Conservation Services Programme Annual Plan 2013/14

Conservation Services Programme
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June 2013

Statement on Conservation Services

Conservation services are defined in section 2 of 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."*

We agree that the outputs described in the following pages, to be delivered in 2013/14, are "conservation services" in accordance with this definition. Cost recovery principles have been applied in accordance with section 262 of the Fisheries Act 1996.

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Minister of Conservation

Al Morrison
Director-General of Conservation

Table of Contents

1. Overview

1.1 Introduction

The Conservation Services Programme Annual Plan 2013/14 ("Annual Plan") includes the conservation services to be delivered as the Conservation Services Programme ("CSP"), and subject to cost recovery from the commercial fishing industry. As such, this Annual Plan forms the basis for levying the commercial fishing industry under the Fisheries Act 1996. For a summary of the legal basis of levied work described in this Annual Plan, refer to the Conservation Services Strategic Plan 2005-2010[1] ("Strategic Plan"). A collaborative process is currently underway to develop a new Strategic Statement for CSP. In the absence of a final Strategic Statement, this Annual Plan uses the guiding principles and policies from both the initial discussions with stakeholders on the new Strategic Statement (for example recent risk assessment work for seabirds[2] was used to identify priority research gaps for these taxa) and the 2005-10 Strategic Plan, to the extent that it remain relevant.

The Conservation Services Programme's objectives, as described in the Strategic Plan, 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.

Note that research into effects can include:

i. Research into fishing interactions (direct and indirect impacts) on protected species (Interaction Projects, Section 2); and

ii. Research into the adverse effects of commercial fishing on protected species populations (Population Projects, Section 3).

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 (Mitigation Projects, Section 4);

ii. Development of population management plans (none currently proposed).

1.2 Format

The format used to specify the conservation services in this Annual Plan includes an outline of the objectives and rationale for each project, and the outputs that are anticipated to be produced. The project specifications indicate cost recovery information, i.e. project costs (excluding administration costs) and identification of the relevant

[1] Available to download from http://www.doc.govt.nz/publications/conservation/marine-and-coastal/marine-conservation-services/csp-plans/approved-csp-strategic-plan-2005-2010/

[2] Rowe, S. 2010 Level 1 Risk Assessment for incidental seabird mortality associated with New Zealand fisheries in the NZ-EEZ. Marine Conservation Services, Department of Conservation, Wellington. 75 p. Available for download from http://www.doc.govt.nz/mcs
Richard, Y., Abraham, E.R.. 2013. Risk of commercial fisheries to New Zealand seabird populations. New Zealand Aquatic Environment and Biodiversity Report No. 109. Ministry for Primary Industries, Wellington.

provisions within the Fisheries (Cost Recovery) Rules 2001 that determine cost allocation. Costs are summarised in Appendix 1. All financial amounts appearing in this document are exclusive of GST.

1.3 Guiding frameworks

Overarching frameworks exist in relation to fisheries impacts on seabirds (the National Plan of Action to reduce the incidental catch of seabirds in New Zealand fisheries 2013, and underlying risk assessment) and Hector's and Maui dolphins (through Threat Management Plans). Appendix 2 summarises how the projects relevant to seabirds and dolphins, to be delivered both as part of the CSP and by Ministry for Primary Industries (MPI), are guided and prioritised by these frameworks. The summary also illustrates the complementary nature of the projects developed by both agencies.

1.4 Research planning and prioritisation

The following planning and prioritisation process was undertaken in developing the draft CSP Annual Plan 2013/14:

1. Internal examination of a number of information streams and guiding frameworks, including prior knowledge and consideration of long term datasets, informed the identification of project ideas.
2. Discussions were then held with MPI to align research priorities, ensure that no overlaps existed between proposed projects and to maximise synergies between projects.
3. Initial research proposals were then drafted by each agency.
4. A joint DOC-MPI research planning session was held, with open invitation to all CSP stakeholders, at which DOC and MPI presented their respective initial research plans, offing an opportunity to consider the entire package. Specifically, feedback was sought on prioritisation of project proposals and identification of gaps.
5. The draft plan was developed based on this feedback, and provided for formal consultation.

Inshore observer coverage was planned using a process developed jointly by CSP and the Inshore Fisheries team at MPI in consultation with Seafood New Zealand and the Federation of Commercial Fishermen. The programme progresses delivery of objectives identified by a process conducted in preparation for the CSP Annual Plan 2011/12.

Deepwater observer coverage was developed jointly by the CSP and the Deepwater Fisheries team at MPI.

1.5 Consultation

Key stages in the consultation process on this plan were as follows:

20 March 2013	Initial CSP research proposals for 2013/14 circulated to stakeholders
22 March 2013	Joint CSP-MPI presentation of initial research proposals to stakeholders
5 April 2013	Close of comments on initial CSP research proposals

17 April 2013	Draft Conservation Services Programme Annual Plan 2013/14 released for public consultation
29 May 2013	Public consultation period closes
14 June 2013	Summary of public submissions and response to comments completed
mid-June 2013	Director-General of Conservation conveys the Conservation Services Programme Annual Plan 2013/14 as amended in accordance with public comments to the Minister of Conservation

1.6 Administrative costs

Administration costs have always been a contentious matter relating to the delivery of conservation services. Administration requirements of each project differ, as does the time required to address these. Currently, administration charges are distributed in a pro-rated fashion across projects, in accordance with the cost of the project. This approach is broadly appropriate, for example, the most costly project (INT2013/01 Observing commercial fisheries in 2013/14) incurs the majority of administration expenses. For that project, administration includes observer training programmes and training materials, data management, briefing and debriefing, liaison at sea and with other agencies when necessary, and reporting. For other projects, the administration burden may be significantly less. Administration also includes charges for the use of Departmental facilities and services.

DOC is continually striving to maximise efficiencies, and the administration costs for delivering conservation services dropped by $15,000 between 2008/09 and 2009/10, and subsequently dropped again by $13,000 for 2011/12 and has been maintained at this level. We welcome stakeholder views on different ways to attribute administration costs across projects.

2. Interaction Projects

2.1 Observing commercial fisheries

Project code: INT2013-01

Start Date: 1 July 2013

Completion Date: 30 June 2014

Overall Objective

To understand the nature and extent of protected species interactions with New Zealand commercial fishing activities.

Specific Objectives

1. To identify, describe and, where possible, quantify protected species interactions with commercial fisheries;
2. To identify, describe and, where possible, quantify measures for mitigating protected species interactions;
3. To collect other relevant information on protected species interactions that will assist in assessing, developing and improving mitigation measures.

Rationale

The management approach

Understanding the nature and extent of interactions between commercial fisheries and protected species can identify where the most significant interactions are occurring and can be used to inform development of ways to mitigate those interactions and adverse effects. Such data contribute to assessments of the risks posed to protected species by commercial fishing and whether mitigation strategies employed by fishing fleets are effective at reducing protected species captures.

The CSP Observer Programme will continue to purchase baseline services for "offshore" fisheries from MPI Observer Services, given the scale of their operation, which allows observers to be placed strategically across New Zealand Fisheries. Where data collection involves using techniques beyond observation and recording, providers with specific expertise and/or equipment will be considered. For the purposes of providing costings, the rate provided by MPI Observer Services has been used. As such, for the purposes of planning, costings for observer coverage are based on those provided by the MPI Observer Services to provided a best estimate .

Research Approach

To date, the bulk of publicly available information on at-sea interactions between fishing vessels and protected species in New Zealand waters has been collected by Government (DOC/MPI) observers.
The allocation of observer coverage across fisheries will be made in relation to:

- Historic mortality of protected species.
- Fishing effort.
- Past observer coverage.
- The status of particular threatened protected species.

- Current level of information.
- Risk assessment work which has been undertaken (e.g. Rowe 2010a, Richard & Abraham. 2013).
- Information needs identified for newly introduced protected species.

In 2013/14, increased coverage of Foreign Charter Vessels also forms an important factor driving the distribution of observer coverage. Decisions around coverage levels on Foreign Charter Vessels are driven by multiple factors, but the coverage continues to provide a platform for delivery of CSP Observer Programme coverage.

The duties of an observer in respect of the CSP Observer Programme can be summarised as:

- Monitoring and recording the interactions of protected species with fishing operations.
- Reporting on the efforts made to mitigate the adverse effects of commercial fishing on protected species.
- Recording, photographing and tagging all protected species bycatch.
- Recovering and returning the bodies of dead protected species for identification and autopsy (new protocols for seabird returns are detailed in Appendix 3).
- Recording at least on a daily basis the numbers, and the behaviour of, marine mammal and seabird species seen around the fishing vessel.
- Carrying out other tasks (e.g. making observations on discard and offal discharge) as required.

In addition to the duties discussed above, CSP will occasionally use observers to collect data for specific mitigation or information acquisition projects. Examples of past projects include fish waste trials, observations of warp interactions on inshore trawl vessels and blue-dyed bait trials.

Information collected includes:

- Environmental conditions (e.g. sea state).
- Fishing methods (including a description of gear employed) and operations.
- Processing waste management practices.
- Abundance and behaviour of protected species in vicinity of vessel.
- Mitigation practices adopted.
- Knowledge and approach of crew.
- Interactions between protected species and fishing gear.

It is important to note that observer programmes typically have high spatial and temporal variation, as well as multiple priorities for information collection, which can make the data challenging to interpret and extrapolate to estimate actual bycatch rates by fishery, location, or other desired variables. Data accuracy and relevance can be affected by inter-observer variability, 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 to vessels, as it is not always possible to place observers on vessels randomly or representatively. Nevertheless, the use of fisheries observers is currently considered to be the most reliable and flexible means of acquiring data on protected species interactions.

Application of observer coverage by fishery in 2013/14:

For the purposes of planning observer coverage, fisheries are divided into two broad categories: firstly, those fisheries that are poorly known and generally characterised by small vessel, owner operated fleets (see 2.1.1). The majority of these vessels operate in the inshore area (i.e. to around 200 m depth), some small vessels, particularly bottom longline vessels under 36 m, will operate in deeper waters such as the Chatham Rise (and are observed as part of deepwater longline coverage). Details of the approach used to set days in these fisheries is described in the Joint Department of Conservation/Ministry for Primary Industries Inshore Observer Programme 2013/14 plan (included as Section 2.1.1 of this plan). In general, coverage in these fisheries was aimed at reducing uncertainly around the risk to particular protected species which was identified in both the level 1 and level 2 risk assessments (Rowe 2010, Richard & Abraham 2013), and assessing mitigation options for interactions identified, as well as delivering on Threat Management Plan objectives for Hector's and Maui dolphins.

The second group of fisheries can be considered 'better known' and have generally had some level of ongoing observer coverage over the last ten years or more (see 2.1.2). Most of these fisheries are characterised by large vessels operating further offshore and are termed 'offshore' fisheries. Observers working in these fisheries generally have multiple priorities including stock assessment, compliance and protected species interactions. DOC contributes to a portion of observer time in these fisheries and, as such, days are planned differently to the poorly known fisheries. In order to set observer days for the period 1 July 2013 – 30 June 2014, effort data from previous years was examined, in conjunction with MPI, to ensure that desired coverage levels are achievable with the days planned and that these coverage levels would meet the data requirements of both agencies. All time periods are based on 1 July - 30 June in line with the period that observer coverage runs (i.e. not the fishing year). Following Ministerial decisions in 2012, there is a substantial increase in foreign charter vessel coverage. This has resulted in a proportionally greater volume of coverage going on to these vessels.

Protected species interaction data for the period 1 July 2004 to 30 June 2011 are reported by Rowe (2009, 2010b) and Ramm (2010, 2012, 2013), which are available from the CSP web pages (http://www.doc.govt.nz/publications/conservation/marine-and-coastal/conservation-services-programme/csp-reports/).

Fisheries Management Areas are referred to by three letter codes as follows:

AKE	FMA 1	East North Island from North Cape to Bay of Plenty
CEE	FMA 2	East North Island from south of Bay of Plenty to Wellington
SEC	FMA 3	East coast South Island from Pegasus Bay to Catlins
SOE	FMA 4	Chatham Rise
SOU	FMA 5	South Island from Foveaux Strait to Fiordland
SUB	FMA 6	Subantarctic including Bounty Island and Pukaki Rise
SOI	FMA6A	Southern offshore islands – Auckland and Campbell Islands
CHA	FMA 7	West Coast South Island to Fiordland including Kaikoura
CEW	FMA 8	West North Island from South Taranaki Bight to Wellington
AKW	FMA 9	West North Island from North Cape to North Taranaki Bight
KER	FMA 10	Kermadec

2.1.1 "Inshore" Fisheries: Joint DOC-MPI Inshore Observer Programme

Introduction

During the planning round for the 2011/12 observer programme a tiered approach was developed to prioritising areas of observer coverage. This planning process was described in detail in the Marine Conservation Services Programme Annual Plan 2011/12[3]. This tiered process has endured into the planning for the 2013/14 year and decisions on the levels and placement of this observer coverage were undertaken jointly between DOC and MPI. These decisions were informed by risk assessments (levels 1, 2 and 3 where applicable), Hector's and Maui's dolphin Threat Management Plan priorities, previous observer data and fish-stock related data collection.

For 2013/14 the cost of observer coverage is being jointly recovered by both DOC and MPI similar to the way in which offshore observer coverage is cost recovered. Broadly, for coverage driven by protected species interactions each costs will be recovered evenly by each agency. For coverage driven by fisheries needs but also collecting protected species information the observer's time will be prorated to reflect the time spent on each set of tasks generally 85% Fisheries, 15% Conservation Services.

The Joint DOC-MPI Inshore Observer Programme

The goals of the Inshore Observer Programme are to:

- *inform management of impacts from fishing on protected species by identifying and quantifying interactions between inshore fisheries and protected species, and assessing the effectiveness of mitigation measures, where appropriate*;
- *minimise adverse effects of fishing on the aquatic environment, including on biological diversity; and*
- *inform management of fish stocks by gathering biological and other information on board fishing vessels.*

The information gathered is used to inform management of impacts from fishing, in support of statutory obligations under the Fisheries Act 1996 related to protected species. These obligations include:

> ***Section 9***
> *"…*
> *(a) associated or dependent species [including protected species] should be maintained above a level that ensures their long-term viability:*
> *(b) biological diversity of the aquatic environment should be maintained:*
> *…".*

[3] Available for download from http://www.doc.govt.nz/publications/conservation/marine-and-coastal/marine-conservation-services/csp-plans/mcs-annual-plan-2011-12/

Section 15

"(1) If a population management plan has been approved under section 14F of the Wildlife Act 1953 or section 3E of the Marine Mammals Protection Act 1978, the Minister—

(a) shall take all reasonable steps to ensure that the maximum allowable fishing-related mortality level set by the relevant population management plan is not exceeded:

(b) may take such other measures as he or she considers necessary to further avoid, remedy, or mitigate any adverse effects of fishing on the relevant protected species.

(2) In the absence of a population management plan, the Minister may, after consultation with the Minister of Conservation, take such measures as he or she considers are necessary to avoid, remedy, or mitigate the effect of fishing-related mortality on any protected species, and such measures may include setting a limit on fishing-related mortality.

…".

The information gathered may also support other relevant statutory obligations under other legislation (e.g. Wildlife Act 1953, Marine Mammals Protection Act 1978).

Inshore Observer Projects

The table below summarises the observer projects for 2013/14

Method	Area	Statistical Area	Percentage of effort	Season	Total number of days	Objective
Setnet	East Coast South Island	22	65%	Sep-Mar	290	Dolphins
	West Coast South Island	33-35	100%	All year	40	Dolphins
	West Coast North Island	To be confirmed – Subject to Ministerial decisions			250	Dolphins
Small inshore trawl (except flatfish)	West Coast North Island	To be confirmed – Subject to Ministerial decisions			370	Dolphins, seabirds, total catch verification
	West Coast South Island	33-35	25%	All year	450	Dolphins, seabirds, total catch verification
	East Coast South Island	20, 22	50%	Jul-Nov	410	Dolphins, seabirds
Bottom longline	North-east North Island	003-008	30%	Oct-Mar	600	Seabirds

Hector's and Maui Dolphins

Background information

In 2007, the then Ministry of Fisheries and the Department of Conservation (DOC) developed the Threat Management Plan (TMP) to guide management of human-induced threats to Hector's and Maui's[4] dolphins. A review of the TMP was signalled for 2013, dependent on relevant new information being available at that time.

In 2012, the review of the Maui's dolphin component of TMP was brought forward as a result of new information (a new population estimate and the accidental capture of a Hector's or Maui dolphin off the coast of Taranaki in January 2012). The Ministry for Primary Industries (MPI) and DOC consulted on the proposed management measures in late 2012. The Minister for Primary Industries and the Minister of Conservation have received MPI and DOC's final advice on the issue. The Ministers' decision is expected shortly.

The Hector's dolphin component of the TMP is scheduled for review in the short to medium term (dependent on Ministerial decisions) and will seek to ensure that measures are effective at managing the human-induced risks to the three genetically distinct populations around the South Island (East Coast and top of the South Island, West Coast and the South Coast).

Hector's dolphins

Overall project objectives/information needs

1. Estimate the capture rate of Hector's dolphins in **setnet fisheries** on the **East Coast** of the South Island
2. Estimate the capture rate of Hector's dolphins in **setnet fisheries** on the **West Coast** of the South Island
3. Estimate the capture rate of Hector's dolphins in **trawl fisheries** on the **East Coast** of the South Island
4. Estimate the capture rate of Hector's dolphins in **trawl fisheries** on the **West Coast** of the South Island
5. Estimate Hector's dolphin **abundance and distribution** on the **East Coast** of the South Island
6. Estimate Hector's dolphin **abundance and distribution** on the **West Coast** of the South Island
7. Estimate the risk posed by setnet and trawl fisheries to Hector's dolphins throughout their range

Please note that objectives 5, 6 and 7 do not directly require observer coverage at this stage. However the location of Hector's dolphin sightings by Observers will inform these projects.

[4] During recent consultation, iwi advised MPI that it is 'Maui' rather than 'Maui's' dolphins. Accordingly, Maui is used throughout this Project Brief except when reference the title of the TMP.

PROJECT A

Project Title	Interactions with Hector dolphins, **East Coast** South Island
Start Date	1 September 2013
Completion Date	31 March 2014
Targeted fishing methods	Inshore **setnet** vessels
Targeted Statistical Areas	22

Project Objectives

1. Gather information to estimate the number of captures and the capture rate of Hector's dolphins in setnet fisheries on the East Coast of the South Island.
2. Additionally, spatial distribution data will be obtained.

Information Needs

An overall capture rate for the East Coast and top of the South Island population needs to be estimated as the East Coast has the highest levels of setnet activity. Observer coverage is targeted in a statistical area where there are high levels of setnet fishing occurring.

Statistical area 018 (off the Kaikoura coast) was covered in 2010/11 (100 days). Statistical area 022 (off Timaru coast) was covered in 2012/13, however delivery issues have seriously affected coverage and more data are needed to ensure a robust estimate of captures and capture rate.

Robust estimation of total Hector's dolphin captures requires that the fishing behaviour observed is representative of normal situations (i.e. if we can assume that observer placement is not changing behaviour). To minimise any potential bias, relatively high coverage as a percentage of effort by area/month is proposed.

Proposed Coverage

- Statistical area 22.
- 65% coverage of setnet effort is required to gain enough scientifically robust data.
- 290 observer days are required.

Secondary information to be collected

To make the best use of Observers' time, secondary information can sometimes be collected, which will then inform other priorities. Secondary information collected will include:

- Biological sampling of fish to help inform stock assessments.
- Information on the nature and extent of setnet interactions with seabirds, in particular yellow-eyed penguins.

Related Research

- An East Coast South Island aerial survey is planned to obtain estimates of Hector's dolphin abundance and distribution, which when combined with capture observations will allow estimation of the risk posed by setnet fisheries in this area.
- Observer coverage on East Coast South Island trawl vessels is proposed (refer to Seabirds section), primarily to investigate the capture rate of at-risk seabirds. Secondary information on incidental capture rates of protected species will also be collected.
- An ongoing autopsy programme for Hector's and Maui dolphins aims to identify sub-species, cause of death, body condition, parasitism for any beach-cast or captured dolphins. This allows better understanding of the health and condition of the various Hector's and Maui dolphins.

PROJECT B

Project Title	Interactions with Hector's dolphins, **West Coast** South Island
Start Date	1 July 2013
Completion Date	30 June 2014
Targeted fishing methods	Inshore **setnet** vessels
Targeted Statistical Areas	33, 34, 35

Project Objectives

1) Gather Information to estimate the number of captures and the capture rate of Hector's dolphins in setnet fisheries on the West Coast of the South Island.
2) Additionally, spatial distribution data will be obtained.

Information Needs

An overall capture rate for the West Coast population needs to be estimated. Observer coverage is targeted in statistical areas where setnet fishing is occurring. There is significantly lower setnet activity taking place on the West Coast, compared to the East Coast, however the West Coast population is thought to be the most abundant population and therefore even though only a small number of days will be observed, it may be possible to provide a robust estimate of captures and capture rate.
Robust estimation of total Hector's dolphin captures requires that the fishing behaviour observed is representative of normal situations (i.e. if we can assume that observer placement is not changing behaviour). To minimise any potential bias, relatively high coverage as a percentage of effort by area/month is proposed.

Proposed Coverage

- Statistical areas 33, 34 and 35.
- 100% coverage of setnet effort is required to gain enough scientifically robust data.
- 40 observer days required.

Secondary information to be collected

- Biological sampling of fish to help inform stock assessments.
- Interactions with other protected species are known to occur in this area, including common dolphins and fur seals. Observer coverage will add to the understanding of the nature and extent of these interactions.

Related Research

- A West Coast South Island aerial survey is proposed to obtain estimates of Hector's dolphin abundance and distribution, which when combined with capture observations will allow estimation of the risk posed by setnet fisheries in this area.
- Observer coverage on West Coast South Island trawl vessels is proposed to obtain an estimate of the capture rate of Hector's dolphins in the trawl fisheries on the West Coast of the South Island.
- An ongoing autopsy programme for Hector's and Maui dolphins aims to identify sub-species, cause of death, body condition, parasitism for any beach-cast or captured dolphins. This allows better understanding of the health and condition of the various Hector's and Maui dolphins.

PROJECT C

Project Title	Interactions with Hector's dolphins, **East Coast** South Island – Note: the observer effort associated with this project also appears under the seabirds section.
Start Date	1 July 2013
Completion Date	30 November 2013
Targeted fishing methods	Inshore small **trawl** vessels (not flatfish)
Targeted Statistical Areas	20, 22

Project Objectives

1. Gather Information to estimate the number of captures and the capture rate of Hector's dolphins in the trawl fisheries on the East Coast of the South Island.
2. Additionally, spatial distribution data will be obtained.

Information Needs

An overall capture rate from trawling for the East Coast population needs to be estimated. Observer coverage is targeted in statistical areas where the highest levels of trawling are occurring.

Robust estimation of total Hector's dolphin captures requires that the fishing behaviour observed is representative of normal situations (i.e. if we can assume that observer placement is not changing behaviour). To minimise any potential bias, relatively high coverage as a percentage of effort by area/month is proposed.

Proposed Coverage

- Statistical areas 20 and 22.
- 50% coverage of trawl effort is required to gain enough scientifically robust data.
- 410 observer days required.

Secondary information to be collected

- Information will be gathered on the incidental mortality of other protected species including Salvin's albatross and White-capped albatross which have been identified in the level 2 risk assessment as species subject to elevated risk.
- Observations on the nature of warp interactions will inform improvements to estimates of cryptic mortality which feed in to the level 2 risk assessment. These observations will also improve the understanding of efficacy of any mitigation methods in use in this fishery.
- Biological sampling of fish to help inform stock assessments.
- Information on total commercial catch will be obtained.

Related Research

- An East Coast South Island aerial survey is planned to obtain estimates of Hector's dolphin abundance and distribution, which when combined with capture observations will allow estimation of the risk posed by setnet fisheries in this area.
- Coverage on East Coast South Island setnet vessels is proposed to estimate the number of captures and the capture rate of Hector's dolphins in setnet fisheries in the area.
- An ongoing autopsy programme for Hector's and Maui dolphins aims to identify sub-species, cause of death, body condition, parasitism for any beach-cast or captured dolphins. This allows better understanding of the health and condition of the various Hector's and Maui dolphins.

PROJECT D

Project Title	Interactions with Hector's dolphins, **West Coast** South Island
Start Date	1 July 2013
Completion Date	30 June 2014
Targeted fishing methods	Inshore small **trawl** vessels (not flatfish)
Targeted Statistical Areas	33, 34, 35

Project Objectives

1. Gather information to estimate the number of captures and the capture rate of Hector's dolphins in the trawl fisheries on the West Coast of the South Island.
2. Additionally, spatial distribution data will be obtained.

Information Needs

An overall capture rate for the West Coast population needs to be estimated. Observer coverage is targeted in statistical areas where the highest levels of trawling are occurring. Robust estimation of total Hector's dolphin captures requires that the fishing behaviour observed is representative of normal situations (i.e. if we can assume that observer placement is not changing behaviour). To minimise any potential bias, relatively high coverage as a percentage of effort by area/month is proposed.

Proposed Coverage

- Statistical areas 33, 34 and 35.
- 25% coverage of trawl effort is required to gain enough scientifically robust data.
- 450 observer days required.

Secondary information to be collected

- Information will be gathered on the incidental mortality of other protected species including White-capped albatross which has been identified in level 2 risk assessment as a species subject to elevated risk.
- Observations on the nature of warp interactions will inform improvements to estimates of cryptic mortality which feed in to the level 2 risk assessment. These observations will also improve the understanding of efficacy of any mitigation methods in use in this fishery.
- Biological sampling of fish will help inform stock assessments.
- Information on total commercial catch.

Related Research

- A West Coast South Island aerial survey is proposed to obtain estimates of Hector's dolphin abundance and distribution, which when combined with capture observations will allow estimation of the risk posed by setnet fisheries in this area.
- Observer coverage on West Coast South Island setnet vessels is proposed to estimate the number of captures and the capture rate of Hector's dolphins in setnet fisheries in the area.
- An ongoing autopsy programme for Hector's and Maui dolphins aims to identify sub-species, cause of death, body condition, parasitism for any beach-cast or captured dolphins. This allows better understanding of the health and condition of the various Hector's and Maui dolphins.

Maui dolphins

Overall project objectives/information needs

1. Estimate the capture rate of Maui dolphins in **setnet fisheries** on the West Coast of the North Island.
2. Estimate the capture rate of Maui dolphins in **trawl fisheries** on the West Coast of the North Island.

PROJECT E

Project Title	Interactions with Maui dolphins, **West Coast** North Island
Start Date	*TBC - Subject to the Ministerial decisions*
Completion Date	*TBC - Subject to the Ministerial decisions*
Targeted fishing methods	Inshore **setnet** vessels
Targeted Statistical Areas	*TBC - Subject to Ministerial decisions*

Project Objectives

1. Gather Information to estimate the number of captures and the capture rate of Maui dolphins in setnet fisheries on the West Coast of the North Island.
2. Additionally, spatial distribution data will be obtained.

Information Needs

An overall capture rate for Maui dolphins needs to be estimated. Observer coverage will be targeted to reflect Ministerial decisions made in response to the Review of the Maui's dolphin TMP.

Robust estimation of total Maui dolphin captures requires that the fishing behaviour observed is representative of normal situations (i.e. if we can assume that observer placement is not changing behaviour). To minimise any potential bias, relatively high coverage as a percentage of effort by area/month will be proposed.

Proposed Coverage

250 days -TBC – Subject to Ministerial decisions.

Secondary information to be collected

- Biological sampling of fish will help inform stock assessments.

Related Research

- Ongoing aerial and boat based surveys of the West Coast North Island supported by biopsy sampling where possible.
- An ongoing autopsy programme for Hector's and Maui dolphins aims to identify sub-species, cause of death, body condition, parasitism for any beach-cast or captured dolphins. This allows better understanding of the health and condition of the various Hector's and Maui dolphins.

PROJECT F

Project Title	Interactions with Maui dolphins, **West Coast** North Island
Start Date	*TBC - Subject to the Minister's decisions*
Completion Date	*TBC - Subject to the Minister's decisions*
Targeted fishing methods	Inshore small **trawl** vessels (not flatfish)
Targeted Statistical Areas	*TBC - Subject to the Minister's decisions*

Project Objectives

1. Gather information to estimate the number of captures and the capture rate of Maui dolphins in trawl fisheries on the West Coast of the North Island.
2. Additionally, spatial distribution data will be obtained.

Information Needs

An overall capture rate for Maui dolphins needs to be estimated. Observer coverage will be targeted to reflect Ministerial decisions made in response to the review of the Maui's dolphin TMP.

Robust estimation of total Maui dolphin captures requires that the fishing behaviour observed is representative of normal situations (i.e. if we can assume that observer placement is not changing behaviour). To minimise any potential bias, relatively high coverage as a percentage of effort by area/month will be proposed.

Proposed Coverage

370 days - TBC – Subject to Ministerial decisions.

Secondary information to be collected

- Biological sampling of fish will help inform stock assessments.
- Information on total commercial catch.
- Information will be gathered on the incidental mortality other protected species including seabirds other marine mammals and protected fish species.
- Observations on the nature of warp interactions will inform improvements to estimates of cryptic mortality which feed in to the level 2 risk assessment.

Related Research

- Ongoing aerial and boat based surveys of the West Coast North Island supported by biopsy sampling where possible.
- An ongoing autopsy programme for Hector's and Maui dolphins aims to identify sub-species, cause of death, body condition, parasitism for any beach-cast or captured dolphins. This allows better understanding of the health and condition of the various Hector's and Maui dolphins.

Seabirds

Background information

More species of seabirds breed in New Zealand than anywhere else in the world. These seabirds face different levels of risk from fishing operations. This depends upon their demographic and biological characteristics, their foraging behaviours, and their extent of overlap with fisheries.

A level 2 risk assessment (Richard & Abraham 2013) estimates impacts and associated population-level risk, including uncertainty, for 70 seabird species breeding in New Zealand. This risk assessment will provide the initial basis for assigning species to risk categories under a revised *National Plan of Action to reduce the incidental catch of seabirds in New Zealand fisheries* (NPOA-Seabirds), and to guide research and mitigation prioritisation.

Observer coverage is often needed as a component of these research and mitigation projects, and should be planned alongside them. The risk assessment can also inform the targeting of observer coverage to address uncertainties in the assessment and gain more information in priority areas. The outcomes of the L2 risk analysis can be disaggregated in space, in time, and with respect to different fisheries or components of the fishing fleet (e.g. specific gear configurations). From this analysis we can identify particular aspects such as fisheries, locations, and/or fishing methods that contribute disproportionately to population-level risk for the most at-risk seabirds, and target our management or research efforts accordingly.

Overall project objectives/information needs

1. Improve capture rate estimation for high-risk species subject to uncertain levels of capture (focus on black petrel, flesh-footed shearwater) in **inshore bottom longline** fisheries (focus in **north-east of North Island**).
2. Improve capture rate estimation for high-risk species subject to uncertain levels of capture (focus on Salvin's albatross, New Zealand white-capped albatross) in **inshore trawl** fisheries other than flatfish (focus in **East Coast South Island, West Coast South Island**).
3. Improved estimation of cryptic mortality and/or live-capture post-release survival in **inshore bottom longline fisheries.**
4. Improved estimation of cryptic mortality and/or live-capture post-release survival associated with warp strikes and net captures in **inshore trawl** fisheries.
5. Improve understanding of the efficacy of mitigation used in inshore trawl and bottom longline fisheries

PROJECT G

Project Title	Variables affecting capture rates of at-risk seabirds (black petrels, flesh-footed shearwaters) in inshore bottom longline fisheries in the **north-east North Island**
Start Date	1 October 2013
Completion Date	31 March 2014
Targeted fishing methods	Inshore **bottom longline** vessels targeting **snapper**
Targeted Statistical Areas	003, 004, 005, 006, 007, 008

Project Objectives

1. Collect information to reduce uncertainty associated with the estimated capture rate of at-risk seabird species (primarily black petrels and flesh-footed shearwaters) in inshore bottom longline fisheries targeting snapper.

2. Collect information to improve current estimates of cryptic mortality/ live-release survival in inshore bottom-longline fisheries.
3. Collect information to evaluate the efficacy of inshore bottom longline mitigation efforts.

Information Needs

Black petrel is identified by the L2 risk assessment as the single most at-risk seabird species from commercial fisheries interactions. Current capture estimates are unrealistically high (mean risk ratio = 19.4) and improved observer coverage is likely to result in a more realistic estimate. In the meantime however, MPI is confident that current impacts are unsustainable, and management action is needed. The primary objective of observer coverage targeting black petrels is to better understand what factors most strongly determine variable capture rates, in order to support consideration of mitigation options.

Risk to black petrels derives primarily from inshore bottom long-line fisheries, spread approximately equally between the three defined fishery groups (i.e. small bottom longline targeting bluenose; small bottom longline targeting snapper; and small bottom longline targeting other inshore species). A second at-risk species from inshore bottom longline fisheries, flesh-footed shearwater (mean risk ratio = 1.32), is more coastal in its distribution so that risk to this species arises primarily from bottom longline vessels targeting snapper. Due to low historical observer coverage in all inshore bottom longline fishery groups, these risk estimates are subject to considerable uncertainty. Capture rates recorded by fishery observers can be expected to substantially improve these estimates.

A related research project is currently planned to model black petrel (and flesh-footed shearwater) capture rates as a function of multiple variables potentially affecting interactions with fisheries, including analysis of higher resolution spatial and temporal distributions (of both birds and vessels), and fleet variables such as vessel experience and mitigation. *It will be important that new observer coverage is spread across the range of spatial and temporal variables where captures are thought to occur* (i.e. in all months and all statistical areas) and if possible across the full range of fleet or behavioural variables examined (i.e. on different types of vessels). If new coverage is somehow unrepresentative (i.e. because vessels of a particular class resist accepting observers, or the presence of an observer biases fisher behaviour), capture rate estimation arising from the new model will be uninformed, and associated risk estimates are likely to remain uncertain (and high).

Current estimates of cryptic mortality in inshore bottom longline fisheries rely on observations elsewhere and do not include consideration of post-release survivability for live-captured birds. Fishery-specific observations can be expected to yield substantial improvements. Dedicated observer coverage to characterise interactions and to evaluate the likely fate of birds released alive is a high priority.

Proposed Coverage

- Statistical areas 003, 004, 005, 006, 007 and 008.
- 30% coverage of bottom longline effort targeting snapper, spread to the extent practical across the range of vessels and in space and time, is required to gain scientifically credible estimates of factors affecting capture rates.
- Summer coverage is required (black petrels are absent in winter).
- 600 observer days required.

Secondary information to be collected

- Biological and size composition data collection from target and bycatch species (e.g. retained sharks) will inform stock assessments.
- Information will be gathered on the incidental mortality of other protected species including other seabirds, protected fish, and potentially other protected species.
- Observations of seabird behaviour, mitigation efficacy and fishing practice will inform ways of reducing risk to these seabirds.

Related Research

- Projects MIT 2011-03, MIT2011-04 & MIT2012-01 investigating ways of reducing availability of inshore bottom longline hooks to seabirds[5].
- Project POP2012-03 Black petrel - at-sea distribution and population estimate[6]
- Proposed project POP2013-04 Black petrel population trend and demographics (Section 3.6).
- Proposed project INT2013-05 Assessment of cryptic mortality on trawl warps and longlines (Section 2.5).
- Proposed project MIT2013-01 Sea trials of the Kellian line setter (Section 4.2).
- Project PRO2013-12 modelling black petrel (and flesh-footed shearwater) capture rates as a function of multiple variables potentially affecting seabird interactions with inshore bottom longline fisheries.
- Project PRO2013-01 Protected species capture estimation.
- Project PRO2013-02 Developing predictive models of protected species distribution.
- Project PRO2013-16 Reducing uncertainty in L2RA for higher risk seabirds.

PROJECT H

Project Title	Capture rate of at-risk seabirds (Salvin's albatross, New Zealand white-capped albatross), in inshore trawl fisheries, **East Coast South Island -** Note: the observer effort associated with this project also appears under the Hector's dolphin section.
Start Date	1 July 2013
Completion Date	30 November 2013
Targeted fishing methods	Small inshore **trawl** vessels (not targeting flatfish)
Targeted Statistical Areas	20, 22

Project Objectives

1. Collect information to reduce uncertainty associated with the estimated capture rate of at-risk seabird species (primarily Salvin's and Chatham Island albatross) in inshore trawl fisheries.
2. Collect information to characterise seabird interactions with inshore trawl fisheries, to improve associated estimates of cryptic mortality/ live-release survival, and potentially to inform mitigation.
3. Collect information to evaluate the efficacy of inshore trawl mitigation efforts.

[5] Reports available for download at www.doc.govt.nz/csp
[6] Further details available in the CSP Annual plan 2012/13 http://www.doc.govt.nz/publications/conservation/marine-and-coastal/conservation-services-programme/csp-plans/csp-annual-plan-2012-13/

Information Needs

Salvin's albatross is identified by the L2 risk assessment as the second most at-risk seabird species from commercial fisheries interactions (mean risk ratio = 2.76). New Zealand white-capped albatrosses are also potentially at-risk (mean risk ratio = 0.7). For both of these species greater than 40% of this risk derives from a single fishery group (small inshore trawl excluding flatfish) but due to low historical observer coverage in this fishery group, these estimates are subject to considerable uncertainty. Capture rates recorded by fishery observers can be expected to substantially improve these estimates. Estimation of cryptic mortality associated with trawl fisheries relies on estimating the relative proportion of capture events that are in the net vs. on the warps, and on assumptions about the fate of birds that collide with moving warps but are not entangled. Our current estimates rely on observations from other fisheries and areas, including from trawl vessels with substantially different physical configurations; fishery-specific observations can therefore be expected to yield substantial improvements. Dedicated observer coverage to characterise the nature of trawl fishery interactions with different classes of seabird, and to evaluate the likely fate of live-released birds or of birds experiencing aerial warp strakes, is a high priority. Because the current cryptic mortality estimate for albatrosses is quite high, improving this information can be expected to yield substantial improvements in overall estimation of risk for these species.

Proposed Coverage

- Statistical areas 20 and 22.
- 50% coverage of trawl effort is required to control for spatio-temporal variability.
- 410 observer days are required.

Secondary information to be collected

- Biological (fish) data collection from target and bycatch species will inform stock assessments.
- Information will be gathered on the incidental mortality of other protected species including other seabirds, Hector's dolphins and other marine mammals, and protected fish species.
- Information on total commercial catch will be obtained.

Related Research

- Proposed project INT2013-05 Assessment of cryptic mortality on trawl warps and longlines (Section 2.5).
- CSP project POP2012-05 White-capped albatross – population estimate[7].
- Proposed project POP2013-02 Auckland Islands white-capped albatross population estimate (Section 3.4).
- CSP project POP2012-06 Salvin's albatross population and at-sea distribution estimate (Section 3.2).
- Project PRO2013-01 Protected species capture estimation.
- Project PRO2013-02 Developing predictive models of protected species distribution.
- Project PRO2013-15 Observations to understand seabird cryptic mortality (inshore trawl).
- Project PRO2013-16 Reducing uncertainty in L2RA for higher risk seabirds.

[7] Further details available in the CSP Annual plan 2012/13 http://www.doc.govt.nz/publications/conservation/marine-and-coastal/conservation-services-programme/csp-plans/csp-annual-plan-2012-13/

Total Commercial Catch Project

PROJECT I

Project Title	Total Commercial Catch Project
Start Date	2013
Completion Date	2016
Targeted fishing methods	Inshore small **trawl** vessels (not flatfish)
Targeted Statistical Areas	*To be confirmed*

Background Information

Information on total mortality is important to ensure good fisheries management decision making and that best use is made of New Zealand's fisheries resources. There is uncertainty surrounding the level of total mortality in some inshore fisheries.

Project Objectives/ Information needs

1. Gather information on total commercial catch. Information may include species, quantity, size, area, season and age.

Proposed Coverage

- West Coast South Island, East Coast South Island, upper West Coast North Island and upper East Coast North Island. Exact statistical areas to be confirmed.
- 25% coverage of trawl effort on 100% of the vessels is required to gain enough scientifically robust data.
- 800 observer days required. – *Please note that these observer days will be delivered during 2013/14 in conjunction with coverage for the dolphin and seabird objectives described above.*

Secondary information to be collected

- Information on interactions with protected species.

2.1.2 "Offshore" Fisheries

As for previous years, planning of observer days was conducted jointly with MPI in order to identify an overall amount of observer coverage which will meet both agencies goals. Costs were then apportioned to each agency on the basis of how much of the observers' work in each fishery will be focused on Conservation Services. Typically the CSP component is 15% of the total days, which reflects the time that observers are likely to spend on protected species tasks. These fisheries have generally received higher levels of observer coverage compared to the fisheries discussed in 2.1.1, with the exception of the surface longline domestic and scampi fisheries where observer coverage has remained below 10% in recent years. For middle depth trawl fisheries, in order to better reflect the fact that vessels will target multiple species over a single trip, they have been divided on an area basis to both assist in addressing information needs and observer planning.

Planned days for 2013/14 are summarised in the table below. These fisheries are monitored to track changes in protected species interactions and mitigation efficacy over time. Data is collected to allow estimation of capture levels and to better understand the nature of protected species interactions in order to develop mitigation solutions. Foreign Charter Vessel coverage is identified as a separate category, in recognition of the multiple factors influencing high observer coverage levels of these vessels.

Summary of 2013/14 observer days planned in better known fisheries

Fishery	Stocks covered	Total days	MPI CR %	MPI Days	CSP CR %	CSP Days
FOREIGN CHARTER VESSELS						
Foreign Charter Vessels	430 days STN1; remaining days to be recovered as follows: HOK1; LIN3-7; HAK All; BAR All; SQU1T and SQU6T; JMA3-7; SBW All; WWA All; SWA All	6000	85	5100	15	900
DOMESTIC VESSELS						
Deepwater trawl fisheries:						
ORH 1	ORH1	55	90	50	10	5
East Coast NI Deepwater	ORH2A, BYX2, CDL2	175	90	158	10	17
Chatham Rise Deepwater	ORH3B, OEO3A, OEO4, BYX3	250	90	225	10	25
Sub-Antarctic Deepwater	ORH3B, OEO1, OEO6	80	90	72	10	8
West Coast NI Deepwater	ORH7A	20	90	18	10	2
Middle depth trawl fisheries:						
Chat Rise Domestic	HOK1, HAK1, HAK4, LIN3, LIN4, SWA3, SWA4, JMA3, EMA3	140	85	119	15	21
HOK Cook Strait	HOK1	80	85	68	15	12
HOK WCSI inside the line	HOK1, HAK7,LIN7, SWA1, JMA7, EMA7	65	85	55	15	10
Scampi	SCI (ALL)	150	80	120	20	30
Deepwater bottom longline fisheries:						
Bottom longline	LIN3, LIN4	98	85	83	15	15
Surface longline fisheries:						
Domestic tuna longline - EC STN	STN1	157	85	133	15	24
Domestic tuna longline - WC STN	STN1	35	85	30	15	5
Domestic tune longline - EC BIG/SWO	BIG1, SWO1	225	85	191	15	34
Domestic tune longline - WC BIG/SWO	BIG1, SWO1	35	85	30	15	5
Purse seine fisheries:						
Domestic SKJ	SKJ1	70	85	60	15	10
Super seiner SKJ	SKJ1	30	85	26	15	4

Further background to these fisheries and the allocation of observer days is provided below.

PELAGIC AND MIDDLE DEPTH TRAWL FISHERIES

Finfish

Pelagic and middle depth trawl fisheries primarily target hoki, hake, ling, warehou, jack mackerel and southern blue whiting. A large proportion of observer coverage in these fisheries will be targeted at Foreign Charter Vessels, and vessels may often target multiple species in the same trip. The rationale provided here is divided on a geographic and fishery basis in order to best identify CSP information needs.

West Coast South Island

Coverage will largely targeted at the 'Hoki season' from July to September. Observers record information on which mitigation techniques are employed in this fishery. Mitigation techniques employed include offal and discard management, and the use of bird scaring devices (legally required for larger vessels).

Cook Strait

This fishery operates distinctly from other hoki targeting fisheries in that vessel size is limited to under 46m. A large number of vessels shift to this fishery from other areas with a short but intense period of fishing taking place. Trips are generally overnight with catch rates of hoki being high. This fishery has also been the site of some of the highest numbers of fur seal captures therefore observer coverage in this fishery has been increased. Observers record information on which mitigation techniques are employed in this fishery. Mitigation techniques employed include offal and discard management, and the use of bird scaring devices (legally required for larger vessels). Observer coverage from July to September will be focused in the Cook Strait.

Chatham Rise

The Chatham Rise middle depth trawl fishery operates in a spatially distinct area to the other middle depth trawl fisheries, and so encounters a different assemblage of protected species. This fishery is operated exclusively by larger vessels. Observers record information on which mitigation techniques are employed in this fishery. Mitigation techniques employed include offal and discard management, and the use of bird scaring devices (legally required for larger vessels). Observer coverage for the period October to May will be spread across SEC, SOE, SOU and SUB.

Sub-Antarctic

The Sub-Antarctic middle depth trawl fishery is largely dominated by tows targeting southern blue whiting around the Bounties and Campbell Islands where significant mammal captures have taken place. Observer time will be focussed on monitoring and recording interactions with fur seals and sea lions. Data is also collected on seabird interactions and behaviour due to the location of this fishery and its close vicinity to many seabird breeding islands. The landing of protected coral will also be recorded and sub-samples will be taken for identification.

Observers are tasked with recording information on which mitigation techniques are employed on vessels to better understand interactions between fishing gear and captures of protected species. Mitigation techniques employed in this fishery include offal and discard management and the use of bird scaring devices.

West Coast North Island

This fishery group is dominated by the jack mackerel trawl fishery. Observer time will be focussed on recording protected species interactions and the behaviour of cetaceans, pinnipeds and seabirds around the vessel. Observers will also record information on

which mitigation and avoidance techniques are employed in this fishery. Vessels can employ several techniques aimed at reducing the likelihood of interacting with dolphins, including not fishing during hours of the day when dolphin interactions are more likely, not shooting nets when dolphins are sighted, avoiding a shallow headline depth, and avoiding targeting small mackerel, which appear to be the dolphins' target prey. During the 2013/14 observer year coverage is planned to target the period October to December and April to June to coincide with key jack mackerel fishing periods.

Scampi

The priority for observers in southern areas will be to monitor interactions with seabirds New Zealand sea lions. The landing of protected coral will also be recorded and sub-samples will be taken for identification if required. Data is also collected on seabird interactions and behaviour around vessels. Observers record information on which mitigation techniques are employed in this fishery, including offal and discard retention and the use of bird scaring devices as well a specific gear configurations used.

Squid6T

The CSP Observer Programme will form 20% of days planned for the squid 6T fishery to monitor interactions with protected species and measures to reduce those interactions. Particular areas of CSP interest in this fishery include offal and discard management and captures of seabirds in trawl nets. Observer placement in 2013/14 will be focussed to monitor interactions with NZ sea lions and seabirds from January to May.

DEEP WATER BOTTOM TRAWL FISHERIES

Orange Roughy and Oreo

Observer time will be focussed on assessing the extent of protected coral landed on vessels as well as monitoring and recording interactions with, and behaviours of, seabirds. Sub-samples of corals will be taken for identification when required. Mitigation techniques employed in this fishery include offal and discard management, the use of bird scaring devices and trawling known tracks to avoid catching deep sea invertebrates.

SURFACE LONGLINE FISHERIES

Domestic surface longline

Monitoring priorities for 2013/14 will include collecting information on protected species interactions, mitigation techniques and offal/discard management practices employed in the fishery. Historic captures of protected ray species mean that increased observer focus will go into documenting of these captures and particularly the post release fate of the animals. Observer coverage will be in AKE, CEE, CHA and KER to monitor interactions with seabirds and turtles. Coverage will be throughout the year.

Charter surface longline

Observer time will be focussed on monitoring and recording interactions with seabirds and sea turtles, including captures and behaviour of protected species around the vessel. Observers will record information on which mitigation techniques are employed in this fishery which can include the use of tori lines, night setting, weighted lines and offal and discard management. Observer coverage in 2013/14 will be dependent on where charter tuna vessels focus fishing effort.

BOTTOM LONGLINE FISHERIES

Deep-sea ling

Observer time will be focussed on monitoring and recording interactions with seabirds including captures and behaviour around the vessel. Observers record information on

which mitigation techniques are employed in this fishery, including the use of tori lines and line weighting regimes. Observer coverage in 2013/14 will be focussed to monitor seabird interactions during September, October, May and June.

PURSE SEINE FISHERIES

Skipjack tuna

Observer coverage has historically taken place in this fishery, though not for the purposes of protected species monitoring. Two ray species (*Manta birostris* and *Mobula japanica*) have historically been reported as bycatch in this fishery and therefore for the 2013/14 year CSP will be levying for coverage in this fishery in order to assess the nature and extent of protected fish captures in this fishery. Observer coverage is planned for AKE and AKW in both the domestic purse seine and super seine fisheries.

CSP OBSERVER PROGRAMME OUTPUTS

1. A descriptive report summarising observer data relating to protected species collected in offshore fisheries and inshore fisheries will be provided to stakeholders. Note that this will include information relating to protected species collected in the joint DOC/MPI Inshore Observer Programme.
2. Specific information can be requested from CSP at any time and will be delivered within a reasonable timeframe (usually within 10 working days).
3. All seabirds are returned and/or photographed, where possible, for identification and autopsy (see project INT 2013-02: Identification of seabirds captured in NZ fisheries).
4. Data will be available for other DOC and MPI projects including mitigation development/testing, bycatch estimation, risk management and other modelling projects.

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Indicative Research Cost: See Appendix 1 for details

Cost Recovery: F(CR) Item 8 (100% Industry)

Fish Stocks: See Appendix 1 for details

2.2 Identification of seabirds captured in New Zealand fisheries

Project Code: INT 2013-02

Start Date: 1 July 2013

Completion Date: 30 June 2016

Overall Objective

To determine which seabird species are captured in fisheries and the mode of their capture.

Specific Objectives

1. To determine, through examination of returned seabird specimens, the taxon, sex, and where possible age-class and provenance of seabirds killed in New Zealand fisheries (for returned dead specimens).
2. To detail the injuries, body condition and stomach contents and, where possible, the likely cause of mortality (for returned dead specimens).
3. To report any changes in the protocol used for the necropsy of seabirds (for returned dead specimens).
4. To determine, through examination of photographs, the taxon and, where possible, sex, age-class and provenance of seabirds captured in New Zealand fisheries (for live captures or dead specimens discarded at sea).

Rationale

Large numbers of seabirds frequent New Zealand commercial fishing waters. Birds with significant differences in conservation status can appear morphologically similar. The accurate determination of the taxon of seabirds captured in New Zealand fisheries is vital for examining the potential threat to population viability posed by incidental fisheries captures. Observers on commercial vessels are not always able to identify seabirds at sea with high precision and the assessment of the age-class, sex and provenance of captured individuals requires autopsy in the majority of cases. Historically all dead seabird specimens collected by observers have been returned for necropsy where possible. However, in many cases, the taxon can be confirmed through expert examination of photographs taken by observers, and this can be achieved at lower cost than returning carcases and performing necropsy. In order to maximise cost efficiencies, and in recognition of increased observer coverage levels in the offshore Foreign Charter Vessel fleet, a new protocol has been developed to determine which specimens are returned for full necropsy. This protocol aims to strike a balance between returning birds for full necropsy (for rarer species and in less observed fisheries) and photographing birds for determination of taxon (for commonly caught species in well observed fisheries).

Examining the causes of mortality and types of injuries incurred by individual seabirds returned from fisheries is necessary to help reduce future seabird captures in New Zealand fisheries by identifying gear risks. Linking this information to species, age- and sex-class, and breeding status, helps identify if different groups of seabirds are vulnerable to different risks in fishing interactions.

Information gained through this project will link to Ministry for Primary Industries databases, seabird bycatch estimates, and will inform ongoing risk assessment, research and modelling of the effects of fisheries bycatch on seabird populations. Further, the mode of capture and associated information will enable robust analyses to be made of the

factors contributing to seabird capture events and inform the development of appropriate mitigation strategies.

Research approach

Specific objectives 1-3

Dead birds returned by government observers will be delivered, suitably packaged and labelled, to the contractor. Observers make note of the circumstances of capture and provide a tentative identification. Seabirds returned will be examined to determine the following:

- Species identification and classification;
- Sex;
- Moult and brood patch development as a partial indicator of breeding status;
- Age;
- Provenance (origin) (where possible);
- Subcutaneous fat score as an index of body condition;
- Stomach and gizzard contents; and
- General body condition including any signs of injury and cause of death (where possible).

These data will be reported by species and fishery stratum (fishing method, fishery area and target species). The methodologies used in examining the specimens and categorising them into different groups shall be fully described. Differences in research protocols compared to previous necropsy research on New Zealand seabirds returned from fisheries shall be fully detailed and the implications of any differences discussed.

Specific objective 4

Where government observers recorded an incidental bird capture and no specimen is retained (either live captures or discarded dead birds), all photographs obtained, by specimen, will be delivered to the contractor in electronic format. Details of the date, time, location and fishery of capture will also be provided. Photographs will be examined to determine the following:

- Identification and classification, to the lowest taxonomic level possible;
- Sex (where possible);
- Age (where possible); and
- Provenance (origin) (where possible).

These data will be reported by taxon and fishery stratum (fishing method, fishery area and target species). When a specimen is identified and separated from similar species, the identification features used shall be fully described.

Outputs

1. A summary of results will be reported, for circulation to stakeholders, on a quarterly basis.
2. Information requested by CSP will be provided within a reasonable timeframe (usually 10 working days).

3. Annual report(s) of confirmed identification, sex, age, provenance and all other data collected, of all specimens examined. To the extent possible, the final report will also identify potential interactions between seabirds and fishing gear, and identify factors that may have contributed to seabird mortality. Data will be reported by fishery stratum (fishing method, fishery area and where possible target species).
4. Presentation of six monthly and annual reports to the CSP Technical Working Group.
5. Provision of all data collected in electronic format, suitable for updating Ministry for Primary Industries databases and/or other relevant databases.

Note: Compared to previous years, there is a higher number of observer days planned for 2013/14, but a lower proportion of birds observed captured will be returned for necropsy. The remainder of the birds being examined photographically (Specific Objective 4). It is expected that the costs of this project will be based on the actual number of birds necropsied and photographed. A three year term is proposed.

Indicative Research Cost: $80,000 per annum

Cost Recovery: F(CR) Item 4 (100% Industry)

Fish stocks: BAR 1, 7, BCO 4, BIG 1, BNS1, 2, 3, 7, BUT5, 7, BWS 1, ELE3, 5, 7, EMA 1, 3, 7, FLA1, 2, 3, 7, GMU1, GSH 1, 3, 4, 7, 8, 9, GSP 1, 7, GUR 1, 2, 3, 7, 8, HAK 1, 4, 7, HOK 1, HPB 1, 2, 3, 4, 7, 8, JDO 1, 2, 3, 7, JMA 1, 3, 7, KIN 1, 7, 8, LEA 1, 2, 3, LIN 1, 2, 3, 4, 5, 6, 7, MAK 1, MOK 1, 3, 5, MOO 1, ORH 1, 2A, 2B, 3A, 3B, OEO 1, 3A, 4, 6, PAR 1, 9, POR 1, POS 1, RBM 1, RSN 1, 2, RIB 1, 2, RCO 1, 3, 7, RSK 1, 3, 7, 8, SBW 6A, 6R, 6I, 6B, SCH1, 2, 3, 4, 5, 7, SCI 1, 2, 4A, 6A, 6B, SKI 1, 3, 7, SNA 1, 2, 3, 7, 8, SPD 1, 3, 4, 5, 7, 8, SPE 1, 3, 4, 7, SPO1, 3, 7, 8, SQU1T, 6T, SSK 1, 3, 7, 8, STA 1, 3, 4, 5, 7, STN 1, SWA 1, 3, 4, SWO 1, TAR 1, 2, 3, 4, 5, 7, 8, TOR 1, TRE 1, 2, 7, TRU 3, 4, WAR 1, 2, 3, 7, 8, WWA 2, 3, 4, 5B, 7, YEM 1, 8, 9, YFN 1

2.3 Identification of marine mammals, turtles and protected fish captured in New Zealand fisheries

Project Code: INT 2013-03

Start Date: 1 July 2013

Completion Date: 30 June 2015

Overall Objective

To determine which marine mammal, turtle and protected fish species are captured in fisheries and their mode of capture.

Specific Objective

1. To determine, primarily through examination of photographs, the taxon and, where possible, sex, age-class and provenance of marine mammals, turtles and protected fish captured in New Zealand fisheries (for live captures and dead specimens discarded at sea).

Rationale

The accurate determination of the taxon of marine mammals, turtles and protected fish captured in New Zealand fisheries is vital for examining the potential threat to population viability posed by incidental fisheries captures. Observers on commercial vessels are not always able to identify marine mammals, turtles and protected fish at sea with high precision, and the assessment of the age-class may require expert knowledge. Information gained through this project will link to Ministry for Primary Industry databases and will inform ongoing bycatch estimation, risk assessment, research and modelling of the effects of fisheries bycatch on marine mammals, turtles and protected fish populations.

This is a new project and is designed to complement the existing seabird identification project. Observers routinely collect samples of genetic material from these taxa, and these can be used to resolve uncertain identification determinations from photographs.

Research approach

Where government observers recorded an incidental capture of a marine mammal, turtle or protected fish generally no specimen is retained, instead photographic records are taken and a genetic sample taken. Live interactions are photographed where possible. All photographs obtained, by specimen, will be delivered to a suitable expert for that taxonomic group in electronic format on a quarterly basis. Details on the date, time, location and fishery of capture will also be provided. Photographs will be examined to determine the following:

- Identification, to the lowest taxonomic level possible;
- Sex (where possible);
- Age (where possible); and
- Provenance (origin) (where possible).

These data will be reported by taxon and fishery stratum (fishing method, fishery area and target species). When a specimen is identified, the identification features used shall be fully described.

Genetic samples of all bycaught marine mammals, turtles and protected fish are routinely collected by observers and where photographic analysis cannot adequately determine taxa, genetic analysis may be undertaken.

Outputs

1. A summary of results will be reported, reviewed by the CSP Technical Working Group, and published on an annual basis.
2. Information requested by CSP will be provided within a reasonable timeframe (usually 10 working days).
3. Provision of all data collected in electronic format, suitable for updating Ministry for Primary Industries databases and/or other relevant databases.

Note: A two year term is proposed.

Indicative Research Cost: $15,000 per annum

Cost Recovery: F(CR) Item 4 (100% Industry)

Fish stocks: BAR 1, 7, BCO 4, BIG 1, BNS1, 2, 3, 7, BUT5, 7, BWS 1, ELE3, 5, 7, EMA 1, 3, 7, FLA1, 2, 3, 7, GMU1, GSH 1, 3, 4, 7, 8, 9, GSP 1, 7, GUR 1, 2, 3, 7, 8, HAK 1, 4, 7, HOK 1, HPB 1, 2, 3, 4, 7, 8, JDO 1, 2, 3, 7, JMA 1, 3, 7, KIN 1, 7, 8, LEA 1, 2, 3, LIN 1, 2, 3, 4, 5, 6, 7, MAK 1, MOK 1, 3, 5, MOO 1, ORH 1, 2A, 2B, 3A, 3B, OEO 1, 3A, 4, 6, PAR 1, 9, POR 1, POS 1, RBM 1, RSN 1, 2, RIB 1, 2, RCO 1, 3, 7, RSK 1, 3, 7, 8, SBW 6A, 6R, 6I, 6B, SCH1, 2, 3, 4, 5, 7, SCI 1, 2, 4A, 6A, 6B, SKI 1, 3, 7, SNA 1, 2, 3, 7, 8, SPD 1, 3, 4, 5, 7, 8, SPE 1, 3, 4, 7, SPO1, 3, 7, 8, SQU1T, 6T, SSK 1, 3, 7, 8, STA 1, 3, 4, 5, 7, STN 1, SWA 1, 3, 4, SWO 1, TAR 1, 2, 3, 4, 5, 7, 8, TOR 1, TRE 1, 2, 7, TRU 3, 4, WAR 1, 2, 3, 7, 8, WWA 2, 3, 4, 5B, 7, YEM 1, 8, 9, YFN 1

2.4 Optimisation of observer data collection protocols

Project Code: INT 2013-04

Start Date: 1 July 2013

Completion Date: 30 June 2014

Overall Objective

To review the data collected by fisheries observers in relation to understanding the interaction with protected species, and refine efficient protocols for future data collection.

Specific Objectives

1. To examine the information historically collected by observers on factors relevant to protected species interactions.
2. To provide recommendations on refinement or development of data collection protocols to allow for more informative and efficient data collection.

Rationale

The data collected by observers are used primarily to inform fisheries management, risk assessment (Richard & Abraham 2013) and mitigation development. Historically, much of this information was in the form of ad-hoc observations and diary comments, with various protocol improvements over time (e.g. development of standardised CSP Protected Species Abundance Form). As our understanding of protected species interactions has developed, so has our understanding of the factors which influence these interactions. Therefore it is timely and appropriate to have a reassessment, from a protected species perspective, of the data collected by observers. This will identity the most useful observations and where necessary refine and standardise the protocols and recording factors. The work will allow for more efficient use of observer time and more timely analysis of data returned. With refinement of CSP objectives currently underway as part of the development of a new CSP Strategic Statement, this project will ensure observer data collection protocols will be fully aligned to the new objectives going forward.

Research approach

The data collected by observers in New Zealand will be examined in terms of it's utility for meeting CSP objects, primarily informing our understanding of the nature and extent of protected species interactions with commercial fisheries. This will include examining appropriate subsamples of diary notes and trip reports. Review of international observer data collection protocols should be undertaken and compared to New Zealand protocols in order to highlight any gaps or areas of improvement. Comparisons of protocols used in different fisheries (e.g. offshore and inshore fisheries) will also be made to identify the most effective protocols. Project INT2013-05 will develop detailed protocols to assess cryptic mortality in trawl and longline fisheries, and consideration of these protocols as potential tools for ongoing monitoring will for part of this project. Recommendations should then be made for methods of improving the data collection to increase utility in terms of both meeting objectives and providing cost effective mechanisms for collection and transfer of data to end uses (e.g. to risk assessment frameworks). Recommendations should include but not be limited to; movement from qualitative to quantitative (or categorical) recording of factors, shift to electronic or automated recording or the recording of whole new sets of variables.

Outputs

1 A report analysing the environmental, catch and vessel activity variables relevant to protected species interactions currently recorded by observers.

2. Recommendations on improvement to the recording of these variables to increase the utility and cost effectiveness of the data collected.

3. Recommendations on the recording of additional variables which would add to the understanding of the nature and extent of protected species interactions.

Note: See also project INT2013-05.

References

Richard, Y., Abraham, E.R.. 2013. Risk of commercial fisheries to New Zealand seabird populations. New Zealand Aquatic Environment and Biodiversity Report No. 109. Ministry for Primary Industries, Wellington.

Indicative Research Cost: $40,000

Cost Recovery: F(CR) Item 4 (100% Industry)

Fish stocks: BAR 1, 7, BCO 4, BIG 1, BNS1, 2, 3, 7, BUT5, 7, BWS 1, ELE3, 5, 7, EMA 1, 3, 7, FLA1, 2, 3, 7, GMU1, GSH 1, 3, 4, 7, 8, 9, GSP 1, 7, GUR 1, 2, 3, 7, 8, HAK 1, 4, 7, HOK 1, HPB 1, 2, 3, 4, 7, 8, JDO 1, 2, 3, 7, JMA 1, 3, 7, KIN 1, 7, 8, LEA 1, 2, 3, LIN 1, 2, 3, 4, 5, 6, 7, MAK 1, MOK 1, 3, 5, MOO 1, ORH 1, 2A, 2B, 3A, 3B, OEO 1, 3A, 4, 6, PAR 1, 9, POR 1, POS 1, RBM 1, RSN 1, 2, RIB 1, 2, RCO 1, 3, 7, RSK 1, 3, 7, 8, SBW 6A, 6R, 6I, 6B, SCH1, 2, 3, 4, 5, 7, SCI 1, 2, 4A, 6A, 6B, SKI 1, 3, 7, SNA 1, 2, 3, 7, 8, SPD 1, 3, 4, 5, 7, 8, SPE 1, 3, 4, 7, SPO1, 3, 7, 8, SQU1T, 6T, SSK 1, 3, 7, 8, STA 1, 3, 4, 5, 7, STN 1, SWA 1, 3, 4, SWO 1, TAR 1, 2, 3, 4, 5, 7, 8, TOR 1, TRE 1, 2, 7, TRU 3, 4, WAR 1, 2, 3, 7, 8, WWA 2, 3, 4, 5B, 7, YEM 1, 8, 9, YFN 1

2.5 Assessment of cryptic seabird mortality on trawl warps and longlines

Project Code: INT 2013-05

Start Date: 1 July 2013

Completion Date: 30 June 2015

Overall Objective

To estimate appropriate fishery and species group specific scalars to allow the robust quantification of total mortality from standard observed levels of seabird captures.

Specific Objectives

1. To estimate appropriate fishery and species group specific scalars to allow the robust quantification of total mortality from standard observed levels of seabird captures.
2. To provide recommendations on future data collection, to refine these estimates further and monitor change over time.

Rationale

Recent level-2 seabird risk assessment identified the considerable uncertainty in scalars to account for unobserved or unobservable seabird mortality, or cryptic mortality. Whilst scalars have been estimated for some fisheries, their suitability to the full range of New Zealand trawl and longline fisheries is mostly untested. This project will focus designing data collection protocols, and analysis of results, to develop scalars for the inshore trawl and bottom longline fisheries, where quantitative information on cryptic mortality is particularly sparse. It is envisaged that the CSP Observer Programme will provide a platform for the collection of at-sea information.

Research approach

The Ministry for Primary Industries project PRO2012-07 will include a review of relevant literature, and provide a starting point for this project.

The first year of this project will focus on developing suitable data collection protocols, in reference to earlier work where appropriate (e.g. PRO2012-07 outputs, protocols developed for trawl warp strike observation in New Zealand trawl fisheries), and implementation of these protocols by observers as part of CSP Observer Programme data collection.

The second year of this project will have a focus on the assessment and analysis of data collected and the estimation of appropriate scalars.

Note the related project INT2013-04 is a wider ranging review of observer data collection protocols. The findings from the initial phase of this project will feed into that project for consideration as potential future routine monitoring.

Outputs

1 Report of methodology for estimating fishery and species group specific cryptic mortality estimates.

2 Estimation of fishery and species group specific scalars suitable for integration into risk assessments and bycatch estimations where appropriate.

3 Recommendations on future data collection to refine these scalars further and monitor changes over time.

Note: A two year term is proposed. See also project INT2013-04.

Indicative Research Cost:

$40,000 for the period 1 July 2013 to 30 June 2014

$70,000 for the period 1 July 2014 to 30 June 2015

Cost Recovery: F(CR) Item 4 (100% Industry)

Fish stocks: BAR 1, 7, BCO 4, BIG 1, BNS1, 2, 3, 7, BUT5, 7, BWS 1, ELE3, 5, 7, EMA 1, 3, 7, FLA1, 2, 3, 7, GMU1, GSH 1, 3, 4, 7, 8, 9, GSP 1, 7, GUR 1, 2, 3, 7, 8, HAK 1, 4, 7, HOK 1, HPB 1, 2, 3, 4, 7, 8, JDO 1, 2, 3, 7, JMA 1, 3, 7, KIN 1, 7, 8, LEA 1, 2, 3, LIN 1, 2, 3, 4, 5, 6, 7, MAK 1, MOK 1, 3, 5, MOO 1, ORH 1, 2A, 2B, 3A, 3B, OEO 1, 3A, 4, 6, PAR 1, 9, POR 1, POS 1, RBM 1, RSN 1, 2, RIB 1, 2, RCO 1, 3, 7, RSK 1, 3, 7, 8, SBW 6A, 6R, 6I, 6B, SCH1, 2, 3, 4, 5, 7, SCI 1, 2, 4A, 6A, 6B, SKI 1, 3, 7, SNA 1, 2, 3, 7, 8, SPD 1, 3, 4, 5, 7, 8, SPE 1, 3, 4, 7, SPO1, 3, 7, 8, SQU1T, 6T, SSK 1, 3, 7, 8, STA 1, 3, 4, 5, 7, STN 1, SWA 1, 3, 4, SWO 1, TAR 1, 2, 3, 4, 5, 7, 8, TOR 1, TRE 1, 2, 7, TRU 3, 4, WAR 1, 2, 3, 7, 8, WWA 2, 3, 4, 5B, 7, YEM 1, 8, 9, YFN 1

3. Population Projects

NOTE: This multi-year project (POP2012-02) was consulted on in 2012/13 and is included here for completeness

3.1 New Zealand sea lions – demographic assessment of the cause of decline at the Auckland Islands

Project code: POP2012-02

Start Date: 1 July 2012

Completion Date: 30 June 2014

Overall Objective

To determine the key demographic factors driving the observed population decline of New Zealand sea lions at the Auckland Islands.

Specific Objectives

1. To identify which demographic parameters are the key drivers of the observed population decline of New Zealand sea lions at the Auckland Islands.
2. To identify potential demographic mechanisms through which both direct and potential indirect effects of fishing can impact on the population level of New Zealand sea lions at the Auckland Islands, or increase the susceptibility of the population to such effects.

Rationale

New Zealand sea lions are classified as Nationally Critical (Baker et al 2010), and are incidentally killed each year in southern commercial trawl fishing operations targeting species including squid, scampi and southern blue whiting. The foraging areas of New Zealand sea lions at the Auckland Islands have been shown to overlap with commercial trawl fishing activity, particularly SQU6T and SCI6A (e.g. Chilvers 2008, 2010). Approximately 75% of New Zealand sea lions breed at the Auckland Islands, where population data have been collected since the mid-1990s, including estimates of pup production and resighting of marked animals. Over the last decade there has been a considerable decline in pup production at the Auckland Islands (Chilvers 2010, 2011), and while disease events have occurred over this period (Castinel et al 2007), direct fishing bycatch is the major known anthropogenic impact on the population. In contrast, pup production appears to have increased on Campbell Island, the second major breeding location for the species (Maloney et al 2009). A literature review to identify potential indirect effects of commercial fishing on the Auckland Islands population as part of CSP project POP2010-01 has recently been completed (Bowen 2012). The review highlighted a number of key information gaps that currently prevent a full understanding of any such potential indirect effects.

In order to manage the commercial fisheries impacts on New Zealand sea lions at the Auckland Islands it is critical to understand the key demographic factors driving trends in the population and how fishing impacts on these parameters, or how any demographic processes influencing the population may alter its susceptibility to fishing impacts. This project aims to both identify these key parameters and identify the mechanisms through

which fishing impacts are influencing these parameters and hence influencing the population trend.

Research Approach

A large body of relevant data is available, particularly mark-resight data that has been collected in a standardised way for several years (see Chilvers 2010, 2011 for further details of how data is collected), and data proposed to be collected in 2012/13 (see POP2012-01). Data will be made available through the New Zealand sea lion database, currently in development as part of work under CSP project POP2011-01 (Specific Objective 3). It is envisaged that a staged process incorporating technical input and advice from the CSP Technical Working Group will be used to develop and refine the methodological approach.

During the first year of this project a number of candidate methods should be identified, trialled and presented to the CSP Technical Working Group. The Group will assist in identifying the preferred analytical approach or approaches, and these will be applied for an in-depth analysis in year 2 in order to address the specific objectives of this project.

See also related project POP2012-01.

Note: previous CSP projects on New Zealand sea lions include: POP2011-01, POP2010-01, POP2007-01, POP2006-01, POP2005-01, POP2004-01, MAM2002-1, MAM2001-1 and MAM2000-1. Outputs of these projects include DOC reports, published papers, and CSP Technical Working Group reports. See the Marine Conservation Services website (http://www.doc.govt.nz/mcs) for links to many of these publications.

Outputs

1. A technical report (or reports) that identify and describe a range of potential modelling approaches suitable for addressing the specific objectives of this project by utilising existing data.
2. A technical report (or reports) detailing an in-depth analysis, including a detailed methodology, of existing data to address the specific objectives of this project. The results must include identification of key demographic drivers of the observed population decline and assess the actual and potential impacts of commercial fishing on the population through these drivers.

References

Baker C.S., Chilvers B.L., Constantine R., DuFresne S., Mattlin R., van Helden A., Hitchmough R. (2010) Conservation status of New Zealand Marine Mammals (suborders Cetacea and Pinnipedia), 2009. *New Zealand Journal of Marine & Freshwater Research* 44:101-115.

Bowen, W.D. 2012. A review of evidence for indirect effects of commercial fishing on NewZealand sea lions (*Phocarctos hookeri*) breeding on the Auckland Islands. Report or Department of Conservation, Wellington. 41 p. Available for download at http://www.doc.govt.nz/publications/conservation/marine-and-coastal/marine-conservation-services/csp-reports/review-of-indirect-effects-of-fishing-on-new-zealand-sea-lions/

Castinel, A.; Duignan, P.J.; Pomroy, W.E.; Lopez-Villalobos, N.; Gibbs, N.J.; Chilvers, B.L.; Wilkinson, I.S. 2007: Neonatal mortality in New Zealand sea lions (*Phocarctos hookeri*) at Sandy Bay, Enderby Island, Auckland Islands from 1998 to 2005. *Journal of Wildlife Diseases* 43: 461.

Chilvers, B.L. 2008: Foraging site fidelity of lactating New Zealand sea lions. *Journal of Zoology* 276: 28-36.

Chilvers, B.L. 2010 Research to assess the demographic parameters and at sea distribution of New Zealand sea lions, Auckland Islands. Draft Final Report POP2007-01 for Department of Conservation, Wellington. 32 p. Available for download at http://www.doc.govt.nz/mcs

Chilvers, B.L. 2011 Research to assess the demographic parameters of New Zealand sea lions, Auckland Islands: Draft Final Report November 2011. POP2010-01 Draft Final Report for Department of Conservation, Wellington. 20 p. Available for download at http://www.doc.govt.nz/mcs

Maloney, A.; Chilvers, B.L.; Haley, M.; Muller, C.G.; Roe, W.; Debski, I. 2009: Distribution, pup production and mortality of New Zealand sea lion Phocarctos hookeri on Campbell Island / Motu Ihupuku, 2008. *New Zealand Journal of Ecology* 33: 97-105.

Indicative Research Cost:

$60,000 for the period 1 July 2012-30 June 2013

$50,000 for the period 1 July 2013-30 June 2014

Cost Recovery: F(CR) Item 2 (90% Industry, 10% Crown)

Fish Stocks: SQU6T, SCI6A.

NOTE: This multi-year project (POP2012-06) was consulted on in 2012/13 and is included here for completeness

3.2 Salvin's albatross – population estimate and at-sea distribution

Project code: POP2012-06

Start Date: 1 July 2012

Completion Date: 30 June 2014

Overall Objective

To estimate the at-sea distribution and population size and trend of Salvin's albatross at the Bounty Islands.

Specific Objectives

1. To determine the foraging range of Salvin's albatross at the Bounty Islands.
2. To estimate the population size of Salvin's albatross at the Bounty Islands.
3. To determine the population trend of Salvin's albatross at the Bounty Islands with reference to historic data.

Rationale

Salvin's albatross is endemic to New Zealand, with the main breeding population at the Bounty Islands. Salvin's albatross has been recorded bycaught predominantly in trawl fisheries, in relatively high numbers, and has been identified as at potentially high risk from commercial fisheries impacts (Richard et al. 2011). There is poor knowledge of Salvin's albatross currently, limited mainly to study of the small population at The Snares Islands (e.g. Sagar et al. 2011). In late 2011 an expedition to the Bounty Islands collected population information on Salvin's albatross on two islands, and initial results suggest a substantial population decline since 2004, in addition to apparent declines from 1997 to 2004 (J. Amey pers. comm.). The apparent decline in population combined with relatively high fisheries risk makes obtaining robust population information for this species a high priority requirement to ensure fisheries impacts can be adequately managed. An aerial census of the Bounty Islands was also completed in 2010 (Baker et al. 2011), and whilst this method showed promise as a suitable monitoring method, ground-truthing is required. No tracking data has been collected for Salvin's albatross at the Bounty Islands. Determining the population trend and foraging ranges of the Bounty Islands population has also been recognised internationally as a research priority (ACAP 2011).

Research Approach

In the first year of this project a full analysis of the ground count data collected in 2011 in comparison to existing ground count and aerial information will be conducted to determine trends in population level, and if possible make estimates of the entire population size. Results of the analysis should be used to make recommendations on suitable methodological approaches to monitoring the population size of Salvin's albatross at the Bounty Islands, including consideration of aerial survey methods.

The tracking component of this project will involve two visits to the Bounty Islands. The first visit, in 2012/13, will be to place logging devices on breeding birds that are capable of recording data for at least one year. A second visit in 2013/14 will retrieve the devices, and the data gained will be analysed to produce kernel density plots of temporal spatial

foraging distribution. The data obtained will be reported in a format suitable for use in future fisheries risk assessments.

Dependent on the recommendations from the year 1 analysis of existing population information, it is envisaged that an aerial survey to estimate population size will be trialled in year 2, together with ground-truthing assistance provided by personnel recovering tracking devices. The results will be reported in comparison to the aerial survey of Baker et al (2011), and make recommendations on the suitability and accuracy of the method to monitor the population in future years.

Outputs

1. A technical report (or reports) detailing the methods used and results found, including the spatial distribution of foraging areas in relation to fishing effort, updated population estimates and an analysis of population trend, to the extent possible given existing data, of Salvin's albatross at the Bounty Islands.
2. Electronic data of the spatial distribution of foraging areas in a format suitable for use in fisheries risk assessments for Salvin's albatross at the Bounty Islands.
3. Recommendations for future monitoring of the population level of Salvin's albatross at the Bounty Islands.

References

Agreement on the Conservation of Albatrosses and Petrels. 2011: Report of the Breeding Sites Working Group and Status and Trends Working Group – Joint BSWG4/STWG6. Final Report to the Sixth Meeting of Advisory Committee, Guayaquil, Ecuador, 29 August – 2 September 2011

Baker, B., Jenz, K., Cunningham, R. 2011: Data collection of demographic, distributional and trophic information on the white-capped albatross to allow estimation of effects of fishing on population viability – 2010 Field Season. Final Research Report for project PRO2006/01. Unpublished report held by the Ministry of Fisheries, Wellington.

Richard, Y., Abraham, E.R., Filippi, D. 2011: Assessment of the risk to seabird populations from New Zealand commercial fisheries. Final Research Report for projects IPA2009/19 and IPA2009/20. Unpublished report held by the Ministry of Fisheries, Wellington.

Sagar, P.M., Charteris, M.R., Carrol, J.W.A., Scofield, R.P. 2011: Population size, breeding frequency and survival of Salvin's albatrosses (*Thalassarche salvini*) at the Western Chain, The Snares, New Zealand. *Notornis* 58: 57-63.

Indicative Research Cost:

$80,000 for the period 1 July 2012-30 June 2013

$120,000 for the period 1 July 2013-30 June 2014

Cost Recovery: F(CR) Item 3 (50% Industry 50% Crown)

Fish Stocks: BAR1, BIG1, GUR3, HOK1, LIN4, OEO3A, OEO4, ORH3B, SBW6A, SCI3A, SCI4A

3.3 New Zealand sea lion population project (Auckland Islands)

Project code: POP2013-01

Start Date: 1 July 2013

Completion Date: 30 June 2014

Overall Objectives

To estimate New Zealand sea lion pup production in the Auckland Islands and collect data to allow the estimation of key demographic parameters

Specific Objectives

1. To estimate New Zealand sea lion pup production at Enderby, Figure of 8 and Dundas Islands.
2. To mark New Zealand sea lion pups at Enderby and Dundas Islands following established techniques.
3. To conduct a three to five week period of resighting previously marked animals at Enderby Island.
4. To update the New Zealand sea lion database.

Rationale

New Zealand sea lions are classified as Nationally Critical (Baker et al 2010), and are incidentally killed each year in southern commercial trawl fishing operations targeting species including squid, scampi and southern blue whiting. The foraging areas of New Zealand sea lions at the Auckland Islands have been shown to overlap with commercial trawl fishing activity, particularly SQU6T and SCI6A. Approximately 75% of New Zealand sea lions breed at the Auckland Islands, where population data have been collected since the mid-1990s, including estimates of pup production and resighting of marked animals. Since 2001 there has been a considerable decline in pup production at the Auckland Islands. A literature review to identify potential indirect effects of commercial fishing on the Auckland Islands population as part of CSP project POP2010-01 has recently been completed (Bowen 2012). The review highlighted a number of key information gaps that currently prevent a full understanding of any such potential indirect effects.

In order to manage the commercial fisheries impacts on New Zealand sea lions at the Auckland Islands it is critical to understand the population level and key demographic factors driving trends in the population. CSP project POP2012-02 (see Section 3.1 of this plan) is currently analysing population data collected during previous years in order to determine the key demographic factors driving the observed population decline of New Zealand sea lions at the Auckland Islands This project will extend the time series of population data available.

The current SQU6T Operational Plan[8] includes a trigger point related to New Zealand sea lion pup production at the Auckland Islands, and this project will provide the estimate for 2013/14.

Research Approach

Pup production at Dundas and Enderby Island has been estimated using two methods in recent years: aerial (Baker et al 2012) and ground based mark-recapture methods (Chilvers 2012). Results from 2012/13 (POP2012-01) are being finalised as of June 2013. A

[8] See http://www.fish.govt.nz/en-nz/Consultations/Archive/2011/Squid+fishery+around+the+Auckland+Islands/default.htm

technical advisory group will consider the appropriate methods to use at Enderby and Dundas Islands in 2013/14, once results from 2012/13 have been finalised, and will consider early findings from POP2012-02. Pup production at Figure of 8 Island will be by direct count following established methods (Chilvers 2012).
Marking of pups and resighting of marked adults will follow established methods (Chilvers 2012 and those methods yet to be fully reported from 2012/13). It is also proposed that the resighting season be restricted to a three to five week period starting on approximately 12 January 2014. This is based on a review[9] of historic resighting data commissioned by DOC.

Outputs

1. Data collected, in an electronic format suitable for upload into the New Zealand sea lion database.
2. New Zealand sea lion database updated and made available to relevant investigators. Any changes to the structure of the database must be fully documented.
3. A technical report (or reports) detailing the methods used, a summary of data collected and estimates of New Zealand sea lion pup production at the Auckland Islands.

Note: Maximum cost efficiencies will be achieved through aligned delivery with projects POP2013-02 and POP2013-03. Previous CSP projects on New Zealand sea lion population data collection include: POP2012-01, POP2011-01, POP2010-01, POP2007-01, POP2006-01, POP2005-01, POP2004-01, MAM2002-1, MAM2001-1 and MAM2000-1. See also POP2012-02 (Section 3.1 of this document).

References

Baker C.S., Chilvers B.L., Constantine R., DuFresne S., Mattlin R., van Helden A., Hitchmough R. (2010) Conservation status of New Zealand Marine Mammals (suborders Cetacea and Pinnipedia), 2009. *New Zealand Journal of Marine & Freshwater Research* 44:101-115.

Baker, B., Jenz, K., Chilvers, L. 2012. Aerial survey of New Zealand sea lions – Auckland Islands 2011/12. Report prepared for Ministry of Agriculture & Forestry, DeepWater Group Limited & Department of Conservation. Available for download from http://www.doc.govt.nz/publications/conservation/marine-and-coastal/conservation-services-programme/csp-reports/aerial-survey-of-new-zealand-sea-lions-auckland-islands-2011-12/

Bowen, W.D. 2012. A review of evidence for indirect effects of commercial fishing on NewZealand sea lions (*Phocarctos hookeri*) breeding on the Auckland Islands. Report or Department of Conservation, Wellington. 41 p. Available for download at http://www.doc.govt.nz/publications/conservation/marine-and-coastal/marine-conservation-services/csp-reports/review-of-indirect-effects-of-fishing-on-new-zealand-sea-lions/

Chilvers, B.L. 2012. Research to assess the demographic parameters of New Zealand sea lions, Auckland Islands 2011/12. Final Research Report, November 2012. Department of Conservation, Wellington. Available for download from http://www.doc.govt.nz/publications/conservation/marine-and-coastal/conservation-services-programme/csp-reports/new-zealand-sea-lion-research-auckland-islands-2011-12/

Indicative Research Cost: $200,000
Cost Recovery: F(CR) Item 3 (90% Industry 10% Crown)
Fish Stocks: SQU6T, SCI6A.

[9] MackKenzie, D. I. 2012. Review of female New Zealand sea lion tag-resight data collected on Enderby Island. Unpublished report held by the Department of Conservation, Wellington.

3.4 White-capped albatross population estimate (Auckland Islands)

Project code: POP2013-02

Start Date: 1 July 2013

Completion Date: 30 June 2014

Overall Objectives

To estimate the population size and trend of white-capped albatross at the Auckland Islands using aerial survey methods.

Specific Objectives

1. To estimate the population size of white-capped albatross at the Auckland Island.
2. Determine the population trend of white-capped albatross at the Auckland Island.

Rationale

White-capped albatross is endemic to New Zealand and breeds predominantly on the Auckland Islands. This species has been one of the most commonly recorded bycaught protected species in New Zealand waters, particularly in off-shore trawl fisheries, and was identified as one of the seabird species at highest risk from New Zealand commercial fisheries (Richard & Abraham 2013). Updated information on the population trend will assist in determining the susceptibility of this population to fisheries impacts as well as allow future assessment of ongoing fisheries management in regards to impacts on this species. Population modelling in a fisheries context by Francis (2012) concluded that global fishing bycatch (but not New Zealand fishing only) presents a risk to population viability and highlights the absence of information on juvenile survival and age at first breeding. Updated information on the population trend will assist in determining the susceptibility of this population to fisheries impacts as well as allow future assessment of ongoing fisheries management in regards to impacts on this species.

Research Approach

The methods will follow established aerial survey techniques for white-capped albatross at the Auckland Islands (Baker et al 2011 and those to be reported from POP2012-05), and timed to maximise cost efficiency synergies with project POP2013-01.

Outputs

1. A technical report (or reports) detailing the methods used and results found, including updated population estimates and an analysis of population trend, to the extent possible given existing data, of white-capped albatrosses at the Auckland Islands.

Note: Maximum cost efficiencies will be achieved through aligned delivery with projects POP2013-01 and POP2013-03. Previous CSP population projects on white-capped albatross include POP2012-05 and POP2005-02.

References

Baker, B., Jenz, K., Cunningham, R. 2011: Data collection of demographic, distributional and trophic information on the white-capped albatross to allow estimation of effects of fishing on population viability " 2010 Field Season. Final Research Report for project PRO2006/01. Unpublished report held by the Ministry of Fisheries, Wellington.

Francis, R.I.C.C. 2012. Fisheries Risks to the Population Viability of White-capped Albatross *Thalassarche steadi*. New Zealand Aquatic Environment and Biodiversity Report No. 104.

Richard, Y., Abraham, E.R.. 2013. Risk of commercial fisheries to New Zealand seabird populations. New Zealand Aquatic Environment and Biodiversity Report No. 109. Ministry for Primary Industries, Wellington.

Indicative Research Cost: $60,000

Cost Recovery: F(CR) Item 3 (50% Industry 50% Crown)

Fish Stocks: BAR5, BIG1, HOK1, SCI6A, SQU1T, SQU6T, STN1, SWA4

3.5 Gibson's albatross population study (Auckland Islands)

Project code: POP2013-03

Start Date: 1 July 2013

Completion Date: 30 June 2014

Overall Objectives

To estimate the population trend, fecundity and age-class survival of Gibson's albatross at the Auckland Islands.

Specific Objectives

1. To estimate the population size and trend of Gibson's albatross at the Auckland Islands.
2. To estimate the adult survival of Gibson's albatross at the Auckland Islands.

Rationale

This taxon (*Diomedea antipodensis gibsoni*) is endemic to New Zealand and breeds only at the Auckland Islands. Reported incidental captures have been predominantly from surface longline fisheries. The population has exhibited a marked decline in the population since 2005 due to reductions in adult survival, proportion of adults breeding and breeding success (Francis et al 2012). Adult survival was the parameter contributing most uncertainty to the risk ratio of Richard & Abraham (2013). Further information on population size and trend, and updated estimates of adult survival will inform updated fisheries risk assessment work and allow future assessment of ongoing fisheries management in regards to impacts on this taxon.

Research Approach

Detailed counts of breeding birds and observations of marked birds have been made in a 53 ha study area on Adams Island, Auckland Islands, the major breeding site for Gibson's albatross (see Walker & Elliot 1999, 2005 for further details). It is envisaged that similar methods will be used in the 2013/14 breeding season to provide comparable, updated estimates of population size and trend and adult survival.

Outputs

1. Data, in an electronic format, suitable for informing updated fisheries risk assessment and relevant population modelling.
2. A technical report (or reports) detailing the methods used and results found, including an updated population estimate, an analysis of population trend and updated estimates of adult survival of Gibson's albatross at the Auckland Islands.

Note: Maximum cost efficiencies will be achieved through aligned delivery with projects POP2013-01 and POP2013-02. Previous CSP population projects on Gibson's albatross include POP2012-07, POP2004-02 and BRD2001-01.

References

Francis, R.I.C.C., Elliot, G., Walker, K. 2012: Fisheries risk to the viability of Gibson's wandering albatross *Diomedea gibsoni*. Draft New Zealand Aquatic Environment and Biodiversity Report. Unpublished report held by the Ministry of Fisheries, Wellington.

Richard, Y., Abraham, E.R.. 2013. Risk of commercial fisheries to New Zealand seabird populations. New Zealand Aquatic Environment and Biodiversity Report No. 109. Ministry for Primary Industries, Wellington.

Walker, K.; Elliott, G. 1999: Population changes and biology of the wandering albatross *Diomedea exulans gibsoni* at the Auckland Islands. *Emu* 99: 239-247

Walker, K.; Elliott, G. 2006: At-sea distribution of Gibson's and Antipodean wandering albatrosses, and relationships with long-line fisheries. *Notornis* 53 (3): 265-290

Indicative Research Cost: $60,000

Cost Recovery: F(CR) Item 3 (50% Industry 50% Crown)

Fish Stocks: ALB, BIG1, STN1, SWO1.

3.6 Black petrel population project

Project code: POP2013-04

Start Date: 1 July 2013

Completion Date: 30 June 2014

Overall Objectives

To estimate the population trend, fecundity and age-class survival of black petrel at Great Barrier Island (Aotea Island).

Specific Objectives

1. To estimate the black petrel population size at Great Barrier Island and describe the population trend by comparing the estimate to relevant existing data.

Rationale

Black petrels are endemic to New Zealand and breed only on Great Barrier Island (Aotea Island) and Hauturu/Little Barrier Island. Black petrels have been observed caught in trawl, surface longline and bottom longline fisheries. Recent level-2 seabird risk assessment identified this species as at greatest risk from commercial fishing in New Zealand, and found estimates of adult survival to be a major source of uncertainty (Richard & Abraham 2013). Considerable research on black petrels on Great Barrier Island and estimates of key population parameters for Great Barrier Island have been made (e.g. Bell et al. 2011, Francis & Bell 2010), though estimates of juvenile survival remain highly uncertain (Bell et al 2011). Further time-series data will improve our understanding of the population dynamics and allow future assessment of ongoing fisheries management in regards to impacts on this species.

Research Approach

Monitoring, marking and resighting protocols will follow established techniques (Bell et al. 2011) to ensure maximum comparability with historic time-series data. Random transect methods were used in 2012/13 as part of project POP2012-03, and results are yet to be reported as at June 2013. A repeat of the random transect survey is not proposed for 2013/14, but would form an important component of a longer term monitoring strategy.

Outputs

1. A technical report (or reports) detailing the methods used and results found, including an updated population estimate and an analysis of population trend, to the extent possible given existing data.

Note: Previous CSP population projects on black petrels include POP2012-03, POP2009-01, POP2008-01, POP2007-02, POP2005-04, POP2004-4, BRD2003-1, BRD2002-5 and BRD2001-3.

References

Bell, E.A., Sim, J.L., Scofield, P., Francis, C. 2011: Population parameters of the black petrels (*Procellaria parkinsoni*) on Great Barrier Island (Aotea Island), 2009/10. Research report for Department of Conservation, Wellington. Available for download from http://www.doc.govt.nz/mcs

Francis, R.I.C.C.; Bell, E.A. 2010: Fisheries risks to the population viability of black petrel (*Procellaria parkinsoni*). *New Zealand Aquatic Environment and Biodiversity Report No. 51.* Ministry of Agriculture and Forestry, Wellington.

Richard, Y., Abraham, E.R.. 2013. Risk of commercial fisheries to New Zealand seabird populations. New Zealand Aquatic Environment and Biodiversity Report No. 109. Ministry for Primary Industries, Wellington.

Indicative Research Cost: $60,000

Cost Recovery: F(CR) Item 3 (50% Industry 50% Crown)

Fish Stocks: BIG1, BNS1, SNA1.

3.7 Development of coral distribution modelling

Project code: POP2013-05

Start Date: 1 July 2013

Completion Date: 30 June 2014

Overall Objectives

To describe the distribution of deep sea corals in relation to areas where they are at risk of interactions with commercial fishing gear.

Rationale

A number of protected coral taxa are known to be bycaught in commercial fisheries in New Zealand, particularly deepwater trawls targeting orange roughy or oreo species. In order to understand the risk to protected corals, and ensure commercial fishing impacts on protected corals is minimised, it is important to quantify the spatial extent of these impacts. This project will expand on recent work (Baird et al 2013) to more robustly identify the distribution of deep sea corals by utilising additional sources of information relevant to the distribution of corals. This information will form a vital component of future risk assessment and fisheries management of areas where corals are at highest risk of interactions with commercial fishing gear.

Research Approach

This work will build on that reported by Baird et al (2013). A number of additional information is, or by July 2013 will be, available to inform more detailed distributional modelling. This includes productivity gradient/seasonality, aragonite saturation horizon, calcite saturation horizon, modelling at a lower taxonomic level and ground truthing with independent data. Modelling at a sub-regional level (e.g. Chatham Rise) may also be appropriate to allow maximum utility of available data.

Outputs

1. Data on coral distribution in an electronic format suitable for use in fisheries risk assessment.
2. A technical report or reports describing the methods used and mapping the distribution of protected corals in relation to commercial fishing effort.
3. Recommendations for any future research required to further improve the estimation of risk to protected corals from commercial fishing.

References

Baird, S.J., Tracey D., Mormede, S., Clark, M. 2013. The distribution of protected corals in New Zealand waters. Research report for the Department of Conservation. Available for download from http://www.doc.govt.nz/publications/conservation/marine-and-coastal/conservation-services-programme/csp-reports/distribution-of-protected-corals/

Indicative Research Cost: $60,000

Cost Recovery: F(CR) Item 3 (50% Industry 50% Crown)

Fish Stocks: BYX1, 2, 3, 7, 8, BAR4, 5, 7, CDL1, 2, 3, 4, 5, 6, 7, 8, 9, EMA3, 7, FRO1, 2, 3, 4, 5, 6, 7, 8, 9, SKI3, 7, GSH 4, 5, 6, GSP1, 5, 7, HAK1, 4, 7, HOK1, JMA3, 7, LIN3, 4, 5, 6, 7, LDO1, 3, ORH1, 2A, 2B, 3A, 3B, 7A, 7B, OEO1, 3A, 4, 6, PRK1, 2, 3, 4A, 5, 6A, 6B, 7, 8, 9, RBT 1, 3, 7, RIB3, 4, 5, 6, 7, 8, RBY1, 2, 3, 4, 5, 6, 7, 8, 9, SCI1, 2, 3, 4A, 5, 6A, 6B, 7, 8, 9, SPE3, 4, 5, 6, 7, SWA1, 3, 4, SBW1, 6A, 6B, 6I, 6R, SPD4, 5, SQU1T, 6T, WWA1, 2, 3, 4, 5, 6, 7, 8, 9.

3.8 Update protected fish review: oceanic whitetip shark

Project code: POP2011-06

Start Date: 1 July 2013

Completion Date: 30 June 2014

Overall Objectives

To describe population information and the nature and extent of interactions with commercial fishing for oceanic white-tip sharks, to the extent possible from existing information.

Specific Objectives

1. To review existing information to describe the nature and extent of interactions between commercial fishing and oceanic white-tip sharks.
2. To identify information gaps in the understanding of the nature and extent of interactions between commercial fishing and oceanic white-tip sharks, and provide recommendations for further research to address any gaps identified.
3. To review existing information to describe population information relevant to assessing risk from commercial fishing to oceanic white-tip sharks.
4. To identify population information gaps relevant to assessing risk from commercial fishing to oceanic white-tip sharks, and provide recommendations for further research to address any gaps identified.

Rationale

The oceanic whitetip shark was afforded absolute protection under the Wildlife Act 1953 in January 2013. This project aims to supplement the Francis & Lyon (2012) review of information on all other protected fish species, conducted as part of CSP project POP2011-03. This information is required in order to understand the nature and extent of adverse effects of commercial fishing on oceanic whitetip sharks, and will identify key information gaps in existing information.

Research Approach

It is envisaged that an additional chapter to the Francis & Lyon (2012) review will be commissioned. The format and extent of information covered will be consistent with the previous review.

Outputs

1. A written review of the oceanic white-tip shark in terms of population information and nature and extent of protected species interactions in the form of an updated chapter for the Francis & Lyon (2012) review.

References

Francis, M., Lyon, W. 2012. Review of commercial fishery interactions and population information for eight New Zealand protected fish species. Research report for the Department of Conservation. Available for download from http://www.doc.govt.nz/publications/conservation/marine-and-coastal/conservation-services-programme/csp-reports/protected-fish-review-of-fishery-interactions-population-information/

Indicative Research Cost: $8,000
Cost Recovery: F(CR) Item 3 (50% Industry 50% Crown)
Fish Stocks: BIG1, STN1, SWO1.

4. Mitigation Projects

NOTE: This multi-year project (MIT2012-05) was consulted on in 2012/13 and is included here for completeness

4.1 Protected species bycatch newsletter

Project code: MIT2012-05

Start Date: 1 July 2012

Completion Date: 30 June 2014

Overall Objective

To produce a newsletter to communicate protected species-related information to trawl and longline fishermen.

Rationale

Reducing the impacts of commercial fishing on protected species relies on individual fishermen actively applying best practice mitigation methods to their fishing activity. Applying and developing mitigation methods in specific circumstances requires an understanding of the protected species that may be impacted, and the nature with which they interact with fishing activity. A range of relevant information exists, often the result of research projects, and the newsletter will serve as a vehicle for communication to fishermen, fishing companies, and other interested parties. An evaluation of previous examples of this work by Pierre (2012) indicates that this format shows promise in reaching a broad sector of the fishing community and wider stake holders, and provides recommendations for further development.

Outputs

A bimonthly newsletter covering best practice mitigation methods, current relevant events, updates on novel methods or new mitigation trials and information on protected species and the nature of their interaction with commercial fishing. The newsletter must build on the recommendations of Pierre (2012) where possible.

References:

Pierre., J. 2012. MIT2011-05 Protected Species Bycatch Newsletter Report to the CSP TWG 28 May 2012. Available for download at: http://www.doc.govt.nz/upload/documents/conservation/marine-and-coastal/marine-conservation-services/mit-2011-05-ocean-guardian-evaluation-report.pdf

Indicative Research Cost: $20,000

Cost Recovery: F(CR) Item 4 (100% Industry)

Fish Stocks: BAR 1, 7, BCO 4, BIG 1, BNS1, 2, 3, 7, BUT5, 7, BWS 1, ELE3, 5, 7, EMA 1, 3, 7, FLA1, 2, 3, 7, GMU1, GSH 1, 3, 4, 7, 8, 9, GSP 1, 7, GUR 1, 2, 3, 7, 8, HAK 1, 4, 7, HOK 1, HPB 1, 2, 3, 4, 7, 8, JDO 1, 2, 3, 7, JMA 1, 3, 7, KIN 1, 7, 8, LEA 1, 2, 3, LIN 1, 2, 3, 4, 5, 6, 7, MAK 1, MOK 1, 3, 5, MOO 1, ORH 1, 2A, 2B, 3A, 3B, OEO 1, 3A, 4, 6, PAR 1, 9, POR 1, POS 1, RBM 1, RSN 1, 2, RIB 1, 2, RCO 1, 3, 7, RSK 1, 3, 7, 8, SBW 6A, 6R, 6I, 6B, SCH1, 2, 3, 4, 5, 7, SCI 1, 2, 4A, 6A, 6B, SKI 1, 3, 7, SNA 1, 2, 3, 7, 8, SPD 1, 3, 4, 5, 7, 8, SPE 1, 3, 4, 7, SPO1, 3, 7, 8, SQU1T,

6T, SSK 1, 3, 7, 8, STA 1, 3, 4,, 5, 7, STN 1, SWA 1, 3, 4, SWO 1, TAR 1, 2, 3, 4, 5, 7, 8, TOR 1, TRE 1, 2, 7, TRU 3, 4, WAR 1, 2, 3, 7, 8, WWA 2, 3, 4, 5B, 7, YEM 1, 8, 9, YFN 1.

4.2 Sea trials of the Kellian line setter

Project code: MIT2013-01

Start Date: 1 July 2013

Completion Date: 30 June 2014

Overall Objective

To test the at-sea feasibility, and to the extent possible, the effectiveness, of reducing the availability of hooks to seabirds by using the improved Kellian line setter, in inshore bottom longline fisheries.

Specific Objectives

1. To identify the range of bottom longline gear configurations and conditions that allow effective and safe use of the device by conducting experimental at-sea trials.
2. To describe line sink profiles of bottom longlines set through the device, as a proxy for mitigation effectiveness.
3. To provide recommendations on any further development and refinement of the device that may be required to enable reliable, effective and safe use in commercial bottom longline fishing operations.

Rationale

Recent level-2 seabird risk assessment has highlighted the high degree of potential risk that small vessel (inshore) bottom longline fisheries pose to a number of protected species, such as black petrels and flesh-footed shearwaters (Richard & Abraham 2013). Preliminary results from CSP project MIT2011-04 (Baker & Frost, 2013) indicates that substantial improvements in design of the Kellian line setting device have been achieved, and a modified prototype suitable for deployment in a commercial fishing environment will shortly be available. The findings from that project are due to be finalised in July 2013. This project will conduct at-sea testing of the modified prototype.

Research approach

The hydrodynamic attributes and functionality of the Kellian line have been assessed in the controlled environment of a flume tank. This work has led to a modified and improved design. However, in order to test efficacy in commercial fishing operations the designs must be tested in a variety of gear configurations and weather conditions. Where necessary, alterations to the design will have to be made in order to improve practical operation and safety. Cost effectiveness will also need to be considered in any design in order to ensure that a final product can be mass produced in an economic way. The trials will assess any impact on the easy and operation of fishing activities and assess effectiveness as a mitigation strategy by measuring line sink profiles as a proxy for seabird capture risk.

The project has been costed to include fishing vessel charter and use of time depth recorders.

Outputs

1. A written report detailing the at-sea trials of the improved Kellian line setter, documenting the factors which affect the performance of the device and any changes or operational protocols to improve performance or safety.
2. Recommendations for any further development and improvements required to the device in order to achieve commercial scale production use.

References

Baker, G.B., Frost, R. 2013. Development of the Kellian Line Setter for Inshore Bottom Longline Fisheries to reduce availability of hooks to seabirds. Preliminary research report for Department of Conservation. Available for download from: http://www.doc.govt.nz/Documents/conservation/marine-and-coastal/marine-conservation-services/mit-2011-04-kellian-line-setter-development.pdf

Richard, Y., Abraham, E.R.. 2013. Risk of commercial fisheries to New Zealand seabird populations. New Zealand Aquatic Environment and Biodiversity Report No. 109. Ministry for Primary Industries, Wellington.

Research Cost: $110,000

Cost Recovery: F(CR) Item 4 (100% Industry)

Fish Stocks: BAR 1, 4, 5, 7, BNS 1, 2, 3, 7, 8, GUR 1, 3, 7, 8, HPB 1, 2, 3, 4, 5, 7, 8, JDO 1, 3, 7, KIN 1, 7, 8, LEA 1, 2, 3, LIN 1, 2, 3, 4, 5, 6, 7, MOK 3, 5, PAR 1, 9, POR 1, RSN 1, SPO 1, 3, 7, 8, RCO 1, 3, 7, RSK 1, 3, 7, 8, SCH 1, 2, 3, 5, 7, 8, SNA 1, 2, 7, 8, SPD 1, 3, 4, 5, 7, 8, SPE 1, 3, 4, 5, 7, SSK 1, 3, 7, 8, STA 1, 3, 4, 5, 7, TAR 1, 3, 4, 5, 7, 8, TRE 1, 7, TRU 3, 4.

4.3 Surface longline mitigation

Project code: MIT2013-02

Start Date: 1 July 2013

Completion Date: 30 June 2014

Overall Objective

To test a range of mitigation methods which reduce the availability of surface longline hooks to seabirds at line setting.

Specific Objectives

1. To conduct sea trials of a range of mitigation methods which reduce availability of hooks to seabirds.
2. To provide a comparison of these methods in their mitigation effectiveness, highlighting strengths and drawbacks and applicability to differing surface longline configurations and operations.
3. To provide recommendations on any further development and refinement of methods to enable reliable and safe use in commercial surface longline operations.

Rationale

Surface longline fisheries globally have accounted for significant levels of seabird bycatch (Anderson et al. 2011), and despite the introduction of a number of mandatory mitigation methods for this fishing method in New Zealand , recent level-2 seabird risk assessment has identified that surface longline fisheries still poses considerable risk (Richard & Abraham 2013). International research into seabird mitigation measures has had a considerable focus on developing novel methods for surface longline fisheries (e.g. ACAP 2013), and a number of methods have recently been developed that show good potential to reduce the availability of baited hooks to seabirds, whilst not causing additional safely or operational difficulties for fishermen. Work in New Zealand to test some of these methods is underway as part of CSP project MIT2012-04. The delivery of this project will be dependent on findings reported from MIT2012-04.

Research approach

This project will further expand the trials currently being undertaken as part of CSP project MIT2012-04, in collaboration with the Ministry for Primary Industries to provide comparative results across a range of mitigation options. Therefore, trials will be conducted using the protocols developed in MIT2012-04. Details of mitigation methods or devices selected will be informed by findings and recommendations from MIT2012-04, to be considered by a technical advisory group.

It is envisaged that CSP and MPI observer coverage will be used as a platform for delivery of at-sea work.

Outputs

1. Written report detailing the at-sea trials of the mitigation methods tested, documenting the factors which affect the mitigation efficiency, practicality or safety of the methods and any developments that may improve performance.
2. Recommendations for any further development and improvements to the methods if applicable.

Note: Previous CSP projects include MIT2012-04. Implementation of this project will be dependent on review of findings from MIT2012-04 by a technical advisory group.

References:

Agreement on the Conservation of Albatrosses and Petrels. 2013: Report of the Seabird Bycatch Working Group SBWG5. Seventh Meeting of Advisory Committee, La Rochelle, France, 6 - 10 May 2013 (AC7 Doc 14 Rev1).

Anderson, O.R.J., Small, C., Croxall, J.P., Dunn, E.K., Sullivan, B.J., Yates, O., Black, A. 2011. Global seabird bycatch in longline fisheries. *Endangered Species Research* 14: 91-106.

Richard, Y., Abraham, E.R.. 2013. Risk of commercial fisheries to New Zealand seabird populations. New Zealand Aquatic Environment and Biodiversity Report No. 109. Ministry for Primary Industries, Wellington.

Research Cost: $70,000

Cost Recovery: F(CR) Item 4 (100% Industry)

Fish Stocks: BIG1, STN1, SWO1, YFN1.

4.4 Characterisation of smaller vessel deep water bottom longline operations in relation to risk factors for seabird capture

Project code: MIT2013-03

Start Date: 1 July 2013

Completion Date: 30 June 2014

Overall Objective

To characterise the smaller vessel deep water bottom longline fishery with respect to factors relating to seabird capture.

Specific Objectives

1. To review observer, fisher and catch effort data on vessel operations, and findings from previous mitigation projects in deep water bottom longline fisheries, and identify key risk factors for seabird interactions.
2. To characterise the range of bottom longline vessels over 20m with respect to factors relating to seabirds captures.
3. To provide recommendations on mitigation practices in this fishery.

Rationale

Recent level-2 risk seabird assessment has identified considerable risk, and uncertainty, posed by a subset of the bottom longline fishery executed by smaller deep water vessels (Richard & Abraham 2013). In conjunction with targeted observer coverage in that fishery (see CSP project INT2013-01), this project will characterise the range of bottom longline fishing operations and how these have changes over time to identify key factors related to seabird capture, including hook sink rates and mitigation practices currently used.

Research approach

A review of the current state of knowledge of fishing operations of smaller deep water bottom longline vessels will highlight gaps in knowledge and key risks. Information will be drawn together from findings of previous mitigation projects in deep water bottom longline fisheries, observer data, diaries and trip reports, fisher reports and catch effort data as well from direct interviews with fishermen. A report will be developed characterising the range of vessel operations and key operational risk factors. Recommendations will also be made to develop suitable and effective mitigation strategies in this fishery.

Outputs

1. Written report characterising the operations of this fishery and factors which contribute most to risk to seabirds.
2. Recommendations for improvements to data collection protocols for observers in this fishery
3. Provide recommendations on mitigation practices for this fishery

References

Richard, Y., Abraham, E.R.. 2013. Risk of commercial fisheries to New Zealand seabird populations. New Zealand Aquatic Environment and Biodiversity Report No. 109. Ministry for Primary Industries, Wellington.

Research Cost: $40,000

Cost Recovery: F(CR) Item 4 (100% Industry)

Fish Stocks: LIN 2, 3, 4.

4.5 Basking shark mitigation: detection, avoidance and live release

Project code: MIT2013-04

Start Date: 1 July 2013

Completion Date: 30 June 2014

Overall Objective

To identify and develop mitigation strategies to minimise the risk of capture of basking sharks by demersal trawl vessels and where possible identify methods for live release.

Specific Objectives

1. To identify and develop mitigation strategies to minimise the risk of capture of basking sharks by demersal trawl vessels.
2. To identify methods of releasing landed animals alive and with minimal injury.
3. To provide recommendations for future development and testing of any mitigation or live release strategies identified.

Rationale

The basking shark population status in New Zealand is poorly understood, though populations are likely to be susceptible to fisheries impacts, and considerable catch/bycatch has been reported (Francis and Sutton 2012). This project aims to identify ways that basking sharks may be identified during fishing operations (e.g. on sonar) and possible protocols to actively modify fishing operations to avoid or minimise bycatch. Methods to facilitate live release of basking sharks once caught will also be investigated.

Research approach

It is envisaged this project will consist of a review of international literature, including grey literature and other forms of documentation to identify what strategies are available to identify and subsequently avoid basking sharks during fishing. Following form that one or more expert workshops, including participation of commercial fishermen from a range of relevant demersal trawl fisheries, will be held to discuss techniques for mitigation, detection, avoidance and live release. This work should lead to recommendations on suitable and effective mitigation strategies that can be developed in these fisheries. Collection of observational data by the CSP Observer Programme (INT2013-01) could also be considered.

Outputs

1. A written report reviewing the state of knowledge of the detection, avoidance and live release of basking sharks. The report should detail the outcomes of the literature review and expert workshop(s) and compare the strengths and shortcomings of any method identified
2. Recommendations for the application and development of basking shark detection, avoidance and live release methods for demersal trawl vessels.

References:

Francis, M. P., Sutton, P. 2012: Possible factors affecting bycatch of basking sharks (Cetorhinus maximus) in New Zealand trawl fisheries. *Research report to the Department of Conservation.* Available at http://www.doc.govt.nz/Documents/conservation/marine-and-coastal/marine-conservation-services/pop2011-04-baskings-shark-by-catch-review-final-report.pdf

Research Cost: $15,000

Cost Recovery: F(CR) Item 4 (100% Industry)

Fish Stocks: CDL6, HAK1, 4, 7, HOK1, JMA7, LIN5, 6, OEO 6, ORH 1, 2A, 2B, 3B, RCO3, SCI6A, 6B, SKI2, SKJ1, SPD3, 5, SQU1T, 6T, SWA3, 4, WWA5B.

4.6 Development of bird baffler design for offshore trawl vessels

Project code: MIT2013-05

Start Date: 1 July 2013

Completion Date: 30 June 2014

Overall Objective

To assess, and improve where necessary, the design, durability and performance of bird bafflers currently deployed on trawl vessels >28 m in length.

Specific Objectives

1. To design and construct one or more improved bird baffler design(s).
2. To conduct at sea trials of the improved baffler(s) in order to assess efficacy and utility of the design.
3. To produce recommendations in the construction of bird baffler designs in a variety of media in order to maximise uptake in commercial fisheries.

Rationale

Previous work on the assessment and improvement of seabird scaring devices on trawlers >28 m in length by Cleal et al (2013), identified that further work is required to improve the design and performance of bird bafflers currently in use. This project will aim to work collaboratively with vessel operators to identify and construct improved bird bafflers.

Research approach

It is envisaged that this project will involve the design, construction, installation and testing of bird bafflers onboard a number of commercial trawlers. Opportunities for collaboration in the implementation of the project will be actively sought. The functionality of the designs should be tested in terms of effectiveness at mitigating seabird captures, crew safety, resilience to weather and ease of use. Recommendations should then be developed in suitable media such as industry publications, fact sheets and industry newsletters in order to maximise uptake in commercial fisheries.

Outputs

1. Design and construction of one or more bird baffler designs.
2. Written report detailing the design, testing methodology and results in terms of mitigation effectiveness, crew safety, resilience to weather and ease of use.
3. Resource factsheet(s) for offshore trawl vessels on optimal designs for seabird scaring devices

References:

Cleal, J., Pierre, J. P., Clement, G., 2013: Warp strike mitigation devices in use on trawlers >28 m in length operating in New Zealand fisheries. Research report to the Department of Conservation. Available for download from http://www.doc.govt.nz/documents/conservation/marine-and-coastal/marine-conservation-services/approved-mcs-annual-plan-2011-12.pdf

Research Cost: $70,000

Cost Recovery: F(CR) Item 4 (100% Industry)

Fish Stocks: BYX1, 2, 3, 7, 8, BAR4, 5, 7, CDL1, 2, 3, 4, 5, 6, 7, 8, 9, EMA3, 7, FRO1, 3, 4, 5, 6, 7, 8, 9, SKI3, 7, GSH 4, 5, 6, GSP1, 5, 7, HAK1, 4, 7, HOK1, JMA3, 7, LIN3, 4, 5, 6, 7, LDO1, 3, ORH1, 2A, 2B, 3A, 3B, 7A, 7B, OEO1, 3A, 4, 6, PRK1, 2, 3, 4A, 5, 6A, 6B, 7, 8, 9, RBT 3, 7, RIB3, 4, 5, 6, 7, 8, RBY1, 3, 4, 5, 6, 7, 8, 9, SCI1, 2, 3, 4A, 5, 6A, 6B, 7, 8, 9, SPE3, 4, 5, 6, 7, SWA1, 3, 4, SBW1, 6A, 6B, 6I, 6R, SPD4, 5, SQU1T, 6T, WWA1, 2, 3, 4, 5, 6, 7, 8, 9.

Appendix 1: Cost Allocation Tables

A: CSP 2013/14 Projects

Code	Project	Research	Admin	Total	CR Item	Industry %	Industry	Crown
Interaction projects								
INT2013-01	Observing commercial fisheries	$1,021,140	$113,769	$1,134,909	8	100	$1,134,909	$-
INT2013-02	Identification of seabirds captured in New Zealand fisheries	$80,000	$8,913	$88,913	4	100	$88,913	$-
INT2013-03	Identification of marine mammals, turtles and protected fish captured in New Zealand fisheries	$15,000	$1,671	$16,671	4	100	$16,671	$-
INT2013-04	Optimisation of observer data collection protocols	$40,000	$4,457	$44,457	4	100	$44,457	$-
INT2013-05	Assessment of cryptic seabird mortality on trawl warps and longlines	$40,000	$4,457	$44,457	4	100	$44,457	$-
Population projects								
POP2012-02	New Zealand sea lions – demographic assessment of the cause of decline at the Auckland Islands	$50,000	$5,570	$55,570	2	90	$50,013	$5,557
POP2012-06	Salvin's albatross – population estimate and at-sea distribution	$120,000	$13,369	$133,369	3	50	$66,684	$66,685
POP2013-01	New Zealand sea lion population project (Auckland Islands)	$200,000	$22,283	$222,283	2	90	$200,054	$22,229
POP2013-02	White-capped albatross population estimate (Auckland Islands)	$60,000	$6,685	$66,685	3	50	$33,342	$33,343
POP2013-03	Gibson's albatross population study (Auckland Islands)	$60,000	$6,685	$66,685	3	50	$33,342	$33,343
POP2013-04	Black petrel population project	$60,000	$6,685	$66,685	3	50	$33,342	$33,343
POP2013-05	Development of coral distribution modelling	$60,000	$6,685	$66,685	3	50	$33,342	$33,343
POP2013-06	Updated protected fish review: oceanic whitetip shark	$8,000	$891	$8,891	3	50	$4,445	$4,446
Mitigation projects								
MIT2012-05	Protected species bycatch newsletter	$20,000	$2,228	$22,228	4	100	$22,228	$-
MIT2013-01	Sea Trials of the Kellian line setter	$110,000	$12,255	$122,255	4	100	$122,255	$-
MIT2013-02	Surface longline seabird mitigation	$70,000	$7,799	$77,799	4	100	$77,799	$-
MIT2013-03	Characterisation of smaller vessel deep water bottom longline operations in relation to risk factors for seabird capture	$40,000	$4,457	$44,457	4	100	$44,457	$-
MIT2013-4	Basking shark mitigation: detection, avoidance and live release	$15,000	$1,671	$16,671	4	100	$16,671	$-
MIT2013-05	Development of bird baffler design for offshore vessels	$70,000	$7,799	$77,799	4	100	$77,799	$-
TOTAL		**$2,139,140**	**$238,329**	**$2,377,469**			**$2,145,180**	**$232,289**

B: CSP Observer Allocation

Fishery	Stocks covered	Total days	MPI CR %	MPI Days	DOC CSP CR %	DOC CSP Days	Cost per day	CSP research cost
FOREIGN CHARTER VESSELS								
Foreign Charter Vessels	430 days STN1; remaining days to be recovered as follows: HOK1; LIN3-7; HAK All; BAR All; SQU1T and SQU6T; JMA3-7; SBW All; WWA All; SWA All	6000	85	5100	15	900	$450	$405,000
DOMESTIC VESSELS								
Deepwater trawl fisheries:								
ORH 1	ORH1	55	90	50	10	5	$450	$2,250
East Coast NI Deepwater	ORH2A, BYX2, CDL2	175	90	158	10	17	$450	$7,650
Chatham Rise Deepwater	ORH3B, OEO3A, OEO4, BYX3	250	90	225	10	25	$450	$11,250
Sub-Antarctic Deepwater	ORH3B, OEO1, OEO6	80	90	72	10	8	$450	$3,600
West Coast NI Deepwater	ORH7A	20	90	18	10	2	$450	$900
Middle Depth trawl fisheries:								
Chat Rise Domestic	HOK1, HAK1, HAK4, LIN3, LIN4, SWA3, SWA4, JMA3, EMA3	140	85	119	15	21	$450	$9,450
HOK Cook Strait	HOK1	80	85	68	15	12	$450	$5,400
HOK WCSI inside the line	HOK1, HAK7,LIN7, SWA1, JMA7, EMA7	65	85	55	15	10	$450	$4,500
Scampi	SCI (ALL)	150	80	120	20	30	$450	$13,500
Deepwater bottom longline fisheries:								
Bottom longline	LIN3, LIN4	98	85	83	15	15	$450	$6,750
Surface longline fisheries:								
Domestic tuna longline - EC STN	STN1	157	85	133	15	24	$585	$14,040
Domestic tuna longline - WC STN	STN1	35	85	30	15	5	$585	$2,925
Domestic tune longline - EC BIG/SWO	BIG1, SWO1	225	85	191	15	34	$585	$19,890
Domestic tune longline - WC BIG/SWO	BIG1, SWO1	35	85	30	15	5	$585	$2,925

Continued over leaf

B: CSP Observer Allocation (Continued)

Fishery	Stocks covered	Total days	MPI CR %	MPI Days	DOC CSP CR %	DOC CSP Days	Cost per day	CSP research cost
Purse Seine fisheries:								
Domestic SKJ	SKJ1	70	85	60	15	10	$585	$5,850
Super seiner SKJ	SKJ1	30	85	26	15	4	$585	$2,340
Inshore fisheries:								
Setnet WCNI (E*) – TBC, coverage will be MPI Crown funded		250	-	250	-	-	-	-
Setnet ECSI (A*)	SCH3, SPO3, ELE3, BAR1	290	50	145	50	145	$635	$92,075
Setnet WCSI (B*)	LIN7, SPO7, SCH7	40	50	20	50	20	$635	$12,700
Inshore trawl WCNI – TBC (F,I*)	GUR1, TRE7, SNA8	370	85	315	15	55	$635	$34,925
Inshore trawl WCSI (D,I*)	BAR7, GUR7, STA7, TAR7, RCO7, WAR7	450	85	383	15	67	$635	$42,545
Inshore trawl ECSI (C,H*)	BAR3, ELE3, GUR3, RCO3, STA3,TAR3,	410	50	205	50	205	$635	$130,175
Bottom longline (SNA) (G*)	SNA1	600	50	300	50	300	$635	$190,500
TOTAL								**$1,021,140**

EC = East Coast WC = West Coast ECSI = East Coast South Island WCSI = West Coast South Island
*Inshore Observer Programme project reference

Appendix 2: Guiding Frameworks (see Section 1.3)

HECTOR'S/MAUI DOLPHINS

Purpose:

1 To provide information on the abundance and distribution of dolphins for TMP[10]
2 To provide information on the level of captures of dolphins for TMP[11]
3 To provide information on the capture rates of dolphins for TMP[12]

Agency	Dolphin Population	Purpose	Project	Observer days	Description	Linkages
DOC-MPI	MDO	1	Setnet (INOBS-E)	250 – TBC*	Estimate captures and identify MDO/HDO	
DOC-MPI			Trawl (INOBS-F)	370 – TBC*	Estimate captures and identify MDO/HDO	Cryptic mortality (INT2013-05) Total Commercial Catch (INOBS-I)
MPI		1	PRO2013-09	-	Construct population model to establish probability of extinction and focus areas for research	
DOC-MPI DOC-MPI	HDO ECSI	2,3 2,3	Setnet (INOBS-A) Trawl (INOBS-C)	290 (65%) 410 (50%)	Estimate captures and capture rate Estimate captures and capture rate	Aerial survey ECSI PRO2012 Aerial survey ECSI PRO2012; seabird captures (INOBS-H) Cryptic mortality (INT2013-05) Total Commercial Catch (INOBS-I)
MPI DOC-MPI DOC-MPI	HDO WCSI	1,3 2,3 2,3	PRO2013-06 Setnet (INOBS-B) Trawl (INOBS-D)	 40 (100%) 450 (25%)	To give updated abundance and distribution Estimate captures and capture rate Estimate captures and capture rate	 Total Commercial Catch (INOBS-I)
MPI	HDO	1	PRO2013-08		Examine possible impact of research design issues for estimates of populations in SCSI and Cloudy/Clifford Bay	

TMP = Threat Management Plan INOBS = Inshore Observer Programme Project reference MDO = Maui dolphin HDO = Hector's dolphin
WCSI = West Coast South Island ECSI = East Coast South Island SCSI = South Coast South Island *Subject to Ministerial decisions

[10] Aerial surveys to give distribution and abundance estimate
[11] Level of estimated captures for comparison to PBR
[12] Need both finescale distribution data and capture data to estimate capture rate per density of dolphin population to allow for risk based protection measures.

SEABIRDS

Capture estimation/risk assessment

Purpose :

1 To estimate annual mortalities
2 To improve risk assessments

Agency	Project	Purpose	Observer days	Description	Linkages
MPI	PRO2013-01	1	-	Estimate number of annual mortalities; Monitor seabird deaths	Comparison with L2 RA outputs
DOC	INT2013-02	1	-	Identifies seabirds captured from photographs	Input to PRO2013-01 and seabird risk assessment
MPI	PRO2013-13	2	-	Incorporate international mortality estimates for NZ seabirds	Input to seabird risk assessment (widening methodology)
DOC	INT2013-05	2	-	New protocols and additional data on warp strike in inshore trawl	Input to seabird risk assessment (refine mortality estimates)
MPI	PRO2013-02	2	-	Review additional sources for information on seabird and other species distributions	Input to seabird risk assessment (refine mortality estimates)
DOC-MPI	INOBS-H	1, 2	410	ECSI trawl coverage to reduce the uncertainty in the L2RA catch estimates for inshore trawl	Total Commercial Catch (INOBS-I) INT2013-05 POP2012-06
DOC-MPI	INOBS-G	1, 2	600	ECNI BLL to reduce uncertainty of black petrel capture levels and identify causes of captures	POP2013-04
MPI	PRO2013-17	2	-	Southern Bullers albatross, risk ratio 1.42 (0.75-2.58) - incorporate new data into level 3 risk assessment	

Population research (driven by risk assessment findings)

Purpose: To update population information

Agency	Programme	Risk Ratio	Description	Linkages
DOC	POP2012-06	3.03 (1.47 – 5.41)	Salvin's albatross - population estimate and at sea distribution	INOBS-H –seabirds ECSI trawl for captures
DOC	POP2013-02	1.03 (0.28 – 3.13)	White-capped Albatross population estimate and trend	INOBS-H - seabirds
DOC	POP2013-03	0.52 (0.25 – 1.00)	Gibson's albatross population estimate and survival/breeding estimates – level 3 risk assessment found steep decline	INOBS-H - seabirds
DOC	POP2013-04	20.50 (11.4 – 32.8)	Black petrel population estimate and survival/breeding estimates s	INOBS-G – Black Petrel

Mitigation Research

Purpose: To mitigate seabird captures

Agency	Programme	Risk Ratio	Description	Linkages
DOC	MIT2013-01	Black Petrel BLL 1870 (67.20 – 11,500)	Trial Kellian line setter device to reduce sea-bird catch in BLL esp black petrel and flesh-footed shearwater	INOBS-G
DOC	MIT2013-02	2.07 (0.77 – 4.91) All species	Surface longline - test range of mitigation options	INT2013-01 (CSP Observer Programme)
DOC	MIT2013-03	Capture estimates noted as highly uncertain	Deep water bottom longline smaller vessels - observe line setting practices and mitigation with recommendations for new options	CSP Observer Programme
DOC	MIT2013-05		Review effectiveness of current deep water trawl bird bafflerdesign and improve if possible	