

## Initial research proposals for delivery through CSP in 2013/14

This document outlines initial research proposals for possible delivery through CSP during 2013/14, with indicative research costs. This document forms background material for the joint CSP-MPI Aquatic Environment research planning meeting of 22 March 2013. Stakeholder input is sought on the scope of projects, relative priority for delivery in 2013/14, and identification of research gaps/additional proposals for potential delivery in 2013/14. This feedback will be used to further develop a selection of proposals into the draft CSP Annual Plan 2013/14 for formal consultation.

### INTERACTION PROJECTS

INT-1 Observing commercial fisheries

INT-2 Identification of seabirds captured in New Zealand fisheries

INT-3 Identification of marine mammals, turtles and protected fish captured in New Zealand fisheries

INT-4 Optimisation of observer data collection protocols

INT-5 Assessment of cryptic seabird mortality on trawl warps and longlines

### POPULATION PROJECTS

POP2012-02 New Zealand sea lions – demographic assessment of the cause of decline at the Auckland Islands\*

POP2012-06 Salvin's albatross – population estimate and at-sea distribution\*

POP-1 Auckland Islands New Zealand sea lion population project

POP-2 Auckland Islands white-capped albatross population estimate

POP-3 Auckland Islands Gibson's albatross population study

POP-4 Black petrel population project

POP-5 Development of coral distribution modelling

POP-6 Update protected fish review: oceanic whitetip shark

### MITIGATION PROJECTS

MIT2012-05 Protected species bycatch newsletter\*

MIT-1 Sea trials of Kellian line setter

MIT-2 Surface longline mitigation

MIT-3 Inshore bottom longline: larger vessel characterisation and factors related to seabird capture

MIT-4 Basking shark mitigation: detection and avoidance

MIT-5 Development of bird baffle design for offshore trawl vessels

\*These projects are multi-year projects consulted on in previous years and included here for the sake of completeness.

**INTERACTION PROJECTS****INT-1 Observing commercial fisheries**

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.

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.

As in previous years, inshore coverage will be delivered as a joint initiative between DOC and MPI using a risk based planning process to identify areas of priority for observer placement. Where appropriate Observer Services are then allocated between agencies on either a pro-rata or project basis. See separate joint DOC-MPI proposal for inshore coverage.

In offshore fisheries MPI Observer Services maintains a higher level of coverage over a broad temporal and spatial scale. As such the allocation of observer days between agencies within a fishery is pro-rated based on the proportion of time spent on each agencies requirements.

**INT-2 Identification of seabirds captured in New Zealand fisheries**

\$80,000

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 specimens and/or photographs returned by observers, the taxon, and where possible sex, age-class and provenance, of seabirds captured in New Zealand fisheries.
2. To detail the sex, age-class, injuries, body condition and stomach contents and, where possible, the likely cause of mortality for returned seabird specimens.

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. Government 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 necropsy and/or expert examination of photographs in the

majority of cases. Additional information to characterise the nature interaction can also be obtained by necropsy (e.g. type of injury and stomach contents). Information gained through this project will link to Ministry for Primary Industry databases and will inform ongoing risk assessment, research and modelling of the effects of fisheries bycatch on seabird populations. A protocol for determining which samples are returned for necropsy, and which are photographed, is in development.

Note: this project represents a modified extension to the current seabird identification project. Collection of genetic material to resolve uncertain identification determinations is also being considered. Three year term proposed.

**INT-3 Identification of marine mammals, turtles and protected fish captured in New Zealand fisheries**

\$15,000

Objective: To determine, through examination of observer photographs, the taxon, sex, and where possible age-class of marine mammals, turtles and protected fish captured in New Zealand fisheries.

The accurate determination of the taxon of marine mammals, turtles and protected fish in New Zealand fisheries is vital for examining the potential threat to population viability posed by incidental fisheries captures. Government 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 examination of photographs. Information gained through this project will link to Ministry for Primary Industry databases and will inform ongoing risk assessment, research and modelling of the effects of fisheries bycatch on marine mammals, turtles and protected fish populations.

Note: this is a new project and is designed to complement the existing seabird identification project. Collection of genetic material is standard, and can be used to resolve uncertain identification determinations. Three year term proposed.

**INT-4 Optimisation of observer data collection protocols**

\$40,000

Objective: To examine the information collected by observers on factors that effect protected species interactions and refine or develop these to allow for more informative and efficient data collection.

The data collected by observers continues to inform fisheries management, risk assessment and mitigation development. Much of this information is in the form of ad-hoc observations and diary comments. As understanding of protected species interactions has developed, so has the 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 observer. This will identify 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.

**INT-5 Assessment of cryptic seabird mortality on trawl warps and longlines**

\$90,000

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.

Recent level-2 seabird risk assessment identified the considerable uncertainty in scalars to account for unobserved or unobservable seabird mortality, or cryptic mortality. 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.

Two year term may be required.

## POPULATION PROJECTS

**POP2012-02 New Zealand sea lions – demographic assessment of the cause of decline at the Auckland Islands** \$50,000

Project consulted in 2012. Year 2 of a two-year project.

**POP2012-06 Salvin’s albatross – population estimate and at-sea distribution** \$120,000

Project consulted in 2012. Year 2 of a two-year project.

**POP-1 Auckland Islands New Zealand sea lion population project** \$100,000-  
\$200,000

### Option A:

Objectives:

1. To estimate New Zealand sea lion pup production at Enderby and Dundas Islands using aerial survey or land-based mark-resight techniques.
2. To mark New Zealand sea lion pups at Enderby Island following established techniques.

### Option B:

Objectives:

1. To estimate New Zealand sea lion pup production at Enderby, Figure of 8 and Dundas Islands using land-based mark-resight and direct count techniques.
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.

New Zealand sea lions are classified as Nationally Critical, 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.

Note: the two options here vary in the extent of population data collected, and associated research cost. Maximum cost efficiencies will be achieved through joint delivery with white-capped and Gibson’s albatross research projects.

**POP-2 Auckland Islands white-capped albatross population estimate** \$60,000

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

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. 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.

Note: maximum cost efficiencies will be achieved through joint delivery with New Zealand sea lion and Gibson's albatross research projects

**POP-3 Auckland Islands Gibson's albatross population study** \$60,000

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

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. 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.

Note: maximum cost efficiencies will be achieved through joint delivery with New Zealand sea lion and white-capped albatross research projects

**POP-4 Black petrel population project** \$60,000

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

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. Considerable research on black petrels on Great Barrier Island has been conducted, and 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.

**POP-5 Development of coral distribution modelling** \$60,000

Objective: To identify areas where deep sea corals are at highest risk of interactions with commercial fishing gear.

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 (CSP project POP2011-06) to more robustly identify areas where deep sea corals are at highest risk of interactions with commercial fishing gear by utilising additional sources of information relevant to the distribution of corals.

**POP-6 Update protected fish review: oceanic whitetip shark** \$8,000

Objectives:

1. To describe the nature and extent of interactions between commercial fishing and oceanic whitetip shark to the extent possible from existing information
2. To describe population information relevant to assessing risk to oceanic whitetip shark from commercial fishing to the extent possible from existing information.

The oceanic whitetip shark was afforded absolute protection under the Wildlife Act 1953 in January 2013. This project aims to supplement previous work (project POP2011-03) which reviewed information on all other protected fish species. It is envisaged that an additional chapter will be commissioned to update the previous project report. This information is required in order to understand the nature and extent of any adverse effects of commercial fishing on oceanic whitetip sharks, and will identify key information gaps in existing information.

**MITIGATION PROJECTS**

**MIT2012-05 Protected species bycatch newsletter** \$20,000

Project consulted in 2012. Year 2 of a two-year project.

**MIT-1 Sea trials of Kellian line setter** \$80,000

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

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. Project MIT2011-04 is currently developing a modified prototype of the Kellian line setter, suitable for deployment in a commercial fishing environment. This project will conduct at-sea testing of the modified prototype.

**MIT-2 Surface longline mitigation** \$70,000

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

Surface longline fisheries globally have accounted for significant levels of seabird bycatch, 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. International research into seabird mitigation measures has had a considerable focus on developing novel methods for surface longline fisheries, 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 safety or

operational difficulties for fishermen.

This project will further expand trials currently being undertaken jointly between CSP (project MIT2012-04) and MPI to provide comparative results across a range of mitigation options. It is envisaged that CSP and MPI observer coverage will be used as a platform for delivery of at-sea work.

**MIT-3 Inshore bottom longline: larger vessel characterisation and factors related to seabird capture** \$60,000

Objective: To characterise the larger vessel inshore bottom longline fishery with respect to factors relating to seabird capture.

Recent level-2 risk seabird assessment has identified considerable risk, and uncertainty, posed by a subset of the inshore bottom longline fishery executed by larger vessels. In conjunction with targeted observer coverage in that fishery, this project will aim to utilise the at-sea platform provided by observers to collect in-depth information on key factors related to seabird capture, including hook sink rates and mitigation practices currently used. The project will include design of data collection protocols, provision of expert advice and equipment, analysis of results, and recommendations to develop suitable and effective mitigation strategies in this fishery.

**MIT-4 Basking shark mitigation: detection and avoidance** \$15,000

Objective: To identify and develop mitigation strategies to minimise the capture of basking sharks by demersal trawl vessels.

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. 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. It is envisaged this project will consist of one or more expert workshops and possible collection of observational data of fishing practices through the CSP Observer Programme, and recommendations to on suitable and effective mitigation strategies that can be developed in this fishery.

**MIT-5 Development of bird baffler design for offshore trawl vessels** \$70,000

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

Previous work on the assessment and improvement of seabird scaring devices on trawlers >28 m in length (project MIT2011-07), 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..