Department of Conservation
Te Papa Atawhai

Ministry for Primary Industries
Manatū Ahu Matua

Inshore Observer Programme 2013/14

26 March 2013 ***Draft proposal***

While every effort has been taken to ensure the information presented in this document is accurate, the reports should not be quoted or forwarded to people as it is in draft form.

Purpose:
The Ministry for Primary Industries and the Department of Conservation wish to have early discussions around the contents of this proposal with the commercial fishing sector prior to public consultation.

Key Messaging:

1. 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.*

2. 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.
   …".

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

Proposed Observer Projects

The table below summarises the observer projects proposed for 2013/14

Method	Area	Statistical Area	Percentage of effort	Season	Total number of days	Objective
Set net	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				Dolphins
Small inshore trawl (except flatfish)	West Coast North Island					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	Hauraki Gulf	003-008	30%	Sep-Feb	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[1] 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).

[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.

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.

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.

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 set net 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 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 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'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. 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, 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 set net 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 set net 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'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 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 set net fisheries in this area.

- Coverage on East Coast South Island set net vessels is proposed 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 estimate[2].

- CSP Proposed project POP-2 Auckland Islands white-capped albatross population estimate[2].

- CSP project POP2012-06 Salvin's albatross population and at-sea distribution estimate[2].

- 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.

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.

[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

- 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 set net fisheries in this area.
- Observer coverage on West Coast South Island set net vessels is proposed 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 estimate[3].
- CSP Proposed project POP-2 Auckland Islands white-capped albatross population estimate.
- 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.

[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

Maui dolphins

Overall project objectives/information needs

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	*TBC - Subject to the Ministerial decisions*
Completion Date	*TBC - Subject to the Ministerial decisions*
Targeted fishing methods	Inshore **set net** 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 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 proposed.

Proposed Coverage

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'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	*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

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'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 **Hauraki Gulf**).

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 Title	Variables affecting capture rates of at-risk seabirds (black petrels, flesh-footed shearwaters) in inshore bottom longline fisheries in the **Hauraki Gulf**
Start Date	1 September 2013
Completion Date	28 February 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 2011-01 MIT2012-01 investigating ways of reducing availability of inshore bottom longline hooks to seabirds[4].
- Project POP2012-03 Black petrel - at-sea distribution and population estimate[5]
- Proposed project POP-4 Black petrel population trend and demographics[6]
- Proposed project INT-5 Assessment of cryptic mortality on trawl warps and longlines[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 proposed for the CSP 2013/14 annual plan

[7] Project proposed for the CSP 2013/14 annual plan

- 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). 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 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 INT-5 Assessment of cryptic mortality on trawl warps and longlines[8]
- CSP project POP2012-05 White-capped albatross – population estimate[9].
- CSP Proposed project POP-2 Auckland Islands white-capped albatross population estimate[9].
- CSP project POP2012-06 Salvin's albatross population and at-sea distribution estimate[9].
- 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

[8] Project proposed 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

Total Commercial Catch Project

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.