

A Descriptive Analysis of New Zealand Bottom Trawl Catch & Effort in the Proposed Convention Area of the South Pacific Regional Fisheries Management Organization

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Introduction

Interim management and conservation measures adopted at the 3rd negotiation meeting of the South Pacific Regional Fisheries Management Organization (SPRFMO), held in Reñaca, Chile in May 2007, require all participants to limit bottom fishing effort or catch to average levels over the period 2002 - 2006, during the interim period Oct 2007 until 2010. Implementation of this measure therefore requires participants in bottom fisheries in the SPRFMO area to conduct analyses to determine average levels of catch and effort over the 2002-2006 period. This paper presents such analyses for New Zealand operated (flag, charter or joint-venture) high seas trawl fishing operations over the period concerned.

The interim measures further require participants to '*not expand bottom fishing activities into new regions of the Area where such fishing is not currently occurring*', and '*In respect of areas where vulnerable marine ecosystems are known to occur or are likely to occur based on the best available scientific information, close such areas to bottom fishing unless, ... , conservation and management measures have been established to prevent significant adverse impacts on vulnerable marine ecosystems and the long-term sustainability of deep sea fish stocks*'.

The interim measures do not give clear guidance on a number of important details relevant to implementation of the provisions related to limiting bottom fishing activities to within the '*current*' fishing area. For example, it is not clear whether the 2002 - 2006 reference period chosen for determining average past effort and catch also applies to the definition of current fishing area. Efforts to map current fishing areas also raise questions regarding what resolution to use for mapping of trawl footprints. This paper explores the implications of using various grid-block resolutions for trawl footprint mapping, using New Zealand high seas trawl data for the period 2002 to 2006. We also provide a brief overview of current scientific knowledge regarding the distribution of seamounts and vulnerable marine systems known to occur, or likely to occur, in the SPRFMO area, for comparison with the presented trawl footprint information.

Data Preparation & Summary

In terms of permits required by all New Zealand trawl fishing operations on the high seas, vessels are required to complete daily tow-by-tow high seas Total Catch & Effort Processing Return (TCEPR) or High Seas Trawl Catch Effort Return (HSTCER) forms. The data set used for this analysis was an extract of all high-seas trawl-fishing data (bottom- and midwater trawl) TCEPR and HSTCER data submitted by New Zealand operated vessels over the calendar years 2002 - 2006. These data were comprehensively groomed and corrected for apparent errors in factors such as tow start or end position (particularly east-west errors), tow durations and distances relative to tow positions, and catches relative to tow durations. The groomed data were imported into SPlus® for subsequent summary of catches by species, year, area and flag.

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Target Species and Species Contributions

A total of 137 species or species groups were reported on the extracted catch return forms. However, the top ten species (in terms of contribution to catch weight) contributed 96% of the total catch from all areas over 2002-2006 (see Table 1), and further analysis was restricted to these top ten species.

Table 1. Top ten species to the total New Zealand trawl catch in the SPRFMO area over 2002 - 2006.

Species Code	Scientific Name	Common Name	Total Catch (Kg)
ORH	<i>Hoplostethus atlanticus</i>	Orange roughy	12 026 124
BOE	<i>Allocyttus niger</i>	Black oreo	895 772
EPT	<i>Epigonus telescopus</i>	Deep sea cardinal	684 042
BYX	<i>Beryx splendens</i> and <i>B. decadactylus</i>	<i>B. splendens</i> Slender beryx <i>B. decadactylus</i> Longfinned beryx	430 979
SSO	<i>Pseudocyttus maculatus</i>	Smooth oreo	305 818
RIB	<i>Mora moro</i>	Ribaldo	291 100
RAT	<i>Macrouridae</i> .Family	Rattails	275 625
BSH	<i>Dalatias licha</i>	Seal shark	120 479
BOA	<i>Paristioporus labiosus</i>	Sowfish	84 784
SOR	<i>Neocyttus rhomboidalis</i>	Spiky oreo	79 828

Definition of Fishing Areas

Past New Zealand high-seas bottom trawling effort has been focussed on five distinct and separate fishing grounds shown in Figure 1 (Clark 2006). From experience with studies conducted within the New Zealand EEZ, these separate fishing grounds are likely to support separate stocks of species such as orange roughy. Catch summaries were therefore stratified by these fishing areas. The latitude / longitude boundaries for these fishing grounds as defined by Clark (2006) for New Zealand high-seas orange roughy catch analyses were adopted for analyses presented here:

South Tasman Rise (although no fishing was conducted here in 2002 - 2006)
46.0° S - 50.0° S and 145.0° E - 150.0° E

Lord Howe Rise
35.0° S - 36.75° S and 164.0° E - 167.0° E
and 32.5° S - 35.0° S and 162.0° E - 166.0° E

West Norfolk Ridge
32.5° S - 34.5° S and 166.5° E - 168.16667° E
(excluding tows within the New Zealand EEZ)

Northwest Challenger Plateau
36.83333° S - 39.5° S and 166.0° E - 170.0° E
(excluding tows within the New Zealand EEZ)

Louisville Ridge
North: 35.0° S - 39.9° S and 165.0° W - 172.0° W
Central: 40.0° S - 44.9° S and 157.0° W - 167.0° W
South: 45.0° S - 50.0° S and 148.0° W - 159.0° W

Other
Fishing in areas outside these areas, north of the West Norfolk and Lord Howe areas.

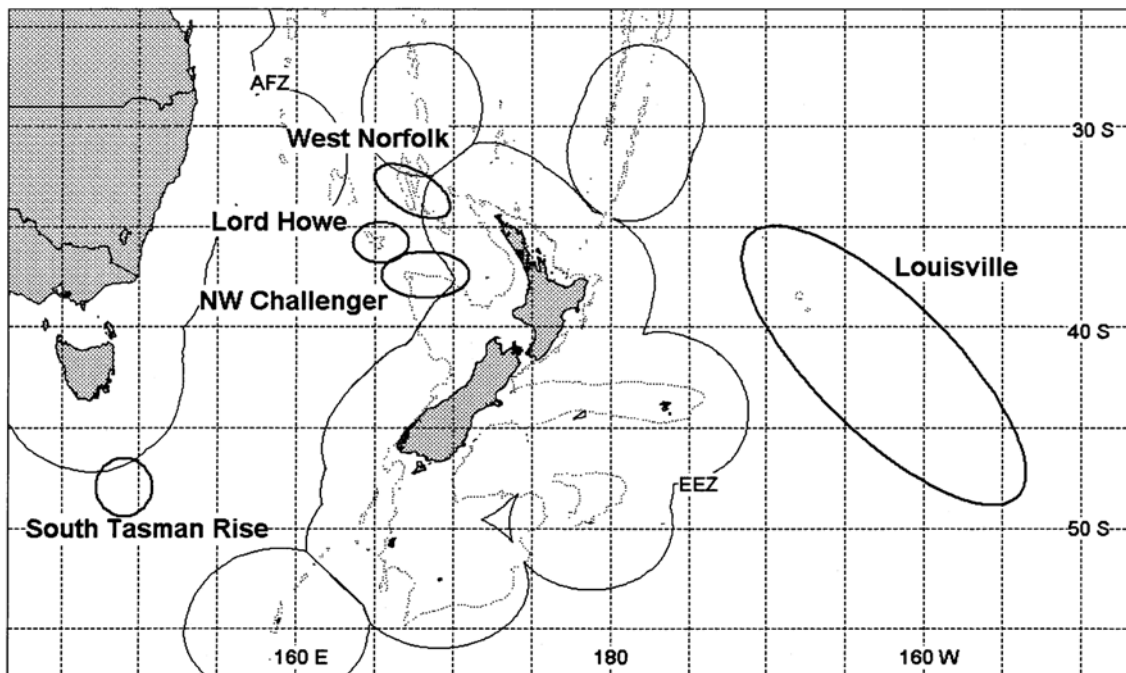


Figure 1. Map showing location of major fisheries for orange roughy outside New Zealand and Australian EEZs (1000m depth contour shown around New Zealand) (from Clark 2006).

The distribution of approximate trawl tow start positions of New Zealand high-seas trawling operations in the SPRMO area over 2002 - 2006 within these defined fishing areas is shown in Figure 2. In addition to summarising catches by these defined fishing areas, tabular data summaries were also generated by 5° x 5° block. Grid block codes and midpoint latitudes and longitudes used are summarised in Table 2.

Table 2. Block codes and midpoints used for 5° x 5° block definitions used in analyses in this paper.

Block Label	Midpoint Lat	Midpoint Lon	Block Label	Midpoint Lat	Midpoint Lon
47	-27.5	157.5	105	-37.5	187.5
55	-37.5	162.5	114	-42.5	192.5
56	-32.5	162.5	115	-37.5	192.5
65	-37.5	167.5	123	-47.5	197.5
66	-32.5	167.5	124	-42.5	197.5
75	-37.5	172.5	133	-47.5	202.5
76	-32.5	172.5	134	-42.5	202.5
77	-27.5	172.5	143	-47.5	207.5
87	-27.5	177.5	153	-47.5	212.5
97	-27.5	182.5	163	-47.5	217.5

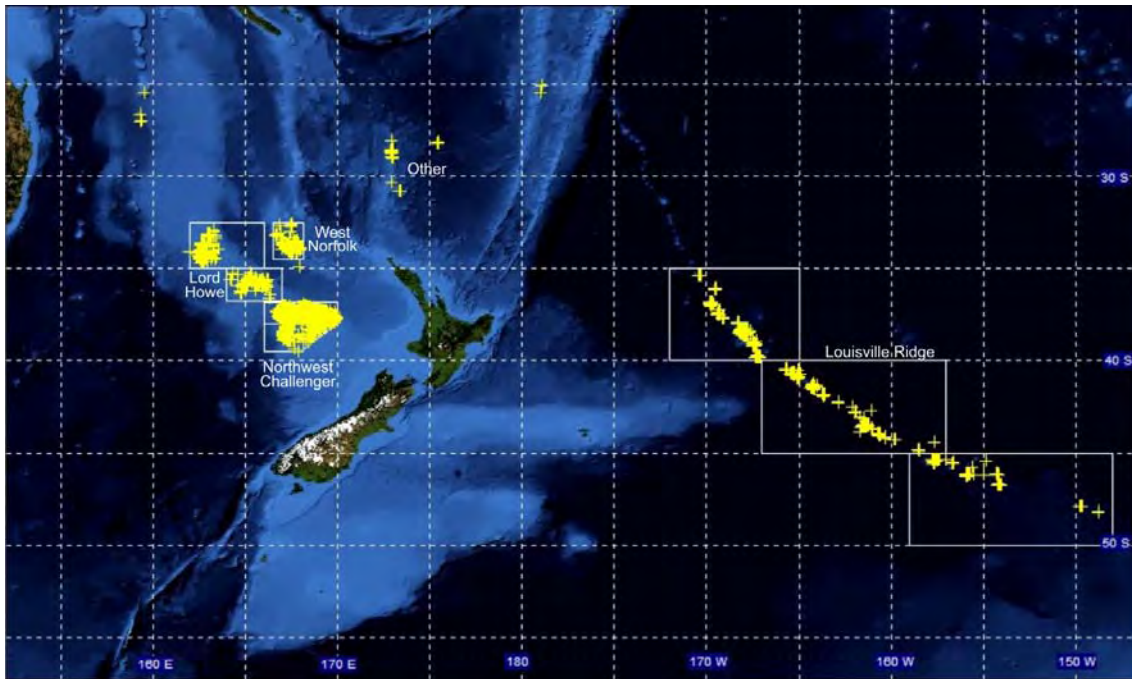


Figure 2. Map showing the distribution of approximate trawl tow start positions of New Zealand high-seas trawling operations in the SPRMO area over 2002 - 2006, within the defined fishing areas (from Clark 2006).

Catch and Effort Summaries

Table 3 shows a summary of the total reported trawling effort (number of vessels and number of tows), and catch of the top ten species, per year in all fishing areas. A total of 40 different New Zealand operated vessels have participated in this fishery over the period, making almost 14,000 tows and reporting almost 16,000 t of all species (retained) catch. The average annual effort (vessels and tows) and average annual catches of the top ten species in all areas are also shown for each year. Table 4 shows the total trawl effort (number of vessels and tows) and catches of the top ten species over the entire 2002 - 2006 period, reported by fishing area. Figure 3 shows the comparative magnitudes of catches of the top five species by fishing area.

The number of vessels participating in these fisheries per year has declined from 28 in 2002 to 15 in 2006. Orange roughy contributed 76% of the total reported catch, and was the declared target species on most trips. Other significant contributors to catches, and occasionally listed as target species, were deep sea cardinal fish, oreos (black, smooth and spiky oreo) and alphonsinos (slender and longfinned beryx). Together, these eight species contributed about 92% of the reported total catch. The orange roughy catch is summarised separately per area and year in Table 5. Average annual catches per area confirm the Louisville Ridge as the most important area for orange roughy overall. However, Figure 4 shows that there have been different trends in annual catch in the various areas.

Table 3. Summary of the total annual catch (kg) of the top ten species by New Zealand high-seas trawling operations in the SPRFMO area from 2002-2006.
(See Table 1 for explanation of species codes used.)

Year	No. Vessels	No. Tows	ORH	BOE	EPT	BYX	SSO	RIB	RAT	BSH	BOA	SOR	All Species
2002	28	3,524	3,118,555	126,924	159,128	17,801	51,088	49,981	61,497	36,863	0	17,723	3,740,728
2003	24	3,486	2,405,686	72,882	227,666	191,908	29,541	92,645	84,859	55,702	84,754	29,271	3,541,988
2004	22	2,746	2,170,043	102,158	87,458	167,684	120,293	48,323	34,786	7,968	0	13,592	2,839,485
2005	22	2,493	2,564,224	528,386	188,516	25,707	94,514	63,295	67,297	4,817	30	13,624	3,645,665
2006	15	1,413	1,679,745	61,902	21,245	27,850	9,582	36,358	27,181	15,099	0	4,477	1,929,591
Average	22	2,732	2,387,651	178,450	136,803	86,190	61,004	58,120	55,124	24,090	16,957	15,737	3,139,491

Table 4. Summary of the total annual catch (kg) of the top ten species by New Zealand high-seas trawling operations in the SPRFMO area from 2002-2006, by fishing area. (See Table 1 for explanation of species codes used.)

Fishing Area	No. Vessels	No. Tows	ORH	BOE	EPT	BYX	SSO	RIB	RAT	BSH	BOA	SOR	All Species
Challenger	31	6,509	3,646,987	6,301	395,986	57,487	880	251,639	272,358	114,178	30	49,549	5,098,966
West Norfolk	13	1,082	1,560,814	110	30,186	3,726	10	4,165	378	32		241	1,609,971
Lord Howe	19	1,490	863,602	1,516	253,021	344,683	1,268	19,246	1,161	1,474	30	14,045	1,597,313
Louisville	23	4,466	5,866,350	882,175	4,820	24,459	302,860	15,502	1,568	3,985		14,852	7,197,440
Other	10	115	500	2,150		595		50	155	780	84,724		193,767
Total	40	13,662	11,938,253	892,252	684,013	430,950	305,018	290,602	275,620	120,449	84,784	78,687	15,697,457
% Contribution to Total catch			76%	6%	4%	3%	2%	2%	2%	1%	1%	1%	

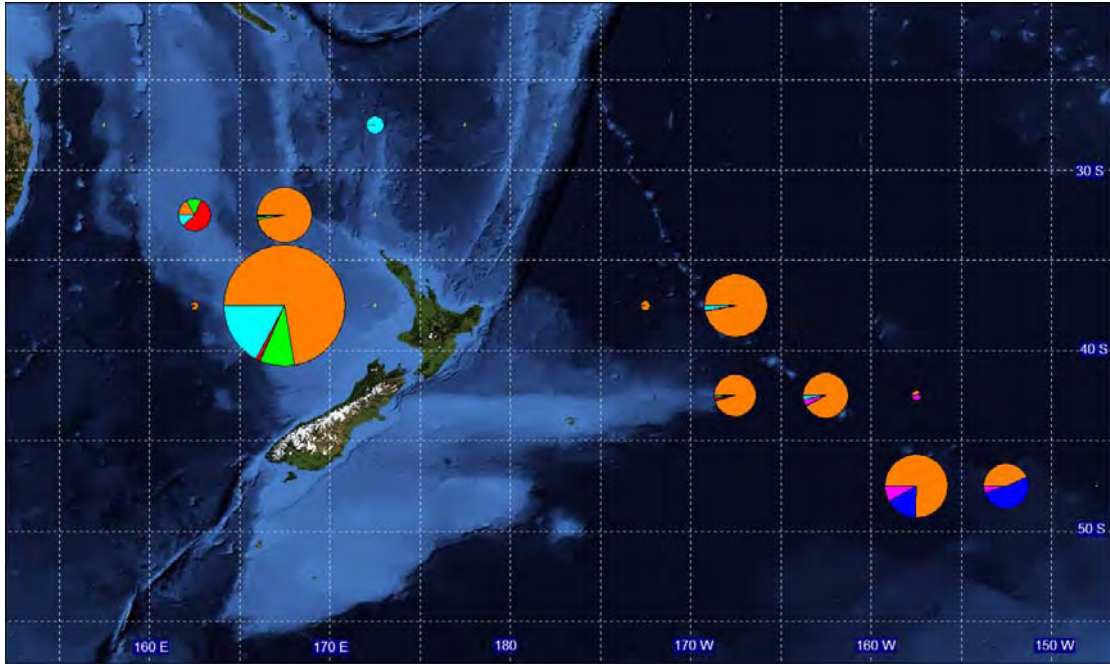


Figure 3. Catch by species by 5° grid block. ORH=orange, EPT=green, BOE=dark blue, SSO=purple, BYX=red, OTHER=light blue. Overall circle size is proportional to total catch, maximum = 6 100t.

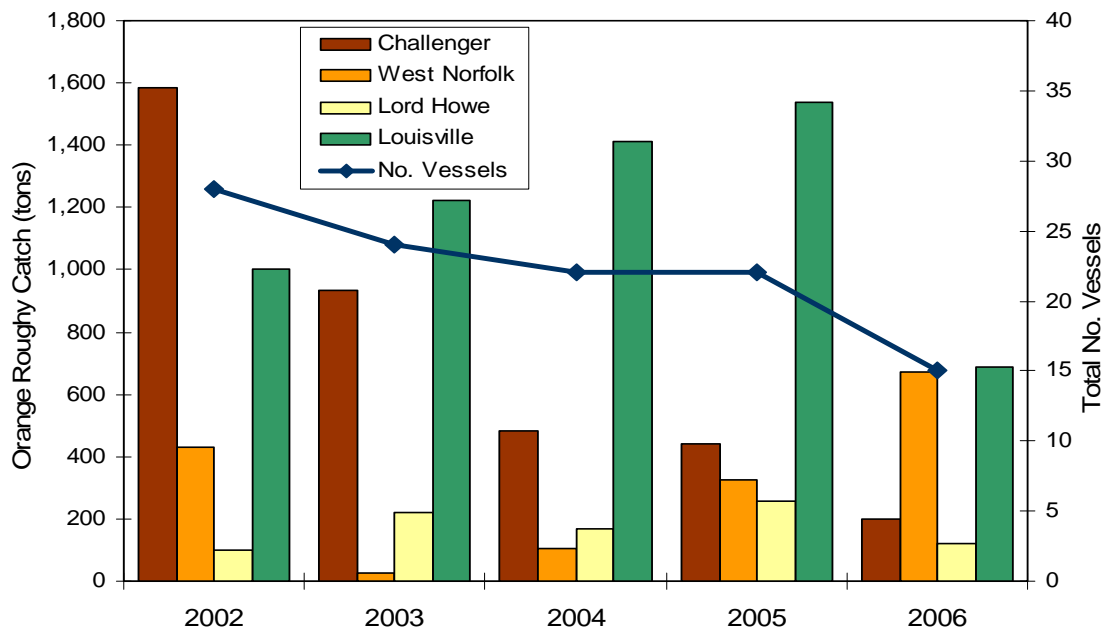


Figure 4. Summary showing trends in total reported effort (no. of vessels) and catch (kg) of orange roughy by New Zealand high-seas trawling operations in the four main fishing areas area from 2002-2006.

Table 5. Reported total catch (kg) of orange roughy by New Zealand high-seas trawling operations in the SPRFMO area from 2002-2006, by fishing area, and average annual catch over the period.

Year	Challenger	West Norfolk	Lord Howe	Louisville	Other Areas	All Areas
2002	1,584,640	431,937	97,634	1,004,294	50	3,118,555
2003	935,399	25,686	219,578	1,225,023	0	2,405,686
2004	483,707	106,156	168,435	1,411,745	0	2,170,043
2005	443,308	327,419	255,686	1,537,361	450	2,564,224
2006	199,933	669,616	122,269	687,927		1,679,745
Average	729,397	312,163	172,720	1,173,270	125	2,387,651

Over the 2002 - 2006 period, the most important area has been the Louisville Ridge, contributing 46% of the total reported catch of orange roughy, followed by the NW Challenger Plateau, contributing 32% of the catch. However, the Challenger area was the most important fishing area in 2002, providing over half of the catch in that year. In fact, the Challenger area was the most important fishing area prior to this as well (Clark 1998, 2000, 2004, 2006), but there has been a steady and substantial decline in orange roughy catches in the Challenger area over the period, with catches in 2006 being only 13% of the 2002 catch. In contrast, catches on the Louisville Ridge (taken as a whole) have remained well above 1,000 t per year in all but 2006.

This does not reflect what happened in all areas of the Louisville Ridge. Catches on the northern Louisville Ridge (the first, and originally the main part of this area to be fished) have also declined to half of what they were in 2002. However, this decline has been offset by increases in effort and catch in the central, and subsequently the southern portions of the Ridge, with the southern area now being the main contributor to catches from the Louisville Ridge.

Additional summaries of these data are provided in Tables 7 to 10 in Appendix A. Tables 7a) - 7e) show total annual effort and catch of the top ten species by year for the various fishing areas, by all vessels. While all of these vessels have been operating under New Zealand companies, and reporting their data to New Zealand, not all the vessels were New Zealand flagged. Overall, 79% of the total catch over 2002 - 2006 was made by New Zealand flagged vessels, but 7% each was made under Korean and Cook Islands flags, and 3% each under Australian and Ukraine flags, under various charter or joint-venture arrangements. Tables 8a) - 8e) show the breakdown of effort and catch of the top ten species over the 2002-2006 period under the various flags, in each fishing area. Tables 9a) to 9e) then show annual effort and catch for the top ten species by New Zealand flag vessels only, by 5° block within each fishing areas. Tables 10a) - 10e) show comparative summaries of annual effort and catch for the top ten species by non-New Zealand flag vessels by 5° block within each fishing area.

Trawl Footprint Mapping

The interim measure requirement to ensure that fishing effort must not expand beyond 'current' fishing areas implies that participants need to map the distribution of their current, or recent, fishing effort. The interim measures do not provide a definition of 'current', and it is not clear if the 2002 - 2006 reference period for determining recent average catch and effort should also apply to mapping of trawl footprints. However, for the purposes of this paper, the reference period of 2002 - 2006 has also been used for mapping of the trawl footprint of New Zealand vessels.

A more difficult question is: what geo-spatial resolution to use for mapping effort footprints? The interim measures provide no definition or guidance on this either. The problem is that trawl track positions are neither precisely reported, nor are the reported positions precisely indicative of the

actual seabed area impacted by trawls. There are many factors contributing to this lack of precision:

- New Zealand vessels only report trawl positions to the nearest minute, which is only approximately to the nearest 2.5km angular distance.
- Only start and end points of trawls are reported, but it is known that actual trawl tracks are not straight lines between these points, particularly when depth contours are being followed, or acoustic targets being tracked.
- At the depths fished, even precisely reported ship's positions are not necessarily accurate indicators of the position of the net in relation to the track of the ship.

As a consequence it is not actually feasible for vessels to accurately trawl exactly the same track as trawled previously, notwithstanding the substantial improvements in navigational equipment over the past decade. It is misleading to try and plot trawl footprints at resolutions more accurate than 2.5km, or more, given that actual trawl tracks are not straight lines between reported start and end points.

In fact, analyses conducted by O'Driscoll & Clark (2005) show that vessels do not repeat their trawl tracks when fishing seamount features typically targeted in these deepwater trawl fisheries. Figure 5 (from O'Driscoll & Clark 2005) shows the distribution of trawl directions and distances around four seamounts in the New Zealand zone. Although there are some directional preferences on certain seamounts (related to the topography of the seamount concerned), such as shown on Mt Kiso, vessels may conduct radial trawls on seamounts from almost any direction, as shown by the distribution of trawl directions on the Colville Knoll, Tolaga Knoll and Goomzy seamount.

For all these reasons, it is therefore problematic to interpret trawl footprints as actual trawl tracks. Some approach to map trawl footprints as some buffered area around trawl tracks is required. The most practical and logical is to map footprints as grid blocks over the trawl tracks, at some chosen resolution. However, there are substantial differences in the estimates of 'impacted' area using different grid resolutions, with coarser resolutions including increasing areas of un-trawled ground around the actual tracks.

The effect of grid cell size was investigated by using GIS software to generate grid blocks over trawl tracks at resolutions of 10 minutes and 1 degree, with any grid block being defined as 'fished' when crossed by a single trawl track. The full area of each grid cell is used in calculating the total area of the footprint, irrespective of the location and number of trawls in the cell. For this simple comparative analysis, approximate areas per fished grid block were calculated for each block using the formula:

$$1 \text{ min Block Area (m}^2\text{)} = \cos(\text{Latitude}) \times (1852\text{m} \wedge 2)$$

and midpoint latitudes for the West Norfolk (34° S), Lord Howe (35° S), Challenger (38° S) and Louisville Ridge (41° S) areas.

For comparison, GIS software was also used to generate an actual merged buffer around all of the trawl tracks in the Challenger Plateau area, using a buffer radius of 200m on either side of the trawl tracks, to represent a more 'accurate' estimate of actual area impacted by the assumed trawl tracks. The results are summarised in Table 6.

Table 6. Estimated footprint based on 1° and 10' spatial resolution for the 4 main high seas fishing areas fished by New Zealand operated vessels from 2002 - 2006. For comparison, the estimated area of actual trawl track areas using a 200m buffer around tracks is shown for the Challenger area.

Fishing Area	Grid Size	No. of Blocks Fished	Area of Fished Blocks (km ²)
Northwest Challenger	200m buffer	-	14,480
	10 min	177	47,790
	1 deg	10	97,300
Lord Howe	10 min	102	28,662
	1 deg	11	111,265
West Norfolk	10 min	44	12,496
	1 deg	5	51,185
Louisville Ridge	10 min	128	33,152
	1 deg	26	242,294

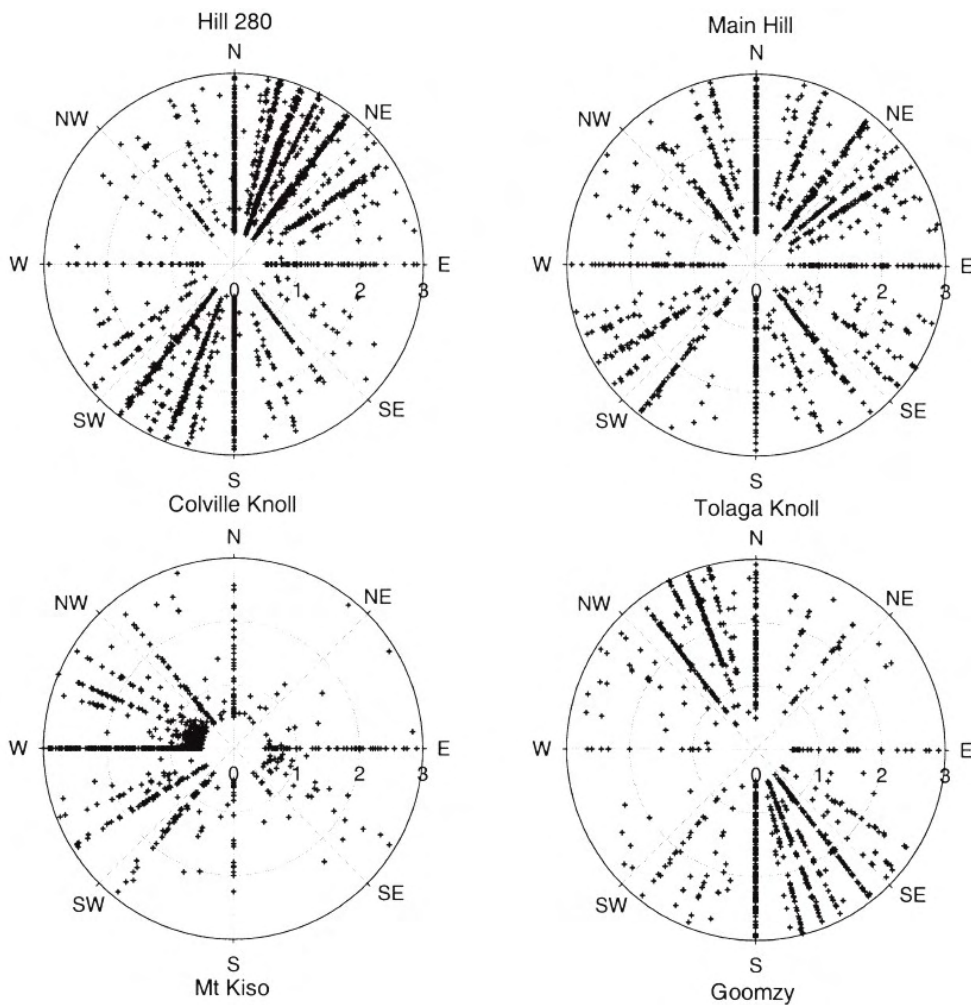


Fig. 5 Scatter plots showing the length (in nautical miles) and direction of tows on four New Zealand seamounts. Each point represents a single tow (from O'Driscoll & Clark 2005).

The distribution of approximate trawl tow start positions in the Lord Howe, West Norfolk and Challenger areas are shown against a 1° grid in Figure 6.

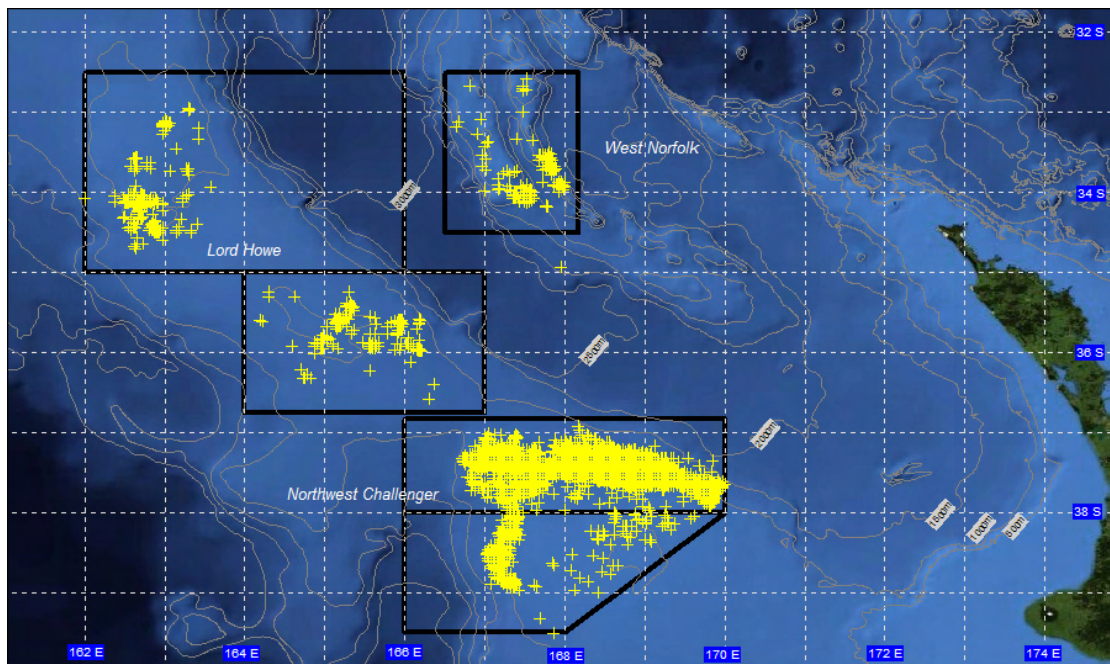


Figure 6. Trawl positions in the mid-Tasman Sea fisheries, against a 1° grid.

The distribution of ‘impacted’ grid blocks assuming a 10’ grid resolution is shown in Figure 7 for the Lord Howe and West Norfolk areas, and in Figure 8 for the Challenger area. The effect of adopting a grid size of 10’ can be gauged by comparing the blocks in Figures 7 and 8 with the tow start positions in Figure 6. The effect of moving to coarser resolutions of 20’ or 1° may be gauged by visualizing shaded blocks incorporating, respectively, 4 or 36 of the 10’ blocks. The actual effect on calculated areas is shown in Table 6 for 10’ and 1° resolutions.

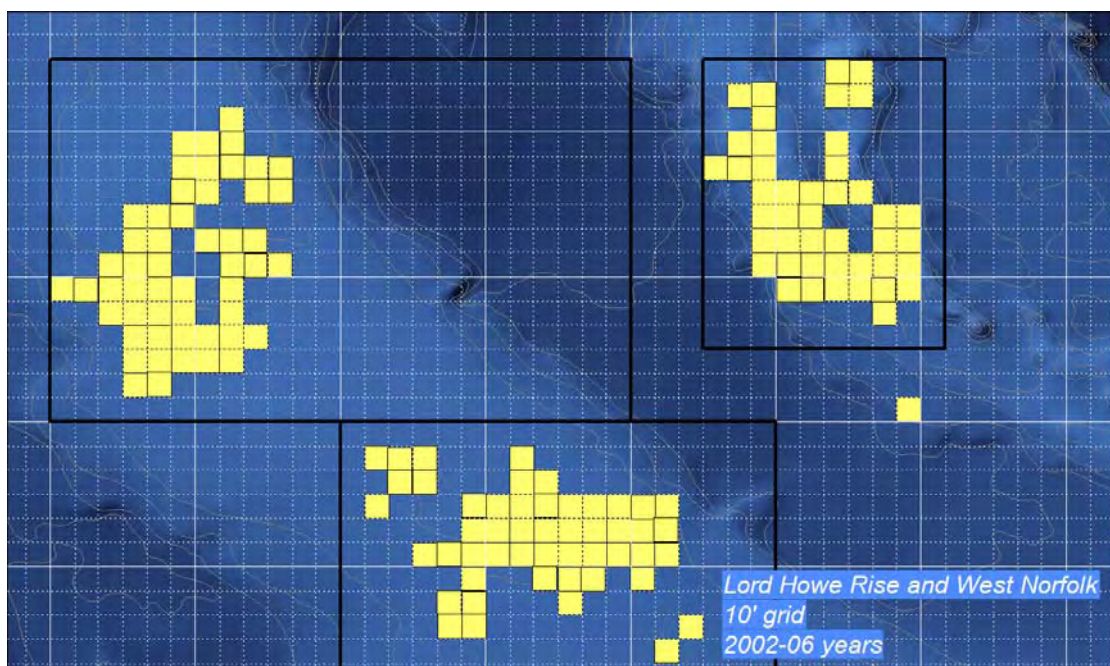


Figure 7. Trawl “footprint” from the Lord Howe and West Norfolk Fishing Areas, using a 10’ grid.

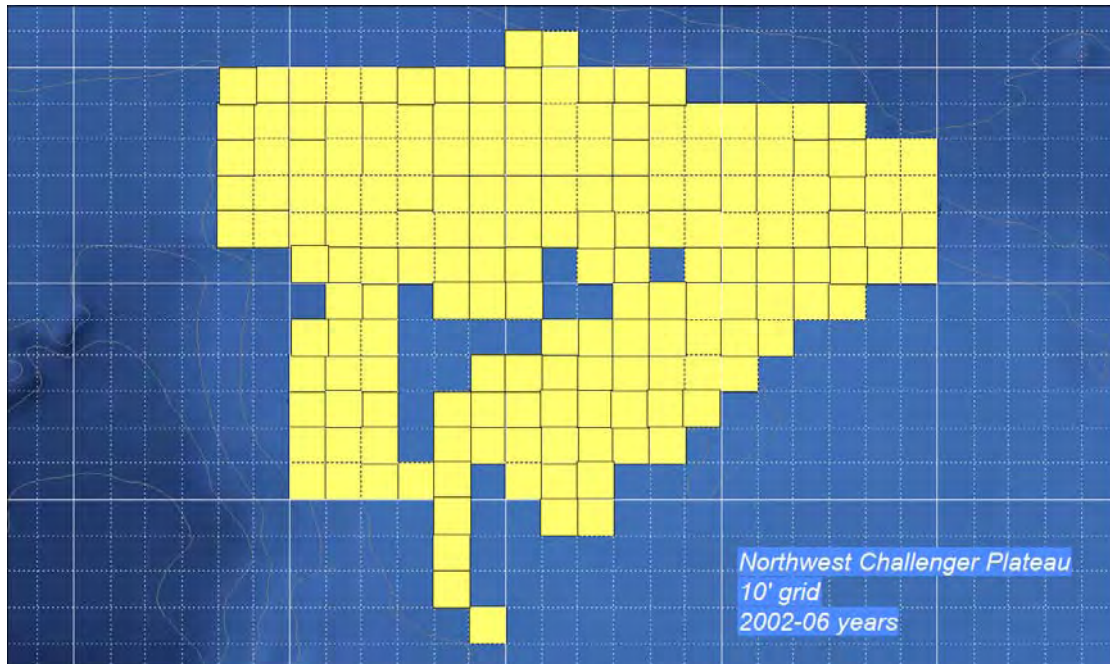


Figure 8. Trawl “footprint” from the Northwest Challenger Fishing Area using a 10’ grid

The distribution of approximate trawl tow start positions along the Louisville Ridge is shown in Figure 9 against a 1° grid. The distribution of ‘impacted’ grid blocks assuming a 10’ grid resolution is shown in Figures 10 to 12 for the Northern, Central and Southern Louisville areas respectively.

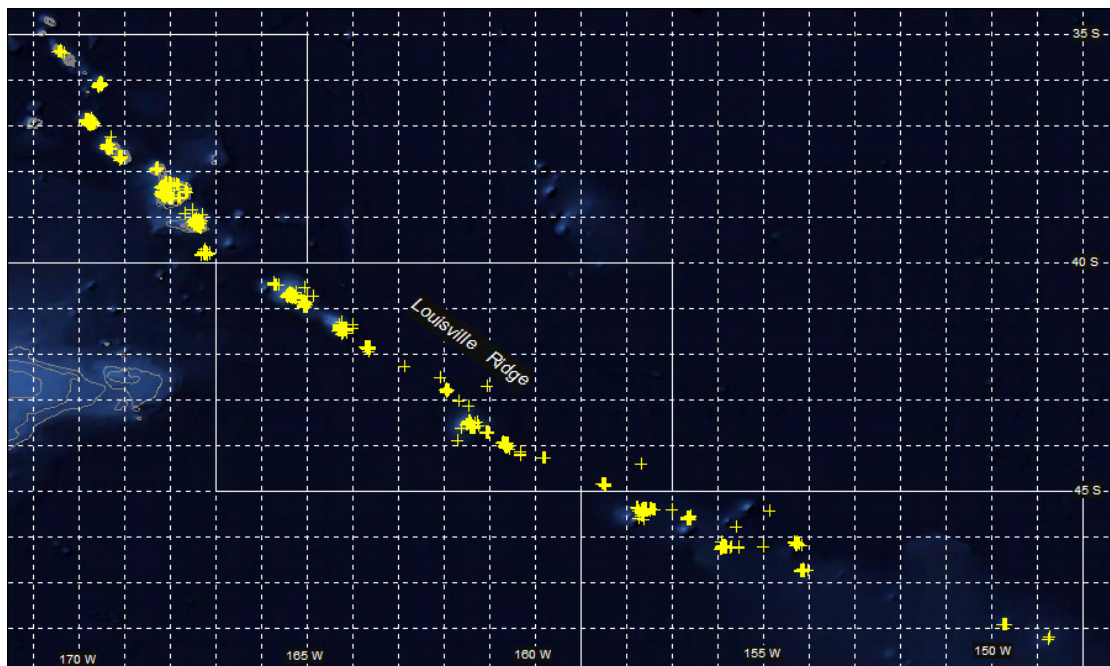


Figure 9. Trawl locations from tows east of New Zealand on the Louisville Ridge against a 1° grid.

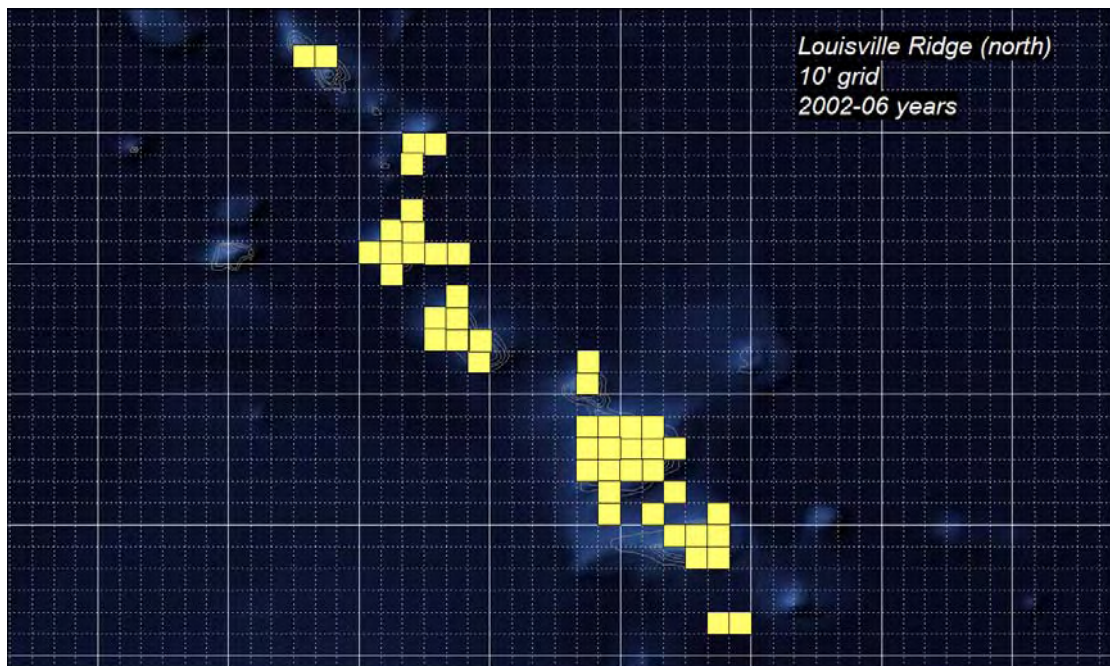


Figure 10. Trawl “footprint” from the Northern Louisville Ridge Fishing Area, using a 10’ grid.

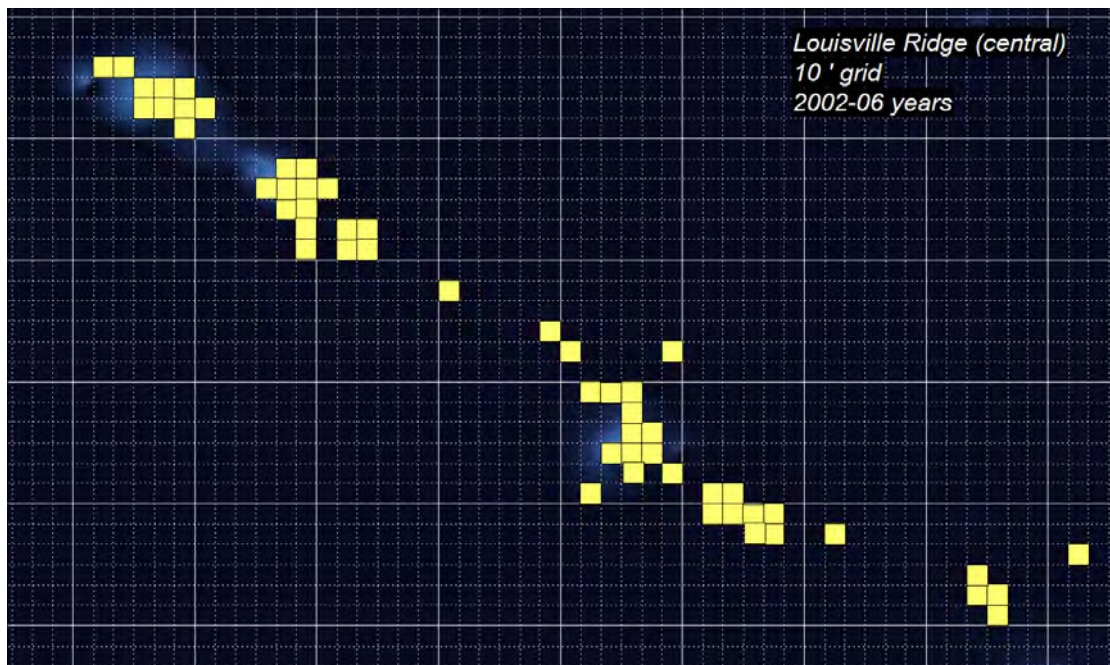


Figure 11. Trawl “footprint” from the Central Louisville Ridge Fishing Area, using a 10’ grid.

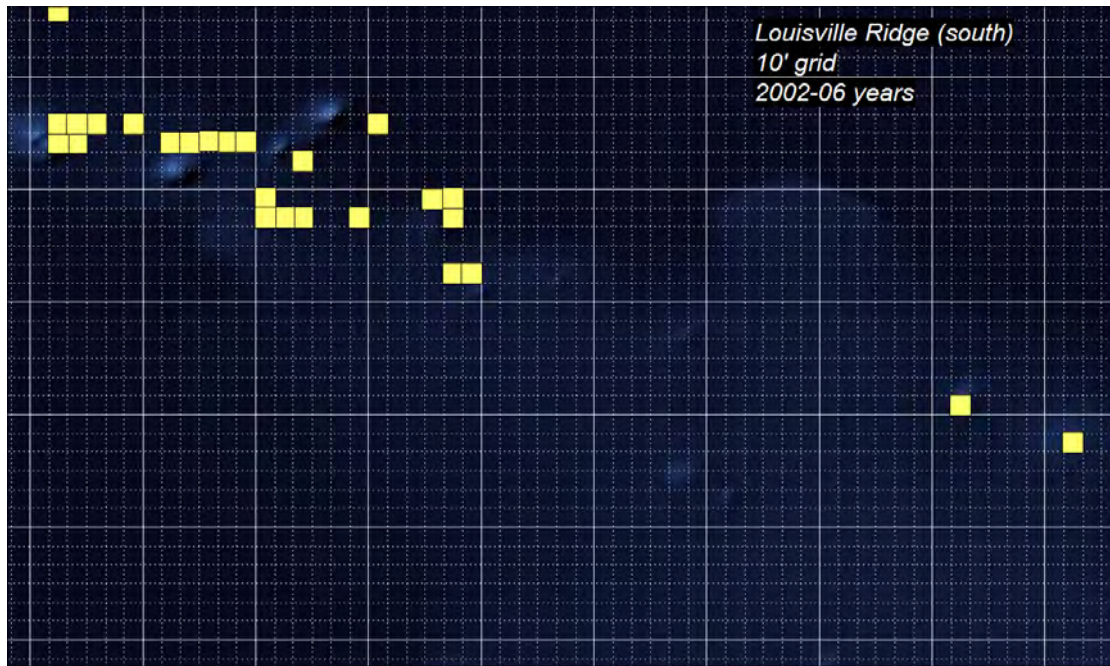


Figure 12. Trawl “footprint” from the Southern Louisville Ridge Fishing Area, using a 10’ grid.

The magnitude of the effect of adopting increasingly coarser grid resolutions to map trawl footprints is related to the density of original trawl tracks, and the over-estimation of ‘impacted’ area increases substantially for lightly trawled areas. Using the area estimates in Table 6, for the densely trawled Challenger area, the estimate of impacted area using a 1° grid resolution is double that estimated using a 10’ grid. In comparison, the estimate of impacted area on the lightly trawled Louisville Ridge area at 1° grid resolution is more than seven times greater than at a resolution of 10’. However, even using a relatively fine grid size of 10’ provides an estimate of impacted area on the Challenger Plateau that is three times that estimated using a 200m radius buffer around the actual trawl tracks.

Identification and Mapping of Seamounts & VMEs

The SPRFMO interim measures expressly require participants to “*Cooperate to identify, on the basis of the best available scientific information, vulnerable marine ecosystems in the Area and to map sites where these ecosystems are located*”. For any proposed future bottom fishing operations in the period during which the interim measures apply, participants are specifically required to identify areas where vulnerable marine ecosystems (VMEs) are known or likely to occur, and to not fish in those areas, unless “*based on an assessment ..., conservation and management measures have been established to prevent significant adverse impacts on vulnerable marine ecosystems*”. In addition to developing maps of recent bottom fishing footprints, maps of the known or predicted distribution of vulnerable marine ecosystems (VMEs) in proposed fishing areas will be required to meet these interim measures.

For the deepwater fisheries under consideration, most fishing is conducted on seabed topographic features, particularly seamounts, ridges and knolls. These seabed features also typically support VMEs, including the habitat-forming cold-water corals and sponge fields specifically mentioned in the UN General Resolution 61/105, calling for protection of such systems, and which provides the basis for the SPRFMO interim measures.

Scientific research to define, characterise and map these seabed features, and to ascertain to what extent various seamount features do support VME communities, has accelerated rapidly over the past few years. Kitchingman & Lai (2004) generated the first comprehensive global map of predicted seamounts using satellite altimetry data. This analysis identified 14,290 predicted seamounts in total, of which 4,330 occur in the South Pacific from 120°E to South America (see Figure 13). Clark *et al* (2006) (the UNEP CenSeam Report) compared these predicted seamount positions with a number of environmental variables at the predicted seamount positions, and with information on environmental and habitat requirements of particular VME species, such as cold water corals, to develop indices of habitat suitability, and to predict the distribution of seamounts estimated to have suitable habitat for stony corals based on ENFA analysis of global coral data. From the potential set of seamounts shown in Figure 13, Figure 14 shows the distribution of the resulting 1,600 seamounts considered to have a habitat suitability 50% or greater for stony corals total, 560 of which occur in the South Pacific.

Maps such as these will need to be developed, and steadily improved over time as information on distribution of deepwater benthic species improves, to provide a basis from which to evaluate whether proposed bottom fishing operations are likely to impact upon VMEs.

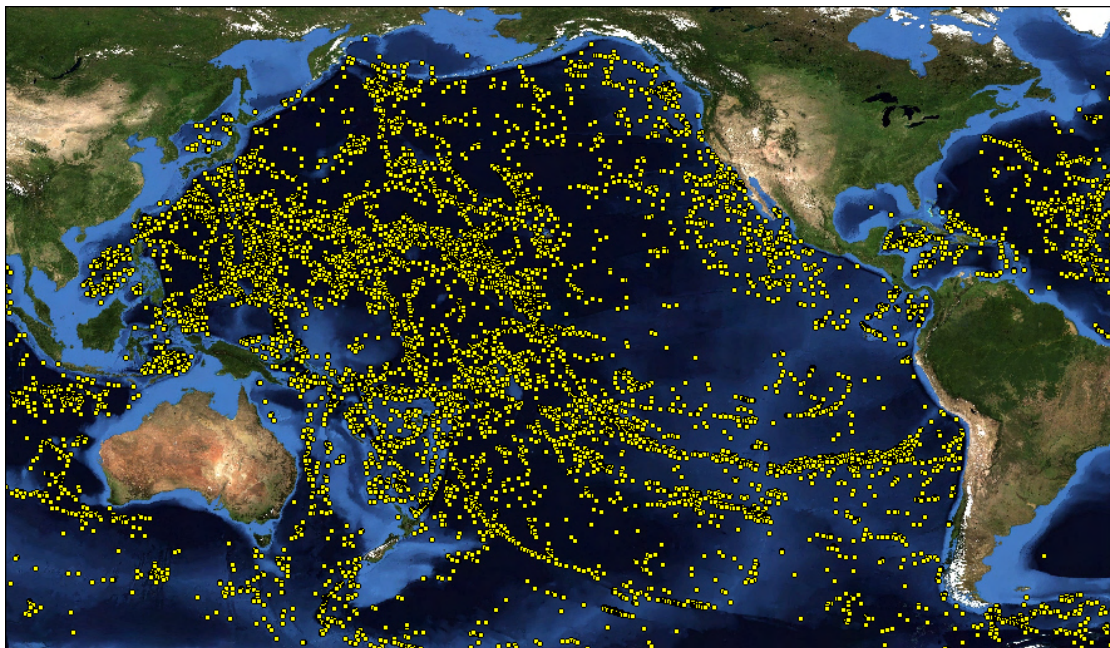


Figure 12. Distribution of potential seamounts predicted by satellite altimetry analyses (from Kitchingman & Lai 2004). This technique is thought able to detect seamount features with an elevation of 1500m or greater.

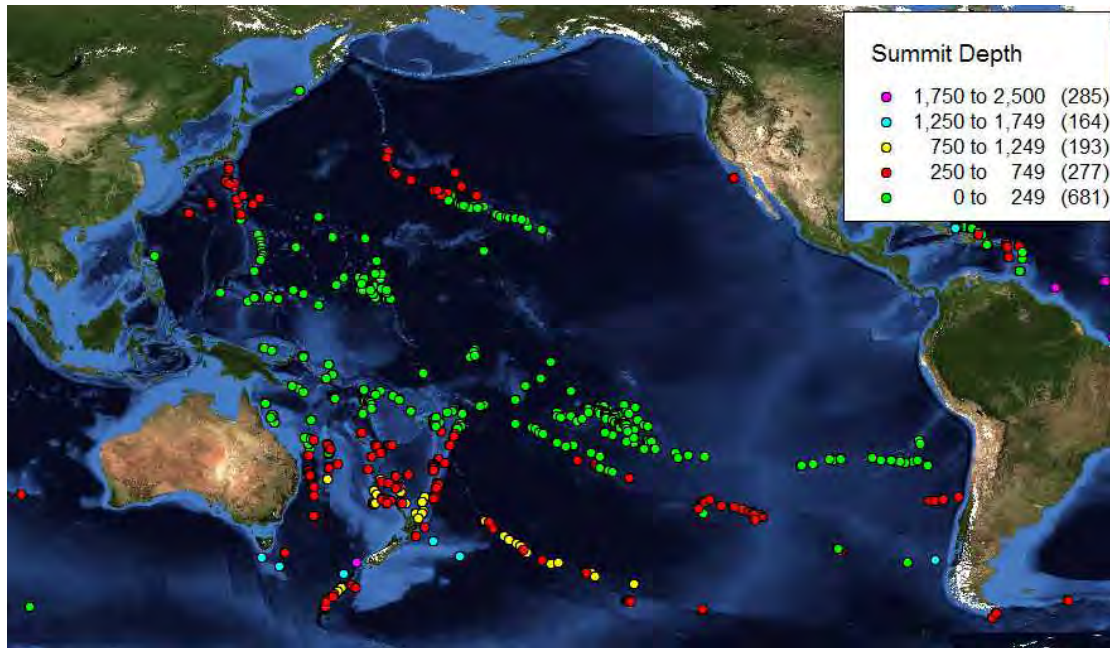


Figure 13. Distribution of seamounts estimated to have suitable habitat for stony corals based on ENFA analysis of global coral data (CenSeam UNEP report). Seamount data set from Figure 12 is used, with those plotted having habitat suitability 50% or greater. Estimated summit depths of the seamounts are colour coded (see legend).

Acknowledgements

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Appendix A

**Table 7: Number of vessels and tows, and catch by 10 top species by year, for all flag vessels in the fishing area.
(See Table 1 for explanation of species codes used throughout this appendix.)**

7a: Challenger.

Year	Number of		Catch (Kg)										Total
	Vessels	Tows	ORH	SSO	BOE	SOR	BYX	EPT	RIB	BSH	BOA	RAT	
2002	23	2147	1 584 640	745	1 537	12 602	13 565	111 597	33 168	35 632	0	61 360	1 938 674
2003	21	2070	935 399	107	2 692	23 466	30 171	205 066	90 053	54 108	30	84 364	1 521 294
2004	15	849	483 707	0	1 776	3 403	2 805	41 537	39 002	7 419	0	33 810	653 053
2005	17	1036	443 308	28	221	9 826	10 086	37 698	59 408	2 916	0	66 541	689 175
2006	8	407	199 933	0	75	252	860	88	30 008	14 103	0	26 283	296 770
Total	31	6509	3 646 987	880	6 301	49 549	57 487	395 986	251 639	114 178	30	272 358	5 098 966

7b: Norfolk.

Year	Number of		Catch (Kg)										Total
	Vessels	Tows	ORH	SSO	BOE	SOR	BYX	EPT	RIB	BSH	BOA	RAT	
2002	3	296	431 937	0	0	90	110	493	299	0	0	0	436 741
2003	6	88	25 686	0	0	0	6	396	190	0	0	35	27 343
2004	2	110	106 156	0	0	0	15	304	504	0	0	0	107 940
2005	6	323	327 419	0	110	130	2 305	14 911	1 432	20	0	25	348 320
2006	6	265	669 616	10	0	21	1 290	14 082	1 740	12	0	318	689 627
Total	13	1 082	1 560 814	10	110	241	3 726	30 186	4 165	32	0	378	1 609 971

7c: Lord Howe.

Year	Number of		Catch (Kg)										Total
	Vessels	Tows	ORH	SSO	BOE	SOR	BYX	EPT	RIB	BSH	BOA	RAT	
2002	10	182	97 634	25	1 476	2 513	3 071	46 988	8 493	700	0	62	162 390
2003	12	466	219 578	2	0	3 013	140 266	21 404	1 700	724	0	155	425 376
2004	9	447	168 335	40	0	5 167	162 598	41 717	6 558	50	0	201	420 896
2005	12	256	255 686	1 201	40	2 281	13 143	135 837	1 530	0	30	562	418 668
2006	6	138	122 269	0	0	1 071	25 605	7 075	965	0	0	181	169 883
Total	19	1 489	863 502	1 268	1 516	14 045	344 683	253 021	19 246	1 474	30	1 161	1 597 213

7d: Louisville.

Year	Number of		Catch (Kg)										
	Vessels	Tows	ORH	SSO	BOE	SOR	BYX	EPT	RIB	BSH	BOA	RAT	Total
2002	15	885	1 004 294	50 318	123 761	2 518	755	50	7 971	501	0	10	1 201 212
2003	12	773	1 225 023	29 432	70 190	2 792	21 320	800	702	120	0	305	1 379 674
2004	12	1 330	1 411 745	120 253	100 382	5 022	2 116	3 900	2 259	499	0	775	1 656 281
2005	9	875	1 537 361	93 285	526 015	1 387	173	70	925	1 881	0	79	2 186 962
2006	6	603	687 927	9 572	61 827	3 133	95	0	3 645	984	0	399	773 311
Total	23	4 466	5 866 350	302 860	882 175	14 852	24 459	4 820	15 502	3 985	0	1 568	7 197 440

7e: Other.

Year	Number of		Catch (Kg)										
	Vessels	Tows	ORH	SSO	BOE	SOR	BYX	EPT	RIB	BSH	BOA	RAT	Total
2002	4	14	50	0	150	0	300	0	50	30	0	65	1 711
2003	4	88	0	0	0	0	145	0	0	750	8 4724	0	188 301
2004	1	10	0	0	0	0	150	0	0	0	0	0	1 215
2005	2	3	450	0	2 000	0	0	0	0	0	0	90	2 540
2006	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	9	115	500	0	2 150	0	595	0	50	780	84 724	155	193 767

Table 8: Number of vessels and tows, and catch by 10 top species for all years by vessel flag in the fishing area for the period 2002–2006. Note: – is no fishing and 0 is a zero catch for that cell.

8a: Challenger.

Flag	Number of		Catch (Kg)										Total
	Vessels	Tows	ORH	SSO	BOE	SOR	BYX	EPT	RIB	BSH	BOA	RAT	
NZ	29	6 236	3 298 057	880	6 169	48 065	54 795	394 996	250 574	114 178	30	272 153	4 740 335
Australia	2	245	343 130	0	0	1 385	2 406	420	1 065	0	0	0	350 396
Cook Isl	1	25	5 700	0	132	99	286	570	0	0	0	205	8 235
Korea	-	-	-	-	-	-	-	-	-	-	-	-	-
Ukraine	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	31	6 506	3 646 887	880	6301	49 549	57 487	395 986	251 639	114 178	30	272 358	5 098 866

8b: West Norfolk.

Flag	Number of		Catch (Kg)										Total
	Vessels	Tows	ORH	SSO	BOE	SOR	BYX	EPT	RIB	BSH	BOA	RAT	
NZ	11	1 075	1 560 184	10	110	241	3 726	30 186	4 165	32	0	378	1 609 341
Australia	1	5	630	0	0	0	0	0	0	0	0	0	630
Cook Isl	1	2	0	0	0	0	0	0	0	0	0	0	0
Korea	-	-	-	-	-	-	-	-	-	-	-	-	-
Ukraine	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	13	1 082	1 560 814	10	110	241	3 726	30 186	4 165	32	0	378	1 609 971

8c: Lord Howe.

Flag	Number of		Catch (Kg)										Total
	Vessels	Tows	ORH	SSO	BOE	SOR	BYX	EPT	RIB	BSH	BOA	RAT	
NZ	17	1 144	664 512	1 268	1 516	13 945	188 256	212 169	18 221	1 474	30	1161	1 168 566
Australia	2	50	192 290	0	0	100	410	0	0	0	0	0	193 120
Cook Isl	1	296	6 700	0	0	0	156 017	40 852	1 025	0	0	0	235 527
Korea	-	-	-	-	-	-	-	-	-	-	-	-	-
Ukraine	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	19	1 490	863 502	1 268	1 516	14 045	344 683	253 021	19 246	1 474	30	1 161	1 597 213

8d: Louisville.

Flag	Number of		Catch (Kg)										
	Vessels	Tows	ORH	SSO	BOE	SOR	BYX	EPT	RIB	BSH	BOA	RAT	Total
NZ	17	2 561	3 728 048	249 492	586 421	14 822	2 193	170	3 251	3 985	0	651	4 631 839
Australia	-	-	-	-	-	-	-	-	-	-	-	-	-
Cook Isl	2	250	839 810	29 395	12 190	0	0	0	40	0	0	0	881 495
Korea	3	1 083	871 487	6 603	232 774	30	1 086	50	11 041	0	0	867	1 152 561
Ukraine	1	573	427 005	17 370	50 790	0	21 180	4 600	1 170	0	0	50	531 545
Total	23	4 453	5 866 355	302 860	882 175	14 822	24 459	4 820	15 502	3 985	0	1 568	7 197 440

8e: Other.

Flag	Number of		Catch (Kg)										
	Vessels	Tows	ORH	SSO	BOE	SOR	BYX	EPT	RIB	BSH	BOA	RAT	Total
NZ	7	114	695	0	150	0	595	0	50	780	84 724	155	193 119
Australia	-	-	-	-	-	-	-	-	-	-	-	-	-
Cook Isl	2	20	0	0	2 000	0	0	0	0	0	0	0	11 288
Korea	-	-	-	-	-	-	-	-	-	-	-	-	-
Ukraine	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	9	115	695	0	150	0	595	0	50	780	84 724	155	204 407

Table 9a: Number of vessels and tows, and catch by 10 top species for the calendar years 2002–2006, “NZ” flag vessels and 5 degree blocks in the fishing area "Challenger".

Calendar Year	5 degree area	Number of		Catch (Kg)										
		Vessels	Tows	ORH	SSO	BOE	SOR	BYX	EPT	RIB	BSH	BOA	RAT	Total
2002	65	22	2 060	1 459 198	745	1 537	11 217	13 315	111 597	32 373	35 632	0	61 360	1 810 802
2003	65	18	1 959	868 011	107	2 560	23 367	28 229	204 486	89 783	54 108	30	84 159	1 448 745
2004	65	14	782	346 737	0	1 776	3 403	2 305	41 127	39 002	7 419	0	33 810	513 873
2005	65	16	1 031	424 278	28	221	9 826	10 086	37 698	59 408	2 916	0	66 541	670 145
2006	65	8	407	199 933	0	75	252	860	88	30 008	14 103	0	26 283	296 770

Table 9b: Number of vessels and tows, and catch by 10 top species for the calendar years 2002–2006, “NZ” flag vessels and 5 degree blocks in the fishing area "West Norfolk".

Calendar Year	5 degree area	Number of		Catch (Kg)										
		Vessels	Tows	ORH	SSO	BOE	SOR	BYX	EPT	RIB	BSH	BOA	RAT	Total
2002	66	3	296	431 937	0	0	90	110	493	299	0	0	0	436 741
2003	66	4	83	25 056	0	0	0	0	396	190	0	0	35	26 713
2004	66	2	110	106 156	0	0	0	15	304	504	0	0	0	107 940
2005	66	6	323	327 419	0	110	130	2 305	14 911	1 432	20	0	25	348 320
2006	66	5	263	669 616	10	0	21	1 290	14 082	1 740	12	0	318	689 627

Table 9c: Number of vessels and tows, and catch by 10 top species for the calendar years 2002–2006, “NZ” flag vessels and 5 degree blocks in the fishing area "Lord Howe". Note: – is no fishing and 0 is a zero catch for that cell.

Calendar Year	5 degree area	Number of		Catch (Kg)										Total
		Vessels	Tows	ORH	SSO	BOE	SOR	BYX	EPT	RIB	BSH	BOA	RAT	
2002	55	6	52	32 597	0	0	96	328	230	1 326	327	0	29	34 998
	56	2	3	0	0	0	0	0	0	0	0	0	0	0
	65	9	123	63 527	25	1 476	2 317	2 743	46 758	7 167	373	0	33	125 782
	66	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total	9	178	96 124	25	1 476	2 413	3 071	46 988	8 493	700	0	62	160 780
2003	55	2	9	1 070	0	0	0	0	0	10	260	0	0	1 340
	56	4	113	11 034	0	0	0	57 785	1 524	20	0	0	0	79 385
	65	7	270	205 474	2	0	3 013	7 881	19 880	1 670	464	0	155	249 647
	66	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total	9	392	217 578	2	0	3 013	65 666	21 404	1 700	724	0	155	330 372
2004	55	3	9	7 050	0	0	0	0	0	0	0	0	0	8 450
	56	4	96	14 780	0	0	75	80 720	750	20	0	0	150	115 965
	65	7	106	110 255	40	0	5 092	51	115	5 513	50	0	51	123 678
	66	1	1	0	0	0	0	0	0	0	0	0	0	0
	Total	7	211	132 085	40	0	5 167	80 771	865	5 533	50	0	201	248 093
2005	55	3	3	1 010	0	0	0	0	0	2	0	0	0	1 024
	56	6	93	61 930	0	0	0	12 796	55 004	328	0	30	60	134 969
	65	10	149	126 716	1201	40	2 281	347	80 833	1 200	0	0	502	216 645
	66	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total	11	245	189 656	1201	40	2 281	13 143	135 837	1 530	0	30	562	352 638
2006	55	2	3	150	0	0	0	0	0	0	0	0	0	150
	56	1	64	50	0	0	0	25 375	360	195	0	0	100	36 070
	65	4	51	28 969	0	0	1 071	230	6 715	770	0	0	81	40 563
	66	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total	5	118	29 169	0	0	1 071	25 605	7 075	965	0	0	181	76 783

Table 9d: Number of vessels and tows, and catch by 10 top species for the calendar years 2002–2006, “NZ” flag vessels and 5 degree blocks in the fishing area "Louisville". Note: – is no fishing and 0 is a zero catch for that cell.

Calendar Year	5 degree area	Number of		Catch (Kg)										Total
		Vessels	Tows	ORH	SSO	BOE	SOR	BYX	EPT	RIB	BSH	BOA	RAT	
2002	105	4	23	15 205	0	0	0	0	0	60	10	0	0	15 405
	114	5	33	85 881	1 000	0	857	30	0	270	60	0	10	88 180
	115	10	208	86 664	1 413	402	1 491	105	0	686	331	0	0	96 040
	124	7	57	212 582	2 695	45	170	0	0	340	0	0	0	216 128
	133	2	16	7 365	6 110	10	0	0	0	0	100	0	0	13 585
	134	2	7	12 600	13 200	2 025	0	0	0	25	0	0	0	27 850
	143	3	48	170 085	24 900	115 200	0	0	0	0	0	0	0	310 925
	153	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total	11	392	590 382	49 318	117 682	2 518	135	0	1 381	501	0	10	768 111
2003	105	3	14	9 910	0	0	0	0	0	0	0	0	0	9 910
	114	4	23	37 180	0	0	70	0	0	0	0	0	0	37 265
	115	5	247	429 597	13	10	51	210	0	92	120	0	0	431 908
	124	5	77	48 636	209	10	41	0	0	10	0	0	0	48 906
	133	6	22	152 610	21 500	52 410	2 600	0	0	0	0	0	0	229 120
	134	2	7	7 050	3 560	6 000	0	0	0	0	0	0	0	16 910
	143	6	25	98 700	0	1 400	0	0	0	0	0	0	0	100 100
	153	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total	9	415	783 683	25 282	59 830	2 762	210	0	102	120	0	0	874 119
2004	105	3	61	40 245	0	0	0	0	0	0	82	0	33	40 370
	114	3	90	196 160	30	0	995	30	0	40	0	0	0	198 010
	115	6	360	246 827	110	1 000	3 890	1 765	100	480	217	0	0	257 566
	124	3	97	233 600	11 870	552	127	0	0	358	0	0	205	248 522
	133	4	164	305 960	46 070	64 260	10	0	0	0	200	0	135	417 340
	134	1	6	1 700	30 700	400	0	0	0	0	0	0	0	32 800
	143	3	40	87 003	805	20 470	0	0	0	0	0	0	15	108 978
	153	1	2	10	1 510	1 250	0	0	0	0	0	0	0	2 770
	Total	8	820	1 111 505	91 095	87 932	5 022	1 795	100	878	499	0	388	1 306 356

Table 9d: continued.

Calendar Year	5 degree area	Number of		Catch (Kg)										
		Vessels	Tows	ORH	SSO	BOE	SOR	BYX	EPT	RIB	BSH	BOA	RAT	Total
2005	105	1	2	230	0	0	0	0	0	0	0	0	0	230
	114	3	106	113 560	0	0	670	0	0	220	1191	0	3	115 788
	115	4	127	154 821	20	0	510	18	70	295	670	0	7	156 633
	124	4	126	139 143	20 730	20	192	5	0	20	20	0	47	182 116
	133	4	184	274 685	41 665	163 390	15	0	0	0	0	0	22	480 152
	134	1	6	155	420	30	0	0	0	0	0	0	0	605
	143	2	63	45 947	14 830	100 325	0	0	0	0	0	0	0	161 308
	153	1	4	0	220	120	0	0	0	0	0	0	0	340
	Total	6	593	728 576	77 885	263 885	1 387	23	70	535	1 881	0	79	1 097 172
2006	105	-	-	-	-	-	-	-	-	-	-	-	-	-
	114	3	64	89 810	30	65	915	20	0	10	225	0	0	92 265
	115	4	87	134 543	15	0	1 332	10	0	130	130	0	64	138 526
	124	2	20	3 980	520	0	140	0	0	215	170	0	70	5 250
	133	2	135	280 278	4 247	22 288	666	0	0	0	459	0	40	308 585
	134	1	2	10	0	0	80	0	0	0	0	0	0	100
	143	2	33	5 316	1 100	34 739	0	0	0	0	0	0	0	41 355
	153	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total	4	341	513 937	5 912	57 092	1 333	30	0	355	984	0	174	586 081

Table 9e: Number of vessels and tows, and catch by 10 top species for the calendar years 2002–2006, “NZ” flag vessels and 5 degree blocks in the fishing area "Other". Note: – is no fishing and 0 is a zero catch for that cell.

Calendar Year	5 degree area	Number of		Catch (Kg)											
		Vessels	Tows	ORH	SSO	BOE	SOR	BYX	EPT	RIB	BSH	BOA	RAT	Total	
2002	47	1	4	0	0	0	0	0	0	0	0	0	0	0	0
	55	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	65	1	1	50	0	0	0	0	0	0	50	0	0	0	525
	66	1	2	0	0	150	0	300	0	0	0	0	0	0	700
	75	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	76	1	5	0	0	0	0	0	0	0	0	30	0	5	386
	77	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	87	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	97	1	2	0	0	0	0	0	0	0	0	0	0	60	100
	114	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	123	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total	4	14	50	0	150	0	300	0	50	30	0	65	1 711	
2003	47	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	55	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	65	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	66	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	75	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	76	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	77	3	71	0	0	0	0	145	0	0	750	84 724	-	179 063	
	87	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	114	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	123	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total	3	71	0	0	0	0	145	0	0	750	84 724	-	179 063	
2004	47	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	55	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	65	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	66	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	75	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	76	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	77	1	1	0	0	0	0	0	0	0	0	0	0	0	160

Table 9e: continued.

Calendar Year	5 degree area	Number of		Catch (Kg)										
		Vessels	Tows	ORH	SSO	BOE	SOR	BYX	EPT	RIB	BSH	BOA	RAT	Total
2004	87	1	9	0	0	0	0	150	0	0	0	0	0	1 055
	97	-	-	-	-	-	-	-	-	-	-	-	-	-
	114	-	-	-	-	-	-	-	-	-	-	-	-	-
	123	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total	1	10	0	0	0	0	150	0	0	0	0	0	1 215
2005	47	-	-	-	-	-	-	-	-	-	-	-	-	-
	55	-	-	-	-	-	-	-	-	-	-	-	-	-
	65	-	-	-	-	-	-	-	-	-	-	-	-	-
	66	-	-	-	-	-	-	-	-	-	-	-	-	-
	75	1	1	450	0	0	0	0	0	0	0	0	90	540
	76	-	-	-	-	-	-	-	-	-	-	-	-	-
	77	-	-	-	-	-	-	-	-	-	-	-	-	-
	87	-	-	-	-	-	-	-	-	-	-	-	-	-
	97	-	-	-	-	-	-	-	-	-	-	-	-	-
	114	-	-	-	-	-	-	-	-	-	-	-	-	-
	123	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total	1	1	450	0	0	0	0	0	0	0	0	90	540
2006	47	-	-	-	-	-	-	-	-	-	-	-	-	-
	55	0	0	0	0	0	0	0	0	0	0	0	0	0
	65	-	-	-	-	-	-	-	-	-	-	-	-	-
	66	-	-	-	-	-	-	-	-	-	-	-	-	-
	75	-	-	-	-	-	-	-	-	-	-	-	-	-
	76	-	-	-	-	-	-	-	-	-	-	-	-	-
	77	-	-	-	-	-	-	-	-	-	-	-	-	-
	87	-	-	-	-	-	-	-	-	-	-	-	-	-
	97	-	-	-	-	-	-	-	-	-	-	-	-	-
	114	-	-	-	-	-	-	-	-	-	-	-	-	-
123	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Total	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 10a: Number of vessels and tows, and catch by 10 top species for the calendar years 2002–2006, “non-NZ” flag vessels and 5 degree blocks in the fishing area "Challenger". Note: – is no fishing and 0 is a zero catch for that cell.

Calendar Year	5 degree area	Number of		Catch (Kg)										
		Vessels	Tows	ORH	SSO	BOE	SOR	BYX	EPT	RIB	BSH	BOA	RAT	Total
2002	65	1	87	125 442	0	0	1385	250	0	795	0	0	0	127 872
2003	65	3	111	67 388	0	132	99	1942	580	270	0	0	205	72 549
2004	65	1	67	136 970	0	0	0	500	410	0	0	0	0	139 180
2005	65	1	5	19 030	0	0	0	0	0	0	0	0	0	19 030
2006	65	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 10b: Number of vessels and tows, and catch by 10 top species for the calendar years 2002–2006, “non-NZ” flag vessels and 5 degree blocks in the fishing area "West Norfolk". Note: – is no fishing and 0 is a zero catch for that cell.

Calendar Year	5 degree area	Number of		Catch (Kg)										
		Vessels	Tows	ORH	SSO	BOE	SOR	BYX	EPT	RIB	BSH	BOA	RAT	Total
2002	66	-	-	-	-	-	-	-	-	-	-	-	-	-
2003	66	2	5	630	0	0	0	0	0	0	0	0	0	630
2004	66	-	-	-	-	-	-	-	-	-	-	-	-	-
2005	66	-	-	-	-	-	-	-	-	-	-	-	-	-
2006	66	1	2	0	0	0	0	0	0	0	0	0	0	0

Table 10c: Number of vessels and tows, and catch by 10 top species for the calendar years 2002–2006, “non-NZ” flag vessels and 5 degree blocks in the fishing area "Lord Howe". Note: – is no fishing and 0 is a zero catch for that cell.

Calendar Year	5 degree area	Number of		Catch (Kg)										Total	
		Vessels	Tows	ORH	SSO	BOE	SOR	BYX	EPT	RIB	BSH	BOA	RAT		
2002	55	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	56	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	65	1	4	1 510	0	0	100	0	0	0	0	0	0	0	1 600
	66	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total	1	4	1 510	0	0	100	0	0	0	0	0	0	0	1 600
2003	55	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	56	1	72	0	0	0	0	74 600	0	0	0	0	0	0	93 004
	65	2	2	2 000	0	0	0	0	0	0	0	0	0	0	2 000
	66	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total	3	74	2 000	0	0	0	74 600	0	0	0	0	0	0	95 004
2004	55	1	1	3 000	0	0	0	0	0	0	0	0	0	0	3 000
	56	1	223	6 700	0	0	0	81 417	40 852	1 025	0	0	0	0	142 523
	65	1	12	26 650	0	0	0	410	0	0	0	0	0	0	27 380
	66	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total	2	236	36 350	0	0	0	81 827	40 852	1 025	0	0	0	0	172 903
2005	55	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	56	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	65	1	11	66 030	0	0	0	0	0	0	0	0	0	0	66 030
	66	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total	1	11	66 030	0	0	0	0	0	0	0	0	0	0	66 030
2006	55	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	56	1	2	2 000	0	0	0	0	0	0	0	0	0	0	2 000
	65	1	18	91 100	0	0	0	0	0	0	0	0	0	0	91 100
	66	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total	1	20	93 100	0	0	0	0	0	0	0	0	0	0	93 100

Table 10d: Number of vessels and tows, and catch by 10 top species for the calendar years 2002–2006, “non-NZ” flag vessels and 5 degree blocks in the fishing area "Louisville". Note: – is no fishing and 0 is a zero catch for that cell.

Calendar Year	5 degree area	Number of		Catch (Kg)										Total	
		Vessels	Tows	ORH	SSO	BOE	SOR	BYX	EPT	RIB	BSH	BOA	RAT		
2002	105	3	4	0	0	0	0	0	0	0	0	0	0	0	20
	114	2	5	450	0	40	0	20	0	0	0	0	0	0	640
	115	4	404	381 552	0	2 019	0	500	0	1 030	0	0	0	0	388 851
	124	3	80	31 910	1 000	4 020	0	100	50	5 560	0	0	0	0	43 590
	133	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	134	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	143	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	153	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total		4	493	413 912	1 000	6 079	0	620	50	6590	0	0	0	433 161
2003	105	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	114	2	143	230 090	200	1670	30	20100	0	60	0	0	135	257820	
	115	2	151	178 020	0	2220	0	1010	800	130	0	0	150	202690	
	124	3	43	27 480	750	1170	0	0	0	410	0	0	20	30565	
	133	2	15	5 750	3000	350	0	0	0	0	0	0	0	9280	
	134	1	2	0	0	0	0	0	0	0	0	0	0	0	
	143	1	4	0	200	4950	0	0	0	0	0	0	0	5200	
	153	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total		3	358	441 340	4150	10360	30	21110	800	600	0	0	305	505555	
2004	105	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	114	4	111	51 090	3 520	760	0	25	3 800	311	0	0	216	60 596	
	115	4	238	147 745	73	450	0	214	0	1 023	0	0	133	150 669	
	124	4	68	27 685	3 130	50	0	82	0	47	0	0	38	31 315	
	133	1	72	61 040	21 185	4 720	0	0	0	0	0	0	0	86 945	
	134	1	8	12 080	0	0	0	0	0	0	0	0	0	12 080	
	143	1	7	400	1 250	6 000	0	0	0	0	0	0	0	7 650	
	153	1	6	200	0	470	0	0	0	0	0	0	0	670	
Total		4	510	300 240	29 158	12 450	0	321	3 800	1 381	0	0	387	349 925	

Table 10d: continued.

Calendar Year	5 degree area	Number of		Catch (Kg)										
		Vessels	Tows	ORH	SSO	BOE	SOR	BYX	EPT	RIB	BSH	BOA	RAT	Total
2005	105	-	-	-	-	-	-	-	-	-	-	-	-	-
	114	3	52	80 040	30	180	0	100	0	20	0	0	0	81 070
	115	3	64	91 060	0	300	0	50	0	50	0	0	0	92 220
	124	3	73	210 110	5 210	600	0	0	0	320	0	0	0	217 300
	133	3	43	374 610	5 900	7 100	0	0	0	0	0	0	0	387 850
	134	1	1	0	0	0	0	0	0	0	0	0	0	0
	143	3	49	53 000	4 260	253 950	0	0	0	0	0	0	0	311 350
	153	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total	3	282	808 820	15 400	262 130	0	150	0	390	0	0	0	1 089 790
2006	105	-	-	-	-	-	-	-	-	-	-	-	-	-
	114	2	71	66 950	60	1 465	0	65	0	1 660	0	0	65	70 538
	115	2	86	29 740	50	50	0	0	0	1 345	0	0	85	31 671
	124	2	80	70 800	660	360	0	0	0	285	0	0	57	72 592
	133	2	19	2 500	1 940	1 460	0	0	0	0	0	0	15	6 041
	134	2	3	4 000	150	0	0	0	0	0	0	0	3	4 188
	143	1	3	0	800	1 400	0	0	0	0	0	0	0	2 200
	153	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total	2	262	173 990	3 660	4 735	0	65	0	3 290	0	0	225	187 243

Table 10e: Number of vessels and tows, and catch by 10 top species for the calendar years 2002–2006, “non-NZ” flag vessels and 5 degree blocks in the fishing area "Other". Note: – is no fishing and 0 is a zero catch for that cell.

Calendar Year	5 degree area	Number of		Catch (Kg)										Total	
		Vessels	Tows	ORH	SSO	BOE	SOR	BYX	EPT	RIB	BSH	BOA	RAT		
2002	65	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	76	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	77	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	87	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	163	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2003	65	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	76	1	1	0	0	0	0	0	0	0	0	0	0	0	0
	77	1	15	0	0	0	0	0	0	0	0	0	0	0	9 238
	87	1	1	0	0	0	0	0	0	0	0	0	0	0	0
	163	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total	1	17	0	0	0	0	0	0	0	0	0	0	0	9 238
2004	65	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	76	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	77	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	87	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	163	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2005	65	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	76	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	77	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	87	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	163	1	2	0	0	2 000	0	0	0	0	0	0	0	0	2 000
	Total	1	2	0	0	2 000	0	0	0	0	0	0	0	2 000	
2006	65	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	76	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	77	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	87	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	163	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-