

# CSP Initial research proposals 2015/16

CSP RAG 18 February 2015

## 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 18 February 2015. The prioritised proposals will be used to develop the CSP Annual Plan 2015/16.

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

- [CSP Strategic Statement 2014](#)
- CSP Seabird medium term research plan 2015
- Draft CSP fish plan 2015
- [CSP Annual Plan 2014/15](#)

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## **Interaction Projects**

### **INT-1 Observing commercial fisheries**

**Term:** One year.

**Guiding Objectives:** CSP Objectives A, B, C; National Plan of Action – Seabirds, National Plan of Action – Sharks; Hector’s and Maui’s 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, according to 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 2015/16.

### **INT-2013-02 Identification of seabirds captured in New Zealand fisheries**

This multi-year project was consulted in 2013/14 and is due for completion 30 June 2016. It is proposed to form part of the CSP Annual Plan for 2015/16.

Full details are provided in the CSP Annual Plan 2014/15.

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

**Term:** Two years.

**Guiding Objective:** CSP objectives B and C; CSP Protected Fish Plan; National Plan of Action 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 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 cannot always 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 feed into Ministry for Primary Industries 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: \$15,000 per annum

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

**Term:** One year.

**Guiding Objective:** CSP objectives B and C; CSP Protected Fish Plan; National Plan of Action Sharks

**Project Objective:** To develop identification tools targeted at both commercial fishermen and observers to improve the quality of data reported on captures of marine mammals, turtles and protected fish.

The accurate at-sea identification of marine mammals, turtles and protected fish captured in New Zealand fisheries can be difficult. Having up-to-date identification tools will improve the quality of data reported on captured animals of these taxa, thus contributing to a better understanding of the nature and extent of interactions. Such data contributes to risk assessments used in fisheries management, and enables the development of appropriate mitigation options where required.

Indicative cost: \$10,000

### **INT-4 Supporting genetic analysis of protected fish species**

**Term:** One year.

**Guiding Objectives:** CSP Objective E; CSP Protected Fish Plan; National Plan of Action – Sharks

**Project Objectives:**

1. To establish a repository for genetic samples of protected fish species.
2. To conduct a stock take of complete, current and planned genetic analyses internationally, in relation to New Zealand's nine protected fish species.
3. To provide recommendations on the most appropriate methods of furthering genetic analyses in order to inform management of New Zealand's protected fish species in relation to fisheries bycatch.

Reviews of the nine shark species protected under the Wildlife Act 1953 have highlighted a general paucity of data on the genetic structuring of stocks (Francis & Lyon 2012; 2014). This lack of information on population structure makes meaningful quantification of the extent of risk to these species problematic. Internationally these are a number of universities and research institutes undertaking genetic analyses on these species, with work being at various stages of planning or completion. Undertaking a stock take of these projects and pooling of samples with those collected from bycaught animals in New Zealand will allow a more strategic approach to planning and support of research to understand the genetic structuring of these protected fish species.

Indicative cost: \$30,000

#### **References**

Francis, M. P., Lyon, W. S 2012: Review of commercial fishery interactions and population information for eight New Zealand protected fish species. Report prepared by NIWA for the New Zealand Department of Conservation, Wellington.

Francis, M. P., Lyon, W. S. 2014. Review of commercial fishery interactions and population information for the oceanic whitetip shark, a protected New Zealand species. Report prepared by the National Institute of Water and Atmospheric Research for the New Zealand Department of Conservation, Wellington. 15p.

## **INT-5 Post release survival of white pointer sharks in New Zealand setnet fisheries**

**Term:** Two years.

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

### **Project Objectives**

1. To estimate post release survival rates for white sharks caught in commercial setnets.
2. To identify the operational and biological factors that affect post-release mortality of white sharks.
3. To identify methods of improving post release survival.

White pointer sharks have been observed caught throughout the New Zealand EEZ and in a wide range of fisheries (Francis & Lyon 2012). 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 of live released animals 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.

Indicative cost: \$80,000 in total

### **References**

Francis, M. P., Lyon, W. S. 2012: Review of commercial fishery interactions and population information for eight New Zealand protected fish species. Report prepared by NIWA for the New Zealand Department of Conservation, Wellington.

Francis, M. P. 2014: Survival and depth distribution of spinetail devilrays (*Mobula japonica*) released from purse seine catches. Report prepared by NIWA for the New Zealand Department of Conservation, Wellington.

## **INT-6 Identification and storage of cold-water coral bycatch specimens**

**Term:** Three years.

**Guiding Objectives:** CSP Objectives B, C and E.

### **Project Objectives:**

1. Identify coral bycatch that cannot be identified by Government fisheries observers to the finest taxonomic level (assign codes to coral specimens to the species level wherever possible, when this is not possible, identify specimens to genus or family level).

2. Record all identified coral specimens and ensure storage in an appropriate taxonomic collection.

The 2010 amendment of Schedule 7A of the Wildlife Act 1953 protects all hard corals, including: black corals (all species in the order Antipatharia); gorgonian corals (all species in the order Alcyonacea (previously known as Order Gorgonacea)); stony corals (all species in the order Scleractinia); and hydrocorals (all species in the family Stylasteridae). Identifying coral bycatch that is unable to be identified by Government fisheries observers to the finest taxonomic level provides vital baseline information that can help to better inform research and marine protection such as predictive modelling, benthic risk assessments and management of benthic marine protected species.

Indicative cost: \$40,000 per annum

### **INT-7 Black petrel and flesh-footed shearwater foraging behaviour around fishing vessels**

**Term:** One year.

**Guiding Objectives:** CSP Objective B; National Plan of Action - Seabirds.

**Project Objective:** To describe the foraging characteristics, in particular dive depth, of black petrels and flesh-footed shearwaters around fishing vessels in response to available bait.

In order to achieve effective seabird mitigation solutions for longline fisheries it is important to understand the availability of baited hooks to seabirds. This project will investigate the diving behaviour of black petrels, the seabird most at risk from commercial fisheries, and flesh-footed shearwaters in response to bait in circumstances recreating small vessel bottom longline fishing activity (the fishery posing most risk). This information need has been identified in the *Black Petrel and Flesh-footed Shearwater Action Plan*, as part of the implementation of the National Plan of Action -Seabirds. The project methodology will be developed by a technical expert working group, and may involve underwater camera monitoring of birds foraging for baits available in a non-lethal form close to a fishing vessel.

Indicative cost: \$40,000

### **INT-8 Indirect effects of commercial fishing on yellow-eyed penguins**

**Term:** One year.

**Guiding Objectives:** CSP Objective D.

**Project Objective:** Develop a detailed research plan to understand the indirect effect of commercial fishing induced benthic habitat modification on the mainland population of yellow-eyed penguins.

Ellenberg and Mattern ([2012; output of CSP project POP2011-08](#)) provide research recommendations to understand the impact of fishing induced benthic habitat modification on yellow-eyed penguins in the Otago and Foveaux Strait regions. The recommendations include data collection on yellow-eyed penguins using GPS devices, and sea floor surveys. This project would build on these initial recommendations to define a programme of research necessary to understand the indirect effects on yellow-eyed penguins, paying regard to cost effectiveness and synergies with other research programmes.

Indicative cost: \$30,000

## **INT-9 Indirect effects of commercial fishing on Buller's shearwater**

**Term:** One year.

**Guiding Objectives:** CSP Objective D.

**Project Objective:** Identify potential indirect effects of commercial fishing on Buller's shearwater

Commercial fishing, including purse seine, may be driving changes in fish populations in the Hauraki Gulf area leading to reduced availability of suitable prey for Buller's shearwater in surface waters (as poor divers, Buller's shearwater specialise in foraging in association with fish work-ups). This may be contributing to reduced breeding success of this species, which breeds only at the Poor Knights Islands. This project will assess available information to describe mechanisms for such potential indirect effects of commercial fishing, and provide recommendations to better understand mechanisms identified.

Indicative cost: \$20,000

**Cryptic mortality of seabirds:** The CSP seabird plan 2015 identifies considerable uncertainty in risk estimates arises from uncertainty in cryptic mortality (e.g. Salvin's albatross, white-capped albatross, Stewart Island shag and white-chinned petrels). No projects are proposed for 2015/16 as relevant work is proposed by MPI for 2015/16.



## **Population Projects**

*Projects arising from the CSP Seabird medium term research plan 2015*

### **POP-1 Black petrel: Aotea/Great Barrier Island & Hauturu/Little Barrier Island population project**

**Term:** One year. Note: Objective 1 (population estimate) will form the second year of a two year project initiated in 2014/15 (POP2014-02 Objective 1A).

**Guiding Objectives:** CSP Objective E; CSP seabird plan 2015; National Plan of Action - Seabirds

#### **Project Objectives**

1. To estimate the population size of black petrel at Great Barrier and Little Barrier Islands.
2. To estimate key demographic parameters of black petrel at Great Barrier Island.

CSP Project POP2014-02 initiated research to better estimate the total population size by targeting survey effort at areas outside the main breeding colony on Great Barrier Island, and at Little Barrier Island. Trials of a mixed method approach using acoustic monitoring and ground searching are being conducted during 2014/15. Objective 1 of this project will build on the recommendations from POP2014-02, to be reviewed by the CSP Technical Working Group in mid-2015, to conduct adequate field surveys to robustly estimate the total breeding population size on both islands. Other areas of priority to CSP include refining estimates of key demographic parameters, primarily juvenile survival, which has been demonstrated to be critical to determining the population trajectory (Bell et al 2011). Continuation of the mark-recapture study at Great Barrier Island will be the secondary focus of this project (Objective 2), and opportunities to maximise logistical synergies between the two objectives will be sought.

Indicative cost: \$100,000

#### **Reference**

Bell, E.A., Sim, J.L., Scofield, P., Francis, C. 2011: Population parameters of the black petrels (*Procellaria parkinsoni*) on Great Barrier Island (Aotea Island), 2009/10. Report prepared by Wildlife Management International Limited for the New Zealand Department of Conservation, Wellington.

### **POP-2 Salvin's albatross: Bounty Islands population project**

**Term:** Two years.

**Guiding Objectives:** CSP Objective E; CSP seabird plan 2015; 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 (Amev & 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 seek to obtain a

representative sample of year-round foraging tracks from breeding birds at the Bounty Islands, conduct a ground-truthed aerial census and make further ground counts comparable to historic data. Completing all these components in one project will maximise cost-effectiveness at this remote site.

Indicative cost: \$220,000 in total

#### References

- Amey, J., Sagar, P. 2013. Salvin's albatross population trend at the Bounty Islands, 1997-2011. Report prepared by the National Institute for Water and Atmosphere for the New Zealand Department of Conservation, Wellington. 31p.
- Baker, G.B., Jenz, K., Sagar, P. 2014. 2013 Aerial survey of Salvin's albatross at the Bounty Islands. Report prepared by Latitude 42 Environmental Consultants Pty Ltd for the New Zealand Department of Conservation, Wellington. 10p.
- Thompson, D., Sagar, P., Torres, L., and Charteris, M. 2014. Salvin's albatrosses at the Bounty Islands: at-sea distribution. Report prepared by NIWA for the New Zealand Department of Conservation, Wellington. 15p.

### **POP-3 Southern Buller's albatross: Snares/Tini Heke population project**

**Term:** Three years.

**Guiding Objectives:** CSP Objective E; CSP seabird plan 2015; National Plan of Action - Seabirds

**Project Objective:** To estimate key demographic parameters of Southern Buller's albatross at the Snares.

An established study site for Southern Buller's albatross, with substantial historic mark-resight effort, exists at the Snares (Sagar 2014), one of the most accessible subantarctic island groups. This project will continue standard mark-recapture monitoring to further improve estimates of key demographic parameters, particularly adult survival. Note that updated quantitative modelling of this population is underway during 2014/15 (commissioned by the Ministry for Primary Industries).

Indicative cost: \$50,000 per annum

#### Reference

- Sagar, P. 2014. Population studies of Southern Buller's albatrosses on The Snares. Report prepared by NIWA for the New Zealand Department of Conservation, Ministry for Primary Industries and Deepwater Group Ltd.

### **POP-4 Flesh-footed shearwater: Various locations population project**

**Term:** Three years. Note: Objectives 1 and 3 may be completed in the first two years.

**Guiding Objectives:** CSP Objective E; CSP seabird plan 2015; National Plan of Action - Seabirds

#### Project Objectives

1. To estimate the population size of flesh-footed shearwater, including at Middle Island (Mercury Islands).
2. To estimate key demographic parameters of black petrel at Lady Alice Island/Mauimua and Ohinau Islands.
3. To describe the at-sea distribution of flesh-footed shearwater breeding at Northland breeding sites.

Baker et al (2010) report on the last species-wide population estimate. Objective 1 will update this estimate, using comparable methods. One key breeding site, Middle Island (Mercury Islands) was not estimated by Baker et al (2010), and obtaining a robust estimate for this site will be a key priority. Waugh et al (2014; reporting on CSP Project POP2011-02) provided advice on population monitoring required to estimate adult survival, juvenile survival, fecundity and age of first reproduction of flesh-footed shearwaters. Objectives 2 of this project will build on these recommendations, conducting further demographic mark-recapture field work at the established study sites at Lady Alice/Mauimua and Ohinau Island. Waugh et al (2014) also reported detailed data on the at-sea distribution and foraging behaviour of flesh-footed shearwaters from Ohinau Island. Objective 3 of this project would expand this knowledge to include Northland populations as well, as recommended by Waugh et al (2014).

Indicative cost: \$100,000 per annum

#### Reference

Baker, B., Hedley, G., Cunningham, R. 2010 Data collection of demographic, distributional and trophic information on the flesh-footed shearwater to allow estimation of effects of fishing on population viability: 2009-10 field season. Research Report for Ministry of Fisheries project PRO2006/01. Ministry of Fisheries, Wellington. 62 p

Waugh, S.M., Jamieson, S.E., Stahl, J.C., Filippi, D.P., Taylor, G.A., and Booth, A. 2014. Final Report on Project POP2011-02 Flesh-footed Shearwaters-population study and foraging areas. Report prepared by the Museum of New Zealand, Te Papa Tongarewa for the New Zealand Department of Conservation, Wellington, 68 p.

### **POP-5 Gibson's albatross: Adam's Island population project**

**Term:** Three years, with Objective 1 completed in year 1.

**Guiding Objectives:** CSP Objective E; CSP seabird plan 2015; National Plan of Action - Seabirds

**Project Objective:** To estimate key demographic parameters of Gibson's albatross at Adams Island.

#### Project Objectives

1. To estimate the population size of Gibson's albatross at the Auckland Islands.
2. To estimate key demographic parameters of Gibson's albatross at Adams Island.

CSP Project POP2014-02 initiated research to better estimate the total population size at the Auckland Islands by investigating a mixed method approach using aerial and ground searching during 2014/15. Objective 1 of this project will build on the recommendations from POP2014-02, to be reviewed by the CSP Technical Working Group in mid-2015, to conduct adequate field surveys to robustly estimate the total breeding population size at the Auckland Islands. Adams Island is an established study site for Gibson's albatross, with a study area that has been repeatedly visited since 1991. All nesting birds in this study site have been banded since 1997 and every cohort of chicks has been banded since 1996. Objective 2 of this project will continue standard mark-recapture monitoring to further improve estimates of key demographic parameters, particularly adult survival.

Indicative cost: \$100,000 in year 1, \$60,000 per annum in years 2 and 3

#### Reference

Elliott G. And Walker K. 2014. Gibson's albatross research - Adams Island 2014. Report prepared by Albatross Research for the New Zealand Department of Conservation, Wellington.

## **POP-6 New Zealand white-capped albatross: Auckland Islands population project**

**Term:** One year.

**Guiding Objectives:** CSP Objective E; CSP seabird plan 2015; National Plan of Action - Seabirds

**Project Objective:** To estimate the population size of NZ white-capped albatross at the Auckland Islands.

Recent population trend estimates of white-capped albatross at the Auckland Islands using aerial counts (part of CSP project POP2013-02) provide evidence for a possible decline, though considerable year to year variability in number of birds present leads to uncertainty about population trend. An additional aerial survey, with ground truthing, is being conducted in 2014/15 (as part of CSP project POP2014-02) and this project will seek to conduct a further aerial census that can be compared with previous photographic survey results to determine the population trend with more certainty. Note the CSP seabird plan 2015 provides for a review of the population work on this species in 2016/17.

Indicative cost: \$60,000

### **References**

- Baker, G.B., Jenz, K. Cunningham, R. 2014. White-capped albatross aerial survey 2014. Report prepared by Latitude 42 for the New Zealand Department of Conservation, Wellington.
- Francis, R. I. C. C. 2012. Fisheries risks to the population viability of white-capped albatross (*Thalassarche steadi*). *New Zealand Aquatic Environment and Biodiversity Report*, 104, 24.

## **POP-7 Antipodean albatross: Antipodes Island population project**

**Term:** Three years, with Objective 1 completed in year 1.

**Guiding Objectives:** CSP Objective E; CSP seabird plan 2015; National Plan of Action - Seabirds

### **Project Objectives**

1. To estimate the population size of Antipodean albatross at Antipodes Island.
2. To estimate key demographic parameters of Antipodean albatross at Antipodes Island.
3. To describe the at-sea distribution of Antipodean albatross at Antipodes Island.

A recent study of the Antipodean albatross (Elliott & Walker 2014) suggests a rapid decline of the population on Antipodes Island and further population modelling is underway (under contract to the Ministry for Primary Industries). There is an established study site for Antipodean albatross, with almost annual visits since 1994, monitoring survival rates, productivity, recruitment, and population trends. This project will continue this intensive monitoring of the Antipodean albatross and aim to better understand the cause(s) of the decline in population. Elliott & Walker 2014 also suggest that since the decline in population, the Antipodean albatross is foraging over a greater area of ocean, noting a shift in behaviour. Objective 3 of this project will aim to track their movements and better understand these concerns.

Indicative cost: \$60,000 per annum

### **Reference**

- Elliott G. & Walker K. 2014: Antipodean wandering albatross – population study.

## **POP-8 Westland petrel: Mainland population project**

**Term:** Three years.

**Guiding Objectives:** CSP Objective E; CSP seabird plan 2015; National Plan of Action - Seabirds

**Project Objective:** To estimate key demographic parameters of Westland petrel.

Westland petrels have been studied in their breeding area on the west coast of the South Island since 1970, with variable effort over time. Estimates of key demographic parameters have been published (e.g. Waugh 2006), and updated analyses are underway (Waugh, pers. comm.). This project will continue standard mark-recapture monitoring to further improve estimates of key demographic parameters, particularly adult survival.

Indicative cost: \$40,000 per annum

### **Reference**

Waugh, S. M., Doherty, P. F., Adams, L., Woods, G. C., Bartle, J. A., & Hedley, G. K. (2006). Demography of Westland petrels (*Procellaria westlandica*), 1995–2003. *Emu*, 106(3), 219–226.

## **POP-9 Northern Buller's albatross: review taxonomy**

**Term:** One year.

**Guiding Objectives:** CSP Objective E; CSP seabird plan 2015; National Plan of Action - Seabirds

### **Project Objectives:**

1. To reassess the taxonomic status of breeding populations of northern Buller's albatross.
2. Identify genetic markers to allow routine genetic assessment of bycaught Buller's albatross to determine their population of origin.

Currently two subspecies of Buller's albatross, northern and southern, are generally recognised, though uncertainty remains around the taxonomic relationships across the Buller's albatross clade. An isolated breeding population occurs at the Three Kings, and the taxonomic status of this population is of current research interest (M. Rayner pers. comm.). Northern and southern Buller's albatross are currently categorised as at high and very high risk. This proposal seeks to build on current taxonomic research interests and utilise existing material where possible.

Indicative cost: \$40,000

## **POP-10 White-chinned petrel: Auckland Islands population project**

**Term:** One year.

**Guiding Objectives:** CSP Objective E; CSP seabird plan 2015; National Plan of Action - Seabirds

### **Project Objectives:**

1. To estimate the population size of white-chinned petrel at the Auckland Islands.
2. To describe the at-sea distribution of white-chinned petrel breeding at the Auckland Islands.

Investigation of the population status and at-sea distribution of white-chinned petrels breeding at the Auckland Islands has only recently been instigated (including research supported by CSP project 2014-02). This project aims to build on current University of Otago and NIWA

research programmes to better estimate the total population size and conduct tracking studies to describe the foraging distribution of this population. Note the taxonomy of the species is being reviewed during 2014/15 and work is also currently underway that can aid assessment the feasibility of conducting mark-recapture studies of this species at the Auckland Islands – future CSP research responses will be reliant on these findings.

Indicative cost: \$25,000 as part funding to other on-going research

### **POP-11 Northern giant petrel: Auckland Islands population project**

**Term:** One year.

**Guiding Objectives:** CSP Objective E; CSP seabird plan 2015; National Plan of Action - Seabirds

**Project Objective:** To estimate the population size of Northern giant petrel at the Auckland Islands.

The most recent published population estimate for this population, based on the compilation by Patterson et al. (2008) dates to the 1980s. This project will seek to conduct adequate field surveys to robustly estimate the total breeding population size at the Auckland Islands.

Indicative cost: 60,000, with potential cost savings by combining this with other projects at the Auckland Islands

#### **Reference**

Patterson, D. L., Woehler, E. J., Croxall, J. P., Cooper, J., Poncet, S., Fraser, W. R. 2008. Breeding distribution and population status of the northern giant petrel *Macronectes halli* and the southern giant petrel *M. giganteus*. *Marine Ornithology*, 36(2), 115-124.

### **POP-12 NZ storm petrel: Little Barrier Island population project**

**Term:** One year.

**Guiding Objectives:** CSP Objective E; CSP seabird plan 2015; National Plan of Action - Seabirds

**Project Objective:** To estimate the population size of NZ storm petrel at Little Barrier Island.

The New Zealand storm petrel was confirmed breeding on Little Barrier Island in February 2013, but there is no accurate data regarding their total population size. Collaborative research on the population is underway, and this project will seek to support existing research efforts to obtain an initial population estimate.

Indicative cost: 30,000 as part funding to other on-going research

#### *Marine mammal projects*

### **POP-13 New Zealand Sea Lion: Auckland Islands Population Project**

**Term:** One 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 mark New Zealand sea lion pups at Enderby and Dundas Islands following established techniques.
3. To conduct a five week period of resighting previously marked animals at Enderby Island.
4. To update the New Zealand sea lion database.

New Zealand sea lions are classified as Nationally Critical (Baker et al 2010), and some 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 70% of New Zealand sea lions breed at the Auckland Islands, where population data have been collected since the mid-1990s, including estimates of pup production and resighting of marked animals. Since 2001 there has been a considerable decline in pup production at the Auckland Islands. A literature review to identify potential indirect effects of commercial fishing on the Auckland Islands population as part of CSP project POP2010-01 has recently been completed (Bowen 2012). The review highlighted a number of key information gaps that currently prevent a full understanding of any such potential indirect effects, and recognised the importance of continued collection of mark-recapture, pup production and pup weight data.

In order to manage the commercial fisheries impacts on New Zealand sea lions at the Auckland Islands it is critical to understand the population level and key demographic factors driving trends in the population. CSP project POP2012-02 analysed the population data collected during previous years in order to determine the key demographic factors driving the observed population decline of New Zealand sea lions at the Auckland Islands, and will extend the time series of population data available for further analyses.

In response to the continued decline at the Auckland Islands, the Ministers of Conservation and Primary Industries announced the development of a Threat Management Plan (TMP) for New Zealand sea lions in 2014. Research underway in 2014/15 (including CSP project POP2014-01) is addressing some of the key information gaps identified in the development of the TMP. It is envisaged that this project will continue to provide important information on pup production and population status of New Zealand sea lions required to manage the fisheries impact on the species, and that other research, and/or management actions, will be progressed as part of the TMP (and beyond), and may be delivered alongside the research programme proposed here. The scope of this project will be reviewed by the CSP Technical Working Group following the completion of 2014/15 field work, and risk assessment conducted as part of the TMP.

## References

- Baker C.S., Chilvers B.L., Constantine R., DuFresne S., Mattlin R., van Helden A., Hitchmough R. 2010. Conservation status of New Zealand Marine Mammals (suborders Cetacea and Pinnipedia), 2009. *New Zealand Journal of Marine & Freshwater Research* 44:101-115.
- Bowen, W.D. 2012. A review of evidence for indirect effects of commercial fishing on New Zealand sea lions (*Phocarcos hookeri*) breeding on the Auckland Islands. Report prepared for the Department of Conservation, Wellington. 41 p.

Indicative cost: 250,000

## **POP-14 Cetacean habitat suitability modelling project**

**Term:** One year.

**Guiding Objectives:** CSP Objective E.

**Project Objective:** To provide spatial distribution information for cetacean species to inform fisheries risk assessment.

This proposal is to provide part funding to the NIWA cetacean habitat suitability modelling project. A major component of this project will be to solicit and compile existing cetacean sightings datasets from marine mammal scientists in New Zealand and industry representatives that hold marine mammal observer datasets collected during seismic surveys. These additional data will enhance NIWA models of cetacean habitat use and improve confidence in predicted habitat suitability patterns.

Model results will provide an improved understanding of the environmental drivers of cetacean habitat use and generate reliable predictions of species habitat suitability patterns. All outputs from this research project, including model results, prediction maps, confidence maps, and species sightings data, will be made available to all stakeholders through a web-based portal. This approach will allow end-users to conveniently access the data and maps they need to assess cetacean distribution information within their area of interest. This web portal will enable quick and dynamic access to the best available information on the habitat suitability of various cetacean species in New Zealand.

It is hoped that results from this project will feed in to the longer term Marine Mammal Risk assessment in NZ waters, and to DOCs 5 year marine mammal medium term research plan.

Indicative cost: \$30,000 as part funding to the project

### *Protected fish projects*

## **POP-15 Updated basking shark bycatch review**

**Term:** One year.

**Guiding Objectives:** CSP Objective B; CSP Protected fish Plan; National Plan of Action – Sharks

**Project Objectives:**

1. To update the 2012 review of basking shark bycatch with information from the most recent fishing years.
2. To reassess the efficacy of management measures.
3. To update the review of relevant research on basking shark population parameters.
4. To explore potential future work to better understand basking shark populations and biology around New Zealand.

Since the review of Francis & Sutton (2012; output of CSP POP2011-04) a series of bycatch events and industry management interventions have occurred. The National Plan of Action-Sharks has also been developed which has specific objectives related to increasing understanding and improving management of shark populations. Advances have also been made in the understanding of basking shark biology. It is therefore timely to update the review of Francis & Sutton (2012), to ensure the most recent available information is readily available to inform management of fisheries bycatch of this species.

Indicative cost: \$15,000



## References

Francis, M., Sutton, P. 2012. Basking Shark Bycatch Review. Report prepared by National Institute of Water and Atmospheric Research for the New Zealand Department of Conservation, Wellington, 38p.

## POP-16 Marine reptiles - review of interactions and populations

**Term:** 1 year.

**Guiding Objectives:** CSP Objectives B, C and E

### Project Objectives

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

All marine reptiles are fully protected in the New Zealand EEZ, with five species of sea turtles recorded as well as sea snakes and kraits. Observer coverage has reported low but regular bycatch of sea turtles in surface longline and inshore trawl fisheries with green turtles being the most commonly caught, these have also been records of leatherback and hawksbill captures. While observed bycatch incidence has been low, this is likely influenced by low observer coverage in these fisheries. The life history parameters of marine reptiles make them susceptible to adverse effects from fisheries bycatch. Understanding the nature and extent of these interactions is important to develop appropriate management. Consolidating existing information (Specific Objectives 1 and 3) and identifying key information gaps in existing information (Specific Objectives 2 and 4) forms the first stage of this process.

Indicative cost: \$30,000

## *Coral projects*

## POP-17 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

#### Reference

Clark, M; Tracey, D; Anderson, O; Parker, S (2014). Pilot ecological risk assessment for protected corals. Report prepared by NIWA for the New Zealand Department of Conservation, Wellington.

### POP-18 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.

**Indicative cost:** \$50,000

### POP-19 NZ fur seal: Bounty Islands population assessment

**Term:** 1 year.

**Guiding Objectives:** CSP Objective E.

#### Project Objectives:

1. To determine the population trend of fur seals at the Bounty Islands, to the extent possible using existing data.

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 during a number of surveys of other species at the Islands, notably Salvin's albatross. This data exists as on ground observations and aerial photographs, and may be informative in assessing population trends. This project will assess existing information to determine its suitability for estimating the population trend of fur seals, and make recommendations on future data collection that may allow a better assessment of fur seal population level and trend. In particular, these recommendations will seek to collect data in association with other potential future monitoring (such as for Salvin's albatross) to maximise cost efficiencies.

**Indicative cost:** \$20,000

## **Mitigation Projects**

### **MIT2014-01 Protected species bycatch newsletter**

This multi-year project was consulted in 2014/15 and is due for completion 30 June 2016. It is proposed to form part of the CSP Annual Plan for 2015/16.

Full details are provided in the CSP Annual Plan 2014/15.

### **MIT-1 Inshore small vessel bottom longline: seabird mitigation**

**Term:** Two years.

**Guiding Objectives:** CSP Objective A; CSP seabird plan 2015; National Plan of Action - Seabirds

**Project Objective:** Develop and/or test the feasibility and effectiveness of one, or more, seabird mitigation strategies not currently in widespread use in the small vessel surface longline fishery.

Inshore small vessel bottom longline fisheries (targeting bluenose, snapper and other targets except ling) contribute the greatest proportion of risk to black petrels, the most at-risk seabird (see Table 7 of the CSP seabird plan 2015). Those targeting snapper pose most risk to flesh-footed shearwater, and collectively the inshore small vessel bottom longline fishery (including ling target) pose considerable risk to most very high risk seabirds. This is despite current mitigation requirements and use. This project aims to ensure that mitigation options are available that are both effective and practical in this fishery. Recent work has included the development of an underwater line setting device (including CSP project MIT2013-01), and characterisation of sink rates (including CSP project MIT2013-03). This project may build on the recommendations from earlier work and/or develop/test novel strategies.

Indicative cost: \$100,000 per annum

### **MIT-2 Seabird Liaison Officers**

**Term:** 1 year.

**Guiding Objectives:** CSP Objective A; CSP seabird plan 2015; National Plan of Action – Seabirds

**Project Objective:** To provide one, or more, liaison officers to the inshore fishing fleet who will be tasked to assist those fleets in reducing their risk to seabirds.

To effectively reduce the risk of interactions with seabirds 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. Equally an adequate working understanding of seabird biology, taxonomy and behaviour assist in understanding the risk posed in each area and season. By employing liaison officers who have operational experience in fishing fleets along with an understanding of best practice mitigation and seabird characteristics it is possible to spread information over the fishing fleet in a collaborative and practical manner. These officers should also be equipped with fact sheet/ resources and mitigation material to assist in the dissemination of this knowledge.

Indicative cost \$80,000

### **MIT-3 Small vessel surface longline: seabird mitigation**

**Term:** Two years.

**Guiding Objectives:** CSP Objective A; CSP seabird plan 2015; National Plan of Action - Seabirds

**Project Objective:** Develop and/or test the feasibility and effectiveness of one, or more, seabird mitigation strategies not currently in widespread use in the small vessel surface longline fishery.

The small vessel surface longline fishery poses substantial risk to most high and very high risk seabirds (see Table 7 of the CSP seabird plan 2015) despite current mitigation requirements and use. This project aims to ensure that mitigation options are available that are both effective and practical in this fishery. Recent work has included testing of new weighting options and the hook pod (including CSP project MIT2013-02). This project may build on the recommendations from earlier work and/or develop/test novel strategies.

Indicative cost: \$100,000 per annum

### **MIT-4 Inshore small vessel trawl: seabird mitigation**

**Term:** Two years.

**Guiding Objectives:** CSP Objective A; CSP seabird plan 2015; National Plan of Action - Seabirds

**Project Objective:** Develop and/or test the feasibility and effectiveness of one, or more, seabird mitigation strategies not currently in widespread use in the small vessel surface longline fishery.

The inshore small trawl fishery contributes the greatest proportion of risk to Salvin's and New Zealand white-capped albatrosses (see Table 7 of the CSP seabird plan 2015). There is currently no mandatory seabird mitigation requirement for trawlers under 28 m in length. This project aims to ensure that mitigation options are available that are both effective and practical in this fishery.

Indicative cost: \$100,000 per annum

### **MIT-5 Entanglement of whales in pot/trap lines and setnets and a review of potential mitigation methods**

**Term:** One year.

**Guiding Objectives:** CSP Objectives A and B

**Project Objectives:**

1. To assess the level of entanglement of whale species in pot/trap lines and setnets in New Zealand and make recommendations on whether or not the current levels of risk warrant mitigation, and
2. To identify and assess the current mitigation techniques for cetacean capture in the pot/trap lines and setnets both domestically and internationally and make recommendations as to their applicability in the New Zealand market.

Whales (primarily humpbacks, though also southern right whales and orca) can become entangled fish pot/trap lines or setnets (including down-lines). Within New Zealand this is

most common in Kaikoura, during winter, where the humpback whale northern migration comes close to shore and overlaps with the rock lobster fishing activity. In recent years there have also been increasing reports on the North Island, including Orca. The occasional Southern right whale has also been reported as entangled.

The Department of Conservation holds data on the occurrence of these entanglement events. DOC also has a response team which will attempt a release a whale if conditions allow. The number of incidents annually is low in New Zealand in comparison with other countries, however, in recent years there has been a notable increase in occurrence outside of Kaikoura, and including other species. The frequency of humpback whale entanglements will also be related to the status of the humpback whale population as the risk of entanglement will increase with increasing numbers of whales passing through the inshore waters of the East Coast of the South Island. DOC coordinates an annual survey of the humpback whale migration each winter, and the most recent season (2014) observed the second highest count of whales coming through the Cook Strait (92) since the survey commenced in 2004.

It would be timely to assess the level of risk posed to whales from commercial pot/trap and setnet fishing activity, and determine whether or not the current level of risk warrants increased mitigation measures.

In other countries where there is considerable risk to whales from pot line entanglement, a range of mitigation methods have been employed, including seasonal closures and gear modifications, some of which may or may not be applicable in the New Zealand scenario. An assessment of the current mitigation options available and their relevance to the New Zealand scenario would be beneficial if the risk to whales was deemed significant.

Indicative cost: \$30,000

## **MIT-6 Review of mitigation techniques in pelagic trawl fisheries: marine mammal mitigation**

**Term:** 1 year.

**Guiding Objectives:** CSP Objective A

**Project Objectives:**

1. To undertake a review of historic and current mitigation techniques used in pelagic trawl fisheries around the world that are similar to the New Zealand jack mackerel fishery.
2. To produce a catalogue of these techniques defining their nature, strengths and shortcomings, and possible applicability to the New Zealand jack mackerel fishery.
3. To provide any relevant recommendations for testing within New Zealand fisheries.

The jack mackerel trawl fishery captures more cetaceans (typically common dolphins) annually than any other New Zealand fishery. A number of techniques for mitigation against interactions in this fishery have been developed, including acoustic deterrents, alterations to fishing practice and avoiding hauls at certain times of day. No validation has been performed to test whether these measures are effective, nor whether other mitigation techniques have been developed overseas which might be more effective.

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

**Indicative cost:** \$40,000