

CSP Initial research proposals 2017/18

CSP RAG 1 March 2017

Purpose

These initial project proposals have been developed to deliver outputs to address research gaps identified by the Conservation Services Programme (CSP) Research Advisory Group (RAG). These gaps have been identified through the development of medium term research plans, or at previous meetings of the RAG. It is intended that these initial proposals, and any other proposals identified by the RAG, will be prioritised at the CSP RAG meeting of 1 March 2017. The prioritised proposals will be used to develop the CSP Annual Plan 2017/18

These initial research proposals should be considered in light of the following key documents:

- [CSP Strategic Statement 2015](#)
- Draft CSP Seabird medium term research plan 2017 (updated plan to be provided as a background document for the meeting)
- [CSP Protected fish medium term research plan 2016](#)
- [CSP Annual Plan 2016/17](#)

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Interaction Projects

Ongoing projects

INT-2015-3 Identification and storage of cold-water coral bycatch specimens

This multi-year project was consulted on in 2015/16 and is due for completion in June 2018. It is proposed to form part of the CSP Annual Plan 2016/17
Full details are provided in the CSP Annual Plan 2015/16

INT-2016-02 Identification of seabirds captured in New Zealand fisheries

This multi-year project was consulted on in 2016/17 and is due for completion in June 2019. It is proposed to form part of the CSP Annual Plan 2017/18
Full details are provided in the CSP Annual Plan 2016/17

Proposed projects

INT-1 Observing commercial fisheries

Term: 1 year.

Guiding Objectives: CSP Objectives A, B, C; National Plan of Action – Seabirds, National Plan of Action – Sharks; Hector’s and Māui dolphin Threat Management Plan.

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

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

The CSP Observer Programme will continue to purchase baseline services for “offshore” fisheries from MPI Observer Services, given the scale of their operation, which allows observers to be placed strategically across New Zealand Fisheries. Inshore fisheries observer coverage will also be delivered by MPI Observer Services, per a joint planning process.

Planning of observer coverage is undertaken jointly by MPI and DOC as part of a separate process and will be consulted on as part of the consultation on the CSP Annual Plan 2017/18.

INT-2 Identification of marine mammals, turtles and protected fish captured in New Zealand fisheries

Term: 3 years.

Guiding Objectives: CSP Objectives B, C; NPOA – Sharks.

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

The accurate determination of the taxon of marine mammals, turtles, and protected fish captured in New Zealand fisheries is vital for examining the potential threat to population viability posed

by incidental fisheries captures. Observers on commercial vessels are not always able to identify marine mammals, turtles and protected fish at sea with high precision, and the assessment of the age-class may require expert knowledge. Information gained through this project will link to Ministry for Primary Industry databases and will inform ongoing bycatch estimation, risk assessment, research and modelling of the effects of fisheries bycatch on marine mammals, turtles and protected fish populations. Funding will contribute to both expert identification and development of a web-based platform which allows for the pairing of imagery to meta data, which will then be made available to relevant experts.

Indicative cost: \$15,000 per annum

INT-3 Supporting the utility of electronic monitoring to identify protected species interacting with commercial fisheries

Term: 2 years.

Guiding Objectives: CSP Objectives A, B, C; National Plan of Action – Seabirds, National Plan of Action – Sharks; Hector’s and Māui dolphin Threat Management Plan.

Project Objectives:

1. Develop tools to aid in the effective identification of protected species from camera footage.
2. Provide training materials for remote viewers of fisheries data to enable the collection of robust data on the nature of interactions.

Electronic monitoring through use of video and sensor data has been operating in a number of fisheries around the world for a variety of management needs. The utility of these systems for the monitoring of protected species interactions is dependent on robust, objective based planning and adequate investment in upskilling of footage reviewers. In New Zealand, the Ministry for Primary Industry’s Integrated Electronic Monitoring and Reporting System (IEMRS) has set in place ambitious timelines for roll out throughout the New Zealand fishing fleets. Overall objectives of IEMRS are not limited to protected species monitoring however to ensure maximum utility and therefore value of the system it will be critical that footage reviewers are adequately skilled in protected species identification and the nature of their interactions with fishing operations.

Drawing on both domestic and international experience this project will develop and produce training and resource materials directed at footage reviewers to enable them to accurately identify and characterise the natural and contributing factors of protected species interactions, undertake more accurate speciation of cryptic taxa and make more accurate assessments of the fate or injury status of animals interacting with fishing activities. Information gained through this project will link to MPI databases and will inform ongoing bycatch estimation, risk assessment, research and modelling of the effects of fisheries bycatch on marine mammals, turtles and protected fish populations.

Indicative cost: \$20,000 per annum

INT-4 Post release survival of white pointer sharks

Term: 1 year.

Guiding Objectives: CSP Objectives A, B and C; CSP Protected Fish Plan; National Plan of Action – Sharks.

Project Objective: A continuation of continuation of last year's work based on the recommendations derived from INT2016-03.

White pointer sharks have been observed caught throughout the New Zealand EEZ and in a wide range of fisheries. As with other shark species there is a general paucity of information on the life history characteristics of white pointer sharks however indications are that they are generally slow growing and late maturing (Francis & Lyon 2012) making them susceptible to fishing impacts at a population level. While those animals caught in deeper water offshore trawls are generally identified as dead, those caught in coastal setnet fisheries, particularly on the South Coast South Island and West Coast North Island are often reported as being released alive. In order to adequately assess fishery impact and develop mitigation solutions to maximise the likelihood of survival it is important to understand the post release survival of these animals. Studies on other elasmobranchs, bycaught in New Zealand fisheries have identified low survival rates of animals which were assessed as alive and in good condition at time of release (Francis 2014). Identifying factors which affect post release survival allows mitigation practices to be developed to reduce fisheries impacts.

This project will build on the recommendations of INT2016-03 (due for review by the CSP TWG 15 March 2017).

Indicative cost: \$40,000

Post-release survival of seabirds

No project proposed as relevant research is currently being delivered by MPI project PRO2015-01

Population Projects

Ongoing Projects

POP2015-02 Flesh-footed shearwater: Various locations population project

This multi-year project was consulted on in 2016/17 and is due for completion in June 2018. It is proposed to form part of the CSP Annual Plan 2017/18
Full details are provided in the CSP Annual Plan 2016/17

POP2016-05 Yellow-eyed penguin foraging and indirect effects

This multi-year project was consulted on in 2016/17 and is due for completion in June 2018. It is proposed to form part of the CSP Annual Plan 2017/18
Full details are provided in the CSP Annual Plan 2016/17

Proposed Projects

POP-1 Chatham Islands seabird research

Term: 1 year.

Guiding Objectives: CSP Objective E; CSP seabird plan 2017; National Plan of Action - Seabirds

Project Objective: To collect information on key aspects of the biology of selected at-risk seabird species in order to reduce uncertainty or bias in estimates of risk from commercial fishing.

Objective	Species	Target biological information
1	Northern Buller's albatross	A - Population size at Sisters
2	Northern royal albatross	A - Population size at Sisters
3	Chatham Island albatross	A – Increased resight data B – Banding of new birds

Ground team to return to the Sisters to complete counts for the Northern Buller's, and Northern royal albatross. This trip will fill the gaps left by the 2016 work which was unable to reach the island due to weather. Additionally, a resurvey of Northern Royal albatross will be particularly important to reduce uncertainty in the biennial breeder. Repeating counts of the Chatham Island albatross at the pyramids will allow for increased resighting of banded birds to feed into the MPI funded Level 3 modelling of this species.

The Conservation Services Programme Seabird medium term research plan 2017 (CSP seabird plan 2017) outlines a five-year research programme to deliver on the seabird population research component of CSP. It is targeted at addressing relevant CSP Objectives (as described in the CSP Strategic Statement) and National Plan of Action – Seabirds Objectives. This proposal delivers priority research components of the CSP seabird plan 2017 involving field work at the Chatham Islands. The proposal has been developed to maximise cost and logistical efficiencies between components. Supporting rationale for all the components is summarised in the CSP seabird plan

2017. It is envisaged that a variety of methods will be used, including ground-based counts, aerial survey, boat-based survey and satellite imagery derived counts. Methods will be developed and tailored to each species and site.

Indicative cost: \$30,000 – \$60,000.

Black petrel: Population demographics and tracking – Great Barrier Island.

No project proposed as MPI propose to deliver this research as part of PRO2017-01.

POP-2 Salvin’s albatross: Bounty Islands population project

Term: 2 years.

Guiding Objectives: CSP Objective E; CSP seabird plan 2017; National Plan of Action - Seabirds

Project Objectives:

1. To estimate the population size of Salvin’s albatross at the Bounty Islands.
2. To describe the at-sea distribution of Salvin’s albatross breeding at the Bounty Islands.

Recent population estimates of Salvin’s albatross at the Bounty Islands (part of CSP project POP2012-06) using ground and aerial methods have found contrasting evidence in regards population trend (Amey & Sagar 2013; Baker et al 2014). The at-sea foraging distribution of this population is described from only a small sample size of individuals due to device failure in a recent study (Thompson et al 2014; part of POP2012-06).

This project will be designed following recommendations from a methodology workshop undertaken as part of project POP2016-06, the report from which will be tabled at the CSP Technical Working Group meeting of 1 March 2017. The summary recommendations were as follows:

- Two-year project.
- Satellite mapping of island to allow area of occupancy to be quantified.
- Aerial photographic survey in year 1 (and ideally repeated in year 2) to estimate total number of breeding pairs and area of occupancy.
- Aerial survey conducted in late September.
- Ground visit in both years, coinciding with aerial survey to allow ground truthing.
- Focus on GLS deployments in year 1, with trial PPT/GPS transmitting device deployment.
- Focus on GLS retrieval and additional PPT/GPS transmitting device deployment in year 2.
- Identify any potential constraints limiting breeding success.
- Band and resight birds with potential to establish a study site area on Proclamation Island (easiest access and most existing data).

Indicative cost: \$100,00-200,000 per annum

Southern Buller’s albatross: Population demographic study at the Snares

No project proposed as MPI propose to deliver this research as part of PRO2017-01.

POP-3 Auckland Islands seabird research

Term: 3 years.

Guiding Objectives: CSP Objective E; CSP seabird plan 2017; National Plan of Action - Seabirds

Project Objective: To collect information on key aspects of the biology of selected at-risk seabird species at the Auckland Islands.

This proposal covers prioritised components to reduce uncertainty or bias in estimates of risk from commercial fishing involving fieldwork at the Auckland Islands, which have been developed to maximise cost and logistical efficiencies between components.

Objective	Species	Target biological information
1	White-capped albatross	A - Adult survival and other demographic parameters (Disappointment Island) B - Population size
2	Gibson's albatross	A - Adult survival and other demographic parameters (Adams Island) B - Population size

The Conservation Services Programme Seabird medium term research plan 2017 (CSP seabird plan 2017) outlines a five-year research programme to deliver on the seabird population research component of CSP. It is targeted at addressing relevant CSP Objectives (as described in the CSP Strategic Statement) and National Plan of Action – Seabirds Objectives. This proposal delivers priority research components of the CSP seabird plan 2017 involving field work at the Auckland Islands. The proposal has been developed to maximise cost and logistical efficiencies between components and ensure the continuation of priority long term datasets. Supporting rationale for all the components is summarised in the CSP seabird plan 2017. It is envisaged that a variety of methods will be used, including ground-based counts, aerial survey, boat-based survey and satellite imagery derived counts. Methods will be developed and tailored to each species and site.

Indicative cost: \$100,000-150,000 per annum

POP-4 Antipodes Island seabird research

Term: 3 years.

Guiding Objectives: CSP Objective E; CSP seabird plan 2017; National Plan of Action - Seabirds

Project Objective:

1. To collect information on adult survival and other key demographic parameters of Antipodean albatross (3 year term).
2. To estimate the population size of Antipodean albatross (1-2 year term).
3. To estimate the population size of white chinned petrels and Northern giant petrels at Antipodes Island (1 year term).

This proposal covers prioritised components to reduce uncertainty or bias in estimates of risk from commercial fishing involving fieldwork at Antipodes Island, which have been developed to maximise cost and logistical efficiencies between components.

The draft Conservation Services Programme Seabird medium term research plan 2017 (CSP seabird plan 2017) outlines a five-year research programme to deliver on the seabird population research component of CSP. It is targeted at addressing relevant CSP Objectives (as described in the CSP Strategic Statement) and National Plan of Action – Seabirds Objectives. This proposal delivers priority research components of the CSP seabird plan 2017 involving field work at Antipodes Island. The proposal has been developed to maximise cost and logistical efficiencies between components and ensure the continuation of priority long term datasets. Supporting rationale for all the components is summarised in the CSP seabird plan 2017. It is envisaged that a variety of methods will be used, including ground-based counts, aerial survey, boat-based survey and satellite imagery derived counts. Methods will be developed and tailored to each species and site.

Indicative cost: \$100,000-150,000 per annum

POP-5 Campbell Island seabird research

Term: 1 year.

Guiding Objectives: CSP Objective E; CSP seabird plan 2017; National Plan of Action - Seabirds

Project Objective:

1. To estimate the population size of Campbell Island albatross.
2. To estimate the population size of Northern giant petrels at Campbell Island.

This proposal covers prioritised components to reduce uncertainty or bias in estimates of risk from commercial fishing involving fieldwork at Campbell Island, which have been developed to maximise cost and logistical efficiencies between components. If research on New Zealand sea lions is undertaken at Campbell Island in 2017/18 further cost and logistical efficiencies will be possible.

The draft Conservation Services Programme Seabird medium term research plan 2017 (CSP seabird plan 2017) outlines a five-year research programme to deliver on the seabird population research component of CSP. It is targeted at addressing relevant CSP Objectives (as described in the CSP Strategic Statement) and National Plan of Action – Seabirds Objectives. This proposal delivers priority research components of the CSP seabird plan 2017 involving field work at Campbell Island. The proposal has been developed to maximise cost and logistical efficiencies between components. Supporting rationale for all the components is summarised in the CSP seabird plan 2017. It is envisaged that a variety of methods will be used, including photo-point counts (consistent with previous surveys of Campbell Island albatross) and ground-based counts. Methods will be developed and tailored to each species and site.

Indicative cost: \$60,000 – \$100,000

POP-6 Indirect effects on seabirds in north-east North Island region

Term: 1 or 2 year(s).

Guiding Objective: CSP Objective D

Project Objective: This project will address priority recommendations from project INT2016-04. This may include further research on:

1. The diet, and changes in diet, of seabirds breeding in north-east North Island region that forage in association with fish work-ups.
2. The composition and availability of prey items for seabirds from, or arising from, fish work-ups.
3. Population research gaps for seabirds that may be affected by the availability of fish work-ups.
4. High resolution spatial foraging patterns of seabirds that may be affected by the availability of fish work-ups.

This project builds on the findings of INT2016-04. (Indirect effects of commercial fishing on Buller's shearwater and red-billed gulls). Results from INT2016-04 are due for presentation to the CSP Technical Working Group on 16 March 2016. The objectives of this proposed project will be refined based on discussion at, and feedback from, the Technical Working Group.

Poor knowledge of both the diet of seabirds and what prey items are being made available to seabirds from fish work-ups is currently limiting our understanding of the mechanisms through which changes in fish work-ups may be driving seabird population changes. Population data is also incomplete and limits our assessment of trends over time.

Field research focussed on key sites such as the Mokohinau Islands, Poor Knights and Three Kings, where species such as red-billed gulls and Buller's shearwater breed, may be needed to further our understanding of their diet, their foraging areas and their population trends. Sampling prey availability in fish work-ups and under normal conditions would provide further information of the range of prey made available.

Indicative cost: \$50,000-150,000 (dependent on scope of proposed project)

POP-7 New Zealand Sea Lion: Auckland Islands Pup count

Term: 1 year.

Guiding Objectives: CSP Objective E.

Project Objectives:

1. To estimate New Zealand sea lion pup production at Enderby, Figure of 8 and Dundas Islands.
2. To update the New Zealand sea lion database.

At a minimum annual pup counts are required for current fisheries management purposes in order to monitor against a trigger level related to potential population declines. These pup counts can be conducted over a shorter field season than a full resighting programme and therefore reduce the quantum of cost. However, simple pup counts will not collect the range of data required to inform changes in demographic parameters which may be driving population trends.

Indicative cost: \$100,000

POP-8 New Zealand fur seal: Bounty Islands population assessment

Term: 1 year.

Guiding Objectives: CSP Objective E.

Project Objectives:

1. To collate existing information on fur seal numbers and distribution at the Bounty Islands.
2. To recommend future data collection protocols to better estimate the population size and trend of fur seals at the Bounty Islands.

New Zealand fur seals are captured in the southern blue whiting trawl fishery around the Bounty Islands at one of the highest rates of any trawl fishery, however, information on their population level and trend at this site is poor. Data on fur seals has been collected opportunistically during a number of surveys for other species at the Islands, notably Salvin's albatross. This data consists of on ground observations and aerial photographs, and may be informative in assessing population trends. This project would assess existing information to determine its suitability for estimating the population trend of fur seals, and make recommendations on future data collection that may enable a better assessment of fur seal population level and trend. These recommendations would seek to suggest methods for collecting data in association with other monitoring work (such as for Salvin's albatross) to maximise cost efficiencies.

Indicative cost: \$20,000

POP-9 New Zealand fur seal: Cook Strait habitat use assessment

Term: 2 years.

Guiding Objectives: CSP Objective E.

Project Objectives:

1. To characterise and map fur seal breeding and haul out sites in the bottom of the North Island and top of the South Island.
2. To characterise fur seal habitat usage in the Cook Strait region.
3. To determine which fur seal colonies overlap with the Cook Strait hoki fishery.

New Zealand fur seals are bycaught throughout New Zealand fisheries. Fisheries such as West coast and Cook Strait hoki, and southern blue whiting are known to have high observed bycatch rates. While, over time, bycatch rates appear to have decreased in the West Coast hoki fishery; in the Cook Strait there has been more limited observer coverage and relatively high observed bycatch rates of fur seals for some years. There remains a high degree of uncertainty about the impact of this fishery on the New Zealand fur seal population, including which colonies are most at risk. The colonies most likely to be impacted are at the top of the South Island, and bottom of the North Island; little is known about the health of fur seal colonies in these regions. It is proposed to reduce uncertainty around the affected population in a staged manner.

Year one will involve a characterisation and mapping exercise to determine location of breeding colonies in relation to the fishery and categorisation of estimated size of each colonies (small (0-50), medium (50-200), large (200-1000), extra-large (1000+)) similar to that previously undertaken by Taylor et al 1995, but broadening the scope to include Golden Bay, Wekakura Point and the bottom of the North Island.

Based on this characterisation, in the second year, key colonies will be selected for a satellite tagging study to determine the foraging range of fur seals and combined with fine scale fisheries data to describe the extent of spatial and temporal overlap between fur seals the Cook Strait hoki fishery.

Indicative cost: \$100,000-\$150,000 (~\$50,000 for the first year characterisation, and up to \$100,000 for the second year, satellite tagging).

POP-10 Indirect effects of fishing on New Zealand sea lions

Term: 2 years.

Guiding Objectives: CSP Objective D

Project Objective:

1. Analyse and process the current backlog of opportunistic and historic diet samples.
2. Determine whether changes in sea lion pup-survival at the Auckland Islands between 2000 and 2006 are associated with changes in sea lion diet.

Since nutritional stress of females has been identified as a potential driver of population decline, it is acknowledged that analysis of historic faecal and scat samples would improve our understanding of female nutritional stress and the impacts on the population. It is proposed that any new opportunistic samples and historic samples are worked up and made available for further demographic modelling and bioenergetic assessment.

Diets of New Zealand sea lion have been investigated using stomach contents and regurgitates, as well as from fatty acid composition and stable isotope analysis. While the former methods have provided data for many years, they remain snapshots of diets that may be biased by differential digestion and egestion rates of particular tissues (e.g., hard parts such as beaks and otoliths). The fatty acid composition of predators has the potential to reflect diets over longer periods, and to be unbiased by digestion and egestion rates. However, some fatty acids will be preferentially assimilated and metabolized (converted) by the predator, so predators' fatty acid composition rarely reflects diet fatty acids directly. This process of assimilation and modification needs to be accounted for. This can be achieved by using a set of conversion coefficients estimated from previous captive feeding trials. Bayesian modelling can be applied to range of methods used for collection of data on diet to compare with pup survival. This project will focus on the data rich time period of 2000-2006.

Indicative cost: \$100,000-150,000 for both years (~50-100K for year 1, ~50-55K for year 2)

POP-11 The age and growth of New Zealand protected corals at high risk

Term: 1 year.

Guiding Objectives: CSP Objective E.

Project Objective: Determine the age and growth characteristics of key high risk New Zealand cold-water coral species.

Clark et al (2014; part of CSP project POP2013-05) predicted the distribution of deep sea corals in relation to areas where they are at risk of interactions with commercial trawl gear targeting orange roughy and oreo species on the Chatham Rise. One component of this work was the development of a pilot ecological risk assessment (ERA) for protected corals in New Zealand. Risk assessments such as these are key tools for management in that they inform potential management approaches by providing a better understanding of various aspects and characteristics of coral species and the fishery that contribute to risk determination. The key limitation of this pilot ERA was data paucity on coral productivity. This relates directly to the "recoverability" of corals from disturbance, which is a key factor in further developing an ERA for protected corals in New Zealand waters. There is currently a paucity of information surrounding deep sea coral regeneration times following trawling disturbances or other damage. A key priority in filling this information gap is research that will allow estimation of the age and growth characteristics of key New Zealand cold-water coral species such as the black corals

(*Bathypathes* spp) as well as select gorgonian groups highlighted by the pilot ERA as high risk, such as the primnoid seafans and the genus *Paragorgia*.

Indicative cost: \$50,000

POP-12 Cold-water coral connectivity in New Zealand

Term: 1 year.

Guiding Objectives: CSP Objective E.

Project Objectives:

1. Review coral connectivity information in New Zealand (based on existing genetics work, and knowledge from overseas of reproductive potential).
2. Undertake a genetic study of key deep sea coral species highlighted by the pilot ecological risk assessment (ERA) as high risk (e.g., black corals (*Bathypathes* spp) as well as select gorgonian octocoral groups. The initial study will focus on primnoid seafans where little information is available, and if time allows on the genus *Paragorgia*.

The recolonisation potential of protected cold-water coral species is largely unknown and remains a key information gap to inform an ERA for protected corals in New Zealand. This study would review connectivity information on cold water corals in New Zealand, based on existing genetics work and knowledge from overseas on reproductive potential, that would help identify key at risk species of which a mode of recolonisation is not yet known. Following this information review, a genetic study investigating previously identified at risk coral species would be undertaken. The initial study will focus on primnoid seafans (most likely *Primnoa* sp.) where little information is available. *Paragorgia* could also be investigated although this species has been well studied in our region by our Colombian colleagues. The Chatham Rise offers an ideal study site, where future sampling is likely, thereby improving the amount of material required to undertake such an investigation. Outputs of this work will directly inform acute assessment of the risk of commercial fishing on protected coral species and subsequently and appropriate management measures.

Indicative cost: \$50,000

Mitigation Projects

Ongoing projects

MIT2016-01 Protected species bycatch media

This multi-year project was consulted on in 2016/17 and is due for completion in June 2018. It is proposed to form part of the CSP Annual Plan 2017/18
Full details are provided in the CSP Annual Plan 2016/17

MIT2016-02 Entanglement of cetaceans in pot/trap lines and setnets and a review of potential mitigation methods

This multi-year project was consulted on in 2016/17 and is due for completion in June 2018. It is proposed to form part of the CSP Annual Plan 2017/18
Full details are provided in the CSP Annual Plan 2016/17

Proposed projects

MIT-1 Protected species liaison project (SLL and BLL)

Term: 2 years.

Guiding Objectives: CSP Objective A; CSP seabird plan 2017; National Plan of Action – Seabirds; National Plan of Action -Sharks

Project Objectives:

1. To provide one or more liaison officers to the inshore bottom longline and small vessel surface longline fishing fleets, with a focus on northern North Island, to assist those fleets reduce their protected species bycatch.
2. To coordinate the seabird liaison officer roles with wider efforts targeted at protected species bycatch reduction in relevant fisheries to achieve the greatest reduction in bycatch possible.

To effectively reduce the risk of interactions with protected species it is important for vessels to take the latest developments in mitigation technology and be able to adapt them to their specific operations. Translating the latest scientific research and fishing regulations into operational parameters is not always a straight forward process. To reduce that risk at a species level it is necessary for there to be consistency of application of mitigation across all fleets interacting with the species. Seabird liaison officers have formed a vital interface between skippers, government and researchers. Other projects and processes are also underway, which aim to reduce protected species bycatch, including the work of collaborative groups involving industry, Government and eNGOs, and process driven by the Ministry for Primary Industries. Coordinating liaison officers with these other processes to maximise reduction results is important.

Over the past 4 years, liaison officers have been iteratively rolled out across a series on inshore and HMS fisheries, prioritised based on risk. In the past, this roll has focused on seabird interaction, however with increased embedding of this programme it is now appropriate to expand to other protected species interactions, namely marine mammal, turtle and protected fish interactions.

Currently there are a series of parallel and complimentary processes in place tasked with embedding operational procedures into inshore fishing activities, a coordination role to this project will be critical to ensuring that maximum value will be gained from and aligned approach.

Continuation of the liaison role with an expansion into other protected species issuing gear as well as education role. Including conservation and management measure CMM2008-03 (CMM2008-03 2008), WCPFC commission members are to adopt the United Nations Food and Agriculture Organisation (FAO) Guidelines to Reduce Sea Turtle Mortality where appropriate.

Indicative cost: \$150,000 per annum

MIT-2 Characterization and development of offal management for small vessels

Term: 1 year.

Guiding Objectives: CSP Objectives A and B; CSP seabird plan 2017; National Plan of Action – Seabirds;

Project Objectives

1. To characterise offal management strategies for trawl and longline vessels <28m both domestically and internationally.
2. To analyse these practices against protected species abundance and bycatch.
3. To provide recommendations on best practice offal management.

Discharge of offal is one of the main factors leading to aggregations of seabirds around fishing vessels, leading to increased risk of interaction. In larger vessel fisheries, offal management has received extensive research and subsequently regulation and operational practices constrain the activity to reduce risk of protected species interaction. Smaller vessel fisheries have received far less research into this subject and practices across the fleet are more variable, safety and stability concerns have been cited as limitations.

This project aims to compile and utilise existing information on both offal management practices on trawl vessels <28m and assess the practicalities of refinements to these. Where data is adequate, a quantitative assessment of offal management practices against bycatch levels will be undertaken. Data sources will include observer data and diaries, commercial fishing data, international literature published and grey literature and select fisher interviews and will be used to inform best practice advice for a range of smaller vessels.

Indicative cost: \$30,000

MIT-3 Mitigation of New Zealand fur seal captures

Term: 1 year.

Guiding Objectives: CSP Objective A and B

Project Objectives:

1. To characterise the nature of fur seal captures in New Zealand fisheries and make recommendations on whether the current levels of risk warrant development of implementation of improved mitigation.
2. To identify and assess the current mitigation techniques for fur seal capture domestically and internationally and make recommendations as to their applicability in the New Zealand market.

New Zealand fur seals are bycaught throughout New Zealand fisheries. Fisheries such as West coast and Cook Strait hoki, and southern blue whiting are known to have high observed bycatch rates. While bycatch rates in some fisheries have appeared to have decreased over time, in others there has been more limited observer coverage and relatively high observed bycatch rates of fur seals for some years.

A previous CSP project (MIT2006/09) aimed to reduce the incidental capture of fur seals in trawl nets through the development of a Fur Seal Exclusion Device (SED). Unfortunately, due to several factors (such as: fish density, behaviour, and size; target fish escapement levels; and fish impacts with bars), the use of SEDs in the hoki fishery is problematic, but its applicability to the southern blue whiting fishery have yet to be explored. No recent investigation has been undertaken to review potential factors (i.e. number of trawl turns, turns conducted with doors up vs. down) in relation to captures nor has there been an investigation whether mitigation techniques have been developed overseas which might be more effective.

Given the level of bycatch events in this fishery, it is appropriate to produce a review of international bycatch mitigation techniques and determine their applicability to New Zealand's fishery to inform potential future management actions in this fishery.

This project aims to compile and utilise existing information on fine scale operational, environmental, behavioural, spatial and temporal data and characterise the factors influencing fur seal interactions. Data sources will include observer data and diaries, commercial fishing data, international literature published and grey literature and select fisher interviews and will be used to inform best practice advice.

Indicative cost: \$30,000

MIT-5 Dolphin interactions with trawl fisheries – Characterisation and mitigation methods

Term: 1 year.

Guiding Objectives: CSP Objectives A and B

Project Objectives:

1. To characterise the nature of dolphin captures in key New Zealand trawl fisheries.
2. To undertake a review of historic and current mitigation techniques used in comparable trawl fisheries around the world.
3. To provide recommendations on mitigation techniques relevant to key trawl fisheries and, where necessary, what further testing should be undertaken.

Cetacean interactions occur throughout New Zealand trawl fisheries; a variety of species are captured, numerically dominated by common dolphins. Trawling methods in New Zealand are highly diverse; correspondingly, interaction rates vary considerably between different trawl methods and target species. A high degree of spatial and temporal variation is also present in interaction data. A number of techniques for mitigation against interactions in this fishery have been developed, both domestically and internationally, including acoustic deterrents, alterations to fishing practice and avoiding hauls at certain times of day.

The first phase of his project aims to compile and utilise existing information on fine scale operational, environmental, behavioural, spatial and temporal data and characterise the factors most influential to marine mammal interactions. The second phase will catalogue relevant mitigation techniques; defining their nature, strengths, and shortcomings. These techniques will be assessed against the key variables identified to determine their applicability to New Zealand's fishery to inform potential future management actions in the fishery

Data sources will include observer data and diaries, commercial fishing data, international literature published and grey literature and select fisher interviews and will be used to inform best practice advice.

Indicative cost: \$50,000

