



Australian Government

Australian Fisheries Management Authority



# Ecological Risk Management

REPORT FOR THE BASS STRAIT CENTRAL ZONE SCALLOP FISHERY

November 2009

## Summary of priority issues for managing the ecological effects of fishing in the Bass Strait Central Zone Scallop Fishery

The priority list of species to be addressed in the Bass Strait Central Zone Scallop Fishery (BSCZSF) appears below.

Taxonomic Group	Scientific Name	Common Name	Role in Fishery	Highest Level of Assessment	Risk Score
Invertebrate	<i>Eucrassatella kingicola</i>	Crassatella	Discard	Level 2 PSA Residual Risk Assessment	High
Invertebrate	<i>Hapalochlaena maculosa</i>	Southern blue ringed octopus	Discard	Level 2 PSA Residual Risk Assessment	High
Invertebrate	<i>Bellidilla undecimspinosa</i>	Pebble crab	Discard	Level 2 PSA Residual Risk Assessment	High
Invertebrate	<i>Luidia australiae</i>	Black and white seastar	Discard	Level 2 PSA Residual Risk Assessment	High

The priority list was compiled from the highest level of assessment undertaken for the fishery and includes:

- Four discard species identified as high risk under the Level 2 PSA Residual Risk Assessment; noting that,
- no protected (threatened, endangered and protected - TEP) species thought to occur within the area of the fishery were identified at high risk through these processes.

Under the Level 2 PSA 26 species/species groups were assessed as being at high risk. After the application of the Level 2 Residual Risk Guidelines, four species remained at high risk.

132 protected (TEP) species are theoretically found within the waters of the fishery. These include three species of sharks, 58 species of seabirds, 37 species of marine mammals and 34 species of bony fish (all Syngnathids). In addition, as part of AFMA's ecological risk management (ERM) process, we will take all reasonable steps to minimise interactions with those protected (TEP) species which are thought to occur in the area of the fishery.

Species that form the priority list for the BSCZSF will be managed under one or more of the following policies or measures:

- Harvest Strategy Policy and Guidelines;
- Non-key Commercial Species (byproduct) Policy;
- Bycatch and Discard Program;
- Shark Policy and the Chondrichthyan Guide for Fisheries Managers; and
- Protected (TEP) species under various international plans of action, recovery plans etc.



## **Description of the Bass Strait Central Zone Scallop Fishery**

Commercial scallop fishing in the Bass Strait commenced in the early 1970s and is managed under three jurisdictions. AFMA manages the Central Zone fishery and, Victoria and Tasmania manage zones generally out to 20 nm off their respective coastlines.

The main target species is the commercial scallop, *Pecten fumatus*. Statutory Fishing Rights (SFRs) are also issued for doughboy scallop, *Chlamys (Mimachlamys) asperrimus*, a byproduct species, but these are rarely retained.

The principal harvest method is by a scallop harvester (or dredge).

The main markets for Bass Strait Central Zone Scallop Fishery scallops have historically been France, Hong Kong, the United States of America and the domestic market.



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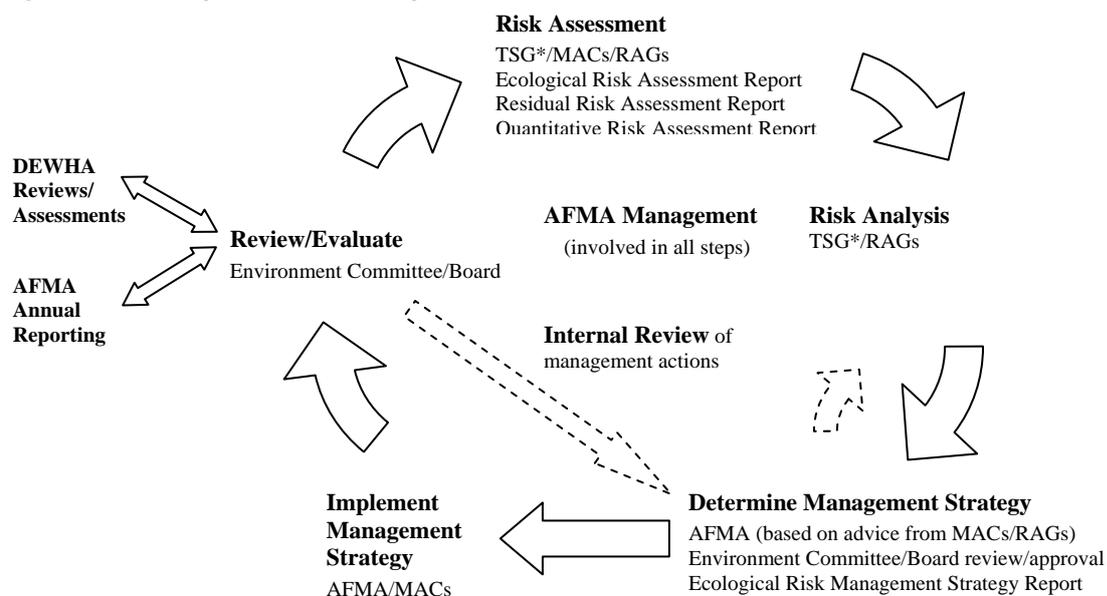
# 1. OVERVIEW

- **Implementing ecological risk management in Commonwealth managed fisheries**

Through an approach known as ecosystem based fisheries management (EBFM), AFMA aims to minimise the impacts of Commonwealth managed fisheries on all aspects of the marine ecosystem. AFMA’s adoption of EBFM is a significant departure from traditional fisheries management with the focus shifted from the direct management of target species to also considering the impacts on bycatch species, protected (threatened, endangered and protected - TEP) species, habitats, and communities.

Key to AFMA’s implementation of EBFM has been to develop and implement an ecological risk management (ERM) framework (refer to **Figure 1**). The framework details a robust and transparent process to assess, analyse and respond to the ecological risks posed by Commonwealth managed fisheries.

**Figure 1: Ecological Risk Management framework**



\*TSG – Technical Support Group – currently provided by CSIRO

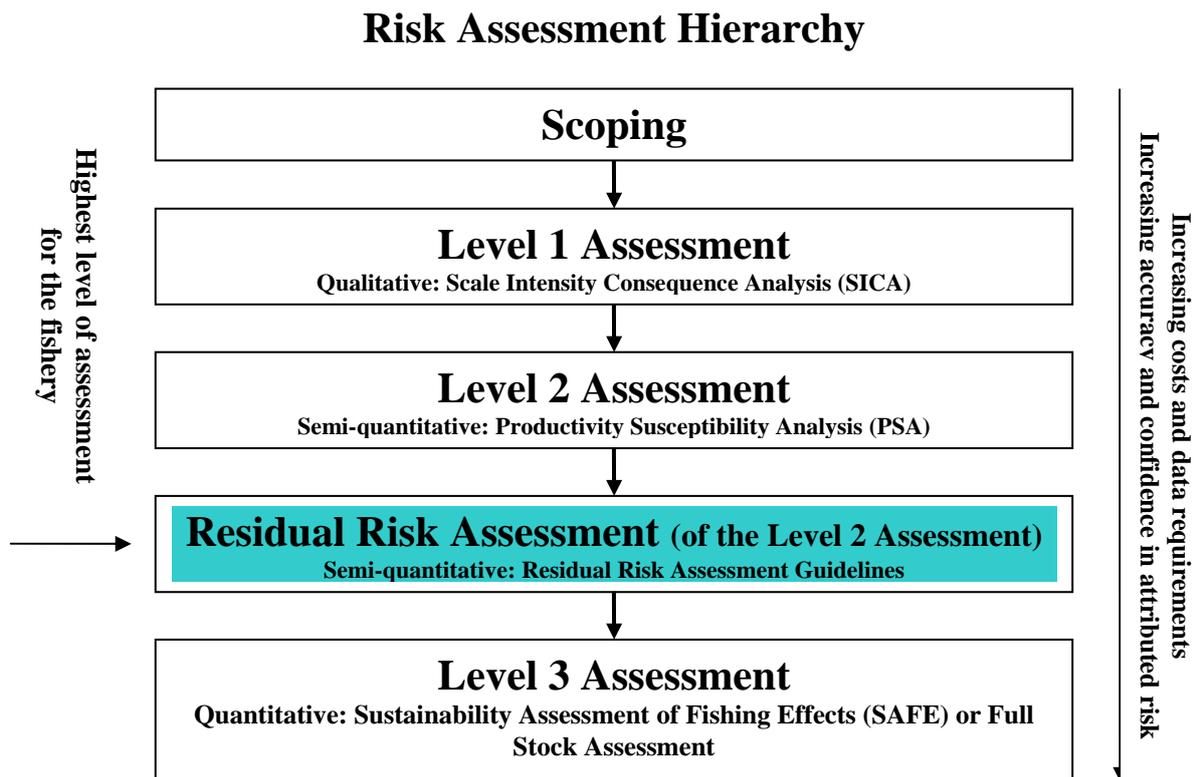
The ERM framework progresses through a number of steps and involves a hierarchy of risk assessment methodologies progressing from a comprehensive but largely qualitative analysis at Level 1 to a quantitative analysis at Level 3 (refer to **Figure 2**). This approach is a means of screening out low risk activities and focusing more intensive and quantitative analyses on those activities assessed as having a greater environmental impact on AFMA managed fisheries.

The initial assessment stage involves the development of a qualitative ecological risk assessment (ERA) for each individual fishery. ERAs assess the impact, direct and indirect, that a fishery’s activities may have on the marine ecosystem. These assessments provide the foundation for further risk assessment and analysis. While it has been a long and complex process, ERAs have now been completed (to varying degrees – either Level 1, 2 or 3) for all major Commonwealth managed fisheries.



The next stage of the assessment process involves the development of a residual risk assessment of the outcomes of the qualitative Level 2 PSA assessment for each individual fishery. Level 2 PSA Residual Risk assessments evaluate and refine ERA high risk outcomes by taking into account additional information not considered through the ERA process, in particular the mitigating effects of some current management arrangements. In addition to the residual risk process, a number of fisheries have also undergone further quantitative risk assessment (Level 3 assessment).

**Figure 2:** Risk assessment hierarchy



The results of the risk assessments are now the focus for the development and implementation of this ERM strategy. Further information on the risk assessment process and methodologies applied can be found on AFMA’s website.

- **Developing an ecological risk management strategy**

The priority list for the Bass Strait Central Zone Scallop Fishery (BSCZSF) was developed using:

- An individual ERA completed to Level 2; and
- A Level 2 PSA Residual Risk Assessment for all non protected (TEP) species identified as high risk.

In addition, all reasonable steps will be taken to minimise interactions with protected (TEP) species which have been identified through the ERA process.



Once identified, species that form the priority list for each fishery will be managed either through fishery specific arrangements or under one or more of the following policies or measures:

- Harvest Strategy Policy and Guidelines;
- Non-key Commercial Species (byproduct) Policy;
- Bycatch and Discard Program;
- Shark Policy and the Chondrichthyan Guide for Fisheries Managers; and
- Protected (TEP) species under various international plans of action, recovery plans etc.

This ERM strategy clearly identifies how each species or group of species may be managed under the policies or measures described above.

ERM strategies to address those remaining species identified as at medium or low risk may be implemented at a later date. Due to limitations in the ERA methodology, for assessing the impacts of fishing operations on habitats and communities, AFMA will defer the development of an ERM strategy for these components until more refined and meaningful results become available.

- o **Measuring individual mitigation strategies**

In managing the priority species identified in each fishery we will prepare reports with clear performance measures which address both long and short term goals and aims. Ongoing monitoring and review of the mitigation measures will occur. In the medium to longer term these results will also be used when assessing any change of status of a species eg. where a bycatch or byproduct species moves to become a target species. Mitigation actions can be taken for individual species or groups of species.

Fisheries are encouraged to consider “cross” fishery solutions when implementing measures for species that are identified as at risk across more than one fishery and/or where fishing methods cross fishery boundaries.

Outcomes of the ERM strategies and measures described in each fishery’s various work plans and Harvest Strategies will flow into a number of processes including annual reporting to the Department of the Environment, Water, Heritage and the Arts (DEWHA).

It is expected that each fishery will be reassessed against the ERA methodology on a periodic basis in line with the review of any Wildlife Trade Operation (WTO) accreditation in place in the fishery.

## **2. ECOLOGICAL RISK MANAGEMENT PRIORITY LIST**

The risks that the BSCZSF poses to the sustainability of the marine ecosystem have been assessed through the application of a progression of risk assessment methodologies as listed below:

- An individual ERA completed to Level 2 in June 2007; and,
- A Level 2 PSA Residual Risk Assessment completed in November 2009.



**Table 1** details the results at each level of assessment. Further information and reports for each level of assessment can be found on AFMA’s website.

Level of assessment and risk levels attributed	Target Species	Byproduct Species	Bycatch Species	Protected (TEP) Species
<b>Level 1 SICA Assessment</b>				
Consequence score (for each species component)	4	3	3	2
Proceeded to Level 2 PSA Assessment (scores $\geq 3$ )	Yes	Yes	Yes	No
<b>Level 2 PSA Assessment</b>				
High Risk	1	0	25	-
Medium Risk	0	1	57	-
Low Risk	0	0	58	-
<b>Level 2 PSA Residual Risk Assessment</b>				
High Risk	0	-	4	-
Medium Risk	1	-	6	-
Low Risk	0	-	14	-
<b>Level 3 SAFE Assessment - not undertaken for the BSCZSF</b>				

The results of these risk assessments have been consolidated to form a priority list for the fishery comprised of:

- Four species that have not undergone a further rapid quantitative risk assessment and are identified as high risk through the application of the residual risk assessment methodology; and,
- 132 protected (TEP) species identified through the ERA.

**Table 2** details the priority species list for the BSCZSF on which AFMA will focus ERM efforts. Overall four discard species were identified.

**Table 2:** Priority species list for the BSCZSF

Taxonomic Group	Scientific Name	Common Name	Role in Fishery	Highest Level of Assessment	Risk Score
Invertebrate	<i>Eucrassatella kingicola</i>	Crassatella	Discard	Level 2 PSA Residual Risk Assessment	High
Invertebrate	<i>Hapalochlaena maculosa</i>	Southern blue ringed octopus	Discard	Level 2 PSA Residual Risk Assessment	High
Invertebrate	<i>Bellidilia undecimspinosa</i>	Pebble crab	Discard	Level 2 PSA Residual Risk Assessment	High
Invertebrate	<i>Luidia australiae</i>	Black and white seastar	Discard	Level 2 PSA Residual Risk Assessment	High

In addition to the above four species that were identified as priorities on ecological grounds, the risk assessments also identified that 132 protected (TEP) species are thought to occur within the waters of the fishery (refer to **Table 3**). None of these 132 protected (TEP) species were assessed as being at high ecological risk. However, consistent with good fisheries management and the specific requirements of the *Environment Protection and Biodiversity*



*Conservation Act 1999* (EPBC Act), all reasonable steps will be taken to ensure that interactions with these protected (TEP) species are minimised.

**Table 3:** Protected (TEP) species identified through the risk assessment process.

Taxonomic Group	Common Name	Role in Fishery	Highest Level of Assessment	Risk Score
Chondrichthyan	3 species of sharks	TEP	Level 1 SICA	Not at risk
Marine Bird	58 species of seabirds	TEP	Level 1 SICA	Not at risk
Marine Mammal	37 species of marine mammals	TEP	Level 1 SICA	Not at risk
Teleost	34 species of Syngnathids	TEP	Level 1 SICA	Not at risk

### 3. ECOLOGICAL RISK MANAGEMENT STRATEGY

The BSCZSF is currently managed through the:

- *Bass Strait Central Zone Scallop Fishery Management Plan 2002* (the Plan);
- *Fisheries Management (Bass Strait Central Zone Scallop Fishery) Regulations 2002* (the Regulations); and,
- BSCZSF Harvest Strategy developed in accordance with the *Commonwealth Fisheries Harvest Strategy Policy* of September 2007, and implemented for the 2009 fishing season.

The Harvest Strategy in combination with the Plan and the Regulations prescribes a combination of input and output controls as detailed below. There are also a number of monitoring and assessment initiatives in place for the fishery.

- Annual total allowable catch (TAC) management for the key target and byproduct species set in line with the Harvest Strategy Policy and BSCZSF harvest control rules;
- Minimum size and discard limits for the key target species;
- Comprehensive closed area spatial management regime including Marine Protected Area (MPA) closures;
- Seasonal closures;
- Annual fishery surveys providing data on target, byproduct (required for TAC setting) and bycatch species;
- Targeted research on target species stock dynamics;
- Logbooks and observer program collecting catch and interaction data on target, byproduct, bycatch and protected (TEP) species.

Under the previous management regime for the BSCZSF, the entire area of the fishery was open to commercial fishing with only discrete areas closed providing limited protection for the commercial scallop stock. With the implementation of the BSCZSF Harvest Strategy, the fishery now operates under a comprehensive closed area spatial management regime where the majority of the fishery is closed to commercial fishing and only discrete areas are open to commercial fishing on a rotational or staged basis.

To put this into perspective, the total area of the fishery is 155,844 km<sup>2</sup> with the area less than 100 m deep, the preferred habitat for commercial scallops, being around 70,000 km<sup>2</sup>. In 2009,



BSCZSF operators were only permitted to operate in an area of just over 90 nm<sup>2</sup> (approximately 309 km<sup>2</sup>) with only a proportion of that actually fished due to the distribution of scallops within this permissible area. The area open to commercial fishing during the 2009 season equates to less than 0.2% of the area of the fishery that could potentially be fished for scallops. By targeting discrete areas where large scallops are in high densities, harvesting efficiency is maximised and impacts on the remainder of the scallop stock, non-target species, habitats and communities are minimised.

The ERM strategy for the BSCZSF will address the species identified as priorities through the risk assessment process. The strategy will employ a number of fisheries management policies and measures to deliver appropriate actions to mitigate the risk posed by the fishery. Further details of how individual species will be addressed are provided below.

- **Harvest Strategies for key commercial (target and some byproduct) species**

The implementation of Harvest Strategies for all Commonwealth managed fisheries is a key component of AFMA's management of key commercial species (target and some byproduct species). Individual fishery specific Harvest Strategies will set out clear decision rules to manage fisheries in an environmentally sustainable manner while also ensuring maximum economic returns.

The BSCZSF has developed a Harvest Strategy for the target and byproduct species in the fishery. Both the target species, *Pecten fumatus*, and byproduct species, *Chlamys (Mimachlamys) asperrimus*, covered by this strategy have been assessed as medium risk through the ERA process. Though not considered priorities under this strategy, these species will continue to be managed under the Harvest Strategy framework. Further details of the control rules contained in the BSCZSF Harvest Strategy are provided in the previous section.

- **Management of non-key commercial (byproduct) species**

AFMA is currently developing a policy to address any gaps in the management of byproduct species in Commonwealth fisheries. No priority species fall under this policy.

- **Managing bycatch and discarding**

AFMA's program for addressing bycatch and discarding in Commonwealth managed fisheries was released in March 2008. The program implements a two streamed approach for minimising and mitigating against capture of bycatch and protected (TEP) species as well as strategies to minimise the discarding of target and quota species.

A Bycatch and Discarding Work Plan (previously known as a bycatch action plan (BAP)) was implemented for the BSCZSF effective from 1 June 2009 to 31 May 2011. This Work Plan outlines the strategies and actions AFMA will use to address the following key objectives:

- Respond to those priority species identified as high ecological risks (refer to **Table 4**) and take steps to increase the knowledge of priority species and their interactions with the fishery;
- Develop a longer-term response plan for all remaining priority species based on scientific advice;
- Develop measures to mitigate protected (TEP) species interactions; and,
- Ensure through independent monitoring that robust estimates of discarding are made and used in the Harvest Strategy for the BSCZSF.



The following projects will be undertaken during the period of the Work Plan to pursue the above objectives:

- Implementation of observer coverage designed to fill critical information gaps about priority and protected (TEP) species and bycatch and discarding more generally;
- Analysis of observer, logbook and survey data to identify information gaps and emerging issues;
- Promoting industry awareness of bycatch and discarding issues including the importance of logbook data to improve the quality of reporting; and
- Review of monitoring program.

These projects will contribute towards future mitigation strategies, fill critical information gaps about priority species and about bycatch and discarding more generally, and will assist in the development of a more strategic approach to the management of bycatch and discarding in the fishery. Through the review of the Work Plan, further projects can be added if they are consistent with the research priorities identified for the fishery and there is funding capacity.

In addition to the Work Plan, the fishery has also implemented a Harvest Strategy. The Harvest Strategy contains comprehensive rules regarding spatial management which have the secondary effect of protecting benthic species and habitats.

**Table 4** details the priority species which will be addressed under the Bycatch and Discard Program. These species are considered high risk due to a lack of detailed information regarding spatial distribution and life history characteristics.

**Table 4:** Priority species to be addressed under the Bycatch and Discard Program.

Taxonomic Group	Scientific Name	Common Name	Role in Fishery	Highest Level of Assessment	Risk Score
Invertebrate	<i>Eucrassatella kingicola</i>	Crassatella	Discard	Level 2 PSA Residual Risk Assessment	High
Invertebrate	<i>Hapalochlaena maculosa</i>	Southern blue ringed octopus	Discard	Level 2 PSA Residual Risk Assessment	High
Invertebrate	<i>Bellidilia undecimspinosa</i>	Pebble crab	Discard	Level 2 PSA Residual Risk Assessment	High
Invertebrate	<i>Luidia australiae</i>	Black and white seastar	Discard	Level 2 PSA Residual Risk Assessment	High

○ **Chondrichthyan Guide for Fisheries Managers**

A practical guide has been developed to assist fishery managers and stakeholders to adopt and implement management arrangements for Chondrichthyan species. The Chondrichthyan Working Group utilised expert based advice to develop effective mitigation strategies and to identify gaps in research and data. Three protected (TEP) species will be covered by this guide (refer to **Table 5**).



**Table 5:** Species to be addressed by utilising the Chondrichthyan Guide for Fisheries Managers and any associated policies.

Taxonomic Group	Scientific Name	Common Name	Role in Fishery	Highest Level of Assessment	Risk Score
Chondrichthyan	<i>Carcharias taurus</i>	grey nurse shark	TEP	Level 1 SICA	Not at risk
Chondrichthyan	<i>Carcharodon carcharias</i>	white shark	TEP	Level 1 SICA	Not at risk
Chondrichthyan	<i>Rhincodon typus</i>	whale shark	TEP	Level 1 SICA	Not at risk

o **Protected (TEP)**

All protected (TEP) species identified through the ERA process (as occurring in the area of the fishery) will automatically be included in the priority list for each fishery. Many of these species are already managed under various international plans of action including the:

- Threat Abatement Plan 2006: for the incidental catch (or bycatch) of seabirds during oceanic longline fishing operations;
- National Strategy to Address Interactions between Humans and Seals: Fisheries, Aquaculture and Tourism;
- Recovery Plan for Marine Turtles in Australia; and,
- Draft Recovery Plan for the Australian Sea Lion.

The BSCZSF has limited interactions with protected (TEP) species and through the risk assessment process, commercial fishing is considered to pose a low risk to these species. However, information on interactions with protected (TEP) species will continue to be collected and evaluated through annual surveys, logbooks, and independent observers.

**Table 6:** List of protected (TEP) species which were not found to be at high ecological risk, but which were considered to overlap with the area of the fishery. All reasonable steps will be taken to minimise interactions with these species.

Taxonomic Group	Scientific Name	Common Name	Role in Fishery	Highest Level of Assessment	Risk Score
Chondrichthyan	<i>Carcharias taurus</i>	grey nurse shark	TEP	Level 1 SICA	Not at risk
Chondrichthyan	<i>Carcharodon carcharias</i>	white shark	TEP	Level 1 SICA	Not at risk
Chondrichthyan	<i>Rhincodon typus</i>	whale shark	TEP	Level 1 SICA	Not at risk
Marine Bird	<i>Anous stolidus</i>	Common noddy	TEP	Level 1 SICA	Not at risk
Marine Bird	<i>Catharacta skua</i>	Great Skua	TEP	Level 1 SICA	Not at risk
Marine Bird	<i>Daption capense</i>	Cape Petrel	TEP	Level 1 SICA	Not at risk
Marine Bird	<i>Diomedea amsterdamensis</i>	Amsterdam Albatross	TEP	Level 1 SICA	Not at risk
Marine Bird	<i>Diomedea antipodensis</i>	Antipodean Albatross	TEP	Level 1 SICA	Not at risk
Marine Bird	<i>Diomedea dabbenena</i>	Tristan Albatross	TEP	Level 1 SICA	Not at risk
Marine Bird	<i>Diomedea epomophora</i>	Southern Royal Albatross	TEP	Level 1 SICA	Not at risk
Marine Bird	<i>Diomedea exulans</i>	Wandering Albatross	TEP	Level 1 SICA	Not at risk
Marine Bird	<i>Diomedea gibsoni</i>	Gibson's Albatross	TEP	Level 1 SICA	Not at risk



Marine Bird	<i>Diomedea sanfordi</i>	Northern Royal Albatross	TEP	Level 1 SICA	Not at risk
Marine Bird	<i>Eudyptula minor</i>	Little Penguin	TEP	Level 1 SICA	Not at risk
Marine Bird	<i>Fregatta tropica</i>	Black-bellied Storm-Petrel	TEP	Level 1 SICA	Not at risk
Marine Bird	<i>Fulmarus glacialisoides</i>	Southern fulmar	TEP	Level 1 SICA	Not at risk
Marine Bird	<i>Garrodia nereis</i>	Grey-backed storm petrel	TEP	Level 1 SICA	Not at risk
Marine Bird	<i>Haliaeetus leucogaster</i>	White-bellied Sea-Eagle	TEP	Level 1 SICA	Not at risk
Marine Bird	<i>Halobaena caerulea</i>	Blue Petrel	TEP	Level 1 SICA	Not at risk
Marine Bird	<i>Larus novaehollandiae</i>	Silver Gull	TEP	Level 1 SICA	Not at risk
Marine Bird	<i>Larus pacificus</i>	Pacific Gull	TEP	Level 1 SICA	Not at risk
Marine Bird	<i>Macronectes giganteus</i>	Southern Giant-Petrel	TEP	Level 1 SICA	Not at risk
Marine Bird	<i>Macronectes halli</i>	Northern Giant-Petrel	TEP	Level 1 SICA	Not at risk
Marine Bird	<i>Morus capensis</i>	Cape gannet	TEP	Level 1 SICA	Not at risk
Marine Bird	<i>Morus serrator</i>	Australasian Gannet	TEP	Level 1 SICA	Not at risk
Marine Bird	<i>Oceanites oceanicus</i>	Wilson's storm petrel (subantarctic)	TEP	Level 1 SICA	Not at risk
Marine Bird	<i>Pachyptila turtur</i>	Fairy Prion	TEP	Level 1 SICA	Not at risk
Marine Bird	<i>Pelecanoides urinatrix</i>	Common Diving-Petrel	TEP	Level 1 SICA	Not at risk
Marine Bird	<i>Phalacrocorax fuscescens</i>	Black faced cormorant	TEP	Level 1 SICA	Not at risk
Marine Bird	<i>Phoebetria fusca</i>	Sooty Albatross	TEP	Level 1 SICA	Not at risk
Marine Bird	<i>Phoebetria palpebrata</i>	Light-mantled Albatross	TEP	Level 1 SICA	Not at risk
Marine Bird	<i>Procellaria aequinoctialis</i>	White-chinned Petrel	TEP	Level 1 SICA	Not at risk
Marine Bird	<i>Pterodroma lessoni</i>	White-headed petrel	TEP	Level 1 SICA	Not at risk
Marine Bird	<i>Pterodroma leucoptera</i>	Gould's Petrel	TEP	Level 1 SICA	Not at risk
Marine Bird	<i>Pterodroma macroptera</i>	Great-winged Petrel	TEP	Level 1 SICA	Not at risk
Marine Bird	<i>Pterodroma mollis</i>	Soft-plumaged Petrel	TEP	Level 1 SICA	Not at risk
Marine Bird	<i>Pterodroma solandri</i>	Providence Petrel	TEP	Level 1 SICA	Not at risk
Marine Bird	<i>Puffinus carneipes</i>	Flesh-footed Shearwater	TEP	Level 1 SICA	Not at risk
Marine Bird	<i>Puffinus gavia</i>	Fluttering Shearwater	TEP	Level 1 SICA	Not at risk
Marine Bird	<i>Puffinus griseus</i>	Sooty Shearwater	TEP	Level 1 SICA	Not at risk
Marine Bird	<i>Puffinus huttoni</i>	Hutton's Shearwater	TEP	Level 1 SICA	Not at risk
Marine Bird	<i>Puffinus tenuirostris</i>	Short-tailed Shearwater	TEP	Level 1 SICA	Not at risk
Marine Bird	<i>Sterna albifrons</i>	Little tern	TEP	Level 1 SICA	Not at risk
Marine Bird	<i>Sterna bergii</i>	Crested Tern	TEP	Level 1 SICA	Not at risk
Marine Bird	<i>Sterna caspia</i>	Caspian Tern	TEP	Level 1 SICA	Not at risk
Marine Bird	<i>Sterna fuscata</i>	Sooty tern	TEP	Level 1 SICA	Not at risk
Marine Bird	<i>Sterna hirundo</i>	Common tern	TEP	Level 1 SICA	Not at risk
Marine Bird	<i>Sterna paradisaea</i>	Arctic tern	TEP	Level 1 SICA	Not at risk
Marine Bird	<i>Sterna striata</i>	White-fronted Tern	TEP	Level 1 SICA	Not at risk
Marine Bird	<i>Thalassarche bulleri</i>	Buller's Albatross	TEP	Level 1 SICA	Not at risk
Marine Bird	<i>Thalassarche carteri</i>	Indian Yellow-nosed Albatross	TEP	Level 1 SICA	Not at risk



Marine Bird	<i>Thalassarche cauta</i>	Shy Albatross	TEP	Level 1 SICA	Not at risk
Marine Bird	<i>Thalassarche chlororhynchus</i>	Yellow-nosed Albatross, Atlantic Yellow-	TEP	Level 1 SICA	Not at risk
Marine Bird	<i>Thalassarche chrysostoma</i>	Grey-headed Albatross	TEP	Level 1 SICA	Not at risk
Marine Bird	<i>Thalassarche eremita</i>	Chatham albatross	TEP	Level 1 SICA	Not at risk
Marine Bird	<i>Thalassarche impavida</i>	Campbell Albatross	TEP	Level 1 SICA	Not at risk
Marine Bird	<i>Thalassarche melanophrys</i>	Black-browed Albatross	TEP	Level 1 SICA	Not at risk
Marine Bird	<i>Thalassarche nov. sp.</i>	Pacific Albatross	TEP	Level 1 SICA	Not at risk
Marine Bird	<i>Thalassarche platei</i>	Pacific albatross	TEP	Level 1 SICA	Not at risk
Marine Bird	<i>Thalassarche salvini</i>	Salvin's albatross	TEP	Level 1 SICA	Not at risk
Marine Bird	<i>Thalassarche steadi</i>	White-capped Albatross	TEP	Level 1 SICA	Not at risk
Marine Mammal	<i>Arctocephalus pusillus doriferus</i>	Australian Fur Seal	TEP	Level 1 SICA	Not at risk
Marine Mammal	<i>Arctocephalus tropicalis</i>	Subantarctic fur seal	TEP	Level 1 SICA	Not at risk
Marine Mammal	<i>Balaenoptera acutorostrata</i>	Minke Whale	TEP	Level 1 SICA	Not at risk
Marine Mammal	<i>Balaenoptera bonaerensis</i>	Antarctic Minke Whale	TEP	Level 1 SICA	Not at risk
Marine Mammal	<i>Balaenoptera borealis</i>	Sei Whale	TEP	Level 1 SICA	Not at risk
Marine Mammal	<i>Balaenoptera edeni</i>	Bryde's Whale	TEP	Level 1 SICA	Not at risk
Marine Mammal	<i>Balaenoptera musculus</i>	Blue Whale	TEP	Level 1 SICA	Not at risk
Marine Mammal	<i>Balaenoptera physalus</i>	Fin Whale	TEP	Level 1 SICA	Not at risk
Marine Mammal	<i>Berardius arnuxii</i>	Arnoux's Beaked Whale	TEP	Level 1 SICA	Not at risk
Marine Mammal	<i>Caperea marginata</i>	Pygmy Right Whale	TEP	Level 1 SICA	Not at risk
Marine Mammal	<i>Delphinus delphis</i>	Common Dolphin	TEP	Level 1 SICA	Not at risk
Marine Mammal	<i>Eubalaena australis</i>	Southern Right Whale	TEP	Level 1 SICA	Not at risk
Marine Mammal	<i>Globicephala macrorhynchus</i>	Short-finned Pilot Whale	TEP	Level 1 SICA	Not at risk
Marine Mammal	<i>Globicephala melas</i>	Long-finned Pilot Whale	TEP	Level 1 SICA	Not at risk
Marine Mammal	<i>Grampus griseus</i>	Risso's Dolphin	TEP	Level 1 SICA	Not at risk
Marine Mammal	<i>Hydrurga leptonyx</i>	Leopard seal	TEP	Level 1 SICA	Not at risk
Marine Mammal	<i>Hyperoodon planifrons</i>	Southern Bottlenose Whale	TEP	Level 1 SICA	Not at risk
Marine Mammal	<i>Kogia breviceps</i>	Pygmy Sperm Whale	TEP	Level 1 SICA	Not at risk
Marine Mammal	<i>Kogia simus</i>	Dwarf Sperm Whale	TEP	Level 1 SICA	Not at risk
Marine Mammal	<i>Lagenodelphis hosei</i>	Fraser's Dolphin	TEP	Level 1 SICA	Not at risk
Marine Mammal	<i>Lagenorhynchus obscurus</i>	Dusky Dolphin	TEP	Level 1 SICA	Not at risk
Marine Mammal	<i>Lissodelphis peronii</i>	Southern Right Whale Dolphin	TEP	Level 1 SICA	Not at risk
Marine Mammal	<i>Megaptera novaeangliae</i>	Humpback Whale	TEP	Level 1 SICA	Not at risk
Marine Mammal	<i>Mesoplodon bowdoini</i>	Andrew's Beaked Whale	TEP	Level 1 SICA	Not at risk
Marine Mammal	<i>Mesoplodon densirostris</i>	Blainville's Beaked Whale	TEP	Level 1 SICA	Not at risk
Marine Mammal	<i>Mesoplodon ginkgodens</i>	Gingko Beaked Whale	TEP	Level 1 SICA	Not at risk



Marine Mammal	<i>Mesoplodon grayi</i>	Gray's Beaked Whale	TEP	Level 1 SICA	Not at risk
Marine Mammal	<i>Mesoplodon hectori</i>	Hector's Beaked Whale	TEP	Level 1 SICA	Not at risk
Marine Mammal	<i>Mesoplodon layardii</i>	Strap-toothed Beaked Whale	TEP	Level 1 SICA	Not at risk
Marine Mammal	<i>Mesoplodon mirus</i>	True's Beaked Whale	TEP	Level 1 SICA	Not at risk
Marine Mammal	<i>Orcinus orca</i>	Killer Whale	TEP	Level 1 SICA	Not at risk
Marine Mammal	<i>Physeter catodon</i>	Sperm Whale	TEP	Level 1 SICA	Not at risk
Marine Mammal	<i>Pseudorca crassidens</i>	False Killer Whale	TEP	Level 1 SICA	Not at risk
Marine Mammal	<i>Tasmacetus shepherdi</i>	Tasman Beaked Whale	TEP	Level 1 SICA	Not at risk
Marine Mammal	<i>Tursiops aduncus</i>	Indian Ocean bottlenose dolphin	TEP	Level 1 SICA	Not at risk
Marine Mammal	<i>Tursiops truncatus</i>	Bottlenose Dolphin	TEP	Level 1 SICA	Not at risk
Marine Mammal	<i>Ziphius cavirostris</i>	Cuvier's Beaked Whale	TEP	Level 1 SICA	Not at risk
Teleost	<i>Heraldia nocturna</i>	Upside-down Pipefish	TEP	Level 1 SICA	Not at risk
Teleost	<i>Heraldia sp. 1 [in Kuitert, 2000]</i>	Western upsidedown pipefish	TEP	Level 1 SICA	Not at risk
Teleost	<i>Heteroclinus perspicillatus</i>	Common weedfish	TEP	Level 1 SICA	Not at risk
Teleost	<i>Hippocampus abdominalis</i>	Big-bellied / southern potbellied seahorse	TEP	Level 1 SICA	Not at risk
Teleost	<i>Hippocampus bleekeri</i>	pot bellied seahorse	TEP	Level 1 SICA	Not at risk
Teleost	<i>Hippocampus breviceps</i>	Short-head Seahorse, Short-snouted Seaho	TEP	Level 1 SICA	Not at risk
Teleost	<i>Hippocampus minotaur</i>	Bullneck Seahorse	TEP	Level 1 SICA	Not at risk
Teleost	<i>Hippocampus whitei</i>	white's seahorse	TEP	Level 1 SICA	Not at risk
Teleost	<i>Histiogamphelus briggsii</i>	Briggs' Crested Pipefish, Briggs' Pipefish	TEP	Level 1 SICA	Not at risk
Teleost	<i>Histiogamphelus cristatus</i>	Rhino Pipefish, Macleay's Crested Pipefish	TEP	Level 1 SICA	Not at risk
Teleost	<i>Hypselognathus rostratus</i>	Knife-snouted Pipefish	TEP	Level 1 SICA	Not at risk
Teleost	<i>Kaupus costatus</i>	Deep-bodied Pipefish	TEP	Level 1 SICA	Not at risk
Teleost	<i>Kimblaesus bassensis</i>	Trawl Pipefish, Kimbla Pipefish	TEP	Level 1 SICA	Not at risk
Teleost	<i>Leptoichthys fistularius</i>	Brushtail Pipefish	TEP	Level 1 SICA	Not at risk
Teleost	<i>Lissocampus caudalis</i>	Australian Smooth Pipefish, Smooth Pipefish	TEP	Level 1 SICA	Not at risk
Teleost	<i>Lissocampus runa</i>	Javelin Pipefish	TEP	Level 1 SICA	Not at risk
Teleost	<i>Maroubra perserrata</i>	Sawtooth Pipefish	TEP	Level 1 SICA	Not at risk
Teleost	<i>Mitotichthys mollisoni</i>	Mollison's Pipefish	TEP	Level 1 SICA	Not at risk
Teleost	<i>Mitotichthys semistriatus</i>	Half-banded Pipefish	TEP	Level 1 SICA	Not at risk
Teleost	<i>Mitotichthys tuckeri</i>	Tucker's Pipefish	TEP	Level 1 SICA	Not at risk
Teleost	<i>Notiocampus ruber</i>	Red Pipefish	TEP	Level 1 SICA	Not at risk
Teleost	<i>Phycodurus eques</i>	Leafy Seadragon	TEP	Level 1 SICA	Not at risk
Teleost	<i>Phyllopteryx taeniolatus</i>	Weedy Seadragon, Common Seadragon	TEP	Level 1 SICA	Not at risk
Teleost	<i>Pugnaso curtirostris</i>	Pug-nosed Pipefish	TEP	Level 1 SICA	Not at risk



Teleost	<i>Solegnathus robustus</i>	Robust Spiny Pipehorse, Robust Pipehorse	TEP	Level 1 SICA	Not at risk
Teleost	<i>Solegnathus spinosissimus</i>	spiny pipehorse	TEP	Level 1 SICA	Not at risk
Teleost	<i>Stigmatopora argus</i>	Spotted Pipefish	TEP	Level 1 SICA	Not at risk
Teleost	<i>Stigmatopora nigra</i>	Wide-bodied Pipefish, Black Pipefish	TEP	Level 1 SICA	Not at risk
Teleost	<i>Stipecampus cristatus</i>	Ring-backed Pipefish	TEP	Level 1 SICA	Not at risk
Teleost	<i>Syngnathoides biaculeatus</i>	Double-ended Pipehorse, Alligator Pipefish	TEP	Level 1 SICA	Not at risk
Teleost	<i>Urocampus carinirostris</i>	Hairy Pipefish	TEP	Level 1 SICA	Not at risk
Teleost	<i>Vanacampus margaritifer</i>	Mother-of-pearl Pipefish	TEP	Level 1 SICA	Not at risk
Teleost	<i>Vanacampus phillipi</i>	Port Phillip Pipefish	TEP	Level 1 SICA	Not at risk
Teleost	<i>Vanacampus poecilolaemus</i>	Australian Long-snout Pipefish, Long-snouted Pipefish	TEP	Level 1 SICA	Not at risk

- **Additional fishery specific management arrangements**

There are no additional policies or measures in place in the BSCZSF relevant to the management of the priority species identified for the fishery.

#### **4. REPORTING AND REVIEW**

The reporting mechanisms and frameworks that are in place within each of the policies and measures detailed above will form the principal ERM strategy review components for each fishery. They will also be used when providing input to annual reporting requirements for DEWHA.

A full review of the risk assessments undertaken for each Commonwealth managed fishery will be completed periodically. Outcomes of the ERM strategies and measures described in each fishery's various work plans and Harvest Strategies will flow into a number of processes including annual reporting to DEWHA. Individual fishery Harvest Strategies and Bycatch and Discard Work Plans contain annual and longer term review timeframes and it is expected that the Non-key Commercial Species Policy will do likewise. The Chondrichthyan Working Group has met and produced a generic guide of mitigation measures suitable for use across all Commonwealth managed fisheries.

On a broader scale the outputs from the annual reviews will be used to form the response to any Wildlife Trade Operation (WTO) accreditation or exemption in place in the fishery.



## 5. GLOSSARY

Attribute	A general term for a set of properties relating to the productivity or susceptibility of a particular unit of analysis.
Bycatch	That part of fisher's catch which is returned to the sea either because it has no commercial value or regulations preclude it from being retained, and; That part of the catch that does not reach the deck of the fishing vessel but is affected by the interaction with the fishing gear.
Byproduct	A non-target species captured in a fishery that has value to the fisher and may be retained for sale.
Component	The marine ecosystem is broken down into five components for the risk assessment: target species (TA); byproduct (BI) and bycatch species (DI); protected (TEP) species; habitats; and ecological communities.
EBFM	Ecosystem-based fisheries management considers the impact that fishing has on all of the aspects of the broader marine ecosystem, not just the target species.
ERA	Ecological risk assessment for the effects of fishing as developed by AFMA and CSIRO.
Gear	The equipment used for fishing, e.g. gillnet, Danish seine, pelagic longline, midwater trawl, purse seine, trap etc.
Level 2 PSA Residual Risk	In the context of this document residual risk means the residual risk after the Level 2 PSA assessment.
Scoping	A general step in an ERA or the first step in the ERAEF involving the identification of the fishery history, management, methods, scope and activities.
Susceptibility	Used in Level 2 PSA assessment to calculate the impact on an ecological component due to a fishing activity. The extent of the impact due to the fishing activity, determined by the affect of the fishing activities on the unit.



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