
Associated Species - Marine Mammals

Section Detail Report

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Overview

This report provides information on interactions¹ between marine mammals and commercial fishing activities in New Zealand's Exclusive Economic Zone (EEZ) and the Territorial Sea.

All marine mammals found in New Zealand are protected by law. However, it is not illegal to capture or kill a marine mammal incidentally or accidentally in the course of commercial fishing activities but any such event must be reported to the Ministry for Primary Industries as required. Interactions between marine mammals and commercial fishing activities have occurred widely in New Zealand waters.

The Ministry for Primary Industries (the Ministry, which encompasses Fisheries New Zealand) and the Department of Conservation (DOC) are the regulatory agencies responsible for managing interactions between marine mammals and commercial fishing activities. However, a multi-faceted operational environment (including regulatory agencies, industry and non-government organisations) supports the implementation of marine mammal management measures in New Zealand.

Requirements relevant to the management of marine mammal populations and risks to those populations are specified by statute, i.e. Acts of Parliament, and associated regulations. Assessment of compliance with mandatory measures and conformance with non-regulated measures is informed by on-vessel deployment of government fisheries as well as by other monitoring and surveillance measures (including by satellites, patrol boats and aircraft).. Enforcement is undertaken by Ministry for Primary Industries fisheries officers and the Ministry progresses prosecutions in relation to fisheries offences.

Policy for managing risks to marine mammal populations due to commercial fishing activities is derived from domestic legislation and international obligations. Species-specific management actions are identified in threat management plans.

New Zealand's management of interactions between marine mammals and commercial fishing activities is broadly based on the status of marine mammals, risks to their populations, and the intent of minimizing mortalities. An assessment of the risks that commercial fishing presents to marine mammals and two taxon-specific risk assessments have been completed. These risk assessments inform the prioritisation of research and management interventions.

Non-regulatory initiatives aimed at addressing marine mammal interactions with fishing activities include vessel-based risk management plans and liaison activities, education, research and monitoring, and assessing conformance with on-vessel practices intended to reduce capture risks.

New Zealand is party to a number of legally-binding international agreements as well as voluntary arrangements that relate to interactions between marine mammals and fishing activities. These include conventions focusing on biodiversity and marine mammal-specific instruments.

Key statistics

- Thirty-eight taxa of marine mammal are resident or migrant in New Zealand waters. These include 10 species and subspecies of baleen whale, 25 toothed whale taxa and four species of pinnipeds (three seals as well as the New Zealand sea lion). Another 19 marine mammal species are vagrants (occasional visitors) to New Zealand.
- In New Zealand, marine mammal interactions have been documented with commercial fishing activities using the trawl, surface longline, bottom longline, set net, purse seine and pot methods.

¹ For the purposes of this report, interactions are defined as marine mammals coming into contact with fishing gear and associated fish catch. Interactions may result in captures, injuries or fatalities.

- Since 1992, captures of 16 taxa of marine mammals have been reported to result from commercial fishing activities in New Zealand. These captures include two species of baleen whales, nine toothed whale taxa, and four pinnipeds (three seals as well as the New Zealand sea lion).
- Threat management plans have been completed for the New Zealand sea lion and Māui and Hector's dolphins. The Māui and Hector's dolphin threat management plan is under review.

Scope

This report focuses on the management of marine mammal interactions with commercial fishing activities in New Zealand's Exclusive Economic Zone (EEZ) and Territorial Sea. For the purposes of this report, interactions are defined as marine mammals coming into contact with fishing gear and associated catch. Interactions may lead to captures, injuries or fatalities.

The report is not a quantitative analysis, but instead focuses on the management approach associated with these interactions. Both regulatory and non-regulatory measures and management activities are discussed within the report.

Explicitly out of scope are the following:

- Interactions that occur in non-commercial fisheries
- Interactions that occur in other jurisdictions
- Indirect interactions, for example, where commercial fishing activities may have impacts on food availability,
- Threats unrelated to fishing,
- Other anthropogenic effects on marine mammals, and,
- Broader frameworks for marine conservation.

The New Zealand approach

Introduction

Thirty-eight taxa of marine mammal are resident or migrant in New Zealand waters. These include 10 species and subspecies of baleen whale, 25 toothed whale taxa and three species of seals and sea lions². An additional 19 species are considered vagrants in New Zealand. Vagrants include 10 toothed whales and six species of seals².

The conservation status of marine mammals found in New Zealand is reflected in the New Zealand Threat Classification System (NZTCS) and the IUCN Red List. The New Zealand Threat Classification System (NZTCS) is based on an expert panel evaluation of the status of taxa, that considers population size and trend, number of subpopulations, and area of occupancy on a purely national basis³. Classification categories are listed in Appendix 1. Under the NZTCS, 12 marine mammal taxa are classified as data deficient. Of the remaining 26 taxa, eight are threatened, 11 are not threatened, and seven are migrants. (Of the eight threatened taxa, five are nationally critical, two are nationally endangered, and one is nationally vulnerable)².

The IUCN Red List classifies species using conceptually similar criteria applied at a global scale⁴. Classification categories are listed in Appendix 2. Resident and migrant marine mammals occurring in New Zealand are classified by the IUCN as (number of taxa shown in brackets) data deficient (13 taxa), vulnerable (2), endangered (3), critically endangered (2), least concern (16) and not threatened (2)⁴.

² Baker et al. (2013)

³ Townsend et al. (2008)

⁴ IUCN (2018)

Since 1992, captures of 16 taxa of marine mammals have been reported to result from commercial fishing activities in New Zealand. These captures include two species of baleen whales, nine toothed whale taxa, four species of seal including the New Zealand sea lion^{7,9}.

Changes to population status of marine mammals over time are reflected in changes to threat classification. For example, under the NZTCS, the status of the southern right whale improved from Nationally Endangered to Nationally Vulnerable between 2010 and 2013 due to a documented population increase². While threat classification criteria are not threat-specific, known impacts of fishing on populations are reflected in classifications over time.

Characteristics of marine mammal interactions with commercial fishing activity

The nature and extent of interactions between marine mammals and some New Zealand commercial fisheries has been documented by government fisheries observers since the 1990s^{5,6,7}. In general, the nature and extent of these interactions are better understood for large-scale high-volume fisheries than for smaller-scale inshore fisheries⁷.

The nature of interactions between marine mammals and commercial fishing activities depends on the type of fishing gear used. Marine mammal interactions with commercial fishing gear include^{8,9}:

- captures inside trawl nets
- entanglement in set net (gillnet) meshes
- captures on longline hooks
- entanglement in longlines
- becoming trapped, entangled, or crushed in purse seines
- entanglement in fishing pot lines
- contact with sea lion mitigation devices, and,
- depredation of catch inside trawl nets and on longline hooks.

Legislative framework

The Department of Conservation (DOC) and the Ministry for Primary Industries (the Ministry, MPI, and encompassing Fisheries New Zealand) are the two central government agencies with responsibilities for managing marine mammal interactions with commercial fisheries. Within the Ministry, Fisheries New Zealand is the branch responsible for fisheries management (including marine mammal interactions with fisheries). Compliance and enforcement are conducted at a whole-of-Ministry level.

Department of Conservation

DOC's responsibilities include administering:

- the Marine Mammals Protection Act (MMPA) 1978
- the Marine Reserves Act 1971, and,
- Conservation Services, which are provided for in the Fisheries Act 1996.

All marine mammals are legally protected under the MMPA and it is an offence to take any marine mammal without lawful authority. ("Take" is interpreted broadly in this context, to include, for example, disturbing, herding, or injuring marine mammals, or any attempts to do these things). It is not illegal to capture or kill a marine mammal accidentally or

⁵ e.g. Baird (2001)

⁶ Thompson et al. (2013)

⁷ <https://data.dragonfly.co.nz/psc/>

⁸ Rowe (2007)

⁹ Berkenbusch et al. (2013)

incidentally when commercial fishing, however any such event must be reported as required by fisheries reporting regulations, i.e. in the appropriate format and providing reports within specified timeframes¹⁰.

The MMPA provides for the development of population management plans, which are intended to limit the fisheries-related mortality of protected species. To date, a population management plan has not been completed for any marine mammal, however DOC prepared a draft plan for the New Zealand sea lion in the early 2000s.

The MMPA also provides for the spatial management of interactions between marine mammals and fishing activities. Marine mammal sanctuaries may be created, and commercial fishing (or any other activity, e.g. seismic surveys) may be limited or excluded from these areas. There are currently six marine mammal sanctuaries around New Zealand. In three of these sanctuaries (shown with *), restrictions on fishing are in place:

- Auckland Islands*: created to protect New Zealand sea lions and southern right whales.
- Banks Peninsula*: created to protect Hector's dolphins.
- Catlins Coast: created to protect Hector's dolphins.
- Clifford and Cloudy Bay: created to protect Hector's dolphins.
- Te Waewae Bay: created to protect Hector's dolphins.
- West Coast North Island*: created to protect Māui dolphins.

The Marine Reserves Act 1971 provides for the exclusion of fishing from marine reserves, which may reduce risks of interactions between marine mammals and commercial fishing activities. Marine reserves that are located around rookeries and important haul-out areas for marine mammals include:

- Campbell Island/Moutere Ihupuku Marine Reserve
- Bounty Islands/Moutere Hauriri Marine Reserve
- Auckland Islands/Motu Maha Marine Reserve.

In 2016, the New Zealand government initiated consultation on a new Marine Protected Areas Act to replace the Marine Reserves Act 1971. That work is ongoing.

The role of DOC in relation to marine mammal interactions with commercial fisheries includes the delivery of Conservation Services. These services are outputs produced in relation to the adverse effects of commercial fishing on protected species¹¹. Conservation Services are specified annually by DOC and include a substantial amount of work related to marine mammal interactions with commercial fishing. These services may comprise studies of populations, risk assessments, the review and development of bycatch mitigation measures, and the placement of observers to monitor protected species interactions with fishing operations¹².

Ministry for Primary Industries

The Ministry for Primary Industries (encompassing Fisheries New Zealand) administers the Fisheries Act 1996. The Fisheries Act 1996 provides for the utilisation of fisheries resources whilst ensuring sustainability. Marine mammals are encompassed by the “ensuring sustainability” provision of the Fisheries Act 1996, which is defined as avoiding, remedying, or mitigating any adverse effects of fishing on the aquatic environment.

¹⁰ Fisheries (Reporting) Regulations 2017

¹¹ CSP (2015)

¹² CSP (2018)

Under this Act, the Fisheries (Reporting) Regulations 2017 require commercial fishing permit holders to report captures of marine mammals. The Act also provides for the Minister of Fisheries to apply sustainability measures. Spatial management of fishing activities can apply under this provision, e.g., to reduce the risk of marine mammal captures in certain areas¹³.

Under the Fisheries Act 1996, the Minister of Fisheries^{Error! Bookmark not defined.} is also responsible for taking all reasonable steps to ensure that protected species mortality limits specified in population management plans are not exceeded.

Fisheries Services are specified annually by the Ministry. These may comprise services including studies of marine mammal populations, risk assessments, observer services, and evaluation of bycatch mitigation measures.

Both the Minister of Conservation and the Minister of Fisheries (Primary Industries) have responsibilities under the Kaikōura (Te Tai o Marokura) Marine Management Act 2014. This Act identifies two sanctuaries for marine mammal protection. Commercial fishing is not specifically excluded from these areas^{14,15}.

Policy context

Outside the legislative framework, domestic policy guidance for activities relating to marine mammal interactions with commercial fishing includes:

- The Conservation General Policy 2007¹⁶
This Policy covers six statutes¹⁷ relevant to conservation management, including the Marine Mammals Protection Act 1978 and the Marine Reserves Act 1971. It specifies that marine protected species should be managed for long-term viability and recovery throughout their natural range.
- The New Zealand Biodiversity Strategy 2000¹⁸ and Action Plan 2016¹⁹
This strategy and action plan comprise New Zealand's response to its obligations under the Convention on Biological Diversity 1992. In relation to addressing marine mammal interactions with commercial fishing activities, National Target 5 from the Action Plan is relevant, that is, "*Biodiversity is integrated into New Zealand's fisheries management system*", with the key action that:

"By 2020, New Zealand will have moved towards an ecosystem approach to fisheries management that includes enhanced recording of bycatch from the sea and improved understanding of the rates of change in marine biodiversity."

The New Zealand Biodiversity Strategy is currently under review. The Minister of Conservation is leading the development of the new strategy. The new strategy is scheduled to be finalized in late 2019.

These policies provide high-level guidance for the development of management actions.

Species-specific management policies for some marine mammals are guided by threat management plans, and in some cases, fisheries plans where marine mammal interactions are a particular issue²⁰. DOC and the Ministry of Fisheries

¹³ Fisheries (Auckland and Kermadec Areas Commercial Fishing) Regulations 1986; Fisheries (Central Area Commercial Fishing) Regulations 1986; Fisheries (Challenger Area Commercial Fishing) Regulations 1986; Fisheries (South East Area Commercial Fishing) Regulations 1986; Fisheries (Southland and Sub-Antarctic Areas Commercial Fishing) Regulations 1986; Fisheries (Set Net Prohibition from Pariokariwa Point to Hawera) Notice 2012

¹⁴ Ohau New Zealand Fur Seal Sanctuary (Restrictions) Notice 2014

¹⁵ Te Rohe o Te Whanau Puha Kaikoura Whale Sanctuary (Restrictions) Notice 2014

¹⁶ DOC (2007)

¹⁷ Other statutes encompassed by this Policy are the Wildlife Act 1953, Conservation Act 1987, Reserves Act 1977, and the Wild Animal Control Act 1977.

¹⁸ DOC (2000)

¹⁹ DOC (2016)

developed a draft threat management plan for Hector's and Māui dolphins in 2007 and conducted a review of the Māui dolphin component of this plan in 2012. Decisions on that review were announced in November 2013^{21,28}. A full review of the entire Hector's and Māui dolphin threat management plan is scheduled for completion by DOC and MPI (Fisheries New Zealand) in 2019²².

The Ministry and DOC have also developed a Threat Management Plan for New Zealand sea lions²³.

These plans are discussed in more detail later in the report.

Complying with the New Zealand approach

Implementation of legal and policy requirements

New Zealand government agencies promulgate legislation and regulations through publication. Once legislative requirements have taken effect, the onus is on the identified party to implement them. Where legal requirements apply to specific stakeholder group(s), e.g. commercial fishing permit holders, the Ministry may also send personal correspondence to relevant individuals to notify them directly of the new requirements.

Fishing permit holders are responsible for meeting legal requirements for reporting specific information on marine mammals captured in the course of commercial fishing activities¹⁰.

Commercial fishers are responsible for adhering to restrictions on commercial fishing activities in certain areas¹³.

Marine mammal sanctuary and marine reserve provisions relate to every person, including but not limited to commercial fishers.

Risk-based approach

Government agencies develop and implement risk-based approaches to managing marine mammal interactions with commercial fishing activities.

Risk assessments

Risk assessments are a useful tool for focusing and prioritising management activities including research. For example, where a species is assessed as being at relatively higher risk of experiencing negative population impacts due to commercial fishing, measures to address that risk can be prioritised over potential management actions applicable to species at lower risk. Risk assessments can range from qualitative through to fully quantitative. In the New Zealand context, risk assessments undertaken for marine mammals have incorporated expert opinion and more quantitative approaches (see below). The amount of information available is a key determinant of the approach.

Species-specific risk assessments have been conducted for two high profile marine mammals, the Māui dolphin²⁴ and New Zealand sea lion^{25,26}. A multi-species risk assessment has also been completed^{9,27}.

²⁰ Ministry of Fisheries (2010a)

²¹ Ministry of Fisheries and DOC (2007)

²² <https://www.doc.govt.nz/our-work/our-work-with-maui-dolphin/hectors-and-maui-dolphin-threat-management-plan/review/>

²³ DOC and MPI (2017)

²⁴ Currey et al. (2012)

²⁵ Debski and Walker (2016)

²⁶ Roberts and Doonan (2016)

Summary of Māui dolphin risk assessment

An expert panel conducted the 2012 risk assessment of Māui dolphin²⁴. This dolphin is classified as Nationally Critical by the New Zealand Threat Classification System². The expert panel conducting the risk assessment concluded that 95.5% of human-induced mortalities occurred as a result of fishing (including commercial, recreational, and customary sectors). The remaining mortalities were attributed to non-fishing human-induced threats. The group also concluded that the estimated level of human-induced mortality is higher than the population can sustain. Estimated levels of mortality were 76 times greater than a level at which the Māui dolphin could reach or maintain a population above the subspecies' maximum net productivity level with high certainty²⁴. At the time of the risk assessment, the estimated population size of Māui dolphin was 55 animals aged one year or older (95% confidence limit: 48 – 69)²⁴. In 2015/16, the population was estimated at 63 animals of that age (95% confidence limit: 57 – 75)⁴¹. The population estimate for 2016, agreed in 2018, was 57 (95% confidence interval: 44 – 75)⁶⁰.

Summary of the New Zealand sea lion risk assessment

The New Zealand sea lion risk assessment focused on the two best understood breeding populations, occurring at the Auckland Islands and Otago Peninsula^{25,26}. For the Auckland Islands population, the greatest risks were identified as disease (*Klebsiella* and hookworm), commercial trawl fishing, male aggression, trophic conditions (prey availability), and entrapment and death in mud wallows. Addressing any one of these risks was considered inadequate to resolve the population decline that is evident at the Auckland Islands. Instead, the assessment showed that a holistic view to addressing risks is required^{25,26}.

The small population of sea lions breeding on Otago Peninsula is affected by some different risks than the Auckland Island population. Leading risks to the Otago Peninsula population included deliberate human-induced mortality, setnet fishing, and male aggression^{25,26}.

The threat management plan for New Zealand sea lions was informed by the findings of this risk assessment²³. The vision of the threat management plan is “*to promote the recovery and ensure the long-term viability of New Zealand sea lions, with the ultimate goal of achieving 'Not Threatened' status*”. Goals and actions supporting this objective are discussed further below. The population of New Zealand sea lions was recently estimated at 11,800 (2014/15)²⁶.

Summary of multi-species risk assessment

The multi-species risk assessment assessed the risk that commercial fishing presents to marine mammals. It is designed for data-poor situations. Therefore, it is complemented by approaches that integrate detailed data sets where these are available (e.g., as described above for the New Zealand sea lion). The first iteration of the multi-species risk assessment found that of the 35 marine mammal taxa considered (Figure 1), the twelve species at relatively highest risk from New Zealand commercial fishing activities were²⁷:

- Common dolphin
- Killer whale Type A
- Hector's dolphin
- Māui dolphin
- Bottlenose dolphin
- Short-finned pilot whale
- New Zealand fur seal
- False killer whale
- Long-finned pilot whale

²⁷ Abraham et al. (2017)

- Dusky dolphin
- Southern elephant seal
- New Zealand sea lion.

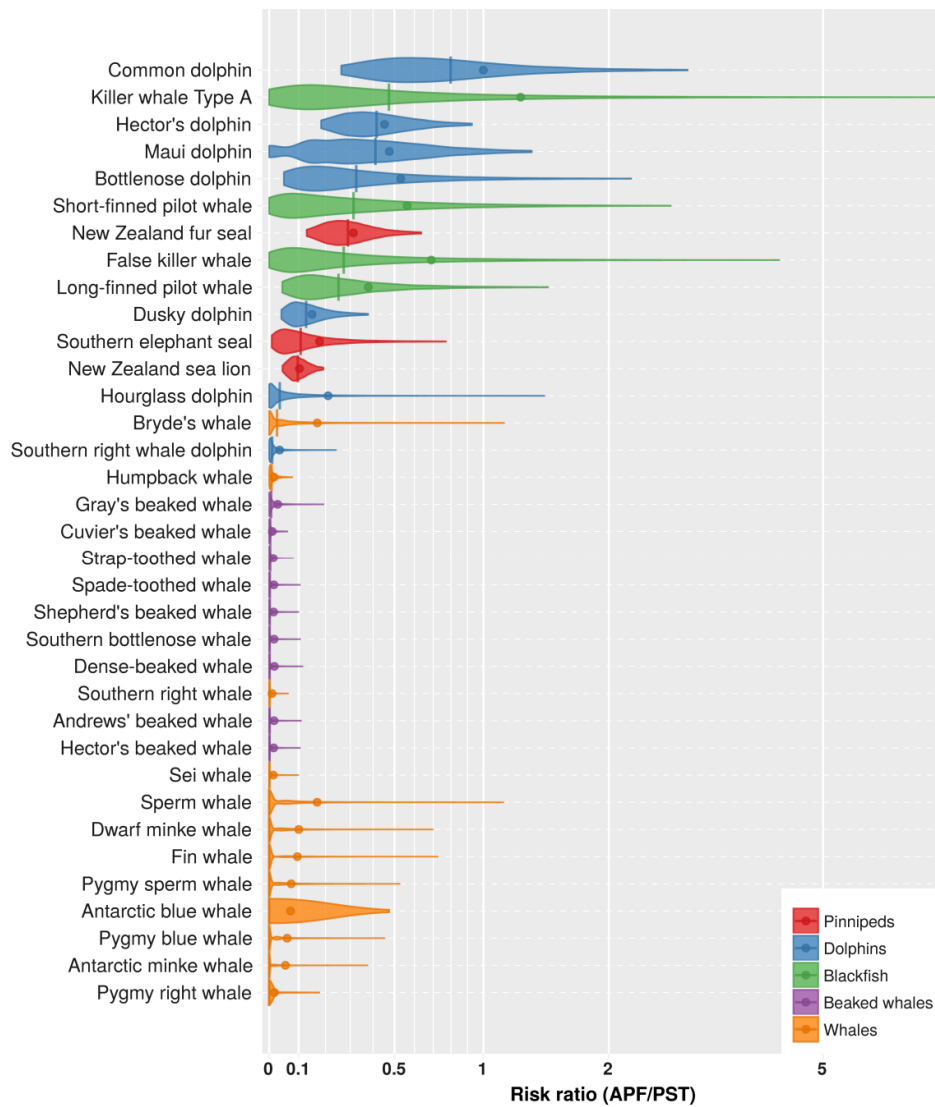


Figure 1. Cumulative fishery risk to marine mammal taxa, across all fishery groups, as estimated by the 2017 New Zealand Marine Mammal risk assessment (Abraham et al., 2017.). (Source: MPI (2017a), reproduced with permission from the Ministry for Primary Industries).

Threat management plans

Hector’s and Māui Dolphin Threat Management Plan

The objectives of the Hector’s and Māui Dolphin Threat Management Plan^{28,29} are:

²⁸ MPI and DOC (2012)

- "to ensure that the long-term viability of Hector's and Māui dolphins is not threatened by human activities, and
- to further reduce impacts of human activities as far as possible, taking into account advances in technology and knowledge, and financial, social and cultural implications".

Hector's and Māui dolphin interactions with commercial fishing activities are a key component of the threat management plan, which considers all human and non-human-induced threats.

Management measures developed and implemented to manage fishing interactions with Māui dolphin were informed by the risk assessment described above for this dolphin. Management decisions were promulgated in November 2013 and remain in place at present³⁰. These include area-based restrictions on fishing activity, and increased monitoring of commercial fishing activities in some areas (Figure 2)^{29,31}.

A review of the Hector's and Māui dolphin threat management plan will be completed in 2019²².

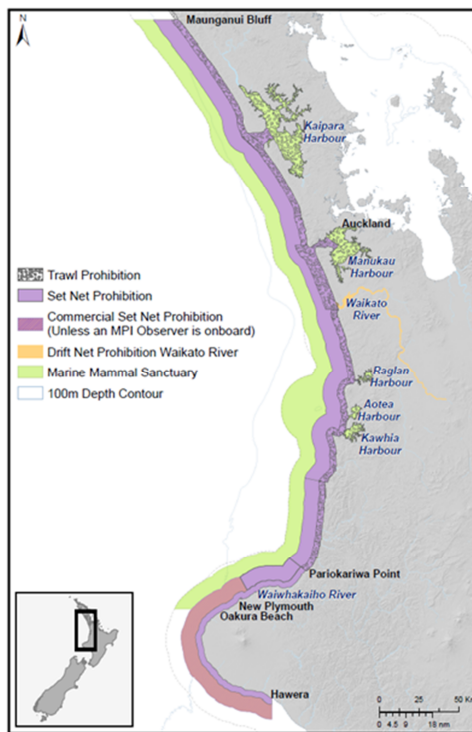


Figure 2. Overview of spatial management measures implemented to reduce risks to Māui dolphin along the West Coast of the North Island of New Zealand. (Source: www.doc.govt.nz/nature/native-animals/marine-mammals/dolphins/maui-dolphin/current-protection-measures/).

New Zealand sea lion Threat Management Plan

²⁹ <http://www.doc.govt.nz/our-work/our-work-with-maui-dolphin/review-of-the-maui-dolphin-threat-management-plan/summary-of-decisions-on-maui-dolphin-threat-management-plan/>

³⁰ <http://www.doc.govt.nz/Documents/getting-involved/consultations/2013/marine-sanctuary/variation-cabinet-paper-msu-ref-13-b-472.pdf>

³¹ <http://www.doc.govt.nz/our-work/our-work-with-maui-dolphin/review-of-the-maui-dolphin-threat-management-plan/summary-of-decisions-on-maui-dolphin-threat-management-plan/>

The New Zealand sea lion Threat Management Plan was finalized in 2017. The vision of this plan is:

“to promote the recovery and ensure the long-term viability of New Zealand sea lions, with the ultimate goal of achieving ‘Not Threatened’ status”²³

The objectives of this Plan are to:

1. *Halt the decline of the New Zealand sea lion population within 5 years*
2. *Ensure the New Zealand sea lion population is stable or increasing within 20 years, with the ultimate goal of achieving ‘Not Threatened’ status.*

Workstreams contributing to delivering on this Plan are developed annually, and the Plan has a 5-year review cycle²³.

Fisheries Plans

Fisheries Plans were developed by the Ministry of Fisheries (now the Ministry for Primary Industries, and encompassing Fisheries New Zealand) as part of a framework linking strategic objectives and outcomes with operational objectives.

In its national and deepwater and middle-depth fisheries plan, the former Ministry of Fisheries, and subsequently, the Ministry for Primary Industries, identified the need to manage marine mammal interactions^{20,32}. This plan provides the overarching strategic framework for deepwater and middle-depth fisheries. The current draft plan was consulted on in 2017. Relevant Management Objectives are³²:

- *“Identify and avoid or minimise adverse effects of deepwater and middle-depth fisheries on associated or dependent and incidentally caught fish species”.*
- *“Manage deepwater and middle-depth fisheries to avoid or minimise adverse effects on the long-term viability of endangered, threatened and protected species”*

Annual Operational Plans specify the management actions that will be implemented each year for deepwater and middle-depth fisheries. In 2018/19, actions relevant to interactions between these fisheries and marine mammals included working with DOC to implement the New Zealand Sea Lion Threat Management Plan, implementing observer coverage to detect marine mammal captures, and monitoring conformance of the fleet with measures in places to monitor and manage fishing impacts,

The current draft national fisheries plan for highly migratory fish species³³ (HMS) requires that the Ministry implements *“an ecosystem approach to fisheries management, taking into account associated and dependent species.”* This objective is carried through from the previous HMS plan³⁴.

Actions detailed in the Annual Operational Plan³⁵ that are relevant to marine mammal interactions include characterizing captures of protected species (including marine mammals).

The Ministry of Fisheries’ draft national fisheries plan for inshore fisheries³⁶ stated that an objective for the management of these fisheries is *“to minimise the adverse impacts of fishing activities on the aquatic environment including biological diversity.”*

³² MPI (2017b)

³³ MPI (2017c)

³⁴ Ministry of Fisheries (2010b)

³⁵ MPI (2017d)

³⁶ Ministry of Fisheries (2011)

Operational Plans addressing marine mammals interactions

SQU6T Operational Plan

Government develops and implements an Operational Plan to manage interactions between New Zealand sea lions and trawl fisheries targeting arrow squid around the Auckland Islands (Quota Management Area SQU6T). The Ministry develops this plan in consultation with DOC and stakeholders^{37,38}. The plan sets a fishing-related mortality limit for sea lions caught during trawl fishing targeting squid in SQU6T. If this fishing-reached mortality limit is reached, the fishery may be closed. The plan also sets out information requirements for commercial fishers entering SQU6T, including providing the Ministry with details of their planned fishing activities.

Critical components of the Government's approach to managing New Zealand sea lion interactions with squid trawl fisheries in the SQU6T area are the fisheries-related mortality limit, the strike rate and the discount rate^{38,39}.

The fisheries-related mortality limit is informed by policy settings and a mathematical model that assesses management settings against population criteria. For example, the model identifies which management settings can provide for a specified level of increase, or maintenance, of the sea lion population³⁹.

For the purposes of fisheries management in SQU6T, the strike rate is the sea lion mortality rate specified per trawl tow. This allows expression of a mortality limit in terms of the number of trawl tows occurring. The strike rate is estimated based on what is known about sea lion interactions with trawl fisheries and the mitigation of these interactions by sea lion exclusion devices (SLEDs)³⁹. SLEDs are designed to allow sea lions to escape from trawl nets. However, they do not always escape and may occasionally sustain injuries that could lead to fatalities after they exit trawl nets. To acknowledge the benefits of SLEDs in facilitating sea lion escape from trawl nets, a discount is applied to the strike rate on trawl tows conducted in SQU6T when SLEDs of the Government-approved design and specifications are deployed³⁹.

Research and monitoring

Research and monitoring relating to marine mammal interactions with commercial fishing activities, and the management of those interactions, is conducted on an ongoing basis. Current research activities supported by the Ministry and DOC include the following^{12,39}:

- Assessing the nature and extent of marine mammal captures in commercial fisheries through observer deployments
- Investigation of electronic monitoring for identifying protected species (including marine mammals) caught in New Zealand commercial fisheries
- Trialling electronic monitoring systems designed for small vessels
- Spatial distribution of New Zealand sea lions and overlap with fisheries
- Modelling efficacy of SLEDs
- Data collection for New Zealand sea lion populations at Auckland Islands, Campbell Island and Rakiura (Stewart Island)
- Integrated modelling of the Auckland Island sea lion population
- Abundance and distribution of Hector's and Māui dolphins
- Risk assessment for Hector's and Māui dolphins

Beyond current monitoring approaches focused on fisheries observer deployment, the Ministry is implementing Digital Monitoring (DM) across New Zealand commercial fishing vessels. (DM was previously known as the Integrated Electronic Monitoring and Reporting System (IEMRS)).

³⁷ MPI (2017e)

³⁸ MPI (2018)

³⁹ MPI (2017a)

DM comprises vessel geospatial positioning reporting and near-real time catch and effort reporting. The roll-out of these requirements is underway, with implementation across the New Zealand commercial fleet scheduled for completion by the end of 2019. Electronic logbooks will be used by fishers to meet statutory reporting requirements, including when marine mammals are caught in the course of fishing operations. (Note that prior to the initiation of DM, some larger fishing vessels were already reporting catch and effort information electronically and were required to carry Vessel Monitoring Systems to provide geospatial information).

The requirement for electronic monitoring (EM) using on-vessel cameras is under ongoing consideration by Government. Exemptions to the existing regulations for EM are now in place⁴⁰. (These regulations were promulgated in 2017). The current Minister of Fisheries has stated that re-consultation would occur in future if EM is to be progressed⁴¹.

Stakeholder engagement

Stakeholder engagement is a core component of the government's approach to addressing marine mammal interactions with commercial fishing activities.

Consultation on regulatory proposals is required by law, and also occurs on some non-regulatory management initiatives. For example, the development of the New Zealand sea lion threat management plan was underpinned by a detailed public consultation process⁴².

On an ongoing basis, DOC and the Ministry, respectively, convene the Conservation Services Programme Technical Working Group and the Aquatic Environment Working Group (AEWG). These groups include stakeholders such as fishing industry representatives, science providers, NGOs, and independent experts. The groups review and evaluate marine mammal research and management work, and make recommendations on future work, including that comprising Conservation and Fisheries Services. These groups do not operate by consensus, but DOC and the Ministry take the groups' deliberations into account, e.g. when making decisions about whether to accept research findings as final.

Marine mammals management work outside commercial fisheries

For seals and sea lions, land-based work at breeding sites may include research to understand population status and trajectories, and attachment of monitoring devices to these animals to determine at-sea movements. These activities are relevant to an understanding of the risks of marine mammal interactions with commercial fishing. Some of this work is conducted and/or supported by Government. However, a significant amount of non-government work also supports delivery on government management priorities for marine mammals, for example studies conducted by universities.

Non-regulatory initiatives

Marine Mammal Operational Procedures

Marine Mammal Operational Procedures (MMOPs) have been developed for New Zealand trawl vessels ≥ 28 m in overall length as a non-regulatory measure that is required by DWG. These procedures have been revised over time^{43,49} and are focused on reducing the risks of marine mammal captures during trawling⁴⁴. The current MMOPs include:

- Procedures that apply when a marine mammal is incidentally captured, including reporting and safe removal of live-caught animals from the vessel
- Measures to be taken to avoid marine mammal captures, and,

⁴⁰ <https://www.fisheries.govt.nz/protection-and-response/sustainable-fisheries/strengthening-fisheries-management/fisheries-change-programme/digital-monitoring-resources/#exemptions>

⁴¹ <https://www.beehive.govt.nz/release/next-steps-digital-monitoring-fisheries>

⁴² <http://www.doc.govt.nz/get-involved/have-your-say/all-consultations/2016/threat-management-plan-for-new-zealand-sea-lions-rapoka/>

⁴³ Deepwater Group (2014)

⁴⁴ Deepwater Group (2018a)

- Identification information for seals, sea lions and some dolphin species.

The implementation of MMOPs is supported by DWG's environmental liaison officer conducting workshops with vessel operators, skippers and crew.

The MMOPs are also supported by a one-page document summarizing 10 key measures for managing interactions with marine mammals⁴⁵.

Government fisheries observers audit on-vessel conformance with MMOPs and DWG follows up with vessel operators, to investigate any issues identified.

Protected Species Risk Management Plans

Liaison work focusing on the management of marine mammal interactions is underway amongst coastal trawlers (vessels < 28 m overall length). Protected Species Risk Management Plans (including marine mammals) were prepared for 11 vessels operating around Otago in 2017/18. This work builds on initiatives undertaken in 2014/15, that were focused around the South Island⁴⁶. In 2018/19, liaison work has been extended to coastal trawlers operating in other areas.

In 2018/19, vessels fishing with set nets (gillnets) are included in liaison officers' work programmes for the first time. An expansion of work with these vessels is planned in coming years^{Error! Bookmark not defined.}.

Liaison work conducted in coastal trawl (excluding vessels targeting hoki under the Deepwater Group Ltd, who operate under the DWG Liaison Officer programme) and set net fisheries is currently executed as a conservation service, overseen by DOC¹², who implement the programme in collaboration with MPI and Fisheries Inshore New Zealand.

Government fisheries observers audit the implementation of voluntary risk management plans. Liaison officers then follow up with vessel operators, to resolve any issues identified and update risk management plans if appropriate.

Conformance and verification measures

External measures

Fishing permit holders are legally required to report all marine mammal captures in the course of commercial fishing to the Ministry for Primary Industries. (In practice, the vessel skipper typically adopts this responsibility). Reports are stored in the Ministry's databases and used for research and management as the data quality and quantity allow.

Where voluntary or mandatory near-real time reporting of captures occurs, timely management action may be taken to address captures and/or factors that may exacerbate the risk of captures.

Government fisheries observers are placed on vessels to collect information on many components of fishing operations. Observer duties relating to management of marine mammal interactions with commercial fishing activities include documenting where fishing activities occur, recording marine mammal sightings and captures, and taking photographs or samples of marine mammals landed on fishing vessels to enable confirmation of species identification¹². Observers are focused on information collection, not enforcement. Information they collect is then returned to government agencies onshore for follow-up. Government has some ability to audit fisher self-reports against observer reports where observers are placed on fishing vessels.

⁴⁵ Deepwater Group (2018b)

⁴⁶ Pierre (2017)

A compliance role is executed by Ministry for Primary Industries Fisheries Officers, who conduct port visits to fishing vessels and may board vessels at sea. Fisheries Officers also issue infringement notices and collect information that may inform prosecutions for fisheries offences.

Aerial surveillance is also used to gather information on compliance with commercial fisheries legislation. Similar to information collected by observers, surveillance information is returned to the Ministry for onshore processing and any follow-up deemed appropriate. Detecting fishing in closed areas is one example of information collected from aerial surveillance.

Geospatial position reporting (GPR) provides another tool for the Ministry to monitor the position of larger fishing vessels. GPR is one component of MPI's digital monitoring framework⁴⁷, and supersedes the requirement for Vessel Monitoring Systems (VMS)⁴⁸. In time, the requirement to automatically report vessel locations will be rolled out more broadly across the commercial fishing fleet.

Where non-compliance with legal requirements is detected (including failure to report marine mammal captures), offences and penalties apply. These are articulated in the legislation (Acts and associated regulations). Penalties include forfeiture of property, fines and imprisonment, depending on the nature and gravity of the offence. Section 252 of the Fisheries Act articulates penalties relevant to provisions of that Act. For example, the penalty for providing false information is imprisonment for a term up to 5 years and/or a fine of up to \$250,000. In contrast, penalties applicable under the Fisheries (Reporting) Regulations 2017 and Fisheries (Satellite Vessel Monitoring) Regulations 2017 comprise fines of up to \$100,000. The Fisheries (Geospatial Position Reporting) Regulations 2017 include a penalty of \$1,000 per day if offences against these regulations continue.

Where non-regulated triggers specified in MMOPs and Protected Species Risk Management Plans are reached, fishers must report to liaison officers. Liaison officers can then work with fishers to identify and resolve issues that may have exacerbated capture risks.

Government fisheries observers also document conformance with MMOPs and vessel-specific risk management plans. Information flow back to industry enables follow-up where non-conformance is identified. The Ministry/Fisheries New Zealand's Annual Review Reports provide publicly available reporting on conformance with non-regulatory measures including MMOPs⁴⁹.

Other measures

For fisheries certified as sustainable by the Marine Stewardship Council, the sustainability of protected species captures, and associated management measures, are key parts of the fisheries assessment and annual audit processes⁵⁰. Detailed information supporting fisheries assessments is available in the Public Certification Reports available on the species profile page of OpenSeas.

Comparability to international best practice

Overarching measures

⁴⁷ Fisheries (Geospatial Position Reporting) Regulations 2017

⁴⁸ Fisheries (Satellite Vessel Monitoring) Regulations 1993

⁴⁹ Fisheries New Zealand (2018)

⁵⁰ www.msc.org

New Zealand's approach to managing marine mammal interactions with commercial fisheries is guided by or linked to a number of international agreements, conventions, plans and guidelines. Some of these originate in fisheries-specific contexts whilst others are more broadly related to the conservation of biodiversity or marine mammals. In broad terms, the relevance of these instruments to marine mammal interactions with fishing activity is that a commitment exists to ensure that:

- the use of fisheries resources is sustainable, and,
- the conservation status of marine mammals is not compromised by commercial fishing activities.

In many cases, marine mammal interactions with fisheries are encompassed in provisions for considering the effects of fishing on associated, dependent or ecologically-related species.

Binding agreements that relate to the sustainable use of fisheries resources include the following.

- United Nations Convention on the Law of the Sea (UNCLOS) 1982⁵¹
This convention requires New Zealand to consider the effects of fishing such that populations of associated or dependent species (i.e. including marine mammals) are maintained or restored above "*levels at which their reproduction may become seriously threatened*"⁵². The convention also identifies the role of international organisations in the conservation, management and study of marine mammals.
- Convention for the Conservation of Southern Bluefin Tuna 1994⁵³
This convention focuses on the management of southern bluefin tuna (*Thunnus maccoyii*). Marine mammals are ecologically-related species in the context of this convention. Parties report captures of ecologically-related species to the Commission and subsidiary groups as appropriate.
- United Nations Fish Stocks Agreement 1995⁵⁴
This agreement implements provisions of UNCLOS, requiring the adoption of conservation and management measures that ensure associated and dependent species and species belonging to the same ecosystem as harvested fish stocks, are maintained for long-term viability.
- Western and Central Pacific Fisheries Convention 2004⁵⁵
This Convention is underpinned by UNCLOS. Its objective is to ensure the long-term conservation and sustainable use of highly migratory fish stocks in the western and central Pacific Ocean.

The Commission that implements the Convention has created a binding conservation and management measure (CMM 2011-03) prohibiting the vessels of member countries, cooperating non-members and participating territories from setting purse seine nets on tuna schools when cetaceans are observed with these schools. The measure outlines steps that must be taken if cetaceans are unintentionally encircled by purse seine fishing gear. This applies in the convention area both on the high seas and inside EEZs.

The Commission also prohibited the use of large-scale drift nets on the high seas within the convention area (CMM 2008-04).

⁵¹ http://www.un.org/depts/los/convention_agreements/texts/unclos/UNCLOS-TOC.htm

⁵² http://www.un.org/depts/los/convention_agreements/texts/unclos/unclos_e.pdf

⁵³ <https://www.ccsbt.org/>

⁵⁴ In full: United Nations Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks

⁵⁵ <https://www.wcpfc.int/>

- Convention on the Conservation and Management of High Seas Fishery Resources in the South Pacific Ocean 2009⁵⁶
Parties to this binding Convention focus on conservation and sustainable use of fisheries in the South Pacific. This includes the development and implementation of conservation measures intended to protect and maintain the ecosystems in which fisheries resources occur. Conservation measures relating to marine mammals include requirements for the collection of data from vessels to assess the impacts of fishing on non-target and associated or dependent species (CMM 02-2018). For marine mammals, these data include the identity of the species caught, number of captures, sex, type of interaction, and any risk factors operating that may have contributed to the capture event occurring.

Binding agreements that identify marine mammal species specifically, and promote an improvement in their conservation status are:

- International Convention for the Regulation of Whaling 1946⁵⁷
The purpose of this convention, operationalised by the International Whaling Commission (IWC), is the conservation of whales and management of whaling. The Commission's role includes compiling and reviewing large amounts of information on whales and dolphins. It passes resolutions on decisions made.

The Scientific Committee of the IWC considers information presented by members and makes recommendations on research and management. This Committee concluded in 2016 that bycatch mitigation measures New Zealand is applying to Māui dolphins are inadequate⁵⁸. In 2017, the Scientific Committee agreed that longline fishing was a potential alternative to set net and trawl fishing that would reduce risks to Māui dolphin. Fishing industry initiatives to change fishing methods to reduce the risk of gear interactions with Māui dolphins were noted⁵⁹. In 2018, the Scientific Committee noted that:

“no new management action regarding the Māui dolphin has been enacted since 2013. It [the Committee] therefore concludes, as it has repeatedly in the past, that existing management measures in relation to bycatch mitigation fall short of what has been recommended previously and expresses continued grave concern over the status of this small, severely depleted subspecies.”⁶⁰

- The Convention on the Conservation of Migratory Species of Wild Animals (CMS) 1979⁶¹
Appendix I and II of this Convention list marine mammals that occur in New Zealand. Their listing in Appendix I identifies species as being in danger of extinction. This obligates New Zealand to strictly protect listed species by prohibiting take, conserving habitats, facilitating their migration and managing other factors that might endanger them.

Appendix II recognises listed species' unfavourable conservation status, and the requirement for international cooperation to deliver management to improve that status. The Convention encourages range states for listed species to develop agreements for management of listed species or species groups.

Non-binding instruments that relate to the management of marine mammal interactions with commercial fishing activity include:

- United Nations Food and Agriculture Organization Code of Conduct for Responsible Fisheries (CCRF) 1995⁶²

⁵⁶ <http://www.sprfmo.int/>

⁵⁷ <https://iwc.int/convention>

⁵⁸ Scientific Committee of the International Whaling Commission (2017a)

⁵⁹ Scientific Committee of the International Whaling Commission (2017b)

⁶⁰ Scientific Committee of the International Whaling Commission (2018)

⁶¹ <http://www.cms.int/>

⁶² <http://www.fao.org/3/a21f9e2a-22cf-5223-9d5b-328a99f1e748/11145e00.pdf>

This Code provides a principled approach to fisheries management and promotes the protection of marine biodiversity and endangered species.

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Appendix 1. Conservation status categories of the New Zealand Threat Classification³

Where taxa are taxonomically determinate, categories and subcategories are:

- Extinct
- Data Deficient
- Threatened
 - o Nationally Critical
 - o Nationally Endangered
 - o Nationally Vulnerable
- At Risk
 - o Declining
 - o Recovering
 - o Relict
 - o Naturally Uncommon
- Non-resident Native
 - o Migrant
 - o Vagrant
 - o Coloniser
- Not Threatened
- Introduced and Naturalised

Where taxa are taxonomically indeterminate, categories and subcategories are:

- Data Deficient
- Threatened
 - o Nationally Critical
 - o Nationally Endangered
 - o Nationally Vulnerable
- At Risk
 - o Naturally Uncommon

Appendix 2. IUCN Red List Categories⁴

- Extinct
- Extinct in the wild
- Critically endangered
- Endangered
- Vulnerable
- Near threatened
- Least concern
- Data Deficient
- Not evaluated

Appendix 3. Scientific names of marine mammals in this report

- Common dolphin (*Delphinus delphis*)
- Killer whale Type A (*Orcinus orca* Type A)
- Hector's dolphin (*Cephalorhynchus hectori hectori*)
- Māui dolphin (*C. h. maui*)
- Bottlenose dolphin (*Tursiops truncatus*)
- Dusky dolphin (*Lagenorhynchus obscurus*)
- Short-finned pilot whale (*Globicephala macrorhynchus*)
- False killer whale (*Pseudorca crassidens*)
- Long-finned pilot whale (*Globicephala melas*)
- Southern right whale (*Eubalaena australis*)
- Leopard seal (*Hydrurga leptonyx*)
- New Zealand fur seal (*Arctocephalus forsteri*)
- Southern elephant seal (*Mirounga leonina*)
- New Zealand sea lion (*Phocarctos hookeri*)

Report Details

Section	Associated species – Marine Mammals
Report author(s)	Johanna Pierre, JPEC Ltd (Director)
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Lead Agency Review	Andrew Baxter, Department of Conservation
Date of review	9 April 2019
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Relevant legislation, regulation and statutes	<p>Marine Reserves Act 1971</p> <p>Marine Mammals Protection Act 1978</p> <p>Fisheries Act 1996</p> <p>Kaikōura (Te Tai o Marokura) Marine Management Act 2014</p> <p>Fisheries (Satellite Vessel Monitoring) Regulations 1993</p> <p>Fisheries (Reporting) Regulations 2001</p> <p>Fisheries (Set Net Prohibition from Pariokariwa Point to Hawera) Notice 2012</p> <p>Ohau New Zealand Fur Seal Sanctuary (Restrictions) Notice 2014</p> <p>Te Rohe o Te Whanau Pūha Kaikoura Whale Sanctuary (Restrictions) Notice 2014</p>
Relevant regulatory agencies	<p>Ministry for Primary Industries www.mpi.govt.nz</p> <p>Department of Conservations www.doc.govt.nz</p>