



Australian Government

Department of Agriculture, Fisheries and Forestry
ABARES

Australian National Report on 2011 fishing activities to the South Pacific Regional Fisheries Management Organisation (SPRFMO) Science Working Group

Peter Ward, Justin Roach & Patty Hobsbawn

Research by the Australian Bureau of Agricultural
and Resource Economics and Sciences

SPRFMO document number: SWG-11-10
October 2012

© Commonwealth of Australia

Ownership of intellectual property rights

Unless otherwise noted, copyright (and any other intellectual property rights, if any) in this publication is owned by the Commonwealth of Australia (referred to as the Commonwealth).

Creative Commons licence

All material in this publication is licensed under a Creative Commons Attribution 3.0 Australia Licence, save for content supplied by third parties, logos and the Commonwealth Coat of Arms.



Creative Commons Attribution 3.0 Australia Licence is a standard form licence agreement that allows you to copy, distribute, transmit and adapt this publication provided you attribute the work. A summary of the licence terms is available from creativecommons.org/licenses/by/3.0/au/deed.en. The full licence terms are available from creativecommons.org/licenses/by/3.0/au/legalcode.

This publication (and any material sourced from it) should be attributed as: Author A, Author B, 2012, Title of the publication, ABARES (Research report, Technical report, Report to client prepared for the 'insert name of client'), Canberra, Month. CC BY 3.0.

Cataloguing data

Ward, P, Roach, J & Hobsbawn, P 2012, Australian National Report on 2011 fishing activities to the South Pacific Regional Fisheries Management Organisation (SPRFMO) Science Working Group, ABARES (Technical report prepared for the South Pacific Regional Fisheries Management Organisation (SPRFMO) Science Working Group), Canberra, October.

ABARES project: 43350

Internet

Australian National Report on 2011 fishing activities to the South Pacific Regional Fisheries Management Organisation (SPRFMO) Science Working Group is available at: daff.gov.au/abares/publications.

Department of Agriculture, Fisheries and Forestry**Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES)**

Postal address GPO Box 1563 Canberra ACT 2601

Switchboard +61 2 6272 2010|

Facsimile +61 2 6272 2001

Email info.abares@daff.gov.au

Web daff.gov.au/abares

Inquiries regarding the licence and any use of this document should be sent to: copyright@daff.gov.au.

The Australian Government acting through the Department of Agriculture, Fisheries and Forestry has exercised due care and skill in the preparation and compilation of the information and data in this publication.

Notwithstanding, the Department of Agriculture, Fisheries and Forestry, its employees and advisers disclaim all liability, including liability for negligence, for any loss, damage, injury, expense or cost incurred by any person as a result of accessing, using or relying upon any of the information or data in this publication to the maximum extent permitted by law.

Contents

1	Description of Fisheries.....	1
1.1	Fleet composition	1
1.2	Area of operations	2
2	Catch, Effort and CPUE.....	3
3	Fisheries Data Collection and Research Activities.....	6
3.1	Logbooks	6
3.2	Vessel Monitoring System	6
3.3	Research	6
4	Biological Sampling and Length/Age Composition of Catches.....	8
5	Summary of Observer and Port Sampling Programs	9
5.1	Observer Program	9
5.2	Port Sampling Program.....	9
	Appendix A.Taxa recorded in the SPRFMO Area, 2010.	10
	References	11

Tables

Table 1	Fishing effort, catches and the number of Australian vessels that actively fished in the SPRFMO Area, 2008–2011.....	1
Table 2	Permitted fishing methods for the SPRFMO area, 2008–2011.	2
Table 3	Number of active high seas vessels, effort and annual catch of the major species using trawl gear in the SPRFMO area, 1987-2011. No trawl effort or catch were recorded for the SPRFMO area in 2008, 2009 and 2010.	4
Table 4	Number of active high seas vessels and annual catch of major species using non-trawl gear in the SPRFMO Area, 1997-2011.	5
Table 5	Summary of demersal trawl and demersal longline fishing effort, observer coverage and sampling in the SPRFMO Area in 2011.....	9

Maps

Map 1	Identified fishing grounds in the SPRFMO Area.....	2
-------	--	---

1 Description of Fisheries

This report provides a summary of the fishing activities undertaken by Australian-registered vessels in 2011 in the South Pacific Regional Fisheries Management Organisation (SPRFMO) area.

This summary excludes data from within the Exclusive Economic Zone (EEZ) of mainland Australia and external territories (e.g. Macquarie Island or Norfolk Island). Data are not reported for fisheries that operate in the Western and Central Pacific Fisheries Commission (WCPFC) area.

Operators in the SPRFMO area are currently authorised 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).

Australian vessels conducted no pelagic fishing for jack mackerel (*Trachurus* spp.) in the SPRFMO Area during 2011.

Data presented are logbook records collected and reported by fishers. The data include records from 1987 to 2011. 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.

1.1 Fleet composition

Two Australian vessels fished in the area of the SPRFMO in 2011; one trawler and one non-trawl vessel (Table 1, Table 2).

Table 1 Fishing effort, catches and the number of Australian vessels that actively fished in the SPRFMO Area, 2008–2011

	Vessels that actively fished pelagically			Vessels that actively bottom fished					
	Year	2008	2009	2010	non-trawl			trawl	
Vessels		0	0	0	2009	2010	2011	2009	2010
		0	0	0	3	3	1	0	0
Catch (t)		0	0	0	60	95	91	0	0
Effort*		0	0	0	302,700	332,808	442,500	0	0
									2011
									1
									63
									92

Note: * Effort is presented in hours for trawl. Fishing effort is presented as hooks for non-trawl and pelagic.

Table 2 Permitted fishing methods for the SPRFMO area, 2008–2011.

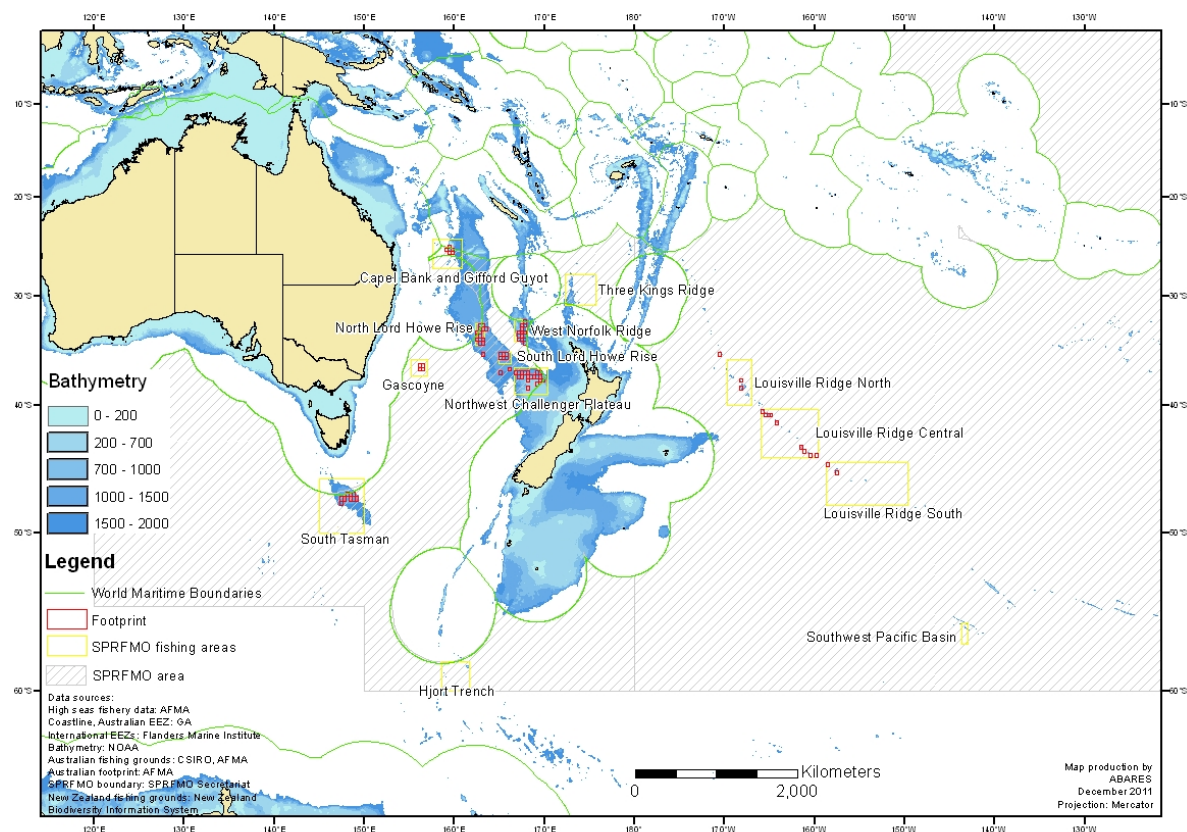
Classification	Gear type
Bottom gear	Demersal longline
	Demersal trawl
	Dropline
	Automatic longline
	Minor line
Pelagic gear	Mid-water trawl

1.2 Area of operations

In 2011 AFMA revised the high seas permit conditions for vessels operating in the SPRFMO area. The new permit conditions restrict vessels to fishing within the Australian fishing footprint as defined by a series of coordinates (Map 1).

Most fishing operations in 2011 were within the Australian fishing footprint (2002–06), however there were four longline sets and one trawl shot adjacent to the Australian fishing footprint. AFMA has conducted an investigation into the longline activities and has laid charges on the vessel master and concession holder which are currently before the court. AFMA are conducting preliminary investigations into the trawl activity outside the footprint.

In 2011, the fishing activity occurred between January and December. As mentioned above, in 2011 additional management measures were included in the permit conditions as described in AFMA (2011). The move-on provision for trawlers of 50 kilograms of corals or sponges in a shot was not triggered in 2011.

Map 1 Identified fishing grounds in the SPRFMO Area

Source: CSIRO (2011)

2 Catch, Effort and CPUE

The total catch of all species reported by Australian vessels in 2011 was 154 tonnes. Redthroat emperor (*Lethrinus miniatus*), jackass morwong (*Nemadactylus macropterus*), yellowtail kingfish (*Seriola lalandi*), seabream (*Gymnocranius* spp.) and blue-eye trevalla (*Hyperoglyphe antarctica*) were the top five species caught by weight. These five species collectively comprised the vast majority of the total catch (see Appendix A for species composition in 2010).

There was no fishing effort directed at, or catch of jack mackerel (*Trachurus* species) by Australian vessels operating in the SPRFMO area in 2011.

The catch, nominal effort and catch per unit effort (CPUE) are shown for key species in Table 3 (trawl) and Table 4 (non-trawl).

Total effort for the trawl fishery declined from 104 trawl hours in 2006 to zero trawl hours in 2008, 2009 and 2010. Trawl effort reported in 2011 was 91.8 hours. Total number of active vessels in the trawl fishery declined from 12 in 1998 and 2000, to two in 2007 and zero in 2008, 2009 and 2010. In 2011 there was one Australian trawler active in the SPRFMO Area. The nominal CPUE for orange roughy (*Hoplostethus atlanticus*) in the trawl fishery shows substantial variation over time, with no clear trend. Other species caught by the trawl fishery, including smooth oreo dory (*Pseudocyttus maculatus*), spiky oreo dory (*Neocyttus rhomboidalis*), alfonsino (*Beryx decadactylus*) and cardinal fish (Apogonidae) also show fluctuations in CPUE over time.

Total effort in the demersal longline and dropline fishery was 332,808 hooks in 2010 and 442,500 hooks in 2011. The number of active vessels in the demersal longline and dropline fishery peaked at five active vessels in 2006 and then declined to three active vessels in 2008, 2009 and 2010. In 2011 one vessel operated in the demersal longline and dropline fishery.

Table 3 Number of active high seas vessels, effort and annual catch of the major species using trawl gear in the SPRFMO area, 1987-2011. No trawl effort or catch were recorded for the SPRFMO area in 2008, 2009 and 2010.

Year	No. Vessels	Effort (Trawl h)	Catch of major species (t) (nominal CPUE t/rawl h)						Total Catch (t)
			Orange roughy	Smooth oreo	Spikey oreo	Alfonsino	Cardinal-fishes	Other species	
1987 – 1990 ¹	6	105	9 (0.08)	0 (0)	0 (0)	0 (0)	0 (0)	8	17
1991 – 1993 ¹	6	85	367 (4.31)	1 (0.01)	107 (1.26)	0 (0)	0 (0)	4	479
1994	7	257	192 (0.74)	0 (0)	6 (0.02)	0 (0)	2 (0)	3	203
1995 – 1996 ¹	6	62	21 (0.34)	12 (0.19)	10 (0.16)	0 (0)	52 (0.84)	2	98
1997	10	396	1458 (3.68)	505 (1.27)	448 (1.13)	1 (0)	15 (0.03)	41	2468
1998	12	916	3098 (3.38)	420 (0.46)	620 (0.68)	1 (0)	2 (0)	3	4143
1999	10	777	2514 (3.23)	106 (0.137)	89 (0.11)	8 (0.01)	1 (0)	4	2720
2000	12	752	948 (1.26)	123 (0.16)	86 (0.11)	4 (0)	7 (0)	1	1170
2001	9	307	751 (2.45)	13 (0.04)	31 (0.10)	1 (0)	0 (0)	3	799
2002	8	196	376 (1.91)	6 (0.03)	67 (0.34)	3 (0.01)	0 (0)	3	453
2003	9	102	166 (1.62)	6 (0.06)	63 (0.61)	2 (0.02)	0 (0)	1	238
2004	5	48	369 (7.72)	22 (0.46)	12 (0.26)	1 (0.02)	0 (0)	1	406
2005	3	29	207 (7.19)	74 (2.58)	1 (0.02)	81 (2.81)	0 (0)	14	377
2006	3	104	166 (1.60)	0 (0)	0 (0)	209 (2.02)	0 (0)	75	451
2007	2	70.7	148 (2.09)	0 (0)	1 (0.01)	86 (1.21)	2 (0.02)	16	253
2008	0	0	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0	0
2009	0	0	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0	0
2010	0	0	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0	0
2011	1	91.8	2 (0.02)	0 (0)	0 (0)	47 (0.51)	0 (0)	14	63

Note:¹Data were combined to meet a policy on not reporting data for fewer than five vessels.

Table 4 Number of active high seas vessels and annual catch of major species using non-trawl gear in the SPRFMO Area, 1997-2011.

Year	No. Vessels	Catch of major species (t)					Total catch (t)
		Morwong*	Blue eye trevalla	Ocean blue eye trevalla	Yellowtail kingfish	Other spp.	
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	24	3	0	25	125	177
2009	3	13	4	0	11	79	106
2010	3	23	6	0	19	59	106
2011	1	45	17	0	24	5	91

Note: *Morwong catch from 1997 to 2009 is combined *Nemadactylus macropterus* and *Nemadactylus* spp. All morwong catch for 2010 was *Nemadactylus macropterus*.

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. All Australian flagged vessels fishing on the high seas are required to have a vessel monitoring system (VMS) to verify certain logbook information.

No changes to fisheries data collection or research activities were recorded in the fishery in 2011.

3.1 Logbooks

Since 2002, the permit conditions have included the requirement to record daily catch and effort data in logbooks on a set-by-set (or shot-by-shot) basis, including the location of fishing operations. AFMA distributes, collects and processes these logbooks. Fishers are also required to record discards and bycatch in the logbooks. Disposal of the catch is also monitored by AFMA through catch disposal records. The logbook and catch disposal record data have been submitted to the SPRFMO Interim Secretariat, in line with the SPRFMO data standards (adopted 28 January 2011).

3.2 Vessel Monitoring System

Vessel monitoring systems (VMS) have been required in all Australian Government – managed fisheries since 1 July 2007, including vessels fishing on the high seas. The AFMA VMS is based on Automatic Location Communicators (ALCs) with a built-in Global Positioning System (GPS) fitted to each vessel nominated against a Commonwealth fishing concession. These ALCs transmit data on vessel registration, date, time, vessel position, course and speed via Inmarsat communications satellites to a land earth station. The frequency and accuracy of the VMS position reports meet the SPRFMO data standards.

These data are transferred via a ‘virtual private network’ (VPN) internet link to the AFMA head office in Canberra. At AFMA, vessel tracks are displayed as plots on a digitised marine chart and can be automatically cross referenced against spatial rules. AFMA requires all vessels on the high seas vessels to comply with a stringent installation and maintenance standard for all ALC reporting.

3.3 Research

AFMA commissioned a bottom fishing impact assessment of Australian fishing activity in the SPRFMO area and this was submitted to SPRFMO SWG 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. A final report is expected to be released in late 2012. Preliminary results indicate 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 thereby 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. (2000, 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.

No research, apart from the biological sampling and length composition data collected by Australian observers, was conducted by Australia in the SPRFMO area in 2011.

Australia notified the Interim Secretariat of scientific research activities on the high seas between Australia and New Zealand between 5 May 2012 and 31 October 2012. This work was undertaken as part of the Australian Continuous Plankton Recorder Survey and conducted on the FV Rehua. Any available reports or results will be provided to the SWG in 2013.

4 Biological Sampling and Length/Age Composition of Catches

Length–frequency data were collected by Australian observers in the SPRFMO area in 2011 and submitted to the SPRFMO Secretariat on 26 September 2011.

5 Summary of Observer and Port Sampling Programs

5.1 Observer Program

Since 2010, Australian permit conditions for bottom fishing in the SPRFMO Area required 100 per cent observer coverage on all vessels permitted to use trawl gear. This was achieved for the three trips undertaken by the one Australian trawler active in the Area in 2011.

A minimum of 10 per cent observer coverage is the target for vessels using other demersal fishing methods. An observer monitored one trip of a non-trawl vessel in the SPRFMO Area in 2011, amounting to about 26 per cent observer coverage of all reported sets.

AFMA recruits and trains the observers. Approximately twenty observers are currently employed in the AFMA observer program. All observers have a strong scientific background or have a background in the fishing industry or other maritime industries and must demonstrate experience 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 and/or experience), 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 the requirements regarding observers in 2011.

Table 5 Summary of demersal trawl and demersal longline fishing effort, observer coverage and sampling in the SPRFMO Area in 2011

Logbook				Observer		
Gear	No. of trips	No. of tows/sets ^a	Reported catch (t)	No. of trips	No. of tows/sets ^b	No. of fish measured
Trawl	3	149	63	3	175	289
Longline	9	53	91	1	14	100

^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 be present due to delays in data being added to the database.

5.2 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. As noted above, these data have been submitted to the SPRFMO Interim Secretariat.

Appendix A. Taxa recorded in the SPRFMO Area, 2010.

Common Name	Scientific Name
Alfonsino	<i>Beryx splendens</i>
Black Oilfish	<i>Lepidocybium flavobrunneum</i>
Black Shark - (roughskin)	Centroscymnus spp
Blacktip sharks	<i>Carcharhinus</i> spp
Blue Eye Trevalla	<i>Hyperoglyphe antarctica</i>
Blue Grenadier	<i>Macruronus novaezelandiae</i>
Boarfish	Pentacerotidae
Cardinal Fish	Apogonidae
Dogfishes	Squalidae
Gemfish	<i>Rexea solandri</i>
Ghost shark	Chimaeridae
Gummy Shark	<i>Mustelus antarcticus</i>
Hapuku	<i>Polyprion oxygeneios</i>
Hapuku and Bass Groper-NSW	<i>Polyprion</i> spp
Hussar	<i>Lutjanus adetii</i>
Jackass Morwong	<i>Nemadactylus macropterus</i>
Mixed fish	Mixed fish
Northwest Ruby Fish	<i>Etelis carbunculus</i>
Ocean Perch	<i>Helicolenus Percoides</i>
Oilfish	<i>Ruvettus pretiosus</i>
Orange Roughy	<i>Hoplostethus atlanticus</i>
Oreo Dory - unspecified	<i>Oreosomatidae</i> spp
Pigfish	<i>Bodianus vulpinus</i>
Pink snapper	<i>Pagrus auratus</i>
Ray's Bream	<i>Brama brama</i>
Redfish	<i>Centroberyx affinis</i>
Ribaldo	<i>Mora moro</i>
Richardson's Boarfish /Southern	<i>Pseudopentaceros richardsoni</i>
Rosy Jobfish / King Snapper	<i>Pristipomoides filamentosus</i>
School Shark	<i>Galeorhinus galeus</i>
Southern Frostfish	<i>Lepidopus caudatus</i>
Splendid perch	<i>Caprodon longimanus</i>
Stargazer	Family Uranoscopidae
Striped Trumpeter	<i>Latris lineata</i>
Thresher Shark	<i>Alopias vulpinus</i>
Yellowtail Kingfish	<i>Seriola lalandi</i>

Source: Australian vessel logbook data

References

Australian Fisheries Management Authority (AFMA). 2011. High seas: conservation and management measures to prevent significant adverse impacts on vulnerable marine ecosystems. SPRFMO Paper SWG-10-DW-01b.

Clark, M.R.; Dunn, M.R.; Anderson, O.F. 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. Report to the Australian Fisheries Management Authority (AFMA). SPRFMO Paper SWG-10-DW-01a.

Davies, A.J. & Guinotte, J.M. 2011. Global Habitat Suitability for Framework-Forming Cold-Water Corals” PLoS ONE 6(4): e18483. doi:10.1371/journal.pone.0018483