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Māui and Hector's dolphins: Update on New Zealand's 2020 management decisions

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ABSTRACT

Hector's dolphins are two subspecies: the Nationally Critical Māui dolphins (*Cephalorhynchus hectori maui*) and the Nationally Vulnerable Hector's dolphin (*C. hectori hectori*). New Zealand manages anthropogenic threats to these dolphins using the Hector's and Māui dolphin Threat Management Plan (TMP). The TMP was reviewed and updated in 2019-20, building on a range of new information, including the spatially explicit multi-threat risk assessment (SC/68A/INFO/34) presented to the Scientific Committee in 2019. This paper outlines the outcome of that review, including a new vision, goals, and population objectives for the TMP, as well as the fishing and non-fishing protection measures implemented to achieve the objectives. There are now 31,550 km^2 closed to set net fishing and 12,825 km^2 is closed or subject to restrictions for trawl fishing to protect the dolphins. There are 37,286 km^2 of sanctuaries where seismic surveying and seabed mining are prohibited, with limited exceptions.

BACKGROUND

Hector's dolphins are endemic to New Zealand and are divided into two subspecies based on genetic and morphometric differences. Hector's dolphins (*Cephalorhynchus hectori hectori*) occur primarily in South Island waters. Māui dolphins (*C. h. maui*) are found in the waters off the northwest coast of the North Island and were recognised as a separate subspecies in 2002. Together they are one of the world's rarest dolphin species.

Effects of human activities on these dolphins are managed by the New Zealand government under the Hector's and Māui Dolphin Threat Management Plan (TMP). The TMP provides an overarching framework that identifies human-induced threats to Hector's and Māui dolphins and strategies to mitigate those threats to ensure the dolphin's long-term survival.

The TMP is led by the Department of Conservation (DOC) and Fisheries New Zealand. The partnership between these agencies reflects their respective roles and responsibilities. It is DOC's role and responsibility to manage the populations overall, and it is Fisheries New Zealand's role and responsibility to manage the effects of fishing-related mortality.

The TMP operates on a "subpopulation" scale. This means it differentiates between the two subspecies and recognizes the east, west, north and south coasts of the South Island as separate Hector's dolphin subpopulations, consistent with genetic evidence.

THREATS TO HECTOR'S AND MĀUI DOLPHINS

The dolphins face a range of human-induced threats, both fishing-related and non-fishing related. Some of these are a direct cause of dolphin deaths, such as set net and trawl fishing, and the parasitic disease toxoplasmosis.

Other human-induced threats to the dolphins include seismic surveying, seabed mining, dolphin watching and vessel traffic, oil spills, other pollution and sediment run-off, coastal development, infectious diseases other than toxoplasmosis, and climate change. These other threats may affect the dolphins through various overlapping direct and indirect mechanisms including injury, disease, disturbance, noise, habitat modification, impacts on prey distribution and abundance, reduced foraging success, displacement, and habitat fragmentation. The severity of impacts can be context and scale dependent and will vary depending on a range of interrelated factors (for example, location, spatial extent, size of an operation, technology and timing).

Of these threats, commercial and recreational set netting, trawling, toxoplasmosis, seismic surveying and seabed mining are actively managed under the TMP. The other threats are managed through a range of other existing regulatory regimes.

REVISING THE TMP

A full review of the TMP commenced in 2018, including:

- Revising the vision and long-term goals;
- Establishing clear and quantifiable objectives to better measure success over time;
- Assessing the effectiveness of the management measures in place to reduce human-induced threats against the objectives; and
- Providing direction on future research and monitoring needs.

Extensive research on Hector's and Māui dolphins has taken place since the mid-1980s. The recent development of a multi-threat risk assessment process (SC/68A/INFO/34) has allowed decision-makers to better assess the spatial distribution and relative impact levels arising from key threats to the subpopulations, and how those impacts can be reduced or mitigated most effectively.

A public consultation document was released in 2019 and Ministerial decisions and implementation of the current management measures commenced in 2020. These decisions are described in detail below, including some additional fisheries measures which are still under consideration and for which consultation is being undertaken in 2021-22.

VISION, GOALS AND OBJECTIVES

The vision of the Hector's and Māui dolphin TMP is:
New Zealand's Hector's and Māui dolphin populations are resilient and thriving throughout their natural range.

Goals:
The **long-term goal** is that:
Hector's and Māui subpopulations are thriving or increasing, supported by an enduring, cohesive and effective threat management programme across New Zealand.

Underpinning this are four **medium-term goals:**

1. **Ensure known human-caused threats are managed within levels that allow subpopulations to thrive and recover:** There are a range of human-induced threats that may result in adverse effects to the dolphins. This goal is intended to help ensure that those threats are managed at levels that allow the subpopulations to collectively achieve the overall desired outcome expressed in the vision statement.
2. **Engage all New Zealanders in Hector's and Māui dolphin conservation:** There is a need to engage the public of New Zealand to help understand and, where possible, support the management of human-induced threats to the dolphins. This goal will drive objectives around the ongoing use of stakeholder forums; transparency and accessibility to information on the plan and its performance; education about the dolphins and the threats facing them; and what the public can do to support threat management.
3. **Understand how tangata whenua wish to exercise kaitiakitanga of Hector's and Māui dolphins:** DOC and Fisheries New Zealand will work with tangata whenua to enable them to strengthen their participation in efforts to understand the threats to the dolphins and better protect them, based on mātauranga Maori values and concepts.
4. **Improve knowledge of poorly understood threats to support long- and medium-term goals, which are effectively targeted, measurable and time-bound:** There are some human-induced threats to the dolphins that are poorly understood. Agencies will identify and resource new research and monitoring to improve our understanding of the nature and extent of those threats.

Population Outcomes
Setting population outcomes helps to further define medium-term goal 1 by setting, for each subpopulation, the maximum acceptable impact level for each human-induced threat. The outcomes also help to drive objectives to manage specific threats.

> *Māui dolphins: Human impacts are managed to allow the population to increase to a level at or above 95 percent of the maximum number of dolphins the environment can support.*

This population outcome means the human-induced deaths need to be near as practicable to zero.

> *Hector's dolphins: Human impacts are managed to allow the population to increase to a level at or above 90 percent of the maximum number of dolphins the environment can support.*

The population of Hector's dolphins is much larger than the Māui dolphin population. Therefore, the acceptable level of impact on the Hector's dolphin population can be larger while still allowing the population to be managed at a very high proportion of the maximum number of dolphins the environment can sustain. This allows a balance between rebuilding Hector's dolphin populations and the socioeconomic impacts of measures that have been put in place to do so.

Objectives
Where possible, objectives have been set for some of the medium-term goals to allow for more specific, measurable and/or time-bound outputs to be assessed.

Fisheries management objectives:
Ensure that dolphin deaths arising from fisheries threats do not:

- Exceed the maximum number of human-induced deaths that could occur to achieve the applicable population outcome with 95 percent certainty[1];
- Cause localised depletion;
- Create substantial barriers to dispersal or connectivity between subpopulations.

To support the latter, a sub-objective to allow localised Hector's dolphin populations to recover to, and or remain at or above, 80 percent of un-impacted status (i.e. if fishing was not occurring) has been set.

Toxoplasmosis management objective:

- Reduce Toxoplasma loading to the marine environment so that the number of dolphin deaths attributable to toxoplasmosis is near zero.

Management objectives for other human-induced non-fishing threats

- Ensure adverse effects on the dolphins from other human-induced threats are avoided or minimised.

Engagement objectives

- New Zealanders are aware of, and can identify, Hector's and Māui dolphins;
- Improved public understanding of the reasons and processes to report sightings;
- Improved public understanding of the reasons and processes to report live strandings and beachcast dolphin carcasses;
- Improved public understanding of how threats from activities that can cause human-induced effects on the dolphins are being managed;
- Whānau, hapū and iwi are empowered to exercise kaitiakitanga for Hector's and Māui dolphins, and mātauranga Māori in incorporated into the TMP.

Research objectives
Gathering more information on Hector's and Māui dolphins and the threats impacting on them is crucial to help ensure the actions implemented under the TMP are appropriate and lead to the ability of subpopulations to recover and remain at the desired populations levels.

Under the TMP, a five-year national research plan will be developed to coordinate research activities amongst government agencies and other research providers. The plan will be reviewed annually.

The research objectives are:

[1] The maximum number of human-induced deaths that could occur while achieving the associated population outcome is also referred to as the population sustainability threshold (PST).

- Improve information on cause of death of beachcast dolphins
- Improve understanding of diseases impacting Hector's and Māui dolphins
- Improve information on dolphin distribution and movements
- Improve information on distribution of dolphin prey
- Continue monitoring population size, trends and factors important to population growth for Māui and Hector's dolphins
- Improve information on fisheries impacts
- Improve estimation of dolphin subpopulation status and trends

FISHING PROTECTION MEASURES

Of the fishing-related threats to Hector's and Māui dolphins, set nets have historically represented the biggest threat. Hector's dolphins have also been caught in trawl nets, but this happens less often.

Set net and trawling restrictions, set in regulations established under the Fisheries Act 1996, are in place around the North and South Islands to reduce the threat of fishing-related mortality to these dolphins:

North Island fisheries measures

Set net and trawl closures
There are extensive restrictions on where trawl and set net gear can be used, monitoring requirements, and a fishing-related mortality limit. The set net closure areas following updates made in 2020 have been increased from 6,850 km^2 to 15,025 km^2 (Appendix 1, Figure A). The trawl closure areas (including harbours) have been increased from approximately 4,409 km^2 to 5,837 km^2 (Appendix 1, Figure B).

Under the new measures the estimated number of annual fishing-related Māui dolphin deaths is well below the population sustainability threshold (PST) of 0.14 for the population (Figure 1).

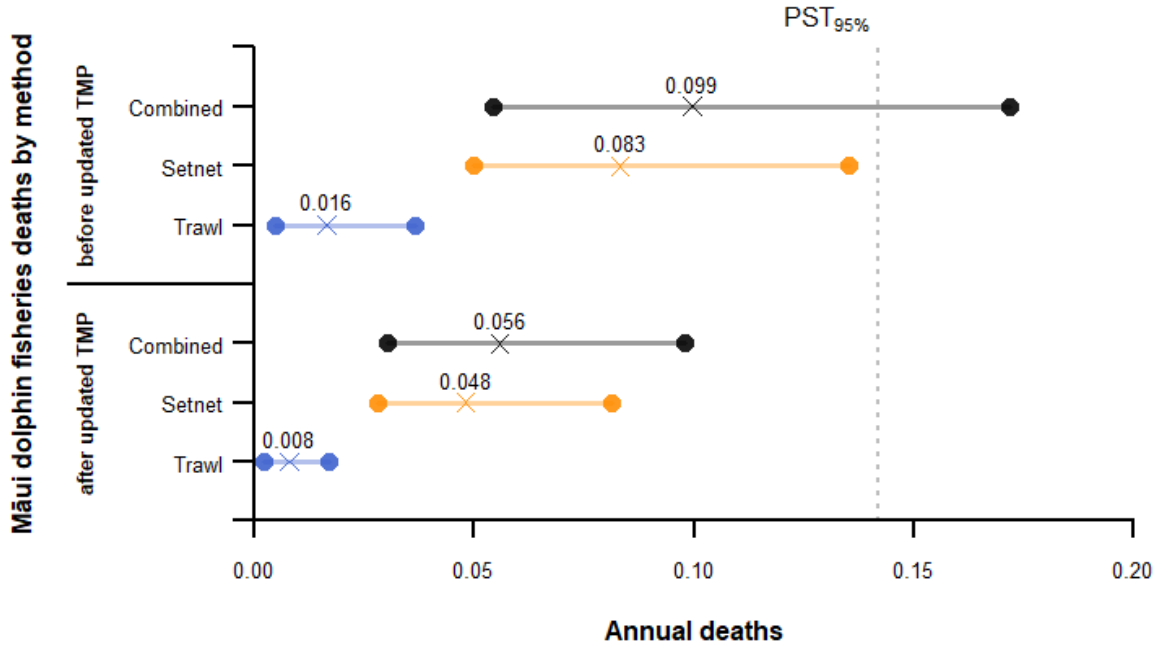

Figure 1. Estimated Māui dolphin deaths in relation to the PST under the commercial set net and trawl restrictions prior to 1 October 2020 and following the new spatial closures that took effect on 1 October 2020. Values to the left of the PST (vertical dotted line) show that the risk of fishing-related mortality is low enough that commercial fishing will not inhibit population growth.

Fishing-related mortality limit

The set net and trawl spatial closures are the principal mechanisms to reduce the risk of bycatch. A fishing-related mortality limit which applies to both recreational and commercial fishers has been established as a backstop measure.

The fishing-related mortality limit for a Hector's or Māui dolphin within the Māui Dolphin habitat zone is 1. The Māui Dolphin habitat zone extends along the mean high-water mark of the West Coast North Island from Cape Egmont to Cape Reinga, including harbours and offshore to the 12 nautical mile Territorial Sea boundary (Appendix 1, Figure C).

The fishing-related mortality limit gives the Minister of Fisheries the power to promptly respond to a range of bycatch scenarios and take immediate action to ensure that the limit on fishing-related mortality is not exceeded, such as in the unlikely event of a:

- near miss capture;
- capture (released alive);
- capture (resulting in death); or
- beachcast incident (where necropsy confirms death was a result of fishing).

It is important to note that regulating for this limit does not constrain the Minister to acting only in the event of the death of a dolphin. The Minister may act in the absence of a death (i.e. a near miss or released alive) to ensure the limit is not exceeded. The mechanism therefore provides for more proactive management than a reactive trigger mechanism which limits action to responding to a limit being reached.

Regulated fishing monitoring requirements

Since 1 November 2019 regulations have been in place that require on-board cameras (to detect and verify any fishing-related mortality) on any set net or trawl vessel (≥8 m and ≤29 m in registered length) that:

- operate in the defined monitoring area that is fisheries statistical areas 040-042, 045 and 046 (Appendix 1, Figure C); and
- operated in that area between 1 October 2017 and 30 September 2018.

South Island fisheries measures

Set net and trawl closures

There are extensive restrictions on the use of commercial and recreational set net and trawl gear around the South Island. The set net closure areas following updates made in 2020 have been increased from approximately 10,345 km^2 to 16,525 km^2 (Appendix 1, Figure D). Trawl measures (which include closures and gear restrictions) covering 6,988 km^2 are shown in Appendix 1, Figure E.

Further consultation on fisheries measures in the South Island

As part of the TMP review process, in announcing decisions on new fisheries measures the Government noted its intention to consult on further measures to manage the risk of fishing-related mortality to South Island Hector's dolphins. Potential options include an extension of the set net ban around Banks Peninsula (shown in Appendix 1, Figure E), the use of trawl gear restrictions to avoid dolphin interactions, and a proposed management approach to use in the event of captures in areas not closed to set-net or trawl fishing. Fisheries New Zealand will undertake this consultation in 2021-22.

NON-FISHING PROTECTION MEASURES

Toxoplasmosis Action Plan

The plan proposes:

- Research to investigate knowledge gaps

- Research to investigate solutions to reduce or eliminate the transfer of the parasite into the marine environment
- Trial solutions to reduce or eliminate the transfer of the parasite into the marine environment.

The plan reflects consultation to date, and is based on existing scientific evidence, but it will inevitably evolve and change as information gaps are filled and experience is gained finding and testing solutions. The plan can be downloaded here: https://www.doc.govt.nz/nature/pests-and-threats/diseases/toxoplasmosis-and-hectors-and-maui-dolphin/toxoplasmosis-action-plan/.

Marine Mammal Sanctuaries
Five marine mammal sanctuaries have been set up under the Marine Mammals Protection Act 1978 to protect Hector's and Māui dolphins (Appendix 1, Figure F). Within these sanctuaries, there are restrictions on seismic surveying and seabed mining. The total area protected by these sanctuaries was doubled in 2020, from 18,625 km^2 to 37,286 km^2.

Seismic surveying
Seismic surveying is prohibited in the five marine mammal sanctuaries with the following exemptions:

- Existing permits under the Crown Minerals Act 1991, and any subsequent permit related to an existing permit;
- Urgent hazard assessments;
- Decommissioning of infrastructure;
- "Level 3" category seismic surveys as defined in the code of conduct for seismic surveying; and
- Nationally significant activities that receive approval from the Minister of Conservation and the Minister of Energy and Resources

Any seismic survey that qualifies for an exemption listed above is required to comply with the 2013 Code of Conduct for Minimising Acoustic Disturbance to Marine Mammals from Seismic Survey Operations.

Seabed mining
Seabed mining is prohibited within the five marine mammal sanctuaries with an exemption for existing permits under the Crown Minerals Act 1991, and any subsequent permit related to an existing permit.

Tourism
Tourism is managed through permitting conditions applied under the Marine Mammals Protection Regulations 1992.

Appendix 1

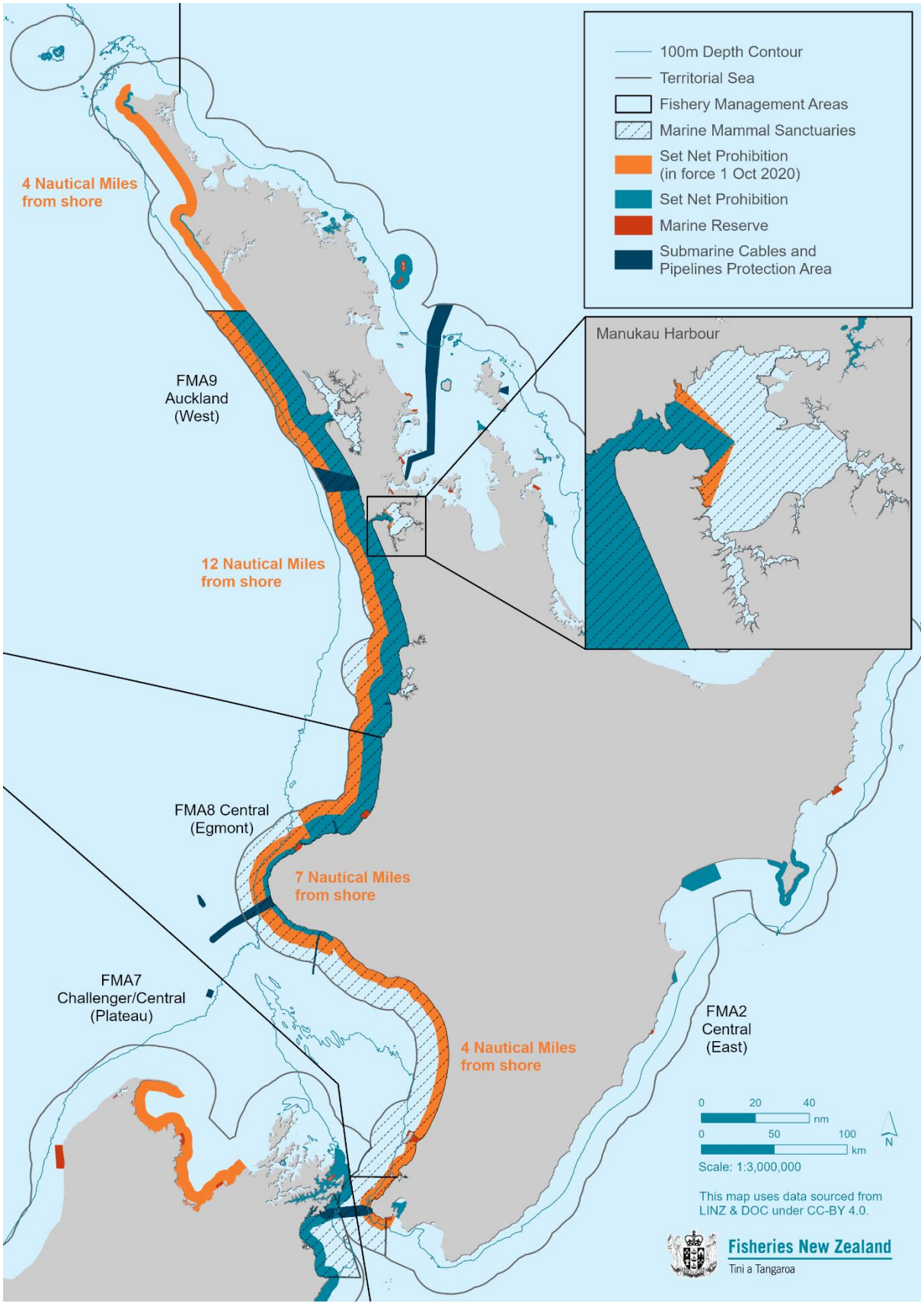

Figure A. Commercial and recreational set net prohibition areas off the west coast North Island.

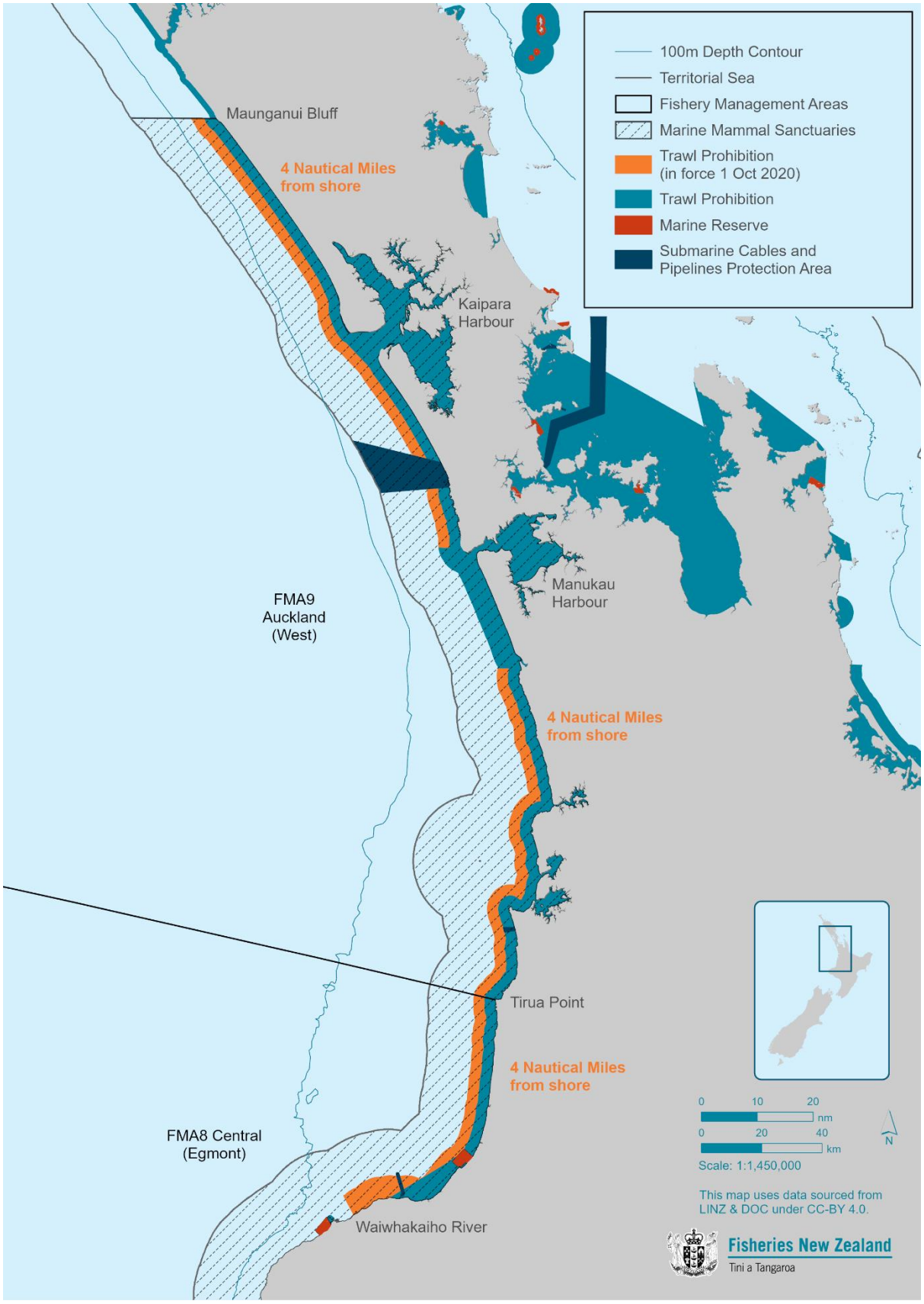

Figure B. Commercial trawl prohibition areas off the west coast North Island.

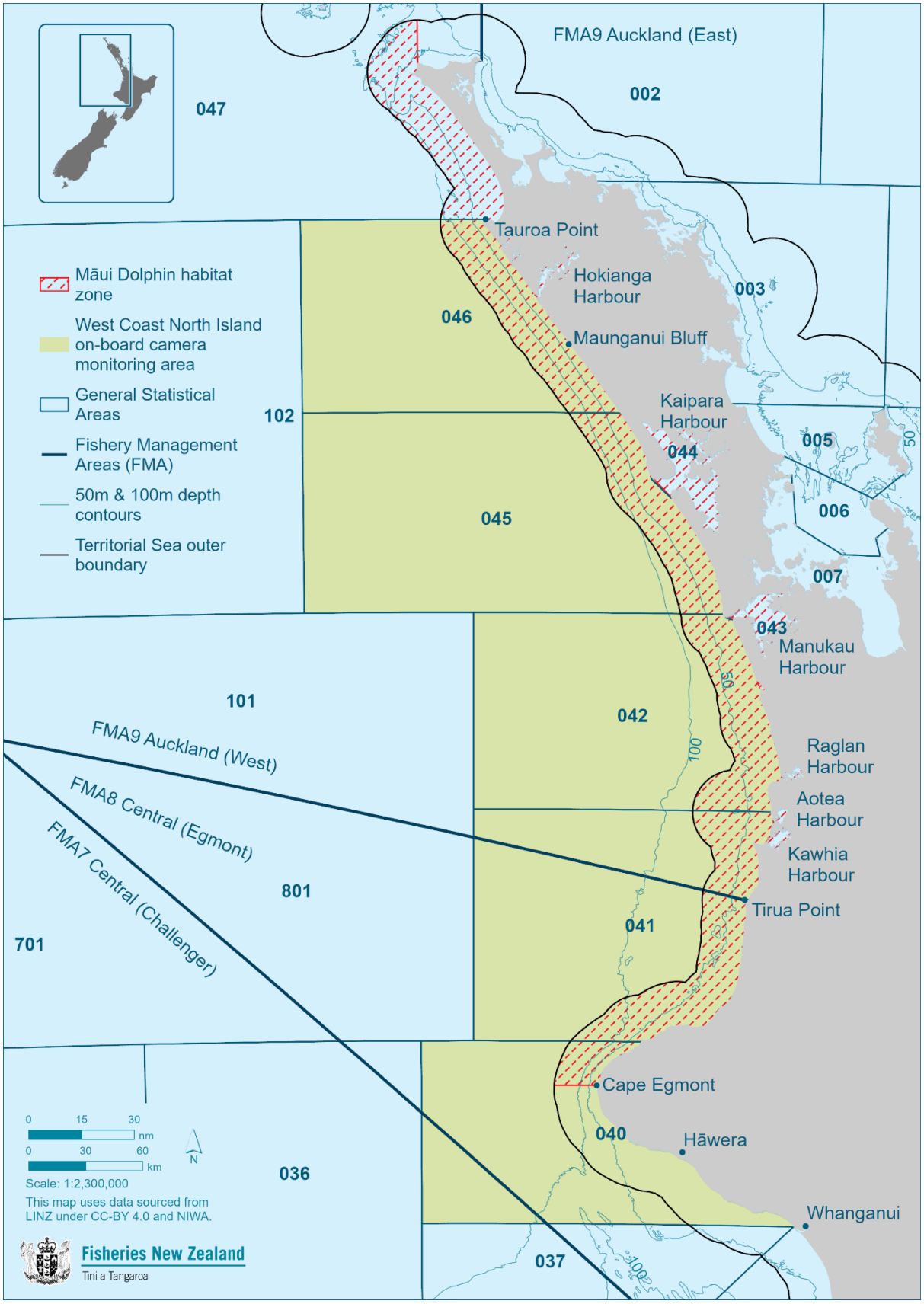

Figure C. The defined Māui dolphin habitat zone within which the fishing-related mortality limit of 1 Māui or Hector's dolphin applies to recreational and commercial fishing. Also shown is the West Coast North Island on-board camera monitoring area (fisheries statistical areas 040, 041, 042, 045 and 046).

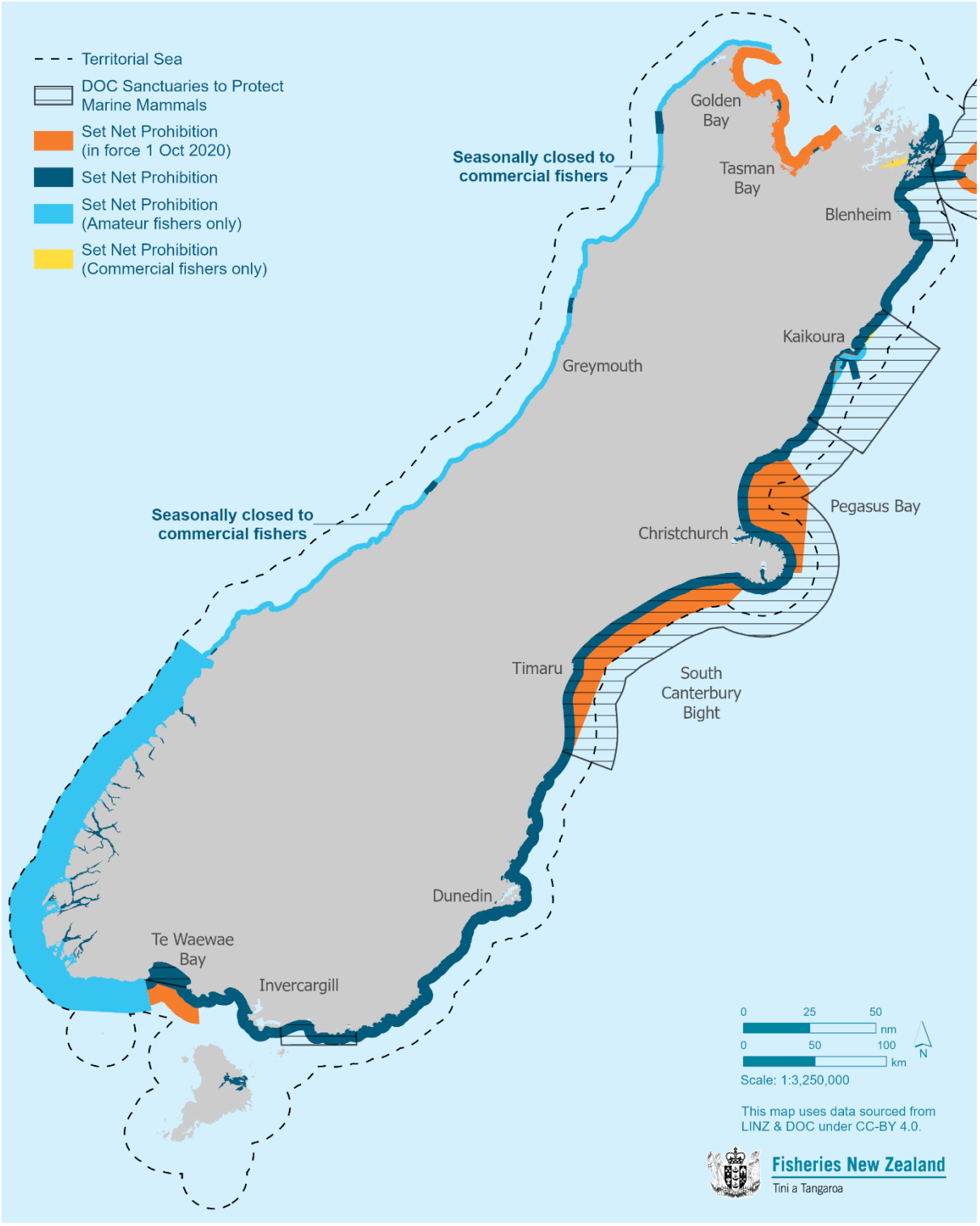

Figure D. Commercial and recreational set net prohibition areas off the South Island.

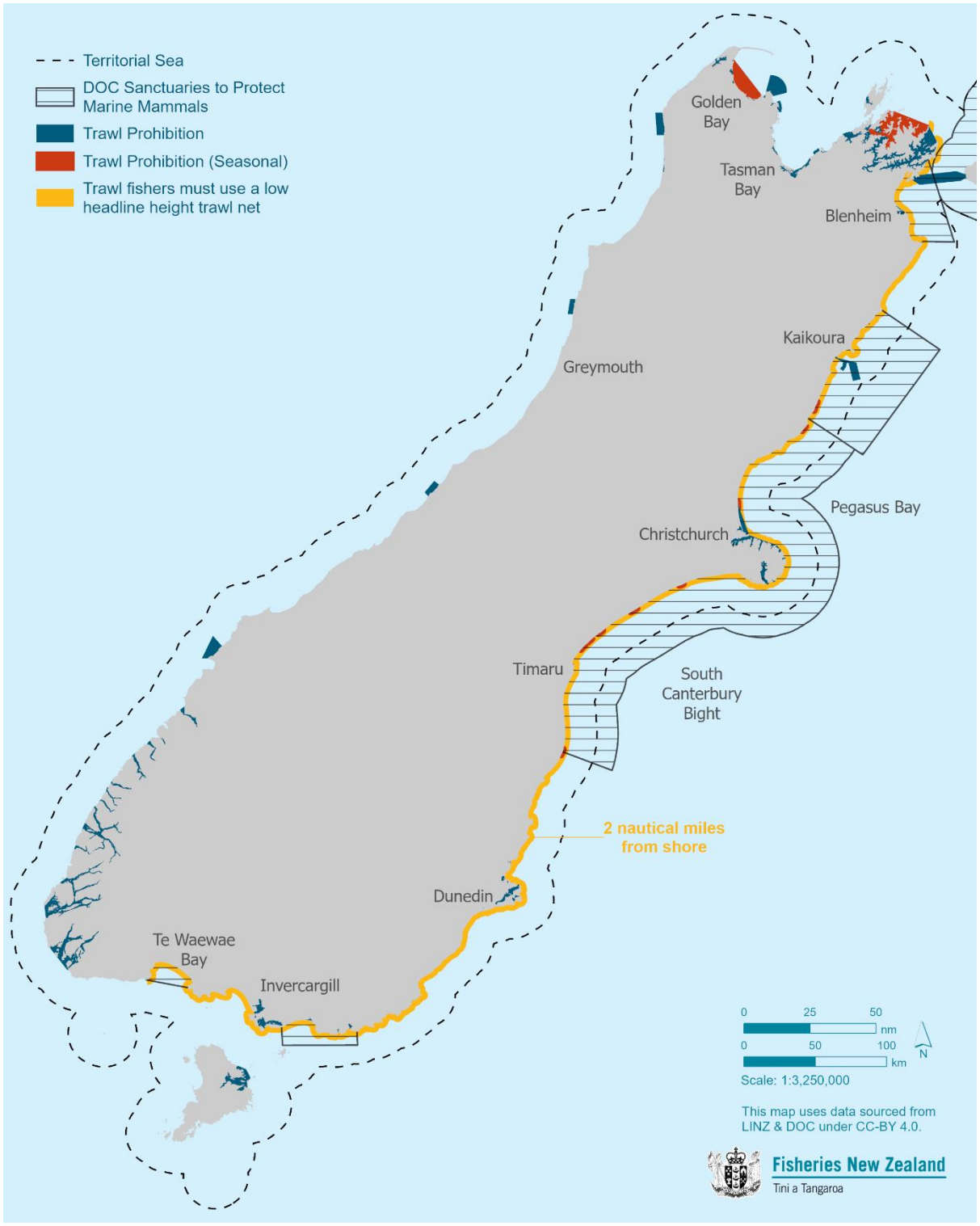

Figure E. Commercial trawl restriction and prohibition areas off the South Island.

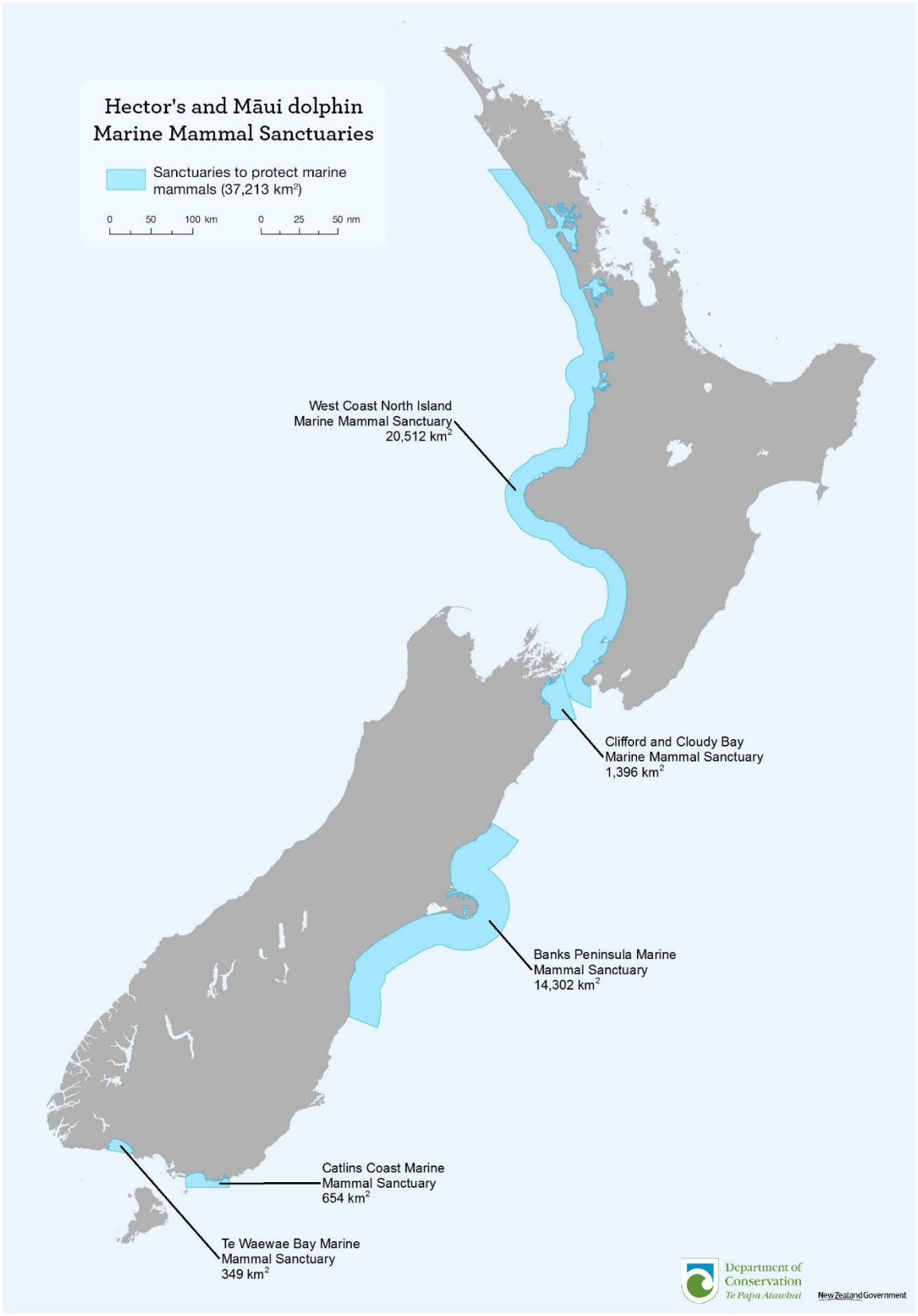

Figure F. Marine mammal sanctuaries established to protect Hector's and Māui dolphins.