

Marine Protected Species Interactions with Commercial Fisheries 2003-2004

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1 Executive summary

This report summarises the captures of protected species of mammals, seabirds and marine reptiles for the Fishing Year 2003/2004 by those vessels in commercial marine fisheries that carried a Ministry of Fisheries (MFish) observer. The aims of the observer programme are to make it possible to more accurately estimate the numbers of animals caught and the circumstances that contributed to their capture; and also to develop and assess the efficacy of mitigation measures employed. The placement of MFish observers on fishing vessels was jointly funded by MFish and the Conservation Services Programme (CSP) of the Department of Conservation (DOC) through levies on the commercial fishing industry. The fisheries covered include:

- hoki trawl
- southern blue whiting trawl
- hake trawl
- squid trawl
- orange roughy
- scampi
- oreo species
- Patagonian toothfish
- alfonsino
- jack mackerel
- chartered pelagic tuna longline
- domestic pelagic tuna longline
- demersal ling longline - deep sea
- demersal ling longline - inshore
- demersal snapper longline (SNA1)

Overall, 3173 days were observed out of a total of 30,981 days of fishing operations from the fisheries listed above. Sixty percent of days were in the three major fisheries of hoki, squid and charter tuna. Overall, the coverage of these operations, by fishing days, was hoki at 12% (827 days), squid at 20% (700 days), and charter tuna at 99% (366). Other fisheries which achieved a high coverage by day were southern blue whiting at 74% (198 days) and deep sea ling at 34% (209 days). Less than 5% coverage of fishing days were achieved in the following fisheries: domestic tuna, inshore ling, snapper (SNA 1), jack mackerel and oreo. Of the 3173 days observed, 1522 days were delivered under contract from CSP for monitoring interactions of protected species and commercial fisheries. The remainder were funded by MFish for other operational and management reasons.

The total number of protected species captured and reported by MFish observers were:

▪ cetaceans	18	(16 killed)
▪ NZ sea lion	21	(20 killed)
▪ NZ fur seal	134	(97 killed)
▪ seabirds	445	(323 killed)
▪ marine reptiles	1	(0 killed)
▪ Total	619	(456 killed)

The discharge of offal and the discarding of unwanted fish species remains the single most persistent factor associated with the capture of seabirds in trawl fisheries. Excluding trawlers which are not equipped with a fishmeal plant from the New Zealand EEZ would markedly lessen this problem. Of the various devices used to mitigate the effects of fishing practices on protected species, probably the one with most promise for trawl fisheries is the recently introduced 'bird baffle'. This is a structure of booms rigged with dangling 'streamers' which aims to increase the apparent dimensions of the stern of a vessel and so cause seabirds to stay beyond the area where the warp cables are operating. When positioned correctly, these bafflers appear to deter birds but rigorous scientific analysis will be needed to confirm this. All four booms of the device must be extended for it to be effective but it has been reported that frequently only the two

side booms are used, possibly because the booms over the stern are not strong enough to withstand rough weather conditions.

In longline fisheries, the large vessels consistently use tori lines and often also operate various other devices (such as sonic cannons) to reduce the incidence of seabird captures. However, for a number of reasons, tori lines are not always used by smaller vessels. In a small vessel, the tori line may become entangled with the mainline and there is also a practice of not rigging a tori line unless birds are actually present. Night setting is the prevalent practice in all longline fisheries and is known to lessen the rates of seabird captures.

2 Introduction

Government fishery observers have accompanied commercial fishing vessels in New Zealand waters since the 1980's. Funds from the Conservation Services Levy¹ have been used to increase observer coverage in fisheries where there are known or suspected problems with protected species bycatch. This makes it possible to more accurately estimate the numbers of animals caught, the circumstances that contributed to their capture, and also to develop and to assess the efficacy of mitigation measures employed. This report describes observed fishing trips (e.g. those fishing trips with a MFish observer aboard) during the October 2003 – September 2004 fishing year in the following fisheries:

- hoki trawl
- southern blue whiting trawl
- hake trawl
- squid trawl
- orange roughy
- scampi
- oreo species
- Patagonian toothfish
- alfonsino
- jack mackerel
- chartered pelagic tuna longline
- domestic pelagic tuna longline
- demersal ling longline – deep-sea
- demersal ling longline
- demersal snapper longline (SNA1)

The objectives of the Observer Project (as specified in the Conservation Services Annual Plan 2003/04) were:

- To obtain statistically reliable information on the number of protected species incidentally taken in commercial fisheries;
- To identify possible means for mitigating the incidental take of these protected species; and
- To collect other biological information on protected species bycatch that will assist in assessment of bycatch mitigation.

Specific objectives for 2003/04 were:

- To monitor fisheries that are known to interact with protected species;
- Enable estimates of protected species captures to be determined;
- Provide indicative information about the capture of protected species where observer coverage has been absent or negligible, but where captures are likely given the fishing method and areas fished (i.e. 'exploratory' observer coverage); and
- To debrief all observer trips made by Ministry of Fisheries observers in order to keep a watching brief on protected species interactions in these fisheries.

¹ For a description of the legislative basis for these levies see the draft Conservation Services Strategic Plan 2004-2010 (<http://www.csp.org.nz/CSP-Strategic-Plan-external.pdf>).

This report does not:

- Attempt to quantify bycatch totals – this is the responsibility of the Ministry of Fisheries; and
- Describe the results of seabird and marine mammal autopsies;

3 Methods

The Conservation Services Programme purchased at-sea observer services from the MFish Observer Programme. The primary function of observers was to collect quantitative and qualitative information about the interaction of protected species and fishing operations. Annex A lists the specific information collected by, and duties undertaken by observers. The type of information selected for collection was based on discussions with fishers, industry representatives, scientists and observers with the aim of providing relevant information to allow for an understanding of any interactions and an identification of potential mechanisms for mitigation. The placement of observers on different fishing operations and the number of days allocated to each fishing operation were based on consideration of several criteria including:

- historical mortality of protected species;
- status of particular threatened protected species; and
- current level of information.

Observer days were funded from levies by both MFish and CSP. There is a clear distinction in the purpose of these days whereby MFish funded days are aimed at providing information primarily for management and stock assessment purposes while CSP days are aimed at delivering information relevant to protected species interaction only. For those observer days which are required under the Conservation Services Plan CSP sets the observers' work priorities, whereas the Ministry of Fisheries sets priorities for observer days levied under the Fisheries Services Plan. There is active co-operation between CSP and MFish to ensure that maximum value is extracted from all at-sea observer days. For the purposes of this report, all trips that were de-briefed in the 2003/2004 fishing year have been analysed and no effort is made to distinguish between trips funded by CSP and those funded by MFish, as the information collected by observers remains essentially the same.

Prior to the departure of an observer to sea, they are briefed by a CSP Briefing Officer to explain the data they are required to collect and advised of logistical issues (e.g. what samples to collect, how to return protected species carcasses). In addition, once the observer returns from the trip, a de-brief is undertaken by a Briefing Officer. Quantitative data is recorded from standard MFish Observer Programme forms (e.g. trip report, CELB) and qualitative data is recorded both from Observer diaries and through discussions with Observers. Specific data of interest to CSP includes:

- the presence or absence of offal and discarded fish
- practices that could lessen the rate of capture of protected species.
- the numbers of protected species killed and released alive.

Please note that while observer identifications of mammals are usually accurate, the precise identification of dead seabirds is a job for a specialist and the observer identifications given in the tables below are provisional – to be confirmed in the annual report of the CSP seabird autopsy contractor.

There are several ways to report observer coverage and fishing effort including the number of days, trips, tows or hooks observed. Proportional coverage may vary depending on what type of coverage is reported. This is important to consider when interpreting data and when assessing coverage. For example, while 99% of fishing days were observed in charter tuna operations in 2003/04, only 74% of hooks were

observed. This can be related to factors such as a single observer working on a vessel that fishes 24 hours a day.

Fisheries are generally characterised by the species they are targeting. While most are identified by the target species name some reflect a combination of fisheries or methods. These fisheries include:

- Chartered pelagic tuna – foreign vessels targeting tuna.
- Domestic pelagic tuna – small and large NZ-registered vessels targeting southern bluefin and bigeye tuna
- Deep sea ling – vessels of c. 50 metres in length targeting ling
- Inshore ling – vessels of c. 20 metres in length targeting ling

It is important to note that care needs to be taken in the interpretation of some data provided in this report. In particular, it may not be appropriate to extrapolate protected species capture rates across the whole of the fishery for reasons including small and/or potentially biased samples. Hence, the statistics presented here are simply a summary of the data returned by the observers and there is no attempt to generate estimates of total bycatch in this report. This work is undertaken in the form of contracts issued by the MFish after consultation with the DOC and as detailed in the MFish Services Plan.

4 Results

4.1 Overview

Overall, 3173 days were observed out of a total of 30,981 days of fishing operations from the fisheries listed in section 2.1. Observer coverage has varied by year and by fishery over time. Sixty percent of days were in the three major fisheries of hoki, squid and charter tuna. Overall, the coverage of these operations, by fishing days, was hoki at 12% (827 days), squid at 20% (700 days), and charter tuna at 99% (366). Other fisheries which achieved a high coverage by day were southern blue whiting at 74% (198 days) and deep sea ling at 34% (209 days). Less than 5% coverage of fishing days were achieved in the following fisheries: domestic tuna, inshore ling, snapper (SNA 1), jack mackerel and oreo. Although the coverage of snapper was low overall, it represented a significant improvement over previous years.

Of the 3173 days observed, 1522 days were delivered under contract from CSP for monitoring interactions of protected species and commercial fisheries while the remainder were funded by MFish for operational and management reasons. A summary of observer coverage and reported protected species interactions by fishery are presented in Table 1. A more detailed break down of protected species interactions by fishery is presented in Table 2 and 3.

Overall, 619 individuals of protected species were reported caught in observed fishing operations. These comprised 173 marine mammals, 445 sea birds and 1 marine reptile (Table 4). While species identification is provisional awaiting confirmation from autopsies, based on species identification made by observers the most frequently caught marine mammal was the NZ fur seal with 134 interactions followed by the NZ sea lion with 21 interactions. In addition 15 common dolphins were caught. Notwithstanding the approximately 110 sea birds that were not identified to species, the most frequently caught sea bird was the NZ white-capped mollymawk with 92 interactions.

Standardised estimates of the number of protected species caught by each fishery are presented in Table 5. Bycatch rate is standardised as the number of individuals caught per 1000 tows for trawl fisheries and for longline fisheries, the number of individuals caught per 1000 hooks. This value includes all individuals caught, including ones that were released alive.

4.2 General fishery descriptions

The following section provides a more detailed explanation of each of the fisheries that were observed. A detailed break down of observer coverage and bycatch of protected species is presented in Tables 1 to 5. See Annex B for the location of Fisheries Management Areas (FMAs).

4.2.1 *Hoki*

Description

The greatest number of trips (13) were vessels fishing either principally or exclusively on the west coast of the South Island (FMA Challenger) between July and September. During the same period there were also 9 vessels engaged in the Cook Strait fishery (FMAs Challenger & Central-East). The remainder fished widely in the central and southern EEZ (FMAs Southeast-Coast, Southeast-Chatham Rise, Southland & Sub-Antarctic) until December.

Mitigation efforts

The interactions of seabirds with hoki vessels appear to be intensified by factors including the deliberate discharge of offal and fish and by the availability of fish that fall out of the cod-end during hauling. Seabirds and fur seals are known to take fish that are protruding from the net ('stickers'). Nine of the larger trawlers in this fishery have a fishmeal plant that utilises and retains all the waste and discarded species (with the exception of sharks). Even on these vessels which are not discharging, there is often 'deck-wash' from the processing operation which puts some offal and liquid waste into the sea alongside the vessel. Thirteen observed vessels did not have meal plants.

Offal that is swept astern of the vessel appears to attract seabirds into the zone where the main warps are cutting the sea surface. This can lead to collisions with a warp (a 'warp-strike') which may injure a bird fatally and which accounts for those which are seen caught up on the 'sprags' (projections of wire cable) of the warps and trawl doors. Captures of sea lions and fur seals often coincide with occasions when a turn has been made just before hauling or when, owing to mechanical failure, hauling is interrupted (or becomes very slow) resulting in the cod-end remaining at the surface for some time. This is an issue identified in the Industry code of practice.

Eleven vessels were reported to have a 'bird-baffler' installed to keep seabirds away from the warp zone astern by making the stern of the vessel appear to be broader and longer than it is. However, the effectiveness of bafflers varied. In three cases, bafflers were of an idiosyncratic design and at least one of these had its dangling 'streamers' too high off the water so that seabirds could fly under them. It was reported that some were not correctly operated in that only two of the four booms were extended and this seriously compromised the intended effect. Others were not sufficiently robust to be operated in heavy seas. A study of the effectiveness a bird baffler in reducing the incidence of warp-strikes has recently been conducted on the FV *Rehua* by the Hoki Fishery Management Company.

4.2.2 *Southern blue whiting*

Description

Ten vessels fished in the southern blue whiting fishery in October 2003 and in August/September 2004. They operated principally to the east of Campbell Island over the Campbell Rise. In the early part of the 2004 season catches ranged from 1 to 45 tonnes, while at the end of the year a maximum catch of 230 tonnes was reported.

Mitigation

Three vessels were noted as having a bird baffler fitted. However, one vessel did not deploy the device at all and another used it with the side booms only out. The remaining vessel generally did not use it in winds

of over 50 knots as the weather was too rough and the baffler was ineffective and could not cope with the conditions.

4.2.3 Hake Trawl

Description

Hake is an important bycatch in the hoki fishery but there have been few observed trips when it has been directly targeted. There were two trips during the 2003/04 year where hake was a significant target species. On one trip it was targetted together with Squid and on the other trip it was targetted in conjunction with White warehou and Ling. These vessels were operating mainly in FMAs Southland and South-east-Chatham Rise.

Mitigation

No mitigation methods were reported.

4.2.4 Squid Trawl

Description

The majority of effort in this fishery was over the southern side of the Snares Shelf and south to the Auckland Islands, corresponding to FMAs Southland and Sub-Antarctic.

Mitigation

A number of vessels had a bird baffler installed, but in one case at least it was operated incorrectly as the astern booms were not extended. It was also noted by observers that bird bafflers, although fitted, were sometimes not used at all (for reasons which were not clear to the observer) or were limited in use by the frequency of high winds.

The Auckland Islands are within the squid fish stock area SQU 6T and in this zone it was compulsory for vessels to use a Sea Lion Exclusion Device (SLED). Note that the use of SLEDs as part of the NZ Sea Lion operational plan for the 2003/04 season was being monitored by the Ministry of Fisheries so it is not reported on here.

Most vessels were reported as discharging offal and/or deck-wash from processing. Even if a vessel was equipped with a meal plant, squid guts were still discharged overboard as they are considered unsuitable for mealing. Even if the squid was packed green, bycatch offal was often discharged.

4.2.5 Chartered Pelagic Tuna Longline

Description

There were 4 observed trips in this fishery. This fishery includes vessels targeting two main species: southern bluefin tuna and bigeye tuna. Most (98% of hooks) of observer effort was spent on monitoring southern bluefin tuna. These vessels fished principally off the southern west coast of the South Island (FMAs Challenger & Southland) from March to July for southern bluefin, with two vessels finishing the season by targeting big eye north of Cape Reinga (FMA Auckland West).

Mitigation

Twin tori lines were used consistently on all vessels while one vessel used three lines. Other mitigation methods included the use of weighted swivels on the mainline and setting in darkness, which was common practice. Offal discharge practices varied but several vessels retained offal and discharged it after setting was completed. It was noted on one vessel that crew members were throwing baits overboard to attract birds – a practice which should be prohibited.

4.2.6 Domestic Pelagic Tuna Longline

Description

There were 10 observed trips by 'domestic' vessels engaged in operations targeting tuna. This fishery includes vessels targeting three main species: southern bluefin, bigeye and albacore. Most (85% of hooks) of observer effort was spent on monitoring southern bluefin with lesser coverage for bigeye (13% of hooks) and albacore (2%). The one large vessel fished off southern Westland (FMAs Challenger & Southland) targeting southern bluefin. The eight smaller vessels fished off East Cape and in the Bay of Plenty (FMAs Central-East & Auckland-East) targeting all three species of tuna.

Mitigation

The large vessel had a tori line in use as well as supplementary seabird deterring devices such as flashing lights ('to make the ship look longer') and star shells. However, tori lines were not used during this observed period by the smaller vessels. All but one of the eight smaller vessels carried a tori line but it was not deployed until there is a strongly perceived need to use it. This was related to operational difficulties in that due to the small size of the vessels, the tori line did not hang very far above the sea surface and tended to become entangled with the mainline. The apparent need for a tori line was based on the perception that the vessel may be in an area with a high number of seabirds or that seabirds aggregate seasonally at certain times. The design of the tori line on these smaller vessels was disliked by crew due to the amount of time required to rig and unrig it. In some vessels the mainline was weighted or weighted swivels were in use. One vessel discharged used baits over the stern during hauling, finding that this practice kept birds feeding well astern of the vessel.

4.2.7 Demersal Ling Longline – Deep-sea

Description

Eight trips were observed during the period but only seven are reported on here as the eighth was undertaking line weighting trials and its fishing methods were thus anomalous. The ling fishing took place in FMAs Central (East), South-east (Chatham Rise), Southland and Sub-Antarctic.

Mitigation efforts

All vessels used a single tori line with one using two tori lines. A variety of other mitigation methods were used including sonic cannons (which were not always working) and some vessels practised weighting the main-line. Two vessels deployed a tori pendulum adjacent to the hauling station. Bird-scaring shells were used by several vessels. In general, night setting was common practice but two vessels (one contrary to the company code of practice) set in daylight on a number of occasions. This daylight setting was reflected in the numbers of seabirds caught (18 Sooty shearwaters). There was a pattern of seabirds feeding aggressively at the discard chute with ling livers being especially sought. There were also some observations of NZ fur seals would attacking the ling on the line, again focusing on the livers.

4.2.8 Demersal Ling Longline – Inshore

Description

There were a total of 19 fishing days with three vessels in this 'inshore' fishery with. Inshore is not a strictly appropriate title for this fishery and in general, actually refers to smaller fishing vessels.

Mitigation efforts

In all three vessels it was the practice to put weights on the main-line and on one vessel a tori line was used consistently. Another vessel used a tori line for daylight sets only, while the third would rig a tori line in October when 'black diving birds' (perhaps referring to sooty shearwaters) were active, but at other times simply deployed a line with a buoy tied to it.

4.2.9 *The Northern Snapper Fishery*

Description

The observed fishery in SNA 1 over the period from late November 2003 to late May 2004 was a longline one but it is important to note that snapper is also caught by trawling and Danish seining. The longline fishery operated from vessels ranging in size from about 6 metres to 17 metres. There was usually a two person crew and trips averaged two to three days in duration. In the Hauraki Gulf, fishing occurred in water depth of 30 to 50 metres but occurred in shallower depths (e.g. 7-12 metres) in the northern area. During the fishing year observers were placed on 29 different vessels.

Mitigation efforts

A tori line was consistently used on only 13 vessels. Of these, one skipper would rig the line only when birds were around. Of the 16 vessels which did not use a tori line, the reasons given varied from dissatisfaction with the CSP-supplied line ('too thick') to a perception that with low numbers of seabirds there was a very small risk of captures. There was also a concern expressed that a tori line could become entangled with the mainline. In general, seabirds appeared to be attracted to these vessels by discarded used baits and in the northern area birds could be seen diving for baited hooks in the very clear water.

4.2.10 *Orange Roughy*

Description

Sixteen 16 trips were observed during the year. The location of fishing ranged over most of the EEZ, with an emphasis on FMAs Auckland East, Auckland West, and South-east.

Mitigation efforts

Advice from observers pointed to two main factors that tended to result in low numbers of interactions with seabirds and marine mammals with orange roughy trawling. Firstly, the duration of a tow is very short compared with those for other fisheries such as hoki or squid. In addition, many vessels bring back their orange roughy catch 'green' with only basic processing of fish bycatch which means that there is little or no offal discard to attract seabirds. Those vessels that do process their catch and discharge offal and discard bycatch fish do appear to attract mammals and seabirds.

4.2.11 *Scampi*

Description

Observers were placed on five vessels trawling for Scampi. The observed trips occurred almost exclusively in FMAs Southeast Coast and Southeast (e.g. Chatham Rise) with a single trip in Sub-Antarctic (SOI).

Mitigation efforts

Some scampi trawlers process bycatch species, especially ling, and the resulting offal together with discarded fish attracts seabirds. One vessel used a 'windy buoy' – a large orange ball at the end of a line, suspended near the discard chute - as a seabird deterrent. It is common practice to use triple nets (ie. three nets fished side by side simultaneously) and two NZ sea lions were killed in a vessel using this method. One report from an observer, noted that a fur seal was captured in the middle net of a different vessel after a gear malfunction resulted in the nets being at the surface for considerably longer than normal during hauling. In one vessel, three NZ white-capped albatrosses were killed by hitting a warp as they approached to feed at the discard chute.

4.2.12 *Miscellaneous Fisheries*

There was a low coverage in other fisheries but the following fisheries had at least some trips observed: Oreos, Alfonsino, Patagonian toothfish and Jack mackerel. No protected species interactions were recorded in any of these fisheries except for Jack mackerel. The trip targeting Patagonian toothfish was an exploratory fishery and occurred in FMA Subantarctic. A single Jack mackerel trip was observed in the

Taranaki Bight (FMA Central (West)) in which 15 Common dolphins were killed, all in night tows using a mid-water net.

5 Discussion

Government fishery observers have accompanied commercial fishing vessels in New Zealand waters for many years. Funds from the Conservation Services Levy have enabled increased observer coverage in fisheries with known protected species bycatch problems. The aim is to more accurately estimate numbers of animals caught, and to develop and to assess the efficacy of any mitigation measures employed. All fisheries observers are routinely trained in protected species identification and are given a comprehensive manual and reference books for use at sea. Observers also retrieve and return seabird and mammal carcasses for autopsy by experienced specialists. Observers are debriefed on return in order to build a complete picture of the way fishing vessels interact with protected species.

There is active co-operation between the Department of Conservation and the Ministry of Fisheries to ensure that maximum value is extracted from all at sea observer days. This issue has been identified and addressed in the 2004/05 Conservation Services Plan whereby CSP and MFish have agreed to allocate observer costs to CSP in approximate relationship to the services received. For the purposes of this report, all trips that were de-briefed in the 2003/2004 fishing year are reported and no effort is made to distinguish between those trips funded by CSP and MFish as the information collected by observers remains essentially the same.

The CSP component of observer days provided significantly more coverage than in the first year of the programme (1995/96). The chartered pelagic tuna fishing fleet has had 100 percent observer coverage for several years and observer coverage of the demersal ling long-line fleet increased substantially since 1996. Increased coverage in the squid fishery around the Auckland Islands has allowed reliable estimates of New Zealand sea lion deaths, which were crucial to the application of the limit on fishing-related mortality managed by the Ministry of Fisheries.

The CSP observer days represented 80% of the target days requested. Over three-quarters (84 %) of CSP observer days were concentrated on four fisheries: deep-sea ling long-line, domestic pelagic tuna long-line, squid trawl and snapper long-line fisheries. The remaining 16 % were spent in the chartered pelagic tuna longline, hoki trawl and inshore ling long-line fisheries. The 146 sea days achieved in the snapper longline fleet is particularly pleasing and could not have been achieved without the help of Kate Bartram (Executive Officer, Northern Inshore Fisheries Company Ltd) and Grant Johnson (CSP Advisory Officer) and the cooperation of the skippers.

The Ministry of Fisheries Observer Services was unable to provide all the observer sea days requested by CSP and other clients, resulting observer sea days being about 20% less than that specified in the annual plan. This led to a substantial over-recovery to be returned to the industry. The Ministry of Fisheries is presently addressing the difficulty in meeting requested services through the following projects.

The need for timely advice to stakeholders about important events involving protected species has been recognised by the establishment of occurrence reports. The first report, dealing with the deaths of 15 common dolphins in the Taranaki Bight jack mackerel fishery in December 2003/January 2004 was released on 4 March 2004. It is planned that further reports will be issued as required.

Annex A. Information and Numerical Data Recorded at Observer De-briefings

1. Data entered into databases.

- Trip no.
- Dates of briefing and de-briefing
- Vessel name, nationality, type and dimensions
- Dates of leaving port and returning
- No. of Seabirds killed/released alive and carcasses returned
- No. of Marine mammals – ditto
- No. of Marine reptiles – ditto
- Species of seabird released (NIWA code)
- No. of tows/sets per FMA and per target species
- Type of trawl net used
- No. of observed hooks set

2. Data and observations recorded but not entered into databases

- Name of de-briefer
- Name of observer/s
- Quota holder
- Details of tagged mammals or dyed seabirds seen
- Abundance and behaviour of seabirds/mammals around vessel (by FMA)
- Cetaceans seen
- Discharge of factory waste (offal/discards/deck-wash/meal plant) – types/times
- Comments on fishing by FMA – catch weights
- Factors relating to seabird and marine mammal captures – numbers of birds/mammals present, gear events, weather, warp condition, etc
- Fishing gear –type , dimensions, where fished
- Gear malfunctions
- State of gear
- Fishing competency of master
- Cooperativeness of Master, crew and company
- Experience with CSP gear
- Details re unloading of seabird and mammal carcasses
- Sightings of marine reptiles and large sharks
- All dead mammals, birds and reptiles are photographed and sexed, measured and tissue-sampled.

Additional information collected for long-liners:

- Details of tori line use, composition of mainline, use of weights and behaviour of mainline
- Setting speed and fishing depth of line
- Use of baitthrower
- Bait – type and thawing time
- Bait thrower
- Presence of other vessels
- Attitudes of master etc to protected species catches
- Knowledge of COPs

Annex B. New Zealand Exclusive Economic Zone and Fishery Management Areas

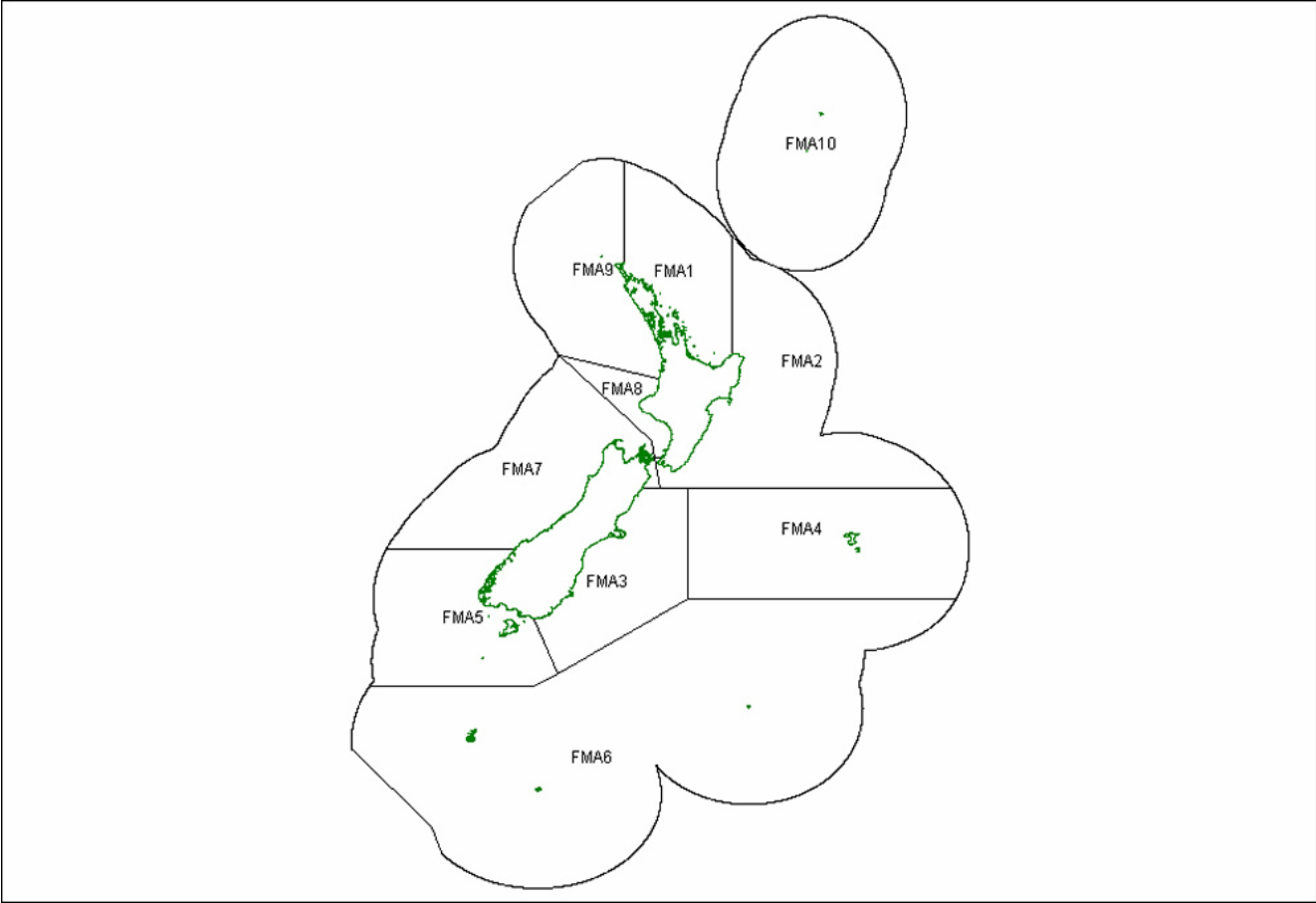


Table 1. Summary of 2003/04 observer coverage and protected species caught

Fishery	No of trips observed ¹	% trips observed	No of fishing days observed ¹	% fishing days observed	No of tows or hooks observed ¹	% tows or hooks observed	No of marine mammals killed	No of marine mammals released alive	Total no of marine mammal interactions	No of sea birds killed	No of sea birds released alive	Total no of sea bird interactions
LONGLINE FISHERIES					(hooks)	(hooks)						
Charter Tuna	4	36	366	99	890760	74	1	10	11	27	18	45
Domestic Tuna	10	1	200	4	363751	0.1	19	12	31	18	3	21
Deep Sea Ling	8	20	209	34	4925160	33	1	0	1	38	24	62
Inshore Ling	3	8	19	1	40973	0.4	0	0	0	0	1	1
Snapper (SNA1)	58	1	140	2	239048	2	0	0	0	4	4	8
TRAWL FISHERIES					(tows)	(tows)						
Hake	2	3	35	5	90	0.1	0	0	0	3	0	3
Hoki	35	47	827	12	2319	12	54	11	65	37	25	62
Jack mackerel	1	2	32	4	98	4	15	0	15	0	0	0
Orange roughy	16	26	269	13	908	12	1	1	2	3	4	7
Oreo species	3	3	11	2	267	10	0	0	0	0	0	0
Scampi	5	8	138	9	376	10	3	0	3	3	0	3
Southern blue whiting	10	38	198	74	349	48	15	0	15	2	0	2
Squid	28	10	700	20	1774	21	20	7	27	188	43	231
Alfonsino	1	1	9	2	32	3	0	0	0	0	0	0
Patagonian toothfish	1	100	20	²	33	²	0	0	0	0	0	0
Total	185		3173		6459692 (hooks)		129	41	170	323	122	445
					6246 (tows)							

Note:

- ¹ This data is provided by MFish
- ² No data available for this fishery.

Table 2. Detailed break down of protected species bycatch in trawl fisheries

SPECIES	HOK			SBW			HAK			SQU			ORH			SCI			JMA			Overall		
	K	R	T	K	R	T	K	R	T	K	R	T	K	R	T	K	R	T	K	R	T	K	R	T
MARINE MAMMALS																								
Common dolphin																			15		15	15	0	15
NZ fur seal	54	10	64	14		14				7	6	13	1	1	2	1		1				77	17	94
NZ sea lion				1		1				16	1	17				3		3				20	1	21
Total	54	10	64	15		15			0	23	7	30	1	1	2	4		4	15		15	112	18	130
SEABIRDS																								
Albatross (unidentified)	6		6	1		1	3		3	57	2	59										67	2	69
Antarctic prion										1	13	14										1	13	14
Black-browed mollymawk	1	2	3							3	1	4										4	3	7
Buller's shearwater														1	1							0	1	1
Cape petrel	2	11	13																			2	11	13
Diving petrel											2	2										0	2	2
Grey petrel														1	1							0	1	1
NZ white-capped mollymawk	4	1	5							69	1	70				3		3				76	2	78
Petrel (unidentified)	5	1	6	1		1				21	1	22		1	1							27	3	30
Prion (unidentified)		1	1																			0	1	1
Salvin's mollymawk										2		2	1		1							3	0	3
Shy mollymawk	4		4							4	6	10	1		1							9	6	15
Sooty shearwater	15	1	16							18	5	23										33	6	39
Southern Buller's mollymawk		3	3							4		4										4	3	7
Southern royal albatross													1		1							1	0	1
Storm petrel		1	1							2	2	4										2	3	5
Westland petrel		3	3																			0	3	3
White-chinned petrel		1	1							7	10	17		1	1							7	12	19
Total	37	25	62	2		2	3		3	188	43	231	3	4	7	3		3			0	236	72	308

Notes:

- K = killed; R = released alive; T = total
- HOK: hoki, SBW: southern blue whiting, HAK: hake, SQU: squid, ORH: orange roughy, SCI: scampi, JMA: jack mackerel
- Species identifications are preliminary and will be confirmed by autopsy programmes

Table 3. Detailed break down of protected species bycatch in longline fisheries

SPECIES	CT			DT			DSL			ISL			SNA1			Overall		
	K	R	T	K	R	T	K	R	T	K	R	T	K	R	T	K	R	T
MARINE MAMMALS																		
NZ fur seal	1	9	10	19	11	30										20	20	40
Pilot whale					1	1	1		1							1	1	2
Whale(unident.)		1	1													0	1	1
Total	1	10	11	19	12	31	1		1			0			0	21	22	43
SEABIRDS																		
Albatross (unidentified)				1		1										1	0	1
Australasian gannet													1	1			1	1
Black petrel												1	1	2		1	1	2
Black-browed mollymawk				1		1										1	0	1
Cape petrel							1		1							1	0	1
Diving petrel								1	1							0	1	1
Flesh-footed shearwater												1	2	3		1	2	3
Giant petrel								1	1							0	1	1
Grey petrel				3		3	1		1							4	0	4
Grey-faced petrel							2		2							2	0	2
Light-mantled sooty albatross				1		1										1	0	1
Little shearwater												1		1		1		1
NZ white-capped mollymawk	10	1	11	2		2					1	1				12	2	14
Pied shag												1		1		1	0	1
Prion (unidentified)								9	9							0	9	9
Salvin's mollymawk				1		1		10	10							1	10	11
Seabird (unidentified)							4		4							4	0	4
Shy mollymawk				1		1										1	0	1
Sooty shearwater		3	3		1	1	17	1	18							17	5	22
Southern Buller's mollymawk	15	14	29	6	2	8										21	16	37
Wandering albatross								1	1							0	1	1
Westland petrel				2		2										2	0	2
White-chinned petrel	2		2				13	1	14							15	1	16
Total	27	18	45	18	3	21	38	24	62		1	1	4	4	8	87	50	137
MARINE REPTILES																		
Leatherback turtle					1	1										0	1	1
Total					1	1										0	1	1

Notes:

- K = killed; R = released alive; T = total
- CT: Charter Tuna, DT: domestic tuna, DSL: deep sea ling, ISL: inshore ling, SNA1: snapper 1

Table 4. Total numbers of protected species bycatch in 2003/04

SPECIES	Trawl Overall			Longline Overall			Trawl and Longline combined		
	K	R	T	K	R	T	K	R	T
MARINE MAMMALS									
NZ fur seal	77	17	94	20	20	40	97	37	134
NZ sea lion	20	1	21	0	0	0	20	1	21
Common dolphin	15	0	15	0	0	0	15	0	15
Pilot whale	0	0	0	1	1	2	1	1	2
Whale (unident.)	0	0	0	0	1	1	0	1	1
SEABIRDS									
NZ white-capped mollymawk	76	2	78	12	2	14	88	4	92
Albatross (unidentified)	67	2	69	1	0	1	68	2	70
Sooty shearwater	33	6	39	17	5	22	50	11	61
Southern Buller's mollymawk	4	3	7	21	16	37	25	19	44
White-chinned petrel	7	12	19	15	1	16	22	13	35
Petrel (unidentified)	27	3	30	0	0	0	27	3	30
Shy mollymawk	9	6	15	1	0	1	10	6	16
Antarctic prion	1	13	14	0	0	0	1	13	14
Cape petrel	2	11	13	1	0	1	3	11	14
Salvin's mollymawk	3	0	3	1	10	11	4	10	14
Prion (unidentified)	0	0	0	0	9	9	0	9	9
Black-browed mollymawk	4	3	7	1	0	1	5	3	8
Grey petrel	0	1	1	4	0	4	4	1	5
Storm petrel	2	3	5	0	0	0	2	3	5
Westland petrel	0	3	3	2	0	2	2	3	5
Seabird (unidentified)	0	0	0	4	0	4	4	0	4
Diving petrel	0	2	2	0	1	1	0	3	3
Flesh-footed shearwater	0	0	0	1	2	3	1	2	3
Black petrel	0	0	0	1	1	2	1	1	2
Grey-faced petrel	0	0	0	2	0	2	2	0	2
Australasian gannet	0	0	0	1	0	1	1	0	1
Buller's shearwater	0	1	1	0	0	0	0	1	1
Giant petrel	0	0	0	0	1	1	0	1	1
Light-mantled sooty albatross	0	0	0	1	0	1	1	0	1
Little shearwater	0	0	0	1	0	1	1	0	1
Prion (unidentified)	0	1	1	0	0	0	0	1	1
Pied shag	0	0	0	1	0	1	1	0	1
Southern royal albatross	1	0	1	0	0	0	1	0	1
Wandering albatross	0	0	0	0	1	1	0	1	1
MARINE REPTILES									
Leatherback turtle						1	0	1	1

Table 5. Estimates of the number of protected species caught per 1000 tows or 1000 hooks

No caught per 1000 tows	HOK	SBW	HAK	SQU	ORH	SCI	JMA
-							
MARINE MAMMALS							
Common dolphin							153.1
NZ fur seal	27.6	40.1		7.3	2.2	2.7	
NZ sea lion		2.9		9		8	
Total	27.6	43.0	0.0	16.3	2.2	10.7	153.1
SEABIRDS							
Total	26.7	5.7	85.7	130.2	7.7	8.0	0.0

No caught per 1000 hooks	CT	DT	DSL	ISL	SNA1
MARINE MAMMALS					
NZ fur seal	0.0112	0.0825			
Total	0.0123	0.0852	0.0002		
SEABIRDS					
Total	0.0505	0.0577	0.0126	0.0244	0.0293
MARINE REPTILES					
Leatherback turtle		0.0027			
Total		0.0027			

Notes:

- HOK: hoki, SBW: southern blue whiting, HAK: hake, SQU: squid, ORH: orange roughy, SCI: scampi, JMA: jack mackerel
- CT: Charter Tuna, DT: domestic tuna, DSL: deep sea ling, ISL: inshore ling, SNA1: snapper 1