Conservation Services Annual Plan 2005/2006

Conservation Services Programme
Marine Conservation Unit
Department of Conservation
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Statement on Conservation Services

The Fisheries Act 1996, defines conservation services as "outputs produced in relation to the adverse effects of commercial fishing on protected species, as agreed between the Minister responsible for the administration of the Conservation Act 1987 and the Director-General of the Department of Conservation, including –

a) research relating to those effects on protected species
b) research on measures to mitigate the adverse effects of commercial fishing on protected species:
c) the development of population management plans under the Wildlife Act 1953 and the Marine Mammals Protection Act 1978."

I am satisfied that the projects identified in this Plan are "conservation services" as defined in the Fisheries Act 1996.

Part 14 of the Fisheries Act 1996 enables the Crown to recover its costs with respect to conservation and fisheries services. Cost recovery must be undertaken in accordance with principles outlined in s.262 of the Fisheries Act 1996. Section 263 of the Fisheries Act 1996 sets out procedures for promulgating cost recovery rules. On 10 September 2001 the Governor-General pursuant to section 263 made the Fisheries (Cost Recovery) Rules 2001, which provides for the apportionment of costs of conservation services as follows:

a) Research relating to protected species populations where risk to those populations by human intervention has been estimated - percentage of costs to be borne by industry is calculated using the formula: A over B, expressed as a percentage, where-
    - *A is the risk to the populations posed by commercial fishing in the EEZ of New Zealand*
    - *B is the total risk of human interventions on the populations*
b) Research relating to protected species populations where risk to those populations by human intervention has not been estimated - 50% of costs to be borne by industry.
c) Services (including research) provided to avoid, remedy, or mitigate that portion of the risk to, or adverse effect on, the aquatic environment or biological diversity of the aquatic environment caused by commercial fishing - 100% of costs to be borne by industry.
d) Observer coverage to support stock assessment process and conservation services - 100% of costs to be borne by industry.
e) Aquaculture services - 100% of costs to be borne by industry.

After consultation with 'interested parties', which includes representatives of commercial fisheries, non-government organisations and Maori, I hereby approve the attached Conservation Services Annual Plan 2005/06.

Hon Chris Carter
Minister of Conservation

Director-General's Introduction

Conservation services are outputs produced in relation to the adverse effects of commercial fishing on protected species, as agreed by the Minister of Conservation and the Director-General of the Department of Conservation.

The Office of the Auditor-General reviewed the administration of the Conservation Services Programme and published its findings in December 2002 and completed a follow up audit in February 2005. The process followed in the development of this Conservation Services Annual Plan and elements of the contents of the Plan reflect many recommendations made by the Auditor-General.

The Department of Conservation has prepared a Conservation Services Strategic Plan that will provide a long term direction for future conservation services. It has commenced working with the Ministry of Fisheries to develop a research plan to assist the implementation of the National Plan of Action to Reduce the Incidental Catch of Seabirds in New Zealand Fisheries. This will provide clarity in terms of research needs and departmental responsibilities

The New Zealand seafood industry has made significant gains in reducing its impact on marine protected species and, in many ways, sets an example to those other countries whose vessels and people fish the Tasman Sea and the Southern and Pacific Oceans. This has been due in no small part to the commercial fishing industry, the Conservation Services Programme, the Ministry of Fisheries, Southern Seabird Solutions, and others. I am confident that the conservation services provided through this Annual Plan will contribute to enhancing the sustainability of commercial fishing in New Zealand waters and contribute to the better protection of New Zealand's seabirds and marine mammals .

Hugh Logan
Director-General of Conservation

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1. Overview of the 2005/2006 Conservation Services Annual Plan

1.1. *Introduction*

The 2005/2006 Conservation Services Annual Plan (Annual Plan) identifies the work that will be subject to cost recovery as a conservation service from the commercial fishing industry. As such, the Annual Plan forms the basis for levying the commercial fishing industry under the Fisheries Act 1996. A summary of the legal basis of the Plan "Legislation and Guidelines used for the Formulation of this Plan" is appended (Appendix Three)[1].

1.2. *Context*

The Ministers of Conservation and Fisheries have now approved the *National Plan of Action to Reduce the Incidental Catch of Seabirds in New Zealand Fisheries* (NPOA). It is clear that many of the objectives of the NPOA are aligned with those of the Conservation Services Programme. The NPOA provides specific mechanisms for the identification and delivery of research and other projects, i.e. the Officials and Technical Working Groups.

Two goals set the overall direction of the NPOA. They are:

1. To ensure that the long-term viability of protected seabird species is not threatened by their incidental catch in New Zealand fisheries waters or by New Zealand flagged vessels in high seas fisheries; and
2. To further reduce incidental catch of protected seabird species as far as possible, taking into account advances in technology, knowledge and financial implications.

The Department of Conservation's *Marine Mammal Action Plan* (MMAP[2]) provides a guide for conservation actions for New Zealand's marine mammals. Key objectives of the MMAP are:

- Mortality assessment: To monitor and assess the magnitude and significance of marine mammal fishing-related mortality in New Zealand waters;
- Mortality minimisation: To prevent, mitigate, and minimise marine mammal fishing-related mortality, taking a precautionary approach to conserving species where information is sparse or lacking.

The Ministry of Fisheries and the Department of Conservation have commenced the development of a joint research plan that identifies research needs to assist the implementation of the seabird NPOA research plan. Both of the NPOA and the MMAP will inform the development of future Conservation Services Annual Plans. Many fisheries have produced or will soon produce codes of practice under the seabird NPOA. These codes will identify how industry performance will be monitored and it is hoped that these or other documents will identify industry proposals and commitments for research. This will enable better integration of government research with that by industry.

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[1] More detail is provided in the draft *Conservation Services Strategic Plan 2005-2010*.

[2] Suisted, R and Neale, D. (2004). *Department of Conservation Marine Mammal Action Plan for 2005-2010.* Department of Conservation, Wellington.

The development of the draft Annual Plan 2005/06 has been informed by:

- the draft *Conservation Services Strategic Plan 2005-2010*;
- the draft *Conservation Services Five-year Research plan 2005-2010*; and the
- *Conservation Service Programme, Department of Conservation and Fisheries Research Services, Ministry of Fisheries Proposed Seabird Projects 2005/06*.

All seabird projects in this Annual Plan were considered at a special meeting of the NPOA Technical Working Group and a subsequent meeting of the NPOA Officials Group.

1.3. *Format*

The format used to specify the conservation services is similar to that adopted in the last Annual Plan and is consistent with that adopted for seabird projects by the Ministry of Fisheries. It includes an outline of the objectives and rationale for each project, and a summary of key policy provisions that have informed the selection of the project. The outputs that are anticipated to be produced by the 2005/2006 projects are also specified.

The project specifications provide cost recovery information including: project costings, identification of the relevant provisions within the Fisheries (Cost Recovery) Rules 2001 that have been used to determine cost allocation, and the identification of fish stocks from which cost will be recovered for each project. These are summarised in Appendix One. All financial amounts appearing in this document are exclusive of GST.

1.4. *Administration Support*

Current staffing within the Conservation Services Programme comprises: one manager, two scientific officers, one briefing officer, and administration support (0.3 FTE[3]).

The table below summarises the research and administrative costs of all projects in a similar fashion to that specified in the 2004/05 Annual Plan. Conservation Services Programme staffing and administration costs have been allocated to different projects primarily in relation to where staff effort is directed. Hence, briefing officer (0.75 FTE) and scientific officer (0.9 FTE) time and costs are included in "observer project operations", while relevant management and administration support is listed in "observer project administration". Remaining costs (including that of the scientific officer leading non-observer projects) have been shared across the remaining projects in proportion to the cost of the project.

[3] Full-time equivalent staff time.

The salary, administrative and overhead costs are made up by the following:

Item	Fisheries Interaction Projects Operations	Fisheries Interaction Projects Administration	Other projects	Total
Total salaries	$112,014	$56,703	$142,707	$311,424
Accommodation, services, and computing	$32,133	$11,320	$33,004	$76,457
Total	**$144,147**	**$68,023**	**$175,711**	**$387,881**

1.6 Conservation Services Levy

The details of the conservation services levy are provided in tables in Appendix One. These details will be used to derive the provisional levies. For clarification: the Minister of Conservation is responsible for approval of the Conservation Services Annual Plan; the Minister of Fisheries is responsible for the actual levying of the costs in accordance with this Plan, once approved.

1.7 Consultation processes

The following processes and documents contributed to the development of the present Annual Plan:

14 September 2004	Draft Strategic Plan and draft Five-year Research Plan released to stakeholders.
6 October 2004	Workshop on draft Strategic Plan and non-seabird elements of draft Five-year Research Plan.
21 October 2004	Joint Ministry of Fisheries (MFish) and Department of Conservation (DOC) seabird research projects released to stakeholders.
28 October 2004	Meeting to discuss the MFish / Conservation Services Programme (CSP) seabird projects.
22 December 2004	Draft 2005/2006 Conservation Services Annual Plan released to stakeholders.
25 February 2005	Stakeholder submissions on the draft Annual Plan closes.
8-29 March 2005	Meetings with stakeholders to discuss submissions and for CSP to seek clarification and respond to matters raised.
9 March 2005	Summary of submissions sent to stakeholders.
24 March 2005	Changes to sea lion population study (POP 2005/01) emailed to all stakeholders.
13 April 2005	Meeting with industry representatives to discuss cost allocation of projects to fisheries.

Further steps:

15 April 2005	*Final 2005/2006 Conservation Services Annual Plan forwarded to Minister of Conservation.*
22 April 2005	*Comments on proposed changes to sea lion project closed.*
26 April 2005	*Confirmation of sea lion population study (POP 2005/01) submitted to Minister of Conservation.*
2 May 2005	*Minister of Conservation advises Minister of Fisheries about details of the 2005/2006 Conservation Services Annual Plan for levy purposes.*

2. Projects

2.1. *Fishing interactions*

2.1.1. Purpose

The purpose of the fishing interactions projects is to:

- Undertake research into the nature and extent of commercial fishing interactions on individuals of protected species in New Zealand waters.

2.1.2. Background

Understanding the nature and extent of interactions between commercial fisheries and seabirds is the foundation of the Conservation Services Programme. This information can identify where the most significant interactions are occurring and can propose ways to minimise adverse effects. It will also monitor the effectiveness of government and industry initiatives, such as the seabird National Plan of Action. Over the last few years the interactions with some fisheries have become well understood, although rarely quantified. Interactions with other, especially inshore, fisheries are less well understood.

Research into fishing interactions includes investigations of direct and indirect adverse effects. Direct impacts on individuals of species include mortality following interactions with fishing equipment such as trawl nets and warps, longlines or set nets. Commercial fishing may also have indirect effects on protected species. "Indirect effects" include adverse impacts on individuals or populations of protected species other than incidental mortality. Indirect effects may occur where fishing:

- Depletes the food of protected species;
- Modifies habitat important for all or part of the life cycle of the protected species; and
- Modifies the behaviour of protected species.

Direct impacts may represent a more tangible adverse impact for many protected species populations than indirect effects, in which case research into indirect effects will be a secondary priority. However, for some species indirect impacts may represent a significant impact on the population over time and therefore represent an equal or greater priority.

2.1.3. Policy guidance

An objective of the NPOA[4] is to ensure that there is sufficient reliable information available for the effective implementation and monitoring of management measures. In particular, information will be required on:

- The interaction of seabird species with fisheries, including the level of incidental catch, so that decisions can be made about appropriate management measures;
- Compliance with management measures, to enable corrective action to be taken where necessary; and
- The effectiveness of the management measures in achieving the goals and objectives of the NPOA.

[4] NPOA section 4.5.2: Information gathering.

Specific research initiatives proposed in the NPOA include[5]:

- Evaluating the current research programme to determine whether it provides the most effective and efficient method of determining the nature and extent of incidental catch for the purposes of the NPOA;
- Designing an ongoing programme of analysis that uses up-to-date information on incidental catch to inform fisheries management, with potential to allow for in-season bycatch limits for high-priority species;
- Undertaking research into the levels of observer coverage needed across different fisheries to achieve target levels of estimation of incidental catch;
- Investigating alternative options for gathering information on incidental catch, such as electronic monitoring; and
- Designing and undertaking a research programme to determine the nature and extent of incidental in the group of fisheries defined as 'Other Fisheries'.

Relevant actions identified in the MMAP[6] include:

- Develop procedures for the thorough documentation of reported fishing-related deaths, to contribute to an understanding of when and why the incident occurred;
- Continue to return for necropsy dead marine mammals that are suspected to have died as a result of fishing;
- Produce annual status and summary reports of the known interactions between marine mammals and fisheries;
- Establish or improve monitoring of set net and trawl fisheries to enable statistically robust estimates of fishing-related mortality.

The Conservation Services Strategic Plan provides that the Observer Project will seek to:

- Provide a baseline level of observation of fisheries where interactions are thought to be generally identified;
- Enhance observations in fisheries where observations have not been undertaken historically or, where understanding of interactions has not yet been obtained;
- Gather data that will facilitate understanding of the nature of fisheries interactions and lead to the development of mitigation techniques; and
- Support the development and testing of mitigation techniques, and the assist in the evaluation of the effectiveness of mitigation methods[7].

The draft Conservation Services Strategic Plan encourages the self-reporting by fisheries of their interactions with protected species[8].

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[5] Section 4.5.3.2 Nature and Extent of Incidental Catch. This section also proposes research on high seas and recreational fisheries, but these are beyond the scope of the Conservation Services Programme. Note that some monitoring of recreational setnetting is proposed in conjunction with commercial setnetting, although this will be funded from the Crown contribution.

[6] Section 3.1.

[7] Policy 12 (d).

[8] Policy 12 (e).

The draft Strategic Plan[9] states that research into the indirect effects of commercial fishing on a protected species will be considered where:

a) Indirect effects may be affecting one or more species populations that are interacting with fisheries in a similar way, or through alteration of habitat/food availability; and

b) The population/s is exhibiting signs of chronic adverse effects; and

c) Research does not duplicate that undertaken by the Ministry of Fisheries.

[9] Policy 13.

2.1.4. INT 2005/01: Observing offshore fisheries

Objectives:

1. To identify, monitor and, where possible, quantify[10] protected species interactions with commercial offshore fisheries;
2. To identify possible means for mitigating the incidental mortality of protected species;
3. To collect biological information on the incidental mortality of protected species that will assist assessing mitigation techniques; and
4. To assess the adoption of mandatory and other reporting of the incidental mortality of protected species.

There is no exact definition for "Offshore fisheries" but generally these are deepwater fisheries conducted offshore. They tend to be characterised as much by vessel size as fishing location. These vessels tend to be greater than 20m in length. The fisheries included in this project are identified in Table 2.

Term of project: Ongoing (reviewed annually)

Rationale

Information on fisheries interactions with protected species can be obtained through:

- Fishery-dependent surveys, e.g. self-reporting, such as current requirements for fishers to report the death or injury of protected species through non-fish bycatch forms
- Fishery-independent surveys, e.g. chartering fishing vessels for research
- Observer programmes utilising observers during normal fishing operations

Overall, the most accurate and reliable means to get protected species bycatch data is through the use of human observers. Data accuracy and relevance can be affected by observer skill, weather conditions and access to vessels, while precision is affected by the observer sampling design. Data quality may also be biased by the opportunistic allocation of observers on vessels, as it is not always possible to place observers on vessels randomly, as some operators will resist the placement of observers, or it may be biased due to either budget or logistical constraints of an observer programme.

Observer programmes typically have high spatial and temporal variation, making the data difficult to interpret and extrapolate to get actual bycatch rates by fishery, location, or other desired variables. All countries with fishery observer programmes have similar difficulties with estimating total bycatch rates from relatively small subsamples, difficulties which would be greatly overcome if data coming back from fishers in the form of logbooks and/or non-fish bycatch forms could be relied upon as a genuine data source.

To date, the bulk of publicly available information of at-sea interactions between fishing vessels and protected species in New Zealand waters has been collected by government (Ministry of Fisheries) observers. It is anticipated that in the future, the fishing industry will collect an increasing portion of this information, especially through codes of practice mandated by the seabird NPOA. This may be a more cost-effective way to collect information and will generate information in areas that have historically been information-

[10] Reporting on quantified estimates of seabird mortality is the responsibility of Ministry of Fisheries (project ENV 2005/01).

poor. The accuracy of this information will need to be assessed through government and/or third party auditing.

The Baseline Observer Services Project involves the collection of a considerable amount of data that are linked or closely aligned with that collected and/or held by the Ministry of Fisheries and the National Institute of Water and Atmospheric Research (NIWA). The following data management issues are being addressed:

- Clearer specifications of information needs (rather than observer seadays) to observer providers including Ministry of Fisheries Observer Services;
- Alignment and possible integration of protected species datasets held by the Conservation Services Programme, Ministry of Fisheries and NIWA in terms of:
  - consistent formats
  - streamlined data entry;
- Improvements in the way that qualitative observer debriefing data are stored; and
- Improved reporting.

Methods

The Conservation Services Programme will continue to purchase baseline services from Ministry of Fisheries Observer Services given the scale of the operation, which allows observers to be placed strategically across all key New Zealand fisheries, and because the sharing of observer costs with other clients (e.g. Ministry of Fisheries Fisheries Management) can significantly reduce costs. No other service provider is able to generate these benefits. However, it may be appropriate to utilise alternative providers in short-term surveys (see next project INT 2005/02).

Observer seadays will be allocated in relation to:

- Historical mortality of protected species;
- Past observer coverage;
- The status of particular threatened protected species; and
- Current level of information.

Observer coverage has been targeted based in part on *Design guidance for a protected species observer programme*[11] (Note that this is report is still in draft form and is currently being edited by the authors with feedback provided from stakeholders), and on past observer allocation and bycatch of protected marine species. Details are shown in Table 1 and Table 2.

Note that observer seadays in the SQU6T squid trawl fishery are delivered through Ministry of Fisheries project OBS2005/04 to support the operational plan for that fishery.

Efforts will focus on vessel types with high catches of species ranking highly in the priority system[12]. As the Observer Project generates considerable information of value for fisheries management, Ministry of Fisheries staff will be closely involved in allocating observer seadays and identifying information needs.

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[11] Fletcher, D. and Manly, B. (2004). Guidelines for design of a protected species observer programme. Draft report for Conservation Services Programme, Department of Conservation.

[12] A relatively small proportion of vessels catch the majority of seabirds (Robertson, CJR, Bell, E, and Scofield, P (2004). Autopsy report for seabirds killed and returned from New Zealand fisheries 1 October 2001 to 30 September 2002. DoC Science Internal Series 155.

Information collected[13] includes:

- Type and position of vessel;
- Environmental conditions (e.g. sea state);
- Fish species being caught;
- Fishing methods (including a description of gear employed) and operations;
- Waste management practices
- Abundance and behaviour of protected species in vicinity of vessel;
- Mitigation practices adopted;
- Knowledge and approach of crew; and
- Interactions between protected species and fishing gear (e.g. using the warp strike protocol).

Application

Details of the application of coverage are shown in Table 1 and 2.

Offshore demersal longline fisheries: Previous data collected through the observer project have revealed that deep sea ling longliners have killed significant numbers of white-chinned petrels, and Salvin's and sooty albatrosses. The industry has responded to higher levels of observer coverage and an earlier unfortunate incident involving the deaths of a large number of white-chinned petrels, through trials of integrated weighted lines, double tori lines, and side-setting. The impacts of these mitigation methods will need to be monitored, although less effort needs to be invested.

Pelagic tuna longline fisheries: Charter tuna vessels have historically had high captures of seabirds (including a variety of albatrosses and petrels[14]) but more extensive observer coverage and the adoption of a code of practice has substantially reduced incidental mortality. A reduced level of surveillance will be retained. The domestic tuna fishery is observed through project OBS 2005/02.

Deep water trawl fisheries: Hoki is a substantial fishery with a significant mortality of fur seals, an issue being addressed by the Hoki Fisheries Management Company, in part through its Marine Stewardship Council certification requirements. The impacts of squid trawlers on endangered NZ sea lions are of particular concern and a maximum allowable level of fishing related mortality has been set for the Auckland Islands squid fishery. The Ministry of Fisheries is monitoring interactions with protected species in this fishery as part of the implementation and monitoring of an operational plan.

Recent investigations have shown that seabirds, especially larger birds, are at risk from interactions (e.g. death, injuries) with trawl warps. This project will work with fishing industry initiatives to monitor the performance of newer mitigation devices, especially "bird bafflers" and offal management techniques.

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[13] Data needs are currently being reviewed by the Conservation Services Programme and the Ministry of Fisheries.

[14] Baird SJ (2001) Estimation of the incidental capture of seabird and marine mammal species in commercial fisheries in new Zealand waters, 1999-00. Draft New Zealand Fisheries Assessment Report 2001, December 2001.

The southern scampi fishery interacts with pinnipeds and seabirds around the subantarctic islands, with three pinnipeds and three seabirds observed caught in 2003/04. There are also potential interactions between the east coast North Island scampi fishery and seabirds including Chatham Islands mollymawk.

A particular focus in 2005/06 will be to monitor the impacts of deepwater trawls on red and black corals.

Shallow water trawl fisheries: The capture of 17 dolphins by three vessels trawling for jack mackerel west of Auckland in November 2004 is of concern, not only as it is a high level of bycatch but also due to the proximity of this fishery to Maui's dolphins[15]. The project will also monitor the interactions between the southern blue whiting fishery and southern pinnipeds, including leopard and elephant seals.

Purse seine fishing: While the tuna and other purse seine fisheries are not large, there have been past seabird and dolphin mortalities, and therefore monitoring is needed.

Outputs

There is a particular focus in 2005/06 of increased reporting of findings. To this end, observer briefing and debriefings will be optimised, and increased resources will be directed towards analysing and reporting the findings of this project. Specific outputs are:

- All seabirds are returned for identification and autopsy[16] (see project INT 2005/03: Seabird autopsy).
- An Annual Report will describe the allocation of seadays and summarise incidental mortalities in key fisheries.
- Situation Alerts will be circulated to companies with vessels in the vicinity of incidents involving significant mortalities of protected species, including advice regarding mitigation measures. These will be followed up with written Occurrence Reports.
- Technical reports will investigate relationships between the key factors affecting incidental mortality. In 2005/06, the focus will be on those vessels that have particularly high and low rates of mortality to identify practices that increase or reduce incidental mortality.
- Data will be used by Ministry of Fisheries as part of Ministry of Fisheries project ENV 2005/01.

Cost Recovery

- Fish stock: Fisheries to be levied are identified in Table 3.
- F(CR) Rules Item 8 (100% industry)
- Project Costing: $527,943

In 2005/06 the Conservation Services Programme and the Ministry of Fisheries have agreed to allocate costs to the Programme in approximate relationship to the services received, broadly as follows:

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[15] While the probability of capture is low, the consequences of the death of even a few Maui's dolphins would be significant.

[16] Few marine mammals are returned (e.g. Hector's and Maui's dolphins, age-tagged marine mammals, and rare marine mammals). Sea lions captured in the SQU 6T fishery through Ministry of Fisheries project OBS2005/04) are processed by the Ministry of Fisheries.

- Fisheries for which only the Conservation Services Programme (not industry or the Ministry of Fisheries) requires observer coverage: Conservation Services Programme pays 100%.
- Longline fisheries, in which the Conservation Services Programme observer needs to observe close to 100% of hooks: Conservation Services Programme pays 20% (where the observer can spend the other 80% meeting Ministry and industry needs).
- Trawl fisheries for which Conservation Services Programme has a particular interest: 20% (where the observer can spend the other 80% meeting Ministry and industry needs).
- Other trawl fisheries: 10%.

Table 1 Observed fishing days for fishing year 2003/2004 and notes on CSP observer allocation for 2005/2006

Target	Fishing days (2003/04)[1]	Fishing days observed (2003/04)[1]	% fishing days observed (2003/04)	Comment on CSP targets for coverage level and primary protected species information [2]
Charter tuna	370	366	99%	50% target for foreign fleet coverage
Deep sea ling	616	209	34%	30% target for seabird interactions
Domestic tuna	4976	200	4%	See details INT2005/02
Hake	732	35	5%	15% target for seabird interactions
Hoki	7124	827	12%	15% target for marine mammal interactions
Inshore ling	1503	19	1%	See INT2005/02
Jack mackerel	731	32	4%	50% target for marine mammal interactions
Longline Snapper	6787	140	2%	See INT2005/02
Orange roughy	2131	269	13%	25% target for protected species interactions
Oreo	727	11	2%	30% target for protected species interactions
Purse Seine	0	0	0%	For protected species interactions
Scampi	1467	138	9%	10% target for marine mammal interactions
Setnet	0	0	0%	See INT2005/02
Southern blue whiting	266	198	74%	30% target for marine mammal interactions
Squid	3522	700	20%	Not levied by CSP in 2005/06. See MFish OBS2005/04 for details

Notes:
[1] Estimates provided by MFish.
[2] The primary protected species of interest is identified here but obviously CSP is interested in collecting information on all protected species interactions in these fisheries.

Table 2 Allocation of observer sea days and costs in offshore fisheries

Fishery	Proposed Mfish observer days 05/06 [1]	No. Of CSP days	Target coverage	% of day required[3]	CSP effective days	Rate/day	At-sea cost	Staff cost	Admin	Total
Charter tuna [2]	300	185	50%	20	37	$500	$18,500	$5,489	$2,303	$26,292
Deep sea ling [2]	325	185	30%	20	37	$500	$18,500	$5,489	$2,303	$26,292
Hake	30	110	15%	20/100	86	$500	$43,000	$12,759	$5,352	$61,111
Hoki [2]	1380	1069	15%	20	214	$500	$107,000	$31,748	$13,319	$152,067
Jack mackerel	285	366	50%	20/100	138	$500	$69,000	$20,473	$8,589	$98,062
Orange roughy	320	320	25%	10	32	$500	$16,000	$4,747	$1,992	$22,739
Oreo	350	218	30%	10	22	$500	$11,000	$3,264	$1,369	$15,633
Purse seine	69	69	[4]	20	14	$500	$7,000	$2,077	$871	$9,948
Scampi [2]	0	147	10%	100	147	$500	$73,500	$21,808	$9,149	$104,457
Southern blue whiting	260	80	30%	20	16	$500	$7,980	$2,368	$993	$11,341
Squid [2]	960	0	See Ministry of Fisheries project							
Total	**4279**	**2749**			**743**		**$371,480**	**$110,223**	**$46,240**	**$527,942**

Notes:
[1] Estimates provided by MFish as of 6 April 2005. Potentially subject to change by MFish.
[2] Fishery defined in the NPOA as a "Fishery with known seabird interactions".
[3] CSP days ≤ MFish days are charged at 20% of full daily rate. CSP days > MFish days are charged at 100% of full daily rate (e.g. hake & jack mackerel)
[4] There has been little observer effort in this fishery, and CSP is sharing observer time with MFish to provide information about protected species interactions.

- "No. of CSP days" indicates the number of observer days required, of which "% of day required" indicates the percentage of each day required for CSP work. The combination of these two generates "effective days" which is the effective number of days to be levied for.
- "Staff costs" are the costs of the science and briefing officers. "Administration costs" are the proportion of the Conservation Services Programme administration costs charged to the Observer Project.

2.1.5. INT 2005/02: Observing inshore fisheries

Objectives:

1. To identify, monitor and, where possible, quantify[17] protected species interactions with commercial inshore fisheries;
2. To identify possible means for mitigating the incidental mortality of protected species;
3. To collect biological information on the incidental mortality of protected species that will assist assessing mitigation techniques; and
4. To assess the adoption of mandatory and other reporting of the incidental mortality of protected species.

There is no exact definition for "Inshore fisheries" but generally these are shallow water fisheries conducted in inshore waters. They tend to be characterised as much by vessel size as fishing location. These vessels tend to be less than 20m in length.

Term of project: 2005/06 (likely to be extended two further years in some fisheries)

Rationale

In the past, observer placement has tended to be driven by fisheries management and science objectives. This has resulted on a focus on large vessel, deepwater fisheries, with relatively little coverage of inshore fisheries. Small, inshore vessels are particularly problematic for placing observers. We have little historical information on snapper, inshore ling and domestic tuna longliners (e.g. small, New Zealand owned and operated vessels) and inshore setnet and trawl fisheries, primarily due to the difficulty in placing observers on these vessels. Data is urgently needed so that a proper assessment of the effects of these fisheries on seabird and marine mammal bycatch can be made. Seabirds caught in the domestic pelagic tuna fishery include black petrels, Campbell albatrosses and flesh-footed shearwaters.

Some of the difficulty in placing observers has been related to the small size of the vessels and the weather dependence of the fisheries. Cooperation by longline snapper fishers has enabled more observers to be placed in 2003/04 than previously. Nevertheless, observer placement is problematic and expensive.

The Observing Inshore Fisheries project involves the collection of a considerable amount of data that are linked or closely aligned with that collected and/or held by the Ministry of Fisheries and NIWA. The following data management issues are being addressed:

- Clearer specifications of information needs (rather than observer seadays) to observer providers including Ministry of Fisheries Observer Services;
- Alignment and possible integration of protected species datasets held by the Conservation Services Programme, Ministry of Fisheries and NIWA in terms of:
  - consistent formats
  - streamlined data entry; and
- Improvements in the way that qualitative observer debriefing data are stored.

The Conservation Services Programme will review data management, linking in with the Ministry of Fisheries Observer Information Strategic Plan.

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[17] Reporting on quantified estimates of seabird mortality is the responsibility of Ministry of Fisheries (project ENV 2005/01).

Methods

- The Conservation Services programme will work with the Ministry of Fisheries and/or private observer companies, commercial fishermen's associations, and fishing companies to facilitate the placement of observers on inshore vessels.
- Observers are to be based in key ports, on-call to gain access to vessels at short notice.
- Observers will not be placed in fisheries where fishing companies provide alternative means to obtain the required information (e.g. audited electronic monitoring or observer services).
- Non-commercial fishing will be monitored (using non-levied funds from the Crown contribution) where this uses similar methods in similar areas to the studied fisheries.

Information to be collected[18] includes:

- Type and position of vessel;
- Environmental conditions (e.g. sea state)
- Fish species being caught;
- Fishing methods (including a description of gear employed) and operations;
- Waste management practices
- Abundance and behaviour of protected species in vicinity of vessel;
- Mitigation practices adopted;
- Knowledge of, and attitudes to, protected species; and
- Interactions between protected species and fishing gear (e.g. using the warp strike protocol).

Application

Details of the application of coverage are shown in Table 1 and 3.

Longline fisheries: We have little historical information on snapper and inshore ling longliners, primarily due to the difficulty of placing observers on these vessels. Data is urgently needed so that a proper assessment of the effects of these fisheries on seabird bycatch can be made. Birds caught include a variety of petrels and shearwaters[19]. The Conservation Services Programme advisory officers have been promoting the adoption of practices to reduce seabird mortality in the snapper fishery[20], but this does not replace the need to have observers on these boats. The results of the snapper and inshore ling observer projects are to be reviewed after the 2004/05 season.

Marine protected species interactions with the domestic pelagic tuna fishery are still relatively unknown. Birds caught include black petrels, Campbell albatrosses and flesh-footed shearwaters[21]. More data are urgently required, but this is difficult as the fishery mainly involves small vessels, which may reduce in numbers as tuna comes into the QMS.

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[18] Data needs are currently being reviewed by the Conservation Services Programme and the Ministry of Fisheries.

[19] Conservation Services Programme unpublished data.

[20] The snapper advisory officer will finish in April 2005 using previously levied funds.

[21] Baird (2001).

Set netting: Information has previously been obtained on commercial set net interactions with Hector's dolphins from the Banks Peninsula and Kaikoura areas. During the 2004/05 summer, information is being collected on interactions with Maui's dolphins (west coast North Island – much of this commercial fishery is currently closed) and yellow-eyed penguins (southern South Island).

Inshore Trawl fisheries: Inshore trawlers may have lower impacts on marine protected species and are not a focus during 2005/06, however, inshore trawling will be researched by CSP staff and on-call observers may be asked to observe inshore trawlers during 2005/06 (Table 3). Inshore trawling will be a priority for the 2006/07 CSP plan.

Outputs

- An Annual Report will describe the allocation of seadays and summarise incidental mortalities in key fisheries. This report will guide the implementation of the seabird NPOA.
- Situation Alerts will be circulated to companies with vessels in the vicinity of incidents involving significant mortalities of protected species, including advice regarding mitigation measures. These will be followed up with written Occurrence Reports.
- Technical reports will investigate relationships between the key factors affecting incidental mortality.
- Data will be used by the Ministry of Fisheries as part of project ENV 2005/01

Cost Recovery

- Fish stock: Observer programmes will focus on the following areas and fisheries: Northwest South Island setnet (MFish Statistical Areas 034-036), southeast South Island setnet fisheries (MFish Statistical Areas 024-026), East Coast North Island domestic tuna, and North-east North Island snapper longline. Fisheries to be levies are identified in Table 3.
- F(CR) Rules Item 8 (100% industry)
- Project Costing: $248,708. Estimates for this work will be revised following consideration of results for inshore observer work for the 2004/05. Non-commercial fishing will be monitored by an extension to the levied component from a Crown contribution of $10,000.

Table 3 Allocation of observer effort and costs in inshore fisheries

Fishery	Proposed MFish observer days 05/06 [1]	No. of CSP days	Target coverage	% of day required	CSP effective days	Rate/day	At-sea cost	Staff cost	Admin	Total
Domestic tuna [2, 3]	550	100	[4]	100	100	$500	$50,000	$14,836	$6,224	$71,059
Inshore ling [2, 3]	0	50	[4]	100	50	$500	$25,000	$7,418	$3,112	$35,530
Longline snapper [2, 3]	0	100	[4]	100	100	$500	$50,000	$14,836	$6,224	$71,059
Setnet [3]	0	100	[4]	100	100	$500	$50,000	$14,836	$6,224	$71,059
Total	**550**	**350**			**350**		**$175,000**	**$51,925**	**$21,783**	**$248,708**

Notes:
[1] Estimates provided by MFish as of 6 April 2005. Potentially subject to change by MFish.
[2] Fishery defined in the NPOA as a "Fishery with known seabird interactions".
[3] Inshore fisheries may be mixed across a variety of methods (e.g. long & bottom lining, trawling) and fisheries (e.g. bluenose, snapper, ling, tuna).
[4] There are not specific targets for coverage as project INT 2005/02 is designed to spread coverage across available vessels of different fisheries with a view to maximising coverage.

- "No. of CSP days" indicates the number of observer days required, of which "% of day required" indicates the percentage of each day required for CSP work. The combination of these two generates "effective days" which is the effective number of days to be levied for.
- "Staff costs" are the costs of the science and briefing officers. "Administration costs" are the proportion of the Conservation Services Programme administration costs charged to the Observer Project.

2.1.6. INT 2005/03: Seabird autopsy (Baseline monitoring)

Objectives:

1. To collect protected seabirds[22] incidentally taken in observed fishing operations for the determination of species, age (where possible), sex, reproductive status, stomach contents and general condition.
2. To establish a profile of those species caught incidentally in commercial fishing operations to identify potential types and causes of interactions and to detect trends.

Term of project:

- 1 October 2005 – 20 June 2007
- Sea birds recovered during the 2005/06 fishing year (1 October 2005 to 30 September 2006) are to be autopsied, with the final report to be produced by June 2007.

Rationale

Large numbers of seabirds frequent New Zealand commercial fishing waters. Birds with significant differences in conservation status can appear morphologically similar. Ministry of Fisheries observers on commercial vessels are not always able to identify seabirds at sea with high precision. Seabirds are returned for fine scale assessment and identification by experts to identify which species are being affected and thereby reflect the impact of commercial fisheries.

A key part of avoiding interactions between seabirds and fishing operations is to identify the factors that attract the birds to the operations. The examination of gut contents can assist in isolating these factors, and expert analysis can identify the cause of death. This information can be combined with factors such as vessel characteristics and the time and location of death, to indicate the type of interactions occurring between seabirds and fishing operations.

The National Plan of Action on Seabirds (NPOA) encourages the development of codes of practice including bycatch limits. The NPOA also highlights the need for ongoing research into the nature and extent of seabird bycatch. The results of this research will contribute to both these objectives.

Methods

Birds returned by official observers will be delivered, suitably packaged and labelled, to the contractor. To ensure compatibility of methods and data with previous autopsy programmes, the methods and definitions to be used are described in Bartle (2000) and used in previous reports[23].

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[22] Note that marine mammals will be autopsied through a Ministry of Fisheries project.

[23] Bartle, JA. 2000. Autopsy report for seabirds killed and returned from New Zealand fisheries 1 October 1996 to 31 December 1997. *Conservation Advisory Science Notes No. 293,* Department of Conservation, Wellington.

Robertson, CJR. 2000. Autopsy report for seabirds killed and returned from New Zealand fisheries 1 January 1998 to 30 September 1998. *Conservation Advisory Science Notes No. 294,* Department of Conservation, Wellington.

Robertson, C.J.R. & Bell, E. 2002a. Autopsy report for seabirds killed and returned from New Zealand fisheries 1 October 1998 to 30 September 1999. *DOC Science Internal Series 28,* Department of Conservation, Wellington.

Information collected includes:

- Species identification and classification[24];
- sex and age;
- subcutaneous fat score as an index of body condition;
- stomach and gizzard contents;
- moult and brood patch development as a partial indicator of breeding status; and
- general body condition including any signs of injury.

Outputs

- A report describing the characteristics of the seabirds returned by observers, identifying potential interactions between seabirds and fishing gear, and identifying factors that may have contributed to seabird mortality. Data will be presented by fishery according to target species and gear type.
- Data will be used by Ministry of Fisheries as part of project ENV 2005/01

Cost Recovery

- Fish stock: Costs allocated to those fisheries that have generated most of the seabirds recovered from observers and to fisheries with suspected impacts on seabirds but where observer coverage has been low. Fisheries levied are: HOK1, SBW6A, 6B, 6I, 6R, HAK1,4,7, ORH1,2,3, OEO1,3A,4,6; SCI2,3,4,6; JMA7; STN1, BIG1, YFN1; LIN 4,5,6A,6B; JMA1, EMA1, SKJ1, KAH1,2; LIN 1,2,3,7; SNA1; SCH3,5,7; SQU1T, 6T; SPO3,7; SPD3,5,7.
- F(CR) Rules Item 4 (100% industry)
- Project Costing: $114,634

Robertson, C.J.R. & Bell, E. 2002b. Autopsy report for seabirds killed and returned from New Zealand fisheries 1 October 1999 to 30 September 2000. *DOC Science Internal Series 29,* Department of Conservation, Wellington

Robertson, C.J.R., Bell, E. & Scofield, P. 2003. Autopsy report for seabirds killed and returned from New Zealand fisheries, 1 October 2000 to 30 September 2001. *DOC Science Internal Series 96.* Department of Conservation, Wellington

Robertson, C.J.R., Bell, E. & Scofield, P. 2004. Autopsy report for seabirds killed and returned from New Zealand fisheries, 1 October 2001 to 30 September 2002. *DOC Science Internal Series 155.* Department of Conservation, Wellington

[24] Cross-compatibility with the Ministry of Fisheries data codes for species will be maintained

2.2. *Population studies*

2.2.1. Purpose

The purpose of population studies is:

- To understand the key indicators of the performance of populations of marine protected species to contribute to the management of commercial fishing impacts on those species.

2.2.2. Background

Variations in an organism's life history characteristics lead to varying sensitivity to fisheries-related impacts on populations. Population studies can provide information to:

- Determine the maximum human-induced mortality that the populations can sustain;
- Help assess the effects of commercial fishing on populations of protected species, including the cumulative loss of individuals through incidental mortality as a result of direct commercial fishing interactions, and determine indirect impacts such as food competition, behaviour modification, and habitat modification; and
- Identify the range or distribution of protected species populations and the potential overlap with commercial fishing activities.

This research should contribute to the development of solutions to address adverse effects. While understanding the impact of the interactions on the total population is not a prerequisite for developing mitigation techniques, this information may be useful in informing priorities or providing the impetus for the development of mitigation measures. An understanding of the severity of the impact will guide the policy response.

While population studies are important for the management of threatened populations, in isolation these studies cannot confirm conclusively whether, or the extent to which, commercial fishing is having impacts, which can be isolated from other impacts, including natural events. Population studies do, however, provide important baseline information upon which management decisions are based and may lead to direct regulatory controls, such as limiting the numbers of protected species that can be potentially harmed through fishing.

2.2.3. Policy guidance

The seabird NPOA notes that research which monitors seabird populations will contribute to the implementation and enforcement of bycatch limits. It will also be used to assess the effectiveness of management measures and the overall effectiveness of the NPOA.

Specific research initiatives proposed by the NPOA include:

- Prioritising seabird species for population modelling;
- Designing and implementing population models and/or monitoring programmes for the top priority species to provide the necessary data to assess the impact of fishing on those populations;
- Evaluating the use of modelling techniques that allow for high-risk, but data-poor species to be managed;
- Undertaking population monitoring of top priority seabird species; and
- Providing annual progress reports to stakeholders on population monitoring programmes.

Relevant actions identified in the *Marine Mammal Action Plan*[25] include:

- Complete population management plans for Hector's/Maui's dolphins and NZ sea lion; and
- Continue to investigate options for addressing and mitigating fishing-related mortality in fisheries, including maximum allowable levels of fishing related mortality.

The draft Conservation Services Strategic Plan specifies that population studies will be undertaken on priority marine protected species where results, either:

- Assist in the development of population management plans; or
- Assist in implementation of the seabird National Plan of Action; or
- Assist in assessing the extent to which commercial fishing interactions causing an adverse effect on the protected species populations, or
- Assist in managing the effects of commercial fishing on protected species populations[26].

Priority species for population studies are specified in the draft Conservation Services Strategic Plan.

[25] Section 3.1.

[26] Policy 14.

2.2.4. POP 2005/01 The effects of fisheries interactions on the New Zealand sea lion

Background

The Minister of Conservation has requested a draft population management plan (PMP) proposing a MALFiRM to take effect from the 2005/06 fishing year and other management advice under the Marine Mammals Protection Act 1978. The PMP will not direct research (including monitoring) activities. However, future needs for, and objectives of, research relating to the New Zealand sea lion within the fisheries context will be strongly affected by the requirements of any PMP. Given that the Minister's assessment of management options is yet to be undertaken, CSP has set objectives and outputs for this project using the same criteria as for the other population projects in the Annual Plan and also giving consideration to the following assumptions:

1. The draft PMP has yet to be notified.

2. The draft Conservation Services Strategic Plan specifies that population studies will be undertaken on priority marine protected species where the results will assist in assessing the extent to which commercial fishing interactions are causing an adverse effect on protected species populations, or assist in managing the effects of commercial fishing on protected species populations.

3. The most likely way of addressing these issues is through population modelling approaches along the lines of the Breen-Kim and Wade models.

4. Data inputs for both of these models are well described and it is appropriate that ongoing sea lion modelling approaches should be based on the best available information including the most up to date data.

5. The minimum data inputs required for these models are (1) estimates of pup production for all colonies at the Auckland Islands and (2) estimates of parameters required in the model e.g. reproductive rate, survival rates.

It therefore follows that project POP 2005/1 will be required to provide information to aid in assessing the extent of adverse effect and managing the effects of commercial fishing.

Objectives

1. To characterise demographic parameters of the New Zealand sea lion population on the Auckland Islands, specifically to:
    - (a) measure pup production;
    - (b) determine survival of previously marked New Zealand sea lions;
    - (c) quantify reproduction by known-age female New Zealand sea lions;
    - (d) tag pups produced during the 2005/06 breeding season; and
    - (e) retain the ability to identify known-age New Zealand sea lions.

Status of the New Zealand sea lion

Conservation Status: Endemic species

IUCN[27] rank: Vulnerable (D2)[28]

DoC Threatened Species Classification[29]: Threatened[30].
Classified as a threatened species under S. 2 (3) of the Marine Mammals Protection Act 1978 on 31st July 1997

Breeding: Auckland Islands and Campbell Island, with a few births recorded on Stewart, Snares and the South Island[31].

Distribution: From Macquarie Island in the subantarctic to the Otago Peninsula, South Island in the north. Occasional sightings of mainly solitary animals have been made intermittently at other locations[32]. Sea lions travel long distances in often short time spans, and males have been recorded moving between breeding sites during the breeding season[33].

Population size: Estimated at 11 914 (94% CI: 10311-13669) in 2004 for the Auckland Island population, which is similar to that estimated in 1999 at 12 500 (95% CI: 10 500 – 14 000). The population estimate for South and Stewart Islands is about 170 adults including less than 10 females. Campbell Island had an estimated 385 pups born in 2003 (95% CI: 330 – 440), but no total population estimate has been calculated (Gales and Fletcher 1999, McConnell 2001, Wilkinson et al. 2003, Childerhouse et al. in press., unpublished, Chilvers unpublished).

Other threats: Between 1997/98 and 2003/04 there were three mass mortality events recorded at the Auckland Islands in which pup mortality increased from the expected 10% (Gales and Fletcher 1999) to an estimated 20 - 60%. Female mortality also increased during the 1997/98 event (Baker 1999, Wilkinson et al. 2003). New Zealand sea lions are subject to interactions with tourists at three main sites: Enderby Island, Otago Peninsula and the Catlins. The nature of this disturbance could become a more serious issue if breeding becomes more widespread and pupping sites are targeted by tourists. Effects of disturbance (harassment, shootings, clubbing, vehicles and dogs) may include habitat loss, injury and/or death to sea lions, and may threaten the

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[27] IUCN (2003). *2003 IUCN Red List of Threatened Species*. International Union for the Conservation of Nature.

[28] On the basis that it is a population characterised by an acute restriction in the number of locations (typically less than five). As such the taxon may be prone to the effects of human activities (or stochastic events whose impact is increased by human activities) within a very short time period in an unforeseeable future and is thus capable of becoming Critically Endangered or even Extinct in a very short time period (IUCN Red List of Threatened Species, Ver 2.3 1994).

[29] Hitchmough, R.A. (2002). New Zealand Threat Classification System lists, 2002. *Threatened Species Occasional Publication 23.* Department of Conservation..

[30] Range restricted, conservation dependent, stable, range restriction has been human induced.

[31] Cawthorn 1993, Gales 1995, Childerhouse and Gales 1998, McNally et al 2001, McConkey et al 2002.

[32] Gales 1995.

[33] Gales 1995, B. Robertson, unpubl.

establishment of new breeding locations on the mainland. In the past the presence of rabbits and their associated burrows on Enderby Island augmented pup mortality at this site. Feral animals have been eradicated or are no longer considered a concern.

Fishing threats: During the late 1970s a trawl fishery for squid was established around the Auckland Islands, which coincides with the pupping and lactating season of New Zealand sea lions resulting in incidental mortality. Sea lions are also occasionally caught in the subantarctic scampi and southern blue whiting trawl fisheries. The indirect effects of fishing have yet to be thoroughly quantified. These effects could include competition for food with fisheries, habitat degradation and prey depletion.

Recent observed bycatch: The Auckland Islands squid trawl fishery caught and killed an average of 57 sea lions per year between 1998 and 2002[34]. Recent estimates of sea lion mortality are shown below.

Fishing year	Estimated total fishing related mortalities in SQU 6T[35]	Other QMA fishing related mortality statistics[38,36]	Total estimated adult mortality as a direct result of fishing[38]	Other human non fishing induced mortalities[37]
2000-01	67	4	71	1
2001-02	84	3	87	1
2002-03	39	3	42	2
2003-04	118	0	118	3

Rationale

Since 1995/96, the Ministry of Fisheries has prepared an operational plan for this fishery that identifies the maximum fishing related mortality for New Zealand sea lions. The model on which this mortality limit was based[38] relied heavily on data collected by the Conservation

[34] Baird, S.J. (2003) *Phocarctos hookeri* (Hooker's sea lion): incidental captures in New Zealand commercial fisheries during 2000/01 and 2001/02. Presentation to the Ministry of Fisheries Aquatic Environment Working Group.

Wilkinson, I., Burgess, J., Cawthorn, M. 2003. New Zealand sea lions and squid: managing fisheries interactions on a threatened marine mammal. *In:* N. Gales, M. Hindell, R., Kirkwood (eds.) Marine Mammals. Fisheries, Tourism and Management Issues. CSIRO Publishing, Australia. pp. 192-207.

[35] Ministry of Fisheries Final Advice Paper 3 September 2004

[36] These figures are simply reports of the number observed kills rather than estimates of the total number killed

[37] From draft Population Management Plan for New Zealand sea lion. Department of Conservation.

[38] Breen, P.A. and Kim, S. W. 2003. Exploring alternative management procedures for controlling bycatch of Hooker's sea lions in the SQU 6T squid fishery. Final Research Report for Ministry of Fisheries Research Project MOF2002/03L Objective 3. National Institute of Water and Atmospheric Research.

Breen, P. A., Hilborn, R., Maunder, M. N. and Kim, S. W. 2003. Effects of alternative control rules on the conflict between a fishery and a threatened sea lion (*Phocarctos hookeri*). Canadian Journal of Fisheries and Aquatic Sciences 60: 527-541.

Services Programme. The use and application of the model was subject to Court proceedings in 2004[39].

Previous research has addressed diet[40], foraging energetics and behaviour[41], distribution, abundance and growth[42].

Methods

Field-based research and appropriate analysis.

Term of project

2005/06 for one year.

Outputs

- A technical report describing demographic parameters of the New Zealand sea lion population on the Auckland Islands. This report would guide fisheries management and determine the extent to which fisheries are impacting on the Auckland Islands New Zealand sea lion population. Technical information would be suitable for incorporation in population models or management plans.

Cost Recovery:

Fish stock: The Auckland Islands squid fishery catches the vast majority of sea lions. Fishery to be levied is SQU6T.

F(CR) Rules: Item 2 (90% industry, reflecting a preliminary risk assessment)

Project Costing: $305,689. Possibility for cost-sharing with other work on Auckland Islands. This project will be put out for tender.

[39] Squid Fishery Management Company Limited v. Minister of Fisheries & Anor. High Court CIV-2003-485-2706 France J & Squid Fishery Management Company Limited v. Minister of Fisheries & Anor 2004 CA39/04

[40] Childerhouse, S., Dix., B., Gales, N. 2001. Diet of New Zealand sea lions (*Phocartos hookeri*) at the Auckland Islands. *Wildlife Research* 28: 291-298.

[41] Costa, D.; Gales, N. 2000: Foraging energetics and diving behaviour of lactating New Zealand sea lions, *Phocarctos hookeri*. *The Journal of Experimental Biology 203*: 3655-3665.

[42] Childerhouse, S., Gibbs, N., McAlister, G., McConkey, S., McConnell, H., McNally, N., Sutherland, D. *in press*. Distribution, abundance and growth of New Zealand sea lion *Phocarctos hookeri* pups on Campbell Island 2003. *New Zealand Journal of Marine and Freshwater Research*.

2.2.5. POP 2005/02: Conduct a population and distributional study of white-capped albatross (Auckland Islands)

Objectives

1. Identify appropriate study sites to enable assessment of population parameters of white-capped albatross;
2. Determine the feasibility of satellite/GPS tracking white-capped albatrosses, and collect data describing distribution of white-capped albatross;
3. Collect field data to allow estimation of population parameters relevant to population effects of fisheries related mortality;
4. Analyse data to estimate population parameters and distribution of white-capped albatross with reference to spatial and temporal fishing effort; and
5. Building on outputs from Ministry of Fisheries project ENV2005/08, develop a study design to meet project objectives.

Status of the white-capped albatross[43]

Conservation status: Endemic species

IUCN[44] rank: Vulnerable (D2)

DoC Threatened Species Classification[45]: Range restricted

Breeding: Breeds at Auckland Islands, Antipodes Islands and Chatham Islands

Distribution: Distribution at sea is poorly known. This albatross is probably the commonest albatross seen over shelf waters adjacent to the New Zealand mainland. Birds were thought to disperse widely in the Southern Ocean and occur in the South Pacific and Indian Oceans. However, birds in these areas may be confused with the closely related shy albatross and Salvin's albatross.

Population size: Most birds (75,000 to 85,000 pairs) breed on the Auckland Islands and where there was a moderate increase in population size detected between 1972 - 1994, although more recent trend data are lacking.

Other threats: Feral pigs have had a significant impact on the breeding population on Auckland Island. Only colonies on cliff ledges inaccessible to pigs have remained intact. Feral cats may possibly take a few chicks on Auckland Island. All the remaining breeding grounds are free of introduced mammals.

Fishing threats: White-capped albatross have been the seabird species most frequently reported killed in the squid trawl fishery in southern New Zealand. The species forages widely in the Southern Ocean, including the South

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[43] Most of the information in these sections is from: Taylor, G.A. (2000). Action Plan for Seabird Conservation in New Zealand, Part A: Threatened Seabirds. *Threatened Species Occasional Publication No. 16*, Department of Conservation updated with more recent information (e.g. observer records).

[44] IUCN (2003). *2003 IUCN Red List of Threatened Species*. International Union for the Conservation of Nature.

[45] Hitchmough, R.A. (2002). New Zealand Threat Classification System lists, 2002. *Threatened Species Occasional Publication 23*. Department of Conservation..

Atlantic Ocean, and therefore may be exposed to a number of longline fisheries on the high seas.

Recent observed bycatch[46]:

Year	BAR	HOK	JMA	ORH	SCI	SQU	SWA	WAR	LIN	Tuna
2000-01	2	6	6		1	133	3		1	3
2001-02		8		1	1	110	10			14
2002-03		5			2	60	1	1		1
2003-04		5			3	70				13

Rationale

Beyond population estimates[47] and genetic structure[48], little is known of the endemic white-capped albatross, formerly considered a subspecies of the shy albatross (*Diomedea cauta*). Knowledge gaps include all aspects of population dynamics and breeding biology, distribution at sea including foraging range, and diet[49]. However, the incidence of white-capped albatross bycatch is significant, and the species was reported caught in five fisheries between 1997/98-2001/02[50]. Despite the limitations on estimations imposed by the vagaries of fisheries observer coverage, incidental mortality of this species has been consistently high, particularly in trawl fisheries[51]. The current paucity of knowledge on this species precludes an understanding of fisheries effects on the population.

Method

Field-based research and appropriate analysis.

Building on outputs from Ministry of Fisheries project ENV2005/08, a study design will be developed that will allow project objectives to be met. This design will employ maximally robust methodologies for field data collection and the data collected will also be subjected to robust analyses. Design of field methodologies is expected to be achieved with reference to

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[46] Note that these figures relate to birds recovered by observers. For some fleets with low observer coverage, the actual number of birds killed will be much higher.

Fish species are: BAR: barracouta, HOK: hoki, JMA: jack mackerel, ORH: orange roughy, SCI scampi, SQU: arrow squid, SWA: silver warehou, WAR: blue warehou, LIN: ling, Tuna: variety of tuna species.

From: Baird S.J. (2004a) Estimation of incidental capture of seabird species in commercial fisheries in New Zealand waters, 2000-01. D*raft New Zealand Fisheries Assessment Report 2004.*

Baird S.J. (2004b) Estimation of incidental capture of seabird species in commercial fisheries in New Zealand waters, 2001-02. D*raft New Zealand Fisheries Assessment Report 2004.*

Baird S.J. (2004c) Estimation of incidental capture of seabird species in commercial fisheries in New Zealand waters, 2002-03. D*raft New Zealand Fisheries Assessment Report 2004.*

Fairfax D. (2005) Marine Protected Species interactions with Commercial Fisheries 2003-04. *Draft Conservation Services Programme Report 2005.*

[47] Taylor (2000)

[48] Abbott and Double (2003a, b)

[49] Taylor (2000a); Robertson et al. (2003a)

[50] Robertson et al. (2003b).

[51] Baird (2004), Robertson et al. (2003b, 2004)

the robust design approach[52]. This approach recommends structuring the sampling of populations at prescribed times within and between (breeding) seasons.

An understanding of the distribution of this species at sea and where it forages in relation to fisheries effort will help identify potential overlap with commercial fisheries. Either satellite or GPS tracking will be deployed to determine distribution at sea.

Term of project

2005/06 for five years (with review at one year).

Outputs

- An understanding of population parameters that can be applied to guide fisheries management and determine whether fisheries are impacting protected species populations. This information would be documented in a report including methodologies used to meet objectives.

Cost Recovery:

Fish stock: Fisheries to be levied are: BAR1,4,5,7; HOK1; JMA3,7; ORH3A,3B; SCI6A,6B,12; SQU1T,6T; SWA3,4; WAR3; LIN3,5,6,7; STN1,BIG1,YFN1

F(CR) Rules: Item 3 (50% : 50% Industry)

Project Costing: $159,213 for one year. Possibility for cost-sharing with other work on Auckland Islands

[52] Pollock (1982)

2.2.6. POP 2005/04: Quantifying the population parameters and distribution of the black petrel

Objectives

1. Collect field data to allow estimation of population parameters relevant to population effects of fisheries-related mortality;
2. Determine at-sea distribution of the black petrel;
3. Analyse data to estimate population parameters and assess distribution of the black petrel with reference to spatial and temporal fishing effort; and
4. Building on outputs from Ministry of Fisheries project ENV2005/08, develop a study design to meet project objectives.

Status of the black petrel

Conservation Status: Endemic species

IUCN[53] rank: Vulnerable (D2)

DoC Threatened Species Classification[54]: Gradual decline

Breeding: Only confirmed from Little Barrier and Great Barrier Islands.

Distribution: The species forages mainly off the eastern North Island although some individuals occur in the Tasman Sea westwards to the Australian coast. Black petrels migrate after breeding to the eastern tropical Pacific, with birds frequently seen off the coast between southern Mexico and northern Peru, and westwards to the Galapagos Islands.

Population size: The current black petrel population is a remnant of what was a very large mainland population. The Great Barrier Island breeding population is probably more than 2500 pairs and about 100 breeding pairs are present on Little Barrier Island. The total population is likely to be about 10,000 birds.

Other threats: Prior to their eradication, feral cats previously killed large numbers of chicks and adult black petrels on Little Barrier Island. Feral cats are present on Great Barrier Island but appear to have little impact on the survival of black petrels. Stray dogs and feral pigs may also be a threat to nesting petrels on Great Barrier Island, but recent information suggests that this is not significant. Ship rats are present in the Great Barrier Island breeding colonies and may take some eggs and chicks. Other potential sources of human threats include boat strike and deliberate killing. Black petrels were formerly harvested by iwi, but there is no evidence that birds are currently taken.

Fishing threats: Black petrels frequently scavenge behind fishing boats and dive deeply to retrieve baits cast by long-liners. At sea distribution has not been robustly investigated, and historically low monitoring of bycatch by fisheries observers means that fisheries-related deaths are poorly known. Banded

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[53] IUCN (2003). *2003 IUCN Red List of Threatened Species*. International Union for the Conservation of Nature.

[54] Hitchmough, R.A. (2002). New Zealand Threat Classification System lists, 2002. *Threatened Species Occasional Publication 23*. Department of Conservation..

black petrels have been caught by recreational line fishers and black petrels may also be at risk from fisheries interactions in the eastern tropical Pacific.

Recent observed bycatch: Black petrels have been recorded in the domestic tuna longline fishery: 2 in 2000-01, 3 in 2001-02, and 1 in 2002-03. Two were recorded in SNA1 in 2003-04, but this is based on a small sample size and observer reports note that black petrels are commonly found around snapper longliners. Baird (2004c) noted that there has been minimal observer coverage of the domestic tuna fleet in northern waters for the five years to 2002-03, but this has been increased recently.

Rationale

The threat status of this species renders it vulnerable to negative impacts, and fishing may fall into this category. At sea distribution has not been robustly investigated, but we know that:

- There have been kills among the few tuna and snapper longline trips that have been observed in the outer Hauraki Gulf;
- Black petrels have an aggressive feeding behaviour and have excellent diving abilities; and
- There are kills of related species such as flesh-footed shearwaters[55].

These factors lead to the conclusion that the black petrel is very vulnerable to commercial fishing. In order to demonstrate the nature and extent of the adverse effects of fishing on the black petrel we need the following information:

- Population demographics: adult and juvenile survival, reproductive output, age at first breeding, interbreeding interval, land-based predation (cats, pigs, rats, tourists). This is all necessary to determine what total mortality pressures the population is experiencing and may sustain and to assess whether the population is in decline;
- Foraging studies to determine the overlap with fishing activities: Work has been carried out trialling dummy transmitters. Satellite transmitters are now small enough such that the determining of NZ foraging patterns using transmitters is now possible; and
- Observer Coverage: Observer placement in small vessel longline fisheries along the north-east North Island has been emphasised (see INT 2005/02: Observing inshore fisheries).

The black petrel is the subject of a current field programme that includes investigating population size and dynamics and breeding patterns. Field work in 2005/06 will focus on data collection leading to the estimation of juvenile survival and recruitment, and investigating distribution at sea. Preliminary modelling work has been done on this species (Hunter et al. 2001), and this work lead to recommendations on improving study design. Modelling to be completed by the Ministry of Fisheries (ENV2004/05) in the fisheries context is also expected to further assist the focusing of data requirements under this project. The outputs from Ministry of Fisheries project ENV2004/05 will be used to guide any future work on this species, including determining future field work requirements.

Method:

Field-based research and appropriate analysis.

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[55] Robertson, C.J.R., Bell, E. and Scofield, P. 2004. Autopsy report for seabirds killed and returned from New Zealand fisheries, 1 October 2001 to 20 September 2002. DoC Science Internal Series 155, DoC Wellington.

Building on outputs from Ministry of Fisheries project ENV2005/08, a study design will be developed that will allow project objectives to be met. This design will employ maximally robust methodologies for field data collection and the data collected will also be subjected to robust analyses. Design of field methodologies is expected to be achieved with reference to the robust design approach[56]. This approach recommends structuring the sampling of populations at prescribed times within and between (breeding) seasons.

An understanding of the distribution of this species at sea and where it forages will help identify potential overlap with commercial fisheries. Either satellite or GPS tracking will be deployed to determine distribution at sea.

Years: 2005/06.

Outputs

- An understanding of population parameters that can be applied to guide fisheries management and determine whether fisheries are impacting protected species populations. This information would be documented in a report including methodologies used to meet objectives.

Cost Recovery:

Fish stock: None.

F(CR) Rules: None. 100% of cost to be met from Crown contribution.

Project Costing: $82,791 for one year.

[56] Pollock (1982)

2.3. *Mitigation*

2.3.1. Purpose

The Purpose of mitigation projects is to:

- Research and develop effective measures to mitigate the adverse effects of commercial fishing on protected species.

2.3.2. Rationale

Understanding the effects of commercial fishing on protected species is critical but, on its own will not contribute to a reduction of those impacts unless fisheries are controlled through regulation. Developing ways to mitigate adverse effects through utilising best practice, including alternative ways of fishing or refining existing methods, can allow fishing to continue.

Industry has a significant role to play, through identifying mitigation options, trialing such methods, and adopting effective practices and technology. When non-target species interact with fishing operations on the water, it is clearly fishers who are most closely involved and therefore most easily able to react. Probably for those reasons, mechanisms for reducing interactions with non-target species have traditionally been developed and deployed by fishers. In some cases, motivation for this development is clearly related to economics - a bait consumed by a bird will not be available to catch a fish. However, increased environmental awareness and the conservation ethic can also motivate the development of methods to reduce interactions.

Measures to address interactions between fisheries and protected species include:

- Spatial and temporal modification of fishing operations;
- Reducing the attractiveness of fishing operations and gear to protected species;
- Deploying barriers to separate protected species from hazards;
- Employing deterrents to dissuade or repel protected species from approaching hazards; and
- Increasing awareness of the availability of mitigation and most effective ways to use mitigation techniques.

2.3.3. Policy guidance

Seabird National Plan of Action

The seabird NPOA notes that research into mitigation measures for reducing incidental catch will be used to inform the voluntary input controls adopted by fisheries through codes of practice. This research will also be used to develop mandatory input controls, should these be required, and play a key role in promoting education and awareness about the need to reduce incidental catch and ways of achieving a reduction. Specific research initiatives include:

- designing a research programme to investigate effective mitigation measures for each fishery with known interactions with seabirds;
- undertaking research on methods of reducing incidental catch in the group of fisheries defined as ‘Other Fisheries’; and
- continually reviewing research into new mitigation measures to determine the implications for the NPOA.

Marine Mammal Action Plan

Relevant actions identified in the MMAP[57] include:

- Seek and support guidelines and promote best practices for fisheries with regard to the protection and management of marine mammals; and
- Continue to investigate options for addressing and mitigating fishing-related mortality in fisheries, including alternative fishing practices and mitigation devices such as pingers.

Conservation Services Strategic Plan

The draft Conservation Services Strategic Plan gives a high priority to projects that contribute to the research, development and communication of effective mitigation methods/approaches[58]. It suggests that research focus on fisheries and fishing methods that bycatch greater numbers of protected species, especially "high" or "high-medium" priority species[59]. Priority mitigation methods for research will be determined by:

a) identifying those mitigation methods that may address impacts on multiple species (having regard to results of prioritisation undertaken in accordance with Policy 9 (a) (b)); or applicable to multiple fishing methods; or

b) researching emerging mitigation approaches that have been recently proposed/developed but are untested or have not been sufficiently trailed; or

c) investigating mitigation approaches currently employed in New Zealand but where the usefulness or effectiveness of the mitigation technique is unclear[60].

[57] Section 3.1.

[58] Policy 15.

[59] Policy 9.

[60] Policy 10.

2.3.4. MIT 2005/02: Improving offal/discard management and increasing bait retention on autoline hooks used in bottom longline fisheries

Objectives

1. Review patterns of offal/discard management;
2. Develop one or more effective and practical methods to minimise the discharge of offal/discards in a form attractive to seabirds; and
3. Develop one or more effective and practical methods to increase bait retention on autoline hooks.

Rationale

Significant numbers of birds are returned from demersal longline fisheries with bait in their stomachs (Robertson et al. 2003, 2004). Although used baits would presumably be a form of waste, birds can also feed on 'new' baits. Significant bait loss may be sustained by autoliners, and baits recorded in stomachs as well as birds foul-hooked next to baits on lines suggests that 'active' baits are being targeted by foraging seabirds[61]. Increasing bait retention and thus decreasing numbers of birds captured on hooks is expected to significantly reduce the number of seabirds returned from the autoline fishery.

Codes of Practice for some New Zealand fisheries prescribe discharge management. The ling autoline fleet Code of Practice[62] prescribes that offal should be discharged when steaming, and that it is not to be discharged during setting. The Code also states that during hauling, offal should only be discharged from the side of the vessel opposite to the hauling station[63]. Despite these recommendations however, significant numbers of birds are returned from demersal longline fisheries with offal in their stomachs[64], suggesting a need to investigate the efficacy of this approach to offal management and to enhance offal management methods.

No trials of bait retention are currently being undertaken[69]. Since the advent of autolining globally, much work is being done to improve bait retention as more baits on hooks mean more fish caught. The machines used on the autoliners have been designed to maximise bait retention and baiting averages are now between 90 and 99%. These machines are developed by Norwegian companies that have been developing machines for over twenty years and are the leaders in the field into improving bait retention. Autoline vessel crews put much effort into maintaining a high baiting average with bait preparation and correct usage. The skipper and mate (as well as observers) keep a close eye on the baiting average during the fishing operations[65].

Method

Desktop, design and at-sea research as appropriate.

Years

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[61] Robertson 2003, 2004.

[62] Ling Autoline Working Group 2004; Lydon 2003.

[63] Ling Autoline Working Group 2004.

[64] Robertson et al. 2003, 2004.

[65] Malcolm McNeill, Sealord Fisheries, personal communication.

2005/06. Note that a similar project relating to waste management of trawlers was levied in 2004/05 but no satisfactory tender could be let. Operational funds will be returned to industry.

Priority species / fisheries affected

Species: Buller's albatross, Chatham albatross, grey petrel, northern giant petrel, Salvin's albatross, white-capped albatross, white-chinned petrels

Fisheries: Bottom longline fisheries

Cost Recovery:

Fish stock: Fisheries to be levied are LIN 4,5,6.

F(CR) Rules: Item 4 (100% industry).

Project Costing: $92,776.

2.3.5. MIT 2005/03: Efficacy of the (Brady) Bird Baffler, tori lines and acoustic scarers in reducing interactions between trawl warps and seabirds at sea

Objective:

1. Evaluate the effectiveness of bird bafflers, tori lines, and acoustic scarers in reducing interactions between trawl warps and seabirds in trawl fisheries.

Rationale

Numerous methods have been investigated with the aim of deterring seabirds and marine mammals from the waters around fishing boats. Of these, possibly the simplest and also the most extensively used is the tori line, initially used by Japanese fishers to reduce bait loss[66]. The efficacy of tori lines in reducing seabird bycatch is well demonstrated in different locations[67].

Although initially used on pelagic longliners, tori lines have recently been demonstrated to be effective at reducing seabird bycatch in other fisheries, including demersal longline[68] and trawl fisheries[69]. In New Zealand, tori lines are in use in demersal longline fisheries[70]. However, modifications of tori line design are ongoing, and given the relatively high number of reported returns of captured seabirds from demersal longline fisheries, reviewing the design of tori lines to assess the potential for improvements to efficacy is worthwhile. Given the success of tori line trials on trawlers in the Falklands, testing tori line efficacy in reducing bycatch on New Zealand trawlers is also warranted.

Experiments in the Falkland Islands contrasted the efficacy of the tori lines in reducing seabird bycatch with that of the Brady Bird Baffler. This latter deterrent has gained acceptance as an effective device for reducing seabird interactions with warps. The Baffler has been trialled on trawlers in New Zealand, however robust empirical tests of the Baffler's effectiveness are few. Preliminary work in the Falkland Islands suggests that the Brady Baffler does not significantly reduce the numbers of contacts between seabirds and trawl warps, and that tori lines were more effective than Brady bafflers at reducing seabird – warp interactions. The low cost of tori lines compared to Bafflers represents a significant advantage in advocating and facilitating the widespread use of tori lines on trawl vessels, if tori lines prove effective. However, the fact that Brady Bird Bafflers have already been deployed on some trawlers fishing in New Zealand waters provides support for experimentally testing the efficacy of this mitigation device.

Data derived to date from work done by the Hoki Fishery Management Company (HFMC) and other agencies does not demonstrate the efficacy of (Brady) bird bafflers, and tori lines and acoustic scarers remain un-investigated on trawl fishing vessels in New Zealand. The objective of this project will be considered in light of relevant work programmes undertaken by the HFMC. If industry can clearly demonstrate that they are undertaking work proposed by CSP to an acceptable standard, and results will emerge within clearly set timelines, than CSP would consider amending or removing that project from the Plan.

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[66] Brothers et al. 1999.

[67] Klaer and Polacheck 1998; Baird and Bradford 2000b; Løkkeberg 2003.

[68] Melvin et al. 2001.

[69] Sullivan et al. 2004, unpubl.

[70] E.g. Ling Autoline Working Group 2003; Lydon 2003.

Method

At-sea research and appropriate analysis.

Years

2005/06

Priority species / fisheries affected

Species: White-capped albatross, Salvin's albatross, Chatham albatross, Antipodean albatross, Campbell albatross, southern royal albatross, grey petrel, northern giant petrel, white-chinned petrel, northern royal albatross.

Fisheries: Deep water and Middle depth trawl fisheries.

Cost Recovery:

Fish stock: The fisheries to be levied are: Deep Water: ORH 3A, 3B, 7A, 7B and Middle Depths: BAR 1, 4, 5, 7; HAK 1, 4, 7; HOK 1; LIN 3, 4, 5, 6, 7; SBW 6A, 6B, 6I, 6R; SQU 1T, 6T; SWA 1, 3, 4; SCI 1, 2, 3, 4, 6A, 6B.

F(CR) Rules: Item 4 (100% industry).

Project Costing: $61,850.

2.3.6. MIT 2005/04 New mitigation ideas

Objectives:

1. Establish a process by which new mitigation ideas are solicited for priority species; and

2. Select best idea(s) for development

Rationale

Fishermen are in daily contact with the interactions between their fishing gear and seabirds. It is therefore not surprising that most suggestions for ways to mitigate these interactions have come from fishermen. Examples include Keith Brady's bird baffler, Dave Kellian's underwater bait setting capsule, and Alex Aitken's fish oil deterrent. Many fishermen have an intuitive sense about what techniques might work, and some of them have carried out initial experiments. However, few have the skills or the resources to conduct robust scientific experiments to determine the effectiveness of their proposals. It is for this reason that international "competitions", such as the United States "Smart Gear" and the Birdlife International competition, to solicit mitigation ideas have proven popular. A local "competition" or mechanism to attract these ideas from local fishermen would be better targeted to local needs and would have a lower threshold for participation. This should be run as a positive, cooperative initiative with key fishing companies or gear suppliers.

Method:

- Place advertisements in media targeted to the fishing industry (e.g. Seafood magazine),
- Establish incentives for submitting proposals for new devices and techniques to mitigate the bycatch of marine protected species,
- Process submissions to select the most appropriate devices and techniques,
- Advertise the successful proposals.

Years: 2005/06, 2007/08.

Species / fisheries affected:

Species: All priority species.

Fisheries: All fisheries capturing priority species.

Cost Recovery:

Fish stock: None.

F(CR) Rules: 100% Crown funded.

Project Costing: $19,106.

2.3.7. MIT 2005/05: Workshops at National Commercial Fishers conference to report observer and mitigation results

Objectives:

1. To provide feedback on protected species bycatch results;
2. To provide feedback to fishers on developments in mitigation methods and devices; and
3. To receive feedback on what fishers are doing with respect to mitigation.

Rationale

There has been insufficient reporting of the results of Conservation Services Programme-funded work to fishers throughout New Zealand. This will increase trust and respect between the fishers and Conservation Services Programme in order to make progress towards a significant reduction in protected species bycatch.

Method

- Workshops and/or presentations at two National Commercial Fishers conferences (e.g. Seafood and Federation conferences)

Term of project: July 2005 – June 2006.

Outputs

- Workshops and/or presentations at two National Commercial Fishers conferences (e.g. Seafood and Federation conferences)

Cost Recovery

Fish stock:	None.
F(CR) Rules:	100% Crown funded.
Project Costing:	$2,574 for participation at two conferences.

Appendix One: Research Costs and Cost Allocation

Reference	Project	Research costs[71]	Admini-stration costs	Depart-mental contribution	Nett cost	Fisheries (Cost Recovery) Rules	Industry cost	Crown cost	Fish stocks to be levied
Fishing interactions									
INT2005/01	Observing offshore fisheries	$481,703	$46,240		$527,943	8 (100% industry)	$527,943	$0	See Table 1.1
INT2005/02	Observing inshore fisheries	$226,925	$21,783	$10,000[72]	$248,708	8 (100% industry)	$248,708	$0	See Table 1.2
INT2005/03	Seabird autopsy programme	$90,000	$24,634		$114,634	4 (100% industry)	$114,634	$0	HOK1, SBW6A, 6B, 6I, 6R, HAK1,4,7, ORH1,2,3, OEO1,3A,4,6; SCI2,3,4,6; JMA7; STN1, BIG1, YFN1; LIN 4,5,6A,6B; JMA1, EMA1, SKJ1, KAH1,2; LIN 1,2,3,7; SNA1; SCH3,5,7; SQU1T, 6T; SPO3,7; SPD3,5,7
Population studies									
POP2005/01	Sea lions	$240,000	$65,689		$305,689	2 (90% Industry)	$275,121	$30,568	SQU6T
POP2005/02	White-capped albatross	$125,000	$34,213		$159,213	3 (50% Industry)	$79,607	$79,607	BAR1,4,5,7; HOK1; JMA3,7; ORH3A,3B; SCI6A,6B,12; SQU1T,6T; SWA3,4; WAR3; LIN3,5,6,7; STN1,BIG1,YFN1
POP2005/04	Black petrel	$65,000	$17,791		$82,791		$0	$82,791	

[71] Cost ranges for some projects have been estimated (see project descriptions). This table shows the indicative costs to be used in the levy cost allocation model.

[72] This $10,000 Department contribution is for observing non-commercial fisheries and is additional money on top of that levied for project INT 2005/02

Reference	Project	Research costs	Admini-stration costs	Depart-mental contribution	Nett cost	Fisheries (Cost Recovery) Rules	Industry cost	Crown cost	Fish stocks to be levied
Research into mitigation									
MIT2005/02	Offal mgmt in longline fisheries	$75,000	$17,776		$92,776	4 (100% industry)	$92,776	$0	LIN 4,5,6;
MIT2005/03	Mitigation in trawl fisheries	$50,000	$11,850		$61,850	4 (100% industry)	$61,850	$0	Deep Water: ORH 3A, 3B, 7A, 7B and Middle Depths: BAR 1, 4, 5, 7; HAK 1, 4, 7; HOK 1; LIN 3, 4, 5, 6, 7; SBW 6A, 6B, 6I, 6R; SQU 1T, 6T; SWA 1, 3, 4; SCI 1, 2, 3, 4, 6A, 6B
MIT2005/04	Mitigation ideas	$15,000	$4,106	$19,106	$0		$0	$0	
MIT2005/05	Conference workshops	$2,000	$547	$2,547	$0		$0	$0	
Sub totals		$1,370,628	$244,629	$31,653	$1,593,604		$1,400,639	$192,966	
Departmental overheads								$25,000	
Estimated Totals		$1,370,628	$244,629	$31,653	$1,593,604		$1,400,639	$217,966	

Table 1.1 Observing offshore fisheries (INT 2005/01) cost allocation

Fishery	Obs. Cost	Staff cost	Admin	Total	Fish stock to be levied
Charter tuna	$18,500	$5,489	$2,303	$26,292	STN1,BIG1,YFN1
Deep sea ling	$18,500	$5,489	$2,303	$26,292	LIN 4,5,6
Hake	$43,000	$12,759	$5,352	$61,111	HAK1,4,7
Hoki	$107,000	$31,748	$13,319	$152,067	HOK 1
Jack mackerel	$69,000	$20,473	$8,589	$98,062	JMA7
Orange roughy	$16,000	$4,747	$1,992	$22,739	ORH1,2A,2B,3A,3B
Oreo	$11,000	$3,264	$1,369	$15,633	OEO1,3A,4,6
Purse Seine	$7,000	$2,077	$871	$9,948	JMA1, EMA1, SKJ1, KAH1,2
Scampi	$73,500	$21,808	$9,149	$104,457	SCI2,3,4,6A,6B
Southern blue whiting	$7,980	$2,368	$993	$11,341	SBW6A, 6B, 6I, 6R
Total	$371,480	$110,223	$46,240	$527,942	

Table 1.2 Observing inshore fisheries (INT 2005/02) cost allocation

Fishery	Obs. Cost	Staff cost	Admin	Total	Fish stock to be levied
Domestic tuna	$50,000	$14,836	$6,224	$71,059	STN1,BIG,YFN
Inshore ling	$25,000	$7,418	$3,112	$35,530	LIN 1,2,3 &7
Longline snapper	$50,000	$14,836	$6,224	$71,059	SNA1
Setnet	$50,000	$14,836	$6,224	$71,059	SCH3,5,7; SPO3,7; ELE3,5,7; SPD3,5,7
Total	$175,000	$51,925	$21,783	$248,708	

Appendix Two: Summary of policies from the draft CSP Strategic Plan

Conservation Services Programme
Marine Conservation Unit
Department of Conservation

February 2005

Objectives

This Strategic Plan provides guidance for the Department of Conservation's administration of the Conservation Services Programme for the five-year period 2005/06 – 2009/10. The Programme's objectives are:

1. To understand the nature and extent of adverse effects from commercial fishing activities on protected species in NZ fisheries waters.
2. To develop effective solutions to mitigate adverse effects of commercial fishing on protected species in NZ fisheries waters.

Research into effects includes:

i. Research into fishing interactions (direct and indirect impacts) on individuals of a protected species; and

ii. Research into the adverse effects of commercial fishing on protected species populations.

Research and development of measures to mitigate the adverse effects of commercial fishing on protected species includes:

i. Research into, and development of, mitigation methods;

ii. Development of population management plans.

Key policies are listed below:

Mandate and focus

Policy 1: The scope of the Conservation Services Programme includes adverse effects on protected species arising from direct or indirect effects of commercial fishing and arising from activities associated with commercial fishing including:
i. any past or present adverse effect; and/or
ii. any past or present cumulative effect;

unconstrained by scale, intensity, duration, or frequency of the adverse effect.

Policy 2: The Conservation Services Programme will consider recovering costs for outputs that are "conservation services", for those protected species that have either:
- been recorded as bycatch, or

- have behavioural or biological characteristics that indicate the species is exposed to risk of adverse effects of direct fishing interactions.

i. excluding those effects or risks posed by any operation in support of or in preparation for any activities associated with commercial fishing;
ii. excluding past adverse effects or cumulative adverse effects.

Policy 3: For the purpose of this Strategic Plan, research on measures to mitigate the adverse effect of commercial fishing on protected species will include research on measures to avoid, remedy or mitigate the adverse effects of commercial fishing on protected species.

Policy 4: New Zealand's obligations with respect to international conventions may only be implemented by the Conservation Services Programme to the extent to which activities are consistent with domestic legislation.

Priorities

Policy 5: Priorities for conservation services work on protected species as defined by the Wildlife Act 1953 (excluding corals and spotted black grouper) and Marine Mammals Protection Act 1978 will be determined through the evaluation of:
(a) threat status; and
(b) level of fisheries interaction in New Zealand fisheries waters;

in accordance with method specified in Appendix 1.

Policy 6: Following the initial identification of priority species using method specified in policy 5, consideration will be given to elevating the priority for particular species where:
(a) knowledge of the level of fishing interaction is limited, and species behaviour and commercial fishing activity indicates that interaction is likely or plausible; or
(b) there are data deficiencies in species population parameters used to derive threat status; or
(c) statutory or government priorities indicate a higher level of prioritisation is required.

Policy 7: Black coral (all species in the Order Antipatharia), and red coral (all species) will be considered priority species for research.

Policy 8: Following the initial identification of priority species using method specified in policy 5, where research effort is being determined for species:
a) within the same category (high, high-medium, medium or low); and
b) the category contains species that have a breeding population in New Zealand, and species that are considered migratory;

preference will be given to those species that have breeding populations in New Zealand.

Policy 9: Priority fisheries/fishing methods will be determined to be those fisheries/methods that:
a) cumulatively bycatch greater numbers of protected species across all species where all mortalities are considered equal; or
b) cumulatively bycatch a greater proportion of "high" or "high-medium" priority species; or
c) lack, or have limited, data on protected species - fisheries interactions.

Policy 10: Priority mitigation methods for research will be determined by:
a) identifying those mitigation methods that may address impacts on multiple species (having regard to results of prioritisation undertaken in accordance with Policy 9 (a) (b)); or applicable to multiple fishing methods; or
b) researching emerging mitigation approaches that have been recently proposed/developed but are untested or have not been sufficiently trialled; or

c) investigating mitigation approaches currently employed in New Zealand but where the usefulness or effectiveness of the mitigation technique is unclear.

Policy 11: Priority will generally be given to research and project proposals that:
(a) most cost-effectively achieve the research goal, such as by utilising opportunities for multi-species/multi-project initiatives to enhance the application and cost-efficiency of research, and to provide for integrated management; or
(b) address information gaps for the species where this knowledge will significantly enhance the value or application of existing knowledge to address adverse effects of commercial fishing on protected species (leverage).

Policy 12: The Conservation Services Observer Project will:
(a) provide a baseline level of observation of fisheries where interactions are thought to be generally identified;
(b) enhance observations in unobserved fisheries or, where interactions are not understood;
(c) gather information that will facilitate understanding of the nature of fisheries interactions and lead to the development of mitigation techniques;
(d) support the development and testing of mitigation techniques, and assist in the evaluation of the effectiveness of mitigation methods; and
(e) encourage and audit the self-reporting by fisheries of their interactions with protected species.

Policy 13: Research into the indirect effects of commercial fishing on a protected species will be considered where:
a) indirect effects may be affecting one or more species populations that are interacting with fisheries in a similar way, or through alteration of habitat/food availability; and
b) the population/s is exhibiting signs of chronic adverse effects; and
c) research does not duplicate that undertaken by the Ministry of Fisheries.

Policy 14: Population studies will be undertaken only where results, either:
(a) assist in the development of population management plans; or
(b) assist in implementation of the seabird National Plan of Action[1]; or
(c) assist in assessing the extent to which commercial fishing interactions causing an adverse effect on the protected species populations, or
(d) assist in managing the effects of commercial fishing on protected species populations.

Policy 15: High priority will be given to projects that contribute to the research, development and communication of effective mitigation methods/approaches.

Policy 16: When prioritising research investment across the range of mitigation methods/approaches, regard will be had to the cost-effectiveness of developing and implementing such methods.

Policy 17: A population management plan for New Zealand sea lion will be developed to be approved in time to inform the 2005/06 fishing season.

Policy 18: Population management plans will also be developed in the following circumstances:
a) for seabird species, where the National Plan of Action process determines that mandatory bycatch limits are appropriate, and population management plans are determined by the Minister of Conservation to be the most effective mechanism to implement bycatch limits;

[1] National Plan of Action to Reduce the Incidental Catch of Seabirds in New Zealand Fisheries

b) for marine mammals that are a high or high-medium priority species as determined by species prioritisation method (policies 5-7), where the Minister of Conservation deems development of a population management plan appropriate;
c) where new species placed in the Wildlife Act schedules are a high or high-medium priority species as determined by species prioritisation method (policies 5-7), and the Minister of Conservation deems development of a population management plan appropriate.

Cost recovery and administration

Policy 19: Risk assessment undertaken in accordance with Item 2 of the schedule of the Fisheries (Cost Recovery) Rules 2001 will be guided by the following:
a) The phrase "human intervention" means any human activity that has adverse effects on protected species, including both direct (active) and indirect (passive) interventions;
b) The phrase "b is the total risk of human interventions on the populations" will be interpreted such that 'total' means 'global' and is not restricted to the range of effects on the population within the EEZ of New Zealand, i.e. "b" includes risk of human interventions on the populations both within and beyond New Zealand's EEZ.

Policy 20: When undertaking risk assessment in accordance with item 2 of the schedule of the Fisheries (Cost Recovery) Rules 2001, uncertainty will be recognised through sensitivity analysis by applying a range around uncertain parameters.

Policy 21: Item 2 of the schedule of the Fisheries (Cost Recovery) Rules 2001 will be used to determine the percentage of costs to be borne by industry for projects where:
a) sufficient data exist to estimate risk in accordance with policy 19; or
b) data for estimating risk is deficient in some way but this can be managed in accordance with policy 20.

Policy 22: Item 3 of the schedule of the Fisheries (Cost Recovery) Rules 2001 will be used to determine the percentage of costs to be borne by industry for projects where risks to those populations by human intervention have not been estimated due to:
a) insufficient data and/or
b) uncertainty associated with existing data of a magnitude that is unable to be managed in accordance with policy 20

Policy 23: Items 2 and 3 of the schedule of the Fisheries (Cost Recovery) Rules 2001 will be used to determine the percentage of costs to be borne by industry for projects such as:
a) population studies of protected species where risk to those populations by human intervention has been estimated (in the case of item 2) or where such risk has not been estimated (in the case of item 3); or
b) development of population models to support development of population management plans.

Policy 24: Item 4 of the schedule of the Fisheries (Cost Recovery) Rules 2001 will be used to determine the percentage of costs to be borne by industry for projects including:
a) advisory services including initiatives that communicate research results to commercial fishing sector;
b) mitigation projects;
c) services required for development, monitoring and review of population management plans not covered by items 2 or 3 of the schedule of the Fisheries (Cost Recovery) Rules 2001; and
d) services provided as an extension to observation services but which are not cost allocated under Item 8, such as autopsy of bycatch specimens.

Policy 25: Management of under and over cost recovery will be undertaken in accordance with agreed principles and processes for management between the Crown and the commercial fishing industry.

Policy 26: A project will be considered to be closed where:
(a) objectives of the project have been achieved; or
(b) objectives of the project are unable to be achieved:

(i) due to failure to secure a contractor for the project through a tendering process; or

(ii) as a result of failure of a contractor to deliver agreed work; or

(iii) where more than two years have elapsed since the project should have been completed and the project has not demonstrated significant progress toward achievement of objectives.

Policy 27: All research projects shall have clear end points defined, either in:
a) The Five-year Research Plan; or
b) The Annual Plan; or
c) Any multi-year contract developed from a project specified in the annual plan.

Policy 28: Costs to be recovered for the development of population management plans will include all procedures and associated costs as described by s.3H Wildlife Act 1953 and s.14I Marine Mammal Protection Act 1978 and costs for the monitoring of PMPs.

Policy 29: Tendering for Conservation Services Programme projects will be undertaken:
a) in accordance with Department of Conservation tendering policy which provides that for services between $5000 - $15000 requirements to tender are discretionary; and
b) generally, in a manner where for services of $15 000 and over, an open tender process will be followed.

Processes and relationships

Policy 30: The Conservation Services Programme will consult with Te Ohu Kaimoana when developing its annual plan and when determining the allocation of costs to quota holders.

Policy 31: The Conservation Services Programme will clarify the roles and responsibilities between it and the Ministry of Fisheries through:
a) Establishing principles for assigning research responsibilities based on the implementation of the seabird National Plan of Action; and
b) Establishing a memorandum of understanding between the Department of Conservation and Ministry of Fisheries to clarify research roles and responsibilities.

Policy 32: The Conservation Services Programme will deliver an annual plan of research based on the research priorities derived from the Strategic Plan and Five-year Research Plan, excluding:
a) research projects that have been previously delivered to satisfactory standards by stakeholders or other agencies;
b) research projects that have been identified by stakeholders as a priority for delivery to satisfactory standards within the timeframe of the relevant annual plan.

Policy 33: The Conservation Services Programme will continue to provide advice and support into stakeholder initiated processes and projects related to addressing adverse effects of commercial fishing on protected species, as a priority, non cost recovered service.

Policy 34: The Conservation Services programme will monitor the proportion of effort (and associated cost) in providing services described in policy 33 and secure alternative funding sources in the event that subsidisation is shown to occur.

Policy 35: The Conservation Services Programme will ensure that the outputs of funded projects are communicated effectively to the appropriate audience in a timely manner, either as part of the project or through collective reporting mechanisms.

Appendix Three: Legislation and Guidelines used for the Formulation of this Plan

The following is a summary of legislative provisions that guide the development and delivery of the 2005/2006 Conservation Services Plan.

Conservation services have been defined in the Fisheries Act 1996 as follows:

conservation services means outputs produced in relation to the adverse effects of commercial fishing on protected species, as agreed between the Minister responsible for the administration of the Conservation Act 1987 and the Director-General of the Department of Conservation, including—
(a) Research relating to those effects on protected species:
(b) Research on measures to mitigate the adverse effects of commercial fishing on protected species:
(c) The development of population management plans under the Wildlife Act 1953 and the Marine Mammals Protection Act 1978

For the purposes of the Fisheries Act, **protected species** have been defined as meaning:

(a) Any marine wildlife as defined in section 2 of the Wildlife Act 1953 that is absolutely protected under section 3 of that Act:

(b) Any marine mammal as defined in section 2(1) of the Marine Mammals Protection Act 1978.

The Crown is enabled to recover the costs of conservation and fisheries services in accordance with Part 14 of the Fisheries Act 1996. The **principles** under which costs may be recovered are specified in S262 as follows:

Cost recovery principles

The cost recovery principles under this Part are as follows:

(a) If a conservation service or fisheries service is provided at the request of an identifiable person, that person must pay a fee for the service:

(b) Costs of conservation services or fisheries services provided in the general public interest, rather than in the interest of an identifiable person or class of person, may not be recovered:

(c) Costs of conservation services or fisheries services provided to manage or administer the harvesting or farming of fisheries resources must, so far as practicable, be attributed to the persons who benefit from harvesting or farming the resources:

(d) Costs of conservation services or fisheries services provided to avoid, remedy, or mitigate a risk to, or an adverse effect on, the aquatic environment or the biological diversity of the aquatic environment must, so far as practicable, be attributed to the persons who caused the risk or adverse effect:

(e) The Crown may not recover under this Part the costs of services provided by an approved service delivery organisation under Part 15A.]

Section 263 of the Act sets out procedures for promulgating cost recovery rules:

(1) The Governor-General may from time to time, by Order in Council made on the recommendation of the Minister, make rules relating to the imposition of levies under this Part.

(2) The rules may—
(a) Prescribe the proportion of costs of conservation services and fisheries services to be recovered as levies:
(b) Prescribe who must pay levies:
(c) Prescribe how the costs are to be apportioned between the persons who must pay the levies.

(3) Without limiting anything in subsections (1) and (2), different rules may apply in respect of different classes of persons, stocks, quota management areas, fishery management areas, conservation services, fisheries services, or any combination of them.

(4) Before making a recommendation under subsection (1), the Minister must—
(a) Be satisfied that the rules to which the recommendation relates comply with the cost recovery principles in section 262; and
(b) Have regard to the extent to which conservation services or fisheries services are wholly or partly purchased or provided by persons other than the Crown.

(5) Without limiting the Acts Interpretation Act 1924, no order made under this section is invalid because it leaves any matter to the discretion of any person.

On 10 September 2001 the Governor-General made the Fisheries (Cost Recovery) Rules 2001 ("the Cost Recovery Rules"). Rule 4 deals with the status of rules. Rule 5 provides:

The proportion of costs to be recovered from the Commercial Fishing Industry for the fisheries or conservation services specified in the first column of the Schedule is the proportion set out in the second column of that Schedule."

Rule 6 provides who must pay the levies and the basis for the levy. The Schedule to the Cost Recovery Rules (extract below) provides for the apportionment of costs of fisheries and conservation services. Relevant parts of the Schedule are as follows:

Services	Percentage of Costs to be Borne by Industry	Allocation Between Stocks
2. Research relating to protected species populations where risk to those populations by human intervention has been estimated	A over B, expressed as a percentage, where- A is the risk to the populations posed by commercial fishing in the EEZ of New Zealand B is the total risk of human interventions on the populations	As in Rule 7(2) or (3)
3. Research relating to protected species populations where risk to those populations by human intervention has not been estimated	50%	As in Rule 7(2) or (3)
4. Services (including research) provided to avoid, remedy, or mitigate that portion of the risk to, or adverse effect on, the aquatic environment or biological diversity of the aquatic environment caused by commercial fishing	100%	As in Rule 7(2) or (3)
8. Observer coverage to support stock assessment process and conservation services	100%	As in rule 8
11. Aquaculture services	100%	As in rule 10