Conservation Services Programme Annual Plan 2025/26

Department of
Conservation
Te Papa Atawhai

New Zealand Government

Statement on Conservation Services

Conservation services are defined in section 2 of the Fisheries Act 1996 as follows:

> *"Conservation services means outputs produced in relation to the adverse effects of commercial fishing on protected species, as agreed between the Minister responsible for the administration of the Conservation Act 1987 and the Director-General of the Department of Conservation, including—*
>
> > *(a) Research relating to those effects on protected species:*
> >
> > *(b) Research on measures to mitigate the adverse effects of commercial fishing on protected species:*
> >
> > *(c) The development of population management plans under the Wildlife Act 1953 and the Marine Mammals Protection Act 1978."*

We agree that the outputs described in the following pages, to be delivered in 2024/25, are "conservation services" in accordance with this definition. Cost recovery principles have been applied in accordance with section 262 of the Fisheries Act 1996.

Hon. Tama Potaka
Minister of Conservation

Stephanie Rowe
Deputy Director-General Biodiversity Heritage and Visitors
Department of Conservation

Table of Contents

1.   Conservation Services Programme Overview

1.1 Background

New Zealand is a maritime nation with the fourth largest exclusive economic zone (EEZ) in the world. Our waters provide for important commercial, recreational and customary fishing resources. They are also the home of many protected species including:

- All marine mammals
- All seabirds (except black backed gulls)
- All marine reptiles
- Nine fish (deepwater nurse shark, white pointer shark, whale shark, basking shark, oceanic white-tip shark, manta ray, spine-tail devil ray, giant grouper and spotted black grouper)
- Black corals (all species in the order Antipatharia)
- Gorgonian corals (all species in the order Gorgonacea)
- Stony corals (all species in the order Scleractinia)
- Hydrocorals (all species in the family Stylasteridae)

Marine protected species can be threatened by commercial fishing via both direct and indirect impacts:

- Direct impacts include being caught, injured, or killed in nets or on hooks. Benthic species may also be impacted by bottom trawlers and other fishing methods operating on or near the seabed.
- Indirect impacts such as habitat modification, food competition and behaviour modification of protected species may also occur. These impacts may compromise the viability or recovery of protected species populations.

The Department of Conservation has a statutory duty to protect the above species as defined in the Wildlife Act 1953 and the Marine Mammals Protection Act 1978. The 2024 high court decision[1] regarding the Environmental Law Initiative (ELI) court case against DOC and the Ministry for Primary Industries (MPI) highlights the importance of the Crown's role in the management of protected species and reinforces DOC's statutory responsibility for conserving protected species from the impacts of commercial fishing.

1.2   What is the Conservation Services Programme?

DOC's primary mechanism for reducing fisheries bycatch is through the Conservation Services Programme (CSP), which levies the commercial fishing industry to monitor the impact of commercial fishing on protected species, study populations of species that are vulnerable to fisheries, and look at ways to mitigate bycatch (Conservation Services).

Conservation Services are defined in the Fisheries Act 1996 as being outputs produced in relation to the adverse effects of commercial fishing on protected species, as agreed between the Minister responsible for administering the Conservation Act 1987 and the Director-General of the Department of Conservation, including:

- Research relating to those effects on protected species.
- Research on measures to mitigate the adverse effects of commercial fishing on protected species.

---

[1] The Environmental Law Initiative v Director-General of the Ministry for Primary Industries [2024] NZHC 3824 Decision

- The development of population management plans under the Wildlife Act 1953 and the Marine Mammals Protection Act 1978.

Conservation Services Levies are:

- Approved by the Minister of Conservation
- Collected by the Ministry for Primary Industries
- Set annually following extensive consultation between relevant government agencies and stakeholder groups

It is a fundamental principle of the CSP that once a bycatch problem is successfully addressed, levies will no longer be charged for that interaction. The CSP relies, in part, on data collected by fisheries observers and onboard cameras to ascertain the adverse effects of commercial fishing on protected species. It is, therefore, in the best interests of fishers to collaborate with researchers, especially in the development of mitigation measures.

1.3 What has CSP achieved to date?

The CSP provides a rare example in the global fishing industry of a transparent and accountable process where industry is legally required to contribute to the costs of research relating to its environmental impacts.

Conservation Services levies have funded many initiatives, such as:

- The development of several promising mitigation devices and practices, including offal and discharge management, improved tori lines and bird bafflers, and the development of haul mitigation devices.
- The trial and implementation of novel mitigation devices with overseas partners, including sliding branch line weights and hook-shielding devices.
- The protected species liaison programme.
- The development of management measures that aim to contribute to reducing current rates of bycatch of protected species.
- Updates to handling and release practices which have contributed to the increase in post-release survival of protected species (e.g. spine-tail devil rays).
- A major shift in awareness and mitigation implementation to address priority bycatch issues such as black petrel bycatch in small vessels in the longline and trawl fisheries. Fishing companies have been involved with DOC in exploring several research avenues and some companies have trialled devices in their fishing operations at considerable expense to themselves

Some fishing companies have also developed and trialled their own ideas for mitigation measures. The most successful of these involved modifications to fishing practices e.g., hauling methods and offal discharge. Similar cooperative and innovative approaches have been seen in some fisheries where marine mammals have been caught in significant numbers, for example the use of sea lion exclusion devices (SLEDs) in the subantarctic squid fishery.

The introduction of levy-funded projects and independent actions of fishing companies have resolved many interactions between commercial fisheries and marine protected species. The New Zealand Government is far better informed of these problems due to increased observer coverage funded through Conservation Services Levies and the recent introduction of onboard cameras in the inshore fleet. Finally, all those who currently pay these levies have a strong financial incentive to reduce interactions with protected species and thus negate the need for levies to be paid.

2.   Planning and Development of the 2025/26 CSP Annual Plan

2.1 CSP Planning process

[The CSP Strategic Statement](#) outlines stakeholder processes used to plan and prioritise research for delivery through CSP. It provides detail on the wider management context, the research planning and prioritisation processes used by CSP, and the way CSP is implemented through collaboration with others.

Since late 2023, CSP has shifted from being driven by the four main protected species groups to a solutions/outcomes focus for determining priority areas for focusing research. This is shaped primarily by taxon specific Medium Term Research Plans, current issues and emerging risks in New Zealand commercial fisheries, and feedback and engagement with other government agencies, industry, and NGOs. The 2025/26 priority areas for CSP are below (Table 1.)

Table 1. 2025/26 CSP Research Priorities

🦀	**SURFACE LONGLINE** –multi-taxa bycatch, limited data
✳️	**LARGE VESSEL TRAWL** – ongoing multi-taxa bycatch, irreversible impacts
🏠	**SUBANTARCTIC** – home to multiple protected species, data gaps
📷	**CAMERAS / INSHORE DATA** – new information, data gaps
✓	**MITIGATION GAPS = CONSERVATION GAINS** – improving outcomes

The CSP planning process considers and works in parallel with other relevant planning and management processes such as the National Plans of Action (NPOAs) for seabirds[2] and sharks[3], Threat Management Plans (TMPs) for Hector's and Māui dolphin[4] and the New Zealand sea lion[5], and Te Kaweka Takohaka mō te Hoiho[6]. The iterative and inclusive planning process ensures that gaps are identified, and research synergies are maximised.

A key component of the planning process is the CSP Research Advisory Group (RAG) consisting of representatives from commercial fishing and environmental groups, scientists, and iwi representatives. This approach delivers a collaborative multi-stakeholder research planning and prioritisation process.

2.2   Observer Planning

MPI and DOC work together to plan and prioritise observer coverage based on specific monitoring objectives for protected species interactions with fisheries and achieving adequate coverage levels for high-

---

[2] [National Plan of Action - Seabirds](#)
[3] [National Plan of Action - Sharks (under review in 2025)](#)
[4] [Hector's and Māui Threat Management Plan](#)
[5] [New Zealand sea lion Threat Management Plan (under review in 2025)](#)
[6] [Te Kaweka Takohaka mō te Hoiho](#)

risk fisheries to allow detection of changes in bycatch over time. These objectives are balanced with other fisheries management objectives, available resources of the observer programme, and feasibility of delivery.

Coverage is aimed at reducing uncertainty around the risks to protected species as well as assessing mitigation options for identified interactions. Furthermore, the allocation of observer coverage across fisheries is also guided by several factors, including data needs for protected species and fisheries management, compliance, and international obligations.

Fisheries New Zealand (FNZ), a branch of MPI, lead the rollout of cameras on commercial fishing vessels. As of April 2025, cameras are on 195 vessels and are expected to be installed on around 230 vessels by the time the rollout is complete in mid-2025. As a result, inshore observer coverage has reduced significantly, however, observers may continue to be used where information cannot be provided by electronic monitoring at this stage. Inter-agency collaboration has determined in which circumstances observers are to be deployed on vessels with cameras.

There is a supplementary process for monitoring and verification planning to reflect the reduced observer placement and compensate for at-sea resourcing; more details can be found under INT2025-02 Port-based bag and tag. However, at-sea observers can/may still be used:

- As part of a vessel-specific monitoring plan,
- Where information cannot be provided by onboard cameras (e.g., where cameras are not suitable and scientific information is required for stock assessments, assessments of the impacts of fisheries, fisheries research, and broader ecosystem research),
- Where required to meet international obligations, and
- To support monitoring and evaluation of the efficacy of the on-board programme.

This year, the process for determining observer priorities and observer days has changed. DOC provided the data needs that are currently unable to be collected by onboard cameras, and FNZ will plan observer coverage accordingly. DOC will continue to receive and analyse observer collected data. The observer programme will not be cost recovered under CSP and will be fully funded by MPI.

2.3   Overview of the CSP Annual Plan 2025/26

The Conservation Services Programme Annual Plan for 2025/26 (Appendix 1) will deliver priority research to inform management of the effects of commercial fishing on marine protected species.

The Plan proposes work in three key areas: Interaction, Population and Mitigation.

Interaction	Examine the interactions between protected species and commercial fisheries. Projects include the retrieval, necropsy and identification of bycaught protected species.
Population	Examine the population dynamics of protected species where there are concerns due to their propensity for being bycaught. Some of the current projects are examining high priority populations of Southern Buller's albatross, New Zealand sea lion, antipodean and white-capped albatross, and black petrel.
Mitigation	Projects apply science or other information to develop or implement measures to reduce the adverse impact of commercial fishing on protected species. Recent projects have included the development of sea lion and seal exclusion devices and measures to manage fish waste in trawl fisheries.

The format used to outline Conservation Services in this Plan includes an outline of the objectives and rationale for each project and the anticipated outputs. Guiding objectives, both CSP Objectives and relevant management plans, are identified for each project. The project specifications also include cost recovery information, e.g., indicative project costs (excluding administration costs), relevant provisions within the Fisheries (Cost Recovery) Rules 2001 that determine cost recovery allocation, the rationale for the cost recovery, and relevant fish stocks to which cost recovery is applied.

2.4   Finances

CSP research is funded by a combination of commercial fishing levies and Crown funding. All species mentioned in this plan are protected and have been recorded as non-targeted species incidentally captured by commercial fishing. As such, the CSP Annual Plan 2025/26 reflects the research required to be carried out in the interests of the effective management of those species, in accordance with section 262(d) of the Fisheries Act (1996) (cost recovery principles) and the Fisheries (Cost Recovery) Rules 2001. To support transparency and compliance with the cost recovery provisions, the cost recovery section of each project in this Plan has been expanded to clearly justify how each project aligns with the rules outlined in Schedule 2 of the Fisheries (Cost Recovery) Rules (Apportionment of costs of fisheries and conservation services).

The Fisheries and Conservation Services levies are set annually to recover the cost of services provided by FNZ to the fishing industry. MPI seeks to keep service costs as low as possible, while continuing to provide for the sustainable utilisation of fisheries.

The CSP levy for 2025/26 is $1.4 million, a reduction of $2 million from 2024/25, and $2.4 million from 2023/24. This includes a reduction of $1.2m as observer coverage is now being fully funded by MPI. DOC is mindful of cost burden on the fishing industry and has made deliberate efforts to reduce the overall cost of the Plan while balancing conservation priorities.

Appendix 1: CSP 2025/26 Project Costs

Code	Project	Research	Admin	Total	CR Item	Industry %	Industry	Crown
Interaction Projects								
INT2023-04	Identification of marine mammals, turtles and protected fish captured in New Zealand fisheries	$15,000	$2,191	$17,191	4	100	$17,191	$0
INT2024-03	Understanding the effects of fishing depth and soak period on turtle and seabird bycatch	$20,000	$2,922	$22,922	4	100	$22,922	$0
INT2025-01	Observing commercial fisheries	MPI funded						
INT2025-02	Species identification of camera-detected protected species captures in New Zealand fisheries	MPI funded						
INT2025-03	Identification of seabirds captured in New Zealand fisheries	$100,000	$14,609	$114,609	4	100	$114,609	$0
INT2025-04	Identification, storage and genetics of cold-water coral bycatch specimens	$90,000	$13,148	$103,148	4B	100	$34,379	$0
					-	0	$0	$68,769
INT2025-05	Port-based bag and tag	$80,000	$11,687	$91,687	4	100	$91,687	$0
INT2025-06	Factors influencing risk of marine mammal and seabird bycatch in inshore trawl and set net fisheries	$40,000	$5,844	$45,844	4	100	$45,844	$0
INT2025-07	Examining recruitment dynamics and recovery potential from fishing-induced adverse impacts on deep-sea corals on Chatham Rise seamounts	$48,500	$7,085	$55,585	4B	100	$18,527	$0
					-	0	$0	$37,059
Population Projects								
POP2023-01	Aerial survey of leatherback turtles off Northeast North Island	$50,000	$7,305	$57,305	3	50	$28,652	$28,652
POP2023-02	Southern Buller's population study	$150,000	$21,914	$171,914	3	50	$85,957	$85,957
POP2023-05	Auckland Islands New Zealand sea lions	$150,000	$21,914	$171,914	2	90	$154,722	$17,191
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	$65,000	$9,496	$74,496	4B	100	$74,496	$0
POP2025-01	Southern Buller's albatross juvenile banding and tracking	$50,000	$7,305	$57,305	Crown funded			$57,305

POP2025-02	Black Petrel and flesh-footed Shearwater demographic modelling	$40,000	$5,844	$45,844	3	50	$22,922	$22,922
POP2025-03	Black petrel monitoring	$35,000	$5,113	$40,113	3	50	$20,057	$20,057
POP2025-04	Auckland Islands seabird research: Gibson's and white-capped albatross	$160,000	$23,375	$183,375	Crown funded			$183,375
POP2025-05	Salvin's albatross Western Chain research	$40,000	$5,844	$45,844				$45,844
POP2025-06	Updated population assessment for New Zealand fur seal in New Zealand	$80,000	$11,687	$91,687	3	50	$45,844	$45,844
POP2025-07	Chatham albatross research	$50,000	$7,305	$57,305	3	50	$28,652	$28,652
POP2025-08	Antipodes albatross and white-chinned petrel research	$120,000	$17,531	$137,531	Crown funded			$137,531
POP2025-09	Campbell Island seabird research	$150,000	$21,914	$171,914				$171,914
POP2025-10	Population growth, distribution and demographics of New Zealand sea lions in northern Stewart Island	$20,000	$2,922	$22,922	3	50	$11,461	$11,461
Mitigation Projects								
MIT2024-01	Protected Species Liaison Programme	$250,000	$36,523	$286,523	4	100	$286,523	$0
MIT2024-06	Efficacy of seabird mitigation in large vessel trawl	$50,000	$7,305	$57,305	4	100	$57,305	$0
MIT2024-07	Hector's dolphin acoustic deterrence devices in trawl and set net fisheries	$60,000	$8,766	$68,766	4	100	$68,766	$0
MIT2025-01	Improving mitigation data streams to assess bycatch mitigation effectiveness in inshore and HMS fisheries	$30,000	$4,383	$34,383	4	100	$34,383	$0
MIT2025-02	Seabird SMART Workshops	$20,000	$2,922	$22,922	4	100	$22,922	$0
MIT2025-03	Using thermal cameras to assess effectiveness of seabird mitigation	$50,000	$7,305	$57,305	4	100	$57,305	$0
MIT2025-04	Supporting uptake of sink rate assessment by fishers in BLL	$40,000	$5,844	$45,844	4	100	$45,844	$0
TOTAL		$2,053,500	$300,000	$2,353,500			$1,390,968	$962,532

Appendix 2: CSP Annual Plan 2025/26 Projects

1.   Interaction Projects

NOTE: This multi-year project was consulted on in 2023/24 and is included here for completeness

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

Project Code: INT2023-04

Start Date: 1 July 2023

Completion Date: 30 June 2026

Guiding Objectives: CSP Objectives B, C; National Plan of Action – Sharks; New Zealand sea lion Threat Management Plan.

Project Objective:

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

Rationale:

The accurate determination of the taxon of marine mammals, turtles and protected fish captured in New Zealand fisheries is vital for examining the potential threat to population viability posed by incidental fisheries captures. Observers on commercial vessels are not always able to identify marine mammals, turtles, and protected fish at sea with high precision and the assessment of the age-class may require expert knowledge. Information gained through this project will link to FNZ databases and will inform ongoing bycatch estimation, risk assessment, research, and modelling of the effects of fisheries bycatch on marine mammal, turtle, and protected fish populations. This project is a continuation of INT2020-02 and is designed to complement the existing seabird and coral identification projects. Observers routinely collect samples of genetic material from these taxa and these can be used to resolve uncertain identifications from photographs.

Research Approach:

Where Fisheries Observers recorded an incidental capture of a marine mammal, turtle, or protected fish, generally no specimen is retained. Instead, photographic records and a genetic sample are taken. Live interactions are photographed where possible. All photographs obtained, by specimen, will be delivered to a suitable expert for that taxonomic group in electronic format on a quarterly basis. Details on the date, time, location, and fishery of capture will also be provided. Photographs will be examined to determine the following:

- Identification, to the lowest taxonomic level possible
- Sex (where possible)
- Age (where possible), and
- Provenance (origin) (where possible).

These data will be reported by taxon and fishery stratum (fishing method, fishery area and target species). When a specimen is identified, the identification features used shall be fully described. Genetic samples of all bycaught marine mammals, turtles and protected fish are routinely collected by Fisheries Observers and where photographic analysis cannot adequately determine taxa, genetic analysis may be undertaken.

Outputs:

1. A summary of results will be reported, reviewed by the CSP TWG, and published on an annual basis.
2. Information requested by CSP will be provided within a reasonable timeframe (usually 10 working days).
3. Provision of all data collected in electronic format, suitable for updating FNZ databases and/or other relevant databases.

Note: A three-year term is proposed

Indicative Research Cost: $15,000 per annum

Cost Recovery Principle: 262(d)

Cost Recovery: F(CR) Item 4 (100% Industry)

Cost Recovery Rationale:

In order to manage, and prioritise (e.g. through risk assessments), the implementation of measures to reduce bycatch it is important to understand what species are being bycaught. There is extensive investment in wider fisheries monitoring of protected species bycatch, but at sea-monitoring (observers or cameras) cannot always determine to species level which protected species is bycaught.

This project provides expert support to ensure the most accurate level of identification for marine mammal, turtle and protected fish species bycaught and supports a range of cross agency activity to reduce bycatch.

Accurate species-level identification enables robust data collection and analysis, which in turn informs the development of targeted mitigation strategies, such as changes to fishing gear, practices, or spatial/temporal closures. By improving the understanding of which species are impacted and how, this work directly contributes to avoiding, remedying, or mitigating the adverse effects of commercial fishing on protected marine species.

Fish stocks: BAR1, BAR4, BAR5, BAR7, BIG1, BNS1, BNS2, BNS3, BNS7, BUT5, BUT7, BWS1, ELE3, ELE5, ELE7, EMA1, EMA3, EMA7, FLA1, FLA2, FLA3, FLA7, GMU1, GSH1, GSH3, GSH4, GSH7, GSH8, GSH9, GSP1, GSP7, GUR1, GUR2, GUR3, GUR7, GUR8, HAK1, HAK4, HAK7, HOK1, HPB1, HPB2, HPB3, HPB4, HPB7, HPB8, JDO1, JDO2, JDO3, JDO7, JMA1, JMA3, JMA7, KIN1, KIN7, KIN8, LEA1, LEA2, LEA3, LIN1, LIN2, LIN3, LIN4, LIN5, LIN6, LIN7, MOK1, MOK3, MOK5, ORH1, ORH2A, ORH2B, ORH3A, ORH3B, OEO1, OEO3A, OEO4, OEO6, RCO1, RCO3, RCO7, RSN1, RSN2, RIB1, RIB2, RSK1, RSK3, RSK7, RSK8, SBW6A, SBW6R, SBW6I, SBW6B, SCH1, SCH2, SCH3, SCH4, SCH5, SCH7, SCI1, SCI2, SCI4A, SCI6A, SCI6B, SKI1, SKI3, SKI7, SNA1, SNA2, SNA3, SNA7, SNA8, SPD1, SPD3, SPD4, SPD5, SPD7, SPD8, SPE1, SPE3, SPE4, SPE7, SPO1, SPO3, SPO7, SPO8, SQU1T, SQU6T, SSK1, SSK3, SSK7, SSK8, STA1, STA3, STA4, STA5, STA7, STN1, SWA1, SWA3, SWA4, SWO1, TAR1, TAR2, TAR3, TAR4, TAR5, TAR7, TAR8, TOR1, TRE1, TRE2, TRE7, TRU3, TRU4, WAR1, WAR2, WAR3, WAR7, WAR8, WWA2, WWA3, WWA4, WWA5B, WWA7, YEM1, YEM8, YEM9

NOTE: This multi-year project was consulted on in 2024/25 and is included here for completeness

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

Project Code: INT2024-03

Start Date: 1 October 2024

Completion Date: 30 September 2025

Guiding Objectives: CSP Objectives A and B, CSP Sea Turtle Medium Term Research Plan, CSP Seabird Medium Term Research Plan

Project Objectives:

1. Characterise depth and temperature profiles using a wider range of TDR data obtained from surface longline vessels to identify their effects on leatherback turtle and seabird bycatch.

2. Investigate if catch composition, proximity to floats and catch per unit effort is correlated with turtle and seabird bycatch and how changes to set depth may affect target species catch rates.

3. Recommend approaches that can be explored for reducing leatherback turtle and seabird bycatch.

Rationale:

The Conservation Services Programme Sea Turtle and Seabird Medium Term Research Plans outline a five-year research programme to deliver on the turtle and seabird interaction research component of CSP. It is targeted at addressing relevant CSP Objectives (as described in the CSP Strategic Statement) and the NPOA-Seabirds. This project delivers priority research components of the plans involving characterising fisheries interactions, particularly for turtles in Northeast NZ, an area identified as a hotspot for fisheries bycatch of critically endangered leatherback turtles in the surface longline fleet.

Research Approach:

Expanding on the initial surface longline depth profile characterisations in MIT2023-02 (Understanding and mitigating seabird and turtle bycatch during the pelagic longline soak period), this desktop study will pool TDR data collected under CSP projects MIT2023-02, MIT2024-02 and MIT2024-03 to characterise depth and temperature profiles across a wider range of the fleet, and assess impacts of fishing depth, catch composition and catch per unit effort on seabird and turtle bycatch.

Using recent EM verified bycatch data and where possible, historic observer data, the project will also assess informative parameters such as duration of set, size of animal, moon phase, number of hooks to nearest float etc. The project will be informed by other relevant turtle and seabird projects currently ongoing or planned by DOC/FNZ and will recommend any other mitigation options for possible future use or testing.

Outputs:

1. A technical report detailing the research undertaken, results, and recommendations to improve bycatch mitigation.
2. All data will be provided to DOC in electronic format.

Note: A two-year term is proposed.

Indicative Research Cost: $20,000 per annum

Cost Recovery Principle: 262(d)

Cost Recovery: F(CR) Item 4 (100% Industry)

Cost Recovery Rationale:

Seabird and turtle bycatch in the surface longline fishery remain a concern. Recently, greatly improved seabird bycatch mitigation has been legislated, but these measures are only designed to reduce bycatch on setting. It is apparent that seabird bycatch is continuing during the soak period, and this is the period in which turtles are most likely bycaught. However, the extent of this issue and the factors driving it remain poorly understood. This project aims to better characterise the bycatch risks during this period of fishing and identify how further management could be undertaken to reduce this going bycatch.

Fish stocks: BIG1, STN1, SWO1, TOR1

References:

Siders, Z. A., Murray, C., Puloka, C., Harley, S., Duffy, C., Long, C. A., ... & Jones, T. T. (2024). Potential of dynamic ocean management strategies for western Pacific leatherback sea turtle bycatch mitigation in New Zealand. *Frontiers in Marine Science, 11,* 1342475

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

DOC CSP project MIT2023-02 Understanding and mitigating seabird and turtle bycatch during the pelagic longline soak period

DOC CSP project MIT2024-02 Enhancing seabird bycatch mitigation across the set and soak periods in surface longline fisheries DOC CSP project

DOC CSP project MIT2024-03 Assessment of weighted hooks as a seabird bycatch mitigation option for surface longline fisheries

Fisheries NZ project PRO2023-15 Post-release survival of leatherback turtles

1.3 INT2025-02 Species identification of camera-detected protected species captures in New Zealand fisheries

Project Code: INT2025-02

Start Date: 1 July 2025

Completion Date: 30 June 2028

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).

Rationale:

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.

Research Approach:

Where electronic monitoring identifies an incidental protected species capture, all footage obtained, by specimen, will be delivered to a suitable taxa expert in electronic format on a regular basis. Details on each capture, including the date, time, location and fishery will also be provided. Camera footage will be examined to determine the following:

- Species identification, to the lowest taxonomic level possible
- Sex (where possible), and
- Age (where possible)

These data will be reported by taxon and fishery stratum (fishing method, fishery area and target species). When a specimen is identified, the identification features used shall be fully described. The level of confidence in each specimen's identification (and associated age and sex information) will also be recorded.

Outputs:

A technical report summarising the confirmed identification and where possible, sex and age 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).

Note: A one-year term is proposed.

Indicative Research Cost: $30,000 per annum

Cost Recovery: 100% MPI funded

1.4 INT2025-03 Identification of seabirds captured in New Zealand fisheries

Project Code: INT2025-03

Start Date: 1 July 2025

Completion Date: 30 June 2028

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

Project Objectives:

1. To determine, through examination of returned specimens, the taxon (including subspecies where applicable), sex, and where possible, age-class and provenance of seabirds captured in fisheries (for 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 subspecies where applicable), and where possible sex, 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 (including subspecies where applicable) of seabirds captured in fisheries (dead specimens discarded at sea).

Rationale:

Large numbers of seabirds frequent New Zealand waters. Birds 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. Seabirds are not always able to be identified at sea or through onboard cameras, 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. 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 develop proof of concept and 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.

Research Approach:

Specific objectives 1-3

Deceased birds returned by Fisheries Observers and fishers will be delivered, suitably packaged and labelled to the research provider. Observers and fishers make note of the circumstances of capture and provide a tentative identification. Seabirds returned will be examined to determine the following:

- Species identification and classification
- Sex
- Moult and brood patch development (as a partial indicator of breeding status)
- Age
- Provenance (origin) (where possible)
- Subcutaneous fat score as an index of body condition
- Stomach and gizzard contents, and
- General body condition including any signs of injury and cause of death (where possible).

The data will be reported on by species and fishery stratum (fishing method, fishery area and target species). The methodologies used in examining the specimens and categorising them into different groups shall be fully described. Differences in research protocols compared to previous necropsy research on New Zealand seabirds returned from fisheries shall be fully detailed and the implications of any differences discussed.

Specific objective 4

Where Fisheries Observers record an incidental bird capture and no specimen is retained (either live captures or discarded dead birds), all photographs obtained, by specimen, will be delivered to the contractor in electronic format. Details of the date, time, location, and fishery of capture will also be provided. Photographs will be examined to determine the following:

- Identification and classification, to the lowest taxonomic level possible
- Sex (where possible)
- Age (where possible), and
- Provenance (origin) (where possible).

These data will be reported by taxon and fishery stratum (fishing method, fishery area and target species). When a specimen is identified and separated from similar species, the identification features used shall be fully described.

Specific objective 5

Based on the genetic markers developed by Foote (2024) a proof-of-concept testing protocol will be developed in Year 1. This protocol will enable genetic determination of species identification through DNA analysis of feather samples collected from bycaught seabird carcasses. Subject to satisfactory progress in year 1, this protocol will be piloted for routine monitoring of feather samples during years 2 and 3.

Outputs:

1. A technical report summarising the confirmed identification, sex, age and provenance and other data collected for 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.

Note: A three-year term is proposed

Indicative Research Cost: $100,000 per annum

Cost Recovery Principle: 262(d)

Cost Recovery: F(CR) Item 4 (100% Industry)

Cost Recovery Rationale:

In order to manage, and prioritise (e.g. through risk assessments), the implementation of measures to reduce bycatch it is important to understand what species are being bycaught. There is extensive investment in wider fisheries monitoring of protected species bycatch, but at sea-monitoring (observers or cameras) cannot always determine to species level which protected species is bycaught.

This project provides expert support to ensure the most accurate level of identification for seabird species bycaught and supports a range of cross agency activity to reduce bycatch.

Accurate species-level identification enables robust data collection and analysis, which in turn informs the development of targeted mitigation strategies, such as changes to fishing gear, practices, or spatial/temporal closures. By improving the understanding of which species are impacted and how, this work directly contributes to avoiding, remedying, or mitigating the adverse effects of commercial fishing on protected marine species.

Fish stocks: BAR1, BAR4, BAR5, BAR7, BIG1, BNS1, BNS2, BNS3, BNS7, BUT5, BUT7, BYX2, BYX3, ELE3, ELE5, ELE7, EMA1, EMA3, EMA7, FLA1, FLA2, FLA3, FLA7, GMU1, GSH1, GSH3, GSH4, GSH7, GSH8, GSH9, GSP1, GSP7, GUR1, GUR2, GUR3, GUR7, GUR8, HAK1, HAK4, HAK7, HOK1, HPB1, HPB2, HPB3, HPB4, HPB7, HPB8, JDO1, JDO2, JDO3, JDO7, JMA1, JMA3, JMA7, KIN1, KIN7, KIN8, LEA1, LEA2, LEA3, LIN1, LIN2, LIN3, LIN4, LIN5, LIN6, LIN7, MAK1, MOK1, MOK3, MOK5, ORH1, ORH2A, ORH2B, ORH3A, ORH3B, OEO1, OEO3A, OEO4, OEO6, RCO1, RCO3, RCO7, RSN1, RSN2, RIB1, RIB2, RSK1, RSK3, RSK7, RSK8, SBW6A, SBW6R, SBW6I, SBW6B, SCH1, SCH2, SCH3, SCH4, SCH5, SCH7, SCI1, SCI2, SCI4A, SCI6A, SCI6B, SKI1, SKI3, SKI7, SNA1, SNA2, SNA3, SNA7, SNA8, SPD1, SPD3, SPD4, SPD5, SPD7, SPD8, SPE1, SPE3, SPE4, SPE7, SPO1, SPO3, SPO7, SPO8, SQU1T, SQU6T, SSK1, SSK3, SSK7, SSK8, STA1, STA3, STA4, STA5, STA7, STN1, SWA1, SWA3, SWA4, SWO1, TAR1, TAR2, TAR3, TAR4, TAR5, TAR7, TAR8, TOR1, TRE1, TRE2, TRE7, TRU3, TRU4, WAR1, WAR2, WAR3, WAR7, WAR8, WWA2, WWA3, WWA4, WWA5B, WWA7, YEM1, YEM8, YEM9

Reference:

Foote, I. 2024. Population genomics of Antipodean and Gibson's albatross and use of genetic markers for threatened seabird species identification. Open Access Te Herenga Waka-Victoria University of Wellington. Thesis. https://doi.org/10.26686/wgtn.27688116

1.5 INT2025-04 Identification, storage and genetics of cold-water coral bycatch specimens

Project Code: INT2025-04

Start Date: 1 July 2025

Completion Date: 30 June 2028

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 and fishers 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) and thereby their use in a range of projects that use this data (e.g., habitat suitability mapping, bycatch assessments etc.)

Rationale:

The 2010 amendment to 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 and fishers 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 COD under the GOC coral code, which could now be updated considering there are preferred 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.

Research Approach:

A catalogue of observer and fisher-collected coral samples will be created and maintained. These samples will be verified taxonomically by domestic experts at regular intervals throughout the year. In addition to this (when possible and as needed), international coral experts will refine the taxonomic identification even further. The updated taxonomic identification of the bycatch samples will then be shared with FNZ for them to update this information in the COD database. In addition to taxonomic verification of returned specimens and photographs, the project will incorporate funding to facilitate genetic analysis of bycatch. Genetic

methods can further elucidate the extent of diversity, refine taxonomic resolution, and distinguish cryptic species. Genetic analyses can also be applied to archived specimens for targeted research on specific taxa or target fisheries. Observer briefings, manuals, and training material will be revised based on outputs of this project to continue to improve the accuracy of at-sea identification, and thus continually provide higher-quality data for downstream usage.

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 and fisher 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 Fisheries Observers.
5. A spreadsheet summarising the changes made to COD records.

Note: A three-year term is proposed

Indicative Research Cost: $90,000

Cost Recovery Principle: 262(d)

Cost Recovery: Project cost will be split 33.33% cost recovered ($29,970 will be 100% Industry F(CR) Item 4B) and 66.67% Crown funded ($60,030)

Cost Recovery Rationale:

In order to manage, and prioritise (e.g. through risk assessments), the implementation of measures to reduce bycatch it is important to understand what species are being bycaught. There is extensive investment in wider fisheries monitoring of protected species bycatch, but at sea-monitoring (observers or cameras) cannot always determine to species level which protected species is bycaught.

This project provides expert support to ensure the most accurate level of identification for protected coral species bycaught and supports a range of cross agency activity to reduce bycatch.

Accurate species-level identification enables robust data collection and analysis, which in turn informs the development of targeted mitigation strategies, such as changes to fishing gear, practices, or spatial/temporal closures. By improving the understanding of which species are impacted and how, this work directly contributes to avoiding, remedying, or mitigating the adverse effects of commercial fishing on protected marine species.

Fish stocks: BAR4, BAR5, BOE3, BOE4, BOE5, BOE6, BYX1, BYX2, BYX3, BYX4, CDL1, CDL2, HAK1, HAK6, HAK7, HOK1, JMA3, JMA7, LIN5, LIN6, LIN7 OEO1, OEO3A, OEO4, OEO6, ORH1, ORH2A, ORH2B, ORH3A, ORH3B, ORH7A, ORH7B, SBW6A, SBW6R, SBW6I, SBW6B, SCI2, SCI3, SCI4A, SQU1T, SQU6T, SWA3, SWA4, WWA5B

1.6 INT2025-05 Port-based bag and tag

Project Code: INT2025-05

Start Date: 1 July 2025

Completion Date: 30 June 2027

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

Project Objective:

To address protected species capture data gaps and enhance verification in fisheries where electronic monitoring is used as the sole monitoring and verification tool.

Rationale:

The 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 physical data collection is required. This includes data comparative to that which is collected by fisheries observers such as species-level verification and biological sample collection. Taxa with similar looking species, especially regarding seabirds and corals, require sampling to confirm identification down to the species level and origin. Such information is particularly pertinent to some of the most at-risk seabird species such as identification of Gibson's vs. Antipodean Albatross and Northern vs. Southern Buller's Albatross. Recent work in Australia further underscored the need for secondary data streams that facilitate challenging seabird identification (e.g., Polanowski et al. 2024 showed that 73% of unidentified albatrosses were Antipodean Albatrosses). Additionally, necropsy specimens are essential to obtain further information about age, sex, body condition, diet, and type of injuries.

Research Approach:

This programme will focus on areas and times historically known to be at high risk of protected species captures. Responsibilities will include the processing of specimens retained by fishers and near real-time ID confirmation to improve fisher identification skills. The success of this project relies on the voluntary support of industry for engagement and protected species retention. Relevant species identification and necropsies will be fulfilled through the INT2024-07, INT2025-03 and INT2025-04 projects.

Outputs:

1. Seabirds (whole specimen or feathers) and corals are returned and/or photographed, where possible, for identification and necropsy with results reported via project INT2025-03: Identification of seabirds captured in NZ fisheries and INT2025-04: 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.

Note: A two-year term is proposed

Indicative Research Cost: $80,000 per annum

Cost Recovery Principle: 262(d)

Cost Recovery: F(CR) Item 4 (100% Industry)

Cost Recovery Rationale:

Similar to the tasks inshore observers used to complete, this project fills a role for species-level verification and biological sample collection for protected species captures. Protected species identification is important as it informs risk assessments and helps to inform and prioritise management actions for fleets of particular risk to protected species populations. Taxa with similar looking species, in particular seabirds and corals, require sampling to confirm identification down to the species level and origin. Such information is particularly pertinent to some of the most at-risk seabird species such as identification of Gibson's vs. Antipodean Albatross and Northern vs. Southern Buller's Albatross. The outputs of this project will enhance our understanding of the level of risk and adverse effects on bycaught protected species and will inform avoidance and mitigation development. This project directly supports fisher engagement and awareness to reduce the risk of further bycatch.

Fish stocks: BAR1, BAR5, BAR7, BIG1, BNS1, BNS2, BNS3, BNS7, BNS8, BUT2, BUT5, BUT7, ELE3, FLA1, FLA2, FLA3, FLA7, GMU1, GUR1, GUR2, GUR3, GUR7, GUR8, HPB1, HPB2, HPB3, HPB4, HPB5, HPB7, HPB8, JDO1, JDO7, KAH1, LIN1, LIN2, MOK1, RCO3, RSK3, SCH2, SCH3, SCH5, SCH7, SCH8, SNA1, SNA2, SNA7, SNA8, SPO1, SPO3, SPO8, STA3, STA5, STA7, STN1, SWO1, TAR1, TAR2, TAR3, TAR7, TAR8, TOR1, TRE1, TRE7, YEM1

Reference:

Polanowski, A.M., MacDonald, A.J., Double, M.C., Barrington, J.H.S., Burg, T.M., Wienecke, B. and McInnes, J.C. (2024), The Development of DNA Markers to Resolve Uncertainties of Seabird Bycatch Identification From Longline Fisheries in Australian Waters. Ecol Evol, 14: e70568. https://doi.org/10.1002/ece3.70568

1.7 INT2025-06 Factors influencing risk of marine mammal and seabird bycatch in inshore trawl and set net fisheries

Project Code: INT2025-06

Start Date: 1 July 2025

Completion Date: 30 June 2026

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.
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.

Rationale:

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 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.

Research Approach:

This project is an exploratory desktop study investigating the impacts of environmental and operational variables on marine mammal and seabird bycatch. The project will use all data available on various factors such as vessel speed, headline height, fishing depth. These will be compiled and analysed for impact and effectiveness and considered for future testing.

One component will be an assessment of international scientific literature. Another component of this project will assess the data variables currently collected through observer, EM reviewer, liaison officers, and fisher-reported data to identify potential improvements that would clarify our understanding of risk factors in the future. Risk factors will be assessed and considered within the context of both capture and non-capture fishing events for detailed analysis.

There will also be an interview component with those who can help clarify operational nuances, decision-making factors and any missing context from data included in the second component above. This will inform the overall assessment of risk factors. Where possible, behavioural or attitudinal insights from liaison officers familiar with the vessels will also be incorporated.

As well as informing targeted improvements in the New Zealand inshore trawl and set net fleets, the findings from this research will be made available to inform global best practice mitigation specifications.

Outputs:

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

Note: A one-year term is proposed

Indicative Research Cost: $40,000

Cost Recovery Principle: 262(d)

Cost Recovery: F(CR) Item 4 (100% Industry)

Cost Recovery Rationale:

Inshore trawl and setnet fisheries remain relatively poorly understood in terms what factors lead to protected species bycatch, and how to manage them. To date most bycatch reduction in these fisheries have been through spatial closure of fisheries, but bycatch continues to occur where fisheries remain in operation. The identification of factors influencing bycatch is the first stage of being able to develop mitigation solutions to reduce these ongoing captures. The outputs will inform future mitigation development projects to have tools for regulatory or non-regulatory introduction through joint agency processes (e.g. NPOAs, TMPs).

Fish stocks: BAR1, BAR5, BAR7, BUT2, BUT5, BUT7, ELE3, FLA1, FLA2, FLA3, FLA7, GMU1, GUR1, GUR2, GUR3, GUR7, GUR8, HPB3, JDO1, JDO7, KAH1, MOK1, RCO3, RSK3, SCH2, SCH3, SCH5, SCH7, SCH8, SNA1, SNA7, SNA8, SPO1, SPO3, SPO8, STA3, STA5, STA7, TAR1, TAR2, TAR3, TAR7, TAR8, TRE1, TRE7, YEM1

1.8 INT2025-07 Examining recruitment dynamics and recovery potential from fishing-induced adverse impacts on deep-sea corals on Chatham Rise seamounts

Project Code: INT2025-07

Start Date: 1 July 2025

Completion Date: 30 June 2027

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

Project Objective:

1. To document the occurrence, extent and timeframes of coral recruitment, recovery and growth on areas subjected to a range of fishing pressure, from areas never trawled, to intensely fished features.
2. To advance our understanding of the vulnerability of different coral groups to fishing impacts and their ability to recover from these disturbances.

Rationale:

The Chatham Rise deepwater trawl fishery, primarily targeting orange roughy, has focused on numerous underwater features including seamounts within a complex known as the Graveyard Knolls. These features have been subject to different fishing effort, with some never fished, some closed to fishing since 2001, and others still open and fished from lightly to intensively. These varied historical and current fishing pressures in the area provide an excellent opportunity to examine rates of coral recruitment, recovery and growth following disturbance, and impacts relative to undisturbed areas.

Therefore, 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 analyse newly acquired high-definition Remotely Operated Vehicle (ROV) captured video and extensive towed-camera survey data of deepwater corals collected during FS Sonne voyage SO309 (16/1—15/2/2025, CSP project INT2024-04). To observe coral fauna, the voyage completed 17 ROV dives within four areas (Graveyard Knolls, Otago shelf, Puysegur/Solander region, and Fiordland shelf), with a focus on video surveys and photo survey data subsequently collected from four seamounts in the Graveyard Knolls subject to varied fishing pressure. These surveys complement and augment a previous time series of video surveys undertaken on the Knolls that indicate very limited recovery, with the last survey 5 years ago. The voyage also located multiple settlement plates deployed at a known time point that can facilitate calibration of coral recovery time frames.

This project offers substantial cost leverage from the successful FS Sonne voyage SO309 that has already acquired requisite data at no cost to New Zealand participants using cutting-edge technology. The research will incorporate analysis of ocean floor observations of select corals to 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 CSP Coral Medium Term Research Plan, will also lend support to spatial management scenario testing for corals that must consider knowledge on recovery and resilience.

Research Approach:

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 analyse new ROV captured video and still records of cold-water coral collected during RV Sonne voyage SO309 (16/1—15/2/2025).

Images generated from towed camera transects on seamounts within the Graveyard complex will be analyzed to generate spatial and abundance data of coral communities in unfished, fished, and closed areas. These new data will be used to assess change over time, particularly in relation to the recovery of deep-sea coral communities following the cessation of fishing activities on closed seamounts. The new data will also be combined with additional information (e.g., fishing effort and risk assessment outputs) to frame outputs within the context of conservation management decisions and processes.

Outputs:

A written summary of results will be provided, along with a full technical report including statistical analysis of coral occurrence, distribution, abundance and recovery across the four seamounts with a specific focus on indications of recruitment/recovery on previously disturbed substrates.

The results and accompanying report will be presented to and reviewed by the CSP Technical Working Group and made available online.

Note: A two-year term is proposed

Indicative Research Cost: $48,500 per annum

Cost Recovery Principle: 262(d)

Cost Recovery: Project cost will be split 33.33% cost recovered ($16,005 will be 100% Industry F(CR) Item 4B) and 66.67% Crown funded ($32,495)

Cost Recovery Rationale:

This project will use video surveys of seamounts that have been heavily fished, never fished, or lightly fished, to measure coral recovery (if any) following direct adverse impacts by commercial fishing. More broadly, this project will be able to look at recovery dynamics of corals after commercial trawling on seamounts. Some of the seamounts have been closed to fishing for 20 years, which also gives us a rare opportunity to determine if spatial closures to fishing/output controls are an effective means to remedy adverse impacts. The outputs will help us understand how to mitigate damage in areas previously trawled and to factor in coral recovery in future mitigation efforts (for example, spatial closures that avoid further impacts, and remedy damage through allowing time to recover).

Fish stocks: BAR1, BAR4, BAR5, BNS3, BYX1, BYX2, BYX3, CDL1, HAK1, HOK1, HPB5, HPB7, JMA3, JMA7, JMA8, LIN1, LIN2, LIN5, LIN6, LIN7 OEO1, OEO3A, OEO4, OEO6, ORH1, ORH2A, ORH2B, ORH3A, ORH3B, ORH7A, ORH7B, SBW6A, SBW6R, SBW6I, SBW6B, SCH5, SCI2, SCI3, SCI4A, SNA1, SPO3, SQU1T, SQU6T, SWA3, SWA4, TAR1, TAR2, TRE1, TRE7, WWA5B

2. Population Projects

NOTE: This multi-year project was consulted on in 2023/24 and is included here for completeness.

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

Project Code: POP2023-01

Start Date: 1 July 2023

Completion Date: 30 June 2026

Guiding Objectives: CSP Objectives B and E; CSP Sea Turtle Medium Term Research Plan

Project Objectives:

1. Assess feasibility of using aerial surveys to monitor leatherback turtles in New Zealand waters.
2. To collect fishery independent information on the distribution, relative abundance and size of leatherback turtles in New Zealand waters.
3. To collect data on pelagic species associated with leatherback turtles in New Zealand waters.

Rationale:

Western Pacific leatherback turtles are Critically Endangered due to a variety of anthropogenic impacts, including bycatch in commercial fisheries throughout their range. Leatherbacks are the sea turtle species most regularly interacting with commercial fisheries in New Zealand waters, with the greatest number being caught by surface longline vessels targeting swordfish and bigeye tuna off the Northeast North Island (FMA 1, FMA 2) during summer and autumn. Interactions with surface longlines are also reported from FMA 7, FMA 8 and FMA 9. Fishery independent data on leatherback distribution and abundance are required to determine overlap with commercial fisheries, inform national and regional risk assessments for this species and identify potential environmental indicators that could be used to avoid or reduce fishery interactions. Identification of hot spots for the species would also assist the development of satellite tagging studies of free-swimming leatherbacks on their foraging grounds. Such studies would provide information on diving behaviour and long-distance movements and could potentially identify critical habitat in NZ waters and confirm source populations of leatherbacks interacting with New Zealand fisheries.

Research Approach:

The project will design and trial a statistically robust aerial line transect survey covering part or all the area off eastern Bay of Plenty and East Cape where interactions with surface longliners are most frequent. It is expected that the methodology will involve the use of overhead fixed wing aircraft, onboard observers and/or digital video technology to record the transects. The first year of the project would involve contracting and survey design phases. The second year would involve preparation and conduction of survey flights between December and April inclusive. Survey flights will be replicated to improve estimation of statistical power, the influence of environmental variables and probability of detection. The final year of the project will involve data analysis, development of recommendations and delivery of final outputs.

Outputs:

1. A technical report describing the proposed survey methodology, capture of relevant environmental variables, statistical analyses and data storage, reviewed by the CSP Technical Working Group.
2. A final report describing the survey results and providing recommendations on potential improvements to the methodology, long-term data storage needs and other potential uses of the data.
3. Provision of all data and video files collected in electronic format.

Note: A three-year term is proposed

Indicative Research Cost: $50,000 year 1, $100,000 year 2, $50,000 year 3

Cost Recovery Principle: 262(d)

Cost Recovery: F(CR) Item 3 (50% Industry, 50% Crown)

Cost Recovery Rationale:

The data produced and synthesized in this final year of this project will support fisheries risk assessments and inform how we might avoid the adverse effects of commercial fishing by reducing the likelihood of interactions between vessels and turtles in New Zealand waters. Specifically, this project will:

1) provide information on how to avoid areas and times where turtles are sighted and focus fishing effort instead where turtles are not sighted,

2) recommend other methods and next steps to further characterise turtle presence and absence in our waters, and

3) be used by the DOC/FNZ working group in the finalisation of the turtle bycatch operational plan.

Fish stocks: BIG1, STN1, SWO1, TOR1

NOTE: This multi-year project was consulted on in 2023/24 and is included here for completeness

2.2 POP2023-02 Southern Buller's population study

Project Code: POP2023-02

Start Date: 1 July 2023

Completion Date: 30 June 2026

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

Project Objectives:

1. Monitor key demographic parameters of southern Buller's albatross (*Thalassarche bulleri bulleri*) (adult survival, breeding probability, breeding success, and population size) on the Snares Islands to reduce uncertainty in risk estimates from commercial fishing and to measure the success of management interventions.
2. Provide updated, high-resolution insights into the at-sea distribution of adult southern Buller's albatrosses from the Snares and Solander Islands.
3. Provide an updated population estimate from Solander Island using an aerial survey.
4. Describe the diving behaviour of southern Buller's Albatrosses from the Snares Islands using time depth recorders (TDRs).

Rationale:

The CSP Seabird Medium Term Research Plan outlines a five-year research programme to deliver on the seabird population research component of CSP. It is targeted at addressing relevant CSP Objectives (as described in the CSP Strategic Statement) and National Plan of Action – Seabirds Objectives. This project delivers priority research components of the CSP Seabird Plan involving the estimation of key demographic parameters of southern Buller's albatross at the Snares and Solander islands and investigates at-sea distribution and diving behaviour. Three established study sites exist at the Snares, with substantial historic mark-resight effort (Sagar 2014), and demographic data having been collected annually at these sites annually since 1992, excluding 2018 and 2021.

Research Approach:

This three-year project is split across two field locations: the Snares and Solander Islands. At the Snares, work will continue with previously established mark-recapture monitoring methodology to further improve estimates of key demographic parameters. Particularly, estimates of annual survival of birds banded as breeders, which have showed continued decline in the most recent data assessment from CSP project POP2019-04. TDR's and GLS tags will also be fitted to breeding birds at the Snares to investigate diving behaviour and distribution patterns. The Solander field work will also entail fitting GPS tags to assess at-sea distribution patterns and work will also include an aerial and ground-based census to update population estimates.

Outputs:

1. Annual technical report(s) on the work undertaken and results found, including updated estimates of key demographic parameters, population size, at-sea distribution, and diving behaviour.

2.   All data will be provided to DOC in electronic format.

Note: A three-year term is proposed

Indicative Research Cost: $150,000 per annum

Cost Recovery Principle: 262(d)

Cost Recovery: F(CR) Item 3 (50% Industry 50% Crown)

Cost Recovery Rationale:

The outputs of this project will provide updated spatial and demographic information which will enable improvements to future iterations of the seabird fisheries risk assessment. The seabird fisheries risk assessment is a management prioritisation tool, reliant on accurate spatial and demographic data, that facilitates assessments of the efficacy of current seabird bycatch mitigation and guidance of future improvements to seabird bycatch mitigation, on a gear and fleet-specific level. The collected information will also support the multi-threat risk assessment lead by MPI for this species, which will aim to provide finer-scale guidance of bycatch mitigation and avoidance. The collection of spatial information also allows for finer scale assessments and enable targeted outreach activities, such as fishery liaison support, to assist operators reduce bycatch. Consequently, the project's outputs will directly contribute to future mitigation of bycatch of this species. As this species is the highest-ranking seabird species on the current risk assessment, continued data improvements are of great importance.

Fish stocks: BAR4, BAR5, HOK1, LIN5, LIN6, ORH3B, SCI4, SCI6A, SQU1T, SQU6T, STN1, SWA4, SWO1

Reference:

Sagar, P.M. (2014). Population studies of Southern Buller's albatrosses on the Snares Population study of Buller's Albatrosses Prepared for Department of Conservation Ministry for Primary Industries and Deepwater Group Limited. 18 p.

2.3 POP2023-05 Auckland Islands New Zealand sea lions

Project Code: POP2023-05

Start Date: 1 July 2023

Completion Date: 30 June 2026

Guiding Objectives: CSP Objective E; New Zealand sea lion Threat Management Plan.

Project Objectives:

1. To estimate annual New Zealand sea lion pup production on Enderby Island, Dundas Island and Figure of Eight Island.
2. To mark a subset of pups following established protocols.
3. To collect tag resights at all locations to provide survivorship data for the demographic model.

Rationale:

The New Zealand sea lion (*Phocarctos hookeri*), one of the world's rarest sea lions, is currently classed as Nationally Vulnerable, with a total population estimate of 10,000 individuals breeding mostly on the subantarctic Auckland Islands (Baker et al. 2019, Roberts & Edwards, unpublished research). New Zealand sea lions are incidentally bycaught 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 areas (Chilvers et al. 2005, Johnston & Childerhouse 2022). 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 (Campbell et al. 2006; Chilvers et al. 2007). The New Zealand sea lion Threat Management Plan, first implemented in 2017, established a range of research and management actions to address the threats to the recovery of this species. A literature review to identify potential indirect effects of commercial fishing on the Auckland Islands population as part of CSP project POP2010-01 (Bowen 2012) highlighted several key information gaps that prevent a full understanding of any such potential indirect effects, including time series data of population dynamics as collected in this project. CSP project POP2012-02 analysed population data to determine the key demographic factors driving the observed decline of New Zealand sea lions at the Auckland Islands. This project found that low pupping rates, a declining trend in cohort survival to age 2 and low adult survival may explain declining pup counts in one studied population (Roberts et al. 2014). Demographic data from the Auckland Islands New Zealand sea lion population is vital to the ongoing assessment of direct and indirect risks to the species from commercial fisheries, as described in fisheries operational plans, and to determine the overall size and vulnerability of the population (Bowen 2012).

Research Approach:

Auckland Islands New Zealand sea lion pup production has historically been estimated using a range of methods including aerial and ground-based direct counts and mark-recapture (Baker et al. 2012, Chilvers 2012; Childerhouse 2012). This project will undertake ground-based pup counts at Enderby Island, Dundas Island and Figure of Eight Island. Researchers will mark a subset of pups following established protocols

and collect high quality resight data from previously marked animals (Chilvers 2012; Childerhouse 2012). It is expected this work will take approximately five weeks.

In the interest of cost-savings, this project may be undertaken in conjunction with wider NZ sea lion Threat Management Plan research and management actions on the Auckland Islands.

Outputs:

1. A technical report detailing methods used and results of the New Zealand sea lion pup production estimates.
2. Data collected during the project to be error-checked, formatted, and uploaded to the New Zealand sea lion demographic database.

Note: A three-year term is proposed

Indicative Research Cost: $150,000

Cost Recovery Principle: 262(d)

Cost Recovery: F(CR) Item 2 (90% Industry, 10% Crown)

Cost Recovery Rationale:

The marking and resighting of Nationally Endangered New Zealand sea lions at the Auckland Islands is used to estimate overall population size and vulnerability of this population to negative interactions with the SQU6T commercial fishery (the direct and indirect mortality of sea lions in this fishery). These data are the critical baseline information necessary for assessing the impact of commercial fishing on this population and for mitigating adverse effects using fisheries management tools such as setting a MALFiRM limit on fishing-related mortality.

The data from this project are used to model productivity and vulnerability of this population to adverse impacts from the SQU6T fishery. Adverse impacts have likely been reduced but have not been eliminated by SLEDs; this fishery is still contributing to the decline of New Zealand sea lions.

This project will yield information that will be used to measure efficacy of management to mitigate risks from the fishery. This project will inform decisions on management actions. Additional management actions could include time-area closures, MALFiRM limits, or gear modifications.

Fish Stocks: SQU6T

References:

Baker B, Jensz K & Chilvers L (2012) Aerial survey of New Zealand sea lions – Auckland Islands 2011/12. Report prepared for Ministry of Agriculture & Forestry, DeepWater Group Limited & Department of Conservation, Wellington, New Zealand. 12p.

Baker CS, Boren L, Childerhouse S, Constantine R, van Helden A, Lundquist D, Rayment W & Rolfe JR (2019) Conservation status of New Zealand marine mammals. Department of Conservation, Wellington, New Zealand. 22 p.

Bowen WD (2012) A review of evidence for indirect effects of commercial fishing on New Zealand sea lions (*Phocarctos hookeri*) breeding on the Auckland Islands. Report prepared for the Conservation Services Programme, Department of Conservation, Wellington, New Zealand. 41p.

Campbell RA, Chilvers BL, Childerhouse S & Gales NJ (2006) Conservation management issues and status

of the New Zealand (*Phocarctos hookeri*) and Australian (*Neophoca cinerea*) sea lions. In: Trites AW, Atkinson S, DeMaster DP, Fritz LW, Gelatt LD, Rea LD, Wynne KM eds. Sea lions of the world. Alaska Sea Grant Alaska College Prog

Childerhouse SJ (2012) Methodology for CSP Project 4426 New Zealand sea lion ground component 2012/13. Report prepared for the Conservation Services Programme, Department of Conservation, Wellington, New Zealand. 8p.

Chilvers BL (2012) Research to assess the demographic parameters of New Zealand sea lions, Auckland Islands 2011/12. Report prepared for the Conservation Services Programme, Department of Conservation, Wellington, New Zealand. 11p.

Chilvers BL, Wilkinson IS & Childerhouse S (2007) New Zealand sea lion, *Phocarctos hookeri*, pup production—1995 to 2006. New Zealand Journal of Marine and Freshwater Research, 41:2, 205-213.

Chilvers BL, Wilkinson IS, Duignan PJ & Gemmell NJ (2005) Summer foraging areas for lactating New Zealand sea lions *Phocarctos hookeri*. Marine Ecology Progress Series vol. 304: 235–247.

Johnston O, Childerhouse S (2022) INT2020-02: Identification of marine mammals captured in New Zealand fisheries 2020-21. Report prepared for the Conservation Services Programme, Department of Conservation, Wellington, New Zealand. Cawthron Report No. 3772. 18 p.

Roberts J, Fu D, Doonan I & Francis C (2014) NZ sea lion: demographic assessment of the causes of decline at the Auckland Islands. Demographic model options: demographic assessment. Report prepared by NIWA for the Conservation Services Programme, Department of Conservation, Wellington, New Zealand. 142p.

NOTE: This multi-year project was consulted on in 2024/25 and is included here for completeness

2.4 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

Project Code: POP2024-02

Start Date: 1 July 2024

Completion Date: 30 June 2026

Guiding Objectives: CSP Objective E; CSP Coral Medium Term Research Plan

Project Objectives:

1. To continue to improve and refine our understanding of coral reproductive behaviour for several stony corals in the New Zealand region using live material and specimens collected in vivo.
2. To use coral reproductive behaviours to inform the productivity and vulnerability values of coral species to fishing impacts and their ability to recover for risk assessments and spatial management scenarios.

Rationale:

This project benefits from the opportunity to collect live, protected deep-sea coral specimens collected on the RV Sonne voyage (CSP project INT2024-04) and will maintain them long-term in aquaria, with the aim of observing and conducting experiments on reproductive and larval biology. Such data contribute to our understanding of the productivity and vulnerability of different coral species to fishing impacts and their ability to recover from these disturbances; such information is used to parameterise risk assessments and spatial management scenarios.

Research Approach:

Intact and targeted corals will be collected via ROV sampling during the RV Sonne voyage in February 2025 and will be maintained in aquaria during the voyage, after which they will be transferred to NIWA's Marine Environment Manipulation Facility. The project will employ histological approaches to determine reproductive traits, and the corals will undergo periodic histological sampling on a seasonal basis; this will give an indication of potential environmental reproductive cues and can infer connectivity potential based upon reproductive timing. Focal species include the stony branching corals *Solenosmilia variabilis*, *Enallopsammia rostrata*, *Madrepora oculata*, and *Goniocorella dumosa* and potentially stony cup corals, i.e. fragile morphotypes subject to direct impacts of bottom trawling that constitute a large portion of coral bycatch in New Zealand. NIWA have expertise maintaining live corals in aquaria and have previously established unexpected spawning behaviour in stony corals (e.g., DOC project BCBC2020-01). This project builds upon previous CSP projects (BCBC2020-01 and POP2022-03) and profits from international collaboration and expertise on deep-sea coral reproduction established in those projects.

Outputs:

1. A technical report detailing the research undertaken, results, recommendations and discussion of results framed within agreed approaches to apply them to coral fisheries assessments.
2. All data will be provided to DOC in electronic format.

Note: A two-year term is proposed

Indicative Research Cost: $65,000 per annum

Cost Recovery Principle: 262(d)

Cost Recovery: F(CR) Item 4B (100% Industry)

Cost Recovery Rationale:

This project will produce research that relates to the recovery and resilience of protected corals to the adverse effects of commercial fishing – specifically how their biology will affect the efficacy of mitigation efforts in areas previously trawled, and how it can be a factor in future mitigation efforts (for example, spatial closures that avoid further impacts, and remedy previous damage through allowing time to recover).

Mitigation decisions would depend on using this knowledge in mitigating coral bycatch, the approach most likely eventually being spatial closures. Understanding how linked coral populations are, which can be determined by assessing their biology, will spatially identify coral populations needing protection. The information will be able to be combined with fishing effort, such as the trawl footprint, to see where the two overlap which will inform mitigation and avoidance decisions, which would not be possible without this work.

Fish stocks: BAR4, BAR5, BYX1, BYX2, BYX3, CDL1, HAK1, HOK1, JMA3, JMA7, JMA8, LIN5, LIN6, LIN7 OEO1, OEO3A, OEO4, OEO6, ORH1, ORH2A, ORH2B, ORH3A, ORH3B, ORH7A, ORH7B, SBW6A, SBW6R, SBW6I, SBW6B, SCI2, SCI3, SCI4A, SNA1, SQU1T, SQU6T, SWA3, SWA4, WWA5B

2.5 POP2025-01 Southern Buller's albatross juvenile banding and tracking

Project Code: POP2025-01

Start Date: 1 July 2025

Completion Date: 30 June 2028

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

Project Objectives:

1. To band representative samples of juvenile cohorts to enable estimates of juvenile survival and recruitment in the future.
2. To support the deployment of satellite tracking devices on juveniles to provide updated novel insights into the at-sea distribution

Rationale:

This project delivers key components of the CSP Seabird Medium Term Research 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 planned.

Research Approach:

This three-year project seeks to address knowledge gaps surrounding the early live stages of Southern Buller's albatross by visiting the key monitoring site, Tini Heke | Snares for three consecutive years with the goal to 1) band three representative cohorts of juvenile Southern Buller's Albatross, enabling future estimates of juvenile survival and recruitment, and 2) provide opportunities for the deployment of satellite tracking devices as provided directly by DOC to enable the first insights into the at-sea distribution of juveniles. This project would address major knowledge gaps in the most at-risk species in New Zealand and allow improved evaluation of the impacts of bycatch in New Zealand fisheries on these species.

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.

Note: A three-year term is proposed

Indicative Research Cost: $50,000 per annum

Cost Recovery: 100% Crown funded for year 1 of the project. The cost recovery of year 2 and 3 of the project will be considered and consulted on when developing the CSP Annual Plan 2026/27.

Fish stocks: N/A (for year 1 of the project)

References:

Sagar, P., Rexer-Huber, K., Thompson, D., Parker, G. (2024) Population studies of southern Buller's albatrosses at Tini Heke / The Snares Islands and Hautere / Solander Islands. Final report to the Conservation Services Programme, Department of Conservation. Parker Conservation, Dunedin. 13 p.

2.6 POP2025-02 Black petrel and flesh-footed shearwater demographic modelling

Project Code: POP2025-02

Start Date: 1 July 2025

Completion Date: 30 June 2027

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.

Rationale:

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 Islands 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. Flesh-footed shearwaters have also been captured at sea in some years. 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 project aims to provide much-needed updates to demographic assessments of these two vulnerable species.

Research Approach:

This project will (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 biases 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 planned 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.

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.

Note: A two-year term is proposed

Indicative Research Cost: $40,000 per annum

Cost Recovery Principle: 262(d)

Cost Recovery: F(CR) Item 3 (50% Industry, 50% Crown)

Cost Recovery Rationale:

This project leverages several existing data streams from various fieldwork projects (including POP2025-03) to further improve specific demographic parameters for these species, enabling improvements to future iterations of the seabird fisheries risk assessment. The seabird fisheries risk assessment is a management prioritisation tool, reliant on accurate spatial and demographic data, that facilitates assessments of the efficacy of current seabird bycatch mitigation and guidance of future improvements to seabird bycatch mitigation, on a gear and fleet-specific level. This project overcomes the shortcomings of data provided directly from fieldwork (e.g., POP2025-03) through modelling and provides the necessary improvements to specific demographic parameters. Consequently, the project's outputs will directly contribute to future mitigation of bycatch of this species. As these species are the fourth-ranking and seventh-ranking species (i.e., the highest-ranking petrel species) on the current risk assessment, improving information is of considerable importance.

Fish stocks: BIG1, BNS1, GUR1, GUR2, JDO1, RSN9, SCH4, SCI1, SCI2, SNA1, SNA2, SWO1, TAR1, TRE1,

References:

Barbraud, C.; Booth, A.; Taylor, G. A.; and Waugh, S. M. (2014) Survivorship in Flesh-footed Shearwater Puffinus Carneipes at Two Sites in Northern New Zealand. Marine Ornithology: Vol. 42 : Iss. 2 , Article 1.

Bell, E.A.; Lamb, S. & Ray, S. (2024). Key demographic parameters and population trends of tākoketai/black petrels (Procellaria parkinsoni) on Aotea/Great Barrier Island: 2023/24. Unpublished Wildlife Management International Ltd. Technical Report to the Conservation Services Programme, Department of Conservation, Wellington. 67 p.

Edwards, C.T.T.; Peatman, T.; Roberts, J.O.; Devine, J.A.; Hoyle, S.D. (2023). Updated fisheries risk assessment framework for seabirds in the Southern Hemisphere. New Zealand Aquatic Environment and Biodiversity Report No. 321. 103 p

Ray, S. Burgin, D., Lamb, S., Olsthoorn, M (2024) Toanui/flesh-footed shearwater population monitoring and estimates: 2023/24 season. Unpublished Wildlife Management International Technical Report to the Department of Conservation. 58 p.

Zhang, J. , Bell, E.A., Roberts, J.O (2020) Demographic assessment of black petrels (Procellaria parkinsoni) on Great Barrier Island (Aotea Island). New Zealand Aquatic Environment and Biodiversity Report No. 244. 52 p.

2.7 POP2025-03 Black petrel monitoring

Project Code: POP2025-03

Start Date: 1 July 2025

Completion Date: 30 June 2028

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.

Rationale:

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 planned to continue monitoring key demographic parameters of this vulnerable species. However, a reduced work programme is planned 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.

Research Approach:

The project will collect data to improve estimates of key demographic parameters of Black Petrel via continued mark-recapture and study grid monitoring following well established methods (e.g., Bell et al. 2024). However, instead of the three annual field trips that have been conducted in previous years (Dec, Jan, and Apr/May), it is planned that the project is reduced to two field trips per year to increase efficiency. Despite this reduction in field time, the outputs from this project remain directly relevant to any future iterations of fisheries risk assessments as well as allowing for more detailed assessments of changes in fisheries related mortalities.

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.

Note: A three-year term is proposed

Indicative Research Cost: $35,000 per annum

Cost Recovery Principle: 262(d)

Cost Recovery: F(CR) Item 3 (50% Industry, 50% Crown)

Cost Recovery Rationale:

The outputs of this project will provide updated spatial and demographic information which will enable improvements to future iterations of the seabird fisheries risk assessment. The seabird fisheries risk

assessment is a management prioritisation tool, reliant on accurate spatial and demographic data, that facilitates assessments of the efficacy of current seabird bycatch mitigation and guidance of future improvements to seabird bycatch mitigation, on a gear and fleet-specific level. Consequently, the project's outputs will directly contribute to future mitigation of bycatch of this species. As this species is the fourth-ranking species (i.e., the highest-ranking petrel) on the current risk assessment, improving information is of considerable importance.

Fish stocks: BIG1, BNS1, RSN9, SCH4, SCI1, SNA1, SWO1, TAR1, TRE1

References:

Bell, E.A.; Lamb, S. & Ray, S. (2024). Key demographic parameters and population trends of tākoketai/black petrels (Procellaria parkinsoni) on Aotea/Great Barrier Island: 2023/24. Unpublished Wildlife Management International Ltd. Technical Report to the Conservation Services Programme, Department of Conservation, Wellington. 67 p.

Edwards, C.T.T.; Peatman, T.; Roberts, J.O.; Devine, J.A.; Hoyle, S.D. (2023). Updated fisheries risk assessment framework for seabirds in the Southern Hemisphere. New Zealand Aquatic Environment and Biodiversity Report No. 321. 103 p

2.8 POP2025-04 Auckland Islands seabird research: White-capped and Gibson's albatross

Project Code: POP2025-04

Start Date: 1 July 2025

Completion Date: 30 June 2028

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

Project Objectives:

1. To monitor adult survival and breeding probability of white-capped albatross.
2. To describe the at-sea distribution of white capped albatross, including juveniles.
3. To monitor the key demographic parameters of Gibson's albatross to reduce uncertainty or bias in estimates of risk from commercial fishing.
4. To estimate the annual population size of Gibson's and white-capped albatross.

Rationale:

This project delivers key components of the CSP Medium Term Research Seabird Plan, on white-capped and Gibson's albatross.

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 analytical 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 project aims to overcome the shortcomings of previous projects (e.g., POP2022-08) by allocating the majority of the budget to ensure adequate field time to address the data gaps that plague this heavily bycaught species.

Gibson's albatross 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 planned, albeit at a reduced intensity when compared to POP2022-08, with a focus on ongoing monitoring of key demographic parameters and population size.

Cost saving synergies with other projects operating within the Auckland Island archipelago (and potentially also Campbell Island) will be employed to ensure the efficiency of this project.

Research Approach:

This three-year project consists of three targeted visits at the optimal time for white-capped albatross (e.g., December) to the main colony of this species (Disappointment Island). The main purpose is to provide three consecutive population estimates derived using the collection of drone imagery of the full island, supported by an updated digital elevation model (DEM; the current DEM is not fit for purpose; Elliott et al. 2023) and the necessary ground truthing, within and beyond Castaway Bay. In addition, these visits will allow to further build on the existing mark-recapture dataset to provide insights into adult survival and breeding probability. During the targeted visits, this project will provide the opportunity for further deployment of tracking devices to better study the at-sea distribution of this high-risk species, as knowledge of current at-sea distribution needs updating. Most notably, current knowledge of the at-sea distribution of juveniles is poor and as such, the final year of this project includes a winter visit to Disappointment Island to attempt and deploy satellite transmitters on juveniles. Combined, the outputs of this project will allow for updated and more detailed evaluation of the impacts of bycatch in New Zealand fisheries on this species.

The project will also collect data to improve estimates of key demographic parameters of Gibson's albatross via continued mark-recapture monitoring. Population size will be monitored through established long-term index plots. The research approach will follow established methods (Walker & Elliott 1999). The suite of estimates provided through this project allows more precise assessment of population trends than from simple nest counts as is common in many other species. The findings provided by this project will allow for continuing and detailed evaluation of the impacts of bycatch in New Zealand fisheries on this species.

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.

Note: A three-year term is proposed

Indicative Research Cost: $160,000 per annum for year 1 and 2, $200,000 for year 3.

Cost Recovery: 100% Crown funded for year 1 of the project. The cost recovery of year 2 and 3 of the project will be considered and consulted on when developing the CSP Annual Plan 2026/27.

Fish stocks: N/A (for year 1 of the project)

References:

Baker, G.B.; Jensz, K.; Cunningham, R.; Robertson, G.; Sagar, P.; Thompson, D.R.; Double, M.C. (2023). Population assessment of White-capped Albatrosses *Thalassarche steadi* in New Zealand. Emu - Austral Ornithology 123: 60–70.

Edwards, C.T.T.; Peatman, T.; Roberts, J.O.; Devine, J.A.; Hoyle, S.D. (2023). Updated fisheries risk assessment framework for seabirds in the Southern Hemisphere. New Zealand Aquatic Environment and Biodiversity Report No. 321. 103 p

Elliott G, Walker K, Rexer-Huber K, Tinnemans J, Long J, Sagar R, Osborne J, Parker, G. (2024). Gibson's wandering albatross: demography, satellite tracking and census. Final Report Prepared for New Zealand Department of Conservation.33 p.

Walker K, Elliott G, Parker GC, Rexer-Huber K. (2023). Gibson's wandering albatross: population study and potential for drone-based whole-island census. POP2022-08 final report prepared for New Zealand Department of Conservation. 28 p.

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 No. 104. Wellington, Ministry for Primary Industries.

Walker, K.; Elliott, G. (1999). Population changes and biology of the wandering albatross *Diomedea exulans gibsoni* at the Auckland Islands. Emu 99: 239–247

Walker, K.; Elliott, G.P.; Rexer-Huber, K.; Parker, G.C.; McClelland, P.; Sagar, P.M. (2020). Shipwrecks and mollymawks: an account of Disappointment Island birds. Notornis 67: 213–245.

2.9 POP2025-05 Salvin's albatross Western Chain research

Project Code: POP2025-05

Start Date: 1 July 2025

Completion Date: 30 June 2026

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

Project Objectives:

1. To provide an updated population estimate for the Western Chain population.
2. To contribute to the demographic dataset to enable estimates of adult survival.

Rationale:

This project 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. 2015, Baker et al. 2014). 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.

Research Approach:

This is a one-year project to provide an updated estimate of the Western Chain Salvin's albatross population through a combination of drone and ground counts from a single visit at the right time of the year (e.g., October 2025). Ground counts will also enable the banding and resighting of previously banded birds, adding to the existing demographic dataset, and providing an opportunity to update survival estimates for this at-risk species. The outputs of this project will allow for updated and more detailed evaluation of the impacts of bycatch in New Zealand fisheries on this highly vulnerable species.

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.

Note: A one-year term is proposed

Indicative Research Cost: $40,000

Cost Recovery: 100% Crown funded

Fish stocks: N/A

References:

Baker, G.B.; Jensz, K.; Sagar, P. (2014) 2013 aerial survey of Salvin's albatross at the Bounty Islands. Unpublished report to the Conservation Services programme, Department of Conservation. 9p.

Edwards, C.T.T.; Peatman, T.; Roberts, J.O.; Devine, J.A.; Hoyle, S.D. (2023). Updated fisheries risk assessment framework for seabirds in the Southern Hemisphere. New Zealand Aquatic Environment and Biodiversity Report No. 321. 103 p

Mattern, T., Pütz, K., Mattern, H., Houston, D., Long, R., Keys, B., … Ellenberg, U., & Garcia-Borboroglu, P. (2024). A rock and a hard place: Are the subantarctic Bounty Islands becoming the new species stronghold for erect-crested penguins? *New Zealand Journal of Zoology*, pp. 11-12.

Sagar, P.M., Amey, J.; Scofield, R.P.; Robertson, C.J.R. (2015) Population trends, timing of breeding and survival of Salvin's albatrosses (*Thalassarche salvini*) at Proclamation Island, Bounty Islands, New Zealand. Notornis, 62:21-29.

2.10 POP2025-06 Updated population assessment for New Zealand fur seal

Project Code: POP2025-06

Start Date: 1 July 2025

Completion Date: 30 June 2026

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

Project Objectives:

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

Rationale:

The New Zealand fur seal/kekeno (*Arctocephalus forsteri*; 'NZFS') comprised 86% of observed marine mammal bycatch between 1995/96 – 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, one on the West Coast of the South Island, and another in the Otago/Catlins region, with other assessments of individual subpopulations 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 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.

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). If abundance data were collected from these unstudied, or understudied, 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 updating population size estimates for key NZFS colonies, we also need to gain a clearer picture of NZFS foraging behaviour and their marine distribution. Establishing the foraging ranges and time-depth dive profiles for NZFS would help to build a more accurate understanding of the degree of overlap between NZFS and commercial fisheries (Roberts and Neale 2016). Currently, we have only limited, and outdated data on these parameters for NZFS in New Zealand (e.g. Harcourt et al. 2002). This could be complimented with scat and regurgitate sampling from the colonies where abundance surveys are being undertaken to improve current understandings of the dietary composition of NZFS at those sites, and what overlap there is with proximal commercial fisheries activity.

Research Approach:

Data will be collected on NZFS pup abundance estimates, from which population estimates can be derived, as well as pup body condition data at key colonies. The research approach will follow established protocols, using a mixture of mark-recapture and direct counts to assess pup production, and collecting biometric information to assess pup condition (Boren et al. 2006; Chilvers 2021; Hall et al. 2024). By deriving reliable population estimates for NZFS colonies, and measures of pup condition, in conjunction with fisheries data, we will be able to provide a more comprehensive assessment of the impacts of fisheries bycatch and resource competition on NZFS populations. These assessments would take place during austral breeding season at important sites such as Cape Palliser and Kaikōura.

Deploying satellite loggers on NZFS (Harcourt et al. 2002) would also provide much needed data on how much of NZFS' marine foraging distribution overlaps with commercial fisheries operations. As such work has not been undertaken on NZFS in New Zealand for some time, this project would seek to design a methodology to implement this work program, including determining which colonies or populations are the most important to gather these data for, and what personnel and resources would be required to achieve this work successfully.

Outputs:

1. A 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.

Note: A one-year term is proposed

Indicative Research Cost: $80,000

Cost Recovery Principle: 262(d)

Cost Recovery: F(CR) Item 3 (50% Industry, 50% Crown)

Cost Recovery Rationale:

By clarifying population dynamics at key sites, the outputs of this project will be used to identify where and when specific NZ fur seal colonies may be vulnerable to population level effects from bycatch mortality. Knowing where pressure points (in space and time) occur will in turn identify how we best avoid, remedy and mitigate the risk of bycatch.

As set out in the 2022 Marine Mammal Risk Assessment, New Zealand fur seals are the most frequent marine mammal captured in commercial fishing in New Zealand, making up 86% of total marine mammal captures. This is the leading anthropogenic cause of fur seal mortality. While there are clear adverse effects of fishing to fur seals, there is a lack of information on population level impacts. The understanding of the

New Zealand fur seal population and its dynamics, including colony level abundance trends and at sea distribution, is crucial at this point to quantify the extent to which commercial fishing has an impact, particularly at the population level, in the Hoki fishery in the Cook Strait and on the West Coast of the South Island (fisheries where there are the highest levels of bycatch). This is critical work to avoid local extinction of fur seal populations. Amongst other, lesser causes of mortality, there are active work programmes investigating ways to mitigate risks to fur seal populations from road death and disease, but no other work to mitigate the risk to fur seal populations caused by commercial fishing.

The extent of known direct adverse effects of commercial fishing on protected species need to be properly understood, to enable our ability to provide meaningful mitigation strategies and approaches. For the New Zealand fur seal, as set out in the CSP Marine Mammal Medium-Term Research Plan, population size and structure (and mitigation studies) have been identified as high priorities. Understanding where the animals are moving at sea relative to colonies will allow us to identify the extent and specific areas where there is overlap with commercial fishing, particularly in the trawl and surface longline fisheries, thus allowing us to know how to best inform avoidance times and areas, as well as how best to apply mitigation techniques such as the use of exclusion devices, offal and discard management techniques and setting and hauling practices, in relation to fur seals. Information from this output will be presented to, and reviewed by, the CSP Technical Working Group. It will ultimately be used to inform industry best practice guidance designed to avoid fur seal captures.

Fish stocks: BAR3, BAR5, BAR7, BIG1, BYX2, ELE3, FLA3, GUR3, HOK1, HPB3, JMA7, LIN3, LIN6 LIN7, SBW6, SCH3, SCH5, SCH8, SPO3, SQU1T, SQU6T, STA7. STN1, SWO1, TAR3, TAR7, TOR1, WAR3

References:

Abraham, E R; Richard, Y; Neubauer, P; Berkenbusch, K (2017) Assessment of the risk to New Zealand marine mammals from commercial fisheries. New Zealand Aquatic Environment and Biodiversity Report No. 189. 123 p

Boren, L J; Morrissey, M; Muller, C G; Gemmell, N J (2006) Entanglement of New Zealand fur seals in man-made debris at Kaikoura, New Zealand. Marine Pollution Bulletin 52: 442–446.

Chilvers, B. L. (2021). Pup numbers, estimated population size, and monitoring of New Zealand fur seals in Doubtful/Pateā, Dusky and Breaksea Sounds, and Chalky Inlet, Fiordland, New Zealand 2021. New Zealand Journal of Marine and Freshwater Research, 57(1), 75–87.

Alasdair A. Hall, B. Louise Chilvers, Jody Suzanne Weir & Laura J. Boren. (2024) Earthquake impacts on a protected pinniped in New Zealand. *Aquatic Conservation: Marine and Freshwater Ecosystems* 34:1.Harcourt, R G; Bradshaw, C J A; Dickson, K; Davis, L S (2002) Foraging ecology of a generalist predator, the female New Zealand fur seal. Marine Ecology Progress Series 227: 11–24

MacKenzie, D.I.; Fletcher, D.J.; Dillingham, P.W.; Meyer, S.; Pavanato, H. (2022). Updated Spatially Explicit Fisheries Risk Assessment for New Zealand Marine Mammal Populations. New Zealand Aquatic Environment and Biodiversity Report No. 290. 218 p.

McIntosh RR, Kirkman SP, Thalmann S, Sutherland DR, Mitchell A, et al. (2018) Understanding meta-population trends of the Australian fur seal, with insights for adaptive monitoring. PLOS ONE 13(9): e0200253.

Pavanato, H.; Schattchneider, J.; Childerhouse, S.; Briscoe, D. (2023). Assessment of New Zealand fur seal / kekeno bycatch by trawlers in the Cook Strait hoki fishery. Report prepared for Department of Conservation. Cawthron Report No. 3854. 32 p.

Roberts, J.; Neale, D. (2016). Census & individual size of New Zealand fur seal/kekeno pups on the West Coast South Island from 1991 to 2016. NIWA Client Report DOC-16305: 2016005WN. 28 p

2.11 POP2025-07 Chatham albatross research

Project Code: POP2025-07

Start Date: 1 July 2025

Completion Date: 30 June 2027

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. To provide the first breeding success estimate, and potentially the first estimate of breeding probability
4. To contribute to the demographic dataset to enable estimates of adult survival

Rationale:

This project 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. 2018). 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.

Research Approach:

This is a two-year project which aims to facilitate a visit during incubation (October) in both years to the sole breeding colony of the species (Tarakoikoia | The Pyramid) to enable 1) ground counting of breeding pairs (supported by a drone if needed) at the right time (i.e., during incubation) to provide two updated population estimates, 2) the banding of unbanded individuals and the resighting of previously banded individuals over two years to add to the demographic dataset and to potentially provide the first insight into breeding probability in the second year, 3) the deployment of remote cameras to provide the first insight into breeding success of this species in the second year, and 4) the deployment of satellite tracking devices and GLS tags in the first year to provide updated insights into the at-sea distribution of this species. Combined, the outputs of this project would provide a much-needed update on a range of different population parameters and allow for updated and more detailed evaluation of the impacts of bycatch in New Zealand fisheries on this species.

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.

Note: A two-year term is proposed

Indicative Research Cost: $50,000 in year 1, $30,000 in year 2

Cost Recovery Principle: 262(d)

Cost Recovery: F(CR) Item 3 (50% Industry, 50% Crown)

Cost Recovery Rationale:

The outputs of this project will provide updated spatial and demographic information which will enable improvements to future iterations of the seabird fisheries risk assessment. The seabird fisheries risk assessment is a management prioritisation tool, reliant on accurate spatial and demographic data, that facilitates assessments of the efficacy of current seabird bycatch mitigation and guidance of future improvements to seabird bycatch mitigation, on a gear and fleet-specific level. Consequently, the project's outputs will directly contribute to future mitigation of bycatch of this species. The collection of spatial information also allows for finer scale assessments and enable targeted outreach activities, such as fishery liaison support, to assist operators reduce bycatch. As this species is the sixth-ranking species on the current risk assessment, improving the very outdated information is of considerable importance.

Fish stocks: BAR4, HOK1, LIN4, ORH3B, SBW1, SCI4A, SQU1T, SSO4

References:

Bell, M.D.; Bell, D.J.; Boyle, D.P.; Tuanui-Chisholm, H. (2018). Rangitatahi Seabird research: December 2017. Technical report to the Department of Conservation.

Edwards, C.T.T.; Peatman, T.; Roberts, J.O.; Devine, J.A.; Hoyle, S.D. (2023). Updated fisheries risk assessment framework for seabirds in the Southern Hemisphere. New Zealand Aquatic Environment and Biodiversity Report No. 321. 103 p

2.12 POP2025-08 Antipodean albatross and white-chinned petrel research

Project Code: POP2025-08

Start Date: 1 July 2025

Completion Date: 30 June 2028

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.

Rationale:

This project 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 will 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 planned to enable more concerted and efficient monitoring and thus reduce costs compared to previous projects (e.g., POP2022-10).

Research Approach:

The project will collect data to improve estimates of key demographic parameters of Antipodean Albatross and White-chinned Petrel via continued mark-recapture monitoring. In addition, the population size of Antipodean albatross will be monitored through established long-term index plots. The research approach will follow established methods (Walker & Elliott 1999). The suite of estimates provided through this project will allow for more precise assessment of population trends than from simple nest counts as is common in many other species. The findings provided by this project will allow for continuing detailed evaluation of the impacts of bycatch in New Zealand fisheries on this species.

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.

Note: A three-year term is proposed

Indicative Research Cost: $120,000 per annum

Cost Recovery: 100% Crown funded for year 1. The cost recovery of year 2 and 3 will be considered and consulted on when developing the CSP Annual Plan 2026/27.

Fish stocks: N/A (for year 1 of the project)

References:

Rexer-Huber K., Whitehead E., Parker G.C., Patterson, E., Walker K., Welch, J., Elliott G. (2024). Antipodean wandering albatrosses and white-chinned petrels 2024. Final report to the Department of Conservation. Parker Conservation, Dunedin. 29 p.

Richard, Y., Berkenbusch, K., Crawford, E., Tornquist, M., Walker, K., Elliott, G., Tremblay-Boyer, L. (2024). Antipodean albatross multi-threat risk assessment. New Zealand Aquatic Environment and Biodiversity Report No. 332. 62 p.

Walker, K.; Elliott, G. (1999). Population changes and biology of the wandering albatross Diomedea exulans gibsoni at the Auckland Islands. Emu 99: 239–247

2.13 POP2025-09 Campbell Island seabird research

Project Code: POP2025-11

Start Date: 1 July 2025

Completion Date: 30 June 2027

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.

Rationale:

This project 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 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 will also provide a platform for possible additional DOC 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 (and potentially the Auckland Islands).

Research Approach:

This two-year project aims to build on the groundwork laid by previous projects (POP2023-04) and provide accurate updated insights into the annual population size of southern royal, Campbell, and grey-headed albatross as well as demographic parameters of southern royal albatross. Specifically, during each year of the project, 25% of the southern royal albatross population will be counted at established study/index plots, while a newly marked population will enable the first insights into adult survival and breeding probability in several decades (Mischler et al. 2024). Further use of remote cameras will provide insights into southern

royal albatross breeding success. Population size of Campbell and grey-headed albatross will be estimated using the well-established photo-points in combination with ground counts to enable the necessary corrections. In addition to this demographic work, this project enables further insights into the at-sea distribution of these three albatross species, either through recovery of previously deployed GLS tags (southern royal albatross) or by providing a platform for DOC-funded satellite tracking devices (in particular for grey-headed albatross). Combined, the outputs of this project will allow for updated and more detailed evaluation of the impacts of bycatch in New Zealand fisheries on this species.

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.

Note: A two-year term is proposed

Indicative Research Cost: $150,000 per annum

Cost Recovery: 100% Crown funded for year 1. The cost recovery of year 2 and 3 of the project will be considered and consulted on when developing the CSP Annual Plan 2026/27.

Fish stocks: N/A (for year 1 of the project)

References:

Edwards, C.T.T.; Peatman, T.; Roberts, J.O.; Devine, J.A.; Hoyle, S.D. (2023). Updated fisheries risk assessment framework for seabirds in the Southern Hemisphere. New Zealand Aquatic Environment and Biodiversity Report No. 321. 103 p

Mischler, C., Thompson, T., Moore, P., Philip, B., Wickes, C. (2024). Campbell Island Seabird Research. POP2023-04 final report prepared for Conservation Services Programme, Department of Conservation. 49 p.

2.14 POP2025-10 Population growth, distribution and demographics of New Zealand sea lions inhabiting northern Stewart Island

Project Code: POP2025-10

Start Date: 1 July 2025

Completion Date: 30 June 2028

Guiding Objectives: CSP Objective E; New Zealand sea lion Threat Management Plan and upcoming Action Plan 2024 - 2029; Marine Mammal Medium Term Research Plan.

Project Objectives:

1) To estimate the population size of New Zealand sea lions, including age and sex range, in and around Patterson's Inlet, northern Stewart Island.
2) To understand the distribution of New Zealand sea lions in and around Patterson's Inlet, northern Stewart Island.

Rationale:

This project delivers important information on New Zealand sea lion numbers on Stewart Island/Rakiura. A decade long study of pup numbers and distribution in Pegasus Inlet has shown that numbers are increasing, with up to 94 pups born there annually (2025). Both the number of pups born and New Zealand sea lion distribution on Stewart Island are expected to continue to grow in the coming years. We know that there is pupping occurring in and around Patterson's Inlet, northern Rakiura, but we don't yet know their numbers and distribution.

With the implementation of cameras on inshore fisheries vessels, it has become clear that sea lions are now being caught in inshore fisheries around Stewart Island/Rakiura. This project delivers key information on sea lions that will inform how we manage this species and thus help prevent a likely rapid increase in captures that would be expected to correlate with an increase in sea lion numbers.

The population of sea lions on Stewart Island/Rakiura is particularly important to understand, given that 1) it is relatively new and yet to reach a size where females breed in colonies, 2) the numbers of pups born on the main breeding colonies on the Auckland Islands are declining and 3) there are opportunities to learn how to prevent bycatch in inshore fisheries before the problem impedes population recovery in the area.

Research Approach:

Patterson's Inlet area of Stewart Island/Rakiura will be surveyed over three consecutive summers to estimate sea lion numbers, demographics (age and sex profiles) and distribution. All known pups in the area will be flipper tagged for three consecutive years to understand sea lion breeding and distribution at this location. Tagged pups will 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. Tag re-sightings around Patterson's Inlet will likely be high given the number of people regularly in the area due to the proximity of Oban township, tourist destinations (Ulva Island, tramping tracks and huts, Millars Beach/Whaling Station) and commercial mussel and salmon farms.

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.

Note: A three-year term is proposed

Indicative Research Cost: $20,000 per annum

Cost Recovery Principle: 262(d)

Cost Recovery: F(CR) Item 3 (50% Industry, 50% Crown)

Cost Recovery Rationale:

New Zealand sea lions have been gradually re-establishing a population on Stewart Island/Rakiura. While historically focus has only been on sea lion vulnerability to bycatch in the Sub-Antarctic fisheries (FMA 6), in the past year there have been two documented cases of sea lions caught and killed in the inshore fisheries around Stewart Island/Rakiura (FMA 5). Two sea lions bycaught in commercial fishing is significant for the Rakiura population, where only 94 pups were born in the summer of 2024-25. By estimating current and future population dynamics of sea lions around northern Stewart Island, the outputs of this project will be used to identify how to avoid a rapid increase in bycatch of sea lions as they re-establish in this area.

Fish stocks: BAR5, BCO5, BUT5, HAK5, HOK1, LIN5, JMA3, JMA7, SCH5, SQU1T, STA5, SWA3, SWA 4, WWA5B

3. Mitigation Projects

NOTE: This multi-year project was consulted on in 2024/25 and is included here for completeness.

3.1 MIT2024-01 Protected Species Liaison Programme

Project Code: MIT2024-01

Start Date: 1 July 2024

Completion Date: 30 June 2027

Guiding Objectives: CSP Objective A and B; CSP Seabird plan; National Plan of Action – Seabirds, National Plan of Action – Sharks.

Project Objectives:

1. To maintain liaison capacity across inshore fleets around the country including surface longline, bottom longline, trawl, set net and purse seine.
2. To prioritise liaison officer activities based on risk, focusing on protected species capture rate outputs and confidence in skippers' ability to implement increased mitigation during high-risk periods.
3. To reduce the risk of protected species bycatch by encouraging vessel operators to meet best-practice bycatch mitigation.
4. To deliver on the goals and objectives of relevant cross-government plans (NPOAs, TMPs, etc).

Rationale:

Over the last decade, the Liaison Programme has expanded and taken on a pivotal role as the interface between skippers, government, and researchers, working to support and educate fishers on best-practice mitigation. To effectively reduce the risk of interactions with protected species, it is important for vessels to be using best-practice mitigation and take all necessary steps, both regulatory and non-regulatory, to avoid interactions. DOC Liaison Programme work has found ongoing face-to-face engagement and dissemination of bycatch mitigation advice to be an effective way to influence behavioural change on the water.

Research Approach:

Building on the work of the previous liaison project, MIT2021-01, the Liaison Programme will continue work encouraging vessel operators to meet best-practice bycatch mitigation. The review and development of Protected Species Risk Management Plans (PSRMPs) as well as following up on protected species trigger events will continue to be a core function, however with priority inshore and HMS fleets mostly covered, the programme will minimise expansion and focus efforts on developing better risk prioritisation and efficient response. Furthermore, monitoring specifications of mitigation in use is critical for identifying contributing factors to protected species capture events. In addition to work underway with the FNZ cameras team, an engagement pathway under INT2025-05 will be utilised to inform on mitigation specifications in use which will then guide Liaison Programme follow-up activities.

Improved protected species capture verification with the rollout of electronic monitoring, means that Liaison Officer engagement can also focus less on inputs (i.e. PSRMPs) and more on vessel-specific outputs (i.e. capture rates). Work between agencies is needed to allow for effective Liaison Programme operations

and to overcome constraints in reporting capability, efficient responses, and feedback loops. Work over the next three years is expected to implement a more effective database for management, utilise and feed back into electronic monitoring data collection, create improved risk response protocols, increase programme visibility with quota holders and ensure finer-scale operational oversight of the programme through the support of a dedicated Liaison Coordinator.

To keep costs down, the project will look to pass lower-risk harbour net vessels onto Seafood New Zealand as well as start to reduce the level of bycatch mitigation materials supplied to the fleets. There will be a regular review of the Liaison Programme to assess project delivery, priorities, scope, and costs.

Outputs:

1. Active use of the new database to input LO vessel visits, trigger responses, mitigation resources and training provided. Historical data is also carried over to the new system.
2. Development of risk response protocols.
3. Active response to priority bycatch events.
4. Regular review and updating of PSRMPs.
5. Ongoing education of priority fleets on protected species issues and mitigations.
6. Annual reports detailing progress and any developments in the fleet or operations.

Note: A three-year term is proposed

Indicative Research Cost: $250,000 per annum. DOC is contributing additional funds to support Liaison Programme operations and data management to the sum of $50,000 for 2024/25 and $50,000 for 2025/26.

Cost Recovery Principle: 262(d)

Cost Recovery: F(CR) Item 4 (100% Industry)

Cost Recovery Rationale:

The outputs of this project will support the uptake of best practice protected species bycatch mitigation in inshore and HMS commercial fleets by direct engagement with operators. Duties include follow-up on protected species bycatch events and providing advice to avoid and/or mitigate risk to further protected species captures.

Fish stocks:

Fishery	Indicative Cost	Fish Stocks
Surface Longline	$62,000	BIG1, STN1, SWO1, TOR1
Bottom Longline	$62,000	BNS1, BNS2, BNS3, BNS7, BNS8, HPB1, HPB2, HPB3, HPB4, HPB5, HPB7, HPB8, LIN1, LIN2, SNA1
Inshore Trawl	$62,000	BAR1, BAR5, BAR7, ELE3, FLA2, FLA3, FLA7, GUR1, GUR2, GUR3, GUR7, GUR8, JDO1, JDO7, RCO3, RSK3, SCH7, SCH8, SNA1, SNA2, SNA7, SNA8, SPO3, SPO8, STA3, STA5, STA7, TAR1, TAR2, TAR3, TAR7, TAR8, TRE1, TRE7
Setnet	$62,000	BUT2, BUT5, BUT7, ELE3, FLA1, FLA2, FLA3, FLA7, GMU1, HPB3, KAH1, MOK1, SCH2, SCH3, SCH5, SCH8, SPO1, SPO3, TAR3, YEM1
Purse seine	$2,000	EMA1, JMA1, KAH1, PIL1, SKJ1, TRE1

NOTE: This multi-year project was consulted on in 2024/25 and is included here for completeness

3.2 MIT2024-06 Efficacy of seabird mitigation in large vessel trawl

Project Code: MIT2024-06

Start Date: 1 July 2024

Completion Date: 30 June 2026

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

Project Objectives:

1. To develop new data collection protocols to assess seabird warp strikes and net interactions in the large vessel trawl fleet.
2. To better characterise seabird interactions with large trawl vessel fishing gear and assess the efficacy of warp cable and net capture mitigation practices using the first year of data collected.

Rationale:

The large vessel trawl fleet continues to account for a substantial proportion of bycatch risk to seabirds in New Zealand despite extensive efforts to reduce the attraction of fishing activities to seabirds and to mitigate seabird warp strikes. Existing observer data was found to be insufficient to adequately quantify the effectiveness of bird bafflers and other mitigation (MIT2022-05 Large vessel trawl warp mitigation) and the efficacy of options to reduce the net capture of seabirds in the fleet remains uncertain. This project will develop new targeted at-sea data collection protocols for seabird interactions with warp cables and the trawl net during hauling. Such data will allow for the assessment of the efficacy of a range of baffler configurations, as well as further assessment of methods to mitigate net captures, such as minimising the pooling area. The data collection protocols developed will also be designed to maximise their utility in better understanding cryptic seabird mortality, the level of which remains highly uncertain for New Zealand trawl fisheries.

Research Approach:

It is envisaged that data collection would primarily be through Fisheries Observers, using additional tools such as temporary camera deployments at the back of the vessel. The scope of the data collection will be the interaction of seabirds with trawl warps during the entire fishing operation, and nets during haul. The project will consider the collection of both direct interactions (e.g. cable strike, net capture) as well as more data rich proxies (e.g. bird abundance in defined risk zones). The use of proxy data will increase the power to assess relative efficacy of different mitigation solutions. The first stage of the project will be a workshop including mitigation experts, industry participants and other interested stakeholders. The workshop will scope the practicality of different data collection options, assess the value of tools such as cameras, and agree a fully defined scope for the protocols to be developed. Following initial roll-out of the protocols, sample data collected will be considered to assess their utility for the intended analyses, and any follow-up workshop(s) will be organized should such changes be required. In year two, the project will analyse the first year of data collection to better characterise seabird interactions with large trawl vessel fishing gear and assess the efficacy of warp cable and net capture mitigation practices to the extent possible. Recommendations will also be made for ongoing monitoring options.

Outputs:

1. Workshop help to refine project scope and assess data collection tools.
2. Revised data collection protocols.
3. Report on the first year of data collection, including a characterisation of seabird interactions with large trawl vessel fishing gear and an assessment of the effectiveness of different seabird bycatch mitigation options based.
4. Recommendations for any further improvements for ongoing monitoring options to enable assessment of seabird bycatch mitigation effectiveness in the fleet.
5. All data will be provided to DOC in electronic format.

Note: A two-year term is proposed

Indicative Research Cost: $50,000 per annum

Cost Recovery Principle: 262(d)

Cost Recovery: F(CR) Item 4 (100% Industry)

Cost Recovery Rationale:

Large vessel trawl fisheries were subject to some of our earlier bycatch mitigation efforts some 20 years ago. Whilst good immediate improvements were made at that time, residual seabird bycatch remains, with annual potential fatalities in the thousands of seabirds. A mix of seabird bycatch mitigation measures are used, and to drive further reductions of seabird bycatch in these fisheries requires robust data on relative effectiveness of different mitigation measures. Routine observer data collection has been proven insufficient to answer these questions so this project aims to establish new data collection protocols to allow future and ongoing data collection that can inform improved bycatch mitigation management through regulatory or non-regulatory cross-agency processes.

Fish stocks: BAR1, BAR4, BAR5, BAR7, BYX1, BYX3, BYX7, CDL2, HAK1, HAK4, HAK7, HOK1, JMA3, JMA7, LIN6, OEO1, OEO3A, OEO6, ORH1, ORH2A, ORH2B, ORH3B, ORH7A, ORH7B, RBT3, RBY1, RBY2, SBW6A, SCI1, SCI2, SCI4A, SPE4, SQU1T, SQU6T, SWA3, SWA4, WWA3, WWA5B.

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

Project Code: MIT2024-07

Start Date: 1 July 2024

Completion Date: 30 June 2026

Guiding Objectives: CSP Objectives A, B and C; Hector's and Māui dolphin Threat Management Plan

Project Objectives:

1. To assess the effectiveness of viable acoustic devices in each class/category (set net and trawl) in the marine environment around an active fishing operation, and test against modelled predictions.

2. To identify any additional factors to consider for effective use in operational settings as well as recommendations for future research.

Rationale:

Reports of Hector's dolphin captures have recently increased following the rollout of onboard cameras. Although spatiotemporal actions are currently seen to be the most effective form of mitigation, other mitigation methods, such as the use of acoustic devices, have been used with some success in other commercial fisheries. This supports the trial of appropriate acoustic devices as a mitigation tool to reduce bycatch of Hector's and Māui dolphins in NZ inshore fisheries.

The application of acoustic devices for mitigation in a New Zealand context, may have unintended consequences for both fisheries and marine mammals, and it is important for all stakeholders to understand the viability and limitations of using such devices. A robust project to evaluate the use of such devices is required if they are to be used for mitigating captures of Hector's dolphins in New Zealand fisheries.

Furthermore, the characteristics of available acoustic devices have been demonstrated to differ markedly from the specifications provided by their manufacturer (Erbe et al. 2011). Using an acoustic device designed for mitigation for one species often does not evoke the same behavioural effect on others. The characterisation of acoustic devices therefore needs to be appropriate for the likely sensitive hearing range of the relevant marine mammal species (Hector's and Māui dolphins) and will increase the probability of mitigation success (Erbe and McPherson 2012).

As such, Seafood New Zealand has initiated a lab characterisation of two types of devices currently in use by the New Zealand inshore fishing industry for both set net and trawl. The work includes the characterisation of device source level and frequency spectra, as well as the examination of potential variability within each device type/model. This work will define device classes and model representative scenarios for tested devices, considering factors such as environmental conditions, configuration on nets/trawl gear, and elements relating to the hearing range of Hector's dolphins.

This project aims to build on this work with further research to ensure effective best practice with the use of these devices and limit unintended consequences to dolphins through testing the previous modelled assumptions in real world at-sea scenarios.

Research Approach:

The first stage of this project will design an at-sea trial for at least one viable device of each class (set net and trawl), following recommendations from modelling scenarios and AEBR 254. Field trial design methodologies will be presented for the consideration of wider stakeholder feedback. Following this, at-sea trials will be conducted to assess the viable device/s against modelled predictions and identify any factors to consider for effective use in an operational setting. The outcome of these trials will be reported along with recommendations to guide best practice usage and recommendations for future research.

Outputs:

1. Report describing preliminary work and options for at-sea trial design and methodologies.
2. Final report describing results, analyses and recommendations on viable device specifications for industry and considerations for effective implementation. Recommendations will be provided for future research.
3. A two-page summary of the key outputs and considerations for effective implementation to be distributed to skippers.
4. All data will be provided to DOC in electronic format.

Note: A two-year term is proposed

Indicative Research Cost: $60,000 per annum

Cost Recovery Principle: 262(d)

Cost Recovery: F(CR) Item 4 (100% Industry)

Cost Recovery Rationale:

The outputs of this project will enable the real-world application and testing of modelled output assumptions for two different acoustic alarms currently in use by inshore fisheries. The outputs will guide the development of best practice guidelines for deploying acoustic alarms as mitigation within set net and trawl fisheries where there is a known by-catch risk to Hector's dolphins.

Fish stocks: BUT5, FLA3, GUR3, HPB3, SCH3, SCH5, SPO3, TAR3, TRE7

References:

Erbe, C., et al. (2011). Acoustic characterization of pingers on Queensland Shark Control nets. International Marine Mammal - Gillnet Bycatch Mitigation Workshop. Boston, MA, USA. https://www.bmis-bycatch.org/references/lkw39ahy

Erbe, C and McPherson, C. (2012). Acoustic characterisation of bycatch mitigation pingers on shark control nets in Queensland, Australia. Endangered Species Research. 19 (2): pp. 109-121.

McPherson, Craig, et al. (2021). Feasibility Study: Vessel-based Hector's Dolphin Acoustic Monitoring Systems. Ministry for Primary Industries. https://www.mpi.govt.nz/dmsdocument/44734-AEBR-254-Feasibility-study-vessel-based-Hectors-dolphin-acoustic-monitoring-systems

3.4 MIT2025-01 Improving mitigation data streams to assess bycatch mitigation effectiveness in inshore and HMS fisheries

Project Code: MIT2025-01

Start Date: 1 July 2025

Completion Date: 30 June 2027

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.

Rationale:

To achieve the overarching objectives of the National Plan of Action – Seabirds and the CSP vision of continual reduction in bycatch towards zero, it is vital to collect that allows the assessment of the effectiveness of seabird bycatch so that continual improvements can be sought and demonstrated.

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 rollout of verified camera monitoring, expanded liaison activities and changes in observer coverage. This project will seek to find ways to best use, and improve, these new data channels.

Research Approach:

This desk-based 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 initial phase of this project 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.

Outputs:

1. Recommendations for potential changes to current or additional data collection avenues.

2. Technical report on the work undertaken and results found.

Note: A two-year term is proposed

Indicative Research Cost: $30,000 per annum

Cost Recovery Principle: 262(d)

Cost Recovery: F(CR) Item 4 (100% Industry)

Cost Recovery Rationale:

Inshore bottom longline and HMS fisheries are required to use a range of mitigation measures to reduce protected species bycatch, and non-statutory mitigation options have been identified for inshore trawl. However, bycatch of seabirds and other protected species continues to be a concern in these fisheries, and more work is required for ongoing reductions in line with statutory and policy objectives. Routine collection of data to fully assess the relative effectiveness of different bycatch mitigation options is key to driving such improved bycatch mitigation management. This project leverages the recent introduction of cameras on boats to identify the key parameters for data collection going forwards and identify how to change current protocols and what additional potential tools or programmes are required to supplement existing data collection, to inform ongoing management actions to further reduce bycatch through regulatory or non-regulatory joint agency processes (e.g. NPOAs, TMPs).

Fish stocks: BAR1, BAR5, BAR7, BIG1, BNS1, BNS2, BNS3, BNS7, BNS8, BUT2, BUT5, BUT7, ELE3, EMA1, FLA1, FLA2, FLA3, FLA7, GMU1, GUR1, GUR2, GUR3, GUR7, GUR8, HPB1, HPB2, HPB3, HPB4, HPB5, HPB7, HPB8, JDO1, JDO7, KAH1, LIN1, LIN2, MOK1, PIL1, RCO3, RSK3, SCH2, SCH3, SCH5, SCH7, SCH8, SNA1, SNA2, SNA7, SNA8, SPO1, SPO3, SPO8, STA3, STA5, STA7, STN1, SWO1, TAR1, TAR2, TAR3, TAR7, TAR8, TOR1, TRE1, TRE7, YEM1

3.5 MIT2025-02 Seabird SMART Workshops

Project Code: MIT2025-02

Start Date: 1 July 2025

Completion Date: 30 June 2028

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

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

Rationale:

Between 2012 and 2017 Southern Seabirds held Seabird SMART Workshops to educate inshore commercial fishers about the issue of fisheries-related seabird mortality. The workshops 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 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.

Research Approach:

As with the previous workshops, the overarching objective is to strengthen an attitude of 'commitment beyond compliance' amongst fishers and help them appreciate the critical role they have in conserving New Zealand seabirds.

Key success factors from earlier workshops include using a professional trainer to design the workshops, a skilled facilitator to oversee and lead the workshop, an independent and neutral co-facilitator that fishers know and respect and having the quota holders and fishing companies championing the workshops. Giveaways to anchor the workshop learnings and to share with crew will be part of the workshop collateral (such things as stickers, posters, caps, key rings have been used in the past).

The workshops will include new information and perspectives that deepen participants appreciation of seabirds and mitigation. Seabird SMART fishers from other regions/fisheries may be included where feasible, to act as peer-to-peer inspiration. There will also be a hands-on aspect to the workshops to add an experiential element. The workshops will encourage fishers to adopt a mindset that any annoyances and problems with current mitigation measures are a problem to solve, not an obstacle to adoption.

The half day workshops will be in the local ports and kept to less than twenty participants to keep them personal and relevant to everyone.

DOC Liaison Officers will take part in the workshops and help seek feedback after each workshop to refine and improve content for following workshops.

DOC, MPI and Seafood NZ will agree on priority fisheries for workshop roll-out.

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.

Note: A three-year term is proposed

Indicative Research Cost: $20,000 per annum

Cost Recovery Principle: 262(d)

Cost Recovery: F(CR) Item 4 (100% Industry)

Cost Recovery Rationale:

The outputs of this project will support the uptake of best practice seabird bycatch mitigation in inshore and HMS commercial fleets by direct engagement with operators through workshops. Topics addressed in the workshops include advice to avoid and/or mitigate risk to further seabird captures on a targeted fleet by fleet basis.

Fish stocks: BAR1, BAR5, BAR7, BIG1, BNS1, BNS2, BNS3, BNS7, BNS8, BUT2, BUT5, BUT7, ELE3, FLA1, FLA2, FLA3, FLA7, GMU1, GUR1, GUR2, GUR3, GUR7, GUR8, HPB1, HPB2, HPB3, HPB4, HPB5, HPB7, HPB8, JDO1, JDO7, KAH1, LIN1, LIN2, MOK1, RCO3, RSK3, SCH2, SCH3, SCH5, SCH7, SCH8, SNA1, SNA2, SNA7, SNA8, SPO1, SPO3, SPO8, STA3, STA5, STA7, STN1, SWO1, TAR1, TAR2, TAR3, TAR7, TAR8, TOR1, TRE1, TRE7, YEM1

3.6 MIT2025-03 Using thermal cameras to assess effectiveness of seabird mitigation

Project Code: MIT2025-03

Start Date: 1 July 2025

Completion Date: 30 June 2026

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.

Rationale:

To achieve the overarching objectives of the National Plan of Action – Seabirds and the CSP vision of continual reduction in bycatch towards zero, it is vital to collect that allows the assessment of the effectiveness of seabird bycatch so that continual improvements can be sought and demonstrated.

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.

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 on element of a mitigation strategy.

Research Approach:

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. Initial investigations have shown that birds can be clearly differentiated from the marine environment using this technology.

This project 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 illumination. It is envisaged that on-vessel trials would be conducted alongside other at-sea mitigation/interaction projects to maximise cost synergies.

Based on the at-sea comparative trials, the project will seek to develop protocols suitable for ongoing future use which allows for the assessment of seabird bycatch mitigation effectiveness at night.

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.

Note: A one-year term is proposed

Indicative Research Cost: $50,000

Cost Recovery Principle: 262(d)

Cost Recovery: F(CR) Item 4 (100% Industry)

Cost Recovery Rationale:

A number of seabird bycatch mitigation measures have been introduced across longline fisheries, however residual bycatch continues (estimated at over 1000 potential fatalities annually). Further improvements can be sought by assessing the relative effectiveness of different mitigation strategies, however setting fishing gear at night is a commonly used mitigation measure, which limits our ability to conduct such assessments using traditional observational methods. This project aims to test novel thermal camera technology to develop its use as a tool to conduct these assessments during nighttime and thus provide the evidence to drive improved bycatch mitigation management through regulatory or non-regulatory cross-agency processes.

Fish stocks: BIG1, BNS1, BNS2, BNS3, BNS7, BNS8, HPB1, HPB2, HPB3, HPB4, HPB5, HPB7, HPB8, LIN1, LIN2, LIN3, LIN4, LIN5, LIN7, SNA1, SNA7, SNA8, STN1, SWO1, TOR1

3.7 MIT2025-04 Supporting uptake of sink rate assessment by fishers in bottom longline fisheries

Project Code: MIT2025-04

Start Date: 1 July 2025

Completion Date: 30 June 2027

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.

Rationale:

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 the uptake of the sink rate adaptive management tools currently in development under CSP project MIT2024-04. As such, it will actively facilitate the ongoing improvement of bespoke seabird bycatch mitigation strategies on a vessel-by-vessel basis in line with efforts to reduce seabird bycatch towards zero.

Research Approach:

The project will allow for provision of gear and advice to enable fishers to adopt and use the tool, which will enhance their management of line configurations to achieve effective seabird bycatch management strategies adapted for their operations.

The project will kick-start uptake and productive use of this new tool, which operators will then be able to continue using over the long term in their efforts to continually improve seabird bycatch mitigation strategies and minimise seabird bycatch.

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.

Note: A two-year term is proposed

Indicative Research Cost: $40,000 per annum

Cost Recovery Principle: 262(d)

Cost Recovery: F(CR) Item 4 (100% Industry)

Cost Recovery Rationale:

Effective use of the sink rate adaptive management tool will enhance management of line configurations and thereby mitigate and reduce risk towards seabird bycatch in their operations.

Fish stocks: BNS1, BNS2, BNS3, BNS7, BNS8, HPB1, HPB2, HPB3, HPB4, HPB5, HPB7, HPB8, LIN1, LIN2, LIN3, LIN4, LIN5, LIN7, SNA1, SNA7, SNA8

Appendix 3: Change log

This change log outlines the amendments made to the initial project list since it was presented at the CSP Research Advisory Group meeting on 17 February 2025[7].

Project	Change
All levied projects	Cost recovery rationale added to all levied projects
INT-1 Observing commercial fisheries	Cost recovery amended, now 100% MPI funded
INT-02 Species identification of camera-detected protected species captures in New Zealand fisheries	Cost recovery amended, now 100% MPI funded
INT-7 Testing eDNA detection of protected species using passive samplers on trawl gear	Removed from the Plan
INT-9 Understanding fisheries overlap and interactions of protected gorgonians (order Alcyonacea), stony corals (order Scleractinia), and hydrocorals in the Fiordland Marine Area	Removed from the Plan
INT-10 Understanding the extent and useage of coral rubble reporting codes by fisheries observers	Removed from the Plan
INT-11 Fine-scale spatial analysis of fishing catch data in relation to New Zealand sea lion foraging areas and body condition	Removed from the Plan
POP-05 Updated population assessment for New Zealand fur seals on Bounty Islands from drone footage	Removed from the Plan
POP-07 Great white shark population estimate	Removed from the Plan
POP-13 Campbell Island seabird winter research	Removed from the Plan
MIT-03 Assessing views on the value of corals to inform current and potential ecosystem-based fisheries management approaches	Removed from the Plan
INT2024-07 Collection and curation of tissue samples from protected fishes and turtles	Removed from the Plan
INT-04 Identification, storage and genetics of cold-water coral bycatch specimens	Increased funding from Crown (equivalent to 33% cost recovery rule for fisheries services) Stocks amended due to feedback from the fisheries cost recovery consultation
INT-05 Port-based data collection programme	Stocks amended due to feedback from the fisheries cost recovery consultation
INT-06 Fishing operational factors influencing bycatch in trawl and set net fisheries	Scope amended to include identifying common risk variables associated with Hector's capture events
INT-08 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	Project number updated to INT2025-07 Duration increased to 2 years Increased funding from Crown (equivalent to 33% cost recovery rule for fisheries services).

	Project title updated to "Examining recruitment dynamics and recovery potential from fishing-induced adverse impacts on deep-sea corals on Chatham Rise seamounts Stocks amended due to feedback from the fisheries cost recovery consultation"
POP2024-02 – Coral Reproductive Biology and Resilience Assessment	Stocks amended due to feedback from the fisheries cost recovery consultation
POP-04 Gibson's albatross research and POP-08 White-capped albatross research	These two projects were combined into one project: POP2025-04 Auckland Islands seabird research: Gibson's and white-capped albatross Cost recovery amended, now 100% crown funded
POP-01 Southern Buller's albatross juvenile banding and tracking	Cost recovery amended, now 100% crown funded
POP-06 Salvin's albatross Western Chain research	Project number updated to POP2025-05 Cost recovery amended, now 100% crown funded
POP-09 Updated population assessment for New Zealand fur seal in New Zealand	Project number updated to POP2025-06 Cost reduced from $100,000 to $80,000
POP-11 Antipodes albatross and white-chinned petrel research	Project number updated to POP2025-08 Cost recovery amended, now 100% crown funded
POP-12 Campbell Island seabird research	Project number updated to POP2025-09 Cost recovery amended, now 100% crown funded
MIT2024-01 Protected Species Liaison Programme	Stocks amended due to feedback from the fisheries cost recovery consultation
MIT-01 Improving mitigation data streams to assess bycatch mitigation effectiveness in inshore and HMS fisheries	Stocks amended due to feedback from the fisheries cost recovery consultation
MIT-02 Seabird SMART Workshops	Stocks amended due to feedback from the fisheries cost recovery consultation