3 History and management of the Small Pelagic Fishery

3.1 Development and management

The history and development of the Small Pelagic Fishery (SPF) can be considered in two stages. Stage one comprises the period from the 1970s to 2000 during which the fishery was predominantly a purse seine fishery for jack mackerel (*Trachurus declivis* and *T. murphyi*) off Tasmania. Stage two, extending from 2001 to the present day, is characterised by a shift in both target species and gear, with much of this period focused on mid-water trawling for redbait, and the emergence of interest in using a freezer vessel in the fishery.

3.1.1 1970–2000

Surveys located large schools of mackerel along the western edge of the Great Australian Bight (GAB) and off eastern Tasmania in 1936. In the 1940s and 1950s purse seining (see Box 3.1) was trialled off New South Wales (NSW) and eastern Tasmania. In 1973, a fish meal plant was established at Triabunna in Tasmania to process jack mackerel and in 1979, the South East Fisheries Committee set a total allowable commercial catch (TACC) of 30,000 tonnes (t) for jack mackerel in Australian waters with 10,000 t reserved for waters off Tasmania (Daley *et al.* 2007a). In 1983, the Offshore Constitutional Settlement (OCS) came into effect. The OCS allows for the exchange of powers for controlling resources, such as small pelagic species, that cross state (within 3 nautical miles (nm)) and Commonwealth (3 nm to 200 nm) boundaries.

Box 3.1 Purse seine

A purse seine is made of a long wall of netting framed with floatline and leadline usually, of equal or longer length than the former, and having purse rings hanging from the lower edge of the gear, through which runs a purse line made from steel wire or rope which allow the pursing of the net. It is generally the most efficient gear for catching large and small pelagic species that are shoaling. Small purse seines can be operated entirely by hand in small scale fisheries. In artisanal or semi-industrial fisheries, the purse seine handling equipment may include: a purse seine winch or a capstan, a purse line reel, a brailer and a power block and in some fisheries, a net drum. In industrial purse seine fisheries, the basic equipment includes: a hydraulic power block, a powerful purse seine winch, a number of derricks, including a brailer or a fish pump, and small winches, an auxiliary boat 'skiff' and sometimes, a helicopter. The purse seine is set around a detected school of fish. After that, the net is closed underneath the school by hauling the purse line running through the rings (pursing). Hydroacoustic instruments, like sonars are important tools to locate fish aggregations.

Source: Food and Agriculture Organization of the United Nations (FAO) (2001–2014a)

Catches of small pelagic species (Figure 3.1) remained low until the mid-1980s (Bulman *et al.* 2008). In 1984 the first large catches of jack mackerel were taken off eastern Tasmania and by the mid-1980s the purse seine fishery off the east coast of Tasmania, based out of Triabunna and fishing surface schools of jack mackerel, was the largest fishery in Australia (by weight). Annual catches increased from 6000 t in the 1984–85 season to a peak of almost 42,000 t in the 1986–87 season. Annual catches in the following decade were between 8000 t and 32,000 t (Hobsbawn *et al.* 2009). Between 1991 and 2000 the jack mackerel purse seine fishery off Tasmania averaged around 12,000 t per annum characterised by strong inter-annual and within-season variability (Daley *et al.* 2007a).

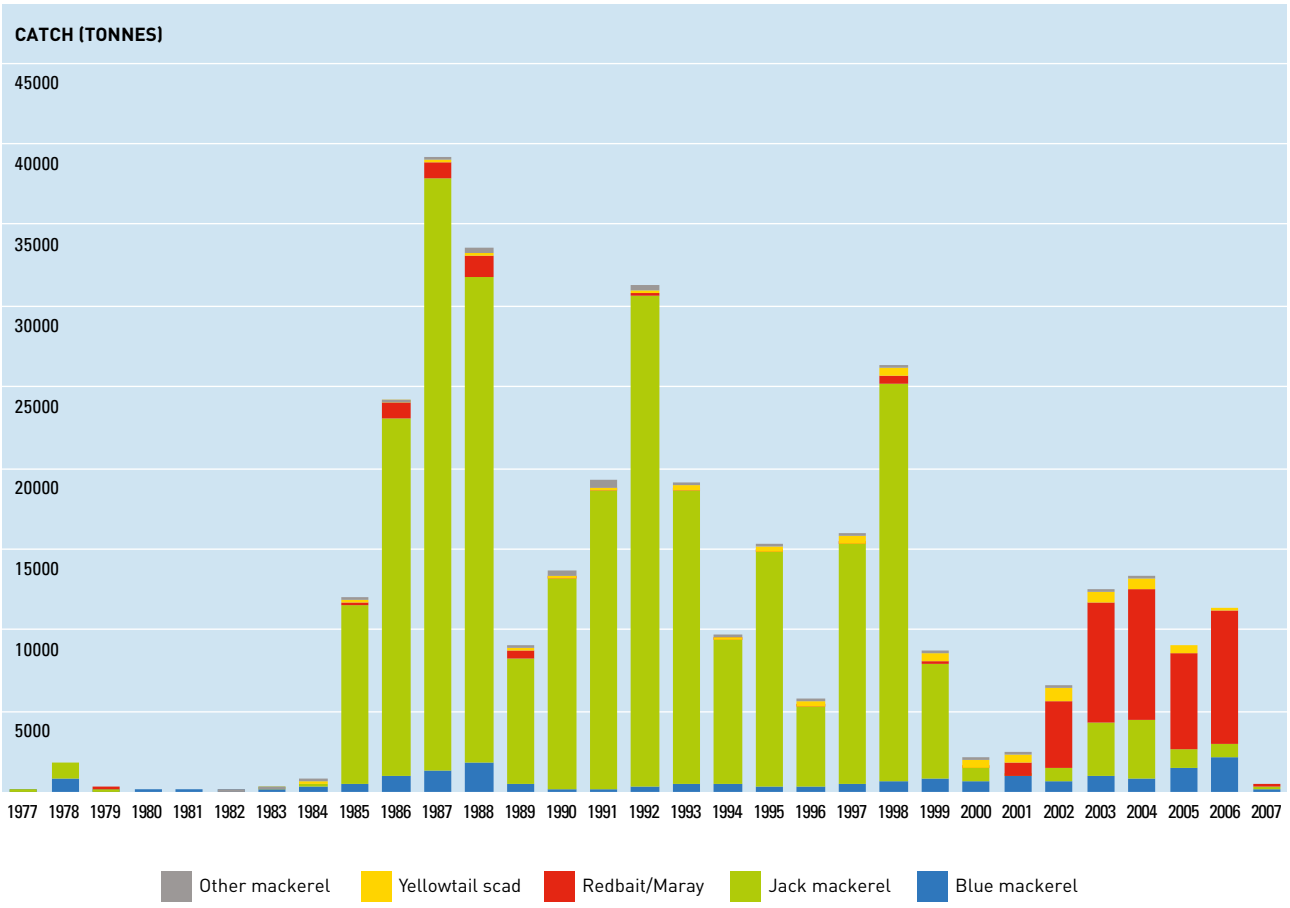

Figure 3.1 Total annual catches of all small pelagic fish species in the major state and Commonwealth fisheries compiled from a database held at CSIRO (not including Western Australia and Queensland). The data are summarised by calendar year and are incomplete for 2007. Species: yellowtail scad *Trachurus novaezelandiae,* redbait *Emmelichthys nitidus*, maray *Etrumeus teres,* jack mackerel *T. declivis* and *T. murphyi*, blue mackerel *Scomber australasicus*. **Source:** Bulman *et al.* (2008), reproduced with permission from the CSIRO and the Fisheries Research and Development Corporation.

By 1988, Tasmania had introduced a management plan for its state waters based on a total allowable catch (TAC) of 50,000 t. In 1991, the Jack Mackerel Fishery was divided into four zones: Zone A, the fishery off Tasmania; and Zones B, C and D (Figure 3.2). In 1995, the jurisdiction of the Tasmanian Jack Mackerel Fishery Management Plan was extended to include Commonwealth-licensed purse seine fishing vessels in Zone A, using a TACC for jack mackerel as the primary management tool. Under these arrangements, Zone A was managed jointly by the Australian Fisheries Management Authority (AFMA) and the Tasmanian Government and included waters both inside and outside 3 nm (Caton and McLoughlin 2004).

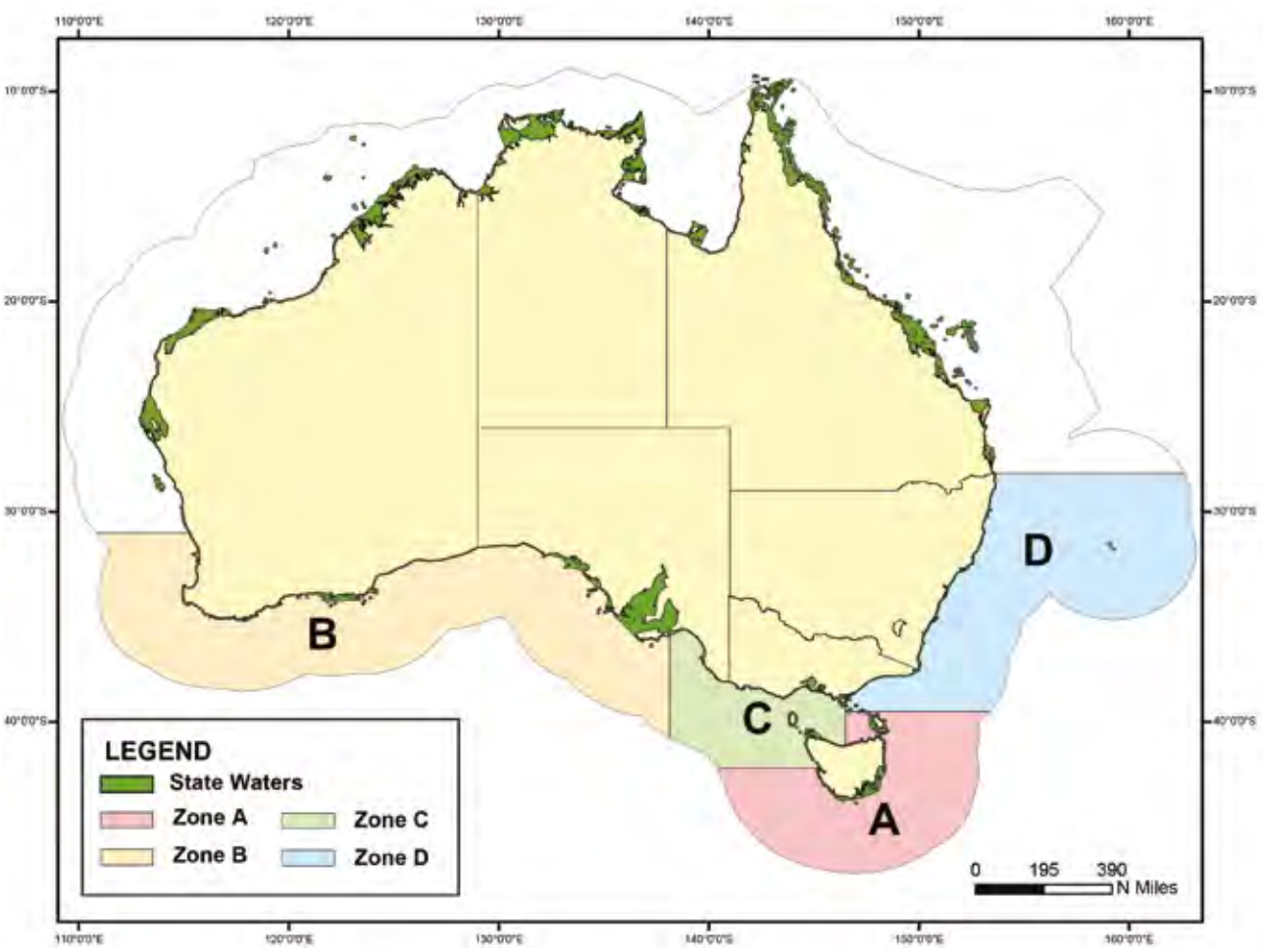

Figure 3.2 Historical management zones in the SPF **Source:** Anon. (2009)

Up until 2000, the Jack Mackerel Fishery was primarily a purse seine fishery, although some vessels were licensed to use mid-water trawl gear. Blue mackerel *Scomber australasicus*, redbait *Emmelichthys nitidus*, yellowtail scad *Trachurus novaezelandiae* and Australian sardines *Sardinops sagax* were taken opportunistically or as bycatch (Caton and McLoughlin 2000). However, in 2001–02 the first significant catches of redbait taken by mid-water trawl in Zone A were recorded (Bulman *et al*. 2008). This effectively marked the beginning of the second development stage in the fishery.

3.1.2 2001 onwards

From December 2001, the SPF was managed under AFMA's Management Policy for the Commonwealth Small Pelagic Fishery. Under that policy, trigger catch limits were set for blue mackerel, yellowtail scad, jack mackerel and redbait in Zones B, C and D. A TACC for small pelagic species in Zone A continued to be set under Tasmanian management arrangements (AFMA 2003, Caton and McLoughlin 2004, McLoughlin 2006).

In 2001–02 trials demonstrated that mid-water trawling (see Box 3.2) was a viable means of targeting small pelagic species and a multi-purpose mid-water trawler/purse seiner, the *FV Ellidi*, was brought to Tasmania in late 2002 for this purpose (AFMA 2003).

Box 3.2 Mid-water trawl

A mid-water trawl consists of a cone shaped body, normally made of four panels, ending in a codend with lateral wings extending forward from the opening. It is usually much larger than a bottom trawl and designed and rigged to fish in midwater, including in the surface water. The front parts are sometimes made with very large meshes or ropes, which herd the targetted fish inwards so that they can be overtaken by smaller meshes in the aft trawl sections. The horizontal opening is maintained either by otter boards or by towing the net by two boats (pair trawling). Floats on the headline and weights on the groundline often maintain the vertical opening. Modern large midwater trawls, however, are rigged in such a way that floats are not required; relying on downward forces from weights to keep the vertical opening during fishing. Sonar is a useful tool to detect fish concentration ahead the trawler and the trawl path and trawl depth can be adjusted accordingly. The fishing depth and the trawl are usually controlled by means of a netsounder (netsonde) or depth recorder. Trawl winches installed on deck control the trawling wires and store them when not in use. Gilson winches and lifting tackle are provided to assist with handling gear at the vessel. Net drums are common tools to handle midwater trawls onboard vessels.

Source: FAO (2001–2014b)

In 2004, foreign interests explored the possibility of bringing the *FV Veronica* into the fishery. The *FV Veronica* was 106 metres (m) in length and had significant fish processing capacity for human consumption (AFMA 2004). At that time there was very limited fishing activity in the SPF and no statutory management plan for the fishery. AFMA took the view that, in light of the apparent increased interest in fishing in the fishery, the management arrangements needed to be enhanced to preclude over-capitalisation (AFMA 2004). AFMA issued an investment warning in 2004 and later that year implemented a freeze on boat nominations in the fishery. This freeze effectively precluded the entry of the *FV Veronica* since the vessel could not be nominated against an SPF fishing permit.

In 2005, AFMA established the Small Pelagic Fishery Management Advisory Committee (SPFMAC) and identified the development of a statutory management plan as one of SPFMAC's first tasks. The AFMA Board lifted the freeze on boat nominations in December 2005 after having made a decision on the nature of the long-term management of the fishery and the nature of long-term access rights to the SPF (SPFMAC 2006).

Between 2005 and 2009, the Small Pelagic Fishery Management Plan 2009[100] (the SPF Management Plan) and the SPF Harvest Strategy (AFMA 2008) were developed (see Sections 3.2.1 and 3.2.2 respectively). At that time, mid-water trawl was the primary catch method in the SPF. However, since 2009, fishing effort by both purse seine and mid-water trawl vessels has declined (Moore *et al*. 2011, Moore and Skirtun 2012, Moore *et al*. 2013) and purse seine is now the dominant fishing method, albeit at low levels. AFMA attributes low levels of effort and catch in the fishery in 2010–11 and 2011–12 to factors including the loss of processing facilities in Eden, NSW, in late 2010, the difficulty in finding fish aggregations off Triabunna in Tasmania and operators waiting for statutory fishing rights (SFRs) to take effect (AFMA 2012a). Total catches declined from just over 5000 t in 2008–09 to 153 t in 2011–12.

10 The SPF Management Plan is available at: http://www.comlaw.gov.au/Details/F2010L00081

In February 2012, the SPF Resource Assessment Group (SPFRAG) considered a proposal by Seafish Tasmania Pty Ltd to bring a mid-water trawl freezer vessel into the SPF under a joint venture arrangement. The proposal included a research plan that would allow for the conduct of further daily egg production method (DEPM) surveys for target species.

In May 2012, the South East Management Advisory Committee (SEMAC)[11] was briefed on Seafish Tasmania's plan to enter into a joint venture with the Dutch fishing company Parlevliet & Van der Plas BV, under which Seafish Tasmania would provide the quota and Parlevliet & Van der Plas BV would provide a suitable freezer trawler (SEMAC 2012). On 30 August 2012, *FV Margiris*, a mid-water trawl vessel of 143 m length with on-board processing and freezing facilities, arrived in Australia. The hold capacity of the vessel was approximately 4500 t. On 5 September 2012, the vessel was renamed the *FV Abel Tasman* and registered as an Australian-flagged boat under the *Shipping Registration Act 1981* (Cwlth). On 20 September 2012, AFMA formally nominated the vessel to Seafish Tasmania's fishing concessions (SFRs). On 19 November 2012 the Environment Minister made the *Final (Small Pelagic Fishery) Declaration 2012*, which precluded large-scale mid-water trawl freezer vessels, such as the *FV Abel Tasman*, from fishing in the SPF for two years while an expert panel undertook an assessment.

Since that time fishing activity has remained low in the SPF (AFMA 2013a, SPFRAG 2014b) with total catch declining to around 40 t in 2012–13 and less than 20 t in 2013–14 (SEMAC 2013, 2014). In the last decade most fishing in the SPF has occurred off the east and west coasts of Tasmania and in the GAB, with little fishing activity off NSW or to the west of the GAB (Moore *et al.* 2011, Moore and Skirtun 2012, Moore *et al.* 2013).

3.2 Proposed management arrangements for the DCFA

The panel's Terms of Reference required it to "consider the fisheries management arrangements under which the Declared Commercial Fishing Activity [DCFA] is proposed to operate and the extent to which these management arrangements address the relevant environmental impacts and uncertainties". The panel took the management arrangements under which the DCFA is proposed to operate as comprising the existing management arrangements for the SPF and the management arrangements that were proposed for the operation of the *FV Abel Tasman*. Those arrangements are described below.

The existing regulatory environment in which the DCFA would operate is comprised of:

- the *Fisheries Administration Act 1991* (Cwlth), which establishes the administrative framework for Commonwealth fisheries, providing, for example, for the establishment of AFMA and the formation of management advisory committees
- the *Fisheries Management Act 1991* (Cwlth) (FM Act), which establishes the fisheries management framework, providing in particular for the preparation of fisheries management plans, the allocation of SFRs and establishing the broad fisheries compliance framework
- the SPF Management Plan and conditions imposed on SPF SFRs
- the SPF Harvest Strategy (AFMA 2008), reflecting the requirements of the Commonwealth Fisheries Harvest Strategy Policy and Guidelines (Department of Agriculture, Fisheries and Forestry (DAFF) 2007)
- the SPF Bycatch and Discard Workplan (AFMA 2011) arising from AFMA's ecological risk management process
- any conditions imposed by the Environment Minister as a result of assessment of the SPF against the provisions of Parts 13 and 13A of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and any exclusions from areas of the SPF arising from the establishment of Commonwealth Marine Reserves.

The SPF Management Plan is made under the FM Act. The key provisions of the plan and the operation of the Harvest Strategy and Bycatch and Discard Workplan are discussed in Sections 3.2.1 to 3.2.3. All of the relevant provisions of these instruments and policies would apply to the DCFA. The application of the EPBC Act to the SPF is discussed in Section 3.2.4.

11 In July 2010 the role of the SPFMAC was assumed by SEMAC in line with a process of rationalisation of AFMA's Management Advisory Committees and Resource Assessment Groups.

3.2.1 SPF management plan

Area

Under the SPF Management Plan, stock-based management replaced the previous zonation of the fishery. Based on a study of stock structure (Bulman *et al.* 2008) the fishery for jack mackerels, blue mackerel and redbait was divided into two sub-areas east and west of longitude 146°30'E (Figure 3.3). The fishery was also extended north along the east coast to latitude 24°29'54"S and an Australian Sardine sub-area designated to accommodate activities authorised by Informally Managed Fishery permits. The area of the SPF, as defined in the SPF Management Plan, does not include state waters and extends to the outer limit of the Australian Fishing Zone (Anon. 2009). Small pelagic species managed under the SPF Management Plan have historically been taken in significant volumes within both Commonwealth and adjacent state jurisdictions. These species are also taken to a lesser extent in several other Commonwealth and state-managed fisheries, mainly the trawl sectors of the Southern and Eastern Scalefish and Shark Fishery (SESSF), the Eastern Tuna and Billfish Fishery (where they are caught for bait), the Western Tuna and Billfish Fishery and the NSW Ocean Hauling Fishery. While the eastern and western stocks are both multi-jurisdictional (state and Commonwealth), South Australia manages the western stock of Australian sardine and the Commonwealth manages the eastern stock (Moore *et al.* 2013).

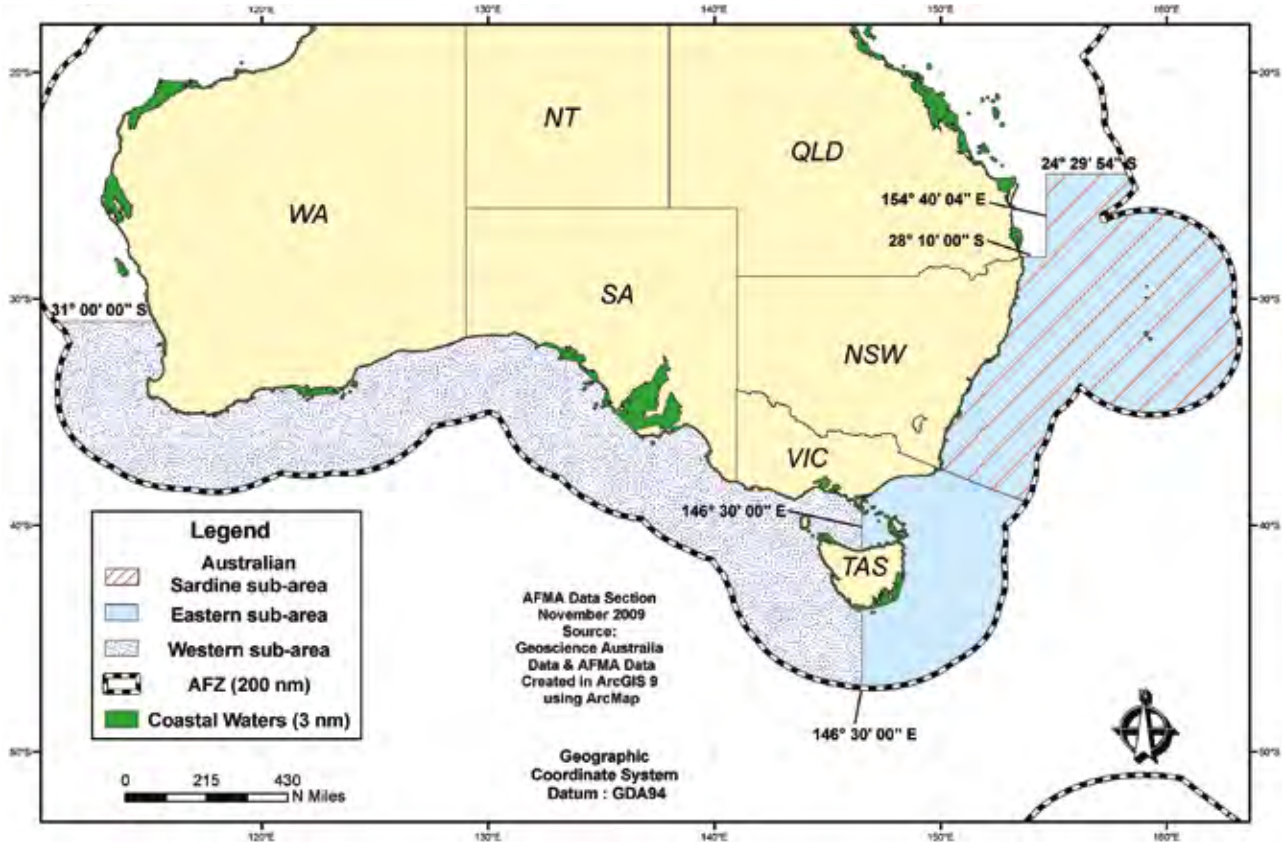

Figure 3.3 Area and sub-areas of the SPF. **Source:** AFMA (2014a), reproduced with permission from AFMA

Species

The SPF Management Plan identifies the quota species of the SPF as blue mackerel, jack mackerels, redbait and Australian sardine. Operators in the SPF may also take and keep non-quota species if quota for that species has been granted under another plan of management and the SPF SFR holder has or acquires the required amount of quota for

that species (Anon. 2009), or if the species is not subject to quota arrangements under another plan of management or otherwise limited or restricted under Section 21 or Section 53 of the SPF Management Plan.

A profile of each of the five quota species, together with a summary of their stock assessment and stock status, is provided in Appendix 4. A summary of the TAC and catch by target stock since the eastern/western stock delineation was introduced is provided in Table 3.1.

The main byproduct species taken in the fishery include barracouta *Thyrsites atun*, silver warehou *Seriolella punctata*, silver trevally *Pseudocaranx georgianus* and yellowtail scad (Tuck *et al.* 2013). Silver warehou and silver trevally are subject to quota in the SESSF and retention of these species by SPF operators requires them to hold appropriate quota for those species. As a result, those species are not considered further in this report. There are, however, no restrictions on the catch of barracouta or yellowtail scad[12] in the SPF.

Between 2002 and 2011, 526 t of barracouta were reported as retained catch in SPF logbooks (Tuck *et al.* 2013). This represents an average of 53 t per year by all gear types in the SPF and 0.8 per cent of the retained catch of around 65,000 t over the period. Observer records for mid-water trawl operations in the SPF for the period 2007–11 report catch of barracouta in only one year with a total of 0.02 t discarded (Tuck *et al.* 2013). If all the current TACs, totalling nearly 35,000 t, were taken annually at the rate of catch between 2002 and 2011, it might be expected that less than 300 t per year of barracouta might be taken. Given this relatively low level of likely catch and noting that the productivity-susceptibility analysis (PSA) rating for this species is low (Daley *et al.* 2007b) the panel considered that this species did not warrant further explicit assessment.

Table 3.1 TAC and catch by target species 2008–09 to 2014–15 (t)

SPECIES	2008–09		2009–10		2010–11		2011–12		2012–13		2013–14		2014–15
	TAC	CATCH	TAC	CATCH	TAC	CATCH	TAC	CATCH	TAC	CATCH	TAC	CATCH	TAC
Australian sardine (east)	2800	1128	1600	636	400	115	400	23	200	39	270	16.9	560
Blue mackerel (east)	5400	175	4300	129	2500	0	2500	0	2600	1.5	2700	0.1	2660
Blue mackerel (west)	8400	1974	7000	966	4200	400	4200	130	6500	0	6500	0	6500
Jack mackerels (east)	5000	276	4900	146	4600	7	4600	0	10,100	0	9800	0	10,230
Jack mackerels (west)	5000	135	4900	111	5000	0	5000	0	5000	0	5000	0	5000
Redbait (east)	14,800	743	10,300	407	8600	13	8600	0	6900	0	5200	0	5000
Redbait (west)	5000	699	5000	120	5000	0	5000	0	5000	0	5000	0	5000
Total target species	46,400	5130	38,000	2525	30,300	535	30,300	153	36,300	40.5	34,170	17	34,950

Sources: AFMA (2012b), AFMA (2013b), Moore *et al.* (2011), Moore and Skirtun (2012), Moore *et al.* (2013), SEMAC (2013), SEMAC (2014), AFMA (2014b)

Yellowtail scad is taken predominantly in NSW state waters, with between 300 t and 500 t taken annually, predominantly by the NSW Ocean Haul Fishery (Ward *et al.* 2013). Bulman *et al.* (2008) note that the Commonwealth fishery reported catch of no more than 13 t per annum. Between 2002 and 2011, 23 t of yellowtail scad were reported in SPF logbooks as being retained (Tuck *et al.* 2013). This represents an average of 2.3 t per year by all gear types in the SPF and less than 0.1 per cent of the retained catch over the period. Observer records for mid-water trawl operations in the SPF for the period 2007–11 report no catch of yellowtail scad and only 0.06 t from purse seine operations, but do record 86 t of 'mackerel scad' *Trachurus* spp. from mid-water trawl catch (Tuck *et al.* 2013). It is not known what proportion of this might comprise yellowtail scad.

12 A 200 t TAC for yellowtail scad was removed upon the introduction of ITQs in the SPF on 1 May 2012 (AFMA 2012b).

The panel noted that yellowtail scad may form mixed schools with redbait (Daley *et al.* 2007b). If, under a DCFA, all the current TAC for redbait (10,000 t for both east and west stocks) was taken annually, at the rate of catch derived from logbook data, it might be expected that less than 10 t per year of yellowtail scad might be taken. Given this relatively low level of likely catch and noting that the bulk of the catch of this species is taken in NSW state fisheries, the panel did not consider that this species warranted further explicit consideration in this report. The panel notes, however, that some targeting of yellowtail scad has recently been initiated by an SPF operator supplying product to the domestic market (Mr A. Penney, Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES) pers. comm. 21 May 2014). The level of this catch is not currently known.

Features of the management plan

The SPF Management Plan provides for a system of individual transferable quotas (ITQs), which take the form of SFRs for blue mackerel, jack mackerels and redbait in the eastern and western sub-areas of the fishery and for Australian sardine in the eastern sub-area. SFRs took effect in the SPF on 1 May 2012. SFRs are subject to a number of conditions (see

) and these can be amended by AFMA as required. Between 2008–09 and 2010–11 only three to five vessels operated in the fishery in any one year. During that time a maximum of two mid-water trawl vessels and four purse seine vessels operated (Moore *et al.* 2011, Moore and Skirtun 2012, Moore *et al.* 2013).

Other key features of the SPF Management Plan are:

- a requirement to set TACs for each quota species and sub-area of the fishery (Section 17)
- authorisation of the purse seine and mid-water trawl fishing methods and any other fishing method determined by AFMA (Section 25)
- obligations on SFR holders (Section 50) including:
  - taking all reasonable measures to ensure that bycatch and the impact of fishing operations on the marine environment are kept to a minimum
  - carrying an observer onboard when directed to do so by AFMA
  - having a compliant vessel monitoring system installed on their vessel
- obligations to take all reasonable steps to avoid interactions with cetaceans; listed threatened species, listed migratory species and listed marine species; and listed threatened ecological communities; and to record any such interactions (Section 52)
- provision for AFMA to direct that fishing is not to be conducted in the fishery, in a sub-area or part of a sub-area in a particular period or periods—this power can be exercised, on an emergency basis, if necessary, without the need for the otherwise prescribed consultation with SEMAC and without giving warning to SFR holders (Section 53).

3.2.2 Harvest strategy

The SPF Harvest Strategy (AFMA 2008) was adopted in 2008 and last updated in 2013. It reflects obligations under the Commonwealth Fisheries Harvest Strategy Policy and Guidelines (DAFF 2007). The objective of the Harvest Strategy (AFMA 2008) is: "The sustainable and profitable utilisation of the Small Pelagic Fishery in perpetuity through the implementation of a harvest strategy that maintains key commercial stocks at ecologically sustainable levels and, within this context, maximises the net economic returns to the Australian community." The panel notes that this objective is consistent with AFMA's legislative objectives set out in sections 3(1)(b) and (c) of the FM Act.

The harvest strategy applies to the species that are subject to quota management under the SPF Management Plan, namely jack mackerels, blue mackerel, redbait and Australian sardine (East). The harvest strategy is used to develop advice on the recommended biological catches (RBCs) and TACs for these species.

The harvest strategy uses a three-tiered approach to determine the RBCs for each quota species, by eastern and western stocks, based on the stock assessment information available. The levels of assessment and monitoring that are required to inform the setting of RBCs at each tier are prescribed. Once the RBC has been derived, an allowance for state catches (based on an average of the previous five years) is deducted before the TACs for Commonwealth fishers are set.

The following description of the operation of the tiered approach is taken from the SPF Harvest Strategy (AFMA 2008).

SPF Harvest Strategy: Tier 1

Assessments must be based on a robust spawning biomass estimate from a DEPM survey and annual fishery assessments which include catch and effort data and size/age structure of the catch. The RBC for each stock in each Zone is based on the median spawning biomass estimated from the DEPM survey and all available information including biological, catch and spatial area of Zone.

Option 1

The RBC cannot exceed levels resulting from the relevant harvest rate which is set according to the age of the DEPM. The maximum harvest rate is 20 per cent of spawning stock biomass (SSB) when there are two DEPMs in three years or three in five years. The maximum harvest rates are then reduced in annual increments of 2.5 per cent to a minimum of 10 per cent to account for increasing uncertainty in stock status since the last survey (Table 3.2).

Table 3.2 Harvest rate for Tier 1, option 1 as defined in the SPF Harvest Strategy

AGE OF DEPM SURVEY (YEARS)	MAXIMUM HARVEST RATE AS % OF MEDIAN SSB ESTIMATES FROM DEPM SURVEY
5	10
4	12.5
3	15
≤2	17.5
2 in 3 or 3 in 5	20

Source: AFMA (2008)

Option 2

The RBC may be set at 15 per cent of the SSB for five fishing seasons following a DEPM survey of the stock. The DEPM cannot be used beyond five years.

Once the DEPM survey exceeds the formulae for either option, the stock must be assessed under Tier 2 or 3 depending on available information.

SPF Harvest Strategy: Tier 2

RBCs are determined by the SPFRAG on an annual assessment of catch and effort data including spatial and temporal patterns, and age structure of catch. The fishery assessment should aim to determine the likelihood of localised depletion or change in the size/age structure of the catch that cannot be adequately explained by reasons other than a decline in abundance.

Maximum RBCs for each Tier 2 species in each Zone are based on approximately 7.5 per cent of the median spawning biomass estimate based on information from the DEPM, outputs from ecosystem and population dynamics modelling and management strategy evaluations, but cannot exceed those listed in Table 3.3 (AFMA 2008).

Table 3.3 Tier 2 maximum RBC values for the western and eastern zones of the SPF (t)

SPECIES	WESTERN ZONE	EASTERN ZONE
Australian sardine	n.a.	3000
Blue mackerel	6500	3000
Jack mackerels	5000	10,600
Redbait	5000	5000

Source: AFMA (2008)

SPF Harvest Strategy: Tier 3

RBCs are determined by SPFRAG on the basis of catch and effort data. Maximum RBCs for Tier 3 species in each Zone may not exceed 500 t.

SPF Harvest Strategy: ecological impacts

The harvest strategy specifies the following approach (AFMA 2008) to accounting for ecological impacts when SPFRAG considers RBCs for target species:

"1. If evidence of significant interactions with threatened, endangered or protected species exists, SPFRAG must recommend one or more of the following:

- that a program be established to mitigate interactions; and/or
- an appropriate reduction in the RBC; and/or
- that the stock/s be reduced to a lower level Tier (i.e. with a smaller catch).

2. If, as a result of fishing, there is evidence of localised depletion or a concerning trend/change in age/size structure, SPFRAG must recommend one or more of the following:

- an appropriate reduction in the RBC; and/or
- appropriate spatial or other management measures.

3. If, as a result of fishing in the SPF, there is evidence of changes in ecosystem function (e.g. reduced breeding success of seabirds), SPFRAG must recommend one or more of the following:

- an appropriate reduction in the RBC; and/or
- appropriate spatial or other management measures; and/or
- that a program be established to:
  - i. assess the potential impacts of the fishery on the ecosystem;
  - ii. investigate potential ecological performance indicators for the fishery;
  - iii. report management performance against those indicators."

3.2.3 Ecological risk assessment

AFMA's Ecological Risk Assessment (ERA) process for each of the purse seine and mid-water trawl sectors of the SPF has comprised:

- a level 2 PSA using the Ecological Risk Assessment for the Effects of Fishing (ERAEF) risk assessment framework
- a residual risk assessment of the level 2 PSA
- a Sustainability Assessment for the Effects of Fishing;
- an Ecological Risk Management (ERM) report
- a Bycatch and Discard Workplan.[13]

13 Each of these documents can be found at **http://www.afma.gov.au/managing-our-fisheries/environment-and-sustainability/ecological-risk-management/**

The panel noted that the ERAEF approach is precautionary, in the sense that fishing activities are assumed to pose high risks in the absence of information, evidence or logical argument to the contrary (Hobday *et al.* 2007). However, the panel also noted that the ERA is based on the distribution of historical fishing effort rather than an assessment of the potential distribution of effort throughout the area of the fishery. This necessarily limits the use of the ERA for the purposes of guiding an assessment of the likely environmental impacts of increased fishing effort over potentially broader areas of the SPF, as might occur under a DCFA. Nevertheless, the ERA remained a useful source of information for the panel's assessment.

The ERM report for the mid-water trawl sector of the SPF identified eight threatened, endangered or protected species (TEPS), all marine mammals, as high-risk species for the mid-water trawl sector:

- Australian fur seal *Arctocephalus pusillus doriferus*
- Risso's dolphin *Grampus griseus*
- bottlenose dolphin *Tursiops truncatus*
- Indo-Pacific bottlenose dolphin *Tursiops aduncus*
- Fraser's dolphin *Lagenodelphis hosei*
- hourglass dolphin *Lagenorhynchus cruciger*
- southern right whale dolphin *Lissodelphis peroni*
- striped dolphin *Stenella coeruleoalba*.

The stated aims of the SPF Bycatch and Discard Workplan (AFMA 2011) are to:

- respond to high ecological risks assessed through AFMA's ERA process completed in 2010 and other assessment processes
- avoid interactions with species listed in the EPBC Act
- reduce discarding of target species to as close to zero as practically possible
- minimise overall bycatch in the fishery over the long term.

The SPF Bycatch and Discard Workplan defines bycatch as "catch other than of the four target species in the SPF and that part of the catch that does not reach the deck of the fishing vessel but is affected by interaction with fishing gear" and defines discarding as "catch (of either target species or bycatch) which is discarded because either it has low commercial value or because regulation precludes it from being retained".

As discussed in Section 3.2.1, it is an offence for SPF operators not to report interactions with species protected under the EPBC Act in their AFMA logbook. A memorandum of understanding between AFMA and the Department of the Environment allows AFMA to report interactions with protected species on behalf of Commonwealth fishers. AFMA provides quarterly interaction reports to the Department of the Environment and publishes the data on the AFMA website (AFMA 2014c).

Tuck *et al.* (2013) collated and analysed all available data on reported interactions with TEPS in the SPF for the period 2001 to 2011. As noted earlier, there has been very little fishing activity in the SPF since that time. The mid-water trawl sector (including pair mid-water trawling) of the SPF has recorded interactions with protected species of seabirds, dolphins and Australian fur seals in the period 2002 to 2007 (Tuck *et al.* 2013). No interactions have been reported with mid-water trawl gear in the fishery since that time (AFMA 2014c). It is a condition of SFRs that all mid-water trawl operators in the SPF are required to have in place vessel management plans (VMP) for seabirds and marine mammals. These mitigation measures are tailored to the operations of each vessel. VMPs are subject to review and monitoring by AFMA on an ongoing basis to ensure that they are effective in preventing interactions (Dr J. Findlay, AFMA *in litt.* 11 June 2013).

The Bycatch and Discarding Workplan states that it deals primarily with the reduction of the risk of bycatch of TEPS such as marine mammals and seabirds. This focus is supported by previous work that found that bycatch levels of finfish species are very low in the SPF. Tuck *et al*. (2013) reviewed logbook and observer data for the SPF for the period 2002–2011. They found that "discarding of fish target or bycatch species is not currently a concern in the SPF because (i) operators can selectively catch the four target species without catching significant amounts of other fish species; and (ii) catches of target species are generally well below the total allowable catch (TAC) limits". This is consistent with the ERA report for the fishery which states that the mid-water trawl fishery is: "Highly targetted and the volume of bycatch less than 1% of the total catch in a shot. Bycatch rates in mid-water trawl are much lower than in demersal trawl (up to 50%). Midwater trawling targets highly aggregated schools of the target species. The volume of bycatch is so small relative to the overall catch in a shot that it can be difficult to measure or even detect. A 30 t shot of redbait may contain 300 kg of barracouta and spotted warehou [*Seriolella punctata*] (Observer data)." (Daley *et al*. 2007b)

The Bycatch and Discarding Workplan identifies three areas of action:

- monitor the trial and use of top-opening seal excluder devices (SEDs) in the Commonwealth Trawl Sector of the SESSF and adapt as appropriate (having regard for health and safety issues) for SPF mid-water trawl boats
- develop and implement VMPs for mid-water trawl operators to minimise TEPS interactions and record procedures for reporting on catch and wildlife interactions
- develop triggers to identify shifts or expansion in effort within the fishery, including increased interactions with TEPS.

AFMA is currently undertaking a process to review and commission new ERAs for AFMA-managed fisheries. The need for review of ERAs will be determined based on a range of factors including a change in the incidence of interactions with species, increased effort or new areas of the fishery or use of new fishing gear. The ERAs will be peer reviewed by the ERA technical working group which has members from the CSIRO, ABARES and private scientists. Based on fishing operations in the SPF to date, these triggers have not been met in either the purse seine or mid-water trawl sectors of the fishery (Dr J. Findlay, AFMA *in litt*. 11 June 2013 and 2 October 2014).

3.2.4 Application of the EPBC Act to the DCFA

EPBC Act assessment

The EPBC Act requires the Australian Government to assess the environmental performance of Commonwealth-managed fisheries. These assessments are required under:

- Part 10, which provides for endorsement of a plan, policy or program following a Strategic Assessment of the impacts of actions under that plan, policy or program, on matters of National Environmental Significance (matters protected by a provision of Part 3 of the EPBC Act)
- Part 13, which provides for assessment of the impact of fishery operations in Commonwealth waters on species protected under Part 13 of the EPBC Act including cetaceans, listed threatened species and ecological communities, listed migratory species and listed marine species. If the assessment finds that the management arrangements require fishers to take all reasonable steps to avoid killing or injuring EPBC Act protected species and the fishery does not, or is not likely to, adversely affect the conservation status of these species, the fishery is accredited. Otherwise, the fishery is not accredited and fishers are liable for prosecution under the EPBC Act should they interact with protected species in Commonwealth waters without a permit
- Part 13A, which provides for assessment of a commercial fishery that wishes to export product against objectives relating to:
  - compliance with Australia's obligations under the Convention on International Trade in Endangered Species of Wild Fauna and Flora and the Convention on Biological Diversity
  - protection of wildlife that may be adversely affected by trade
  - promoting conservation of biodiversity in Australia and other countries

- ensuring that commercial utilisation of Australian native wildlife for the purposes of export is managed in an ecologically sustainable way
- promoting the humane treatment of wildlife
- ensuring ethical conduct during research associated with utilisation of wildlife
- ensuring the precautionary principle is taken into account in making decisions relating to the utilisation of wildlife.

- As a result of a Part 13A assessment, the Environment Minister may decide (a) to include product sourced from the fishery in the list of exempt native species thereby exempting the product from the export control prescribed by the EPBC Act; (b) declare the fishery an approved wildlife trade operation (WTO) for up to three years, subject to conditions; or (c) prohibit the fishery from exporting product.

The SPF is currently accredited, subject to certain conditions (see below), under Part 13 of the EPBC Act for the period that the first Final Declaration is in place.

Assessment of large freezer trawlers in the SPF

In the Schedule to the accreditation of the SPF made by the Environment Minister on 3 September 2012, the following conditions were specified for the operations of 'large-scale mid-water trawl operations' in the SPF. These were specified as 'Condition 1'.

Condition 1

Large-scale mid-water trawl operations must:

(a) "Prior to fishing, have in place demonstrably effective and scientifically proven mitigation approaches and devices to the satisfaction of AFMA to minimise interactions with dolphins, seals and seabirds, including gear handling and net setting rules. These mitigation devices must, as a minimum, include best practice seal excluder devices with top opening escape hatches or equivalent mechanisms

(b) In the event of one or more dolphin mortalities as a result of the mid-water trawl fishing activities:
   i. suspend fishing;
   ii. consult with any AFMA observer onboard and review the effectiveness of mitigation measures; and
   iii. not recommence fishing within 50 nm of the mortality event.

(c) Prior to fishing, have a seabird management plan in place that has been approved by AFMA in consultation with DSEWPaC. The seabird management plan must:
   i. contain appropriate physical mitigation measures and requirements to manage offal discharge; and
   ii. be complied with by the vessel operator and crew during all mid-water trawl fishing activities.

(d) Prior to fishing, have a seal[14] management plan in place that has been approved by AFMA in consultation with DSEWPaC. The seal management plan must:
   i. contain gear handling and net setting rules to minimise the level of seal mortalities;
   ii. be complied with by the vessel operator and crew during all mid-water trawl fishing activities;
   iii. in the event of three seal mortalities in any one fishing shot, require the operator to consult with any AFMA observer onboard and review the effectiveness of mitigation measures before recommencing fishing; and
   iv. in the event of:
      A. three or more seal mortalities in each of three consecutive shots; or
      B. more than 10 seal mortalities within a 24 hour period of fishing; or
      C. more than 10 seal mortalities in one shot

14 On advice from the Department of the Environment, the panel interprets this reference to seals to include only fur seals.

require the operator to

D. suspend fishing;

E. consult with any AFMA observer onboard and review the effectiveness of mitigation measures; and

F. not recommence fishing within 50 nm of the mortality event.

(e) Not fish in areas of the SPF on the continental shelf which are in the Australian sea lion closure area. The area of the Australian sea lion closure is the part of the exclusive economic zone adjacent to the coast of Australia bounded by a notional line beginning at the intersection of the meridian of longitude 129°00'E and the coast of southern Australia, and running progressively:

i. south along that meridian to the intersection with the 150 m depth contour of the continental shelf;

ii. generally easterly along the 150 m depth contour to the point of intersection with the meridian of longitude 140°05'E;

iii. north along that meridian to the intersection with the coastline of South Australia; and

iv. generally westerly along the coastline to the point where the line began.

(f) Ensure that there is an on-board observer at all times with 24 hour monitoring of mid-water trawl fishing activities and there is an underwater camera record of the operation of any bycatch excluder device at all times, and reviewed by an observer each day. The requirements under this Condition will apply to 1 November 2013 with monitoring arrangements to apply after this date to be determined following a review by AFMA and the Department.

(g) When fishing, report daily to AFMA on the level of protected species interactions, including mortalities."

Condition 1 was to be applied by AFMA through variations in SPF SFR conditions (Seafish Tasmania Pty Ltd *in litt*. 16 October 2012) and parts (c) and (d) were to be implemented through seabird and seal and dolphin VMPs.

In addition to the above condition, it was proposed that a further set of conditions would apply to AFMA in the event that a vessel such as the *FV Abel Tasman* operated in the fishery. That condition, specified as Condition 2 in a 'Draft – Two Year Instrument' sent to AFMA by the Environment Minister on 3 September 2012 read as follows.

Condition 2

"In order to manage potential impacts on protected species in the Small Pelagic Fishery, by mid-water trawl operators with a large scale, on-board processing facility on their vessel and the capacity to remain fishing at sea for an extended period, AFMA is to:

a. if protected species interactions occur, report the interaction(s) to the Department within 24 hours of AFMA receiving the report from the vessel.

b. make publicly available on a monthly basis summary reports of protected species' interactions, including mortalities, within the first three months of this instrument being made, and on a quarterly basis thereafter.

c. consider further management responses to mitigate protected species interactions as appropriate.

d. in consultation with relevant scientific experts, the Marine Mammal Working Group or other fora as appropriate and community and non-government organisations, review on a quarterly basis the observed interactions with protected species by Large Scale Mid-Water Trawl Operators in the Fishery, and the appropriateness of the management response.

e. drawing on the outcomes of existing or new research as appropriate and in consultation with the Department and relevant experts, assess and take into account any risk of more concentrated fishing activity disrupting the feeding behaviour of dependant predatory species, particularly protected species."

Ultimately, however, neither Condition 1 nor Condition 2 was imposed. Instead, on 19 November 2012 the first Final Declaration was made, precluding the operations of such vessels for a period of two years. On 28 November 2012 the Environment Minister accredited the SPF Management Plan for the period of the Final Declaration, subject to the following conditions which apply to all mid-water trawl vessels in the SPF.

- Prior to fishing, mid-water trawl vessels must have in place effective mitigation approaches and devices to the satisfaction of AFMA to minimise interactions with dolphins, seals and seabirds.
- AFMA requires that at least one observer be deployed on each new mid-water trawl vessel for the first 10 fishing trips with additional observer coverage or other monitoring implemented as appropriate, following scientific assessment of the SPF.

The panel assumed, for the purposes of its assessment, that the provisions of Conditions 1 and 2 above would have been implemented should an activity of the type specified as a DCFA have commenced operation in the SPF. These conditions are, therefore, included in the panel's interpretation of the fisheries management arrangements under which the DCFA was proposed to operate.

In addition to the above arrangements, the panel was aware that the operators of the *FV Abel Tasman* had expressed a willingness to implement a voluntary 'move-on' rule that limited the total catch during a six-week period to a maximum of 2000 tonnes within a 100 nm diameter area and required that when this limit was reached the vessel must not recommence fishing in the area for at least two weeks (Seafish Tasmania Pty Ltd *in litt.* 16 October 2012). AFMA had not implemented this rule as a formal condition but had offered to provide 'compliance' reporting in-line with any agreements reached between Seafish Tasmania Pty Ltd and other stakeholders (Dr James Findlay, AFMA *in litt.* 12 May 2014). As a result, this move-on rule has not been included in the management arrangements that apply to the DCFA.

The SPF and Commonwealth marine reserves

The South-east Commonwealth Marine Reserves Network (Figure 3.4) occurs within the area of the SPF. Under the *South-east Commonwealth Marine Reserves Management Plan 2013-23*, mid-water trawling is authorised in multiple use zones (depicted in Figure 3.4 in light blue), provided that the gear does not come into contact with the seabed at any stage. In all other zones, mid-water trawling is not allowed, though transiting in these areas is authorised.

The SPF also includes extensive areas of the more recently declared Temperate East and South-west Commonwealth Marine Reserves Networks (proclaimed in November 2012). These reserves are currently under 'no change on the water' transitional management arrangements. These arrangements are given effect through general approvals issued by the Director of National Parks under section 359B of the EPBC Act. They involve i) no zoning restrictions across new areas of reserve and ii) the continuation of any restriction that applied for those areas that used to be a marine park before November 2012 and that are now part of the new reserves. For example, some restrictions on use—including some relevant to the SPF— continue to apply to the area of the previous Great Australian Bight Marine Park (Commonwealth Waters), now part of the larger Great Australian Bight Commonwealth Marine Reserve (Figure 3.5). Specifically, mid-water trawling is authorised in both the Marine Mammal Protection Zone and Benthic Protection Zone provided it does not come in contact with the seafloor. Additionally, between 1 May and 31 August, all vessel access is prohibited (including all forms of fishing) in the Marine Mammal Protection Zone.

The 'no change on the water' arrangements will apply until new management plans for these networks come into effect following an independent review of the zoning and management arrangements of the reserves proclaimed in 2012. It is not possible to speculate on what implications, if any, that review may have for mid-water trawling activity in these areas of the SPF in the future.

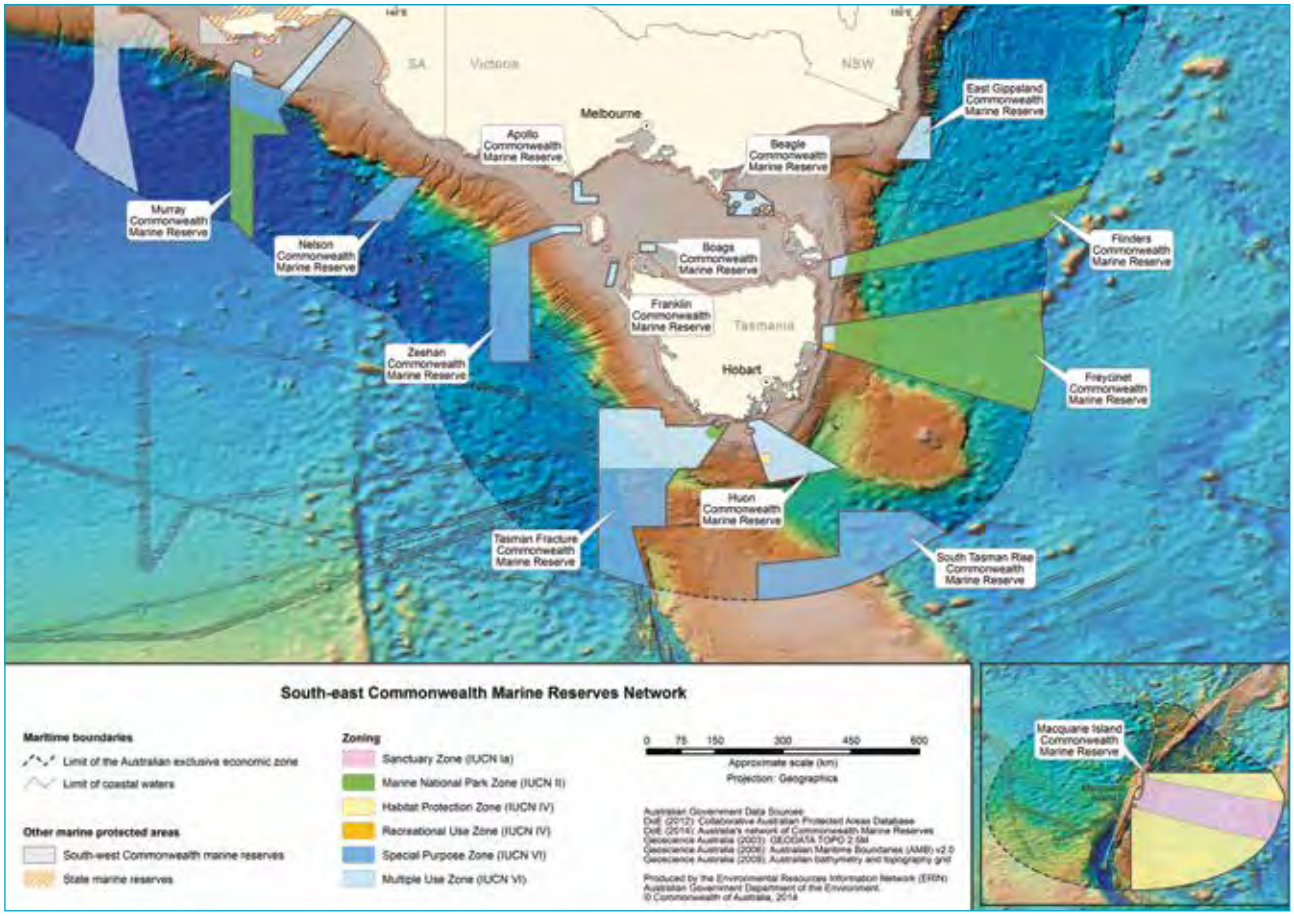

Figure 3.4 South-east Commonwealth Marine Reserves Network **Source:** Department of the Environment

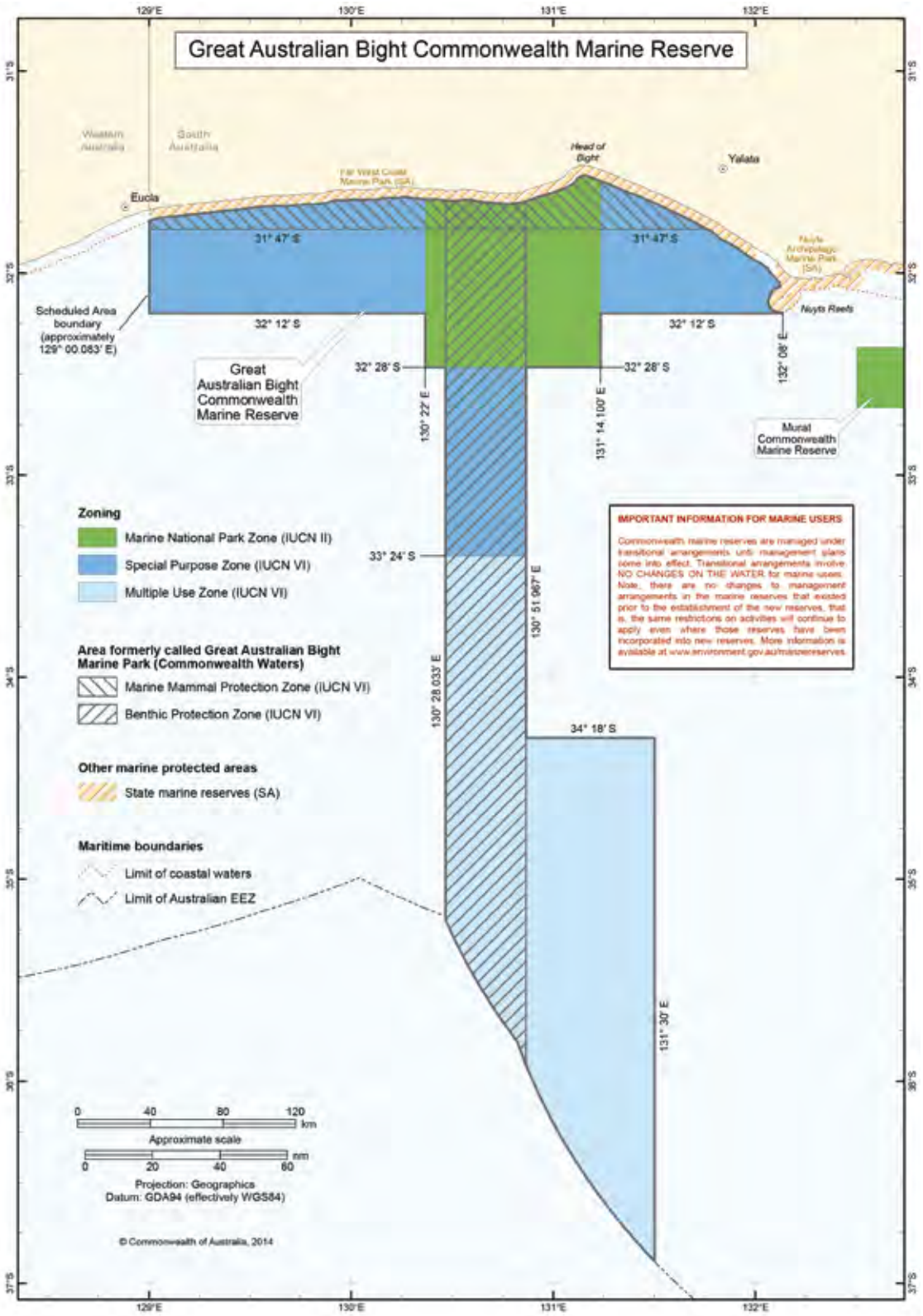

Figure 3.5 Great Australian Bight Commonwealth Marine Reserve map showing the area of the previous Great Australian Bight Marine Park **Source:** Department of the Environment