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Australian National Report on 2013 fishing activities to the South Pacific Regional Fisheries Management Organisation's Scientific Committee

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1 Description of fisheries

This report summarises the fishing activities undertaken by Australian-flagged vessels in 2013 in the South Pacific Regional Fisheries Organisation (SPRFMO) Area of Application. It excludes data from within the Exclusive Economic Zone (EEZ) of mainland Australia and external territories (e.g. Norfolk Island). Data are not reported for tuna and billfish fisheries that operate in the Western and Central Pacific Fisheries Commission (WCPFC) Area. Note that scientific and common names are provided in Appendix A.

Australian operators in the SPRFMO Convention Area are currently authorised by the Australian Government to target various species with mid-water and demersal trawl, traps, dropline, minor line, automatic longline and demersal longline. The vessels undertaking high seas fishing in the SPRFMO Area do so under permits issued by the Australian Fisheries Management Authority (AFMA).

In 2011, AFMA revised the high seas permit conditions for vessels operating in the SPRFMO Area (AFMA 2011). The revised permit conditions restricted vessels to fishing within the 2002–06 Australian fishing footprint as defined by a series of coordinates (Map 1). All fishing operations in 2013 were within the Australian fishing footprint. The threshold limits for an encounter with a VME that trigger Australia's move-on protocols are 50 kg of corals or sponges in a shot for trawlers and 10 kg of corals or sponges per 1000 hooks for longliners. This threshold was not triggered in 2013.

Data sources

Data collected under permit requirements include logbook records reported by fishers, 1987–2013. In 2011, the historic data extraction was reviewed during the development of the Australian bottom fishery impact assessment (CSIRO 2011). This review resulted in the removal of fishing records that appeared to be erroneous. This additional data cleaning resulted in a reduction of the number of active fishing vessels using trawl gear between 2002 and 2006 and a reduction of the number of active non-trawl fishing vessels between 1997 and 2007. The number of active trawl vessels was reduced by between one and six vessels in a given year. The number of trawl hours was reduced by between 13 and 21 trawl hours in any given year. There was relatively little change in the reported catches. The number of active non-trawl vessels was reduced by between one and three vessels in a given year. There was relatively little change in the reported number of hooks and catch. The revised data was submitted to the SPRFMO Interim Secretariat in 2011.

Fleet composition

Three Australian-flagged vessels fished in the SPRFMO Area in 2013; one trawler and two non-trawl vessels (Table 1).

Table 1 Fishing effort, catches and the number of Australian vessels that actively fished in the SPRFMO Area, 2011–2013

	Vessels that actively fished pelagically			Vessels that actively bottom fished					
				Non-trawl			Trawl		
Year	2011	2012	2013	2011	2012	2013	2011	2012	2013
Vessels	0	0	0	1	2	2	1	1	1
Catch (t)	0	0	0	91	110	133	63	287	139
Effort	0	0	0	443	349	594	92	139	115

Note: Fishing effort is presented in hours for trawl and as thousands of hooks for non-trawl.

2 Catch, fishing effort and CPUE

Australian vessels landed a total catch of 272 tonnes caught in the SPRFMO Area in 2013. Alfonsino (*Beryx splendens*), orange roughy (*Hoplostethus atlanticus*), blue-eye trevalla (*Hyperoglyphe antarctica*), jackass morwong (*Nemadactylus macropterus*), and yellowtail kingfish (*Seriola lalandi*) were again the top five species caught by weight. These five species collectively comprised 75 per cent of the total non-trawl catch in 2013. Alfonsino and orange roughy comprised 85 per cent of the 2013 trawl catch (note that scientific and common names are provided in Appendix A). There was no fishing effort directed at, or catch of, jack mackerel (*Trachurus* spp.) by Australian vessels operating in the SPRFMO Area in 2013.

Logbook estimates of catch, nominal fishing effort and catch per unit effort (CPUE) are shown for key species in Table 2 (trawl) and Table 3 (non-trawl). Total effort for the trawl fishery declined from 104 trawl hours in 2006 to zero hours in 2008–10. Trawl effort increased to 92 hours in 2011, and 139 hours in 2012 before a slight decline back to 115 hours in 2013. The total number of active vessels in the trawl fishery declined from twelve in 1998 and 2000, to two in 2007 and zero in 2008–10. One Australian trawler was active in the SPRFMO Area in 2011–13. The nominal CPUE for orange roughy in the trawl fishery shows substantial variation over time, with no clear trend. Other species caught by trawl, including smooth oreodory (*Pseudocyttus maculatus*), spiky oreodory (*Neocyttus rhomboidalis*), alfonsino and cardinal fish (Family Apogonidae), also show fluctuations in CPUE over time.

Effort of non-trawl vessels has not been reported prior to 2008 due to confidentiality restrictions. Effort declined from >750 000 hooks in 2008, to 333 000 hooks in 2010, before increasing again to 594 000 hooks in 2013. The total number of active vessels in the non-trawl fishery declined from a peak of 5 vessels in 2006, to 1 in 2011. There were two active non-trawl vessels in the SPRFMO Area in 2012–13. The nominal CPUE for morwong in the non-trawl fishery shows minimal variation over time, averaging 9.3 t per 1000 hooks in 2011–13. Other major target species show similar low levels of variation in CPUE. Yellowtail kingfish varies the most, from 0.15 t per 1000 hooks in 2012, to 0.04 t per 1000 hooks in 2013.

Map 1 Australia's fishing footprint and identified fishing grounds in the SPRFMO Area

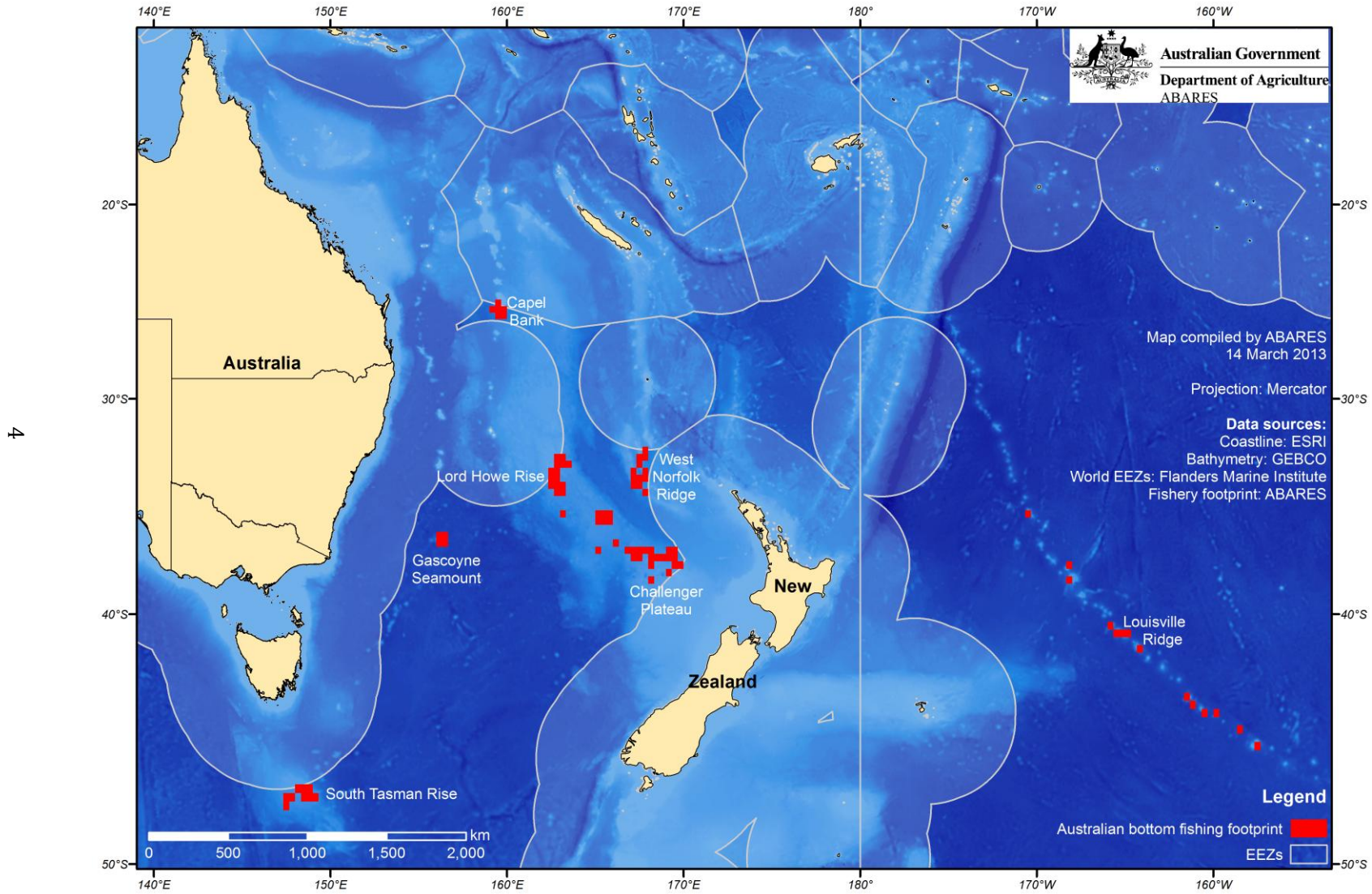


Table 2 Number of active vessels, fishing effort (hours), annual catch (t) and nominal CPUE (t/trawling hour, in parentheses) of major species reported in logbooks by Australian trawlers in the SPRFMO Area, 1987–2013.

Year	No. of vessels	Effort (hours)	Catch of major species (t) and CPUE					Total catch (t)
			Orange roughy	Smooth oreo	Spiky oreo	Alfonsino	Other species	
1987–1990 ^a	6	105	9 (0.08)	0 (0.00)	0 (0.00)	0 (0.00)	8	17
1991–1993 ^a	6	85	367 (4.31)	1 (0.01)	107 (1.26)	0 (0.00)	4	479
1994	7	257	192 (0.74)	0 (0.00)	6 (0.02)	0 (0.00)	5	203
1995–1996 ^a	6	62	21 (0.34)	12 (0.19)	10 (0.16)	0 (0.00)	54	98
1997	10	396	1 458 (3.68)	505 (1.27)	448 (1.13)	1 (0.00)	56	2 468
1998	12	916	3 098 (3.38)	420 (0.46)	620 (0.68)	1 (0.00)	5	4 143
1999	10	777	2 514 (3.23)	106 (0.14)	89 (0.11)	8 (0.01)	5	2 720
2000	12	752	948 (1.26)	123 (0.16)	86 (0.11)	4 (0.00)	8	1 170
2001	9	307	751(2.45)	13 (0.04)	31 (0.10)	1 (0.00)	3	799
2002	8	196	376 (1.91)	6 (0.03)	67 (0.34)	3 (0.01)	3	453
2003	9	102	166 (1.62)	6 (0.06)	63 (0.61)	2 (0.02)	1	238
2004	5	48	369 (7.72)	22 (0.46)	12 (0.26)	1 (0.02)	1	406
2005	3	29	207 (7.19)	74 (2.58)	1 (0.02)	81 (2.81)	14	377
2006	3	104	166 (1.60)	0 (0.00)	0 (0.00)	209 (2.02)	75	451
2007	2	71	148 (2.09)	0 (0.00)	1 (0.01)	86 (1.21)	18	253
2008	0	–	–	–	–	–	–	–
2009	0	–	–	–	–	–	–	–
2010	0	–	–	–	–	–	–	–
2011	1	92	2 (0.02)	0 (0.00)	0 (0.00)	47 (0.51)	14	63
2012	1	139	56 (0.40)	<1(0.01)	<1(0.01)	167 (1.20)	119	287
2013	1	115	49 (0.43)	<1 (0.01)	0 (0.00)	72 (0.63)	17	138

^a In earlier years, data were combined over several years to meet a policy on not reporting data for fewer than five vessels.

Notes: These logbook data are based on visual estimates by skippers of retained catch weights. They do not always exactly match subsequent landings.

Table 3 Number of active vessels, fishing effort ('000s of hooks), annual catch and nominal CPUE (t/hooks, in parentheses) of major species reported in logbooks by Australian vessels using non-trawl gear in the SPRFMO Area, 1997–2013.

Year	No. of vessels	Effort ('000s hooks) ^a	Catch of major species (t) and CPUE					Total catch (t)
			Morwong ^b	Blue-eye trevalla	Ocean blue-eye trevalla	Yellowtail kingfish ^c	Other species ^c	
1997	1	-	1	6	0	0	3	9
1998	3	-	31	26	0	15	34	106
1999	4	-	29	22	0	13	26	90
2000	1	-	79	6	0	14	19	117
2001	3	-	43	21	35	5	53	157
2002	3	-	81	27	66	32	38	244
2003	3	-	16	30	13	1	24	84
2004	3	-	0	2	7	0	8	18
2005	2	-	1	4	0	0	4	9
2006	5	-	10	8	0	22	20	59
2007	2	-	7	16	0	1	24	48
2008	3	751	24 (0.03)	3 (<0.01)	0 (0.00)	25 (0.03)	125	177
2009	3	507	13 (0.03)	4 (<0.01)	0 (0.00)	11 (0.02)	79	106
2010	3	333	23 (0.07)	6 (0.02)	0 (0.00)	17 (0.05)	49	95
2011	1	443	45 (0.10)	17 (0.04)	0 (0.00)	24 (0.05)	5	91
2012	2	349	40 (0.11)	10 (0.03)	0 (0.00)	54 (0.15)	6	110
2013	2	594	39 (0.07)	37 (0.06)	<1 (<0.01)	23 (0.04)	33	133

^a Historical effort not reported due to data handling issues and/or confidentially concerns. ^b Morwong catch from 1997 to 2009 is combined *Nemadactylus macropterus* and *Nemadactylus* spp. Morwong catches in subsequent years were *Nemadactylus macropterus*. ^c Some of the yellowtail kingfish and 'other species' catches presented in previous reports for 2010 were found to have occurred outside the SPRFMO Area. Those catches have been corrected and now match the data submission for 2010.

Notes: These logbook data are based on visual estimates by skippers of retained and discarded catch weights. They do not always exactly match subsequent landings.

3 Fisheries data collection and research activities

Australian vessels require a permit from AFMA to fish in the SPRFMO Area. The permits are issued for a period of up to 12 months. As part of the permit requirements, AFMA collects detailed information on fishing trips, in accordance with the SPRFMO Data Standards.

No changes to fisheries data collection or research activities were recorded in the fishery in 2013.

Logbooks and landings

Since 2002, the permit conditions have included the requirement to record daily catch and fishing effort data in logbooks on a set-by-set (or tow-by-tow) basis, including the location of fishing operations. The logbooks have been revised on several occasions. The current longline logbook (LN01A—Line Fishing Daily Fishing Log) and trawl logbook (EFT01B—Eastern Finfish Trawl Daily Fishing Log) were introduced in 2007. Fishers are also required to record bycatch and discards in the logbooks.

Landings are monitored by AFMA through formal catch disposal records. Catch disposal records are completed by both the fisher and licensed fish receiver at the point of unload to obtain accurate data on fish numbers and verified weight by species. Skippers tend to under-estimate the weights reported in logbooks for most species, so the catch disposal record data have been reported in domestic official statistics since 2007. Compliance checks are conducted on unloads as part of a risk based compliance program. Weight estimates are also derived from the size-monitoring program, and are likely to be more accurate than logbook data for that part of the time series.

The logbook and catch disposal record data have been submitted to the SPRFMO Secretariat, as required by the SPRFMO Data Standards (CMM 2.02).

Vessel Monitoring System

AFMA introduced the compulsory requirement for all Commonwealth-endorsed fishing vessels to be fitted with Integrated Computer Vessel Monitoring Systems (ICVMS) in 2007. For 2013–14 (up to March 2014), there was a 97.4 per cent compliance rate of all Commonwealth nominated vessels that had a fully operational and functioning unit. Compliance with ICVMS requirements has increased markedly since mid 2008. AFMA uses the ICVMS to assist in planning inspections and operations, to assist the observer program in deploying scientific observers and to actively monitor compliance with closed areas.

Research

AFMA commissioned a bottom fishing impact assessment of Australian fishing activity in the SPRFMO Area and this was submitted to the SPRFMO Science Working Group in 2011 (CSIRO 2011).

In 2011, AFMA commissioned ABARES to assess the sustainability of the harvest of key commercial species in the SPRFMO Area by Australian vessels (Woodhams et al. 2012). Results indicated that:

- 1) The main data that could be used for sustainability assessments for deepwater species in the SPRFMO Area are the catch and effort data of fishery participants. For the assessment, Australia had to rely primarily on data for the Australian fleet, with some data on catches by other participants. It will be necessary to obtain catch and effort data from all participants, at adequate spatial scales (at least 0.1 degree square, but preferably shot-by-shot) to evaluate alternative assessment approaches, and conduct deepwater sustainability assessments for the SPRFMO Area.
- 2) Even if data can be obtained from all participants, catch and effort data for deepwater fisheries are typically limited, and may not provide reliable indices of abundance for use in standard stock assessment approaches. Assessments of this nature are likely to remain difficult for any high seas demersal fishery.
- 3) Alternative assessment approaches will therefore need to be considered for these deepwater fisheries. Options include:
 - Application of meta-analysis or similar approaches such as those identified by Clark et al. (2010), to estimate carrying capacity for seabed features or fishing areas. These could be used to provide estimates of sustainable yields by feature or fishing area.
 - The development of spatial habitat prediction models for demersal fish species, analogous to the global habitat prediction models developed by Davies & Guinotte (2011) for coldwater corals. These could be used to develop spatial protection approaches for proportions of fish species populations, using suitable habitat as a proxy for biomass.

In 2013, Australia, in collaboration with New Zealand, undertook research and literature reviews that informed the SPRFMO Scientific Committee discussions on bottom fishing. Specific tasks included:

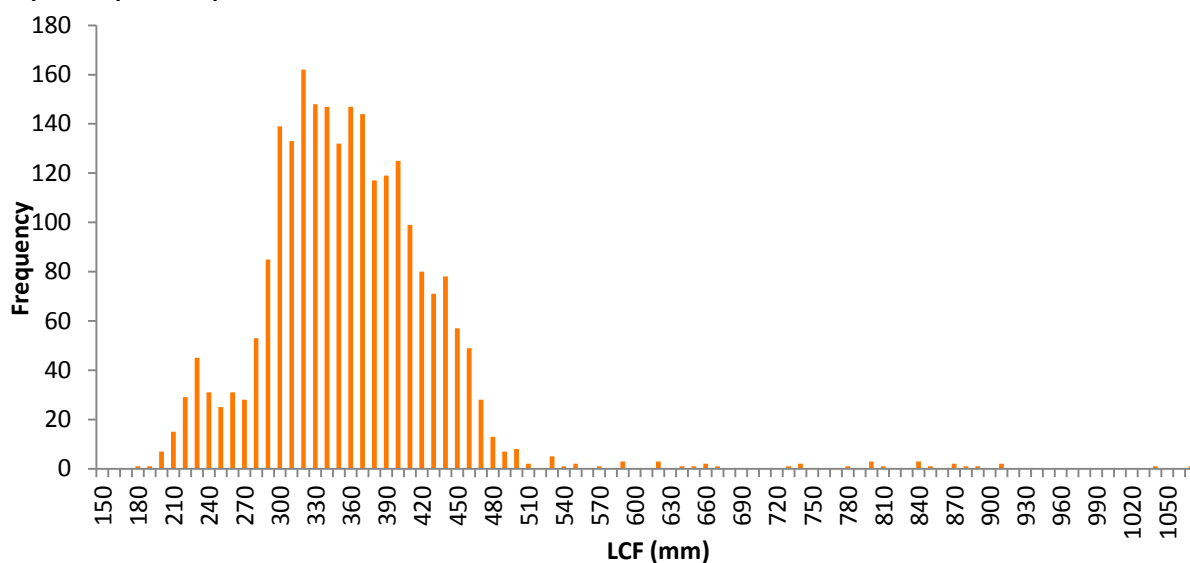
- Identification of vulnerable benthic taxa in the SPRFMO Area and review of move-on rules for different gear types (Hansen et al. 2013).
- Mapping of bottom fished areas and consideration of fishing reference periods in the SPRFMO Area (Penney 2013).

4 Biological sampling and length/age composition of catches

Length–frequency data were collected by Australian observers in the SPRFMO Area in 2012 and 2013, and submitted annually to the SPRFMO Secretariat. Where data are sufficient, length frequencies of alfonsino caught by trawl are presented in Figure 1, and blue-eye trevalla caught by trawl and demersal longline are presented in Figure 2 and Figure 3, respectively. Length is reported as length to caudal fork (LCF).

Figure 1a-b Length frequency of alfonsino measured by observers on an Australian trawler in the SPRFMO Area

a) 2012 (n=2397)



b) 2013 (n = 538)

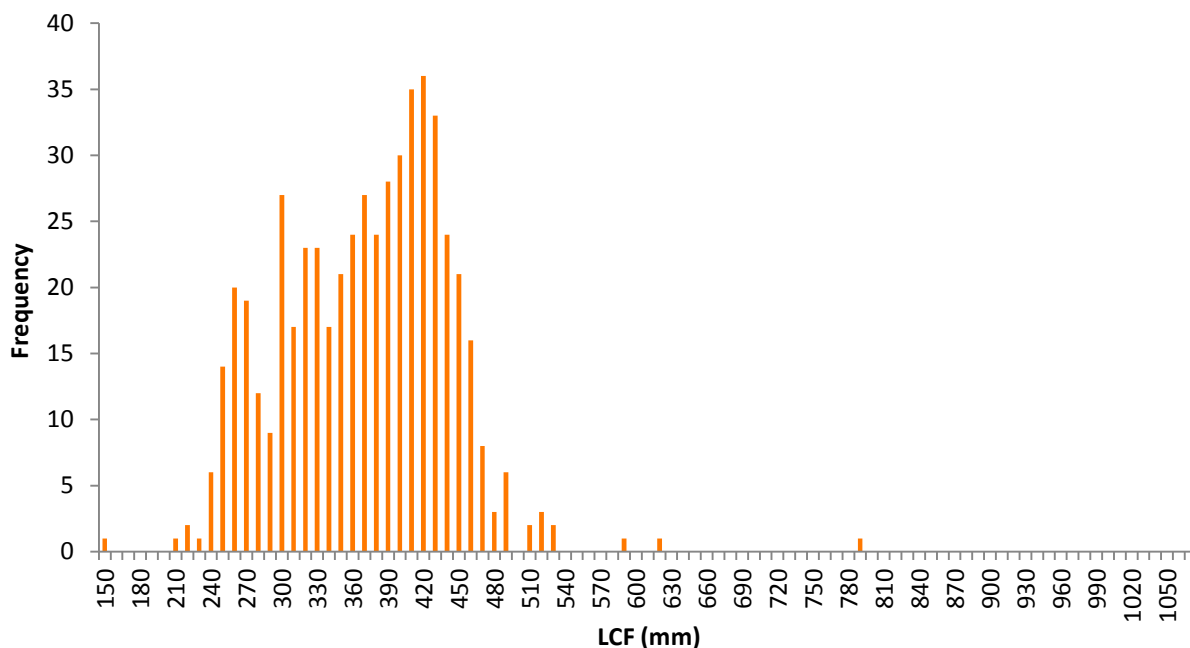


Figure 2 Length frequency of blue eye trevalla measured by observers on an Australian trawler in the SPRFMO Area, 2012. Note that sample size in 2013 (n = 21) was insufficient to produce a length frequency graph.

2012 (n = 392)

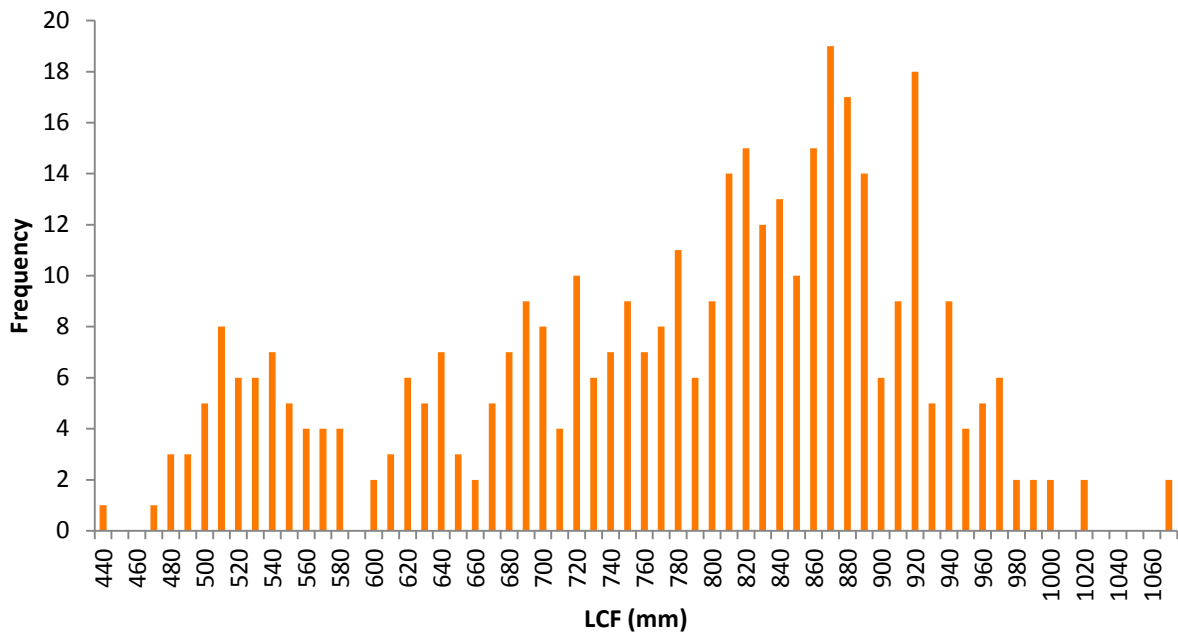
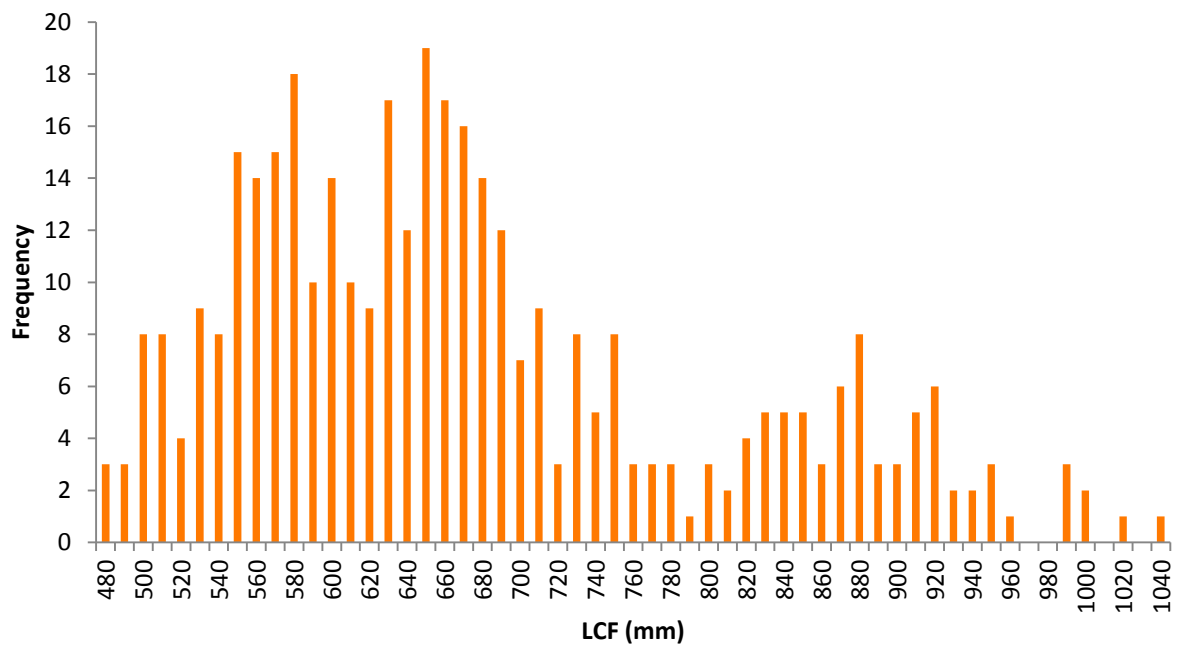


Figure 3 Length frequency of blue eye trevalla measured by observers on Australian longline vessels in the SPRFMO Area, 2013. Note that sample size in 2012 (n = 49) was insufficient to produce a length frequency graph.

2013 (n = 378)



5 Summary of observer and port sampling programs

Observer program

Since 2010, Australian permit conditions for bottom fishing in the SPRFMO Area have required 100 per cent observer coverage on all vessels permitted to use trawl gear. This was achieved for the five trips undertaken by the one Australian trawler active in the Area in 2013.

Ten per cent observer coverage is required for vessels using other demersal fishing methods. Observers monitored 6 of the 13 trips of the two non-trawl vessels in the SPRFMO Area in 2013, amounting to about 44 per cent observer coverage of all reported hooks.

AFMA recruits and trains the observers. About sixteen observers are currently employed in the AFMA observer program. Observers have a scientific background or experience in the fishing industry or other maritime industries and must demonstrate skills in collecting biological data at sea, fisheries research methodologies and collection of associated scientific data. Observers also hold a marine radio operators certificate of proficiency (or similar qualifications), a sea safety certificate and medical certificate, and have completed an AFMA observer training course.

Observers collect a range of data on vessel characteristics, fishing activity, catch composition, discarding and bycatch. There were no changes to observer requirements in 2013.

Observers did not record any bycatch of marine mammals, seabirds or marine reptiles in trawl or non-trawl operations in the SPRFMO Area in 2013.

Table 4 Summary of demersal fishing effort, observer coverage and sampling in the SPRFMO Area in 2013

Gear	Logbook			Observer		
	No. of trips	No. of tows/hooks ^a	Reported catch (t)	No. of trips	No. of tows/hooks ^b	No. of fish measured
Trawl	5	224	139	5	84	1140
Non-trawl	13	594 000	133	6	260 000	646

^a Tows or sets with a zero catch are not reported in the logbook. ^b Observer data include tows or sets with a zero catch in addition to those where a catch was taken. Slight discrepancies may occur due to delays in data being added to the database.

Port sampling program

Australia does not have a port sampling program for vessels that fish in the SPRFMO Area. The disposal of the catch is monitored through catch disposal records where the catch is verified by an AFMA-registered fish receiver. These data have been submitted to the SPRFMO Secretariat.

Appendix A Common and scientific names

Common Name	Scientific Name
Alfonsino	<i>Beryx splendens</i>
Blue-eye trevalla	<i>Hyperoglyphe antarctica</i>
Cardinal fish	Family Apogonidae
Jackass morwong	<i>Nemadactylus macropterus</i>
Jack mackerel	<i>Trachurus</i> spp.
Orange roughy	<i>Hoplostethus atlanticus</i>
Smooth oreodory	<i>Pseudocyttus maculatus</i>
Spiky oreodory	<i>Neocyttus rhomboidalis</i>
Yellowtail kingfish	<i>Seriola lalandi</i>

References

- AFMA (Australian Fisheries Management Authority) 2011, 'High seas: conservation and management measures to prevent significant adverse impacts on vulnerable marine ecosystems', SPRFMO document SWG-10-DW-01b, Tenth Scientific Working Group, Port Vila, 19–23 September 2011.
- Clark, MR, Dunn, MR & Anderson, OF 2010, 'Development of estimates of biomass and sustainable catches for orange roughy fisheries in the New Zealand region outside the EEZ: CPUE analyses, and application of the "seamount meta-analysis" approach', *New Zealand Fisheries Assessment Report 2010/19*.
- CSIRO Marine and Atmospheric Research 2011, 'Bottom Fishery Impact Assessment', SPRFMO Paper SWG-10-DW-01a, Tenth Scientific Working Group, Port Vila, 19–23 September 2011.
- Davies, AJ & Guinotte, JM 2011, 'Global Habitat Suitability for Framework-Forming Cold-Water Corals', *PLoS ONE* 6(4): e18483. doi:10.1371/journal.pone.0018483.
- Hansen, S, Ward, P & Penney, A 2013, 'Identification of vulnerable benthic taxa in the western SPRFMO Convention Area and review of move-on rules for different gear types', SPRFMO Document SC-01-09, First Meeting of the Scientific Committee, La Jolla, 21–27 October 2013.
- Penney, A 2013, 'Spatial analysis of Australian and New Zealand historical bottom trawl fishing effort in the Convention Area of the SPRFMO', SPRFMO Document SC-01-20, First Meeting of the Scientific Committee, La Jolla, 21–27 October 2013.
- Woodhams, J, Stobutzki, I, Noriega, R & Roach, J 2012, 'Sustainability of harvest levels by Australian flagged vessels in the high seas areas of the South Pacific Ocean and South Indian Ocean', ABARES report to client prepared for the Australian Fisheries Management Authority, Canberra, November 2012.