.32	53	High	<60	
22	Chondrichthyan	*Urolophus gigas*	Spotted Stingaree	Urolophidae	DI	1	2	3	1	2	3	2	2.00	1	3	3	1	1.20	2.33	88	Low	≥80	
26	Teleost	*Zebrias scalaris*	Manyband Sole	Soleidae	DI	1	2	1	1	1	1	3	1.43	2	3	3	3	2.33	2.73	77	Med	60-79	
30	Invertebrate	*Portunus armatus*	Blue Swimmer Crab	Portunidae	DI	1	1	1	1	1	2	2	1.29	3	3	2	3	2.33	2.66	80	Low	≥80	
94	Teleost	*Neosebastes pandus*	Bighead Gurnard Perch	Neosebastidae	DI	3	3	3	1	1	1	3	2.14	3	3	3	3	3.00	3.69	35	High	<60	
99	Teleost	*Gymnapistes marmoratus*	Soldier	Tetrarogidae	DI	1	2	3	1	1	1	2	1.57	1	3	3	3	1.65	2.28	90	Low	≥80	
100	Teleost	*Glyptauchen panduratus*	Goblinfish	Tetrarogidae	DI	1	2	3	1	1	1	2	1.57	1	3	3	3	1.65	2.28	90	Low	≥80	
104	Teleost	*Lepidotrigla papilio*	Spiny Gurnard	Triglidae	DI	1	2	1	1	1	1	3	1.43	1	3	3	3	1.65	2.18	92	Low	≥80	
109	Teleost	*Pterygotrigla polyommata*	Latchet	Triglidae	DI	1	2	1	1	1	1	2	1.29	1	3	3	3	1.65	2.09	93	Low	≥80	
118	Teleost	*Platycephalus speculator*	Southern Bluespotted Flathead	Platycephalidae	DI	1	2	1	1	1	1	3	1.43	2	3	3	3	2.33	2.73	77	Med	60-79	
122	Teleost	*Pegasus lancifer*	Sculptured Seamoth	Pegasidae	DI	3	3	3	1	1	1	3	2.14	2	3	2	3	1.88	2.85	73	Med	60-79	
124	Teleost	*Caesioperca lepidoptera*	Butterfly Perch	Serranidae	DI	1	1	1	1	1	1	2	1.14	1	3	3	3	1.65	2.01	95	Low	≥80	
125	Teleost	*Caesioperca rasor*	Barber Perch	Serranidae	DI	1	1	1	1	1	1	2	1.14	1	3	3	3	1.65	2.01	95	Low	≥80	
142	Teleost	*Sillaginodes punctata*	King George Whiting	Sillaginidae	DI	1	1	1	1	1	1	3	1.29	3	3	3	3	3.00	3.26	56	High	<60	
151	Teleost	*Pseudocaranx wrighti*	Skipjack Trevally	Carangidae	DI	1	2	1	1	1	1	3	1.43	3	3	3	3	3.00	3.32	53	High	<60	
156	Teleost	*Parequula melbournensis*	Silverbelly	Gerreidae	DI	1	1	3	1	1	1	3	1.57	3	3	3	3	3.00	3.39	50	High	<60	
158	Teleost	*Pagrus auratus*	Snapper	Sparidae	DI	1	2	2	2	1	1	3	1.71	3	3	3	3	3.00	3.46	47	High	<60	
166	Teleost	*Pempheris multiradiata*	Bigscale Bullseye	Pempheridae	DI	1	1	3	1	1	1	2	1.43	1	3	3	3	1.65	2.18	92	Low	≥80	
168	Teleost	*Enoplosus armatus*	Old Wife	Enoplosidae	DI	3	3	3	1	1	1	2	2.00	1	3	3	3	1.65	2.59	82	Low	≥80	
170	Teleost	*Pentaceropsis recurvirostris*	Longsnout Boarfish	Pentacerotidae	DI	1	1	3	1	1	1	1	1.29	1	3	3	3	1.65	2.09	93	Low	≥80	
174	Teleost	*Parazanclistius hutchinsi*	Short Boarfish	Pentacerotidae	DI	1	1	3	1	1	1	2	1.43	1	3	3	3	1.65	2.18	92	Low	≥80	
175	Teleost	*Oplegnathus woodwardi*	Knifejaw	Oplegnathidae	DI	1	1	3	1	1	1	2	1.43	1	3	3	3	1.65	2.18	92	Low	≥80	
177	Teleost	*Nemadactylus douglasii*	Grey Morwong	Cheilodactylidae	DI	1	2	1	1	1	1	2	1.29	1	3	3	3	1.65	2.09	93	Low	≥80	
183	Teleost	*Sphyraena obtusata*	Striped Barracuda	Sphyraenidae	DI	1	1	1	1	1	1	3	1.29	1	3	3	3	1.65	2.09	93	Low	≥80	
184	Teleost	*Sphyraena novaehollandiae*	Snook	Sphyraenidae	DI	1	2	1	2	2	1	3	1.71	1	3	3	3	1.65	2.38	87	Low	≥80	
193	Teleost	*Ichthyscopus barbatus*	Fringe Stargazer	Uranoscopidae	DI	1	2	3	1	1	1	3	1.71	1	3	3	3	1.65	2.38	87	Low	≥80	
194	Teleost	*Kathetostoma laeve*	Common Stargazer	Uranoscopidae	DI	1	2	3	1	2	1	3	1.86	2	3	3	3	2.33	2.98	68	Med	60-79	
201	Teleost	*Foetorepus calauropomus*	Common Stinkfish	Callionymidae	DI	1	1	3	1	1	1	3	1.57	3	3	3	3	3.00	3.39	50	High	<60	
221	Teleost	*Pseudorhombus jenynsii*	Smalltooth Flounder	Paralichthyidae	DI	1	1	1	1	1	1	3	1.29	1	3	3	3	1.65	2.09	93	Low	≥80	
225	Teleost	*Ammotretis lituratus*	Spotted Flounder	Pleuronectidae	DI	1	2	1	1	1	1	2	1.29	1	3	3	3	1.65	2.09	93	Low	≥80	
231	Teleost	*Eubalichthys mosaicus*	Mosaic Leatherjacket	Monacanthidae	DI	1	2	1	1	1	2	2	1.43	2	3	3	3	2.33	2.73	77	Med	60-79	
232	Teleost	*Meuschenia scaber*	Velvet Leatherjacket	Monacanthidae	DI	1	2	1	1	1	2	2	1.43	1	3	3	3	1.65	2.18	92	Low	≥80	
233	Teleost	*Nelusetta ayraudi*	Ocean Jacket	Monacanthidae	DI	1	2	1	2	2	1	2	1.57	1	3	3	3	1.65	2.28	90	Low	≥80	
234	Teleost	*Scobinichthys granulatus*	Rough Leatherjacket	Monacanthidae	DI	1	1	1	1	1	2	2	1.29	3	3	3	3	3.00	3.26	56	High	<60	
236	Teleost	*Eubalichthys gunnii*	Gunn's Leatherjacket	Monacanthidae	DI	1	2	1	1	1	1	1	1.14	3	3	3	3	3.00	3.21	59	High	<60	
237	Teleost	*Meuschenia freycineti*	Sixspine Leatherjacket	Monacanthidae	DI	1	2	1	1	1	2	1	1.29	1	3	3	3	1.65	2.09	93	Low	≥80	
239	Teleost	*Aracana ornata*	Ornate Cowfish	Ostraciidae	DI	3	3	3	1	1	1	3	2.14	2	3	3	3	2.33	3.16	61	Med	60-79	
241	Teleost	*Aracana aurita*	Shaw's Cowfish	Ostraciidae	DI	3	3	3	1	1	1	3	2.14	2	3	3	3	2.33	3.16	61	Med	60-79	
243	Teleost	*Omegophora armilla*	Ringed Toadfish	Tetraodontidae	DI	1	1	2	1	1	2	2	1.43	1	3	3	3	1.65	2.18	92	Low	≥80	
244	Teleost	*Tetractenos glaber*	Smooth Toadfish	Tetraodontidae	DI	1	1	2	1	1	2	3	1.57	3	3	2	3	2.33	2.81	75	Med	60-79	↓
248	Teleost	*Contusus brevicaudus*	Prickly Toadfish	Tetraodontidae	DI	1	1	2	1	1	2	3	1.57	2	3	2	3	1.88	2.45	86	Low	≥80	↓
249	Teleost	*Diodon nicthemerus*	Globefish	Diodontidae	DI	2	2	2	1	1	1	3	1.71	1	3	3	3	1.65	2.38	87	Low	≥80	
260	Chondrichthyan	*Heterodontus portusjacksoni*	Port Jackson Shark	Heterodontidae	DI	2	3	3	2	2	2	2	2.29	3	3	3	1	1.65	2.82	74	Med	60-79	
286	Chondrichthyan	*Callorhinchus milii*	Elephantfish	Callorhinchidae	DI	1	1	3	1	2	2	2	1.71	1	3	3	3	1.65	2.38	87	Low	≥80	
307	Teleost	*Lophonectes gallus*	Crested Flounder	Bothidae	DI	1	1	2	1	1	1	3	1.43	2	3	3	3	2.33	2.73	77	Med	60-79	
310	Teleost	*Acanthaluteres spilomelanurus*	Bridled Leatherjacket	Monacanthidae	DI	1	1	1	1	1	1	1	1.00	2	3	3	3	2.33	2.53	83	Low	≥80	
311	Teleost	*Acanthaluteres vittiger*	Toothbrush Leatherjacket	Monacanthidae	DI	1	2	1	1	1	1	1	1.14	1	3	3	3	1.65	2.01	95	Low	≥80	
332	Teleost	*Centroberyx affinis*	Redfish	Berycidae	DI	1	3	3	1	1	1	2	1.71	1	3	3	3	1.65	2.38	87	Low	≥80	
369	Chondrichthyan	*Parascyllium ferrugineum*	Rusty Carpetshark	Parascylliidae	DI	3	3	3	1	2	2	2	2.29	1	3	3	3	1.65	2.82	74	Med	60-79	
391	Chondrichthyan	*Asymbolus vincenti*	Gulf Catshark	Scyliorhinidae	DI	1	1	3	1	2	2	3	1.86	1	3	3	3	1.65	2.48	85	Low	≥80	
511	Teleost	*Arripis georgianus*	Australian Herring	Arripidae	DI	2	2	1	1	1	1	3	1.57	1	3	3	3	1.65	2.28	90	Low	≥80	

						Productivity Scores [1-3]								Susceptibility Scores [1-3]									
ERA Species ID	**Species type**	**Scientific name**	**Common name**	**Family name**	**Role in fishery**	Average age at maturity	Average max age	Fecundity	Average max size	Average size at maturity	Reproductive strategy	Trophic level	Total Productivity (average)	Availability	Encounterability	Selectivity	Post-capture mortality	Total (multiplicative)	PSA Score	**MSC PSA-derived score**	Risk Category Name	MSC scoring guidepost	Change in risk
539	Teleost	*Chelidonichthys kumu*	Red Gurnard	Triglidae	DI	1	2	1	1	1	1	2	1.29	1	3	3	3	1.65	2.09	93	Low	≥80	
608	Teleost	*Cheilodactylus nigripes*	Magpie Perch	Cheilodactylidae	DI	1	3	1	1	1	1	1	1.29	1	3	3	3	1.65	2.09	93	Low	≥80	
656	Chondrichthyan	*Pristiophorus nudipinnis*	Southern Sawshark	Pristiophoridae	DI	2	1	3	2	2	3	2	2.14	1	3	3	3	1.65	2.70	78	Med	60-79	
660	Chondrichthyan	*Squatina australis*	Australian Angelshark	Squatinidae	DI	2	3	3	2	2	3	3	2.57	2	3	3	1	1.43	2.94	70	Med	60-79	
669	Chondrichthyan	*Aptychotrema vincentiana*	Western Shovelnose Ray	Rhinobatidae	DI	1	1	3	1	2	3	2	1.86	3	3	3	3	3.00	3.53	43	High	<60	
687	Chondrichthyan	*Trygonorrhina fasciata*	Southern Fiddler Ray	Rhinobatidae	DI	2	2	3	2	2	3	2	2.29	2	3	3	2	1.88	2.96	69	Med	60-79	
714	Chondrichthyan	*Hypnos monopterygium*	Coffin Ray	Torpedinidae	DI	2	3	3	1	1	3	2	2.14	1	3	3	3	1.65	2.70	78	Med	60-79	
757	Teleost	*Lepidotrigla spinosa*	Shortfish Gurnard	Triglidae	DI	1	2	1	1	1	1	3	1.43	2	3	3	3	2.33	2.73	77	Med	60-79	
764	Chondrichthyan	*Dasyatis brevicaudata*	Smooth Stingray	Dasyatidae	DI	2	2	3	2	2	3	3	2.43	2	3	3	2	1.88	3.07	65	Med	60-79	
767	Chondrichthyan	*Dasyatis thetidis*	Black Stingray	Dasyatidae	DI	2	2	3	2	2	3	2	2.29	1	3	3	3	1.65	2.82	74	Med	60-79	
772	Chondrichthyan	*Urolophus cruciatus*	Banded Stingaree	Urolophidae	DI	2	1	3	1	1	3	2	1.86	1	3	3	1	1.20	2.21	91	Low	≥80	
774	Chondrichthyan	*Urolophus paucimaculatus*	Sparsely-spotted Stingaree	Urolophidae	DI	1	2	3	1	1	3	2	1.86	2	3	3	1	1.43	2.34	88	Low	≥80	↓
784	Chondrichthyan	*Myliobatis australis*	Southern Eagle Ray	Myliobatidae	DI	2	2	3	2	2	3	2	2.29	1	3	3	3	1.65	2.82	74	Med	60-79	
812	Chondrichthyan	*Dipturus cerva*	Whitespotted Skate	Rajidae	DI	1	1	3	1	2	2	2	1.71	3	3	3	1	1.65	2.38	87	Low	≥80	
825	Teleost	*Sardinops sagax*	Australian Sardine	Clupeidae	DI	1	1	1	1	1	1	2	1.14	3	3	3	3	3.00	3.21	59	High	<60	↑
831	Teleost	*Engraulis australis*	Australian Anchovy	Engraulidae	DI	1	1	2	1	1	1	2	1.29	2	3	2	3	1.88	2.27	90	Low	≥80	
874	Teleost	*Gonorynchus greyi*	Beaked Salmon	Gonorynchidae	DI	3	3	3	1	1	1	1	1.86	1	3	3	3	1.65	2.48	85	Low	≥80	
887	Teleost	*Paratrachichthys macleayi*	Sandpaper Fish	Trachichthyidae	DI	2	2	1	1	1	2	3	1.71	1	3	3	3	1.65	2.38	87	Low	≥80	
900	Teleost	*Hyporhamphus melanochir*	Southern Garfish	Hemiramphidae	DI	1	2	3	1	1	1	1	1.43	2	2	3	3	1.88	2.36	88	Low	≥80	
903	Teleost	*Sorosichthys ananassa*	Little Pineapplefish	Trachichthyidae	DI	1	2	1	1	1	2	3	1.57	3	3	3	3	3.00	3.39	50	High	<60	
914	Teleost	*Filicampus tigris*	Tiger Pipefish	Syngnathidae	TEP	1	1	2	1	1	2	3	1.57	3	3	3	3	3.00	3.39	50	High	<60	
916	Teleost	*Pseudophycis bachus*	Red Cod	Moridae	DI	1	1	3	1	1	1	3	1.57	1	3	3	3	1.65	2.28	90	Low	≥80	
921	Teleost	*Genypterus tigerinus*	Rock Ling	Ophidiidae	DI	1	3	3	2	2	1	3	2.14	2	3	3	3	2.33	3.16	61	Med	60-79	
954	Teleost	*Histiogamphelus cristatus*	Rhino Pipefish	Syngnathidae	TEP	1	1	2	1	1	2	2	1.43	3	3	3	3	3.00	3.32	53	High	<60	
978	Teleost	*Leptoichthys fistularius*	Brushtail Pipefish	Syngnathidae	TEP	1	2	2	1	1	2	2	1.57	1	3	3	3	1.65	2.28	90	Low	≥80	
999	Chondrichthyan	*Mustelus antarcticus*	Gummy Shark	Triakidae	DI	1	2	3	1	2	3	3	2.14	1	3	3	3	1.65	2.70	78	Med	60-79	
1010	Teleost	*Phycodurus eques*	Leafy Seadragon	Syngnathidae	TEP	1	2	2	1	1	2	2	1.57	1	3	3	3	1.65	2.28	90	Low	≥80	
1011	Teleost	*Phyllopteryx taeniolatus*	Common Seadragon	Syngnathidae	TEP	1	2	2	1	1	2	2	1.57	1	3	3	3	1.65	2.28	90	Low	≥80	
1026	Teleost	*Stigmatopora argus*	Spotted Pipefish	Syngnathidae	TEP	1	1	2	1	1	2	2	1.43	1	3	3	3	1.65	2.18	92	Low	≥80	
1037	Teleost	*Neoplatycephalus richardsoni*	Tiger Flathead	Platycephalidae	DI	1	2	1	1	1	1	2	1.29	1	3	3	3	1.65	2.09	93	Low	≥80	
1040	Chondrichthyan	*Pristiophorus cirratus*	Common Sawshark	Pristiophoridae	DI	1	2	3	2	2	3	3	2.29	1	3	3	3	1.65	2.82	74	Med	60-79	
1065	Chondrichthyan	*Dipturus whitleyi*	Melbourne Skate	Rajidae	DI	2	3	3	2	2	2	3	2.43	3	3	3	3	3.00	3.86	25	High	<60	
1078	Chondrichthyan	*Squalus megalops*	Spikey Dogfish	Squalidae	DI	2	3	3	1	2	3	3	2.43	1	3	3	3	1.65	2.94	70	Med	60-79	
1087	Teleost	*Thyrsites atun*	Barracouta	Gempylidae	DI	1	2	1	2	2	1	3	1.71	2	3	3	3	2.33	2.89	72	Med	60-79	
1088	Teleost	*Trachurus declivis*	Common Jack Mackerel	Carangidae	DI	1	2	1	1	1	1	3	1.43	2	3	3	3	2.33	2.73	77	Med	60-79	
1197	Chondrichthyan	*Orectolobus maculatus*	Spotted Wobbegong	Orectolobidae	DI	2	3	3	3	2	3	3	2.71	1	3	3	3	1.65	3.18	60	Med	60-79	
1267	Invertebrate	*Glycymeris (Glycymeris) striatularis*	a dog cockle (not designated)	Glycymerididae	DI	1	2	3	1	1	1	1	1.43	1	3	1	3	1.20	1.87	97	Low	≥80	
1269	Invertebrate	*Atrina (Atrina) tasmanica*	a razor clam (not designated)	Pinnidae	DI	3	3	3	1	1	1	1	1.86	1	3	3	3	1.65	2.48	85	Low	≥80	
1270	Invertebrate	*Ostrea angasi*	Native Oyster	Ostreidae	DI	3	3	3	1	1	1	1	1.86	1	3	2	3	1.43	2.34	88	Low	≥80	
1271	Invertebrate	*Mimachlamys asperrima*	Doughboy Scallop	Pectinidae	DI	3	3	1	1	1	1	1	1.57	1	3	1	3	1.20	1.98	95	Low	≥80	
1272	Invertebrate	*Pecten fumatus*	Commercial Scallop	Pectinidae	DI	1	2	1	1	1	1	1	1.14	2	3	1	3	1.43	1.83	97	Low	≥80	
1274	Invertebrate	*Eucrassatella kingicola*	a cockle (not designated)	Crassatellidae	DI	3	3	3	1	1	1	1	1.86	2	3	2	3	1.88	2.64	80	Low	≥80	
1280	Invertebrate	*Sepioteuthis australis*	Southern Calamari	Loliginidae	BP	1	1	2	1	1	2	2	1.43	3	3	3	3	3.00	3.32	53	High	<60	
1285	Invertebrate	*Octopus berrima*	an octopus (not designated)	Octopodidae	DI	1	1	3	1	2	2	3	1.86	1	3	3	3	1.65	2.48	85	Low	≥80	
1297	Invertebrate	*Amoria (Amoria) undulata*	Wavy Volute	Volutidae	DI	3	3	3	1	1	2	1	2.00	1	3	3	3	1.65	2.59	82	Low	≥80	
1298	Invertebrate	*Ceratosoma brevicaudatum*	a nudibranch (not designated)	Chromodorididae	DI	3	3	3	1	1	2	3	2.29	1	3	3	3	1.65	2.82	74	Med	60-79	
1304	Invertebrate	*Ophionereis schayeri*	a brittlestar (not designated)	Ophionereididae	DI	3	3	2	1	1	2	3	2.14	1	3	3	3	1.65	2.70	78	Med	60-79	
1306	Invertebrate	*Ophiothrix (Ophiothrix) caespitosa*	a brittlestar (not designated)	Ophiotrichidae	DI	2	1	3	1	2	2	3	2.00	1	3	3	3	1.65	2.59	82	Low	≥80	
1342	Invertebrate	*Lamarckdromia globosa*	Fringed Sponge Crab	Dromiidae	DI	3	3	3	1	1	2	1	2.00	1	3	1	3	1.20	2.33	88	Low	≥80	
1348	Invertebrate	*Ovalipes australiensis*	Common Sand Crab	Portunidae	DI	3	3	3	1	1	2	1	2.00	1	3	3	3	1.65	2.59	82	Low	≥80	
1367	Teleost	*Neosebastes bougainvillii*	Gulf Gurnard Perch	Neosebastidae	DI	3	3	3	1	1	1	3	2.14	1	3	3	3	1.65	2.70	78	Med	60-79	↑
1401	Teleost	*Eubalichthys quadrispinis*	Fourspine Leatherjacket	Monacanthidae	DI	1	2	1	1	1	2	2	1.43	3	3	3	3	3.00	3.32	53	High	<60	
1523	Invertebrate	*Leptomithrax gaimardii*	Great Spider Crab	Majidae	DI	3	3	3	1	1	2	1	2.00	2	3	3	3	2.33	3.07	65	Med	60-79	
1537	Invertebrate	*Melicertus latisulcatus*	Western King Prawn	Penaeidae	TA	1	1	1	1	1	1	1	1.00	3	3	3	3	3.00	3.16	61	Med	60-79	
1664	Teleost	*Hippocampus abdominalis*	Bigbelly Seahorse	Syngnathidae	TEP	1	1	2	1	1	2	2	1.43	1	3	3	3	1.65	2.18	92	Low	≥80	
1806	Invertebrate	*Ibacus peronii*	Eastern Balmain Bug	Scyllaridae	BP	1	3	2	1	1	2	1	1.57	3	3	2	3	2.33	2.81	75	Med	60-79	
1808	Invertebrate	*Luidia australiae*	a seastar (not designated)	Luidiidae	DI	3	3	3	1	1	1	3	2.14	1	3	3	3	1.65	2.70	78	Med	60-79	
1822	Teleost	*Sillago bassensis*	School Whiting	Sillaginidae	DI	1	1	1	1	1	1	2	1.14	2	3	3	3	2.33	2.59	82	Low	≥80	
2495	Teleost	*Kanekonia queenslandica*	Deep Velvetfish	Aploactinidae	DI	3	3	3	1	1	3	2	2.29	1	3	2	3	1.43	2.69	78	Med	60-79	
2721	Invertebrate	*Erugosquilla grahami*	a mantis shrimp (not designated)	Squillidae	DI	1	1	3	1	1	2	3	1.71	3	3	3	2	2.33	2.89	72	Med	60-79	
7620	Teleost	*Trachichthys australis*	Southern Roughy	Trachichthyidae	DI	1	2	3	1	1	1	2	1.57	1	3	3	3	1.65	2.28	90	Low	≥80	
7644	Teleost	*Optivus agrammus*	Western Roughy	Trachichthyidae	DI	1	2	3	1	1	1	3	1.71	3	3	2	3	2.33	2.89	72	Med	60-79	
7761	Teleost	*Pelates octolineatus*	Western Striped Grunter	Terapontidae	DI	1	1	1	1	1	2	2	1.29	2	3	3	3	2.33	2.66	80	Low	≥80	
7771	Teleost	*Maxillicosta scabriceps*	Little Gurnard Perch	Neosebastidae	DI	3	3	3	1	1	1	3	2.14	3	3	2	3	2.33	3.16	61	Med	60-79	

ERA Species ID	Species type	Scientific name	Common name	Family name	Role in fishery	Productivity Scores [1-3]								Susceptibility Scores [1-3]									
						Average age at maturity	Average max age	Fecundity	Average max size	Average size at maturity	Reproductive strategy	Trophic level	Total Productivity (average)	Availability	Encounterability	Selectivity	Post-capture mortality	Total (multiplicative)	PSA Score	MSC PSA-derived score	Risk Category Name	MSC scoring guidepost	Change in risk
7849	Teleost	*Neopataecus waterhousii*	Whiskered Prowfish	Pataecidae	DI	3	3	3	1	1	3	3	2.43	1	3	3	3	1.65	2.94	70	Med	60-79	
7915	Teleost	*Cnidoglanis macrocephalus*	Estuary Cobbler	Plotosidae	DI	1	2	2	1	2	3	1	1.71	1	3	3	3	1.65	2.38	87	Low	≥80	
7947	Teleost	*Rhycherus filamentosus*	Tasselled Anglerfish	Antennariidae	DI	3	3	3	1	1	3	3	2.43	3	3	3	3	3.00	3.86	25	High	<60	
7948	Teleost	*Phyllophryne scortea*	Whitespotted Anglerfish	Antennariidae	DI	3	3	3	1	1	3	3	2.43	1	3	2	3	1.43	2.82	74	Med	60-79	
8003	Chondrichthyan	*Sutorectus tentaculatus*	Cobbler Wobbegong	Orectolobidae	DI	3	3	3	1	2	3	2	2.43	3	3	3	1	1.65	2.94	70	Med	60-79	
8164	Teleost	*Spratelloides robustus*	Blue Sprat	Clupeidae	DI	1	1	1	1	1	2	2	1.29	1	3	3	3	1.65	2.09	93	Low	≥80	
8166	Teleost	*Hyperlophus vittatus*	Sandy Sprat	Clupeidae	DI	1	1	1	1	1	1	2	1.14	1	2	2	3	1.28	1.71	98	Low	≥80	
8258	Chondrichthyan	*Urolophus orarius*	Coastal Stingaree	Urolophidae	DI	1	2	3	1	1	3	2	1.86	3	3	3	1	1.65	2.48	85	Low	≥80	↓
8303	Teleost	*Austrolabrus maculatus*	Blackspotted Wrasse	Labridae	DI	1	1	3	1	1	1	2	1.43	1	3	2	3	1.43	2.02	95	Low	≥80	
8326	Teleost	*Pictilabrus laticlavius*	Senator Wrasse	Labridae	DI	1	2	3	1	1	1	2	1.57	1	3	3	3	1.65	2.28	90	Low	≥80	
8333	Teleost	*Brachaluteres jacksonianus*	Southern Pygmy Leatherjacket	Monacanthidae	DI	1	1	3	1	1	2	2	1.57	3	3	2	3	2.33	2.81	75	Med	60-79	
8341	Teleost	*Cantheschenia longipinnis*	Smoothspine Leatherjacket	Monacanthidae	DI	1	1	3	1	1	2	1	1.43	1	3	3	3	1.65	2.18	92	Low	≥80	
8362	Teleost	*Taratretis derwentensis*	Derwent Flounder	Pleuronectidae	DI	1	2	1	1	1	3	2	1.57	1	3	3	3	1.65	2.28	90	Low	≥80	
8413	Teleost	*Chelmonops curiosus*	Western Talma	Chaetodontidae	DI	1	1	3	1	1	1	2	1.43	1	3	3	3	1.65	2.18	92	Low	≥80	
8597	Teleost	*Polyspina piosae*	Orangebarred Puffer	Tetraodontidae	DI	1	1	3	1	1	2	3	1.71	2	3	2	3	1.88	2.54	83	Low	≥80	↓
8642	Teleost	*Cristiceps australis*	Southern Crested Weedfish	Clinidae	DI	1	1	3	1	1	1	3	1.57	1	3	3	3	1.65	2.28	90	Low	≥80	
8677	Teleost	*Upeneichthys vlamingii*	Bluespotted Goatfish	Mullidae	DI	1	1	1	1	1	1	3	1.29	1	3	3	3	1.65	2.09	93	Low	≥80	
8682	Teleost	*Parapriacanthus elongatus*	Elongate Bullseye	Pempheridae	DI	1	1	3	1	1	1	3	1.57	1	3	3	3	1.65	2.28	90	Low	≥80	
8683	Teleost	*Pempheris klunzingeri*	Rough Bullseye	Pempherididae	DI	1	1	3	1	1	1	2	1.43	2	2	3	3	1.88	2.36	88	Low	≥80	
8719	Teleost	*Vincentia conspersa*	Southern Cardinalfish	Apogonidae	DI	1	1	3	1	1	3	2	1.71	1	3	3	3	1.65	2.38	87	Low	≥80	
8863	Teleost	*Parapercis ramsayi*	Spotted Grubfish	Pinguipedidae	DI	1	1	3	1	1	1	3	1.57	2	3	3	3	2.33	2.81	75	Med	60-79	
8875	Teleost	*Siphonognathus attenuatus*	Slender Weed Whiting	Odacidae	DI	1	1	3	1	1	3	2	1.71	1	3	2	3	1.43	2.23	91	Low	≥80	
8880	Teleost	*Siphonognathus radiatus*	Longray Weed Whiting	Odacidae	DI	1	1	3	1	1	3	2	1.71	1	2	3	3	1.43	2.23	91	Low	≥80	
8881	Teleost	*Siphonognathus argyrophanes*	Tubemouth	Odacidae	DI	1	2	3	1	1	3	2	1.86	1	3	3	3	1.65	2.48	85	Low	≥80	
8883	Teleost	*Odax acroptilus*	Rainbow Cale	Odacidae	DI	1	1	3	1	1	3	1	1.57	1	3	3	3	1.65	2.28	90	Low	≥80	
8884	Teleost	*Siphonognathus caninis*	Sharpnose Weed Whiting	Odacidae	DI	1	1	3	1	1	3	2	1.71	1	3	2	3	1.43	2.23	91	Low	≥80	
8887	Teleost	*Parapercis haackei*	Wavy Grubfish	Pinguipedidae	DI	1	1	3	1	1	1	3	1.57	3	3	2	3	2.33	2.81	75	Med	60-79	
8971	Teleost	*Neoodax balteatus*	Little Weed Whiting	Odacidae	DI	1	1	3	1	1	3	2	1.71	1	3	3	3	1.65	2.38	87	Low	≥80	
8988	Teleost	*Vincentia badia*	Scarlet Cardinalfish	Apogonidae	DI	1	1	3	1	1	3	3	1.86	3	3	2	3	2.33	2.98	68	Med	60-79	
8989	Teleost	*Vincentia macrocauda*	Smooth Cardinalfish	Apogonidae	DI	1	1	3	1	1	3	2	1.71	3	3	2	3	2.33	2.89	72	Med	60-79	
9240	Invertebrate	*Ischnochiton (Heterozona) cariosus*	a chiton (not designated)	Ischnochitonidae	DI	3	3	3	1	1	1	2	2.00	1	3	2	3	1.43	2.46	85	Low	≥80	
9241	Invertebrate	*Pinna bicolor*	Razor Clam	Pinnidae	DI	1	3	3	1	1	1	1	1.57	1	3	3	3	1.65	2.28	90	Low	≥80	
9242	Invertebrate	*Equichlamys bifrons*	Queen Scallop	Pectinidae	DI	2	2	3	1	1	1	1	1.57	2	3	2	3	1.88	2.45	86	Low	≥80	↓
9243	Invertebrate	*Acrosterigma cygnorum*	Heart Cockle	Cardiidae	DI	3	3	3	1	1	1	1	1.86	1	3	2	3	1.43	2.34	88	Low	≥80	
9244	Invertebrate	*Dosinia victoriae*	a venus cockle (not designated)	Veneridae	DI	3	3	3	1	1	1	1	1.86	2	3	2	3	1.88	2.64	80	Low	≥80	
9245	Invertebrate	*Cleidothaerus albidus*	a rock shell (not designated)	Cleidothaeridae	DI	3	3	3	1	1	1	1	1.86	2	2	2	3	1.58	2.44	86	Low	≥80	
9246	Invertebrate	*Sepia apama*	Giant Cuttlefish	Sepiidae	DI	1	1	2	1	2	2	3	1.71	3	3	3	3	3.00	3.46	47	High	<60	
9247	Invertebrate	*Sepia novaehollandae*	a cuttlefish (not designated)	Sepiidae	DI	1	1	3	1	1	2	3	1.71	1	3	3	3	1.65	2.38	87	Low	≥80	
9248	Invertebrate	*Sepioloidea lineolata*	Pinstripe Bottle-Tailed Squid	Sepiadariidae	DI	3	3	3	1	1	2	3	2.29	2	3	2	3	1.88	2.96	69	Med	60-79	
9249	Invertebrate	*Sepiadarium austrinum*	Southern Bottletail Squid	Sepiadariidae	DI	3	3	3	1	1	2	3	2.29	2	3	1	3	1.43	2.69	78	Med	60-79	
9250	Invertebrate	*Octopus australis*	Southern Octopus	Octopodidae	DI	3	3	3	1	1	2	3	2.29	3	3	3	1	1.65	2.82	74	Med	60-79	
9251	Invertebrate	*Diodora lincolnensis*	a keyhole limpet (not designated)	Fissurellidae	DI	3	3	3	1	1	3	1	2.14	1	3	2	3	1.43	2.57	82	Low	≥80	
9252	Invertebrate	*Tugali cicatricosa*	a shield limpet (not designated)	Fissurellidae	DI	3	3	3	1	1	3	1	2.14	1	2	1	3	1.13	2.42	86	Low	≥80	
9253	Invertebrate	*Clanculus flagellatus*	a topshell (not designated)	Trochidae	DI	3	3	3	1	1	3	2	2.29	1	2	1	3	1.13	2.55	83	Low	≥80	
9254	Invertebrate	*Astele (Astele) armillatum*	a topshell (not designated)	Calliostomatidae	DI	3	3	3	1	1	2	2	2.14	2	3	1	3	1.43	2.57	82	Low	≥80	
9255	Invertebrate	*Zoila friendii thersites*	Black Cowry	Cypraeidae	DI	3	3	3	1	1	2	2	2.14	3	3	3	3	3.00	3.69	35	High	<60	
9256	Invertebrate	*Cymatiella verrucosa*	a triton shell (not designated)	Ranellidae	DI	3	3	3	1	1	3	2	2.29	3	2	1	3	1.43	2.69	78	Med	60-79	
9257	Invertebrate	*Fusinus australis*	a spindle shell (not designated)	Buccinidae	DI	3	3	3	1	1	1	2	2.00	1	3	3	3	1.65	2.59	82	Low	≥80	
9258	Invertebrate	*Ptilometra macronema*	a crinoid (not designated)	Ptilometridae	DI	3	3	3	1	1	3	1	2.14	2	3	2	3	1.88	2.85	73	Med	60-79	
9259	Invertebrate	*Astropecten triseriatus*	a seastar (not designated)	Astropectinidae	DI	3	3	3	1	1	1	3	2.14	1	3	3	3	1.65	2.70	78	Med	60-79	
9260	Invertebrate	*Goniodiscaster seriatus*	a seastar (not designated)	Oreasteridae	DI	3	3	3	1	1	1	3	2.14	3	3	2	3	2.33	3.16	61	Med	60-79	
9261	Invertebrate	*Conocladus australis*	Southern Basketstar	Gorgonocephalidae	DI	3	3	3	1	1	1	1	1.86	1	3	3	3	1.65	2.48	85	Low	≥80	
9262	Invertebrate	*Goniocidaris tubaria*	a sea urchin (not designated)	Cidaridae	DI	3	2	3	1	1	1	1	1.71	1	3	2	3	1.43	2.23	91	Low	≥80	
9263	Invertebrate	*Centrostephanus rodgersii*	Longspine Sea Urchin	Diadematidae	DI	1	2	3	1	1	1	1	1.43	3	3	1	3	1.65	2.18	92	Low	≥80	
9264	Invertebrate	*Amblypneustes pallidus*	a sea urchin (not designated)	Temnopleuridae	DI	3	2	3	1	1	1	1	1.71	1	3	1	3	1.20	2.09	93	Low	≥80	
9265	Invertebrate	*Ceto cuvieria*	a holothurian (not designated)	Psolidae	DI	3	3	3	1	1	1	1	1.86	1	3	3	3	1.65	2.48	85	Low	≥80	
9266	Invertebrate	*Holothuria (Thymiosycia) hartmeyeri*	a holothurian (not designated)	Holothuriidae	DI	3	3	3	1	1	1	1	1.86	1	3	3	3	1.65	2.48	85	Low	≥80	
9267	Invertebrate	*Nerocila serra*	an isopod (not designated)	Cymothoidae	DI	3	3	3	1	1	3	2	2.29	1	3	1	3	1.20	2.58	82	Low	≥80	
9268	Invertebrate	*Metapenaeopsis sp.*	Velvet Prawn	Penaeidae	DI	3	3	3	1	1	1	3	2.14	3	3	1	3	1.65	2.70	78	Med	60-79	
9269	Invertebrate	*Alpheus villosus*	Hairy Pistol Prawn	Alpheidae	DI	3	3	3	1	1	2	2	2.14	1	3	1	3	1.20	2.46	85	Low	≥80	
9270	Invertebrate	*Alpheus lottini*	Coral Snapping Shrimp	Alpheidae	DI	3	3	3	1	1	2	2	2.14	1	3	1	3	1.20	2.46	85	Low	≥80	
9271	Invertebrate	*Processa gracilis*	Long-Wristed Shrimp	Processidae	DI	3	3	3	1	1	1	1	1.86	1	3	1	3	1.20	2.21	91	Low	≥80	
9272	Invertebrate	*Paguristes frontalis*	Common Hermit crab	Diogenidae	DI	3	3	3	1	1	3	1	2.14	1	2	2	3	1.28	2.49	84	Low	≥80	
9273	Invertebrate	*Austrodromidia octodentata*	Bristled Sponge Crab	Dromiidae	DI	1	1	3	1	1	3	1	1.57	1	3	1	3	1.20	1.98	95	Low	≥80	

						Productivity Scores [1-3]								Susceptibility Scores [1-3]										
ERA Species ID	**Species type**	**Scientific name**	**Common name**	**Family name**	**Role in fishery**	Average age at maturity	Average max age	Fecundity	Average max size	Average size at maturity	Reproductive strategy	Trophic level	Total Productivity (average)	Availability	Encounterability	Selectivity	Post-capture mortality	Total (multiplicative)	PSA Score	**MSC PSA-derived score**	Risk Category Name	MSC scoring guidepost	Change in risk
9274	Invertebrate	*Austrodromidia australis*	Southern Sponge Crab	Dromiidae	DI	1	1	3	1	1	3	1	1.57	2	3	1	3	1.43	2.12	93	Low	≥80	
9275	Invertebrate	*Naxia aurita*	Golden Decorator Crab	Majidae	DI	3	3	3	1	1	3	1	2.14	1	3	1	3	1.20	2.46	85	Low	≥80	
9276	Invertebrate	*Naxia aries*	Ramshorn Crab	Majidae	DI	3	3	3	1	1	3	1	2.14	1	3	1	3	1.20	2.46	85	Low	≥80	
9277	Invertebrate	*Gomeza bicornis*	Masked Burrowing Crab	Corystidae	DI	3	3	3	1	1	3	1	2.14	3	3	1	3	1.65	2.70	78	Med	60-79	
9278	Invertebrate	*Nectocarcinus integrifrons*	Rough Rock Crab	Portunidae	DI	3	3	3	1	1	3	3	2.43	2	3	2	3	1.88	3.07	65	Med	60-79	
9279	Invertebrate	*Actaea calculosa*	Facetted Crab	Xanthidae	DI	3	3	3	1	1	3	1	2.14	1	3	1	3	1.20	2.46	85	Low	≥80	
9280	Invertebrate	Pilumnidae - undifferentiated	HAIRY CRAB	Pilumnidae	DI	3	3	3	1	1	3	1	2.14	2	3	1	3	1.43	2.57	82	Low	≥80	
9281	Teleost	*Aulopus purpurissatus*	Sergeant Baker	Aulopidae	DI	3	3	3	1	1	1	3	2.14	1	3	3	3	1.65	2.70	78	Med	60-79	
9282	Teleost	*Histiophryne cryptacanthus*	Rodless Anglerfish	Antennariidae	DI	3	3	3	1	1	3	3	2.43	1	3	2	3	1.43	2.82	74	Med	60-79	
9283	Teleost	*Leviprora inops*	Longhead Flathead	Platycephalidae	DI	1	1	1	1	1	1	2	1.14	1	3	3	3	1.65	2.01	95	Low	≥80	
9284	Teleost	*Thysanophrys cirronasa*	Tasselsnout Flathead	Platycephalidae	DI	1	2	1	1	1	1	3	1.43	2	3	3	3	2.33	2.73	77	Med	60-79	
9285	Teleost	*Cynoglossus broadhursti*	Southern Tongue Sole	Cynoglossidae	DI	1	1	3	1	1	3	3	1.86	1	3	3	3	1.65	2.48	85	Low	≥80	
9286	Chondrichthyan	*Asymbolus submaculatus*	Variegated Catshark	Scyliorhinidae	DI	1	1	3	1	2	2	3	1.86	1	3	3	3	1.65	2.48	85	Low	≥80	
90001	Invertebrate	Lepadidae - undifferentiated	a goose barnacle (not designated)	Lepadidae	DI	3	3	3	1	1	3	3	2.43	1	3	1	3	1.20	2.71	78	Med	60-79	
90002	Invertebrate	*Coscinasterias muricata*	Eleven-arm Seastar	Asteriidae	DI	3	3	3	1	2	1	3	2.29	1	3	3	3	1.65	2.82	74	Med	60-79	
90003	Invertebrate	*Tosia magnifica*	Biscuit Seastar	Goniasteridae	DI	3	3	3	1	1	3	3	2.43	1	3	3	3	1.65	2.94	70	Med	60-79	
90004	Teleost	*Seriolella brama*	Blue Warehou	Centrolophidae	TEP	1	2	3	1	1	1	3	1.71	1	3	3	3	1.65	2.38	87	Low	≥80	
90005	Teleost	*Ammotretis rostratus*	Longsnout Flounder	Pleuronectidae	DI	1	2	3	1	1	1	2	1.57	1	3	3	3	1.65	2.28	90	Low	≥80	
90006	Teleost	*Heteroclinus heptaeolus*	Ogilby's Weedfish	Clinidae	DI	3	3	3	1	1	3	3	2.43	1	3	3	3	1.65	2.94	70	Med	60-79	
90007	Teleost	*Torquigener pleurogramma*	Weeping Toadfish	Tetraodontidae	DI	2	1	3	1	1	3	3	2.00	1	3	3	3	1.65	2.59	82	Low	≥80	
90008	Chondrichthyan	*Trygonoptera mucosa*	Western Shovelnose Stingaree	Urolophidae	DI	3	3	3	1	1	3	3	2.43	2	3	3	1	1.43	2.82	74	Med	60-79	
90009	Teleost	*Hypselognathus rostratus*	Kinfesnout Pipefish	Syngnathidae	DI	1	1	3	1	1	2	3	1.71	1	3	3	3	1.65	2.38	87	Low	≥80	
90010	Chondrichthyan	*Trygonoptera imitata*	Eastern Shovelnose Stingaree	Urolophidae	DI	3	3	3	1	2	3	2	2.43	1	3	3	1	1.20	2.71	78	Med	60-79	
90011	Chondrichthyan	*Furgaleus macki*	Whiskery Shark	Triakidae	DI	3	2	3	2	2	3	3	2.57	1	3	3	3	1.65	3.06	65	Med	60-79	
90012	Chondrichthyan	*Orectolobus halei*	Gulf Wobbegong	Orectolobidae	DI	3	2	3	2	2	3	3	2.57	1	3	3	3	1.65	3.06	65	Med	60-79	
90013	Teleost	*Neosebastes scorpaenoides*	Common Gurnard Perch	Neosebastidae	DI	3	3	3	1	2	1	3	2.29	1	3	3	3	1.65	2.82	74	Med	60-79	
90014	Invertebrate	*Sepia braggi*	Bragg's Cuttlefish	Sepiidae	DI	3	3	3	1	1	3	3	2.43	1	3	2	3	1.43	2.82	74	Med	60-79	
90015	Invertebrate	*Octopus kaurna*	Southern Sand Octopus	Octopodidae	DI	3	3	3	1	2	3	3	2.57	1	3	3	3	1.65	3.06	65	Med	60-79	
90016	Invertebrate	*Octopus pallidus*	Pale Octopus	Octopodidae	DI	3	3	3	1	1	2	3	2.29	1	3	3	3	1.65	2.82	74	Med	60-79	
90024	Mammal	*Tursiops truncatus*	Common Bottlenose Dolphin	Delphinidae	DI	2	3	3	3	3	3	3	2.86	1	3	3	3	1.65	3.30	55	High	<60	

Appendix 2: Consequence and Likelihood Tables

Table 9: Consequence levels for retained species

1. Ecological: Target/Retained Species		
1	Minor	Fishing impacts either not detectable against background variability for this population; or if detectable, minimal impact on population size and none on dynamics. Spawning biomass > Target level
2	Moderate	Fishery operating at maximum acceptable level of depletion. Spawning biomass < Target level but > Threshold level (B_{MSY})
3	High	Level of depletion unacceptable but still not affecting recruitment levels of stock. Spawning biomass < Threshold level (B_{MSY}) but > Limit level (B_{REC})
4	Major	Level of depletion is already affecting (or will definitely affect) future recruitment potential of the stock. Spawning biomass < Limit level (B_{REC})

Table 10: Consequence levels for non-retained species

2. Ecological: Non-Retained (Bycatch) Species		
1	Minor	Species assessed elsewhere and/or take is very small and area of capture small compared with known distribution (< 20%).
2	Moderate	Relative area of, or susceptibility to, capture is < 50% and species do not have a vulnerable life history.
3	High	N/A - Once a consequence reaches this point, it should be examined using target/retained species table.
4	Major	N/A.

Table 11: Consequence levels for Threatened, Endangered and Protected Species (TEPS)

3. Ecological: Threatened, Endangered and Protected Species (TEPS)		
1	Minor	Few individuals directly impacted in most years, level of capture/interaction is well below that which will generate public concern.
2	Moderate	Level of capture is the maximum that will not impact on recovery or cause unacceptable public concern.
3	High	Recovery may be affected and/or some clear, but short-term public concern will be generated.

4	Major	Recover times are clearly being impacted and/or public concern is widespread.

Table 12: Consequence levels for Habitat

4. Ecological: Habitat		
1	Minor	Measurable impacts but very localized. Area directly affected well below maximum accepted.
2	Moderate	Maximum acceptable level of impact to habitat with no long-term impacts on region-wide habitat dynamics.
3	High	Above acceptable level of loss/impact with region-wide dynamics or related systems may begin to be impacted.
4	Major	Level of habitat loss clearly generating region-wide effects on dynamics and related systems.

Table 13: Consequence Levels for Ecosystem/Environment

5. Ecological: Ecosystem/Environment		
1	Minor	Measurable but minor changes to the environment or ecosystem structure but no measurable change to function.
2	Moderate	Maximum acceptable level of change to the environment or ecosystem structure with no material change in function.
3	High	Ecosystem function altered to an unacceptable level with some function or major components now missing and/or new species are prevalent.
4	Major	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.

Table 14: Consequence levels for economic impacts on fishery

6. Economic		
1	Minor	A small, measurable but temporary impact on the economic pathways for the industry or the community.
2	Moderate	Some level of reduction for a major fishery or a large reduction in a small fishery that the community is not dependent upon.
3	High	Major sector decline and economic generation with clear flow on effects to the community.
4	Major	Permanent and widespread collapse of economic activity for industry and the community including possible debts.

Table 15: Consequence levels for public reputation factors

7. Public Reputation & Image		
1	Minor	Low negative impact and news profile.
2	Moderate	Some public embarrassment, moderate news profile and minor ministerial involvement.
3	High	High public embarrassment, high impact and news profile, third-party actions, public and significant ministerial involvement.
4	Major	Extreme public embarrassment, prolonged news coverage, third-party actions/enquiry and government censure.

Table 16: Consequence levels for operational effectiveness

11. Operational Effectiveness		
1	Minor	Minor delay in achievement of a key deliverable.
2	Moderate	Minor element of one key deliverable unable to be achieved on time.
3	High	Significant delay but achievement of key deliverable.
4	Major	Non-achievement of more than one key deliverable, or major delay to entire strategic directive.