

Inshore Observer Programme 2013/14 FINAL PLAN

July 2013

The goals of the Inshore Observer Programme (the 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:

... ”

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).

Observer Projects

The table below summarises the observer projects planned for 2013/14:

Fishery	Statistical Area	Relevant stocks for cost-recovery	Percentage of effort required	Season	MPI days	DOC days	Total number of days	Objective
Set net ECSI	22	SCH3, SPO3, ELE3	65%	Sep-Mar	145	145	290	Dolphins
Set net WCSI	33-35	LIN7, SPO7, SCH7	100%	All year	20	20	40	Dolphins
Set net WCNI	To be confirmed – Subject to pending Ministerial decisions							Dolphins
Inshore trawl WCNI								Dolphins, seabirds, total catch verification
Inshore trawl WCSI	33-35	BAR7, GUR7, STA7, TAR7, RCO7, WAR7	25%	All year	383	67	450	Dolphins, seabirds, total catch verification
Inshore trawl ECSI	20, 22	TAR3, RCO3, BAR1, ELE3, GUR3, STA3	50%	Jul-Nov	205	205	410	Dolphins, seabirds
Bottom longline	003-008	SNA1	30%	Oct-Mar	300	300	600	Seabirds

ECSI = East Coast South Island
ECNI = East Coast North Island

WCSI = West Coast South Island
WCNI = West Coast North Island

Cost recovery for these services, where applicable, will be based on a per day rate of \$635.

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's¹ 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 the MPI's and DOC's final advice on the issue. The Ministers' decision is expected shortly.

¹ 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.

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 **set net fisheries** on the **East Coast** of the South Island
2. Estimate the capture rate of Hector's dolphins in **set net 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 set net 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.

Rationale for planned observer coverage levels by fishery and location

Under the spatially explicit risk assessment method utilised by MPI to estimate fisheries risk to protected species, the number of expected captures in any particular time and location is a product of the species abundance in that location, the simultaneous intensity of the fishing effort occurring within the area, and the susceptibility of the species to capture; the latter is termed 'vulnerability'. With this method MPI scientists can estimate captures and associated risk at any spatial scale for which fishing effort data is available. To date the method has been applied for New Zealand seabirds but not for Hector's or Maui dolphins because we lacked reliable data indicative of dolphin distribution and abundance with corresponding observer coverage in the same time and place (to inform estimates of species vulnerability). However, with the preliminary results from the recent ECSI aerial survey and planned observer coverage in the 2013-14 fishing season, rigorous application of this method for dolphins will be possible in 2014.

Within this methodological framework observer coverage is assigned to particular fisheries and locations with the aim of generating robust estimates of commercial fisheries risk to Hector's and Maui dolphins in the most efficient manner possible. Observer planning is a complex optimisation process requiring simultaneous consideration of overlapping science objectives (e.g. seabirds, marine mammals,

fisheries stock assessment, mitigation trials, discard estimation) and multiple constraints including budgets, personnel, seasonal demands and logistics. It is therefore impossible to derive observer coverage targets using simplistic methods such as a ‘target coefficient of variation (CV)’ universally applied for all fisheries and areas.

Observer planning to address Hector’s and Maui dolphin priorities considered the following principles:

- To estimate vulnerability it is most efficient to focus observer coverage in areas/seasons of highest dolphin density, i.e. where the probability of capture is highest *per fishing event*. These are not necessarily the areas of highest risk, because risk is also a function of total fishing effort.
- To achieve unbiased estimates of vulnerability it is important that coverage is representative with respect to fisher behaviour. This means that we need sufficiently high levels of coverage to either make it impossible for fishers to consistently change their behaviour when an observer is on board, or to make it possible to detect these changes when they occur. Statistically this implies that the coverage target is inversely proportional to the number of vessels in the fleet (i.e. fleets with only a few vessels may require nearly 100% coverage during the observed time period).
- To avoid biases arising from observer effects on fisher behaviour it is better to constrain observer coverage to achieve higher proportional coverage for particular areas/seasons and no coverage in others, rather than uniformly low coverage across areas and seasons.
- Where there is potential to address other protected species research priorities simultaneously (e.g. risk to seabirds), then the rationale for target coverage levels will reflect both research priorities.

Project Title	Interactions with Hector dolphins, East Coast South Island
Start Date	1 September 2013
Completion Date	31 March 2014
Targeted fishing methods	Inshore set net 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 set net 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 set net activity. Observer coverage is targeted in a statistical area where there are high levels of set net fishing occurring and where dolphin densities are high.

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 planned.

Planned Coverage

- Statistical area 22 (refer to appendix 1 for a map of the statistical areas).
- 65% coverage of set net effort is required. The relatively high level reflects the need to avoid fisher behavioural bias, the relatively small size of the observed fleet (estimated to be 15 vessels) and the high priority assigned to achieving an estimate of set net vulnerability for Hector's dolphins.
- 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 set net 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 set net fisheries in this area.
- Observer coverage on East Coast South Island trawl vessels is planned (refer to Seabirds section), primarily to investigate the capture rate of at-risk seabirds. Secondary information on incidental capture rates of Hector's dolphins will also be collected.
- An ongoing autopsy programme for Hector's and Maui's 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's dolphins.

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 set net 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 set net 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 set net fishing is occurring and where dolphin density is high. There is significantly lower set net 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, these days will contribute disproportionately to the accuracy of our subsequent estimation of vulnerability (hence 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 planned.

Planned Coverage

- Statistical areas 33, 34 and 35 (refer to appendix 1 for a map of the statistical areas).
- 100% coverage of set net effort is required. The 100% target reflects the very small size of the set net fleet in this area (estimated to be between 1-5 vessels) and the inherent efficiency of targeting coverage in the area of highest dolphin population density.
- 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 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 set net fisheries in this area.

- Observer coverage on West Coast South Island trawl vessels is planned 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’s 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’s dolphins.

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 high levels of trawling are occurring and dolphin densities are highest.

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 planned.

Planned Coverage

- Statistical areas 20 and 22 (refer to appendix 1 for a map of the statistical areas).
- 50% coverage of trawl effort is required. The target reflects the small to moderate size of the fleet in this area and shared prioritisation to also address seabird priorities (see below).
- 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 to a lesser extent 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 set net fisheries in this area.
- Coverage on East Coast South Island set net vessels is planned to estimate the number of captures and the capture rate of Hector’s dolphins in set net fisheries in the area.
- CSP project POP2012-05 White-capped albatross – population estimate².
- CSP Planned project POP-2 Auckland Islands white-capped albatross population estimate².
- CSP project POP2012-06 Salvin’s albatross population and at-sea distribution estimate².
- An ongoing autopsy programme for Hector’s and Maui’s 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’s dolphins.

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.

² Further details available in the CSP Annual plan 2012/13
<http://www.doc.govt.nz/documents/conservation/marine-and-coastal/marine-conservation-services/csp-approved-annual-plan-2012-13.pdf>

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 planned.

Planned Coverage

- Statistical areas 33, 34 and 35 (refer to appendix 1 for a map of the statistical areas).
- 25% coverage of trawl effort is required. The lower target relative to east coast reflects the larger fleet size (hence lower proportion required to ensure representative coverage of fishery behaviour) and lower priority for related seabird objectives (see below).
- 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 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 set net fisheries in this area.
- Observer coverage on West Coast South Island set net vessels is planned to estimate the number of captures and the capture rate of Hector's dolphins in set net fisheries in the area.
- CSP project POP2012-05 White-capped albatross – population estimate³.
- CSP Planned project POP-2 Auckland Islands white-capped albatross population estimate.

³ Further details available in the CSP Annual plan 2012/13

<http://www.doc.govt.nz/documents/conservation/marine-and-coastal/marine-conservation-services/csp-approved-annual-plan-2012-13.pdf>

- Level 2 risk assessment refinement.
- An ongoing autopsy programme for Hector’s and Maui’s 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’s dolphins.

Maui dolphins

Overall project objectives/information needs – *Subject to pending Ministerial decisions*

1. Estimate the capture rate of Maui dolphins in **set net 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 Title	Interactions with Maui dolphins, West Coast North Island
Start Date	<i>TBC - Subject to pending Ministerial decisions</i>
Completion Date	<i>TBC - Subject to pending Ministerial decisions</i>
Targeted fishing methods	Inshore set net vessels
Targeted Statistical Areas	<i>TBC - Subject to pending Ministerial decisions</i>

Planned project Objectives – *Subject to pending Ministerial decisions*

1. Gather Information to estimate the number of captures and the capture rate of Maui dolphins in set net 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 planned.

Planned Coverage

TBC – Subject to pending 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’s 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’s dolphins.

Project Title	Interactions with Maui dolphins, West Coast North Island
Start Date	<i>TBC - Subject to pending Minister’s decisions</i>
Completion Date	<i>TBC - Subject to pending Minister’s decisions</i>
Targeted fishing methods	Inshore small trawl vessels (not flatfish)
Targeted Statistical Areas	<i>TBC - Subject to pending Minister’s decisions</i>

Project Objectives – *Subject to pending Ministerial decisions*

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 planned.

Planned Coverage

TBC – Subject to pending 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’s 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’s 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 et al. 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

Rationale for planned observer coverage levels by fishery and location

The spatially explicit risk assessment method by which we evaluate fisheries risk to seabirds is described above under Hector's dolphins. Because this method has already been implemented for seabirds, spatially resolved estimates of capture rate and risk, *including uncertainty*, are already available for all seabird species. We use these estimates to target observer coverage where it is most effective and determine what level of coverage is required to achieve seabird research priorities. Observer

coverage planning considers the same principles identified (above) for dolphins and the following additional principles:

- Priority is assigned proportional to species-level risk for the eighteen species ranked very high, high or medium risk.
- For species and fisheries where risk reflects high uncertainty regarding capture rates, observer coverage is useful to improve estimates of species vulnerability.
- For species and fisheries where risk reflects known high capture rates (with low uncertainty), observer coverage is not useful to improve estimates of species vulnerability but may be necessary for other purposes (e.g. to better understand factors contributing to high capture rates and inform the choice of appropriate management response).
- Required coverage levels are calculated to ensure that the estimated number of observed captures associated with coverage at the target level (within a specified statistical area and month), are statistically distinguishable from zero.

Project Title	Variables affecting capture rates of at-risk seabirds (black petrels, flesh-footed shearwaters) in inshore bottom longline fisheries in the North-East Coast of the 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.

Planned Coverage

- Statistical areas 003, 004, 005, 006, 007 and 008 (refer to appendix 1 for a map of the statistical areas).
- 30% coverage of bottom longline effort targeting snapper is substantially higher than what has been achieved in the past, and will substantially reduce the current level of uncertainty around risk. This level of coverage is required so that observed effort can be spread across the range of vessels and in space and time to identify specific factors affecting capture rates.
- 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 2011-01 MIT2012-01 investigating ways of reducing availability of inshore bottom longline hooks to seabirds⁴.
- Project POP2012-03 Black petrel - at-sea distribution and population estimate⁵
- Planned project POP-4 Black petrel population trend and demographics⁶
- Planned project INT-5 Assessment of cryptic mortality on trawl warps and longlines⁷
- 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 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.

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).

⁴ Report available for download at www.doc.govt.nz/csp

⁵ Further details available in the CSP Annual plan 2012/13

<http://www.doc.govt.nz/documents/conservation/marine-and-coastal/marine-conservation-services/csp-approved-annual-plan-2012-13.pdf>

⁶ Project planned for the CSP 2013/14 annual plan

⁷ Project planned for the CSP 2013/14 annual plan

For both of these species greater than 40% of this risk derives from a single fishery group (i.e. 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 strikes, 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.

Planned Coverage

- Statistical areas 20 and 22 (refer to appendix 1 for a map of the statistical areas).
- 50% coverage of trawl effort is required. This target reflects the small to moderate size of the fleet in this area, high uncertainty regarding vulnerability in all inshore trawl fisheries, high priority assigned to Salvin's albatross, and shared prioritisation to also address Hector's dolphin priorities (above).
- 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

- Planned project INT-5 Assessment of cryptic mortality on trawl warps and longlines⁸
- CSP project POP2012-05 White-capped albatross – population estimate⁹.
- CSP Planned project POP-2 Auckland Islands white-capped albatross population estimate⁹.

⁸ Project planned for the CSP 2013/14 annual plan

⁹ Further details available in the CSP Annual plan 2012/13

<http://www.doc.govt.nz/documents/conservation/marine-and-coastal/marine-conservation-services/csp-approved-annual-plan-2012-13.pdf>

- CSP project POP2012-06 Salvin's albatross population and at-sea distribution estimate⁹.
- 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

Better Information Better Value

Project Title	Total Commercial Catch Project
Start Date	2013
Completion Date	2016
Targeted fishing methods	Bottom trawl
Targeted Statistical Areas	<i>To be confirmed</i>

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.

Planned Coverage

- *To be confirmed* - Initially the West and East Coasts of the South Island and possibly the West Coast of the North Island.
- 30% 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