# Appendix 1 Terms of Reference for the Expert Panel on a Declared Commercial Fishing Activity

### Background

On 26 April 2013, the then Minister for Sustainability, Environment, Water, Population and Communities made the *Final (Small Pelagic Fishery) Declaration (No. 2) 2013* (the second Final Declaration) which came into force on 27 April 2013.

This declaration provides that the following commercial fishing activities are declared commercial fishing activities for the purposes of Part 15B of the *Environment Protection and Biodiversity Conservation Act 1999 (Cth)* (the EPBC Act):

a. Mid-water trawl activity

This is a commercial fishing activity that:

- i. is in the Small Pelagic Fishery; and
- ii. uses the mid-water trawl method; and
- iii. uses a vessel which has a storage capacity for fish or fish products of 1600 tonnes or greater.
- b. Fish processing activity

This is a commercial fishing activity that:

- i. is in the Small Pelagic Fishery; and
- ii. uses a vessel which has storage capacity for fish or fish products of 1600 tonnes or greater; and
- iii. consists of receiving or processing fish or fish products that are quota species that have been taken in the Small Pelagic Fishery.

The declared commercial fishing activities are prohibited for up to two years while an expert panel conducts an assessment and reports to the Minister on the activities.

The expert panel is established under section 390SH of the EPBC Act, as are the terms of reference for its assessment.

### Terms of Reference

The expert panel will assess the declared commercial fishing activities, particularly the potential for the activities to result in adverse environmental impacts.

The expert panel will assess and advise on:

- 1. the likely nature and extent of direct interactions of the declared commercial fishing activities with species protected under the EPBC Act, particularly seals, dolphins and seabirds;
- 2. the potential for any localised depletion of target species (arising from the declared commercial fishing activities) to result in adverse impacts to the Commonwealth marine environment, including the target species' predators protected under the EPBC Act;
- 3. actions that could be taken by operators of the declared commercial fishing activities or relevant regulatory authorities to avoid, reduce and mitigate adverse environmental impacts of the activities;
- 4. monitoring or scientific research that would reduce any uncertainties about the potential for adverse environmental impacts resulting from the declared commercial fishing activities;
- 5. any other matters about the environmental impacts of the declared commercial fishing activities that the expert panel considers relevant to its assessment; and
- 6. other related matters that may be referred to it by the Minister.

### Date for report

The expert panel must report to the Minister by 27 March 2015.

### Manner of carrying out assessment

In carrying out its assessment, the expert panel will:

- a. examine existing scientific literature, other relevant information and any ongoing research or monitoring projects relevant to the impacts of the declared commercial fishing activities;
- b. consult with and seek submissions from experts in relevant scientific disciplines where the expert panel believes this is necessary to clarify areas of uncertainty about the environmental impacts of the declared commercial fishing activities;
- c. consider the fisheries management arrangements under which the declared commercial fishing activities are proposed to operate and the extent to which those management arrangements address the relevant environmental impacts and uncertainties;
- d. take account of the requirements of the EPBC Act as they relate to the operation and accreditation of Commonwealth fisheries;
- e. commission, through the Department of the Environment, new reviews, research projects, modelling or analyses which the expert panel believes are necessary to fill critical knowledge gaps and where the results of those projects and analyses will allow the expert panel to fulfil its terms of reference;
- f. consult with relevant experts and stakeholders, including in the operations of the declared commercial fishing activities, on the nature and effectiveness of measures available to reduce direct interactions with EPBC Act protected species and the potential ecological effects of any localised depletion resulting from the declared commercial fishing activities; and
- g. identify further necessary and practicable monitoring or research projects that would reduce critical uncertainties for decision making relevant to any future operations of the declared commercial fishing activities.

# Appendix 2 Advice provided to the panel

The panel is very grateful to the many people that provided insights and inputs to inform the panel's assessment. Those people and the nature of their input to the panel's work are identified below. The panel also relied upon advice received during the development of its first declaration report (Expert Panel on a Declared Commercial Fishing Activity 2014, see Appendix 2).

Table A2.1 People who provided advice to the panel

NAME AND POSITION	EXPERTISE	NATURE OF CONSULTATION
Mr Crispian Ashby, Program Manager, Fisheries Research and Development Corporation	Fisheries research	Provision of research reports
Mr John Burgess, Executive Officer/Director, Australian National Sportfishing Association Ltd	Recreational fishing	Submission
Dr James Findlay, Chief Executive Officer, Australian Fisheries Management Authority (AFMA)	Fisheries management	Written responses to requests for information and questions
Dr Nick Rayns, Executive Manager, Fisheries Management, AFMA		Meeting
Mr Steve Shanks, Manager, Scallop, Norfolk Island, Coral Sea and Small Pelagic Fisheries, AFMA		
Mr Gerry Geen, Director, Seafish Tasmania Pty Ltd	Commercial fishing operations: mid-water trawl	Submission to Interim Declaration
		Written response to questions
Ms Rebecca Hubbard, Coordinator, Stop the Trawler Alliance	Conservation	Submission
Mr AK (Sandy) Morison, Fisheries Consultant, Morison Aquatic Sciences	Fisheries Science	Submission
Mr Grant Pullen, Manager, Wild Fisheries Management Branch, Tasmanian Department of Primary Industries, Parks, Water and Environment	Fisheries management	Phone meeting

# Appendix 3 EPBC Act protected species in the SPF area

## **Protected species**

GROUP/SCIENTIFIC NAME	COMMON NAME(S)	EPBC ACT LISTING STATUS	LEVEL 2 PSA RISK (MID- WATER TRAWL) (DALEY ET AL. 2007B)	LEVEL 2 PSA RESIDUAL RISK (MID- WATER TRAWL) (AFMA 2010B)	LEVEL 2 PSA RISK (PURSE SEINE) (DALEY <i>ET</i> <i>AL</i> . 2007A)	LEVEL 2 PSA RESIDUAL RISK (PURSE SEINE) (AFMA 2010A)
MARINE MAMMALS						
Pinnipeds						
Arctocephalus forsteri	New Zealand fur seal	Marine	Medium	Medium	Medium	Medium
Arctocephalus gazella	Antarctic fur seal	Marine	Not assessed	Not assessed	Not assessed	Not assessed
Arctocephalus pusillus	Australian fur seal, cape fur seal	Marine	High	High	High	High
Arctocephalus tropicalis	Subantarctic fur seal	Vulnerable Marine	Medium	Medium	Medium	Medium
Hydrurga leptonyx	Leopard seal	Marine	High	Medium	High	High
Leptonychotes weddelli	Weddell Seal	Marine	Not assessed	Not assessed	Not assessed	Not assessed
Lobodon carcinophagus	Crabeater seal	Marine	Not assessed	Not assessed	Not assessed	Not assessed
Mirounga leonina	Southern elephant seal	Vulnerable Marine	High	Medium	High	High
Neophoca cinerea	Australian sea lion	Vulnerable Marine	Medium	Medium	High	Medium
Ommatophoca rossii	Ross seal	Marine	Not assessed	Not assessed	Not assessed	Not assessed
Cetaceans: Baleen wha	ales					
Balaenoptera acutorostrata	Common minke whale	Cetacean Migratory	Medium	Medium	High	High
Balaenoptera bonaerensis	Antarctic minke whale	Cetacean Migratory	Medium	Medium	Medium	Medium
Balaenoptera borealis	Sei whale	Vulnerable Cetacean Migratory	Medium	Medium	Medium	Medium
Balaenoptera edeni	Bryde's whale	Cetacean Migratory	Medium	Medium	Medium	Medium
Balaenoptera musculus	Blue whale	Endangered Cetacean Migratory	Medium	Medium	Medium	Medium

GROUP/SCIENTIFIC NAME	COMMON NAME(S)	EPBC ACT LISTING STATUS	LEVEL 2 PSA RISK (MID- WATER TRAWL) (DALEY <i>ET</i> <i>AL</i> . 2007B)	LEVEL 2 PSA RESIDUAL RISK (MID- WATER TRAWL) (AFMA 2010B)	LEVEL 2 PSA RISK (PURSE SEINE) (DALEY ET AL. 2007A)	LEVEL 2 PSA RESIDUAL RISK (PURSE SEINE) (AFMA 2010A)
Balaenoptera omurai	Omura's whale	Not listed (all cetaceans protected in the Australian Whale Sanctuary)	Not assessed	Not assessed	Not assessed	Not assessed
Balaenoptera physalus	Fin whale	Vulnerable Cetacean Migratory	Medium	Medium	Medium	Medium
Caperea marginata	Pygmy right whale	Cetacean Migratory	Medium	Medium	Medium	Medium
Eubalaena australis  Megaptera novaeangliae	Southern right whale Humpback whale	Endangered Cetacean Migratory Vulnerable Cetacean	Medium Medium	Medium Medium	Medium High	Medium High
Cetaceans: Toothed ce	taceans	Migratory				
Berardius arnuxii	Arnoux's beaked whale	Cetacean	Medium	Medium	Medium	Medium
Delphinus delphis	Common dolphin, short- beaked common dolphin	Cetacean	Medium	Medium	Medium	Medium
Feresa attenuata	Pygmy killer whale	Cetacean	High	Medium	High	High
Globicephala macrorhynchus	Short-finned pilot whale	Cetacean	High	Medium	High	High
Globicephala melas	Long-finned pilot whale	Cetacean	High	Medium	High	High
Grampus griseus	Risso's dolphin, grampus	Cetacean	High	High	High	High
Hyperoodon planifrons	Southern bottlenose whale	Cetacean	High	Medium	High	High
Kogia breviceps	Pygmy sperm whale	Cetacean	Medium	Medium	Medium	Medium
Kogia sima	Dwarf sperm whale	Cetacean	Medium	Medium	High	High
Lagenodelphis hosei	Fraser's dolphin, Sarawak dolphin	Cetacean Migratory	High	High	High	High
Lagenorhynchus cruciger	Hourglass dolphin	Cetacean	High	High	High	High
Lagenorhynchus obscurus	Dusky dolphin	Cetacean Migratory	Low	Low	High	Medium
Lissodelphis peronii	Southern right whale dolphin	Cetacean	High	High	High	High
Mesoplodon bowdoini	Andrews' beaked whale	Cetacean	High	Medium	High	High
Mesoplodon densirostris	Blainville's beaked whale, dense-beaked whale	Cetacean	High	Medium	High	High
Mesoplodon ginkgodens	Ginkgo-toothed beaked whale	Cetacean	High	Medium	High	High
Mesoplodon grayi	Gray's beaked whale	Cetacean	High	Medium	High	High

GROUP/SCIENTIFIC NAME	COMMON NAME(S)	EPBC ACT LISTING STATUS	LEVEL 2 PSA RISK (MID- WATER TRAWL) (DALEY <i>ET</i> <i>AL</i> . 2007B)	LEVEL 2 PSA RESIDUAL RISK (MID- WATER TRAWL) (AFMA 2010B)	LEVEL 2 PSA RISK (PURSE SEINE) (DALEY ET AL. 2007A)	LEVEL 2 PSA RESIDUAL RISK (PURSE SEINE) (AFMA 2010A)
Mesoplodon hectori	Hector's beaked whale	Cetacean	High	Medium	High	High
Mesoplodon layardii	Strap-toothed beaked whale	Cetacean	High	Medium	High	High
Mesoplodon mirus	True's beaked whale	Cetacean	High	Medium	High	High
Orcinus orca	Killer whale, orca	Cetacean Migratory	Medium	Medium	High	High
Peponocephala electra	Melon-headed whale	Cetacean	Medium	Medium	Medium	Medium
Phocoena dioptrica	Spectacled porpoise	Cetacean	Not assessed	Not assessed	Not assessed	Not assessed
Physeter macrocephalus	Sperm whale	Cetacean Migratory	Medium	Medium	Medium	Medium
Pseudorca crassidens	False killer whale	Cetacean	High	Medium	High	High
Sousa sahulensis (formerly Sousa chinensis)	Australian humpback dolphin (formerly Indo-Pacific humpback dolphin)	Cetacean Migratory	Medium	Medium	High	High
Stenella attenuata	Spotted dolphin, pantropical spotted dolphin	Cetacean Migratory	Medium	Medium	Medium	Medium
Stenella coeruleoalba	Striped dolphin	Cetacean	High	High	High	High
Stenella longirostris	Long-snouted spinner dolphin	Cetacean Migratory	Medium	Medium	Medium	Medium
Steno bredanensis	Rough-toothed dolphin	Cetacean	Medium	Medium	High	High
Tasmacetus shepherdi	Shepherd's beaked whale	Cetacean	Medium	Medium	Medium	Medium
Tursiops aduncus	Indo-Pacific bottlenose dolphin	Cetacean Migratory	High	High	High	High
Tursiops truncatus	Common bottlenose dolphin	Cetacean	High	High	High	High
Ziphius cavirostris	Cuvier's beaked whale	Cetacean	High	Medium	High	High
Dugong						
Dugong dugon	Dugong	Marine Migratory	Medium	Medium	Medium	Medium
Seabirds (central place	e forager species bolded)					
Anous minutus	Black noddy	Marine	Low	Low	High	Medium
Anous stolidus	Common noddy	Marine	Low	Low	High	Medium
Anous tenuirostris melanops	Australian lesser noddy	Vulnerable Marine	Low	Low	High	Medium
Apus pacificus	Fork-tailed swift	Marine Migratory	Not assessed	Not assessed	Not assessed	Not assessed
Ardea alba (listed Marine as Ardea alba and listed Migratory as Egretta alba)	Great egret, white egret	Marine Migratory	Not assessed	Not assessed	Not assessed	Not assessed

GROUP/SCIENTIFIC NAME	COMMON NAME(S)	EPBC ACT LISTING STATUS	LEVEL 2 PSA RISK (MID- WATER TRAWL) (DALEY <i>ET</i> <i>AL</i> . 2007B)	LEVEL 2 PSA RESIDUAL RISK (MID- WATER TRAWL) (AFMA 2010B)	LEVEL 2 PSA RISK (PURSE SEINE) (DALEY ET AL. 2007A)	LEVEL 2 PSA RESIDUAL RISK (PURSE SEINE) (AFMA 2010A)
Ardenna carneipes (listed marine as	Flesh-footed shearwater, fleshy-footed shearwater	Marine	Medium	Medium	High	Medium
Puffinus carneipes)						
Ardenna tenuirostris (listed Marine as Puffinus tenuirostris)	Short-tailed shearwater	Marine Migratory	Medium	Medium	High	Medium
Botaurus poiciloptilus	Australasian bittern	Endangered	Not assessed	Not assessed	Not assessed	Not assessed
Calonectris leucomelas	Streaked shearwater	Marine	Medium	Medium	High	Medium
(listed Migratory as Puffinus leucomelas)		Migratory				
Catharacta skua	Great skua	Marine	Medium	Medium	High	Medium
Daption capense	Cape petrel	Marine	Medium	Medium	High	Medium
Diomedea epomophora epomophora (listed Marine and Migratory as D. epomophora (sensu stricto))	Southern royal albatross	Vulnerable Marine Migratory	Medium	Medium	High	Medium
Diomedea exulans amsterdamensis	Amsterdam albatross	Endangered Marine Migratory	Medium	Medium	High	Medium
Diomedea exulans antipodensis	Antipodean albatross	Vulnerable  Marine  Migratory	Medium	Medium	High	Medium
Diomedea exulans exulans (listed Marine and Migratory as D. dabbenena)	Tristan albatross	Endangered Marine Migratory	Medium	Medium	High	Medium
Diomedea exulans (sensu lato)	Wandering albatross	Vulnerable Marine Migratory	Medium	Medium	High	Medium
Diomedea exulans gibsoni	Gibson's albatross	Vulnerable Marine	Medium	Medium	High	Medium
(listed Marine and Migratory as <i>D. gibsoni</i> )		Migratory				
Diomedea sanfordi	Northern royal albatross	Endangered Marine Migratory	Medium	Medium	High	Medium
Eudyptula minor	Little penguin	Marine	Low	Low	High	Medium
Fregetta grallaria grallaria	White-bellied storm- petrel (Tasman Sea, Australasian)	Marine	Medium	Medium	High	Medium
Fregetta tropica	Black-bellied storm-petrel	Marine	Medium	Medium	High	Medium

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Fulmarus glacialoides	Southern fulmar	Marine	Medium	Medium	High	Medium
Garrodia nereis	Grey-backed storm petrel	Marine	Medium	Medium	High	Medium
Haliaeetus leucogaster	White-bellied sea eagle	Marine Migratory	Not assessed	Not assessed	Not assessed	Not assessed
Halobaena caerulea	Blue petrel	Vulnerable Marine	Medium	Medium	High	Medium
Larus dominicanus	Kelp gull	Marine	Low	Low	High	Medium
Larus novaehollandiae	Silver gull	Marine	Low	Low	High	Medium
Larus pacificus	Pacific gull	Marine	Low	Low	High	Medium
Lugensa brevirostris	Kerguelen petrel	Marine	Medium	Medium	High	Medium
Macronectes giganteus	Southern giant-petrel	Endangered Marine Migratory	Low	Low	High	Medium
Macronectes halli	Northern giant-petrel	Vulnerable Marine Migratory	Low	Low	High	Medium
Morus capensis	Cape gannet	Marine	Low	Low	High	Medium
Morus serrator	Australasian gannet	Marine	Low	Low	High	Medium
Neophema chrysogaster	Orange-bellied parrot	Critically endangered  Marine	Not assessed	Not assessed	Not assessed	Not assessed
Oceanites oceanicus	Wilson's storm petrel	Marine	Low	Low	High	Low
Pachyptila desolata	Antarctic prion	Marine	Not assessed	Not assessed	Not assessed	Not assessed
Pachyptila belcheri	Slender-billed prion	Marine	Not assessed	Not assessed	Not assessed	Not assessed
Pachyptila salvini	Salvin's prion	Marine	Not assessed	Not assessed	Not assessed	Not assessed
Pachyptila turtur	Fairy prion	Marine	Medium	Medium	High	Medium
Pachyptila vittata	Broad-billed prion	Marine	Not assessed	Not assessed	Not assessed	Not assessed
Pandion haliaetus	Osprey	Marine Migratory	Not assessed	Not assessed	Not assessed	Not assessed
Pelagodroma marina	White-faced storm- petrel	Marine	Low	Low	High	Low
Pelecanoides urinatrix	Common diving-petrel	Marine	Low	Low	High	Low
Phaethon rubricauda	Red-tailed tropicbird	Marine	Low	Low	High	Medium
Phalacrocorax fuscescens	Black-faced cormorant	Marine	Medium	Medium	High	Medium
Phoebetria fusca	Sooty albatross	Vulnerable  Marine  Migratory	Medium	Medium	High	Medium

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Phoebetria palpebrata	Light-mantled sooty albatross	Marine Migratory	Medium	Medium	High	Medium
Procellaria aequinoctialis	White-chinned petrel	Marine Migratory	Medium	Medium	High	Medium
Procellaria cinerea	Grey petrel	Marine Migratory	Low	Low	High	Medium
Procellaria parkinsoni	Black petrel	Marine Migratory	Medium	Medium	High	Medium
Procellaria westlandica	Westland petrel	Marine Migratory	Medium	Medium	High	Medium
Procelsterna cerulea	Grey ternlet	Marine	Low	Low	High	Medium
Pseudobulweria rostrata	Tahiti petrel	Marine	Low	Low	High	Medium
Pterodroma cervicalis	White-necked petrel	Marine	Medium	Medium	High	Medium
Pterodroma lessoni	White-headed petrel	Marine	Low	Low	High	Medium
Pterodroma leucoptera leucoptera	Gould's petrel	Endangered Marine	Medium	Medium	High	Medium
Pterodroma macroptera	Great-winged petrel	Marine	Medium	Medium	High	Medium
Pterodroma mollis	Soft-plumaged petrel	Vulnerable Marine	Medium	Medium	High	Medium
Pterodroma neglecta neglecta	Kermadec petrel (western)	Vulnerable Marine	Low	Low	High	Medium
Pterodroma nigripennis	Black-winged petrel	Marine	Medium	Medium	High	Medium
Pterodroma solandri	Providence petrel	Marine	Medium	Medium	High	Medium
Puffinus assimilis	Little shearwater	Marine	Medium	Medium	High	Medium
Puffinus bulleri	Buller's shearwater	Marine	Medium	Medium	High	Medium
Puffinus gavia	Fluttering shearwater	Marine	Low	Low	High	Medium
Puffinus griseus	Sooty shearwater	Marine	Low	Low	High	Medium
Puffinus huttoni	Hutton's shearwater	Marine	Low	Low	High	Medium
Puffinus pacificus	Wedge-tailed shearwater	Marine	Medium	Medium	High	Medium
Stercorarius antarcticus	Brown skua	Not listed	Not assessed	Not assessed	Not assessed	Not assessed
Sterna albifrons	Little tern	Marine	Low	Low	High	Low
Sterna anaethetus	Bridled tern	Marine	Low	Low	High	Low
Sterna caspia	Caspian tern	Marine	Low	Low	High	Medium
Sterna dougallii	Roseate tern	Marine Migratory	Not assessed	Not assessed	Not assessed	Not assessed
Sterna fuscata	Sooty tern	Marine	Low	Low	High	Medium
Sterna hirundo	Common tern	Marine	Low	Low	High	Medium

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Sterna paradisaea	Arctic tern	Marine	Low	Low	High	Medium
Sterna striata	White-fronted tern	Marine	Low	Low	High	Low
Sterna sumatrana	Black-naped tern	Marine	Low	Low	High	Medium
Sternula nereis nereis	Australian fairy tern	Vulnerable	Not assessed	Not assessed	Not assessed	Not assessed
Sula dactylatra	Masked booby	Marine	Low	Low	High	Medium
Thalassarche bulleri platei	Buller's albatross, Pacific albatross	Vulnerable Marine Migratory	Medium	Medium	High	Medium
Thalassarche cauta cauta	Shy albatross, Tasmanian shy albatross	Vulnerable Marine	High	Medium	High	Medium
(listed Marine and Migratory as <i>T. cauta</i> (sensu stricto))		Migratory				
Thalassarche chlororhynchos bassi/T. carteri	Indian yellow-nosed albatross, Atlantic yellow-nosed albatross	Vulnerable Marine Migratory	Medium	Medium	High	Medium
Thalassarche chrysostoma	Grey-headed albatross	Endangered Marine Migratory	Medium	Medium	High	Medium
Thalassarche eremita	Chatham albatross	Endangered Marine Migratory	High	Medium	High	Medium
Thalassarche melanophris	Black-browed albatross	Vulnerable Marine Migratory	High	Medium	High	Medium
Thalassarche melanophris impavida (listed Marine and Migratory as T. impavida)	Campbell albatross	Vulnerable Marine Migratory	Medium	Medium	High	Medium
Thalassarche salvini	Salvin's albatross	Vulnerable Marine Migratory	Medium	Medium	High	Medium
Thalassarche steadi	White-capped albatross	Vulnerable Marine Migratory	Medium	Medium	High	Medium
Thalasseus bergii (listed Marine as Sterna bergii) MARINE REPTILES	Crested tern	Marine	Low	Low	High	Medium

**Turtles** 

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Caretta caretta	Loggerhead turtle	Endangered	Medium	Medium	Medium	Medium
		Marine				
		Migratory				
Chelonia mydas	Green turtle	Vulnerable	Medium	Medium	Medium	Medium
		Marine				
		Migratory				
Dermochelys coriacea	Leatherback turtle	Endangered	Medium	Medium	Medium	Medium
		Marine				
		Migratory				
Eretmochelys imbricata	Hawksbill turtle	Vulnerable	Medium	Medium	Medium	Medium
		Marine				
		Migratory				
Lepidochelys olivacea	Olive Ridley turtle,	Endangered	Not	Not	Not	Not
	Pacific Ridley turtle	Marine	assessed	assessed	assessed	assessed
		Migratory				
Natator depressus	Flatback turtle	Vulnerable	Not	Not	Not	Not
		Marine	assessed	assessed	assessed	assessed
		Migratory				
Seasnakes					ı	
Acalytophis peroni	Horned seasnake	Marine	Medium	Medium	Medium	Medium
Aipysurus laevis	Olive seasnake	Marine	Not assessed	Not assessed	Not assessed	Not assessed
Aipysurus pooleorum	Shark Bay seasnake	Marine	Not assessed	Not assessed	Not assessed	Not assessed
Astrotia stokesii	Stokes' seasnake	Marine	Medium	Medium	Medium	Medium
Disteira kingii	Spectacled seasnake	Marine	Medium	Medium	Medium	Medium
Disteira major	Olive-headed seasnake	Marine	Not assessed	Not assessed	Not assessed	Not assessed
Hydrophis elegans	Elegant seasnake	Marine	Low	Low	Low	Low
Hydrophis ornatus/ Chitulia ornata	Spotted seasnake, ornate reef seasnake	Marine	Medium	Medium	Medium	Medium
Pelamis platurus	Yellow-bellied seasnake	Marine	Medium	Medium	Medium	Medium
SHARKS AND RAYS						
Carcharias taurus (east coast population)	Grey nurse shark	Critically endangered	Medium	Medium	Medium	Low*
Carcharias taurus (west coast population)	Grey nurse shark (west coast population)	Vulnerable	Medium	Medium	Not assessed	Low*
Carcharodon carcharias	Great white shark	Vulnerable	Medium	Medium	High	Low*
Centrophorus harrissoni	Harrisson's dogfish, endeavour dogfish, dumb gulper shark, Harrisson's deepsea dogfish	Migratory  Conservation dependent	Not assessed; not listed at the time of ERA	Not assessed	Not assessed, not listed at the time of ERA	Not assessed

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Centrophorus zeehaani	Southern dogfish, endeavour dogfish, little gulper shark	Conservation dependent	Not assessed, not listed at the time of ERA	Not assessed	Not assessed, not listed at the time ERA	Not assessed
Cetorhinus maximus	Basking shark	Migratory	Not assessed	Not assessed	Not assessed	Not assessed
Galeorhinus galeus	School shark, eastern school shark, snapper shark, tope, soupfin shark	Conservation dependent	Not assessed, not listed at the time of ERA	Not assessed	Not assessed, not listed at the time of ERA	Not assessed
Isurus oxyrinchus	Shortfin mako, mako shark	Migratory	Not assessed, not listed at the time of ERA	Not assessed	Not assessed, not listed at the time ERA	Not assessed
Isurus paucus	Longfin mako	Migratory	Not assessed, not listed at the time of ERA	Not assessed	Not assessed, not listed at the time ERA	Not assessed
Lamna nasus	Porbeagle, mackerel shark	Vulnerable Migratory	Not assessed, not listed at the time of ERA	Not assessed	Not assessed, not listed at the time ERA	Not assessed
Manta birostris	Giant manta ray	Migratory	Not assessed: not listed the time of ERA	Not assessed	Not assessed, not listed at time of ERA	Not assessed
Pristis zijsron	Green sawfish, dindagubba, narrowsnout sawfish	Vulnerable	Not assessed, not listed at the time of ERA	Not assessed	Not assessed, not listed at the time of ERA	Not assessed
Rhincodon typus	Whale shark	Vulnerable	Medium	Medium	Medium	Low*
TELEOST FISH		Migratory				
Syngnathids						
Acentronura australe	Southern pygmy pipehorse	Marine	Low	Low	Low	Low
Acentronura tentaculata	Shortpouch pygmy pipehorse	Marine	Low	Low	Low	Low
Campichthys galei	Gale's pipefish	Marine	Low	Low	Low	Low
Campichthys tryoni	Tryon's pipefish	Marine	Low	Low	Low	Low
Choeroichthys suillus	Pig-snouted pipefish	Marine	Low	Low	Low	Low
Corythoichthys amplexus	Fijian banded pipefish, brown-banded pipefish	Marine	Low	Low	Low	Low
Corythoichthys ocellatus	Orange-spotted pipefish, ocellated pipefish	Marine	Low	Low	Low	Low

GROUP/SCIENTIFIC NAME	COMMON NAME(S)	EPBC ACT LISTING STATUS	LEVEL 2 PSA RISK (MID- WATER TRAWL) (DALEY <i>ET</i> <i>AL</i> . 2007B)	LEVEL 2 PSA RESIDUAL RISK (MID- WATER TRAWL) (AFMA 2010B)	LEVEL 2 PSA RISK (PURSE SEINE) (DALEY ET AL. 2007A)	LEVEL 2 PSA RESIDUAL RISK (PURSE SEINE) (AFMA 2010A)
Cosmocampus howensis	Lord Howe pipefish	Marine	Low	Low	Low	Low
Festucalex cinctus	Girdled pipefish	Marine	Low	Low	Low	Low
Filicampus tigris	Tiger pipefish	Marine	Low	Low	Low	Low
Halicampus boothae	Booth's pipefish	Marine	Low	Low	Low	Low
Halicampus brocki	Brock's pipefish	Marine	Low	Low	Low	Low
Halicampus grayi	Mud pipefish, Gray's pipefish	Marine	Low	Low	Low	Low
Heraldia nocturna	Upside-down pipefish, eastern upside-down pipefish	Marine	Low	Low	Low	Low
Hippichthys cyanospilos	Blue-speckled pipefish, blue-spotted pipefish	Marine	Low	Low	Low	Low
Hippichthys heptagonus	Madura pipefish, reticulated freshwater pipefish	Marine	Low	Low	Low	Low
Hippichthys penicillus	Beady pipefish, steep- nosed pipefish	Marine	low	Low	Low	Low
Hippocampus abdominalis	Big-belly seahorse, eastern potbelly seahorse, New Zealand potbelly seahorse	Marine	Low	Low	Low	Low
Hippocampus angustus	Western spiny seahorse, narrow-bellied seahorse	Marine	Low	Low	Low	Low
Hippocampus breviceps	Short-head seahorse, short-snouted seahorse	Marine	Low	Low	Low	Low
Hippocampus kelloggi	Kellogg's seahorse, great seahorse	Marine	Low	Low	Low	Low
Hippocampus kuda	Spotted seahorse, yellows seahorse	Marine	Low	Low	Low	Low
Hippocampus minotaur	Bullneck seahorse	Marine	Low	Low	Low	Low
Hippocampus planifrons	Flat-face seahorse	Marine	Low	Low	Low	Low
Hippocampus subelongatus	West Australian seahorse	Marine	Low	Low	Low	Low
Hippocampus whitei	White's seahorse, crowned seahorse, Sydney seahorse	Marine	Low	Low	Low	Low
Histiogamphelus briggsii	Crested pipefish, Briggs' crested pipefish, Briggs' pipefish	Marine	Low	Low	Low	Low
Histiogamphelus cristatus	Rhino pipefish, Macleay's crested pipefish, ring- back pipefish	Marine	Low	Low	Low	Low
Hypselognathus horridus	Shaggy pipefish, prickly pipefish	Marine	Low	Low	Low	Low
Hypselognathus rostratus	Knifesnout pipefish, Knife-snouted pipefish	Marine	Low	Low	Low	Low

GROUP/SCIENTIFIC NAME	COMMON NAME(S)	EPBC ACT LISTING STATUS	LEVEL 2 PSA RISK (MID- WATER TRAWL) (DALEY <i>ET</i> <i>AL</i> . 2007B)	LEVEL 2 PSA RESIDUAL RISK (MID- WATER TRAWL) (AFMA 2010B)	LEVEL 2 PSA RISK (PURSE SEINE) (DALEY ET AL. 2007A)	LEVEL 2 PSA RESIDUAL RISK (PURSE SEINE) (AFMA 2010A)
Kaupus costatus	Deepbody pipefish, deepbodied pipefish	Marine	Low	Low	Low	Low
Kimblaeus bassensis	Trawl pipefish, Bass Strait pipefish	Marine	Low	Low	Low	Low
Leptoichthys fistularius	Brushtail pipefish	Marine	Low	Low	Low	Low
Lissocampus caudalis	Australian smooth pipefish	Marine	Low	Low	Low	Low
Lissocampus fatiloquus	Prophet's pipefish	Marine	Low	Low	Low	Low
Lissocampus runa	Javelin pipefish	Marine	Low	Low	Low	Low
Maroubra perserrata	Sawtooth pipefish	Marine	Low	Low	Low	Low
Micrognathus andersonii	Anderson's pipefish, shortnose pipefish	Marine	Low	Low	Low	Low
Micrognathus brevirostris <sup>17</sup>	Thorntail pipefish, thorn-tailed pipefish	Marine	Not assessed	Not assessed	Not assessed	Not assessed
Microphis manadensis	Manado pipefish, Manado River pipefish	Marine	Low	Low	Low	Low
Mitotichthys meraculus	Western crested pipefish	Marine	Low	Low	Low	Low
Mitotichthys mollisoni	Mollison's pipefish	Marine	Low	Low	Low	Low
Mitotichthys semistriatus	Halfbanded pipefish	Marine	Low	Low	Low	Low
Mitotichthys tuckeri	Tucker's pipefish	Marine	Low	Low	Low	Low
Nannocampus subosseus	Bonyhead pipefish, bony-headed pipefish	Marine	Low	Low	Low	Low
Notiocampus ruber	Red pipefish	Marine	Low	Low	Low	Low
Phycodurus eques	Leafy seadragon	Marine	Low	Low	Low	Low
Phyllopteryx taeniolatus	Common seadragon, weedy seadragon	Marine	Low	Low	Low	Low
Pugnaso curtirostris	Pugnose pipefish, Pug-nosed pipefish	Marine	Low	Low	Low	Low
Solegnathus dunckeri	Duncker's pipehorse	Marine	Low	Low	Low	Low
Solegnathus hardwickii 18	Pallid pipehorse, Hardwick's pipehorse	Marine	Not assessed	Not assessed	Not assessed	Not assessed
Solegnathus lettiensis	Gunther's pipehorse, Indonesian pipefish	Marine	Low	Low	Low	Low
Solegnathus robustus	Robust pipehorse, Robust spiny pipehorse	Marine	Low	Low	Low	Low
Solegnathus spinosissimus	Spiny pipehorse, Australian spiny pipehorse	Marine	Low	Low	Low	Low
Solenostomus cyanopterus/paegnius	Robust ghostpipefish, blue-finned ghost pipefish,	Marine	Low	Low	Medium	Low

<sup>17</sup> The panel noted that this species is not valid in Australia. Now *M. pygmaeus*. (Codes for Australian Aquatic Biota (CAAB) Taxon code 37 282087).
18 The panel noted that this species is not valid in Australia. Current valid species likely to be *Solegnathus* sp. 1. (CAAB Taxon code 37 282099).

GROUP/SCIENTIFIC NAME	COMMON NAME(S)	EPBC ACT LISTING STATUS	LEVEL 2 PSA RISK (MID- WATER TRAWL) (DALEY <i>ET</i> <i>AL</i> . 2007B)	LEVEL 2 PSA RESIDUAL RISK (MID- WATER TRAWL) (AFMA 2010B)	LEVEL 2 PSA RISK (PURSE SEINE) (DALEY ET AL. 2007A)	LEVEL 2 PSA RESIDUAL RISK (PURSE SEINE) (AFMA 2010A)
Solenostomus paradoxus	Ornate ghostpipefish, harlequin ghost pipefish, ornate Ghost pipefish	Marine	Low	Low	Low	Low
Stigmatopora argus	Spotted pipefish, gulf pipefish	Marine	Low	Low	Low	Low
Stigmatopora nigra	Widebody pipefish, wide- bodied pipefish, black pipefish	Marine	Low	Low	Low	Low
Stipecampus cristatus	Ringback pipefish, Ring- backed pipefish	Marine	Low	Low	Low	Low
Syngnathoides biaculeatus	Double-end pipehorse, double-ended pipehorse, alligator pipefish	Marine	Low	Low	Medium	Low
Trachyrhamphus bicoarctatus	Bentstick pipefish, Bend stick pipefish, Short- tailed pipefish	Marine	Low	Low	Low	Low
Urocampus carinirostris	Hairy pipefish	Marine	Low	Low	Low	Low
Vanacampus margaritifer	Mother-of-pearl pipefish	Marine	Low	Low	Low	Low
Vanacampus phillipi	Port Phillip pipefish	Marine	Low	Low	Low	Low
Vanacampus poecilolaemus	Longsnout pipefish, Australian long-snout pipefish, long-snouted pipefish	Marine	Low	Low	Low	Low
Vanacampus vercoi	Verco's pipefish	Marine	Low	Low	Low	Low
Other teleost fish						
Hoplostethus atlanticus	Orange roughy	Conservation dependent	Not assessed, not listed at the time of ERA	Not assessed	Not assessed	Not assessed
Rexea solandri	Gemfish	Conservation dependent	Not assessed, not listed at the time of ERA	Not assessed	Not assessed	Not assessed
Thunnus maccoyii	Southern bluefin tuna	Conservation dependent	Not assessed, not listed at the time of ERA	Not assessed	Not assessed	Not assessed

<sup>\*</sup>Level 3 SAFE assessment

# Rationale for not assessing direct interactions of the Fish Processing Activity with species groups

### Dugong Dugong dugon

The panel did not assess the possible impact of direct interactions on dugong specifically, due to the very marginal overlap of the species' distribution with the area of the Small Pelagic Fishery (SPF) and noting that no interactions with dugong in the mid-water trawl or purse seine sector of the SPF had been recorded in the period 2002–2013 (Tuck *et al.* 2013, AFMA 2014e). Finley *et al.* (2015a) considered that while purse seine interactions with dugong in the SPF were possible they were unlikely given the species distribution and behaviour. The distribution of dugong in relation to trawl and purse seine effort in the SPF (2000–2013) is mapped in Figures A3.1 and A3.2 respectively.

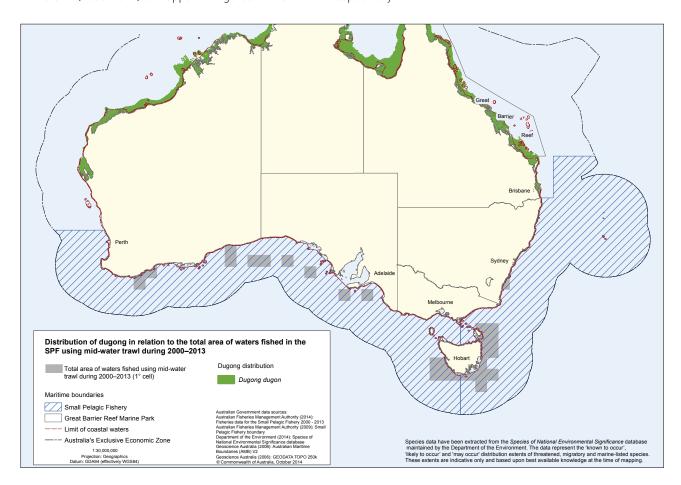


Figure A3.1 Distribution of dugong in relation to the total area of waters fished in the SPF using mid-water trawl during 2000–2013. Source: Map produced by the Environmental Resources Information Network (ERIN), Department of the Environment using unpublished AFMA data.

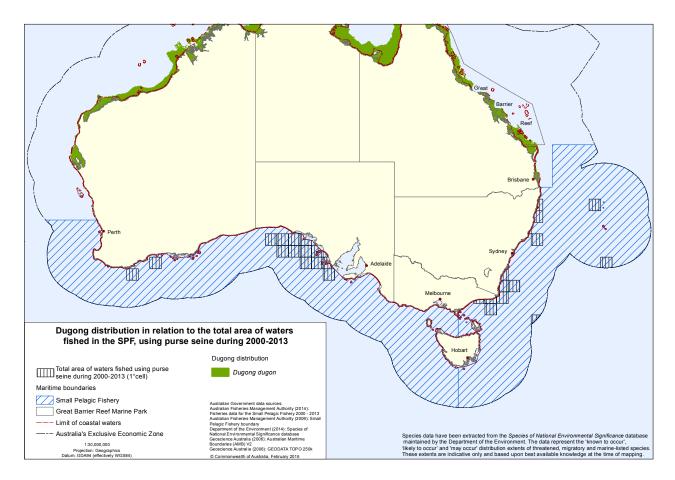


Figure A3.2 Distribution of dugong in relation to the total area of waters fished in the SPF using purse seine during 2000–2013. Source: Map produced by ERIN using unpublished AFMA data.

### **Turtles**

Finley *et al.* (2015b)<sup>19</sup> found that the likelihood of interaction of mid-water trawl gear with turtles in the SPF was low to moderate. The panel noted that no interactions with turtles in the mid-water trawl sector of the SPF had been recorded in the period 2002–2013 (Tuck *et al.* 2013, AFMA 2014e). As a result, the panel did not assess the possible impact of direct interactions of mid-water trawl gear with turtles specifically.

Finley et al. (2015a) found that interactions between loggerhead turtles Caretta caretta, green turtles Chelonia mydas and leatherback turtles Dermochelys coriacea and purse seine gear were moderately likely. However, no interactions with turtles in the purse seine sector of the SPF had been recorded in the period 2002-2013 (Tuck et al. 2013, AFMA 2014e). As a result, the panel did not assess the possible impact of direct interactions of purse seine gear with turtles specifically.

The distribution of protected species of turtles in relation to mid-water trawl and purse seine effort in the SPF (2000–2013) is mapped in Figures A3.3 and A3.4 respectively.

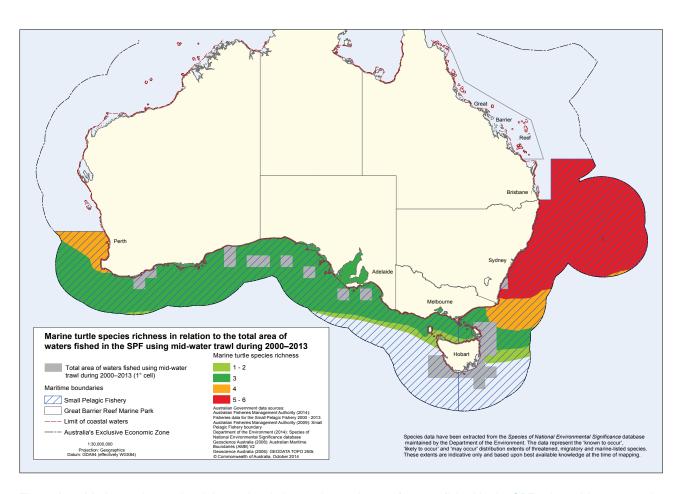


Figure A3.3 Marine turtle species richness in relation to the total area of waters fished in the SPF using mid-water trawl during 2000–2013. Source: Map produced by ERIN using unpublished AFMA data.

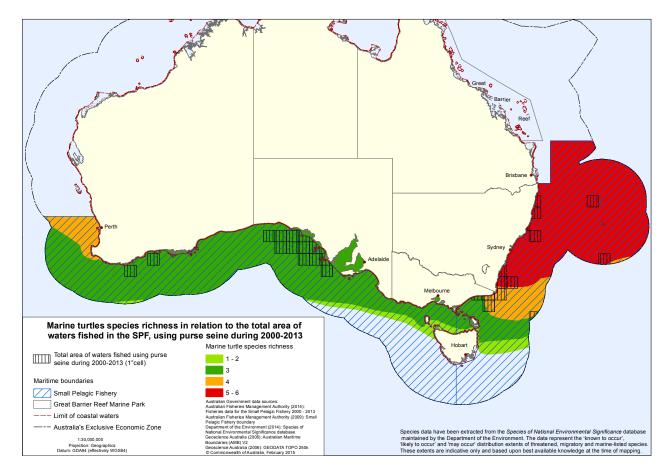


Figure A3.4 Marine turtle species richness in relation to the total area of waters fished in the SPF using purse seine during 2000–2013. Source: Map produced by ERIN using unpublished AFMA data.

### Seasnakes

The panel did not assess the possible impact of direct interactions on protected species of seasnakes specifically, due to the generally low overlap of the species' distribution with the area of the SPF and noting that no interactions with seasnakes in the mid-water trawl or purse seine sectors of the SPF were recorded in the period 2002–2013 (Tuck *et al.* 2013, AFMA 2014e). Finley *et al.* (2015a) found that interactions with seasnakes by purse seine gear in the SPF were unlikely.

The distribution of protected species of seasnakes in relation to mid-water trawl and purse seine effort in the SPF (2000–2013) is mapped in Figures A3.5 and A3.6 respectively.

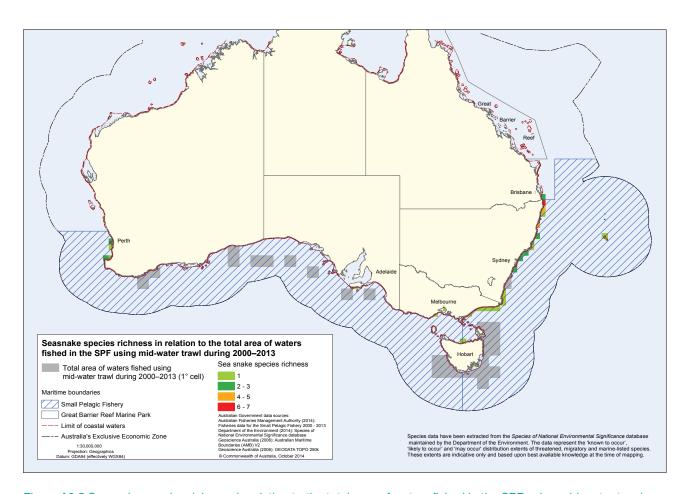


Figure A3.5 Seasnake species richness in relation to the total area of waters fished in the SPF using mid-water trawl during 2000–2013. Source: Map produced by ERIN using unpublished AFMA data.

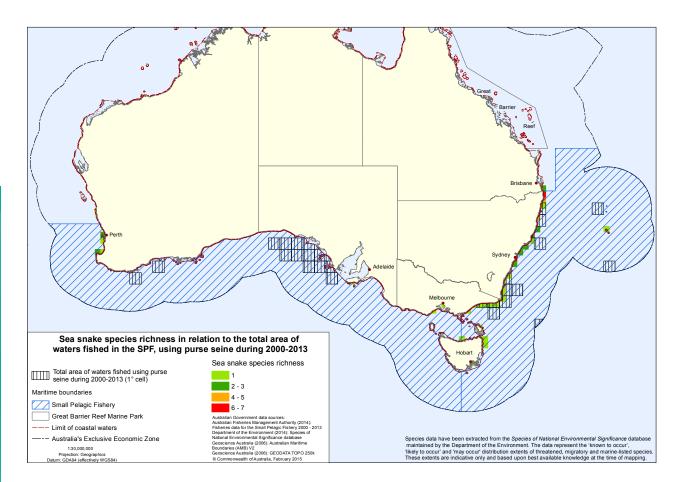


Figure A3.6 Seasnake species richness in relation to the total area of waters fished in the SPF using purse seine during 2000–2013. Source: Map produced by ERIN using unpublished AFMA data.

#### Sharks and rays

Of the 13 protected species (including separate east and west stocks of grey nurse shark *Carcharias taurus*) of sharks and rays occurring in the area of the SPF, only four (grey nurse shark east and west stocks, great white shark *Carcharias carcharodon* and whale shark *Rhincodon typus*), were assessed in the SPF mid-water trawl ecological risk assessment (ERA) (Daley *et al.* 2007b). Each of these was assessed at medium risk by both the ERA and subsequent residual risk assessment. The ERA did not assess basking shark *Cetorhinus maximus* and the remaining species were not protected species at the time the ERA was conducted.

The panel noted that there are only two records of protected shark species being captured in the SPF mid-water trawl sector in the period 2000 to 2011 (Tuck *et al.* 2013). In each case a single individual of great white shark and of shortfin make shark *Isurus oxyrinchus* was captured. Further, of the other protected shark species occurring in the SPF, the panel considered that Harrisson's dogfish *Centrophorous harrissoni*, southern dogfish *C. zeehaani* and school shark *Galeorhinus galeus* are generally likely to be out of the depth range of mid-water trawl gear. Finley *et al.* (2015b) found that it was unlikely that the mid-water trawl sector of the SPF would interact with grey nurse shark or longfin make *Isurus paucus*. While Finley *et al.* (2015b) found that it was possible that interactions could occur with perbeagle *Lamna nasus* and basking shark, no interactions with these species were recorded in the mid-water trawl sector of the SPF in the period 2002–2013 (Tuck *et al.* 2013, AFMA 2014e). Similarly, there are no records of interactions with the giant manta ray *Manta birostris* and extremely low records of catch of any skates or rays in the mid-water trawl sector of the SPF (Tuck *et al.* 2013).

Finley *et al.* (2015a) found that of the protected species of sharks and rays in the SPF the giant manta ray was 'likely' to interact with purse seine vessels and interactions with basking shark, great white shark and shortfin make shark were possible. However the panel notes that no interactions with protected species of sharks and rays have been reported in the purse seine sector of the SPF (Tuck *et al.* 2013, AFMA 2014e).

As a result, the panel has not assessed the possible impact of direct interactions with protected species of sharks and rays specifically. The distribution of these species in relation to mid-water trawl and purse seine effort in the SPF (2000–2013) is mapped in Figures A3.7 and A3.8 respectively.

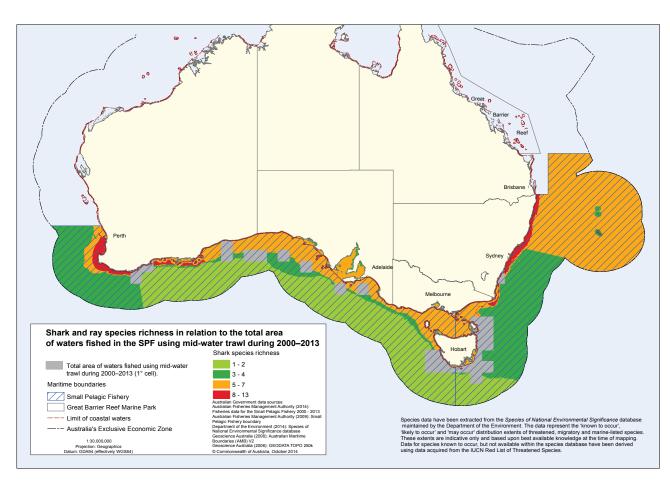


Figure A3.7 Shark and ray species richness in relation to the total area of waters fished in the SPF using mid-water trawl during 2000–2013. Source: Map produced by ERIN using unpublished AFMA data.

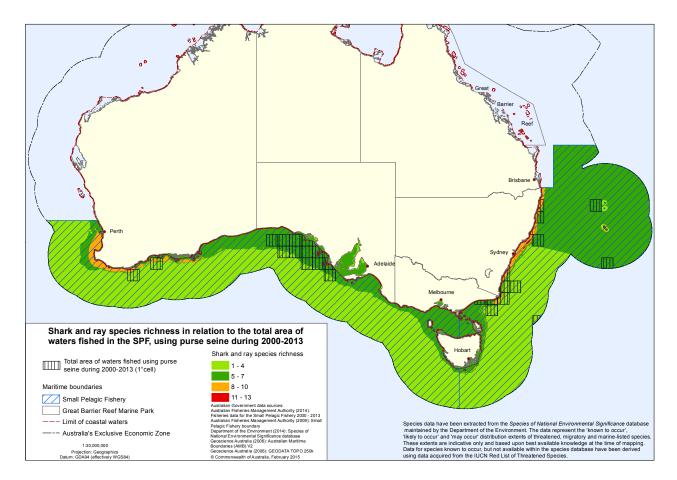


Figure A3.8 Shark and ray species richness in relation to the total area of waters fished in the SPF using purse seine during 2000–2013. Source: Map produced by ERIN using unpublished AFMA data.

### **Teleosts**

Sixty-six species of syngnathids occur within the area of the SPF. Sixty-four of these were rated as low-risk in the midwater trawl sector ERA (Daley et al. 2007b). This rating largely reflects a low susceptibility of these species to the fishing gear/method. The remaining two species were not assessed in the ERA but the panel considered that these two species had limited overlap with the area of the SPF and that it was reasonable to assume these species were unlikely to be more susceptible to the fishing gear/method than the other 64 syngnathid species assessed in the ERA. The purse seine sector ERA (Daley et al. 2007a) found all species to be at low risk except for *Syngnathoides biaculeatus*, which was assessed as medium risk. Finley et al. (2015a) found that it was unlikely that the purse seine gear would interact with this species.

The panel noted that there were no reported interactions between syngnathids and mid-water trawl or purse seine gear in the period 2002–13 (Tuck *et al.* 2013, AFMA 2014e). The distribution of protected species of syngnathid in relation to midwater trawl and purse seine effort in the SPF (2000–2013) is mapped in Figures A3.9 and A3.10 respectively.

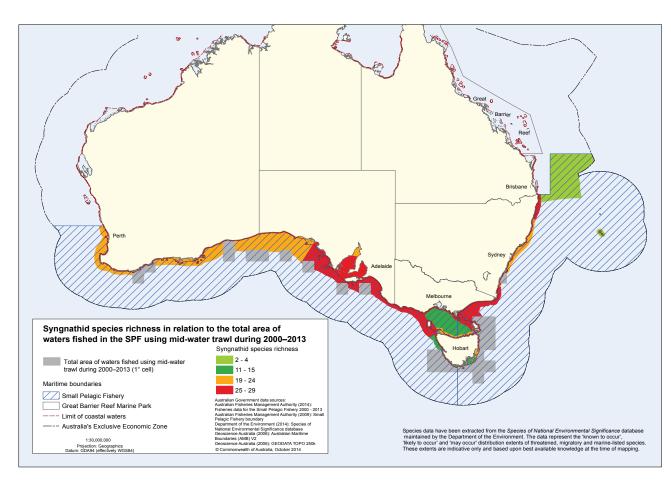


Figure A3.9 Syngnathid species richness in relation to the total area of waters fished in the SPF using mid-water trawl during 2000–2013. Source: Map produced by ERIN using unpublished AFMA data.

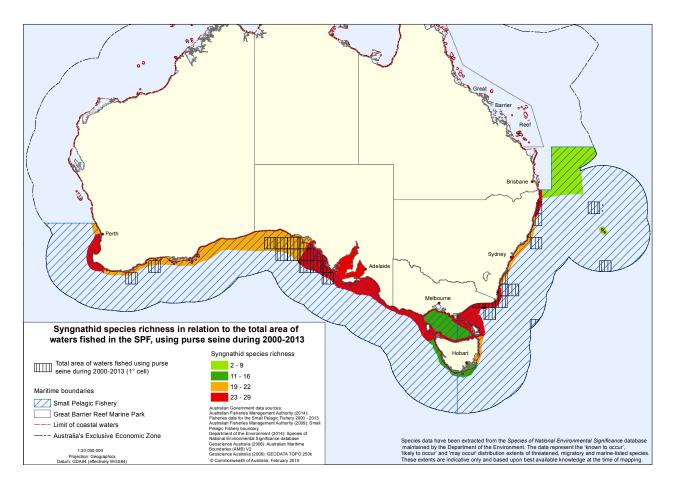


Figure A3.10 Syngnathid species richness in relation to the total area of waters fished in the SPF using purse seine during 2000–2013. Source: Map produced by ERIN using unpublished AFMA data.

In addition, there are three protected species of teleost fishes occurring in the area of the SPF (gemfish *Rexea solandri*, orange roughy *Hoplostethus atlanticus* and southern bluefin tuna *Thunnus maccoyii*). The panel considered that orange roughy is likely to be out of the normal depth range of mid-water trawl and purse seine gear. Very small quantities of gemfish and no southern bluefin tuna or orange roughy were recorded in the SPF mid-water trawl sector in the period 2002–2011 (Tuck *et al.* 2013). Neither of these species was reported in the purse seine catch over the same period. As a result, the panel has not assessed the possible impact of direct interactions with these protected species of teleosts specifically.

## **Shortened forms**

ABARES Australian Bureau of Agricultural and Resource Economics and Sciences

ACAP Agreement on the Conservation of Albatrosses and Petrels

AFMA Australian Fisheries Management Authority

AIDCP Agreement on the International Dolphin Conservation Program

CI Confidence interval

CITES Convention on International Trade in Endangered Species of Wild Fauna and Flora

Cwlth Commonwealth of Australia

cm centimetre

CoP Code of Practice

CPF Central place forager

CSIRO Commonwealth Scientific and Industrial Research Organisation

CTS Commonwealth Trawl Sector

CV Coefficient of variation

DAFF Department of Agriculture, Fisheries and Forestry (Commonwealth) (former)

DCFA Declared Commercial Fishing Activity

DCFA1 Declared Commercial Fishing Activity of the first declaration

DSEWPaC Department of Sustainability, Environment, Water, Population and Communities (Commonwealth) (former)

DML Dolphin mortality limit

EEZ Exclusive Economic Zone

EPBC Act Environment Protection and Biodiversity Conservation Act 1999 (Cwlth)

EPI Ecological Performance Indicator

ERA Ecological risk assessment

ERAEF Ecological risk assessment for the effects of fishing

ERIN Environmental Resources Information Network

ETBF Eastern Tuna and Billfish Fishery

FPA Fish processing activity

FRDC Fisheries Research and Development Corporation

GAB Great Australian Bight
GBR Great Barrier Reef

GHAT Gillnet, Hook and Trap (Fishery)

IATTC Inter-American Tropical Tuna Commission

IOTC Indian Ocean Tuna Commission

ISSF International Seafood Sustainability Foundation

ITQ Individual transferable quota

IUCN International Union for Conservation of Nature and Natural Resources

JMF Jack Mackerel Fishery

kg kilogram

146 km kilometre

km² square kilometre

m metre

mm millimetre

MTA Mid-water trawl activity

NMFS National Marine Fisheries Service (USA)

nm nautical mile

NPF Northern Prawn Fishery

NRM Natural Resource Management

NSW New South Wales

PIRSA Primary Industries and Regions, South Australia

PSA Productivity-susceptibility analysis
RBC Recommended biological catch

RFMO Regional fisheries management organisation

SA South Australia

SARDI South Australian Research and Development Institute

SASF South Australian Sardine Fishery

SASIA South Australian Sardine Industry Association

SBT Southern bluefin tuna

SBTF Southern Bluefin Tuna Fishery

SCPSMF South Coast Purse Seine Managed Fishery (Western Australia)

SCAR EGS Scientific Committee for Antarctic Research Expert Group on Seals

SED Seal excluder device

SESSF Southern and Eastern Scalefish and Shark Fishery

SFR Statutory Fishing Right
SPF Small Pelagic Fishery

SPFRAG Small Pelagic Fishery Resource Assessment Group

SST Sea surface temperature

tonne

TAC Total allowable catch

TACC Total allowable commercial catch

TEPS Threatened, endangered and protected species

US United States of America
VMP Vessel management plan

WA Western Australia

WAFIC Western Australian Fishing Industry Council

WCPO Western and Central Pacific Ocean

WCPFC Western and Central Pacific Fisheries Commission

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