

CSP Initial research proposals 2025/26

CSP RAG 17 February 2025

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 17 February 2025. The prioritised proposals will be used to develop the CSP Annual Plan 2025/26.

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

- [CSP Strategic Statement](#)
- [CSP Seabird Medium Term Research Plan](#)
- [CSP Protected Fish Medium Term Research Plan](#)
- [CSP Marine Mammal Medium Term Research Plan](#)
- [CSP Sea Turtle Medium Term Research Plan](#)
- [CSP Protected Coral Medium Term Research Plan](#)
- [CSP Annual Plan 2024/25](#)

Table of Contents

Interaction Projects	4
Ongoing projects.....	4
Proposed projects.....	4
INT Observing commercial fisheries	4
INT-2 Species identification of camera-detected protected species captures in New Zealand fisheries	5
INT-3 Identification of seabirds captured in New Zealand fisheries.....	5
INT-4 Identification, storage and genetics of cold-water coral bycatch specimens	6
INT-5 Port-based audit and protected species liaison programme.....	7
INT-6 Factors influencing risk of marine mammal and seabird bycatch in inshore trawl and set net fisheries	8
INT-7 Testing eDNA detection of protected species using passive samplers on trawl gear	9
INT-8 Examining recruitment dynamics and recovery potential from disturbance of deep-sea corals using ROV image data collected by RV Sonne in the New Zealand region	10
INT-9 Understanding fisheries overlap and interactions of protected corals in the Fiordland Marine Area; scleractinians, hydrocorals and gorgonians.....	11
INT-10 Understanding the extent and usage of coral rubble reporting codes by fisheries observers.....	11
INT-11 Fine-scale spatial analysis of fishing catch data in relation to New Zealand sea lion foraging areas and body condition.....	12
Population Projects	14
Ongoing projects.....	14
POP2023-01 Aerial survey of leatherback turtles off Northeast North Island.....	14
POP2023-02 Southern Buller's population study	14
POP2023-05 Auckland Islands New Zealand sea lions.....	14
POP2024-02 Improving knowledge on coral life history traits: assessing reproductive capacity to infer productivity, vulnerability and resilience of protected deep-sea corals in the New Zealand region.....	14
Proposed Projects.....	14
POP-1 Southern Buller's albatross juvenile banding and tracking	14
POP-2 Black petrel and flesh-footed shearwater demographic modelling.....	15
POP-3 Black petrel monitoring	16
POP-4 Gibson's albatross research.....	16
POP-5 Updated population assessment for New Zealand fur seals on Bounty Islands from drone footage	17
POP-6 Salvin's albatross Western Chain research.....	18
POP-7 Great white shark population estimate	18

POP-8 White-capped albatross research	19
POP-9 Updated population assessment for New Zealand fur seal	20
POP-10 Chatham albatross research	21
POP-11 Antipodean albatross and white-chinned petrel research.....	22
POP-12 Campbell Island seabird research	22
POP-13 Campbell Island seabird winter research.....	24
POP-14 Population growth, distribution and demographics of New Zealand sea lions in northern Stewart Island.....	24
Mitigation Projects	26
Ongoing projects.....	26
Proposed projects.....	26
MIT-1 Improving mitigation data streams to assess bycatch mitigation effectiveness in inshore and HMS fisheries.....	26
MIT-2 Seabird SMART Workshops.....	27
MIT-3 Assessing views on the value of corals to inform current and potential ecosystem-based fisheries management approaches	27
MIT-4 Using thermal cameras to assess effectiveness of seabird mitigation.....	28
MIT-5 Supporting uptake of sink rate assessment by fishers in bottom longline fisheries.....	29

Interaction Projects

Ongoing projects

INT2023-04 Identification of marine mammals, turtles and protected fish captured in New Zealand fisheries

This multi-year project was consulted on in 2023/24 and is due for completion in June 2026.
It is proposed to form part of the CSP Annual Plan 2025/26.
Full details are provided in the CSP Annual Plan 2023/24.

INT2024-03 Understanding the effects of fishing depth and soak period on turtle and seabird bycatch

This multi-year project was consulted on in 2024/25 and is due for completion in September 2025.
It is proposed to form part of the CSP Annual Plan 2025/26.
Full details are provided in the CSP Annual Plan 2024/25.

INT2024-07 Collection and curation of tissue samples from protected fishes and turtles

This multi-year project was consulted on in 2024/25 and is due for completion in June 2027.
It is proposed to form part of the CSP Annual Plan 2025/26.
Full details are provided in the CSP Annual Plan 2024/25.

Proposed projects

INT Observing commercial fisheries

Term: 1 year

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

Project Objective:

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

Project Summary:

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 Fisheries New Zealand 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 Fisheries New Zealand Observer Services, per a joint planning process. DOC purchases 50% of inshore observer services.

Planning of observer coverage is undertaken jointly by Fisheries New Zealand and DOC as part of a separate process and will be consulted on as part of the consultation on the CSP Annual Plan 2025/26.

Indicative cost: TBD in consultation with FNZ

INT-2 Species identification of camera-detected protected species captures in New Zealand fisheries

Term: 3 years

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

Project Objective:

To determine, through examination of camera footage clips, the taxon and, where possible, sex, age-class and provenance of protected species captured in New Zealand fisheries (for live captures or dead specimens discarded at sea).

Project Summary:

The accurate identification of protected species captured in New Zealand fisheries is vital for examining the potential threat to population viability posed by incidental fisheries captures. Historically, at-sea identification has been undertaken by Fisheries Observers, however with the rollout of cameras on inshore commercial vessels, experts are required to assess and verify records of protected species interactions captured via camera footage to identify species to the lowest possible taxonomic level. Data from this project will inform ongoing bycatch estimation, risk assessment, research, and modelling of the effects of fisheries bycatch on protected species populations.

Project Outputs:

A technical report summarising the confirmed identification, and where possible, sex, age and provenance and all other data collected, of all reviewed protected species. Data will be reported by fishery stratum (fishing method, fishery area and where possible target species).

Indicative Cost: \$30,000 per annum

INT-3 Identification of seabirds captured in New Zealand fisheries

Term: 3 years

Guiding Objectives: CSP Objectives B, C; National Plan of Action – Seabirds.

Project Objective:

1. To determine, through examination of returned specimens, the taxon (including sub-species or variants where applicable), sex, and where possible age-class and provenance of seabirds captured in fisheries (for dead returned dead specimens).
2. To detail the injuries, body condition and stomach contents and, where possible, the likely cause of mortality (for returned dead specimens).
3. To report any changes in the protocol used for the necropsy of seabirds (for returned dead specimens).
4. To determine, through examination of photographs, the taxon (including sub-species or variants where applicable), sex, and where possible age-class and provenance of seabirds captured in fisheries (for live captures, or returned dead specimens or those discarded at sea).
5. To determine, through DNA analysis, the taxon of seabirds captured in fisheries (dead specimens discarded at sea).

Project Summary:

Seabirds with significant differences in conservation status can appear morphologically similar. 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. 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 autopsy and/or genetic analysis in the majority of cases.

Historically all dead seabird specimens collected by observers have been returned for necropsy where possible. However, in many cases, the taxon can be confirmed through expert examination of photographs taken by observers, and this can be achieved at a lower cost than returning carcasses and performing necropsy. In order to maximise cost efficiencies, a protocol is in place to determine which specimens are returned for full necropsy. This protocol aims to strike a balance between returning birds for full necropsy (for rarer species and in less observed fisheries) and photographing birds for determination of taxon (for commonly caught species in well observed fisheries).

Examining the causes of mortality and types of injuries incurred by individual seabirds returned from fisheries is necessary to help reduce future seabird captures in New Zealand fisheries by identifying gear risks. Linking this information to species, age- and sex-class, and breeding status, helps identify if different groups of seabirds are vulnerable to different risks in fishing interactions.

This project will also pilot a new protocol for genetic determination of species identification through DNA analysis of feather samples collected from bycaught seabird carcasses.

Information gained through this project will link to Fisheries NZ databases, seabird bycatch estimates, and will inform ongoing risk assessment, research and modelling of the effects of fisheries bycatch on seabird populations. Further, the mode of capture and associated information will enable robust analyses to be made of the factors contributing to seabird capture events and inform the development of appropriate mitigation strategies.

Project Outputs:

1. A technical report summarising the confirmed identification, sex, age and provenance and all other data collected, of all returned specimens and photographs examined. Data will be reported by fishery stratum (fishing method, fishery area and where possible target species).
2. A technical report summarising the work undertaken and results found from DNA testing of feather samples collected from bycaught seabirds.

Indicative Cost: \$100,000 per annum

INT-4 Identification, storage and genetics of cold-water coral bycatch specimens

Term: 2 years

Guiding Objectives: CSP Objectives B, C, E; CSP Coral Medium Term Research Plan

Project Objectives:

1. To confirm or update bycaught coral identifications determined at-sea by Fisheries Observers to the lowest taxonomic level (i.e., to assign codes to coral specimens at the species level wherever possible, or to genus or family level if not possible).
2. To record all identified coral specimens and their metadata (including haplotype/genetic data) and ensure storage of the physical specimens in an appropriate taxonomic collection.
3. To update relevant government coral identification and observer databases.
4. To update and provide input into coral-relevant resources for Fisheries Observers, including reference material and observer training.
5. To improve the accuracy of protected coral identifications in FNZ's Central Observer Database COD database and thereby their use in a range of projects that use cod data (e.g., habitat suitability mapping, bycatch assessments etc.)

Project Summary:

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. This project will improve the ability of observers to identify protected corals and so improve the quality of data collected. Observer briefings can continue and be formalised, and Observers can be informed about how the research data are used. This will improve their skills at identifying and collecting samples and bycatch data. Specialists can then confirm identifications to help understand distributions at a more detailed taxonomic level.

This project would also examine the specimens listed in FNZ's Central Observer Database (*cod*) database under the GOC coral code, which could now be updated considering there are better identification codes available. A small number of identified records are still coded with 'GOC', the generic high-level code for gorgonian corals in the orders Scleralcyonacea and Malacalcyonacea.

Project Outputs:

1. Records and imagery of previously unidentified cold-water coral bycatch obtained by government funded Fisheries Observers within the New Zealand EEZ.
2. Creation and maintenance of a catalogue of observer collected coral samples.
3. Report(s) detailing confirmed identification, provenance, and all other data collected, for all specimens examined. Data will be reported by fishery stratum (fishing method, fishery area, and, where possible, target species).
4. Updated coral identification guides and other resources for use in training government Fisheries Observers.
5. A spreadsheet summarising the changes made to COD records.

Indicative Cost: \$90,000

INT-5 Port-based data collection programme

Term: 2 years

Guiding Objectives: CSP Objectives A, B, C; National Plan of Action – Seabirds, Te Kaweka Takohaka mō te Hoiho 2020 and Hector's and Māui dolphin Threat Management Plan.

Project Objectives:

To address data gaps, inform capture response work and enhance verification in fisheries where electronic monitoring is used as the sole monitoring and verification tool.

Project Summary:

The ongoing rollout of onboard cameras is leading to an increased breadth of monitoring and verification in the inshore fleet. Although electronic monitoring (EM) offers a lot of opportunities, there are still areas where supplemental data collection is required, such as bycatch mitigation specifications and species-level verification. Similar looking species, especially in regard to seabirds and corals, require physical sampling to confirm identification down to the species level and specimens are essential to obtain any information about age, sex, body condition, diet, and type of injuries. Additionally, identifying the specifications of mitigation in use is critical for identifying contributing factors to protected species capture events, which then informs our advice towards risk reduction and engagement through the Liaison Programme (MIT2024-01).

Project Outputs:

1. Seabirds and corals are returned and/or photographed, where possible, for identification and necropsy with results reported via project INT2022-02: Identification of seabirds captured in NZ fisheries and INT2022-03: Identification, storage and genetics of cold-water bycatch specimens.
2. Data will be available for other projects including mitigation development/testing and risk management projects.
3. A report describing the work undertaken and results.

Indicative Cost: \$80,000 per annum

INT-6 Factors influencing risk of marine mammal and seabird bycatch in inshore trawl and set net fisheries

Term: 1 year

Guiding Objectives: CSP Objectives B and C; CSP Marine Mammal Medium Term Research Plan; Hector's and Māui dolphin Threat Management Plan.

Project Objectives:

1. To identify environmental or operational variables which may have an impact on Hector's dolphin and other marine mammal and seabird bycatch through a review of international scientific literature and comparison with New Zealand fisheries operations.
2. Provide recommendations for improved data collection to allow for demonstrated continual improvement in bycatch mitigation in these fleets.
3. Provide recommendations for future testing of mitigating variables in these fisheries to inform best practice advice.

Project Summary:

A wide range of environmental and operational factors have been identified internationally that can impact the risk of dolphin bycatch in trawl and set net fisheries. Management of Hector's dolphin bycatch in New Zealand thus far has largely focused on spatiotemporal management, but more work is needed to investigate other factors within the context of the domestic fleet which may affect bycatch rates and mitigation options.

Furthermore, noting relatively poor historical data due to low observer coverage in these inshore commercial fleets, more work is needed in order to maximise the information coming through electronic monitoring (EM) and fisher self-reporting. The degree to which environmental and operational factors impact other marine mammal and seabird species in these fisheries is uncertain. Where possible any approaches to mitigate Hector's dolphin bycatch should also mitigate, and not increase, bycatch of other marine mammals and seabirds.

Project Outputs:

1. A report describing the work undertaken, and results and recommendations around environmental and operational variables to consider for mitigating further Hector's dolphin, as well as other marine mammal and seabird, bycatch.

Indicative Cost: \$40,000

INT-7 Testing eDNA detection of protected species using passive samplers on trawl gear

Term: 1 year

Guiding Objectives: CSP Objective B, C, and D.

Project Objectives:

1. Test the efficacy of passive environmental DNA (eDNA) samplers for detecting and characterising protected species contacted by bottom trawling gear, for potential future deployment as a monitoring tool to the commercial deepwater fleet.
2. This project leverages off similar research proposed to MPI AEWG/BRAG INV2025-04. Research proposed to MPI focuses on trialling eDNA samplers for catch composition and for characterisation of bycatch.

Project Summary:

The efficacy of different passive eDNA samplers deployed onto different bottom trawl gear locations will be tested during NIWA fisheries trawl surveys. Three types of passive sampler will be trialled: commercial capsules (Wilderlab passive aquatic samplers), absorbent research sponges (as used in Jeunen et al. 2024), and 3D-printed perforated balls filled with sterile gauze (as used in Maiello et al. 2022). Capsule and sponge samplers will be deployed onto lower warps and bridles and 3D balls will be placed into cod-ends, to examine differences in detectability and community structure. Three replicate samplers will be deployed on each gear location and ten trawls will be sampled at a minimum, for an expected total of 150 samples. Samplers will be retrieved, placed in a preservative and transported to NIWA Wellington for eDNA metabarcoding using two markers: COI mtDNA for characterising corals amongst a broad spectrum of metazoans (Leray et al. 2013), and mtMutS mtDNA for targeted detection of octocorals (Everett & Park 2018). The resulting coral detections will be compared to the composition of coral bycatch plus available distributional data for the trawled regions, to determine if eDNA profiles accurately capture coral taxa known to be present in trawls and associated areas (respectively) and to assess the potential sensitivity of metabarcoding for characterising the diversity of coral communities. These results will be used to assess the efficacy of passive eDNA biomonitoring for potential future deployment onto the commercial fleet, for broadened characterisation of fisheries impacts and as a means to observe the diversity of protected species in the deep ocean.

Project Outputs:

1. eDNA extracts of sampled trawl events: archived at -80oC by NIWA for future reuse and repurposing for other deep-sea and fisheries research.
2. eDNA sequence data: raw data to be archived by NIWA; copies of OTU tables to be provided to DOC.
3. Presentation of results and preliminary report to the CSP Technical Working Group
4. A technical client report documenting methodology and a comparison of eDNA data to available coral distribution data and bycatch records for the sampled area. A comparison of detection rates and diversity patterns by trawl and by location on trawl gear will be included.

Indicative Cost: \$90,000

INT-8 Examining recruitment dynamics and recovery potential from disturbance of deep-sea corals using ROV image data collected by RV Sonne in the New Zealand region

Term: 1 year

Guiding Objectives: CSP Objective B, C, and D.

Project Objectives:

1. Video analysis of select underwater video transects captured by RV Sonne Remotely Operated Vehicle (ROV) with a specific focus on indications of recruitment and growth of corals on previously disturbed substrates.
2. To advance our understanding of the vulnerability of species to fishing impacts and their ability to recover from these disturbances

Project Summary:

To help improve our understanding of the vulnerability of coral species to fishing impacts and their ability to recover from these disturbances, the proposed study aims to use new ROV-captured video and still records of CWC collected during RV Sonne voyage SO309 (16/1–15/2/2025). The proposed voyage plan includes 19 ROV dives of 6 hour-deployments each across five potential regions (Colville Ridge, Graveyard Knolls, Otago shelf, Puysegur/Solander region, Fiordland shelf) which will result in around 110 hours of seafloor transects. During ROV dives, NIWA staff will use established NIWA protocols to record substrate and faunal occurrence observations that are logged with precise time and navigational data using Ocean Floor Observation Protocol (OFOP) software.

Deep-sea corals are considered particularly vulnerable to fishing impacts as they are sessile, emergent fauna and often occur in dense aggregations on seamounts, which can be sites of high trawling effort in the New Zealand region (O'Driscoll and Clark, 2005). It has been hypothesised that these corals also have a very limited resilience to trawling impacts due to their slow growth rates and predicted limited dispersal (Clark et al., 2015). Williams et al. (2010) and Clark et al., (2019), found no evidence of recovery on a monitored seamount features 10–15 years after trawling was prohibited (and concluded it remains uncertain whether recovery of seamount benthic communities once dominated by corals is possible. However, indications of potential recruitment of corals were observed during the last survey to the Chatham Rise Graveyard seamounts in 2020 (TAN2009, Clark et al. 2021).

Detailed in situ observations of the seabed are limited by the use of a towed camera sled on the RV Tangaroa. Repeating transects of this time series, together with the examination of existing settlement plates, using the high-definition ROV capability will allow detailed studies to examine suspected growth and recovery.

This proposal covers post-voyage time to review ocean floor observations of select corals to refine taxonomic identifications, generate estimates of abundance, habitat associations, spatial coverage and a specific focus on indications of recruitment and growth of corals on previously disturbed substrates.

This research, as well as feeding directly into the outcomes stipulated by Objective E of the Draft Coral Medium-Term Research Plan, also provides support to a variety of spatial and other management responses under the Fisheries Act 1996, Marine Protected Areas Policy, or other legislation, (Department of Conservation and Ministry for the Environment (2000); Department of Conservation (2015), and as summarised in Freeman & Cryer (2019).

Project Outputs:

A technical report summarising OFOP-derived coral record data from selected Sonne ROV transects together with results and discussion on the abundance, habitat associations, and spatial coverage of selected coral taxa with a specific focus on indications of recruitment and growth of corals on previously disturbed substrates.

Indicative Cost: \$97,000

INT-9 Understanding fisheries overlap and interactions of protected corals in the Fiordland Marine Area; scleractinians, hydrocorals and gorgonians

Term: 3 years

Guiding Objectives: CSP Objectives B, C, E; Coral Medium Term Research Plan Themes 1-5.

Project Objective: To increase our understanding of the distribution of all types of shallow water protected corals in Fiordland and to assess overlap with fisheries activity.

Project Summary:

This project aims to enhance our ecological understanding of previously unstudied protected coral species in Fiordland, contributing valuable insights into their potential vulnerability to fisheries impacts. The findings will also have broader implications for these and closely related coral species throughout Aotearoa, as all the study species have distributions that extend beyond Fiordland. This research builds upon current CSP project INT2022-05 Determining the resilience of Fiordland corals (Antipatharia) to fisheries impacts.

Project Outputs:

1. A technical report detailing survey findings, including distribution maps for surveyed species based on prior and new data, as well as maps of fishing activity in the study area.
2. Species distribution models for all protected coral species surveyed in this project in Fiordland.
3. Presentations of results to the CSP Technical Working Group, with data shared with DOC to enhance knowledge of coral distribution and diversity in Fiordland.
4. Results shared with the Fiordland Marine Guardians and local iwi through the Kaitiaki Roopū.
5. Peer-reviewed publications to disseminate findings within the wider Aotearoa coral research community and to international audiences interested in protected corals.
6. Student theses, including MSc and PhD students may contribute to the project, resulting in academic theses.
7. Public outreach, including social media content, popular science articles (e.g., The Conversation), and press releases, to increase public awareness of these protected species, the CSP, and the importance of corals in Fiordland's marine ecosystems.

Indicative Cost: \$30,000 per annum

INT-10 Understanding the extent and usage of coral rubble reporting codes by fisheries observers

Term: 1 year

Guiding Objectives: CSP Objective B; CSP Coral Medium Term Research Plan Theme 1.

Project Objectives: To improve our understanding of coral rubble reporting by fisheries observers, and to use those findings to inform current understanding of the distribution of and target fisheries involved in bycatch of coral rubble.

Project Summary:

This project will help us to understand the extent and accuracy of coral bycatch reporting of coral rubble and to determine any necessary refinements to observer reporting guidelines, or to develop post-collection data grooming steps that improve coral reporting accuracy.

Project Outputs:

1. A technical report, based upon observer images and samples (where available), that will quantify the likely proportion of genuine rubble; including how much of 'live or dead' fits each category CBB (coral rubble alive or dead) and CBD (coral rubble dead), if more specific codes could have been

used, if images and/or samples are taken and match reports, and mapping areas/taxa/fisheries for which this code is the most often used.

2. Guidance for observers and fishers on reporting coral rubble.

Indicative Cost: \$30,000

INT-11 Fine-scale spatial analysis of fishing catch data in relation to New Zealand sea lion foraging areas and body condition

Term: 1 year

Guiding Objectives: CSP Objective D; CSP Marine Mammal Medium Term Research Plan; NZSL TMP.

Project Objectives:

1. Analysis of fine-scale spatial overlaps between concurrent fishing takes and foraging areas of individual lactating female sea lions using existing data collected since 1995
2. Investigation of the relationship between these overlaps and the body condition and/or foraging effort of individual female sea lions for estimation of potential competition

Project Summary:

The breeding population of New Zealand sea lions at the Auckland Islands has continued to decline in recent years, despite the reduction in observed direct fisheries mortalities in SQU6T (Manno et al. 2024, <https://protectedspeciescaptures.nz>). Nutritional stress has long been identified as a likely cause of this decline, though previous attempts at understanding the relationship between commercial fisheries catches and New Zealand sea lion population dynamics have failed to make a clear connection (Bowen 2012; Roberts & Doonan 2016; Roberts et al. 2018). The number of breeding-age females at the whole of Auckland Islands now numbers less than 3,000. Considering this, a more meaningful understanding may be gained from analysing the system at a smaller scale.

In late February 2024, the Department of Conservation deployed GPS tracking tags on lactating female New Zealand sea lions at Enderby Island in the Auckland Islands. Body measurements and milk fat content were also collected from the tracked animals. The results indicated that the foraging areas of lactating sea lions have remained similar over at least the last 24 years. Additionally, the female sea lions studied in early 2024 exhibited, on average, improved body condition and reduced foraging effort compared to animals studied at the same colony in the late 1990s and early 2000s. This result was unexpected, considering the observed population decline at the colony since the early 2000s. There were, however, large inter-individual differences between the animals studied. There was also an indication that both body condition and foraging effort were influenced by the specific foraging grounds employed by the females.

Fisheries catch data in the known foraging grounds of New Zealand sea lions in the 2024 tracking period and the preceding 6 weeks (January to April) were the lowest on record for the corresponding period over the years 2002 to 2024. There was minimal overlap between commercial fishing activities and foraging areas of individual sea lions in 2024, raising the question as to whether the good condition of individual sea lions in 2024 may be related to the absence of commercial fishing in specific foraging areas in January and early February of that year.

Research on sea lions was conducted at the Auckland Islands from 1995 to 2010, focusing on individual foraging behaviour, body measurements, and milk fat content of lactating females. This historical dataset presents an opportunity for re-analysis to further investigate the nutritional stress hypothesis. The proposed project will compile, organise and format all existing data on adult female sea lions, including tracking information, body measurements, and milk fat content from the earlier studies. The analyses will aim to identify potential effects of competition at the individual level by integrating concurrent tracking data (characteristics of foraging trips), body condition metrics (measurements and milk fat content), and the spatial distribution of commercial fisheries catch data. Each analysis will be customised to the specific dataset of individual sea lions for the relevant timeframe to establish correlations with fishing data.

The results of this study will further our understanding of the relationship between commercial fisheries and New Zealand sea lions to inform future efforts to support the recovery of the species.

Project Outputs:

1. Raw data package for storage and re-use (with full metadata): tracking data, body measurements, milk fat content and spatial distribution of fishing.
2. Technical report (with recommendations for management and further investigations) and presentation to CSP Technical Working Group.
3. Specific meeting for Fisheries and DOC staff to explain results in more details.

Indicative Cost: \$24,500

Population Projects

Ongoing projects

POP2023-01 Aerial survey of leatherback turtles off Northeast North Island

This multi-year project was consulted on in 2023/24 and is due for completion in June 2026.
It is proposed to form part of the CSP Annual Plan 2025/26.
Full details are provided in the CSP Annual Plan 2023/24.

POP2023-02 Southern Buller's population study

This multi-year project was consulted on in 2023/24 and is due for completion in June 2026.
It is proposed to form part of the CSP Annual Plan 2025/26.
Full details are provided in the CSP Annual Plan 2023/24.

POP2023-05 Auckland Islands New Zealand sea lions

This multi-year project was consulted on in 2023/24 and is due for completion in June 2026.
It is proposed to form part of the CSP Annual Plan 2025/26.
Full details are provided in the CSP Annual Plan 2023/24.

POP2024-02 Improving knowledge on coral life history traits: assessing reproductive capacity to infer productivity, vulnerability and resilience of protected deep-sea corals in the New Zealand region

This multi-year project was consulted on in 2024/25 and is due for completion in June 2026.
It is proposed to form part of the CSP Annual Plan 2025/26.
Full details are provided in the CSP Annual Plan 2024/25.

Proposed Projects

POP-1 Southern Buller's albatross juvenile banding and tracking

Term: 3 years

Guiding Objectives: CSP Objective E; Seabird Medium Term Research Plan; National Plan of Action – Seabirds.

Project Summary:

This proposal delivers key components of the CSP Seabird Plan on Southern Buller's albatross. Southern Buller's albatross is the most at-risk species on the New Zealand fisheries risk assessment, adult survival has been in decline for decades, and recently, the number of breeding adults has shown stark declines in the last two seasons (Sagar et al. 2024). Despite a long-term study dedicated to understanding the drivers of population trends being maintained for decades, little is known about early life history stages, including juvenile survival, recruitment, and the at-sea distribution of juveniles, as juveniles were last banded dates over a decade ago and juveniles have never been tracked before. To address these knowledge gaps, improve insights into the demographic drivers of the declines observed in this species, and to potentially enhance future iterations of New Zealand fisheries risk assessments, a three-year project is proposed.

Project Objectives:

1. Band representative samples of juvenile cohorts to enable estimates of juvenile survival and recruitment in the future

2. Support the deployment of satellite tracking devices on juveniles to provide updated novel insights into the at-sea distribution

Project Outputs:

1. Annual technical report(s) on the work undertaken and results found, including updated at-sea distribution.
2. Annual summary of results will be presented to, and reviewed by, the CSP Technical Working Group, and made available online.
3. Data collected during the project to be made available annually in electronic format.

Indicative Cost: \$50,000 per annum

POP-2 Black petrel and flesh-footed shearwater demographic modelling

Term: 2 years

Guiding Objectives: CSP Objective E; Seabird Medium Term Research Plan; National Plan of Action – Seabirds.

Project Objectives:

1. To estimate black petrel population size using at-sea capture data
2. To estimate black petrel adult survival, juvenile survival, and if possible, breeding probability
3. To estimate flesh-footed shearwater adult survival, juvenile survival, and if possible, breeding probability

Project Summary:

Black petrels and flesh-footed shearwaters both rank high in the updated New Zealand fisheries risk assessment (fourth and seventh, respectively; Edwards et al. 2023) and have been subjected to concerted monitoring across multiple years (Bell et al. 2024, Ray et al. 2024). A large portion of the monitoring consists of the banding and resighting of adults and juveniles at breeding colonies (predominantly Aotea, but also Hauturu, for black petrels, and Ohinau and Lady Alice Island for flesh-footed shearwaters). In addition, Black Petrels have been subjected to four years of concerted at-sea capture efforts to provide an independent banding and resighting data stream. During some years, flesh-footed Shearwaters have been captured at sea as well. For both species, the data sets are now due to be (re)analysed. The latest black petrel demographic assessment dates back to 2017 (Zhang et al. 2020) while the latest flesh-footed shearwater survival assessment from New Zealand dates back to 2012 (Barbraud et al. 2014). This proposed project aims to provide much-needed updates to demographic assessments of these two vulnerable species.

Research Approach:

A project is proposed to (re)analyse the black petrel and flesh-footed shearwater banding datasets across multiple sites and projects through Bayesian multi-state/multi-event capture-recapture models which account for a range of sources of bias including imperfect detection and interannual variation in various parameters to 1) provide an updated and unbiased population size estimate for black petrels leveraging the novel at-sea capture data, 2) provide updated estimates of black petrel adult survival, juvenile survival, and if possible, breeding probability (as estimated through multi-state/event survival models), and 3) provide updated estimates of flesh-footed shearwater adult survival, juvenile survival, and if possible, breeding probability (as estimated through multi-state/event survival models). A two-year project is proposed to allow for ample time to get datasets into the necessary analysis formats. The outputs from this project are directly relevant to any future iterations of fisheries risk assessments as well as allowing for more detailed assessments of changes in fisheries related mortalities.

Project Outputs:

1. Annual technical report(s) on the work undertaken and results found, including updated estimates of population size and key demographic parameters.
2. Annual summary of results will be presented to, and reviewed by, the CSP Technical Working Group, and made available online.
3. Data collected during the project to be made available annually in electronic format.

Indicative Cost: \$40,000 per annum

POP-3 Black petrel monitoring

Term: 3 years

Guiding Objectives: CSP Objective E; Seabird Medium Term Research Plan; National Plan of Action – Seabirds.

Project Objective: To monitor key demographic parameters of the black petrel population.

Project Summary:

Black petrels are the highest-ranking petrel species in the latest fisheries risk assessment (Edwards et al. 2023) and as such, the continuation of the long-term monitoring programme (i.e., continuation of POP2022-01) is proposed to continue monitoring key demographic parameters of this vulnerable species. However, a reduced work programme is proposed as it appears that the population size is increasing at a steady rate (Bell et al. 2024). Despite this apparent positive trend, further data collection is advisable to continue to monitor any changes in population status and trends and provide the baseline information to inform future risk assessments.

Project Outputs:

1. Annual technical report(s) on the work undertaken and results found, including updated estimates of population size and key demographic parameters.
2. Annual summary of results will be presented to, and reviewed by, the CSP Technical Working Group, and made available online.
3. Data collected during the project to be made available annually in electronic format.

Indicative Cost: \$35,000 per annum

POP-4 Gibson's albatross research

Term: 3 years

Guiding Objectives: CSP Objective E; Seabird Medium Term Research Plan; National Plan of Action – Seabirds.

Project Objectives:

1. To monitor the key demographic parameters of Gibson's albatross to reduce uncertainty or bias in estimates of risk from commercial fishing.
2. To estimate the annual population size of Gibson's albatross.

Project Summary:

This proposal delivers key components of the CSP Seabird Plan on Gibson's albatross. The species has shown a concerning decline in the early 2000s, is considered Nationally Critical, and is listed as medium

risk on the updated New Zealand fisheries risk assessment. Considerable efforts over several decades have been invested into understanding the population dynamics of this species (e.g., Francis et al. 2012), including a recent concerted effort to conduct a full island survey at the main breeding site (Adams Island; Elliott et al. 2024). After the population crash, the population appeared stable to increasing between 2006 and 2015, but recent insights indicated that over the period 2016-2024, a slow decline of the population may have become evident again (Elliott et al. 2024). Consequently, to gain further insights into the potential recurrence of a population decline, and the underlying demographic drivers, another three years of population monitoring is proposed, albeit at a reduced intensity when compared to POP2022-08, to focus on ongoing monitoring of key demographic parameters and population size. Cost saving synergies with other projects operating within the Auckland Island archipelago will be employed to ensure the success of this project.

Project Outputs:

1. Annual technical report(s) on the work undertaken and results found, including updated estimates of population size and key demographic parameters.
2. Annual summary of results will be presented to, and reviewed by, the CSP Technical Working Group, and made available online.
3. Data collected during the project to be made available annually in electronic format.

Indicative Cost: \$40,000 per annum

POP-5 Updated population assessment for New Zealand fur seals on Bounty Islands from drone footage

Term: 1 year

Guiding Objectives: CSP Objective E, Marine Mammal Medium Term Research Plan.

Project Objective:

To provide an updated population assessment for New Zealand fur seals on Bounty Islands.

Project Summary:

This project will analyse existing drone footage from the past three years on Bounty Islands to estimate population of fur seals found there. This project has synergies with other projects that plan to analyse this same footage for seabird species.

Project Outputs:

1. Technical report on the work undertaken and results found, including updated estimate of New Zealand fur seals on Bounty Islands.
2. Results will be presented to, and reviewed by, the CSP Technical Working Group.

Indicative Cost: \$10,000

POP-6 Salvin's albatross Western Chain research

Term: 1 year

Guiding Objectives: CSP Objective E; Seabird Medium Term Research Plan; National Plan of Action – Seabirds.

Project Summary:

This proposal delivers key components of the CSP Seabird Plan on Salvin's albatross. Salvin's albatross is the second-most at risk species on the updated New Zealand fisheries risk assessment (Edwards et al. 2023) and is listed as Nationally Critical. The Bounty Island population has been subjected to three recent drone-based population surveys by DOC through cost-saving synergies with external researchers (e.g., Mattern et al. 2024) providing accurate, up-to-date insights into this population. However, the other population of Salvin's albatross on the Western Chain has not been surveyed since 2014 (Sagar et al. 2014, Baker et al. 2015). As the Bounty Island population has been subject to historic steep declines, and more recent significant population fluctuations, an updated population estimate from the second breeding site of this vulnerable species would be beneficial to any future iterations of the fisheries risk assessments.

Project Objectives:

1. Provide an updated population estimate for the Western Chain population
2. Contribute to the demographic dataset to enable estimates of adult survival

Project Outputs:

1. Annual technical report(s) on the work undertaken and results found, including updated estimates of population size, at-sea distribution, and key demographic parameters.
2. Annual summary of results will be presented to, and reviewed by, the CSP Technical Working Group, and made available online.
3. Data collected during the project to be made available annually in electronic format.

Indicative Cost: \$40,000

POP-7 Great white shark population estimate

Term: 2 years

Guiding Objectives: CSP Objective E; Draft National Plan of Action – Sharks (2024).

Project Objective:

To update population estimates for great white sharks to improve bycatch risk assessments in New Zealand commercial fisheries.

Project Summary:

The great white shark (*Carcharodon carcharias*) is a threatened, nationally endangered species and has been protected in New Zealand under the Wildlife Act (1953) since 2007 (Duffy et. al., 2018). There are two genetically distinct groupings in the Australasian region, the eastern Australasian and south-western Australasian populations (Bruce et. al., 2018) (Fig 1). The most recent eastern Australasian population stock status was completed in 2018 (sharks that inhabit eastern Australia and New Zealand waters) by Bruce et. al., (2018) who estimated total numbers at 5,500 (n=214 samples) of which 750 (14%) were adults (>12 years). The sex ratio was 60:40 male-to-female. A prior study by Hilary et. al., (2018) estimated numbers of adults at 280–650, and total population between 2,500–6,750. It is important to regularly update population estimates for great white sharks to better inform bycatch risk assessments and reviews of their threat classification status.

Great white sharks are caught as bycatch in New Zealand commercial and recreational fisheries. The last review of bycatch numbers in New Zealand commercial fisheries was completed in 2022 (assessed between 2008-2021) and figures/discussion below are referenced to Finucci et. al., (2022) unless otherwise stated. Predominantly the fisheries of concern for great white shark bycatch are bottom longline and trawl targeting squid and snapper, and setnet targeting butterfish and common warehou in FMAs 1, 5, 6, 8 & 9. Bycatch typically occurs between December-March. Between 2008-2021 there were 136 observer and fisher reported bycatch events for great white sharks with a peak in bycatch in 2020. Over the 4-year period between 2017-2021 71% of all observer reported bycatch (n = 28/39) was represented by mature (25%) and immature (46%) adults with the majority caught in trawl fisheries. Maturity was not assessed in fisher reported bycatch. Concerningly, half of all observed bycatch (n = 24/48) between 2018-2021 was caught in 2020/21.

It should be noted that around 75% of observer and fisher reported sharks caught between 2008-2021 were assessed as alive, however post-release survival rates are unknown. Bycatch numbers reported by fishers between 2017-2021 were the same in bottom longline and trawl (14 each, 28/41, 68%), predominantly targeting snapper and trevally in FMA1. Ten were caught in set net fisheries targeting school shark in FMA5. Previously (2008-2016), 68% (36/53) of fisher reported bycatch was in set nets and since then the trend has shifted to 68% trawl and bottom longline. A study was done by Francis in 2017 to characterise bycatch in the setnet fishery and increase our understanding of the nature of interactions at that time. The current trend in fisher reported bycatch for great white sharks (2021-2024) has been a further increase in setnet and bottom longline with variable/fluctuating numbers in bottom trawl (FNZ). No observer data is currently publicly available for 2021-2024. DOC has growing concerns about recent increased bycatch numbers of great white sharks and the need to better understand whether this is negatively impacting the population.

Critical to better understanding of the impacts fishing has on the east Australasian great white shark population is the need to regularly update population estimates and risk assessments. A qualitative risk assessment for great whites was undertaken by Ford et. al., (2018) which scored great white sharks at actual or potential for sustainable impact from fisheries. Currently, FNZ is developing a quantitative risk assessment for selected shark species, including great white sharks, which is due for completion in early 2025 (BYC2022-02). Data from the proposed population estimate project will inform future quantitative assessments.

Project Outputs:

1. A technical report detailing methods and results for adult and total population estimates.
2. Data will be made available for FNZ bycatch risk assessments. Tissue and DNA extractions will be archived under CSP INT2024-07.

Indicative Cost: \$110,000 per annum

POP-8 White-capped albatross research

Term: 3 years

Guiding Objectives: CSP Objective E; Seabird Medium Term Research Plan; National Plan of Action – Seabirds.

Project Objectives:

1. To estimate the annual population size of white-capped albatross.
2. To monitor adult survival and breeding probability of white-capped albatross.
3. To describe the at-sea distribution of white capped albatross, including juveniles.

Project Summary:

This proposal delivers key components of the CSP Seabird Plan on white-capped albatross. Specifically, the white-capped albatross is the most bycaught seabird species in New Zealand fisheries (~2600 individuals

annually) and the third-most at-risk species based on the updated New Zealand fisheries risk assessment (Edwards et al. 2023). Contrasting and therefore controversial trend estimates exist indicating either a steep population decline (Walker et al. 2020) or a shallow, non-significant population decline (Baker et al. 2023), depending on the analysis approach. Despite these causes for concern, the latest population estimate of the species from its main breeding site (Disappointment Island) dates back to 2018 and since then, visits to the colony have been short, dependent on other fieldwork priorities, and occurred at suboptimal times, limiting estimates of population size and demographic rates. This proposed project aims to overcome the shortcomings of previous projects (e.g., POP2022-08) by allocating a specific budget to addressing the data gaps that plague this heavily bycaught species.

Project Outputs:

1. Annual technical report(s) on the work undertaken and results found, including updated estimates of population size, key demographic parameters, and at-sea distribution.
2. Annual summary of results will be presented to, and reviewed by, the CSP Technical Working Group, and made available online.
3. Data collected during the project to be made available annually in electronic format.

Indicative Cost: \$120,000 for the first two years and \$150,000 in the final year

POP-9 Updated population assessment for New Zealand fur seal

Term: 1 year

Guiding Objectives: CSP Objective E; Marine Mammal Medium Term Research Plan.

Project Objectives:

1. Provide robust estimates of the abundances of New Zealand fur seal at several important sites in New Zealand.
2. Provide an updated nationwide abundance estimate for New Zealand fur seal in New Zealand.
3. Provide an evidence-based framework for future population monitoring of New Zealand fur seal in New Zealand.

Project Summary:

The New Zealand fur seal/kekeno (*Arctocephalus forsteri*; 'NZFS') comprised 86% of observed marine mammal by-catch between 1995/6 – 2018/19 (Mackenzie et al. 2022). However, understandings of the population level impacts of commercial fisheries on NZFS are limited by a lack of data on the species abundance within New Zealand waters (Abraham et al. 2017; Pavanto et al. 2023).

To accomplish CSP objectives C, D and E, it is important that the size of the NZFS population in New Zealand is properly understood. However, there have only been two longitudinal surveys of New Zealand fur seal in New Zealand – on one the West Coast of the South Island, and the other in Otago/Catlins region – with other assessments of individual sub-populations being inconsistent with regards to timing and methodologies. As such, commonly used estimates of the nationwide NZFS population size are out of date and rely on patchy or unreliable data.

Population abundance estimates are required from sites which currently lack robust data, and from those where explanations for recent negative population trends are unclear. For example, while comprehensive NZFS population size assessments were conducted at Ōhau Point in Kaikōura in 2023 and 2024, the colony abundance estimate from 2024 was roughly half that of 2023, with pups appearing malnourished, despite no evidence of disease in post. Cape Palliser, the only substantial NZFS breeding colony on the North Island, has never been comprehensively assessed. This is despite the recommendation, in POP2021-06, of Pavanto et al. (2023) that a long-term, robust population monitoring programme should be established at Cape Palliser, due to the site's proximity to the Cook Strait, where substantial NZFS bycatch occurs, mainly in

Hoki trawls. Given the links between pup body condition and pup survival, it is also important that longitudinal data on body condition are collected at sites where population size assessments are conducted.

If abundance data were collected from these understudied, or unstudied, sites, it would be possible to provide a more reliable nationwide estimate of the New Zealand fur seal population size than what is currently available.

In addition to population size updates for key NZFS colonies, a framework is required to inform future monitoring of the species within New Zealand. The current uncertainty surrounding the nationwide size of the NZFS population is largely due to the irregularity and methodological inconsistency with which species monitoring has occurred in the past, and evidence from other countries shows that coordinated approaches to fur seal monitoring enable better tracking of population level trends (McIntosh et al. 2018).

Project Outputs:

1. Technical report on the work undertaken and results found
2. Annual summary of results will be presented to, and reviewed by, the CSP Technical Working Group, and made available online.
3. Data collected during the project to be made available annually in electronic format.

Indicative Cost: \$100,000

POP-10 Chatham albatross research

Term: 2 years

Guiding Objectives: CSP Objective E; Seabird Medium Term Research Plan; National Plan of Action – Seabirds.

Project Objectives:

1. To provide an updated population estimate of Chatham albatross.
2. To update the at-sea distribution
3. Provide the first breeding success estimate, and potentially the first estimate of breeding probability
4. Contribute to the demographic dataset to enable estimates of adult survival

Project Summary:

This proposal delivers key components of the CSP Seabird Plan on Chatham albatross. The Chatham albatross is the sixth-most at risk species based on the updated New Zealand fisheries risk assessment (Edwards et al. 2023). This ranking is largely driven by the small population size of this species, which was estimated at ~5300 breeding pairs in 2017 (Bell et al. 2017). Since then, no updated estimates of population size - or any assessments of demographic parameters - have been conducted. Insights on some demographic parameters are entirely lacking for this species, most notably breeding probability and breeding success; of which the former is highly influential on the New Zealand fisheries risk assessment. Similarly, any tracking of this species dates back to 2008 or earlier. The of lack up-to-date estimates of population size, demographic parameters, and at-sea distribution challenges assessments of trends, the accuracy of the fisheries risk assessment and any benefits of seabird bycatch mitigation measures.

Project Outputs:

1. Annual technical report(s) on the work undertaken and results found, including updated estimates of population size, at-sea distribution, and key demographic parameters.
2. Annual summary of results will be presented to, and reviewed by, the CSP Technical Working Group, and made available online.
3. Data collected during the project to be made available annually in electronic format.

Indicative Cost: \$50,000 in the first year, \$30,000 in the second year

POP-11 Antipodean albatross and white-chinned petrel research

Term: 3 years

Guiding Objectives: CSP Objective E; Seabird Medium Term Research Plan; National Plan of Action – Seabirds.

Project Objectives:

1. To monitor key demographic parameters of Antipodean albatross to reduce uncertainty or bias in estimates of risk from commercial fishing.
2. To estimate the annual population size of Antipodean albatross
3. To estimate adult survival of white-chinned petrels.

Project Summary:

This proposal delivers key components of the CSP Seabird Plan on Antipodean albatross and white-chinned petrel. The Antipodean albatross has shown a concerning decline since the early 2000s, is listed as Nationally Critical, is considered a bycatch flagship species, and is listed as medium risk on the updated New Zealand fisheries risk assessment. Considerable efforts over several decades have been invested into understanding the population dynamics of this species (e.g., Richard et al. 2024), including a recent concerted effort to conduct a full island survey at the main breeding site (Antipodes Island; Rexer-Huber et al. 2024). White-chinned petrels also occur on the Antipodes, which are the second most bycaught species in New Zealand fisheries. Over the last three years, a study population of White-chinned petrels has been established on Antipodes providing novel opportunities to estimate key demographic parameters (Rexer-Huber et al. 2024). This project proposes to continue the ongoing monitoring on both species to evaluate the population level impacts of the implementation of seabird bycatch mitigation methods in New Zealand fisheries (Antipodean albatross) and provide novel estimates of survival (white-chinned petrel). Shorter visits to the Antipodes are proposed to enable more concerted and efficient monitoring and thus reduce costs compared to previous projects (e.g., POP2022-10).

Project Outputs:

1. Annual technical report(s) on the work undertaken and results found, including updated estimates of population size and key demographic parameters.
2. Annual summary of results will be presented to, and reviewed by, the CSP Technical Working Group, and made available online.
3. Data collected during the project to be made available annually in electronic format.

Indicative Cost: \$120,000 per annum

POP-12 Campbell Island seabird research

Term: 2 years

Guiding Objectives: CSP Objective E; Seabird Medium Term Research Plan; National Plan of Action – Seabirds.

Project Objectives:

1. To estimate the annual population size of southern royal albatross.
2. To monitor key demographic parameters of southern royal albatross.
3. To describe the year-round distribution of southern royal albatross.

4. To estimate the annual population size of Campbell albatross and grey-headed albatross.
5. To support the deployment of satellite tracking devices on grey-headed albatross.

Project Summary:

This proposal delivers key components of the CSP Seabird Plan on a range of albatross species breeding on Campbell Island. Due to logistical costs involved in getting to Campbell Island, research on the various albatross species has been combined into one Campbell Island seabird research project. While southern royal albatross, grey-headed albatross, and Campbell albatross are all listed as medium to low risk on the most recent New Zealand fisheries risk assessment (Edwards et al. 2023), new insights published since this risk assessment was conducted have shown that all three species have declined concerningly. Specifically, in 2023/24 the population size of southern royal albatross was estimated at 27% lower than listed on the risk assessment, grey-headed albatross at 28% lower, and Campbell albatross at 16% lower (Mischler et al. 2024). As the fisheries risk assessment is sensitive to population size as an input, it is highly likely that the risk to these species has been underestimated in the latest risk assessment.

To improve future iterations of the New Zealand fisheries risk assessments and to provide more accurate estimates of risk to these species, this proposed project aims to provide robust population estimates of all three species, as well as updated demographic parameters, and improved insights into the at-sea distribution of all three species.

Similar to the previous Campbell Island seabird project (POP2023-04), this project may also provide a platform for additional research on other seabird species as risk from bycatch (e.g., Northern Giant Petrel, Antipodean albatross, and white-chinned petrels), but this a lower priority than the research on the species mentioned above and dependent on logistics. Similar to the previous projects (POP2023-04), this project would leverage cost-saving synergies with other work on Campbell.

Project Outputs:

1. Annual technical report(s) on the work undertaken and results found, including updated estimates of population size, at-sea distribution, and key demographic parameters.
2. Annual summary of results will be presented to, and reviewed by, the CSP Technical Working Group, and made available online.
3. Data collected during the project to be made available annually in electronic format.

Indicative Cost: \$150,000 per annum

POP-13 Campbell Island seabird winter research

Term: 1 year

Guiding Objectives: CSP Objective E; Seabird Medium Term Research Plan; National Plan of Action – Seabirds.

Project Objectives:

1. To track at-sea distribution of hoiho during winter to assess overlap with fisheries during this period of their annual cycle.
2. To deploy GPS and TDR devices on grey petrels.
3. To update population estimates of known Campbell Island colonies of grey petrels

Project Summary:

This project delivers key components of the CSP Seabird Plan for hoiho and grey petrels on Campbell Island during the winter months. Hoiho are declining due to a range of stressors including disease, dietary change, and interactions with fisheries. Accurate population estimates and at-sea distribution patterns of hoiho in the subantarctic are critical to assessing risk and targeting management actions to slow their decline. Building on tracking work conducted as part of POP2023-03, this project will determine the marine distribution of hoiho during the non-breeding period/winter when birds are not associated with a nest. It is expected that hoiho will have much larger home ranges during winter, increasing the likelihood of overlap with fishing activities in the subantarctic. Satellite and GPS-depth tracking of hoiho will add to a comprehensive dataset across the annual cycle of hoiho and how their distribution overlaps with fisheries at Campbell Island. The timing of this proposed research also allows for the deployment of GPS and TDR devices on the winter-breeding grey petrels on Campbell, as high-resolution tracking data from New Zealand does not exist yet for this deep-diving, at-risk species. Finally, the last population estimates for grey petrels from Campbell date back to 2015, and as such, this project also proposes to update population estimates of known colonies. Combined, the achieving the objectives of this project will be beneficial to any future iterations of the fisheries risk assessments.

Project Outputs:

1. Annual technical reports on the work undertaken and results found
2. A summary of results will be presented to and reviewed by the CSP Technical Working Group and made available online.
3. Data collected during the project to be made available annually in electronic format.

Indicative Cost: \$150,000

POP-14 Population growth, distribution and demographics of New Zealand sea lions in northern Stewart Island

Term: 3 years

Guiding Objectives: CSP Objective E; New Zealand sea lion Threat Management Plan and upcoming Action Plan; Marine Mammal Medium Term Research Plan.

Project Objectives:

1. Understand population numbers, including age and sex range, and distribution of NZ sea lions in and around Patterson's Inlet, northern Stewart Island.
2. Tag all known pups in the area for three consecutive years to understand breeding and its distribution in the area. Pups are tagged to provide a pool of known age individuals for the

estimation of parameters such as survival, recruitment, movement patterns and reproductive rate if this area were to become part of a long-term study.

Project Summary:

New Zealand sea lion numbers are increasing on Stewart Island / Rakiura. A decade long study of pup numbers and distribution in Pegasus inlet has recorded up to 80 pups born there annually with this number and NZ sea lions distribution on Stewart Island likely to continue to grow.

With the implementation of cameras on inshore fisheries vessels, it is now becoming clear that sea lions are getting caught in inshore fisheries in the Stewart Island area. Additionally with the signing of an aquaculture agreement between Te Rūnanga o Ngāi Tahu (Te Rūnanga), Te Ohu Kaimoana, and the Government permitting great areas around Stewart Island that could be developed for aquaculture, there is an urgent need to understand the numbers and distribution on New Zealand sea lions, not only in Port Pegasus but in Stewart Island northern region around Patterson's Inlet.

Project Outputs:

1. Annual technical report(s) on the work undertaken and results found.
2. Annual summary of results will be presented to, and reviewed by, the CSP Technical Working Group, and made available online.
3. Data collected during the project to be made available annually in electronic format.

Indicative Cost: \$20,000 per annum

Mitigation Projects

Ongoing projects

MIT2024-01 Protected Species Liaison Programme

This multi-year project was consulted on in 2024/25 and is due for completion in June 2027.

It is proposed to form part of the CSP Annual Plan 2025/26.

Full details are provided in the CSP Annual Plan 2024/25.

MIT2024-06 Efficacy of seabird mitigation in large vessel trawl

This multi-year project was consulted on in 2024/25 and is due for completion in June 2026.

It is proposed to form part of the CSP Annual Plan 2025/26.

Full details are provided in the CSP Annual Plan 2024/25.

MIT2024-07 Hector's dolphin acoustic deterrence devices in trawl and set net fisheries

This multi-year project was consulted on in 2024/25 and is due for completion in June 2026.

It is proposed to form part of the CSP Annual Plan 2025/26.

Full details are provided in the CSP Annual Plan 2024/25.

Proposed projects

MIT-1 Improving mitigation data streams to assess bycatch mitigation effectiveness in inshore and HMS fisheries

Term: 2 years

Guiding Objectives: CSP Objective A; National Plan of Action- Seabirds

Project Objectives:

The overall objective is to enable robust, effective and efficient ongoing assessment of seabird bycatch mitigation effectiveness in inshore and HMS fisheries. This will be achieved through the following specific objectives:

1. Identify key parameters for data collection on seabird bycatch mitigation effectiveness going forwards.
2. Provide recommendations for potential changes to current data collection aspects to target key parameters.
3. Identify any additional potential tools or programmes to supplement existing data channels.

Project Summary:

Over recent years there have been considerable changes in data collected relevant to assessing seabird bycatch mitigation effectiveness in inshore and HMS fisheries. There have been improvements to fisher data reporting, wide scale roll out of verified camera monitoring, expanded liaison activities and changes in observer coverage.

This project will seek to better assess mitigation effectiveness in inshore fisheries through data channels other than observer-collected data, including ER, Liaison Programme, and EM data. The project will be desk-based, and the initial phase will be to review and characterise current data to assess the utility in quantifying mitigation effectiveness. The second phase will review key parameters for data collection going forwards, make recommendations for potential changes to current data collection aspects to target those parameters and identify any additional tools or programmes to supplement existing data channels.

This holistic review will help ensure that the full range of data streams are utilised in the most efficient and effective way going forward to be able to assess and monitor the effectiveness of seabird bycatch mitigation as we continue to strive towards our zero-bycatch goal.

Project Outputs:

1. Recommendations for potential changes to current or additional data collection avenues.
2. Technical report on the work undertaken and results found.

Indicative Cost: \$30,000 per annum

MIT-2 Seabird SMART Workshops

Term: 3 years

Guiding Objectives: CSP Objective A; National Plan of Action- Seabirds

Project Summary:

Southern Seabirds has historically held Seabird SMART Workshops to educate inshore commercial fishers about the issue of fisheries-related seabird mortality. The workshops have also helped motivate fishers to share their own knowledge about what proven or new methods they use to keep seabirds away from fishing vessels and inspire them to make further changes on their boats. Previous social science research projects on the drivers of mitigation uptake in inshore and HMS fisheries have highlighted the importance of these workshops to fishers.

The project will provide financial support to continue the roll out of these workshops, both to new participants and provide opportunities for periodic refreshers as well as sharing of knowledge between new and experienced operators.

Project Objectives:

To continue to provide Seabird SMART Workshops for inshore and HMS operators.

Project Outputs:

1. Agreed number of workshops held.
2. Annual evaluation reports on the workshops undertaken, attendance, feedback and any recommendations for improvements to continued delivery of future workshops.

Indicative Cost: \$20,000 per annum

MIT-3 Assessing views on the value of corals to inform current and potential ecosystem-based fisheries management approaches

Term: 3 years

Guiding Objectives: CSP Objective A

Project Objectives:

1. To understand if, how and why multiple sectors, partners and stakeholders value protected corals and how those views might be better incorporated into bycatch mitigation and EBFM approaches
2. To expand engagement through increased outreach with domestic coral-interested stakeholders and treaty partners and to establish collaborations with international agencies / institutions with coral bycatch frameworks

3. To understand approaches for fisher, stakeholder and indigenous engagement with regulatory bodies
4. To ascertain how international approaches might work in New Zealand, or refresh the domestic *status quo*

Project Summary:

New Zealand's fisheries management regime has long recognised ecosystem-based fisheries management as a concept that parallels the purpose of New Zealand's Fisheries Act, as it seeks to maintain a healthy and resilient status of the marine environment whilst providing for utilisation. Nonetheless, implementing and understanding the success of EBFM is challenging, as is the case for protected corals that are irrevocably damaged by commercial fishing activity with minimal and ineffective management actions following a capture event, and with no agreed acceptable limit for bycatch. This project seeks to better understand societal and stakeholder views on the value of coral biodiversity as a driver for fisheries management measures to mitigate bycatch. An important aspect of EBFM is understanding and balancing stakeholder views and sociological values representative of multiple sectors with interest in an ecosystem. As coral distribution, likelihood of interactions, and risk is now relatively well characterised for multiple coral taxa in the NZ EEZ, this project takes a social approach to understand views on the value of corals, and to consider how those could be implemented into EBFM. In particular, the views of fishers and treaty partners in their consideration of taonga species has been minimally addressed. Firstly, engagement will be undertaken with iwi partners, domestic stakeholders, and commercial fishers through workshops, surveys /questionnaires, meetings and discussions. Secondly, we will engage with international entities that also have coral fisheries bycatch, fisheries observers and indigenous partners to compare respective approaches to mitigation. Thirdly, views obtained will then be qualified and considered through application to current policy or pilot testing a novel potential management approach, process, or policy for coral bycatch mitigation. The exact approach will be determined later with the supplier and in parallel with policy, but could be extrapolated from a domestic and/or international policy or decision-making process (e.g. agreed bycatch thresholds, population management plans, structured decision making, DOC Biodiversity Action Plans, Bayesian networks (following RA approach), Fishery Ecosystem Plans (USA), Action Plans (SPREP), input/output controls).

Project Outputs:

1. Establishment and increased reach of coral network (commenced MIT2022-03).
2. Technical report on the work undertaken and results found, including recommendations
3. Peer-reviewed/grey literature for wider dissemination

Indicative Cost: \$60,000 per annum

MIT-4 Using thermal cameras to assess effectiveness of seabird mitigation

Term: 1 year

Guiding Objectives: CSP Objective A; National Plan of Action- Seabirds

Project Objective:

To develop seabird bycatch mitigation effectiveness assessment tools that can be used comparatively at day and night.

Project Summary:

Many seabirds are less active at night and thus conducting fishing activities at night can be an effective bycatch mitigation option. Indeed, setting longlines at night is a key element of both regulatory and best practice mitigation strategies. The comparative assessment of mitigation efficacy of different mitigation methods is most readily achieved through dedicated studies relying on observational bycatch risk proxy

data, such as attacks on baited hooks, contact with trawl warps, or the abundance of birds in high risk areas around fishing gear. Currently these studies can only be achieved during daylight, limiting their applicability to include assessment of different mitigation methods during the night.

This project will assess the utility of thermal cameras to quantify seabird attendance around vessels and potentially other metrics as a proxy for risk, to allow their applicability to night observations. These trials will involve a comparison of visual and thermal camera collected data. The potential use of thermal cameras allows for the assessment of effectiveness of night setting as a mitigation option across a range of moon lamination. It is envisaged that on-vessel trials would be conducted alongside other at-sea mitigation/interaction projects in order to maximise cost synergies.

Having mitigation effectiveness assessment tools that can be used comparatively at day and night will facilitate ongoing improvements to mitigation strategies for fisheries where night fishing activity is already used as an element of a mitigation strategy.

Project Outputs:

1. Proposed protocol(s) for data collection to assess seabird bycatch mitigation effectiveness suitable for use during both day and night.
2. Technical report on the work undertaken and results found.
3. Data collected during the project in electronic format.

Indicative Cost: \$50,000

MIT-5 Supporting uptake of sink rate assessment by fishers in bottom longline fisheries

Term: 2 years

Guiding Objectives: CSP Objective A; National Plan of Action- Seabirds

Project Objective:

To facilitate and support the adoption and use of an adaptive management tool by fishers to effectively assess sink rate of their lines.

Project Summary:

Sinking baited hooks to prescribed depths under the protection of bird scaring lines is a central component of seabird bycatch mitigation in bottom longline fisheries. There are both regulatory requirements and best practices principles which require the measurement of sink rates by bottom longline fishers.

This project will facilitate and drive and uptake of the sink rate adaptive management tools currently in development under CSP project MIT2024-04. The project will allow for provision of gear and advice to enable fishers to adopt and use the tool. Use of the tool will enhance their management of line configurations to achieve effective seabird bycatch management strategies adapted for their operations.

Project Outputs:

1. Provision of gear and advice to fishers to enable their adoption of the adaptive management tool.
2. A summary report on the activities undertaken, feedback from fishers and recommendations for future support which may be required by fishers to use the adaptive management tool

Indicative Cost: \$40,000 per annum