Appendix W Draft marine mammal management plan

CAWTHRON

Ngāi Tahu Seafood Resources: marine mammal management plan

Cawthron Report 3727

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Ngāi Tahu Seafood Resources: marine mammal management plan

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Prepared for Ngāi Tahu Seafood Resources Ltd

CLIENT DRAFT

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Contents

1. Introduction

1.1 Purpose

The purpose of this marine mammal management plan (MMMP) is to provide:

- a monitoring programme with goals and procedures for recording marine mammal presence and interactions / incidents with the Hananui Aquaculture Project (Hananui) marine farms, owned by Ngāi Tahu Seafood Resources Ltd (NTS) off the north coast of Stewart Island / Rakiura, along with appropriate responses and reporting procedures
- mitigation and management actions and techniques to minimise marine mammal interactions and incidents with Hananui marine farms
- procedures for implementation of the MMMP control measures
- a review process that has the flexibility to accommodate future advances in infrastructure and other developments in line with evolving best management practices (BMPs).

1.2 Background

This MMMP has been aligned with national guidelines produced by Fisheries New Zealand (FNZ) to minimise and mitigate the interactions between finfish open ocean aquaculture and marine mammals (Clement et al. 2021). Many of these practices are already reflected in the Finfish Aquaculture Environmental Code of Practice developed by the New Zealand Salmon Farmers Association (NZSFA 2007) and their more recent Sustainable Management Framework for New Zealand Salmon (AQNZ 2015). FNZ's guidance is intended to be consistent with several of the international certification requirements of the Aquaculture Stewardship Council, the Best Aquaculture Practices certification processes and the Seafood Watch Aquaculture standards.

In Aotearoa New Zealand, two statutes specifically manage impacts on marine mammals. The Marine Mammals Protection Act 1978 (MMPA) provides for the conservation, protection and management of all marine mammals, and the Marine Mammals Protection Regulations 1992 (MMPR) establishes procedures for permits and commercial tourism, and prescribes appropriate behaviour for all boats (and aircraft) in the vicinity of marine mammals. Under the MMPA, all marine mammals are considered protected species, and it is an offence to 'take' (which includes, among other things, disturb, harass, injure or kill) a marine mammal without a permit. It also gives defence for accidental or incidental injury or death (e.g. while fishing), provided all such events are reported to the Department of Conservation (DOC).

In addition to the MMPA and the MMPR, any resource consents issued for activities in the coastal marine area under the Resource Management Act 1991 (RMA) are also likely to contain conditions relating to the management of the effects of activities on marine mammals. These conditions will need

to be consistent with the MMPA and the MMPR but may also address wider matters. While the Fisheries Act 1996 also contains provisions relating to marine mammals, these are not relevant to aquaculture activities, which are managed under the RMA.

A number of parties are therefore likely to be involved in the implementation of this MMMP, but the primary responsibilities lie with the consent holder (NTS) and the consent authority (Environment Southland [ES]). DOC will fulfil any responsibilities it has under the MMPA and may be able to provide assistance and advice in relation to marine mammals, as noted in this MMMP, but it is not obligated to do so.

1.3 Objectives

The primary objective of this MMMP is to ensure that NTS operations at Hananui farm sites:

- monitor and document the level of marine mammal presence around the farm sites
- minimise and / or mitigate the attraction (or avoidance) of marine mammals to the farms (e.g. investigation of structures)
- minimise and / or mitigate interactions between the farm structures and marine mammals (e.g. rubbing on the structures)
- avoid, minimise and / or mitigate incidents (e.g. entrapment, injury or entanglement)
- meet the requirements of the MMPR and any permit granted by DOC under the MMPA.

1.4 Terminology

The following terms define how a marine mammal may encounter a farm:

- **Attraction or avoidance** – marine farm structures represent a new physical, visual or acoustic obstruction that marine mammals may choose to ignore, investigate or avoid. Attraction might alter natural foraging and migration patterns and, potentially, lead to interactions and also to incidents. In contrast, avoidance may exclude mammals from part of their habitat, or disrupt migration patterns or foraging behaviour.
- **Interaction** – any physical contact made between a marine mammal and a part or structure of a farm itself. This definition of interaction includes everything from rubbing ropes to bumping against and hauling out onto structures.
- **Incident** – an interaction that results in an injury (e.g. rope cut, abrasion), entrapment (e.g. a live animal within a farm pen), or entanglement (live or fatal) of a marine mammal.

Terms that describe the current conservation status of marine mammals are based on the New Zealand Threat Classification System (NZTCS; Rolfe et al. 2022; Lundquist et al. 2025):

- **Threatened** – includes species classified as Nationally Critical, Nationally Endangered, Nationally Vulnerable or Nationally Increasing
- **At Risk** – includes species classified at Declining, Uncommon or Recovering.

1.5 Roles and responsibilities

According to consent Condition 34(i), the consent holder(s) shall provide the names, contact details and roles of the key people responsible for monitoring, reporting and implementing this MMMP. These people and their details are listed in Table 1. If a role/ responsibility is transferred to a new person, the consent holder shall immediately provide ES's XX compliance officer, Ngāi Tahu ki Murihiku and DOC's Operations Manager Murihiku / Rakiura with the name and details of the new contact.

A liaison procedure with DOC and Ngāi Tahu ki Murihiku representatives shall be established at the beginning of the project for real-time communication regarding any marine mammal sightings of concern (e.g. whale activity in the area near farms; see Section 7.1).

Table 1. Summary of key contacts, roles and responsibilities.

Name	Role / responsibility	Organisation
Operational Manager	Has overall responsibility for the MMMP and all aspects of reporting and MMMP updates. e. @.nz p. (XX) XXX-XXX	NTS
Farm Block or Site Manager	Investigates / reports incidents to ES, DOC and iwi. e. @.nz p. (XX) XXX-XXX	NTS
Wildlife Manager	Undertakes monitoring, and collates and manages data, incidents and reporting across all farms. Train steam members in the MMMP and communicates revisions of the MMMP to farm staff. e. @.nz p. (XX) XXX-XXX	NTS
Communications Manager	Provides external communications to ES, DOC and iwi. e. @.nz p. (XX) XXX-XXX	NTS
All farm and vessel staff	Understand the provisions and expectations of the MMMP, and implement them during day-to-day operations.	NTS
Environment Southland Compliance and Monitoring	Regulates the consent. XXX contact details	ES

Name	Role / responsibility	Organisation
	e. @.nz p. (XX) XXX-XXX	
DOC Operations Manager	Provides conservation advice. XXX contact details e. @.nz p. (XX) XXX-XXX	DOC
Ngāi Tahu ki Murihiku representatives	Provide cultural advice and permissions. XXX contact details e. @.nz p. (XX) XXX-XXX	Iwi
Dr Deanna Clement	Marine mammal specialist e. [redacted] p. [redacted]	Cawthron Institute

1.6 Training

It is the responsibility of NTS to ensure that all team members and sub-contractors understand and can implement the requirements of this MMMP. The Wildlife Manager will be responsible for implementing all the wildlife (seabird, sharks, marine mammals) monitoring protocols, management and reporting. At least one dedicated staff member with the appropriate wildlife training will be on duty during each shift. The Wildlife Manager will be trained by a suitably qualified marine mammal expert, although several experts may be required to deliver the training (including dive and vessel safety and operational procedures), depending on their area of expertise. At a minimum, the Wildlife Manager will be trained on the following topics:

- identifying marine mammals (see Section A1.3 in Appendix 1)
- implementing monitoring protocols (see Section 2 and Sections A1.1 and A1.2 in Appendix 1)
- operating vessels safely around marine mammals (see Appendix 2)
- implementing the disentanglement protocol safely [1] (see Appendix 3)
- completing the reporting databases and incident forms, and preparing annual reports (see Section 7).

Training requirements will vary depending on a staff member's role. In general, staff training may involve the following topics:

- procedures for operating vessels safely around marine mammals, including ensuring that vessels are operated in accordance with the MMPR (see Appendix 2)
- identifying and recording sightings of marine wildlife (see Section A1.3 in Appendix 1)

[1] NTS will work with DOC to consider whether the Wildlife Manager could be trained as part of DOC's marine mammal disentanglement network.

- health and safety equipment and protocols necessary for dealing with live or dead marine wildlife (see Appendix 3)
- health and safety protocols for diving with marine wildlife in accordance with the MMPR (see Appendix 4)
- reporting requirements and time frames (see Section 7).

1.7 Marine mammal management plan review

Regular internal reviews of the effectiveness of the MMMP in managing and mitigating the adverse effects on marine mammals, as well as operational efficacy, will occur:

- following every major operational change to the farms or monitoring systems
- following any incident (e.g. entrapment, injury or entanglement) of any cetacean species or a Threatened or At Risk pinniped species
- following any interaction / incident that is at a level greater than expected,[2] or following any unexpected or unusual interaction / incident involving a marine mammal
- if a recommendation from an investigation of an entrapment, injury or entanglement suggests that a review or update of the MMMP's protocol / procedure is necessary.

An external review of the MMMP's monitoring programme, BMPs and disentanglement protocols will occur after the first 2 years of the consent (and once initial construction has begun), within 30 days of any reported fatal incident, and following any major MMMP changes certified by ES's XXX. Subsequent external reviews shall occur at least every 5 years. An external review shall be conducted by a representative of ES, an experienced marine mammal researcher and NTS representatives, and in consultation with DOC.

With each review, there will also be an opportunity to integrate any findings from the ongoing monitoring, as well as advances in infrastructure and other developments that are in line with the evolution of the science behind BMPs.

[2] At present, these levels of interactions and incidents are unknown but are expected to be low given current species data. For example, an expected and usual interaction would be pinnipeds coming to examine structures and pulling or bumping into nets. Section 2.4 defines what is currently considered to be above these expectations. These expectations will be reassessed after pre-farm baseline monitoring and farm construction monitoring have been completed. Final levels will likely need to be determined through a combination of professional judgement and some form of staged or rolling average.

2. Monitoring programme

To document and quantify marine mammal presence and subsequent interactions (or lack of) with the farms, NTS will undertake a monitoring programme that, at the minimum, is based on the recommendations of the national open ocean guidelines (OOA; Clement et al. 2021). This programme will build an understanding of marine mammal presence around the site while tracking how presence, interactions and incidents change over time, thereby informing the review of management and mitigation measures. Programme results will be regularly assessed by suitably qualified and experienced person(s), and the programme will be adjusted, if necessary, to ensure compliance with relevant consent conditions.

2.1 Purpose

Rather than a cause–effect approach, the purpose of the monitoring programme is to gather data on marine mammal presence (or absence) around the farm sites and any subsequent interactions with the farms. With these data, NTS can evaluate the significance of any major operational changes, pinpoint possible issues, and develop potential solutions more effectively and efficiently against a baseline.

Monitoring goals

Informative monitoring goals are based on monitoring metrics (see below), and at a minimum will include:

- quantifying marine mammal occurrence / interaction / incident rates (relative to absences / effort) at the farm sites (e.g. What marine mammal species are observed near the farm sites?)
- assessing any spatial or temporal trends in marine mammal occurrence / interaction / incident rates and locations (e.g. Are marine mammals present near particular farm sites on a regular basis or at certain times of the year? How does this timing correspond to farming events or other activities?)
- assessing whether any distinct changes or trends in metrics occur over the monitoring period relative to baseline monitoring and any operational farm changes
- assessing whether spatial changes or trends in metrics are evident over the monitoring period, relative to baseline conditions and any operational farm changes.

Monitoring metrics

The metrics to be assessed, at a minimum, will include:

- marine mammal occurrence rates and sighting locations (relative to effort)
- marine mammal interaction rates at the various farm sites
- marine mammal entrapment, injury and entanglement rates at the various farm sites.

The monitoring programme involves three levels of monitoring: baseline, farm and solution monitoring. Each level further describes the different methods (e.g. on-farm and / or off-farm protocols) to be used and over what time periods (e.g. pre-farm, construction phases and operational phases). Further details can be found in Appendix 1. Depending on the outcomes of the various levels, this programme can be adapted and tailored to best address specific issues of each farm.

2.2 Level 1 – Baseline and farm construction monitoring

Pre-farm monitoring

One year of baseline monitoring prior to the introduction of any construction phases (e.g. first moorings for pens through to production) is required within and around the general farm area. The purpose of this monitoring is to benchmark the expected levels of cetacean (dolphins and whales) presence around the farm sites, particularly for less well-studied species such as southern right whales. This baseline information is not necessary for pinnipeds, as current data suggest that New Zealand fur seals and New Zealand sea lions are regularly present in this wider area of the farm sites. Hence, there is no reason to validate their presence in the proposal area prior to any construction. Pre-farm information on cetaceans will validate and fine-tune the MMMP management and mitigation measures while providing the context for comparing Level 2 monitoring results.

Currently, passive underwater acoustic recorders provide the best year-round method for collecting detailed data on the presence of any cetacean species, both day and night and when sea conditions are not favourable for visual sightings. The use of an acoustic array (multiple recorders) is necessary to triangulate the distance of vocalising animals from the farm site to help assess where individuals (particularly whales) may be located relative to farms as they pass through this region of Foveaux Strait. For more details, see Section A1.1 in Appendix 1.

Farm construction monitoring

Benchmarking both the presence (and absence) of all species (cetaceans and pinnipeds) and any potential levels of interactions or incidents with farm structures will also be necessary throughout the on-site construction phases of the farms. It is important to note the various marine mammal watch protocols that should be followed prior to any construction work commencing on the farms (e.g. Section 4.2, Section A1.2 in Appendix 1). It is recommended that both underwater acoustic and visual survey methods be used during the construction phases of the farm. For more details, see Section A1.2 in Appendix 1.

2.3 Level 2 – Farm monitoring

Once the farms are constructed and operational, NTS staff will continue to monitor and report visual sightings and interactions with marine mammals – including when animals are present but are not seen from the farm. These Level 2 monitoring methods are aimed at assessing the frequency and significance

of any interactions, while also gathering much-needed information on research and knowledge gaps that will serve to refine and further improve the MMMP and best practice guidelines.

Observations by the Wildlife Manager and by staff travelling to and from the farms will be recorded to a publicly accessible web-based database[3] following the same protocols established under Level 1 baseline monitoring. However, at Level 2 this will also include recording all pinniped sightings, all interactions (e.g. rubbing ropes, bumping against structures) and all incidents (e.g. entanglements, injuries, entrapments).

Level 2 monitoring shall also include remote technology approaches to monitoring (e.g. underwater acoustic recorders, aerial drones, automatic feed or underwater camera systems, autonomous underwater vehicles, ROVs, geolocators). The intent is to use any automated and / or remote systems that are already being used by farm managers for normal daily operational farm monitoring to also opportunistically monitor marine mammals. For instance, managers may use live underwater feed cameras to check for the presence of marine mammals and any underwater interactions with farm structures.

There are several advantages to using remote monitoring technologies over, or in conjunction with, visual sightings. Key of these is that most remote methods can monitor for the presence of marine mammals both day and night, and when sea conditions are not favourable for visual sightings. The exact monitoring method (or combination of methods) is not specified at this stage, as remote technologies are rapidly developing and several advances are anticipated before monitoring likely commences. However, several key requirements are listed below:

- All surface interactions / contacts (e.g. non-injurious) between any animal and the farm need to be recorded, categorised and quantified.
- Real-time subsurface surveillance or regular reviews of similar recorded data for coincidental interactions (or lack of) between animals and any farm structures should use existing farm systems or technologies, if possible.
- Footage and / or photographs of all interactions with any farm structures (e.g. any physical contact, rub, tail slap, bump, etc.) will be archived by NTS and can be made available to ES, Ngāi Tahu ki Murihiku and / or DOC on request.
- Active (additional visual sighting surveys and remote surveillance) monitoring of marine mammals and any subsequent interactions should be undertaken during high-risk periods, such as structure maintenance / removal (see Section A1.2 in Appendix 1 for more details).
- Record and report all surface and subsurface interactions and incidents (e.g. injury or mortality), as per the incident reporting procedure (Section 7.1).

[3] NTS proposes that it reports wildlife incidents in a similar way to Huon Aquaculture's online environmental dashboard – https://dashboard.huonaqua.com.au/environment

2.4 Level 3 – Solution monitoring

If marine wildlife interactions with farm structures become commonplace and / or result in an entanglement or injury, mandatory Level 3 monitoring will apply. Expected levels of interactions and incidents (see footnote 4 in Section 1.7) are based on the assessment of effects report (Clement 2025) and are defined as:

- no pinnipeds hauling out on pen walkways, with exception of vessel landing platforms
- no incidents resulting in an entrapment, entanglement (live or fatal) or serious injury.

If interactions or incidents exceed the above levels, this is considered commonplace and solution-based monitoring will be required. Level 3 monitoring is aimed at investigating these situations in more detail for any contributing factors and identifying possible solutions with a dedicated monitoring system.[4] The risk of interactions is highly dependent on the species involved and their motivations for being near the farms (e.g. chasing prey, targeting farmed fish, migrating past, hauling out to rest), as these factors will influence whether they interact with the farms and whether this results in an incident. Hence, mandatory real-time farm monitoring with a dedicated wildlife monitoring system will be required in order to report on all detections of marine mammals around farms, any subsequent interactions (or lack of) between animals and any farm structures if detections exceed expectations. Consultation with experienced marine mammal experts will be necessary.

Additional monitoring will be dependent on Level 2 results, but might involve:

- determining attraction factor(s) (i.e. fishing attraction device [FAD], lights, noise, feed / waste)
- assessing marine mammal behaviour around farms
- documenting duration or temporal trends in attraction
- documenting potential outcomes of interactions (e.g. animal observed swimming away quickly, continued to remain around farm for rest of day, etc.)
- developing or improving mitigations to reduce interaction levels.

[4] Examples of possible real-time remote monitoring technology include, at a minimum, video monitoring, passive acoustic monitoring, underwater camera systems, ROV or drone options, and / or geofencing locators.

3. Controls to minimise interactions

Conditions 33(c), 33(d) and 34(b) require a framework to help minimise the attraction (or avoidance) of marine mammals to the farms, which is regularly assessed through the monitoring programme. This section sets out BMPs to help identify and minimise the attraction of marine mammals to the farms and any subsequent interactions.

3.1 Best management practices for vessel(s) / harvesting gear

To ensure underwater noise levels generated by farming activities are as low as possible, all farming equipment and vessels will be regularly maintained to reduce the production of underwater noise and vibrations. Operators of all vessel(s) used on the farms shall ensure that:

- all noise-suppression equipment, such as mufflers and ventilation baffles, shall be maintained in good working order
- all equipment and vessels (e.g. lubrication and repair of winches, generators) are regularly maintaining
- best boating guidelines around marine mammals are followed to minimise any attraction or avoidance responses or subsequent vessel strikes (see Appendix 2 for more details).

3.2 Operational best management practices

Feeding protocols

The amount of feed and dead salmon that is accessible through and outside the nets will be minimised to reduce attracting predators and their prey by:

- implementing feed wastage protocols with stock feeding rates monitored using best practice feed monitoring systems (e.g. underwater cameras), and using false bottoms in nets (see Section 4.1 for more details)
- removing dead fish from pens as soon as is reasonably practical and storing them in a manner that does not attract predators (as managed through the Biosecurity Management Plan and Waste Disposal Plan)
- prohibiting activities that could attract marine mammals to the farm, such as recreational fishing or intentionally feeding other wildlife (e.g. birds, fish).

Underwater and surface lighting

Where and whenever possible, artificial lighting will be minimised to reduce attracting prey fish and predators by:

- using shaded, downward-pointing light sources within fish pens as part of fish husbandry
- reducing the use of lights on farm structures to the minimum required for the health and safety of farm workers and navigation.

Waste and debris

No waste (biodegradable or non-biodegradable) should be released inside the farms or in the surrounding water. Waste is defined as rubbish, packaging, food, rope pieces and similar materials that could end up in the water. Note that feed-based waste is discussed above in the 'Feeding protocols' section. All waste will be collected, stored securely for the weather conditions, and disposed of on land in accordance with the Waste Management Plan and Biosecurity Management Plan.

Access to surface structures

To minimise pinniped interaction with the farm, all floats and surface structures will be secured inside safety and jump fences, where practicable. It is noted that landing platforms for vessels on the side of pens, feeding pipes (and associated stanchions) and mooring buoys will be positioned outside secure fences. However, all efforts will be made to secure these from pinnipeds without compromising the health and safety of staff and / or vessels.

4. Controls to minimise incidents

This section sets out all the protocols and procedures that relate to measures designed to mitigate the risk of incidents between marine mammals and farm infrastructure. The reporting measures included in the associated operational monitoring programme will allow NTS managers to assess and adjust any operations or mitigations, where necessary, to manage the risk of impacts on marine mammals throughout the duration of the consent.

4.1 Best management practices for farm and pen design

To minimise the risk of marine mammal entrapment and / or entanglement, the following will be considered, and, where practicable, implemented prior to and during farm development.

Farm design and layout

The risk of marine mammal entanglement with any farm structures, nets or mooring / warp lines during the design of the farm structures will be reduced by:

- minimising overlap or crossing of underwater warp lines on farms to or from node plates
- ensuring mooring lines are generally at the same height / depth in any horizontal plane in the water column, with little to no vertical staggering or crossing, where practicable
- where crossing lines are necessary for farm integrity or safety, ensuring the overlap occurs as close to the seabed as possible or above the water surface
- spacing the pens within a farm block as close to one another as is operationally possible, with moorings around the sides, to dissuade larger animals from entering the gap between them
- allowing ample spacing between farms (at least 1 km apart in the predominate current direction[5]), as far as is practicable and while adhering to the Biosecurity Management Plan, to prevent channelling animals down long corridors between blocks and / or into another farm block (i.e. a dead-end)
- orienting blocks parallel to Foveaux Strait and whale migration pathways
- maintaining anchor warps under tension in all tidal conditions.

Pen design

NTS is intending to use a single net system and will adhere to the following management techniques:

- using predator-resistant materials in net construction (e.g. semi-rigid or core-stiffened nets that are resistant to, or contain heavy monofilament to provide resistance to, easy tearing, i.e. from chewing)

[5] Based on current salmon farm spacings around Aotearoa New Zealand and in regard to the potential whale species in this region.

- using nets with a mesh size that minimises a predator's ability to penetrate the net with its head, flippers or tail (i.e. < 40 mm half-mesh, e.g. knot to knot unstretched)
- extending any above-surface nets > 2 m if fixed and rigid and > 3 m if flexible above the sea surface (e.g. jump fences) around pens
- using nets with a 'false' bottom separated from the outer net to catch dead fish and remove them from the reach of marine species swimming underneath the nets, or a mortality-collection system that would hold / contain dead fish.

4.2 Operational best management practices

The potential for marine mammals to enter and / or become entangled with the marine farms will minimised through appropriate maintenance and replacement schedules. These include the following:

- Daily maintenance schedules,[6] including:
  - standard maintenance surface inspections and replacement schedules undertaken as part of normal operational activities, to ensure:
    - no marine mammal is entangled in, or has entered, the farm
    - attention is drawn to any unusual fish stock behaviour that may suggest a marine species has entered a net pen
    - nets / pens and lines are well maintained (e.g. holes repaired as soon as feasible) and kept taut
    - tensioning systems of all pen nets (to prevent billowing) are regularly checked and maintained
    - there are no untensioned and / or loose ropes and lines on farms at any time
    - immediate inspections of all nets are carried out after any significant storm events.
  - standard below-water net inspections:
    - during feeding via the feed cameras
    - via net scoring assessments
    - via net cleaning
    - by divers operating in the pens during the course of their normal work.
- Fortnightly / monthly[7] maintenance schedules, including:
  - detailed subsurface visual inspection of all net structures at farms during net cleaning to check for holes and damage.
- Immediately following any significant storm, inspection of farm nets and structures to ensure that no marine mammal has become entrapped or entangled, and no damage has occurred that may allow this to happen.

[6] Daily farm operations will be managed through a system of remote (e.g. camera checks), automatic (e.g. tensioning sensors) and manual (in-person) checks that will have some overlap.
[7] Duration to be confirmed once operations start and net-fouling scores are being collected.

- Implementation of the Waste Management Plan to minimise the potential for loss of farm debris, which could lead to marine mammal entanglement or create other hazards, for example by:
  - collecting or retrieving waste, and storing it securely (especially in high-wind conditions)
  - mitigating the loss of debris through service vessel scuppers
  - maintaining farm infrastructure regularly, to minimise breakages or loss of equipment overboard
  - disposing of all wastes at an approved solid waste facility onshore.
- Before undertaking major operational installations, removals and / or structural maintenance:
  - review the monitoring data to consider whether marine mammals are likely to be in the area and review the management procedures accordingly
  - minimise the period of time nets are not under tension or opened for repair / removal, and ensure farm staff / divers maintain extra vigilance during these situations (see Section A1.2 in Appendix 1).

4.3 Recommendation for minimising pinniped interactions

It has been suggested that pinniped attacks on farmed fish occur primarily through the base of the nets (Northridge at al. 2013). Due to the recognised damage and stress that pinniped entry to a farm can cause, specific and additional mitigation actions for pinnipeds are outlined below.

Measures to prevent predation through the net wall

Various measures can be taken to prevent or reduce predation through the net (particularly the bottom), including:

- recovering fish mortalities from the bottom of nets daily or as soon as is practically possible after detection.
- using 'false' net bottoms (as described in Section 4.1). These should be made of a tough material, resistant to pinniped attacks. A modification to the false bottom involves the creation of an entirely separate base to the net, which hangs approximately 1 m lower than the standard base and prevents predators from pushing the net up from beneath the pen in an attempt to grab mortalities.
- using a mortality-collection system that would hold / contain fish mortalities out of reach of marine species swimming underneath the nets.
- tensioning, especially the correct tensioning of the base of farm nets. This may require the use of down ropes with attached weighting systems.

Electrified wires / fences / mats

To prevent pinnipeds from hauling out or trying to climb over walkway fences, farms in the Marlborough Sounds (Cawthorn 2013) and overseas have used electric wires, fences or mats, with varying degrees of success (e.g. K Shaw, DFO Canada, pers. comm., 22 July 2025). However, there is little documented evidence as to the efficacy of these devices. To prevent undue harm to pinnipeds, both the

USA and Canada have guidelines and regulations around their use. In this case, the use of any such deterrents should be planned in a manner that documents their ability to deter without injury and be limited to those areas of most concern (i.e. vessel landing platform). In general, if such devices are safe for humans, the effects on pinnipeds are expected to be indirect and associated with short-term energetic costs to the animal.

Acoustic deterrent devices (ADD)

Fisheries New Zealand guidelines recommend that ADDs are avoided given the lack of evidence to support their long-term effectiveness for reducing predation at finfish farms. There are also concerns around the potential for ADDs to affect non-target species such as cetaceans through potential displacement, habituation and damage to hearing.[8] However, it is recognised that this area of research is rapidly developing, and it is feasible that an appropriate acoustic deterrent may be developed for specific short-term farm operations (e.g. changing nets) in future years. It is important to note that a DOC marine mammal permit will be required to use any acoustic deterrent device for marine mammals.

NTS will commit to *not using* the following approaches to deter or reduce pinniped interactions and subsequent incidents:

- harassment, and deterrents including:
  - firecrackers / seal bombs
  - cracker shells
  - in-air deterrents (aerial pyrotechnics, bird scarers / propane canons)
  - tactile harassment (rubber projectiles, paintball guns, bean bag rounds, taser technology, seal scare caps).
- aversion methods, including:
  - conditioned taste aversion – lacing a dead salmon with lithium chloride to reduce depredation
  - electric fish – using a plastic fish with electrodes that deliver an electric shock when a pinniped tries to bite or grab it.

[8] Note that the use of acoustic deterrent measures is currently an offence under the MMPA unless permitted by DOC.

5. Controls to minimise the effects of incidents

This section describes the implementation of BMPs to reduce further adverse effects of any entrapment, injury or entanglement (i.e. an incident) of marine mammals with farm structures (see summary in Figure 1). It details the reporting system that will be used to document such events and their outcome. A disentanglement protocol is provided in Appendix 3 in the unlikely event that a live marine mammal becomes entangled with farm structures. NTS acknowledges that handling pinnipeds requires a permit through the MMPA and intends to apply for such permits as a part of the Hananui Fast-track Approvals application.

5.1 Live entrapped incidents

The appropriate guidelines and / or associated protocols for handling marine mammals that become entrapped within the farms are detailed below and in Figure 1, and must be followed by the Wildlife Manager and other farm staff. Any live marine mammal found in the farm must be returned to the wild alive and uninjured.

Emergency release methods are listed below in order of preference:

- **Method 1:** Drop or submerge a section of the pen net and use a crowder net to guide the animal out over the submerged section of pen.
- **Method 2:** Cut a section of the pen in an attempt to release the animal:
    - use a pruning hook to create a vertical cut in the pen near the water's surface
    - next, use a boat hook on either side of the cut to pull the sides apart and create a hole for the animal to swim through
    - use a crowder net to guide the animal to the opening.

Once the animal has been released and no further sightings occur in the vicinity of the farm, the pen must be repaired or the damaged section replaced as soon as is reasonably possible.

All entrapment or entanglement incidents, regardless of outcome (e.g. non-injury, injury or mortality), will be recorded in the NTS incident database and forwarded to DOC, Ngā Rūnanga ki Murihiku and ES once all actions required have been taken and within 48 hours of the incident occurring (see Table 2 in Section 7).

Trapping to remove entrapped pinnipeds

Trapping is recommended to remove any pinniped that has entered a farm cage and cannot be released by Method 1 or Method 2 above. NTS acknowledges that trapping and handling pinnipeds requires a permit through the MMPA and intends to apply for such permits as a part of the Hananui Fast-track Approvals application.

Some promising strategies for the non-lethal removal of pinnipeds from fish farm cages have been proposed and / or tested overseas and are listed below. However, these may need to be trialled and reviewed on an ad hoc basis (i.e. if and when the opportunity presents itself) to determine their feasibility, practicality and efficacy (see Section 1.7).

- **Floating deck:** The intent of this method is to cause the pinniped to haul out by progressively creating a floating deck to cover the cage surface. Floating modular plastic deck blocks are be added until only a small area of open water is available for the pinniped to surface and breathe, forcing it to haul out on the blocks.
- **Fine-mesh net trap:** Similar to the floating deck approach, a fine-mesh net is used to cover the cage surface so that the pinniped is constrained to a small (e.g. 1.5 m-diameter) breathing hole. To force the pinniped to the surface, the net needs to be positioned below the surface (to a depth of approximately 2 m), with access to the surface maintained through a closable, detachable net tunnel.
- **Trap:** A simple trap mechanism can be used alongside either method above to prevent the pinniped from re-entering the water and diving away. The trap needs to be detachable so that it can be manually or mechanically moved to an escape point, where the pinniped can be released.

NTS acknowledges that trapping as a form of mitigation offers only short-term relief to farm operations and does not provide a long-term resolution to pinniped and finfish farm interactions. Instead, such interactions will be avoided through the use of extensive layout and operational standards (see Sections 4.1 and 4.2).

5.2 Live entangled marine mammals

In the event of a live entanglement of a pinniped, dolphin or whale in a farm structure or pen, the Wildlife Manager will contact the XXX Manager (Figure 1). The XX Manager must then contact the local DOC office (or 0800 DOCHOT as a backup) and seek specific advice from DOC's marine mammal disentanglement team.

A disentanglement plan and protocol outlined in Appendix 3 must be followed with advice from DOC. All operations must take place from the surface (with a minimum of two people) and no-one should enter the water for the purpose of directly attempting to dis entangle gear on the animal or be close enough at the surface to touch the animal. When able, an email will be sent to the Marine Species Team – marinemammal@doc.govt.nz. All entanglement incidents, regardless of outcome (e.g. non-injury, injury or mortality), must be recorded in the NTS incident database and forwarded to DOC and Ngāi Tahu ki Murihiku within 24 hrs and to ES within 48 hrs.

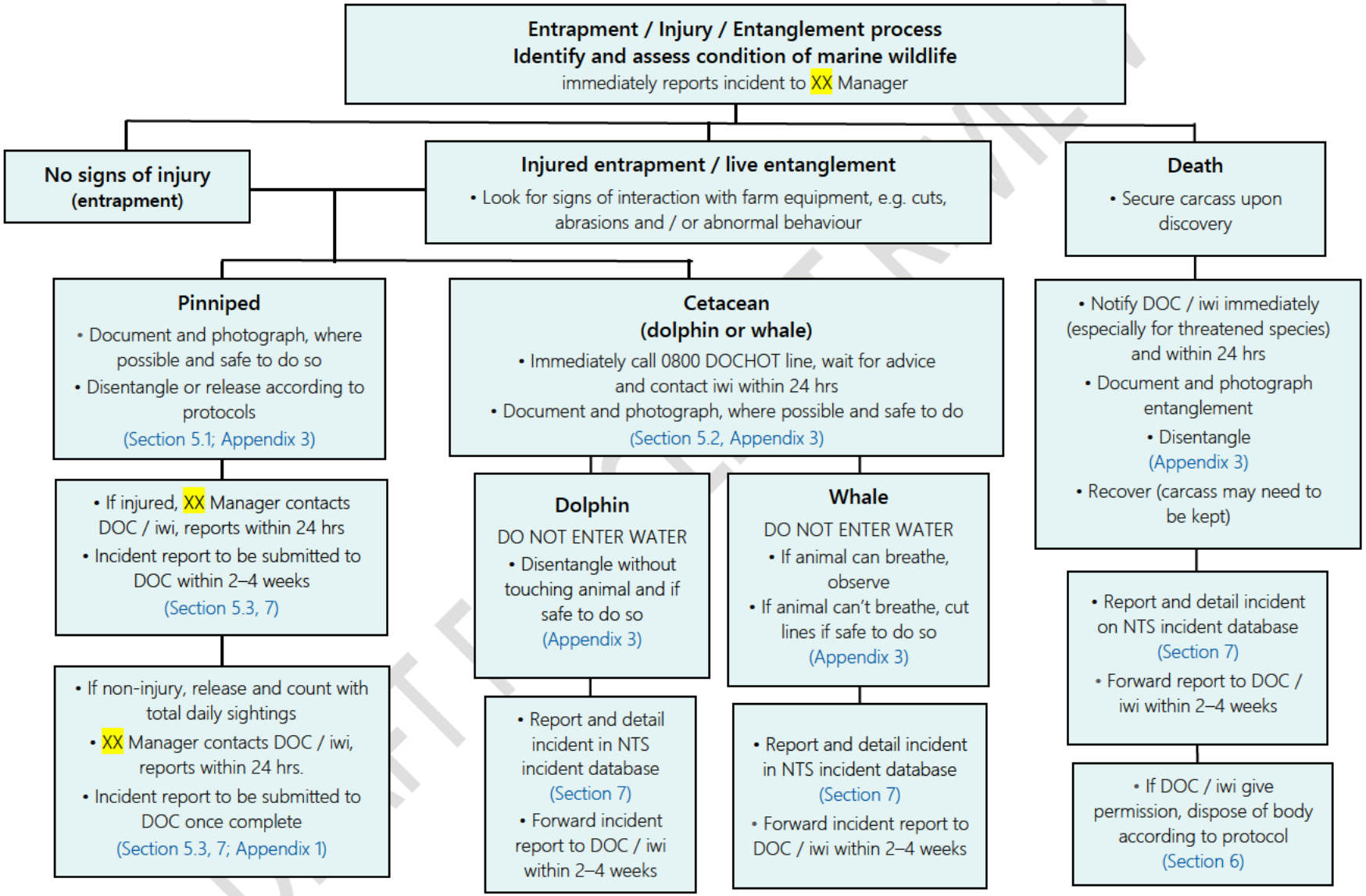

Figure 1. Flow chart outlining the various protocols and procedures for marine mammal incidents (e.g. entrapment, injury or entanglement) on the farms.

5.3 Entrapment and entanglement investigations

After every marine mammal entrapment, injury or entanglement (live or fatal), NTS must conduct a formal investigation that includes recommendations to prevent reoccurrences. The draft investigation must be completed within 2 weeks of the incident. In cases of entanglement (live or fatal) or injury, the investigation report will be discussed and finalised with ES and in consultation with DOC, and then a summary statement (i.e. including farm, date and type of species) must be distributed to Ngāi Tahu ki Murihiku and ES within 1 month (30 days) of the report being finalised, in line with standard reporting requirements for other finfish farms in Aotearoa New Zealand.

Results of all incident investigations (entrapment, injury or live / fatal entanglement) must be taken into account in updates of the MMMP to ensure that any new developments in the response to marine mammal incidents are included.

6. Dead marine mammals

6.1 Notification

The XX Manager must be contacted as soon as any marine mammal mortality occurs, or if any dead marine animal is discovered on or in a pen or entangled in any part of a farm structure. The XX Manager will contact DOC within 24 hours of the incident, and both DOC and NTS will inform Ngāi Tahu ki Murihiku representatives.

DOC personnel and contact details
Rakiura office: XXX

6.2 Documentation and disentanglement

In the event that a marine mammal becomes fatally entrapped or entangled in a farm structure or farm lines, the plan and protocol outlined in Figure 1 shall be followed. As soon as possible, and within 24 hours of discovery of a dead marine mammal, the entrapment / entanglement must be documented, including photographs, while ensuring all appropriate health and safety protocols are followed. To safely remove the carcass following documentation, the disentanglement protocol must be followed (Appendix 3). Any entangling materials must be retained for subsequent investigation.

6.3 Disposal of dead marine mammals

Disposal can occur only after reporting is complete and permission has been granted by DOC and Ngāi Tahu ki Murihiku. In some circumstances, DOC may require a necropsy to be conducted. If so, arrangements for transport to an appropriate necropsy facility must be determined in consultation with DOC on a case-by-case basis. Disposal advice and permission must be sought from Ngā Rūnanga ki Murihiku representatives and DOC.

Notification of relevant iwi is the responsibility of both DOC and NTS, as outlined in Tables 1 and 2.

Agreed protocols between DOC and Ngāi Tahu outline a process for Ngāi Tahu to access cultural materials in the takiwā of Ngāi Tahu whānui and provide input into the management of cultural materials held by DOC (Ngāi Tahu / Department of Conservation 2007). These protocols are also likely to have some influence on the disposal of dead marine wildlife found in connection with Hananui.

7. Reporting requirements

Table 2 sets summarises the reporting requirements as stipulated in Conditions 34(c) and 34(e), and as discussed throughout the MMMP and appendices.

Table 2. The reporting documents and time frames of the MMMP monitoring and management actions.

Reporting information	Time frames
• **Daily farm sightings / interactions** • **Vessel sightings**	• Entered into farm databases, collated fortnightly by Wildlife Manager and uploaded to dashboard monthly • Quarterly internal review (1 March, 1 June, 1 September, 1 December)
Underwater acoustic recordings	Collated by Wildlife Manager and analysed quarterly by experienced acoustician (1 March, 1 June, 1 September, 1 December)
Annual monitoring programme report (summary of monitoring objectives and outcomes each year for length of consent; must occur within 6 months of the end of the calendar year)	Provided to ES, Ngāi Tahu ki Murihiku and DOC each year (includes any reports by acoustic experts)
Summary report of monitoring	Provided to ES, Ngāi Tahu ki Murihiku and DOC at end of major monitoring periods: pre-farm baseline phase and farm construction phase, and then at 5-year intervals once operational
Vessel maintenance register	As required by Maritime New Zealand
Incidents involving entrapment (included in annual reports and uploaded to NTS dashboard website)	DOC, ES and Ngā Rūnanga ki Murihiku notified within 48 hours
Incidents involving entanglement or injury (included in annual reports, and fatalities uploaded to NTS dashboard website)	DOC and Ngā Rūnanga ki Murihiku notified within 24 hours, and ES notified within 48 hours
Incident investigation summary report	Completed in consultation with DOC within 2–4 weeks of incident. Summary report distributed to iwi and ES once completed
Review of best management practices, monitoring programme and disentanglement protocols	Annually or as stipulated in Section 1.7, with any MMMP changes certified by ES and reported to DOC and Ngāi Tahu ki Murihiku

7.1 Incident reporting (injury or entanglement)

Incidents involving the injury or mortality of a marine mammal within a farm structure / gear or by a farm vessel shall be reported to ES, Ngāi Tahu ki Murihiku and DOC's Rakiura office (or DOC's hotline as a backup) as soon as is practicable within 24 hours (Figure 1).

Any incident that results in a marine mammal entrapment, injury or fatality will be documented in the NTS incident database. Incident details shall include as much information as possible relating to the incident (e.g. date, time, weather conditions [visibility, sea state, etc.], location, activity, speed, etc.). Any details of the marine mammal (e.g. species, group size) and its behaviour before, during and after the incident shall also be recorded. If practicable, video or photos should be taken. Information will be used to inform future incidents and how they could be avoided.

Incident liaison procedures

A two-way liaison with DOC shall be established for real-time notification of live / dead entanglements, entrapments or injuries to marine mammals, as well as the regular exchange of sighting data.

Contact persons and details

DOC contact (Rakiura office):		XXX
DOC hotline (if no person can be reached directly):		0800 DOCHOT (0800 362468)
DOC Marine Species Team:	marinemammal@doc.govt.nz	
Consent holder contact:	XX	XXX

8. Appendices

Appendix 1. Marine mammal monitoring programme

A1.1 Underwater acoustic monitoring

To benchmark the presence of cetaceans within the wider farm area and the general frequency with which marine mammals may approach the farm sites, underwater acoustic monitoring shall take place during the baseline (i.e. 1 year) and construction phases (e.g. first moorings through to production). Acoustic arrays (i.e. moored underwater acoustic recorders) automatically listen to and record any underwater sound at frequencies likely to be from marine mammal vocalisations. These recordings (also known as detections) are used to assess whether marine mammals may have been present in a particular area and at what distances they occur from the farm site.

The advantage of using acoustic monitoring over visual sightings is that they can 'listen' for the presence of any marine mammal both day and night and when sea conditions are not favourable for visual sightings. The disadvantages of acoustic monitoring are that hydrophones can only detect the presence of marine mammals that are vocalising (i.e. songs, whistle and calls) or echolocating (i.e. clicks). Hence, this method cannot determine 'true' absence, only an inferred absence of animals that are not within range of the hydrophone (which varies by species) or are not vocalising.

Passive underwater acoustic data shall be undertaken with:

- **Baseline monitoring phase**
  Aim – The resulting data will be used to verify the predicted visitation / presence / seasonality of marine mammals, as described in the effects on marine mammals report (Clement 2025), particularly in regard to whales.
- **Construction phase(s)**
  Aim – The resulting data (in conjunction with visual sighting monitoring data) will be compared to baseline data to assess any trends in the predicted visitation / presence / seasonality of marine mammals.
  Aim – The visual sighting database (see Section A1.2) will be assessed to determine how representative it is of the species observed and their estimated occurrence rates.

At the completion of the two acoustic monitoring phases outlined above, an experienced marine mammal expert will review the data and recommend whether further acoustic monitoring is warranted.

Underwater acoustic protocol

Passive or real-time acoustic monitoring to detect the presence of marine mammals should be undertaken for at least one full year prior to and during farm construction to document any seasonal and / or spatial trends in species occurrence (particularly large whales). An underwater acoustic array (consisting of 3–4 separate recorders and moorings) should be spaced appropriately to triangulate

and track the location of vocalising marine mammals that pass near to the various farm sites (see Figure A1.1 for an example site location). Acoustic recorders may be attached to independent moorings (or to the farm structures themselves during the construction phase), but their attachments need to be as acoustically insulated as possible to avoid noises generated from the farm structures interfering with the recorders' ability to detect marine mammal calls.

The methodology for collecting the underwater noise measurements shall include:

- SoundTrap high-frequency autonomous recorders or equivalent will be used to continuously record all sounds from moored locations
- moorings will be selected to capture the noise at various locations across the farm sites and at varying distances
- the recorders will be attached to the line in a way that prevents noise contamination from the mooring or the connection to the mooring
- recorders will be set to detect a wide range of species, including high-frequency species (such as Hector's dolphin), mid-frequency species (e.g. common dolphin) and low-frequency species (e.g. southern right whale)
- noise emissions from the vessel during transit to the farm sites can be assessed and monitored from the SoundTrap moorings and automatic identification system (AIS) data from the vessel.

Database collation and reporting

Acoustic data shall be collated by the Wildlife Manager and made available at quarterly intervals (i.e. 1 March, 1 June, 1 September and 1 December) to an experienced marine mammal acoustic expert to review and analyse according to the MMMP's goals and metrics (see Section 2.1). Expert reports and annual records will be made available to DOC, Ngāi Tahu ki Murihiku and ES at the end of the baseline or farm construction period.

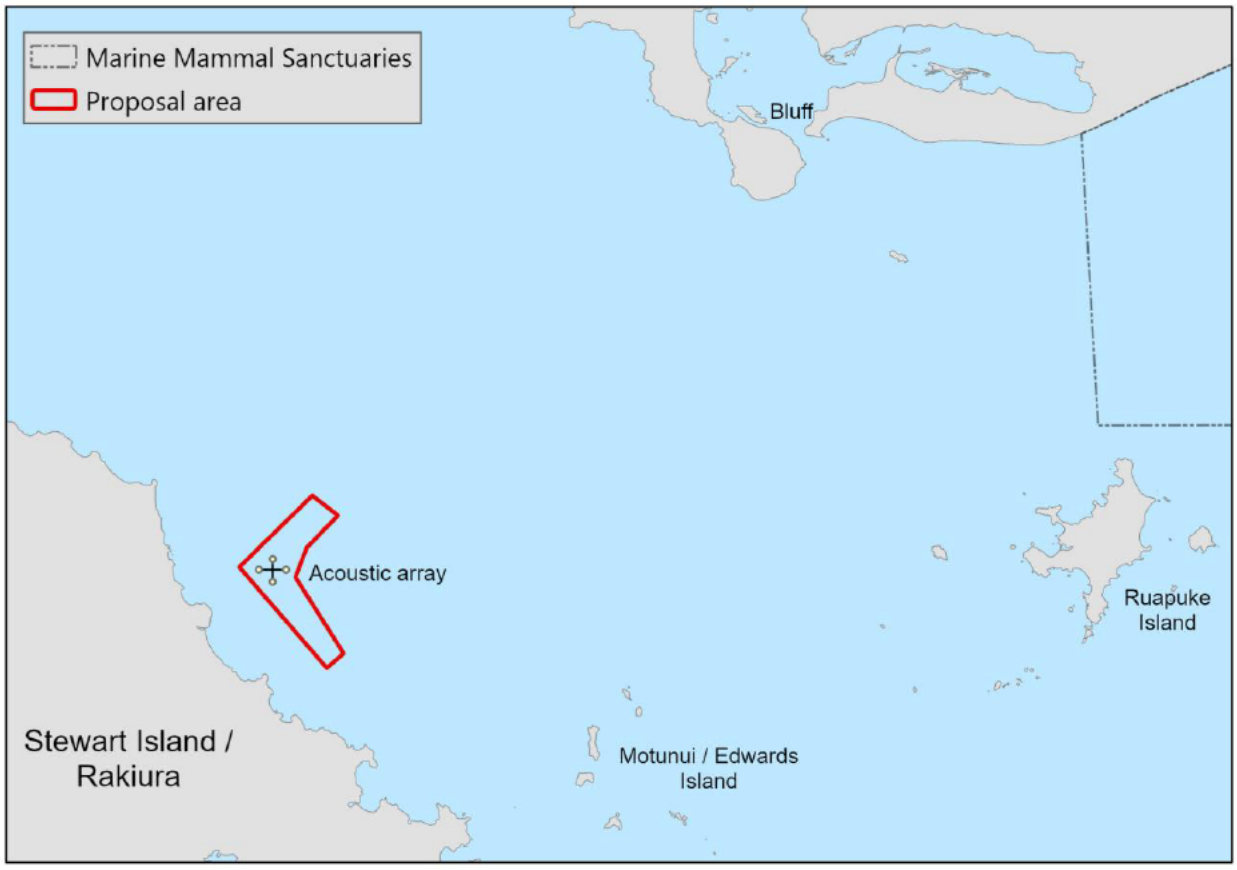

Figure A1.1. An example of the size and extent of an acoustic array with four recorders (yellow circles) spaced at approximately 1 km apart (designated by black lines). The array could be placed in several different locations within the proposal area, as indicated by the red boundary lines.

A1.2 Visual sighting monitoring

To quantify the current level of marine mammal occurrences near the farms relative to the wider region, the consent holders shall monitor and report visual sightings of marine mammals (including absences and trip effort) in the vicinity (up to 1 km) of the farms or when crew are travelling to and from the farm sites. These records include specifically noting any interactions (e.g. touching, bumping) between marine mammals and the vessel(s) or farms.

The monitoring periods and aims of this programme are outlined below:

- **Level 1 – Construction phase(s)**
  Aim – The resulting data will be analysed (in conjunction with baseline passive acoustic monitoring data) to verify the predicted visitation / presence of marine mammals, as described in the effects on marine mammals report (Clement 2025).
- **Level 2 – Operational phases**
  Aim – The resulting data will be analysed to determine use of the project area by marine mammals during active farming operations (e.g. whether marine mammals are continuing to use the project area even though farming is underway).

The need for further visual monitoring during the installation of Stage 2 will be reviewed by NTS (and mana whenua working groups) in consultation with a marine mammal expert, ES and DOC, and will be dependent on the results of the baseline and farm construction monitoring results from Stage 1 and the MMMP, as stipulated in Section 1.7. It is important to note that international agencies are beginning to require regular and transparent (e.g. open source or web-available) monitoring of marine mammals for the duration of a farm's permit / consent.

Visual sighting protocol

On-farm operational sighting protocol

The NTS Wildlife Manager, as well as other staff and crew, will record any opportunistic marine mammal visual sightings while working on the farms and while transiting on vessels to / from and within the consented area during daylight hours. In addition, a trained staff member will conduct a daily search for marine mammals, lasting approximately 15–20 minutes and undertaken at the same time of day and from the same unobstructed and elevated (if possible) position, counting any that are present within the vicinity of the farm sites (up to 1 km). This survey can be done manually (e.g. a person out counting) or using remote cameras with a clear, unobstructed view of the farms and nearby waters in all directions. These count records (including absences) will be entered into a designated database, along with any opportunistic visual sightings noted by the Wildlife Manager or other staff throughout the remainder of the day.

Vessel sighting protocol

Crew of any vessel(s) working on the farms shall be familiar with NTS's best boating guidelines around marine mammals (Appendix 2) and shall have a marine mammal sighting sheet on board (either hard copy or electronic). While working on the farm or in transit, the crew on the vessel(s) shall record daily trip effort and the presence (and absence) of marine mammals observed visually. *Importantly*, skippers also need to log the day(s) the vessel(s) is working when no sightings are observed. The Wildlife Manager will collate vessel marine mammal sighting sheets and effort logs each fortnight (depending on the number of vessel trips undertaken).

Visual surveys prior to major farm maintenance works

Prior to any major net maintenance work (i.e. removing nets, installing or removing pens) in which a marine mammal could enter part of a farm pen or structure, or become entangled in lines or maintenance gear, a visual sighting survey for marine mammals will be undertaken in the vicinity of maintenance area.

The following steps shall be taken:

- Fifteen minutes prior to the start of maintenance work, a designated observer should proceed to the highest, safe vantage point on the farm or vessel.
- The observer shall scan (e.g. with the naked eye and binoculars) for the presence of cetaceans and pinnipeds around the maintenance area for at least 15 minutes prior to the start of maintenance work.

- The nets will not be removed or installed, and any other works will not commence, if any marine mammals are observed within 500 m of the farm. Work will be delayed for at least 15 minutes once animals have moved beyond 500 m of the farm.
- If the net is in the process of being removed or installed and marine mammals are sighted near the farm, all practical measures will be undertaken to minimise interactions, including:
    - continually monitoring the location and direction of travel of the whale, dolphin or pinniped
    - deploying any available vessel(s) between the farm and the whale, dolphin or pinniped to act as a static deterrent
    - pausing the removal or installation if the whale, dolphin or pinniped is seen to be heading towards the net. This will be done only if no other measure is successful and only after considering health and safety protocols of the staff
- all sightings will be reported in the NTS visual sighting database, noting the time of the sighting and the maintenance works underway.

Sighting information

When a marine mammal is sighted (on the farm or from a vessel), the following will be reported on the log sheet:

- species of marine mammal, if possible
- number of animals in group
- GPS coordinates of vessel or farm location at the time of sighting
- approximate distance and location of animal to farm (e.g. ~1 km NE of farm NE corner)
- date and time of sighting
- farming operations or activities the vessel is engaged in (e.g. harvesting, checking lines, travel to / from site)
- observer name and position
- photographs and video footage, if collected.

Signs to look for that indicate dolphin / pinniped presence:

- dorsal fin, flipper or body visible when individuals surface to breathe
- 'puff' sounds when surfacing to breathe
- distinct 'footprint' or circular disturbance on water where animals have submerged
- splashes and aerial behaviours.

Signs to look for that indicate whale presence are similar to that of dolphins, and include:

- distinct and tall blow / steam into air when individuals surface to breathe
- back, dorsal fin (if present) or tail may be visible when individuals surface, rest at the surface or dive.

Database collation and reporting
Farm records shall be collated by the Wildlife Manager on a fortnightly basis and entered into a monitoring database, which will be uploaded monthly to the online dashboard. Sighting records will be compiled quarterly for internal review of the MMMP's goals and metrics. Annual records for each year will be made available to DOC, Ngāi Tahu ki Murihiku and ES each year (e.g. 1 April), and a summary review report (which considers all previous data) will be made available at the end of each major monitoring period: pre-farm baseline monitoring, the farm construction monitoring stage and at 5-year intervals once operational.

The monitoring programme itself should be reviewed after the first 2 years to ensure it is achieving the intended goals. See also Section 1.7 for other review timelines. Any changes to the programme based on this review shall be submitted in writing and certified by ES's XXX Compliance Officer.

A1.3 Identification materials for marine mammals

Whale identification posters
https://www.doc.govt.nz/globalassets/documents/conservation/native-animals/marine-mammals/whale-id-posters-web.pdf

Whale identification flip cards
https://www.doc.govt.nz/globalassets/documents/conservation/native-animals/marine-mammals/whale-id-flip-cards-web.pdf

Dolphin / whale / pinniped identification charts and sighting form
https://www.doc.govt.nz/globalassets/documents/conservation/native-animals/marine-mammals/whale-dolphin-sighting-report.pdf

Additional identification tips
https://www.doc.govt.nz/globalassets/documents/conservation/native-animals/marine-mammals/have-you-seen-marine-mammals.pdf

https://www.DOC.govt.nz/nature/native-animals/marine-mammals

https://www.DOC.govt.nz/marinemammalsightings

Appendix 2. Guidelines for boating around marine mammals

The purpose of these guidelines is to minimise disturbance and the risk of injury to marine mammals. Part 3 of the Marine Mammals Protection Regulations 1992 list the conditions governing behaviour of all vessels and aircraft around marine mammals. All pinnipeds, dolphins and whales are protected under the Marine Mammals Protection Act 1978, and it is an offence to harass, disturb, injure or kill them. Vessels in the vicinity of a marine mammal will (apart from emergency situations) must adhere to the following Department of Conservation (DOC) regulations[9] and additional guidelines:

- Record any sightings, as required in Section 2.2 and described in Appendix 1.
- If you need to, approach whales and dolphins from behind and to the side, as shown in Figure A2.1.*
- Do not circle any marine mammals, obstruct their path or cut through any group*
- Do not approach within 50 m of whales (or 200 m from any large whale mother and calf or calves).*
- Do not encourage bow-riding by marine mammals. Should any marine mammal(s) commence bow-riding in front of a vessel, the vessel master will not suddenly change course or speed.
- Ensure that vessels travel no faster than idle or 'no wake' speed within 300 m of any marine mammal* and idle slowly away.
- Gradually increase speed to out-distance dolphins once 300 m away.*
- Avoid reversing in the vicinity of any marine mammals.

During normal farm operations, the following shall be adhered to:

- If a large cetacean is seen within 300 m of the vessel while undertaking farm operations, assess whether it is safe to continue operations, and keep the vessel in the vicinity of the farm until the cetacean has moved away.
- If the cetacean is still within 300 m when the harvesting or lifting process has finished, determine whether it is necessary and / or safe to move the vessel. Next, determine the best direction that will allow the vessel to move safely and slowly away from the cetacean. Do not increase speed until the cetacean is at least 300 m away.*

[9] An asterisk (*) indicates which points are directly from the vessel regulations stated in Part 3 of the Marine Mammals Protection Regulations 1992. The rest are modified or additional guidelines suggested by the authors of this plan.

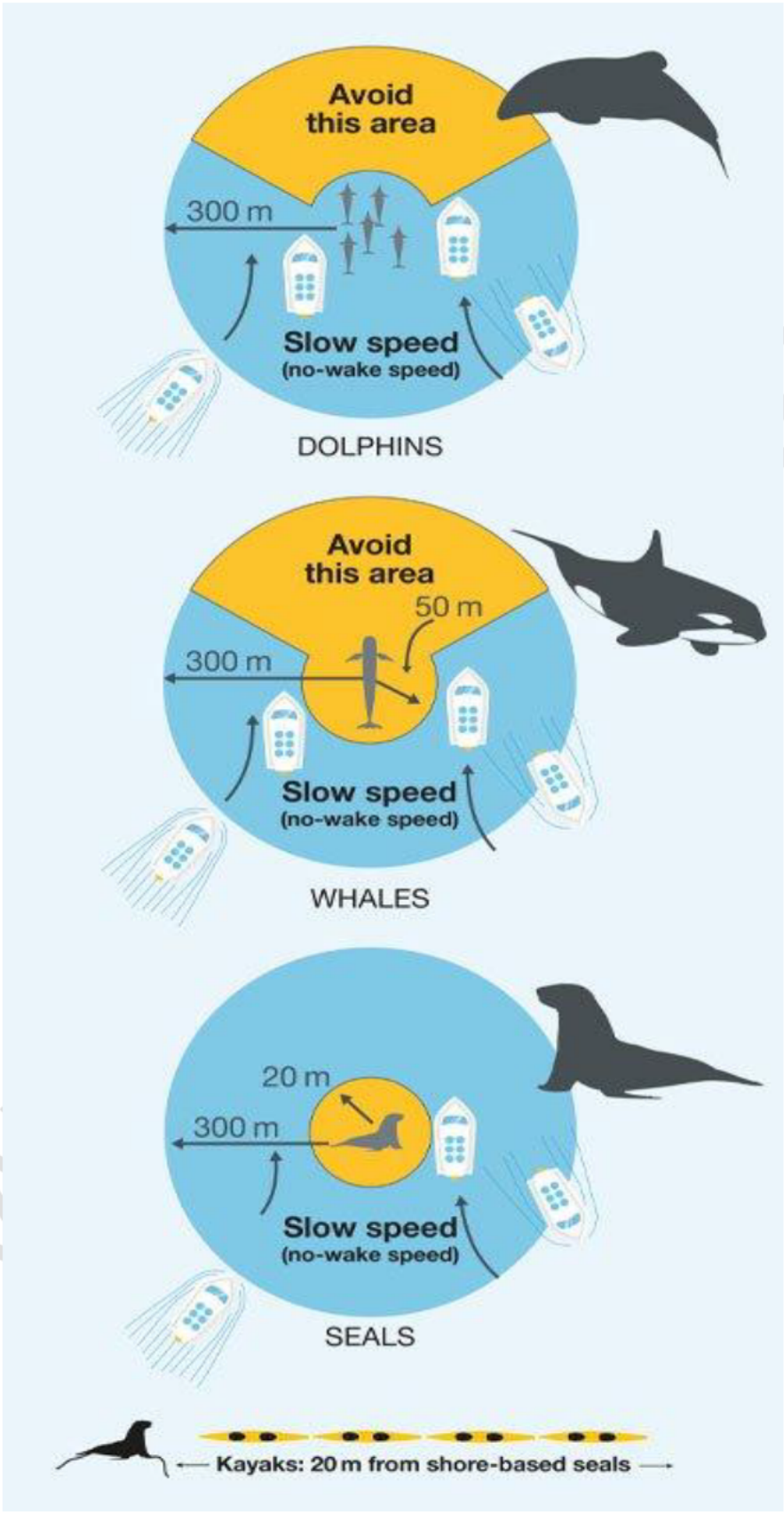

Figure A2.1. Department of Conservation regulations for vessel interactions when approaching, manoeuvring or passing by marine mammals, as specified in the Marine Mammals Protection Regulations 1992.

During transiting activities, more specific vessel behaviours around marine mammals are required, as summarised in Figure A2.1 and listed below:

- If a whale or dolphin is sighted, but is not directly in the path of the vessel (e.g. > 300 m):
  - Keep the boat speed constant and / or slow down while maintaining current direction.
  - Avoid any abrupt or erratic changes in direction.*
  - Maintain or slowly resume normal operating speeds once well way from animals (e.g. >300 m).*
- If a whale is sighted directly in the path of the vessel:
  - If the whale is far enough ahead of the vessel (e.g. > 500 m) and can be avoided, slow to 'no wake' if necessary and maintain a straight course away from the immediate sighting area (where practicable).
  - If the whale is too close to the vessel and cannot be avoided, immediately place the engine in neutral and allow the boat to drift to one side of the sighting area, where practicable (do not assume the whale will move out of the way).*
  - Avoid any abrupt or erratic changes in direction while at speed.*
  - Once the whale has been resighted away from the vessel (e.g. > 300 m), slowly increase speed back to normal operation levels.*
- If a dolphin(s) or pinniped(s) is sighted directly in the path of the vessel:
  - Keep the boat speed constant and / or slow down while maintaining a course slightly to one side of the group, and do not drive through the middle of a pod.*
  - Avoid any abrupt or erratic changes in direction.*
  - Maintain or slowly resume normal operating speeds once well way from animals (e.g. > 300 m).*
- If a dolphin or pinniped approaches a vessel that is underway to bow-ride or ride its stern wave:
  - Keep the boat speed constant and / or slow down (do not exceed 10 knots) while maintaining your course.
  - Avoid any abrupt or erratic changes in direction.*
  - Do not drive through the middle of a pod.*
  - Maintain or slowly resume normal operating speeds once well way from the animals (e.g. > 300 m).*

Appendix 3. Emergency response disentanglement protocol

Responding to a marine mammal entanglement, particularly of larger animals, holds significant risk and is a potentially dangerous task. Human safety is of the utmost importance and should always be considered first before attempting to implement the following procedures. People should **never** enter the water to free an entangled mammal and **never** attempt to free a mammal alone. A buddy should always be present in case help is required.

Immediately upon sighting any live entangled marine mammal, call the Department of Conservation Rakiura office (03 XXX XXXX) in the first instance, then 0800 DOCHOT (0800 362468). Specific advice must be sought from DOC's marine mammal disentanglement team, especially for large whales. When able, send an email to the Marine Species Team (marinemammal@doc.govt.nz). Once DOC's marine mammal disentanglement team has provided advice, follow the protocol outlined below.

Smaller mammals (e.g. bottlenose dolphin, pinniped)
Disentanglement should be attempted only from the farm itself or from a vessel (i.e. do not enter the water). If in doubt about how to release the animal, consult further with DOC.

1. Release the animal from a line or other obstruction immediately without entering the water.
2. Ensure that no line or object remains attached to the animal upon release (if line etc. is attached, it needs to be cut).
3. If lines have been cut and the animal is still entangled when it swims off, notify DOC immediately as its marine mammal disentanglement team may be able to carry out other action.
4. Ascertain whether any injuries have occurred either to the entangled animal or to the person(s) undertaking the procedure.

Larger mammals (e.g. whales)
1. *Entanglement at the surface (i.e. animal is able to breathe without difficulty)*
   If a larger mammal, such as a pilot whale or humpback whale, is entangled *at the surface* (and hence is able to breathe), DOC has a trained team that can respond to the entanglement, if necessary. Regardless, DOC must be contacted immediately on 0800 DOCHOT (0800 362468). Note that the closest entanglement response team is based in Kaikōura, so any response can take several hours. However, this is not normally an issue as it is necessary for a live animal to tire over several hours before a team can get close enough to attempt to cut it free.
2. *Entanglement at depth (i.e. animal is unable to breathe or is struggling to breathe)*
   If the animal is at depth and unable to reach the surface for a breath, there is usually little choice but for the marine farm operator to cut the necessary lines or nets to free the animal. It is recommended that lines are cut into small sections (e.g. cut the pen net at the top into small panels that can be dropped) to increase the chance that the animal can free itself. If the animal is surfacing to take breaths, no attempt should be made to cut it free due to the danger it poses (i.e. there is the potential that it may overturn the vessel).
3. If lines have been cut and the whale is still entangled when it swims off, notify DOC immediately as its marine mammal disentanglement team may be able to carry out other action. If an animal

has been cut free so that it can breathe but is still dragging lines / floats, DOC should be informed immediately so that further disentanglement work can be carried out.

Note: NTS will consult with DOC to ensure the necessary disentanglement gear and tools (e.g. curved knives securely attached to extendable poles) are available on-site if needed. It may be necessary to use a farm vessel with a crane to assist with a rescue attempt involving a large whale in a farm. If this is the case, the DOC marine mammal disentanglement team will advise.

A3.1 Reporting requirements

All entanglement incidents must be reported. Completed incident forms should be passed to the DOC and Ngāi Tahu ki Murihiku representatives and a summary sheet provided to the ES office within 48 hours.

The following details should be included in the NTS incident database:

- date
- time
- farm location (as specific as possible, i.e. coordinates)
- species (e.g. dolphin, whale, pinniped) common names, and if possible, scientific species names
- description of animal (e.g. size) and location, and any injuries
- full description of circumstances – including reasons for entanglement (if known), where the entanglement injury has occurred on the animal, actions taken and the outcome
- photos or video detailing each step in the process
- if the animal is dead, note the degree of decomposition and follow any additional protocols as discussed with DOC (i.e. disposal, send away for necropsy, etc.).

Appendix 4. Diving protocols with pinnipeds or sharks

This protocol must be followed to ensure diver safety around pinnipeds or sharks near NTS farms. A staff / crew member should be placed on watch prior to any divers entering the water to look out for marine wildlife.

Pinnipeds

- If a pinniped is acting aggressively towards the diver or any other staff, the diver(s) should terminate the dive and exit the water.
- The Wildlife Manager should be informed of the safety incident.

Sharks

- Staff are not permitted to carry out activities that could attract sharks to the farm (e.g. fishing, feeding birds, etc.).
- Ideally, diving should be planned outside periods of any mortality recovery.
- Normal dive protocols should be followed to ensure that any divers are being observed and staff are watching for any signs of shark activity.
- If any shark is sighted, the diver(s) should terminate the dive and exit the water.
- The Wildlife Manager should be informed of the safety incident.

9. References

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