NEW ZEALAND FISHERIES FOR NON-HIGHLY MIGRATORY FISH IN THE INDICATIVE ORGANISATION AREA OF THE PROPOSED SOUTH PACIFIC REGIONAL FISHERIES MANAGEMENT ORGANIZATION: 1990 – 2006

New Zealand Ministry of Fisheries

Working Paper presented to the Data and Information Working Group meeting, the Science Working Group meeting and the Third International Meeting on the Establishment of a South Pacific Regional Fisheries Management Organisation

Reñaca, Chile, 23 April – 4 May 2007

CONTENTS

INTRODUCTION

This report provides:

- Meta-data describing catch/effort data available for New Zealand vessels targeting various non-HMS species on the high seas in the indicative area of the proposed South Pacific Regional Fisheries Management Organisation (SPRFMO);
- Detail of the data extract undertaken to complete this report;
- A brief description of the regulatory measures applied to New Zealand vessels on the high seas;
- A brief summary of New Zealand fishing activity in the indicative area of the proposed SPRFMO; and
- A summary of catch and effort of New Zealand vessels on the high seas in the indicative area of the proposed SPRFMO.

Purpose

1) To provide the data New Zealand agreed it would make available at the Second International Meeting on the Establishment of a South Pacific Regional Fisheries Management Organisation;

2) To indicate the full nature and extent of data available from New Zealand describing its high seas fishing activity; and

3) To update the catch information already provided to this process in existing species profiles with new 2006 data.

Species Coverage

This report covers all non-HMS species targeted by New Zealand vessels. The definition used for non-HMS is all species not listed in Annex I of the 1982 UN LOSC. Note that some HMS species may appear in the data extract as by-catch taken incidental to non-HMS fishing activity.

Spatial Coverage

This report covers the indicative area for the proposed SPRFMO (see Figure 1) with the additional constraint that only fishing events south of the equator and on the high seas[1] are included in the report:

[1] A check has been carried out to ensure that records of fishing inside New Zealand's exclusive economic zone have been excluded, but a similar check was not carried out to exclude records of fishing inside other States EEZs. It is possible that a small number of records for fishing by NZ vessels inside other States EEZs may have been included.

- The eastern boundary is the western external edge of the EEZs of South American countries;
- The western boundary is the eastern external edge of the SIOFA area;
- The southern boundary is the northern external edge of the CCAMLR area; and
- The northern boundary is the equator.

This area is a combination of FAO areas 57, 81 and 87. This summary excludes data from within New Zealand's Exclusive Economic Zone (EEZ).

Additional finer scale reporting areas are in common use for certain fisheries (e.g. orange roughy) and data for those fisheries are reported elsewhere (the orange roughy species profile at www.southpacificrfmo.org/working-groups/public/current-work/, Clark 2004) and the scale of those areas are described in Figure 2.

Temporal Coverage

Data are presented for the period 1990 to 2006 inclusive. These are the data that were available within New Zealand's current "Catch Effort" database.

New Zealand has a separate database which documents the fishing that occurred in the 1980's, but this database was not checked for the purposes of compiling this report.

Gear Types

The majority of the reported catch/effort data relates to high-seas non-HMS catch taken by vessels using trawl gear (midwater and bottom trawl). A consistent and substantial minority of the data relates to demersal line fishing gear (bottom longlines, drop lines, trot lines). A small amount of the data relates to hand-lining, baited pots, fish traps and gillnets.

DATA EXTRACT

The full data extract detailed below, and used as a basis for the tables in this report is available at http://www.southpacificrfmo.org/working-groups/data-and-information-working-group/catch-effort-data-submissions/ as a pdf file. The Chairman of the SPRFMO negotiations and the Convenor of the Data and Information Working Group also hold copies of an Excel file version.

The meta data for the data used in this report are:

- The Ministry has prepared this report on the basis of information provided to it in returns provided by fishers;

- This data was compiled in the week starting Monday 9th April 2007, using data from the NZ Ministry of Fisheries Commercial Catch and Effort database;
- This data is provisional and has only undergone the Ministry's routine data grooming;
- A major initiative occurred in 2000 and 2001 to improve the processing of the Ministry's commercial fishing data. Data post 2001 is expected to be of a significantly higher quality than data pre 2000;
- To identify possible highs seas fishing events of interest the catch effort database was searched to find fishing events that met the criteria outlined below:
    - The fishing had to have occurred between 01 January 1990 and 31 December 2006;
    - Data from the “interpreted version” was used where available. This means the data is of the best routinely available quality, however the data has not undergone any detailed checking by the scientists familiar with the individual fisheries;
    - The fishing method had to have been, BT, MW, BLL, PS, DL, SN, HL, RLP, D, TL, SJ, BPT, FP, CP, PL, DS, DI or H. Translations of New Zealand’s fishing methods codes are available on request from rdm@fish.govt.nz;
    - The target species had to have been something other than a tuna species i.e. not species codes 'ALB', 'BIG', 'BTU', 'DTU', 'FTU', 'NTU', 'SKJ', 'STN', 'STU','TOR', 'TUN', 'YFN', 'SWO' or 'STM'. Translations of New Zealand’s species codes are available on request from rdm@fish.govt.nz;
    - The fishing start position had to have been in one of the areas listed below:
        i) start_latitude >= -55 and start_latitude < -25 and start_longitude >= 120 and start_longitude < 150;
        ii) or (start_latitude >= -25 and start_latitude < 20 and start_longitude >= 129 and start_longitude < 185);
        iii) or (start_latitude >= -28.15 and start_latitude < -25 and start_longitude >= 150 and start_longitude < 155);
        iv) or (start_latitude >= -11.5 and start_latitude < 20 and start_longitude >= 115 and start_longitude < 129);
        v) or (start_latitude >= 0 and start_latitude < 15 and start_longitude >= 100 and start_longitude < 115);
        vi) or ((start_latitude >= -25 and start_latitude < 5 and start_longitude >= 185 and start_longitude < 230);
        vii) or (start_latitude >= -25 and start_latitude < 5 and start_longitude >= 230 and start_longitude < 240);
        viii) or (start_latitude >= -60 and start_latitude < -25 and start_longitude >= 155 and start_longitude < 240);

ix) or (start_latitude >= -60 and start_latitude < -28.15 and start_longitude >= 150 and start_longitude < 155));

x) or ((start_latitude >= -60 and start_latitude < 5 and start_longitude >= 240 and start_longitude < 290)

xi) or (start_latitude >= -60 and start_latitude < -55 and start_longitude >= 290 and start_longitude < 292.73));

- As some of New Zealand's within-EEZ fishing was still present in this list of locations, a GIS system was then used to remove records relating to fishing inside New Zealand's EEZ;

- No restriction was applied to type of vessel doing the high seas fishing. Some cases were identified where the vessel that supplied the high seas fishing data did not (at that time) have a valid record in New Zealand's register of vessels authorised to fish. The data from such vessels have been included in this provisional report;
- Data were subsequently aggregated into year by month by 5 degree latitude by 5 degree longitude strata. The latitudes and longitudes given are the mid point of each strata;
- The original data and code for this extract is held by the New Zealand Ministry of Fisheries "Reports" group (reports@fish.govt.nz). In case of further enquiries quote log number 6674.

REGULATORY MEASURES

High Seas Fishing Permits

In 2001 New Zealand implemented a high seas permitting regime through it's Fisheries Act 1996, consistent with the 1995 United Nations Fish Stocks Agreement and the 1993 FAO Compliance Agreement. At this stage it is uncertain whether all catches taken on the high seas prior to 2001 have been reported.

Under this regime, all New Zealand flagged vessels fishing on the high seas, including in the South Pacific, require a high seas fishing permit. Permits are issued annually by the Ministry of Fisheries and all applicants are subject to a compliance history check. High seas fishing permits contain a number of conditions, for example, in relation to reporting and monitoring, control and surveillance. Details on high seas fishing permit conditions can be found at:
http://www.fish.govt.nz/International/High+Seas+Fishing/Content+of+High+Seas+Fishing+Permit+Conditions.htm.

Reporting

All New Zealand flagged vessels fishing on the high seas are required to carry out detailed catch and effort reporting. Vessels 28m and over (in length) are required to report (on a tow by tow basis):

- Dates and times of fishing
- Latitudes and longitudes of fishing
- Several measures of fishing effort
- The catch of the top 5 species (by weight) taken in each tow.

An example of the type of form that a trawler 28m or over (in length) is required to complete and supply is shown in Figure 4.

Vessels under 28m are typically required to report:

- Dates of fishing
- Latitudes and longitudes at midday
- Several measures of fishing effort
- The catch of the top 5 species (by weight) taken in each day.

An example of the type of form that a trawler under 28m is required to complete and supply is shown in Figure 5.

New Zealand is currently approximately half way through an initiative to require tow by tow, latitude and longitude, reporting from the vast majority of vessels 6m and over in length. This initiative will apply to both within zone and high seas fishing. The implementation of this initiative is expected to be complete for trawlers by the end of 2007, and for all fisheries by the end of 2010.

Routine Quality Checking

New Zealand processes approximately 170,000 A4 pages of catch and effort fishing reports each year. The vast majority of these reports document fishing within New Zealand's exclusive economic zone, but some document high seas fishing by New Zealand vessels. All of these reports routinely undergo a highly structured set of data quality checks. Over 100 types of data quality check are carried out for any given fishing method. Comprehensive documentation on the checks that are carried out is available on request from rdm@fish.govt.nz.

The data used in this report have undergone only New Zealand's routine quality checking. This data has not been checked or groomed by scientists who specialise in these fisheries. Such checking and grooming would be an option for future work.

Monitoring, Control and Surveillance

New Zealand uses a number of monitoring, control and surveillance (MCS) tools to control the activities of New Zealand flagged vessels fishing on the high seas. These tools include:

- Fishing permit requirements;
- Fishing permit and fishing vessel registers;

- Vessel Monitoring System (VMS) requirements (i.e. requirement to operate a satellite vessel monitoring system at all times);
- Vessel and gear marking requirements;
- Fishing gear and method restrictions;
- Observer Programme;
- Reporting (including catch and effort reporting) requirements;
- Vessel inspections;
- Control of landings (e.g. requirement to land only to licensed fish receivers);
- Record keeping requirements;
- Auditing of licensed fish receivers;
- Control of transhipment;
- Monitored unloads of fish;
- Information management and intelligence analysis;
- Analysis of catch and effort reporting and comparison with VMS, observer, landing and trade data to confirm accuracy;
- Boarding and inspection by fishery officers at sea; and
- Aerial and surface surveillance.

GENERAL DESCRIPTION OF FISHERIES

Data Coverage and Fishing Areas

This report only covers the period 1990 – 2006, which is the main period of the fishery in terms of effort and catch. However, New Zealand target trawl fisheries for orange roughy have occurred in the South Pacific since the late 1970's.

The Lord Howe Rise and Northwest Challenger Plateau have been the main areas of orange roughy catch in the Tasman Sea outside the New Zealand and Australian EEZs. A fishery on the Norfolk Ridge is a recent development, and the Louisville Ridge fishery to the east of New Zealand continues to the present.

Description of Fish Caught

Bottom trawl catches have been dominated by orange roughy (Hoplostethus atlanticus). The main commercial bycatch species when targeting orange roughy on the high seas have included oreos (*Allocyttus niger*, *Pseudocyttus maculatus*, *Neocyttus rhomboidalis*), cardinalfish (*Epigonus telescopus*), bluenose (*Hyperoglyphe antarctica*), ribaldo (*Mora moro*), seal sharks (*Dalatias* spp.), alfonsino (*Beryx splendens*), and rattails. A further 100 plus fish species have been recorded

as bycatch from orange roughy fisheries by observers on vessels fishing in the Southwest Pacific high seas area. The mix of species that orange roughy is associated with varies with latitude.

Annual Fleet Size and Distribution

The number of vessels operating in these fisheries also increased to a peak of 128 vessels in 1995, of which 79 were bottom trawlers and 25 midwater trawlers (see Table 1). The number of vessels declined steadily to 30 by 2006, including 16 bottom trawlers and 2 midwater trawlers. The number of bottom longline vessels has increased in recent years, from an average of 2 – 3 vessels from 1990 – 2003 to a maximum of 9 vessels in 2006.

Description of Effort

The predominant fishing method has been bottom trawl, accounting for 85% of the total reported fishing effort of 15,299 days fished over this period (see Table 2). Minor fishing methods included Dahn line (951 days fished), bottom longline (702 days fished) and midwater trawl (303 days fished), with these lesser methods being targeted at species other than orange roughy. The fishery initially focussed on the Challenger Rise and Lord Howe Island areas, with a secondary peak in fishing effort, and to a lesser extent catch, occurring over the 2002 - 2003 period.

Description of Catches

Over the 1990 – 2006 reporting period, a total of 80,440t of catch has been reported, of which orange roughy contributed 61,169t (76%), with the remainder consisting primarily of cardinalfish, oreos and bluenose (see Table 3) taken as incidental by-catches. The reported orange roughy annual catch increased rapidly at the start of the fishery from 561t in 1990 to a peak of 12,505t in 1995, and then declined steadily to 1,681t by 2006. Catches of the by-catch species showed similar trends, being proportionally related to orange roughy catch and effort.

NOTE: More detailed descriptions of the fisheries are contained in the species profiles available at http://www.southpacificrfmo.org/working-groups/public/current-work/.

REFERENCES

Clark, M.R. (2004). Descriptive analysis of orange roughy fisheries in the New Zealand region outside the EEZ: Lord Howe Rise, Northwest Challenger Plateau, West Norfolk Ridge, South Tasman Rise, and Louisville Ridge to the end of the 2002-03 fishing year. *New Zealand Fisheries Assessment Report*, 2004/51. 36p.

FIGURES AND TABLES

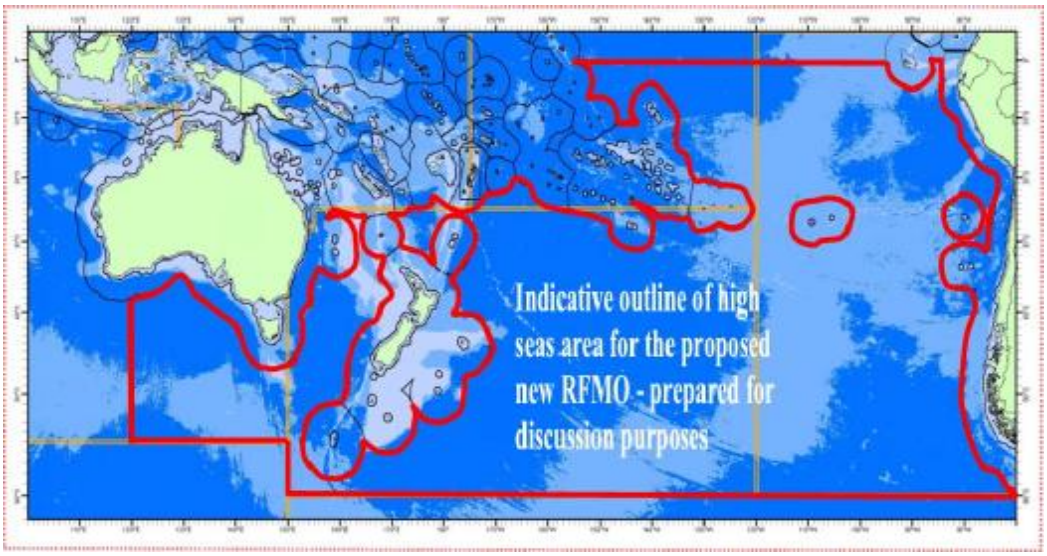


Figure 1: Proposed South Pacific Regional Fisheries Management Organisation area. Source: www.southpacificrfmo.org/

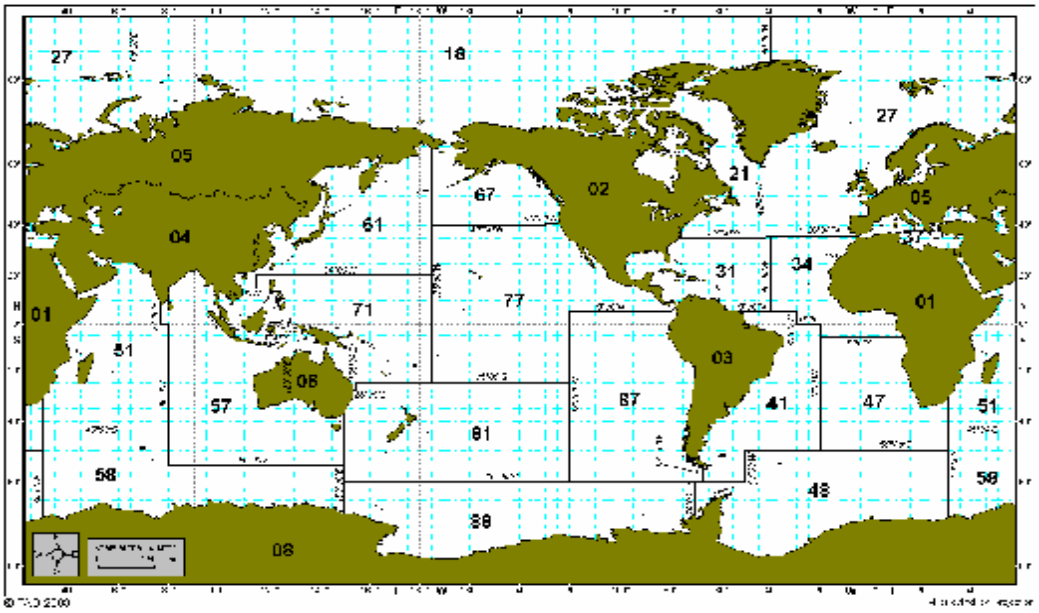


Figure 2: FAO data reporting areas and coordinates. Source: www.fao.org

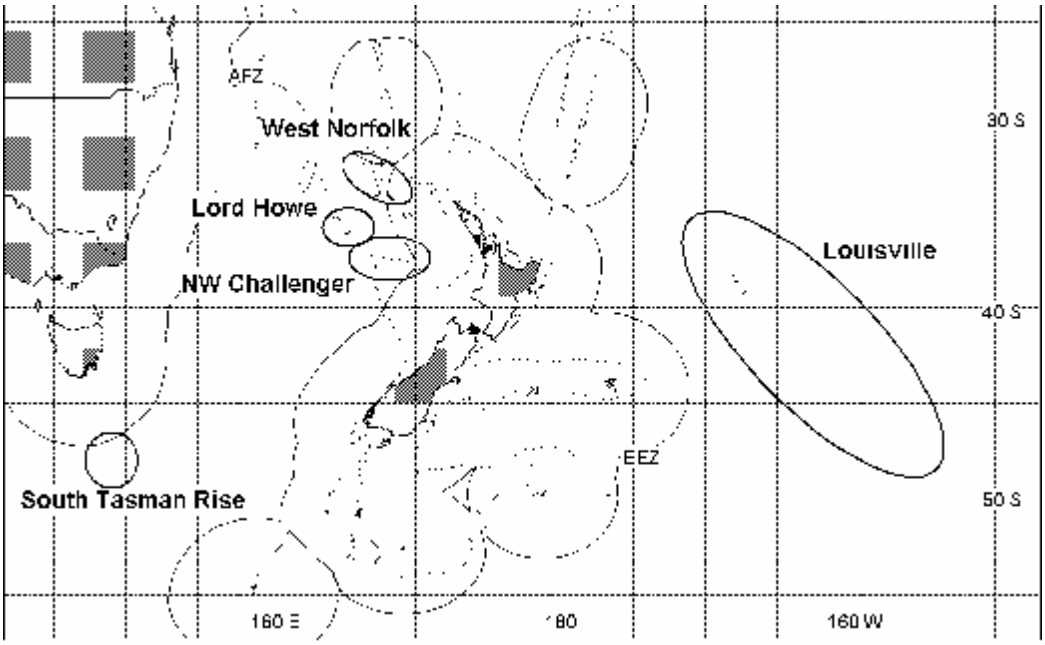


Figure 3: The New Zealand region, showing location of major fisheries for orange roughy outside New Zealand and Australian EEZs (1000 m depth contour shown around New Zealand). Source: Clark (2004).

Table 1. Number of high seas fishing vessels by gear type and year operating in the reporting area from 1990-2006.

Year	Bottom Trawl	Midwater Trawl	Bottom Long Line	Dahn Line	Trot Line	Danish Seine	Squid Jig	Other	Total
1990	26	21	2	1				3	**53**
1991	19	9	5	1	1		1	1	**37**
1992	28	11	4	2	1				**46**
1993	39	10	3	5	1			3	**61**
1994	57	21		3	1			9	**91**
1995	79	25	4	6	2	1	4	7	**128**
1996	72	16	4	5	2	6	2	5	**112**
1997	58	19	4	5		3	12	4	**105**
1998	49	9	7	5		5	4	6	**85**
1999	48	15	4	2		2	2	2	**75**
2000	33	3	2	2		2		1	**43**
2001	18	1		1					**20**
2002	28	2				1			**31**
2003	25	2	3	1			1		**32**
2004	22	2	5	3	1	1		1	**35**
2005	23	1	7	4	3	1		2	**41**
2006	16	2	9	2				1	**30**

Table 2. Number of vessel/days fished by gear type and year operating in the reporting area from 1990-2006.

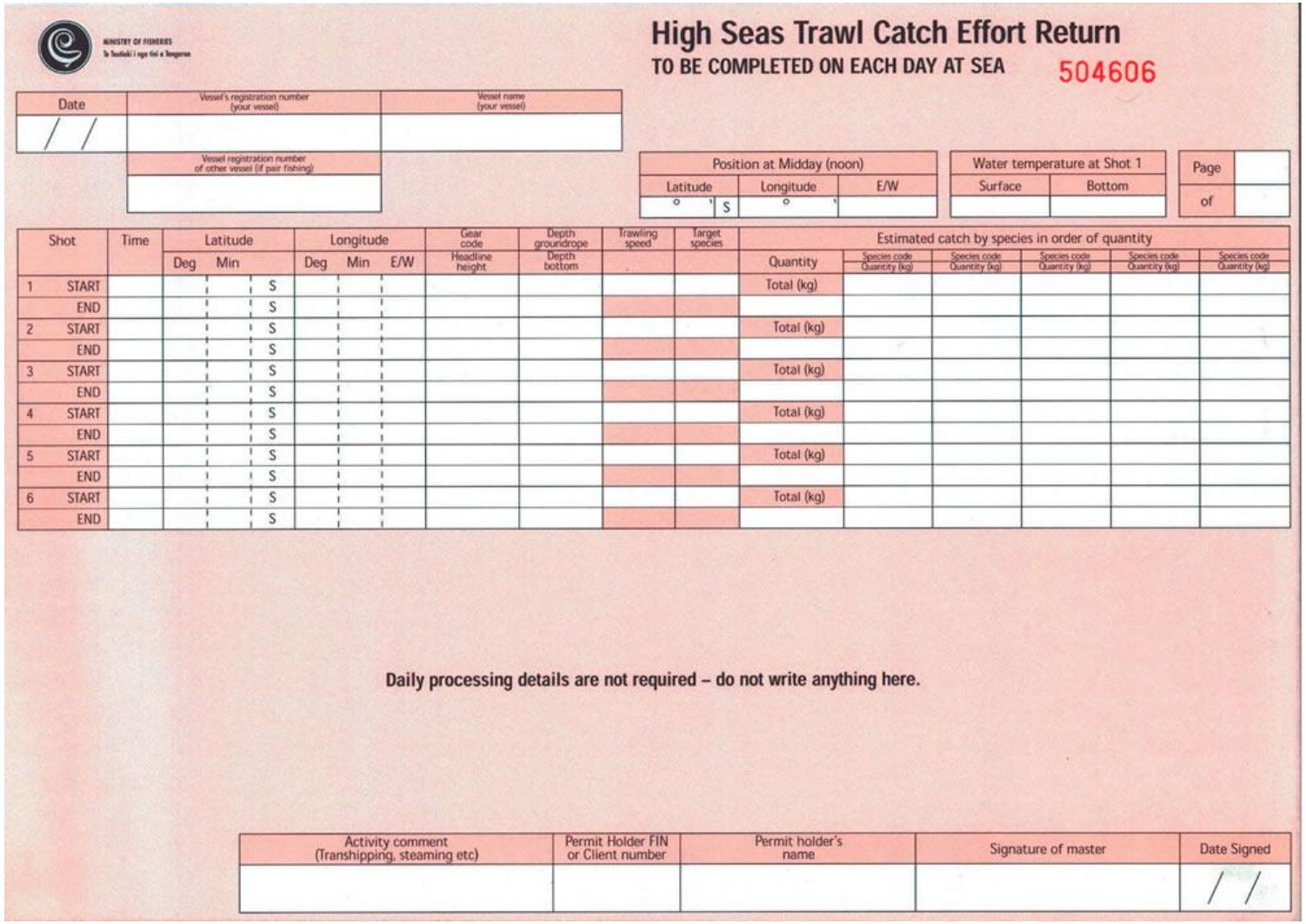
Year	Bottom Trawl	Midwater Trawl	Bottom Long Line	Dahn Line	Trot Line	Danish Seine	Squid Jig	Other	Total
1990	115	32	10	1				10	**168**
1991	39	11	12	13	2		1	2	**80**
1992	90	13	14	24	6				**147**
1993	656	23	23	144	20			4	**870**
1994	1,049	58		91	6			27	**1,231**
1995	1,606	47	4	111	60	1	4	11	**1,844**
1996	1,487	18	15	64	19	9	2	9	**1,623**
1997	771	24	30	167		5	28	8	**1,033**
1998	604	15	12	139		6	5	25	**806**
1999	870	22	28	56		3	2	2	**983**
2000	687	5	8	18		2		1	**721**
2001	677	4		28					**709**
2002	1,250	2				1			**1,253**
2003	1,078	3	31	5			1		**1,118**
2004	824	20	99	37	6	1		4	**991**
2005	803	1	139	28	13	4		2	**990**
2006	424	5	277	25				1	**732**
Total	**13,030**	**303**	**702**	**951**	**132**	**32**	**43**	**106**	**15,299**

Table 3. Catch (t) by year and species for New Zealand vessels operating in the reporting area from 1990-2006.

Year	Hoplostethus atlanticus	Epigonus telescopus	Allocyttus niger	Hyperoglyphe antarctica	Dissostichus eleginoides	Pseudocyttus maculatus	Macruronus novaezelandiae	Beryx splendens, B. decadactylus	Others	Total
1990	561						510		262	**1,333**
1991	141		9	3		20	19		183	**375**
1992	757	10	1	51		8	111	23	132	**1,093**
1993	4,943	245	29	223		31	37	43	529	**6,080**
1994	3,191	1,058	25	136		32	74	86	603	**5,205**
1995	12,505	320	644	175	11	356	261	18	681	**14,971**
1996	9,482	265	113	92	1,145	161	73	70	697	**12,098**
1997	4,178	351	123	169		88	119	31	517	**5,576**
1998	2,432	182	171	140		195	32	464	388	**4,004**
1999	5,892	325	51	53		168	89	39	189	**6,806**
2000	1,886	151	64	19		90	2	29	89	**2,330**
2001	2,942	485	16	49		108		22	117	**3,739**
2002	3,335	159	126	1		51	7	18	277	**3,974**
2003	2,495	227	72	26		29	4	191	599	**3,643**
2004	2,170	87	102	132	3	120	1	167	222	**3,004**
2005	2,570	188	531	101		95	1	25	311	**3,822**
2006	1,681	21	61	277		9	1	28	246	**2,324**
Total	**61,169**	**4,081**	**2,146**	**1,657**	**1,160**	**1,567**	**1,348**	**1,261**	**6,051**	**80,440**

Table 4. Catch (t) by year and area for New Zealand vessels operating in the reporting area from 1990-2006.

Year	Mid point of 5 degree latitude by 5 degree longitude grid cell									Total
	37.5S 167.5E	42.5S 162.5W	42.5S 167.5W	37.5S 167.5W	47.5S 157.5W	47.5S 147.5E	32.5S 167.5E	47.5S 152.5W	Other	
1990	502						3		829	**1,334**
1991	74						4		297	**375**
1992	404						18		673	**1,095**
1993	5,026	2	25	44			67		915	**6,079**
1994	3,627	63	433	7			125		952	**5,207**
1995	1,775	4,391	5,629	236	1,179		79	131	1,552	**14,972**
1996	1,366	865	1,658	3,633	1,730	14	39	536	2,259	**12,100**
1997	1,171	1,240	468	623	396	538	28	341	769	**5,574**
1998	806	736	285	354	26	808	20	65	902	**4,002**
1999	1,613	1,994	191	222	187	1,670	11	91	825	**6,804**
2000	656	853	33	437	86	108	21	20	118	**2,332**
2001	1,750	425	155	843	9		180	175	201	**3,738**
2002	2,302	258	88	481	13		437	288	106	**3,973**
2003	1,787	76	290	618	316		44	105	410	**3,646**
2004	922	279	266	407	500		141	116	372	**3,003**
2005	1,057	394	201	209	872		415	472	202	**3,822**
2006	541	79	162	144	314		877	43	165	**2,325**
Total	**25,379**	**11,655**	**9,884**	**8,258**	**5,628**	**3,138**	**2,509**	**2,383**	**11,547**	**80,381**



MINISTRY OF FISHERIES
Te Tautiaki i nga tini a Tangaroa

High Seas Trawl Catch Effort Return

TO BE COMPLETED ON EACH DAY AT SEA 504606

Date	Vessel's registration number (your vessel)	Vessel name (your vessel)
/ /		

Vessel registration number of other vessel (if pair fishing)

Position at Midday (noon)		
Latitude	Longitude	E/W
° ' S	° '	

Water temperature at Shot 1	
Surface	Bottom

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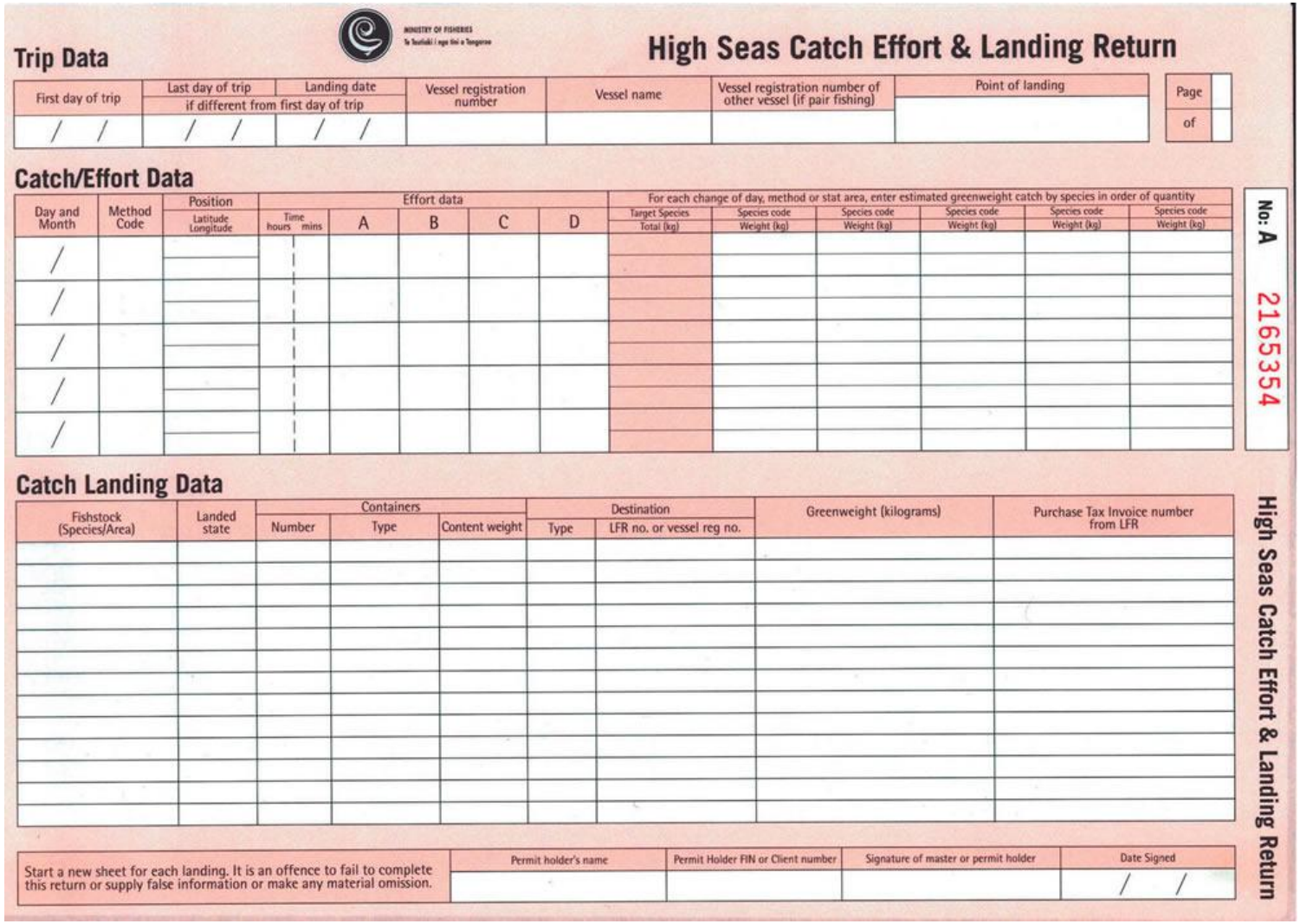
of

Shot	Time	Latitude			Longitude			Gear code / Headline height	Depth groundrope / Depth bottom	Trawling speed	Target species	Estimated catch by species in order of quantity					
		Deg	Min		Deg	Min	E/W					Quantity	Species code / Quantity (kg)	Species code / Quantity (kg)	Species code / Quantity (kg)	Species code / Quantity (kg)	Species code / Quantity (kg)
1 START				S								Total (kg)					
END				S													
2 START				S								Total (kg)					
END				S													
3 START				S								Total (kg)					
END				S													
4 START				S								Total (kg)					
END				S													
5 START				S								Total (kg)					
END				S													
6 START				S								Total (kg)					
END				S													

Daily processing details are not required – do not write anything here.

Activity comment (Transhipping, steaming etc)	Permit Holder FIN or Client number	Permit holder's name	Signature of master	Date Signed
				/ /

Figure 4: The High Seas Trawl Catch Effort Return (HS-TCER) as used since 2001 by New Zealand trawlers 28m and over in length.



MINISTRY OF FISHERIES

High Seas Catch Effort & Landing Return

Trip Data

First day of trip	Last day of trip if different from first day of trip	Landing date	Vessel registration number	Vessel name	Vessel registration number of other vessel (if pair fishing)	Point of landing	Page / of
/ /	/ /	/ /					

Catch/Effort Data

Day and Month	Method Code	Position Latitude Longitude	Effort data Time hours mins	A	B	C	D	For each change of day, method or stat area, enter estimated greenweight catch by species in order of quantity: Target Species Total (kg)	Species code Weight (kg)	Species code Weight (kg)	Species code Weight (kg)	Species code Weight (kg)	Species code Weight (kg)
/													
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No: A 2165354

Catch Landing Data

Fishstock (Species/Area)	Landed state	Containers Number	Type	Content weight	Destination Type	LFR no. or vessel reg no.	Greenweight (kilograms)	Purchase Tax Invoice number from LFR

High Seas Catch Effort & Landing Return

Start a new sheet for each landing. It is an offence to fail to complete this return or supply false information or make any material omission.

Permit holder's name	Permit Holder FIN or Client number	Signature of master or permit holder	Date Signed
			/ /

Figure 5: The High Seas Catch Effort and Landing Return (HS-CELR) as used since 2001 by New Zealand trawlers under 28m in length.