6.0 MPI's fishing-related management proposals

6.1 SUMMARY

The Ministry for Primary Industries (MPI) is seeking tangata whenua and stakeholder views on a range management measures to mitigate the risk of each fishing-related threat that has been identified for the Maui's dolphin population off the WCNI.

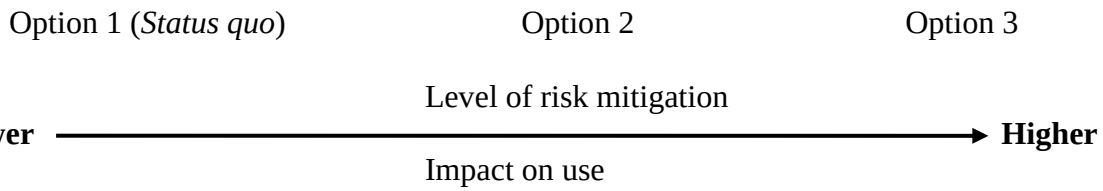
Commercial and Amateur Set Netting (Coastal)		Estimated Cost[115]
Option 1	*Status quo*: Keep existing management, including the interim measures to: • retain the set net ban between 0 and 2 nautical miles offshore from Pariokariwa Point to Hawera; • prohibit the use of commercial set nets between 2 and 7 nautical miles offshore from Pariokariwa Point to Hawera without an observer onboard, and; • pay for observer services costs with Crown-funding. The interim measures would be reviewed in 2015 to inform management going forward.	Annual Value Add: $482 200 Capitalised future value: $2 196 670 Observer coverage (Crown-funded): $334 010 - $526 000 per year
Option 2	Keep existing management, and put the interim measures in place via regulation to: • retain the set net ban between 0 and 2 nautical miles offshore from Pariokariwa Point to Hawera; • prohibit the use of commercial set nets between 2 and 7 nautical miles offshore from Pariokariwa Point to Hawera without an observer onboard, and; • require observer services costs to be cost-recovered from industry beginning 1 October 2013.	Annual Value Add: $482 200 Capitalised future value: $2 196 670 Observer coverage (cost-recovered from industry): $334 010 - $526 000 per year
Option 3	• Extend the set net ban between 0 and 4 nautical miles offshore from Pariokariwa Point to Hawera. • Prohibit the use of commercial set nets between 4 and 7 nautical miles offshore from Pariokariwa Point to Hawera without an observer onboard.	Annual Value Add: $885 932 Capitalised future value: $3 162 581 Observer coverage (cost-recovered from industry): $334 010 - $526 000 per year

Commercial and Amateur Set Netting (Harbours)		Estimated Cost
Option 1	*Status quo*: Keep existing management.	
Option 2	Improve information on Maui's dolphin distribution and set net activity in the Manukau Harbour.	To be confirmed
Option 3	• Extend the existing set net ban in the entrance of the Manukau Harbour further into the harbour. • Improve information on Maui's dolphin distribution and set net activity in the Manukau Harbour.	Annual Value Add: $442 999 Capitalised future value: $1 054 843

Commercial Trawling		Estimated Cost
Option 1	*Status quo*: Keep existing management.	
Option 2	Put in place extensive monitoring coverage in the commercial trawl fishery between 2 and 7 nautical miles offshore from Maunganui Bluff to Pariokariwa Point.	Monitoring coverage (cost-recovered from industry): $786 130 - 1 238 000 per year
Option 3	• Extend the trawl ban from 2 and 4 nautical miles offshore from Kaipara Harbour to Kawhia Harbour. • Put in place extensive monitoring coverage in the commercial trawl fishery between 2 and 7 nautical miles offshore from Maunganui Bluff to Pariokariwa Point.	Annual Value Add: $515 108 Capitalised future value: $2 557 348 Monitoring coverage (cost-recovered from industry): $786 130 - 1 238 000 per year

[115] The analyses estimating the economic impact of loss or displacement of catch is found in Appendix 4 (Section 13).

Fishing-related threats include commercial and non-commercial (amateur and customary) set netting and commercial trawling. The 2 or 3 mitigation options for each fishing threat can be categorised by their ability to reduce the risk of fishing-related mortality and impact on fishers. The options also include measures to improve the information available on the level of interaction between fishing-related threats and the Maui's dolphin population (using observers or other monitoring coverage).



MPI also discusses additional sustainability measures that may support reducing the risk of fishing-related mortality on the Maui's dolphin population. These additional measures would be considered in conjunction with the broader options discussed above where they may further mitigate the potential fishing-related impacts on dolphins while allowing for the use of fisheries resources. The options discussed include:

(1) Fishing gear exemptions:
   a. Exclude some fishing methods from the set net prohibitions if they are likely to avoid, remedy or mitigate any adverse effects of fishing on the Maui's dolphin population.
   b. For example, exclude the activity of ring netting from the set net prohibitions in the Manukau Harbour, and other WCNI harbours.

(2) Finer spatial scale reporting requirements for commercial set net fishers:
   a. Improve information on the distribution and intensity of fishing effort in areas of potential overlap with Maui's dolphin distribution.
   b. For example, require commercial set net fishers to report the start and end position of each set net they deploy.

(3) Changes to fishing behaviour practices:
   a. Consider changes to fishing behaviour or practices that are likely to avoid, remedy or mitigate any adverse effects of fishing on the Maui's dolphin population.
   b. For example:
      i. Reduce the total length and/or number of set nets that can be deployed at any one time
      ii. Introduce seasonal closures in the commercial and amateur set net fishery
      iii. Introduce maximum headline heights for trawl nets

MPI is open to considering other fishing-related management measures to those discussed in this chapter.

The regulatory impact analysis requirements apply to the policy development process for this issue. MPI considers the consultation paper contains the substantive RIA elements.

6.1.1 Document structure

This chapter is organised as follows:

- Summary of the status quo
- Summary of the problem definition and need for action
- Objectives of the review and discussion of statutory considerations
- Summary of the key biological characteristics
- Assessment of the WCNI set net fishery by area (coastal and within harbours) and management options
- Assessment of the WCNI trawl fishery and management options
- Other management measures
- Conclusions

6.2 STATUS QUO

Restrictions on fishing for managing threats to Maui's dolphins off the west coast of the North Island (WCNI) affect the commercial and amateur set net fishery, and commercial trawl fishery (Map 6.1). See Appendix 3 (Section 11) for a chronology of management measures.

6.2.1 Set net restrictions and prohibitions

Commercial and amateur set netting is prohibited from Maunganui Bluff to Pariokariwa Point between 0 and 7 nautical miles offshore. The activities are also prohibited in the WCNI harbours inside the entrances to the Kaipara, Manukau, and Raglan Harbours, and Port Waikato river mouth.

The areas closed to set net were put in place to help avoid Maui's dolphin entanglements in the area where their range has been determined by a combination of:

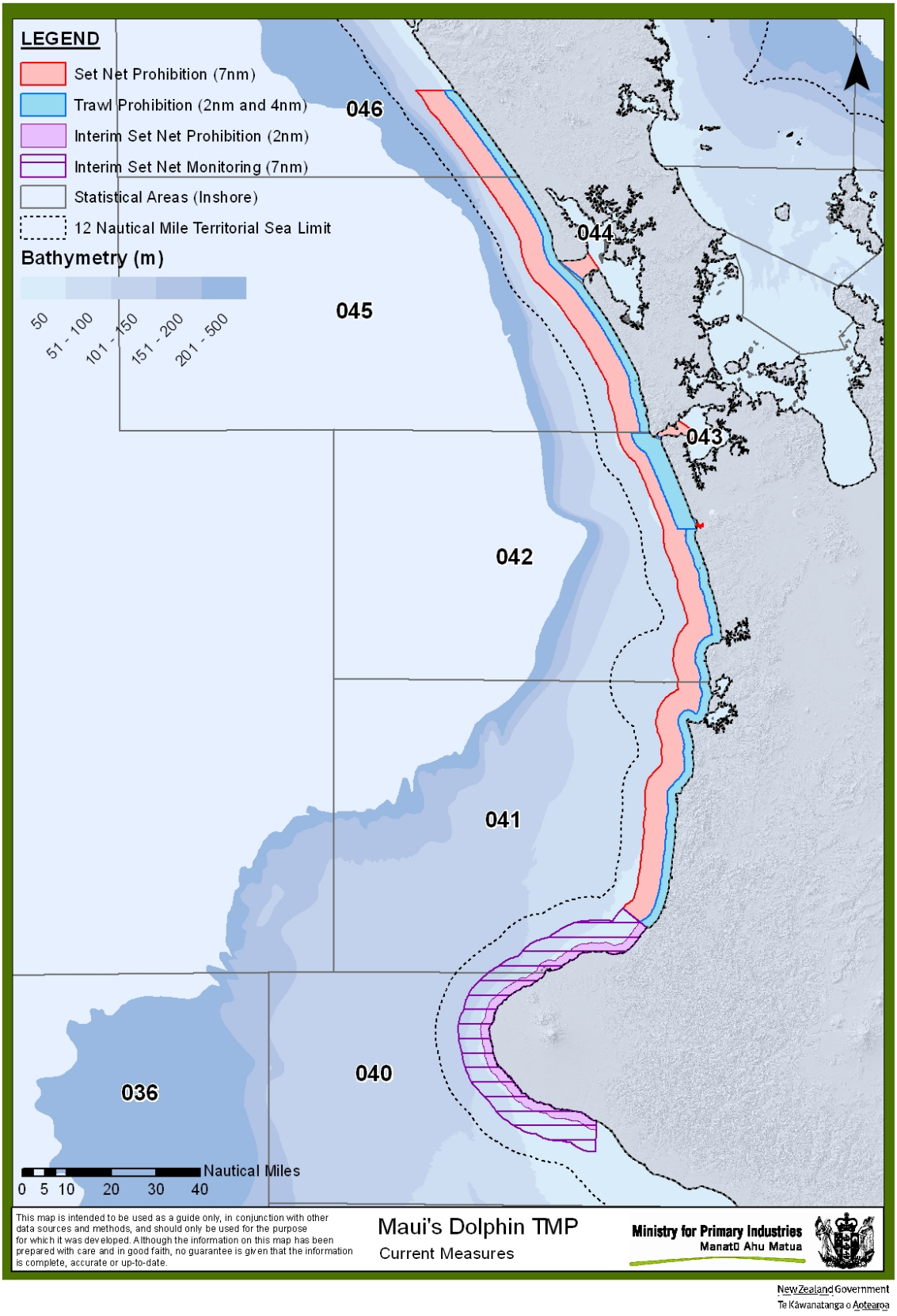
- Strandings (that is dead dolphins washed ashore and dolphins recovered entangled in nets)
- Verified public sightings,
- Aerial and boat-based research surveys, and
- The nature of set net activity in the entrances of harbours (or just outside the entrances) where dolphins have been observed.

These boundaries have been in place since the 2008 review of the TMP. That review noted that while there had been occasional, unsubstantiated public sightings of Maui's dolphins south of Pariokariwa Point, there had been no verified sightings in the area. These sightings were considered to represent isolated and infrequent occurrences. The then Minister of Fisheries decided that the Taranaki region is unlikely to be part of the Maui's dolphin range.

In light of the January 2012 mortality of a Hector's or Maui's dolphin off of Cape Egmont in the Taranaki area and the recent population estimate of Maui's dolphins the Minister for Primary Industries ('the Minister') considered it necessary to take a cautious approach and manage the residual risk in the Taranaki area. The focus of the interim measures is the protection of Maui's dolphins while this review of the Maui's dolphin portion of the TMP is undertaken. The interim measures[116] came into effect in July 2012 and:

- Prohibit commercial and amateur set netting from Pariokariwa Point to Hawera out to 2 nautical miles, and
- Prohibit commercial set netting from Pariokariwa Point to Hawera between 2 and 7 nautical miles offshore unless an observer is onboard.

[116] Fisheries (Set Net Prohibition from Pariokariwa Point to Hawera) Notice 2012



Map 6.1. Current set net and trawl restrictions and prohibitions off the west coast of the North Island shown with the relevant inshore statistical reporting areas (40 – 46).

Observer coverage does not prevent any dolphin mortalities from occurring, however, the monitoring is necessary to gather greater information on the presence of dolphins in the area and their subspecies identity to better inform management. The interim measures will stay in place while the review and the nature of other possible measures to mitigate the risks to Maui's dolphins are decided.

In addition to the areas where set nets are prohibited, there are other commercial and amateur set net regulations and voluntary systems that may help reduce the likelihood of interactions with Maui's dolphins.

6.2.1.1 Commercial set nets

The following commercial set net rules apply throughout New Zealand fisheries waters[117]:

- Commercial fishers cannot use more than 3000 metres of net per day without written authorisation from the director general.
- Commercial fishers must service their net while it is set at least every 18 hours

6.2.1.2. Amateur set nets

The following amateur set net rules apply throughout New Zealand fisheries waters[118]:

- Amateur nets must not exceed 60 metres in length
- The use of stakes to secure amateur nets is prohibited
- Amateur set nets must not be set in a way that causes fish to be stranded by the falling tide
- Amateur nets must not be set within 60 metres of another net

MPI also publicises an amateur set net Code of Practice that promotes good netting practice, including:

- Using a net designed for the fish species being targeted
- Deploying a net with anchors that are suitable for sea conditions to prevent losing nets
- Setting a net that can be easily retrieved
- Staying with and regularly checking the net
- Avoiding setting nets when dolphins are present
- Deploying a net for the shortest soak time possible
- Avoiding setting nets overnight

Similar practices are also followed by commercial set net fishers.

6.2.2 Commercial trawling prohibitions

Commercial trawling is prohibited between 0 and 2 nautical miles offshore between Maunganui Bluff and the Manukau Harbour, and Port Waikato to Pariokariwa Point (Map 6.1). Within this area, between the Manukau Harbour and Port Waikato, trawling is prohibited between 0 and 4 nautical miles offshore. The restrictions were put in place in 2008 to manage the risk that trawlers in this area could catch Maui's dolphins. Trawling is also prohibited in defined areas including: Kaipara Harbour, Manukau Harbour, Hokianga Harbour, Waikato River Mouth, Raglan Harbour, Aotea Harbour, and Kawhia Harbour.

Low levels of bycatch monitoring means that the level of interaction between trawling and commercial set nets and Maui's dolphins outside the closed areas under the current

[117] Fisheries (Commercial Fishing) Regulations 2001
[118] Fisheries (Amateur Fishing) Regulations 1986

management framework (*status quo*) cannot be determined with certainty. Limited monitoring results in uncertainty around catch rates of Maui's dolphins in trawl gear (including any geographical and seasonal variations in catch rates) and consequently the effectiveness of the closed area is unknown.

Fishers are required by law to report any dolphin entanglement. However, MPI cannot be certain that fishers always see and report all fishing-related mortalities. Consequently, the reported fishing-related mortalities may be underestimates and, as such, MPI cannot determine with certainty the extent of actual Maui's dolphin mortalities caused by fishing.

6.3 PROBLEM DEFINITION

MPI considers a review of the current management measures (*status quo*) appropriate because:

- New research on Maui's dolphins estimates:
    - there are approximately 55 dolphins over 1 year old and the population is declining
    - the population can sustain one human-induced mortality every 10 to 23 years without impacting on its ability to rebuild and ensure long-term sustainability.
- A Hector's or Maui's dolphin died in a commercial set net off Cape Egmont in January 2012 occurred outside of the areas closed to set net fishing after the 2008 review of the TMP.
- Information indicates that fishing is the greatest known cause of human-induced mortality of Maui's dolphins.
- The government is concerned over the status and trends of the Maui's dolphin population and has an overall commitment to rebuild threatened species.
- There is increasing public awareness and international trends toward being more risk-adverse in relation to human impacts on vulnerable species.

Much of the risk to the Maui's dolphin population has been managed with the management measures in place throughout large portions of their range. However, there remains an unknown level of residual risk of fishing-related mortality to Maui's dolphins off the WCNI. The unknown levels of residual risk remain at the margins of Maui's dolphin distribution, that is, where Maui's dolphin may occasionally range but their presence is considered rare.

6.3.1 Need for action

The need for the Minister for Primary Industries ('the Minister') to act will be determined by careful consideration of his obligations under the Fisheries Act 1996 ('the Act'). The assessment of the effect of fishing-related mortality is based on the following factors:

- Biology of the Maui's dolphins including:
    - Abundance and population trends
    - Alongshore, harbour, and offshore distribution
    - Vulnerability of the population to human-induced impacts
    - Known susceptibility of the population to fishing
- Assessment of the effect of set net fishing, including:
    - Characterisation of the fishery
    - Effectiveness of current measures in mitigating threats
    - Information on, or likelihood of, set net related mortalities or interactions with Maui's dolphins
- Assessment of the effect of trawl fishing, including:
    - Characterisation of the trawling fishery
    - Effectiveness of current measures in mitigating threats
    - Information on, or likelihood of, trawl related mortalities or interactions with Maui's dolphins
- Overall assessment of the effect of fishing-related mortality on Maui's dolphins off the WCNI and whether it is necessary pursuant to sections 11 or 15(2) of the Act for the Minister to impose more measures in the area.

The Minister must consider whether the residual risk to Maui's dolphins from fishing-related mortality is acceptable. If so, then no further measures would need to be put in place to reduce risk. However, if the Minister deems the current residual risk unacceptable then the options outlined below should be considered to reduce or remove that risk.

6.4 OBJECTIVES AND STATUTORY CONSIDERATIONS

6.4.1 Objectives

The goals of this review of the Maui's portion of the TMP are:

1. To ensure that the long-term viability of Maui's dolphins is not threatened by human activities (both direct and indirect); and
2. 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.

In considering the issues and options outlined in this consultation paper, or that arise during consultation, the relevant statutory considerations within the Act are taken into account. MPI considers that by meeting the statutory obligations under the Act, the Minister will also meet the goals of the TMP with respect to human threats to the Maui's dolphin population that are within their mandate to manage (that is the effects of fishing).

MPI has undertaken an analysis of the relevant statutory obligations (see Appendix 2 for this analysis) and considers the options in this paper to be consistent with these obligations.

6.4.2 Consultation

Section 12 of the Act requires the Minister to consult with such persons or organisations as the Minister considers are representative of those classes of persons having an interest in the stock or the effects of fishing on the aquatic environment in the area concerned, including Maori, environmental, commercial and recreational interests.

It also requires the Minister to provide for the input and participation of tangata whenua having a non-commercial interest in the stock concerned, or an interest in the effects of fishing on the aquatic environment in the area concerned and have particular regard to kaitiakitanga. This paper forms part of that consultation process.

6.4.3 Sustainability measures to manage fishing-related mortality of marine mammals

Two tools under the Act will be considered to put in place any of the management options considered in this consultation paper, or as a result of consultation:

1. Sustainability measures under section 11, or
2. Avoid, remedy or mitigate the effect of fishing related mortality on any protected species under section 15(2) of the Act.

Section 11 of the Act allows the Minister to set or vary any sustainability measure for one or more stocks or areas after taking into account the affects of fishing on the environment, extisitng controls under the Act and the natural variability of the stock concerned. Section 11 sustainability measures can be put in place by either regulation or Gazette notice.

Section 15(2) allows the Minister, in the absence of a population management plan and after consultation with the Minister of Conservation, to take such measures that he or she considers are necessary to avoid, remedy, or mitigate the effect of fishing-related mortality on any protected species[119]. Such measures may include, but are not limited to, setting a limit on fishing-related mortality[120].

[119] Section 15(2) of the Act applies if there is no population management plan (PMP) that has been approved under section 14F of the Wildlife Act 1953 or section 3E of the Marine Mammals Protection Act (MMPA). Maui's dolphins are a protected species for the MMPA. Therefore, they are also 'protected species' under the definition in the Act and section 15. There is no PMP in place for Maui's dolphins. In the absence of a PMP, section 15(2) of the Act applies.

[120] MPI is not proposing to introduce any fishing relating mortality limits for Maui's dolphins. However, should a confirmed fishing-related

Any sustainability measure set under section 15(2) would be introduced by way of regulation.

Section 15(3) provides that the Minister may require, or authorise the chief executive to require any person or class or persons (listed in section 189) to give the Minister or the chief executive such information on fishing-related mortality as the Minister or chief executive, as the case may be, considers necessary. That information may be required in the approved manner and form.

Section 15(4) allows the Minister to recommend the making of such regulations under section 298 of the Act as are considered necessary or expedient for putting in place any measures referred to in section 15(2) or section 15(3).

6.4.4 Case law on section 15(2)

The Court of Appeal has commented that in considering whether to take any measure under section 15(2), the Minister is required to form a view as to the extent which (or perhaps the point at which) utilisation of the fish resource threatens the sustainability of the protected species[121].

The Court of Appeal also commented on the difference between the Minister's obligations in relation to harvestable species and protected species. The Court commented that in the context of a harvestable species, balancing utilisation objectives and conservation values requires utilisation to the extent it is possible[122]. However, the Court noted that setting a fishing-related mortality limit for protected species under section 15(2) requires a different type of exercise[123].

The Court indicated that section 15(2) involved balancing risks on one hand against utilisation advantages on the other[124]. The Minister was required to address the extent to which use of fisheries resources conflicted with conservation of the protected species.

The Court also commented that "fishing-related mortality" refers only to the death of the protected species in the course of fishing activity. Further, relevant to section 15(2) is the impact of fishing on the population of the protected species as a whole, the section does not provide for measures aimed at simply eliminating or reducing individual deaths.[125]

6.4.5 Precautionary approach

The Court of Appeal[126] has recognised that a precautionary approach is available to the Minister when considering the extent to which use of fisheries resources threatened the sustainability of a protected species population. The context of this case was the impact of squid fishing on the sea lion population. This approach was followed by Mallon J in the High Court in 2009 when considering measures put in place to protect Hector's and Maui's dolphins[127].

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mortality of a Maui's dolphin occur before long-term measures are consider, the Minister has already indicated he will look to put in place emergency measures to further reduce fishing-related threat to Maui's dolphins.

[121] *The Squid Case*: *Squid Fishery Management Company v Minister of Fisheries* (Unreported, Court of Appeal, 13 July 2004) Hammond, William Young, O'Regan JJ) para 79.

[122] *The Squid Case*, para 75.

[123] *The Squid Case*, para 77.

[124] *The Squid Case*, para 77.

[125] *The Squid Case*, para 7.

[126] *The Squid Case*, para79.

[127] *New Zealand Federation of Commercial Fishermen Inc et al* v *Minister of Fisheries and Chief Executive of Ministry of Fisheries* High Court, Wellington, 23 February 2010, CIV 2008-485-2016, para 19).

6.5 KEY BIOLOGICAL CHARACTERISTICS

Section 4 (Context) and Section 5 (Threats to Maui's dolphins) of this document summarise the best available information on Maui's dolphin abundance and population trends; alongshore, harbour, and offshore distribution; and vulnerability of the population to fishing-related threats.

These sections should be read with this chapter as they provide the background information that has informed the development of the fishing-related management options being considered.

6.5.1 Uncertainty in the biological information

6.5.1.1 Abundance and population trend of Maui's dolphins

There is uncertainty around the current population estimate for Maui's dolphins. MPI also notes that previous abundance estimates are not directly comparable to indicate population decline. However, all Maui's dolphin abundance estimates signal that the population is very small, and has likely declined from higher levels of abundance.

6.5.1.2 Distribution of Maui's dolphins

Sightings data (and acoustic detections in harbours) have been used to infer the likely alongshore, within harbour, and offshore extent of the Maui's dolphin range in the absence of confirmed observations (via genetic testing). The uncertainty in Maui's dolphin distribution is due to the:

- small population size of Maui's dolphins;
- range in reliability of sightings information;
- snapshot nature of aerial and boat-based surveys and where that effort has been concentrated;
- inability to confirm, without genetic testing, whether a sighting or acoustic detection is of a Hector's dolphin or Maui's dolphin, and;
- limited information available on the extent and frequency of use of WCNI harbours by Maui's dolphins.

6.5.1.3 Vulnerability of Maui's dolphin population to human-induced threats

The nature of PBR analysis, or any modelling exercise relying on estimated biological and variable inputs, does not necessarily lend itself to decision making with certainty. Rather, it provides a general indication of the vulnerability of the population to human-induced mortalities.

6.5.1.4 Long-term viability

Biological[128] and stochastic[129] factors mean that there is a great deal of uncertainty around the minimum abundance that will ensure the long-term viability of Maui's dolphins, and consequently there is no definitive guidance for the Minister on the level above which the species should be maintained. However, the present size of the population is considered unlikely to be viable in the long term.

[128] When populations are small there is a tendency for them to decline further due to the survival or reproduction of individuals being compromised when they are at low numbers. Such effects are referred to as Allee effect or depensation and are particularly important for social animals like dolphins.

[129] Demographic stochasticity refers to fluctuations in population trends due to inherent variability in the survival or reproductive success of individuals. It occurs at small population sizes and can result in skewed sex ratios.

6.6 WCNI SET NET FISHERY FROM PARIOKARIWA POINT TO HAWERA

6.6.1 Characterisation of the fishery

Commercial Set Net Activity

- Commercial set net fishery along this coast primarily targets blue warehou, rig and school shark
- A total of 10 commercial set net vessels have operated in the area in the last three years
- Commercial fishing effort is concentrated within 4 nm of the shore.
- Location of commercial fishing effort (e.g. south or north of New Plymouth) depends on the species being targeted and when fishing occurs (seasonal variation).

Customary Set Net Activity

- The level of customary set net activity between Pariokariwa Point and Hawera cannot be quantified. Set net fishing is a culturally important activity for tangata whenua along this coast and is primarily used to target taonga species like mako (rig)/lemon shark.

Recreational Set Net Activity

- The level of recreational set net activity between Pariokariwa Point and Hawera cannot be quantified. Recreational set net fishing is a culturally important activity for many New Zealanders to enjoy leisurely or rely on for sustenance fishing

The Taranaki region from Pariokariwa Point south to Hawera is fished by non-commercial (inshore) and commercial (both inshore and offshore) set netters. Best available information suggests where set net effort occurs is influenced by the species being targeted as well as the season when fishing occurs. Most set net activity in this area is concentrated from Cape Egmont northwards, between 0 and 4 nautical miles offshore.

6.6.1.1 Commercial fishers

MPI has characterised and analysed the main set net fisheries between Pariokariwa Point and Hawera. This analysis has been used to identify the number of fishers that will possibly be affected by the proposed options and the nature of effects on catch and value.

6.6.1.2 Customary fishers

MPI has little information on the number of customary set net events around the Taranaki coastline and welcomes tangata whenua to comment on the importance of set net as method used for customary fisheries.

6.6.1.3 Recreational fishers

MPI has little information on the number of recreational set net events around the Taranaki coastline, and welcomes stakeholder information on this. Due to inherent data limitations, any quantitative estimates of the level of recreational activity with set nets will be very inexact.

MPI recognises that set netting is a popular recreational activity. Removing the ability to set net would take away the opportunity that exists now and would detract from a popular activity. MPI welcomes stakeholders' specific comments on the nature and extent of how the proposals might have an impact on their individual circumstances.

6.6.2 Maui's dolphin distribution

6.6.2.1 Southern distribution

Best available information indicates that the Taranaki region was once a part of the geographic range of the Maui's population when abundance was higher. Since 1989, the most southern sighting of a live Maui's dolphin was north of Raglan in 2010 and the most southern beachcast Maui's dolphin was found in Albatross Bay, Kawhia Harbour in 2000 (subspecies identity of both confirmed by genetic testing). These Maui's were found within the set net prohibition boundary put in place as a result of the 2008 review of the TMP. However, new research also shows that Maui's dolphins can travel alongshore distances up to 80 km in a year, which is much further than previously known.

Since the 2008 review of the TMP the most southern sighting of a Hector's or Maui's dolphin by DOC staff was near the Mokau River, north of New Plymouth (and within the 0 to 7 nautical miles set net ban north of Pariokariwa Point). But there have also been public sightings of Hector's or Maui's dolphins south to Cape Egmont. While the reliability of public sightings varies, there have been some verified[130] public sightings in the New Plymouth region.

In addition, a Hector's or Maui's dolphin was entangled in a commercial set net off of Cape Egmont in January 2012 ('the January mortality'). In April 2012, a stranded Hector's dolphin was found on an Opunake beach, just south of where the January mortality occurred.

MPI therefore considers information on the alongshore distribution of Maui's dolphin in the Taranaki area (south of Pariokariwa Point) to be uncertain. The limited information for this area suggests that if Maui's dolphins are present between Pariokariwa Point and Hawera, that their presence is rare and infrequent.

6.6.2.2 Offshore distribution

Maui's dolphins are closely related to Hector's and may have similar habitat preferences. However, it is difficult to detect the offshore range of Maui's dolphins because of their low abundance. Aerial sightings of Hector's and/or Maui's dolphins off the WCNI suggests that they are more prevalent in the area between shore and 4 nautical miles offshore, but have been sighted out to 7 nautical miles. The January mortality off of Cape Egmont occurred within 2 nautical miles from shore.

Research establishing that dolphins prefer waters within the 100 m depth contour has only been undertaken for Hector's dolphins. It is unknown how significant the 100 m depth contour is to the distribution of Maui's dolphins, what their offshore limit is, and this is difficult to detect given their low abundance. The offshore distance of the 100 m depth contour varies between Pariokariwa Point and Hawera (from 3.9 nautical miles to 39 nautical miles offshore).

6.6.3 Residual risk from existing commercial and amateur set net prohibitions and restrictions

Commercial and amateur set netting is currently prohibited between: Maunganui Bluff and Pariokariwa Point (out to 7 nautical miles); Pariokariwa Point to Hawera (out to 2 nautical miles); and Pariokariwa Point to Hawera (from 2 and 7 nautical miles without an observer onboard) (Map 6.2).

[130] As defined in section 4.1.9.1 where all public sighting reported to DOC undergo a validation procedure. Those sightings that can be validated are considered more reliable than unverified public sightings.

Distribution information of Maui's dolphins from Pariokariwa Point to Hawera is uncertain. The limited sightings and strandings data in this area suggests the presence of Hector's and/or Maui's dolphins is rare and infrequent.

Prior to the 2008 review of the TMP only less reliable public sightings (as compared to research sightings) have suggested that dolphins are present south of Pariokariwa Point. The previous Minister considered this information insufficient to close the area. Since this review the recent stranded dolphin near Opunake, the January mortality, verified public sightings and anecdotal reports confirm dolphins are present in the area. However, some of these dolphins are Hector's rather than Maui's.

MPI considers that the proximity of the area to the Maui's dolphins' core range means there remains potential for Maui's dolphins to occasionally range south of Pariokariwa Point[131]. But given that the area is outside their core range and the overall number of Maui's dolphins is very small, MPI consider the likelihood of a death from set net activity occurring is low.

However, the consequence of any fishing-related mortality to the Maui's dolphin population is high and a single mortality will have a significant consequence by slowing or preventing the population from increasing in size.

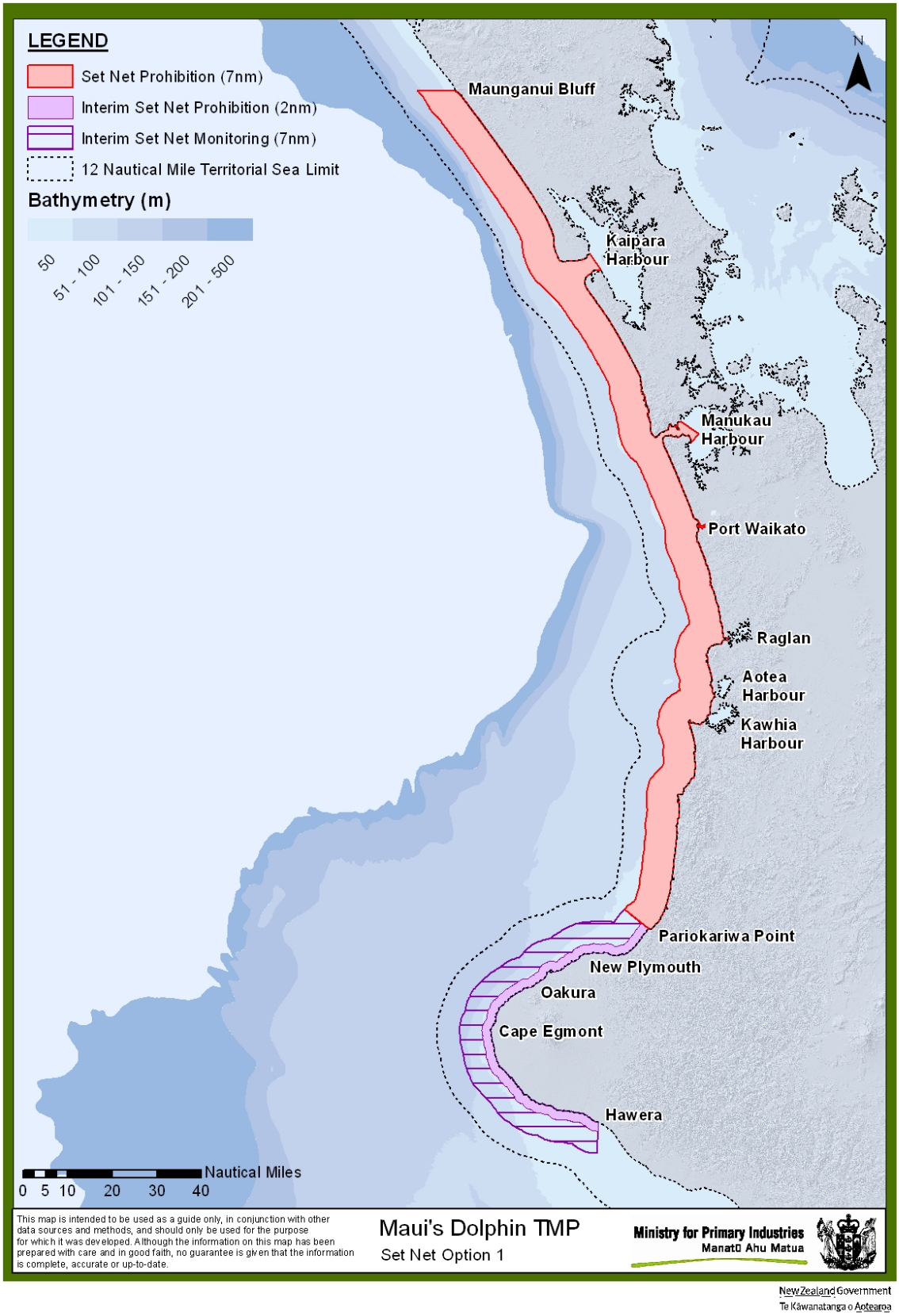
6.6.4 Need to act

MPI considers there is uncertainty about the extent and frequency of Maui's dolphin presence between Pariokariwa Point and Hawera. This uncertainty makes it difficult to quantify the residual risk that exists in the Taranaki region.

The information principles in the Act provide the Minister with guidance on how to respond to uncertain information. See Appendix 2 (Section 10.3) below for a discussion of these principles. A precautionary approach is available to the Minister (see discussion in Section 6.4.5 above).

MPI considers, given the consequence of any mortality to the population as discussed above (but noting the uncertainty also discussed above) that management measures to address the residual risk from set net activity south of Pariokariwa Point should be considered. Notwithstanding, the Minister can take a different view of the level of risk to Maui's dolphins based on the information presented in final advice that will include comments and information received in submissions.

[131] Supported by conclusions in Currey et al (2012) that the northern Taranaki coastline out to 7 nm offshore is an area of residual risk . However, the risk assessment did not take into account the interim measures in place from Pariokariwa Point to Hawera as they were put in place after the risk assessment occurred.



Map 6.2. Current (*status quo*) commercial and amateur set net restrictions off the west coast of the North Island.

6.6.5 Management Options

Commercial and Amateur Set Netting	
Option 1	*Status quo*: Keep existing management, including the interim measures to: • retain the set net ban between 0 and 2 nautical miles offshore from Pariokariwa Point to Hawera; • prohibit the use of commercial set nets between 2 and 7 nautical miles offshore from Pariokariwa Point to Hawera without an observer onboard, and; • pay for observer services costs with Crown-funding. The interim measures would be reviewed in 2015 to inform management going forward.
Option 2	Keep existing management, and put the interim measures in place via regulation to: • retain the set net ban between 0 and 2 nautical miles offshore from Pariokariwa Point to Hawera; • prohibit the use of commercial set nets between 2 and 7 nautical miles offshore from Pariokariwa Point to Hawera without an observer onboard, and; • require observer services costs to be cost-recovered from industry beginning 1 October 2013.
Option 3	• Extend the set net ban between 0 and 4 nautical miles offshore from Pariokariwa Point to Hawera. • Prohibit the use of commercial set nets between 4 and 7 nautical miles offshore from Pariokariwa Point to Hawera without an observer onboard.

The analysis of options discusses the potential effect of each on amateur and commercial fishers. There is uncertainty around the impacts that the proposed measures will have on people's social, cultural and economic wellbeing. This is primarily because there is limited specific information about the fishing activities (for example, effort and target species) that are affected by the proposals[132].

In providing submissions, stakeholders should provide information on any utilisation, economic, social, and cultural factors that may be relevant to the proposed options. In particular, fishers should provide information on how these proposals may impact on their fishing activities.

Customary fishers

In 1992 the Crown introduced legislation empowering the making of regulations recognising and providing for customary food gathering and the special relationship between the Tangata Whenua and places of importance for customary food gathering[133]. These regulations enable tangata tiaki/kaitiaki, or a tangata whenua representative appointed for the area, to issue authorisations.

Kaitiaki have a responsibility to ensure the sustainability of fisheries for future generations. While it is a legal practice for Kaitiaki to continue to issue authorisations under a closure it is discouraged. Customary authorisation are a key tool of the regulations, however Kaitiakitanga is not limited to only authorisations.

The proposed management options do not impose restrictions on Maori customary fishing, which is authorised by kaitiaki. This is consistent with measures put in place to date in respect of Hector and Maui dolphins. The DOC incident database has no Maui's dolphin mortalities attributable to customary set net fishing. MPI understands the use of set nets for

[132] Due to the nature of the reporting framework for commercial fishers and no formal reporting of amateur fishing effort.
[133] Fisheries (Kaimoana Customary Fishing) Regulations 1998

customary fishing is low off the WCNI (occasionally targeting taonga species like mako (rig)/lemon shark) and, accordingly, believes the associated risk to Maui's dolphins is low.

MPI will work alongside tangata tiaki/kaitiaki to raise awareness of the issues and to sustainably manage fisheries and protected species like the Maui's dolphin.

6.6.5.1 Option 1 (Status quo)

Option 1 (Map 6.2 above) would keep the interim measures and:

- prohibit commercial and amateur set net fishing between 0 and 2 nautical miles offshore from Pariokariwa Point to Hawera;
- prohibit the use of commercial set nets between 2 and 7 nautical miles offshore from Pariokariwa Point to Hawera without an observer onboard the vessel, and;
- pay for the cost of observer services out of Crown-funds.

The measures would be reviewed in 2015 after three years of observer coverage (because of the low likelihood of detection of these dolphins) to inform management going forward.

Option 1 considers the need to manage the risk to Maui's dolphins while gathering more information on dolphin presence in the area. The proposed closure area will manage the risk to Maui's dolphins in the inshore area (out to 2 nautical miles) where the January mortality occurred, and the alongshore range based on the maximum travel distance recorded for Maui's dolphins. One-hundred percent observer coverage between 2 and 7 nautical miles offshore does not prevent any dolphin mortalities from occurring. However, such observer coverage will provide independent monitoring and reporting of fishing interactions with, or sightings of Hector's and/or Maui's dolphins beyond 2 nautical miles.

Option 1 assumes the uncertainty in information on whether and how often Maui's dolphins are present in the Taranaki area should be addressed by requiring mandatory observer services costs, which would be Crown-funded.

MPI would work with DOC on finding opportunities for taking biopsies of any Hector's and/or Maui's dolphins sighted by the observers to verify subspecies identity and improve information on whether Maui's dolphins are present in the Taranaki area.

Effectiveness

MPI is unable to quantify the residual risk to Maui's dolphins given the uncertainty in their distribution in the Taranaki area and therefore the vulnerability of Maui's to set net activity in the area.

Using a qualitative assessment MPI considers a spatial closure out to 2 nautical miles will manage the risk to Maui's dolphins in the inshore areas where the January mortality occurred. However, a 2 nautical mile boundary does not cover the Maui's dolphin known offshore distribution. The offshore distribution information available for Hector's and/or Maui's dolphins off the WCNI suggests they are most frequently observed within 4 nautical miles (but within 4 nautical miles they are more often observed between 0 and 2 nautical miles) and make infrequent visits to areas beyond 4 nautical miles. Residual risk would remain for any dolphins that travel further offshore than 2 nautical miles.

Impact on fishers

The primary cost associated with Option 1 is the economic impact on the fishing industry and the wider economy.

Economic impact

MPI notes that the economic impact estimates are notional given that the interim measures are already in place (since July 2012). There are approximately 6-8 commercial set net fishers that were affected by the measures. Industry has submitted previously that a significant portion of catch (pre-interim measures) will not be harvested because the species predominantly targeted are caught between 0 and 2 nautical miles.

MPI has used catch effort and landings data to estimate the value of set net landings coming from the area and the potential volume of landings that would be lost or displaced. A detailed economic impact analysis for each of the management options proposed can be found in Appendix 4[134].

The economic impacts of Option 1 are:

Estimated using landings data from 1 April 2011 to 30 March 2012[135]	
Annual Value Impact	$482 200
Capitalised Future Value Impact	$1 714 470
Subtotal = Cost to Industry	$2 196 670

These estimates should be treated as indicative because they do not fully account for the ability of fishers to shift their effort outside of the 2 nautical mile boundary, noting that the remaining set net closures off the WCNI has already resulted in a large area loss.

Observer coverage

Observer coverage provides a way to continue to gather more certain information on dolphin presence in the area and interactions with fishing activity. However, given the small size of the Maui's dolphin population and the rare and infrequent occurrence of dolphins that have been observed in the area, any information gathering effort would require a long-term commitment.

Observer coverage is typically cost recovered from the fishing industry. Under Option 1, the costs of observer coverage would be met by the Crown. Option 1 is appropriate if the Minister considers this approach appropriate due to the uncertainty in information and because there is a need to gather better information on dolphin distribution in the Taranaki region. The consequence of Crown-funded observer coverage is that there may be a reduction in Crown revenue because available observer cost recovery days will reduce.

MPI notes that since the interim measures have come into effect there are four/five vessels that operate between 2 and 7 nautical miles with an observer onboard. In the absence of information on displacement or removal from the fishery MPI will estimate the cost of observer coverage between 2 and 7 nautical miles using the average number of fishing days per year between 0 and 7 nautical miles.

[134] The catch information used to estimate the potential economic impacts has been improved from that used in the assessment of the interim measures to better account for actual landings and to incorporate landings information for vessels < 6 metres in length. Information to inform this analysis is based on fisher catch reporting data that is groomed and matched with landings information. It includes catch reporting data where it provided by start position or statistical area using the same methods as applied in the development of the 2008 TMP.

[135] Based on comments from industry submitters during consultation on the interim measures, all economic impacts for this region (Pariokariwa Point to Hawera) have been estimated using catch effort and landing data from 1 April 2011 to 30 March 2012, as well as the 3 year average of October fishing year data and the 1 October 2010/11 fishing year. Long term losses have been included in Appendix 4 (section 12) to acknowledge that the management option may result in long term impacts on the commercial fishery.

MPI estimates the ongoing cost of mandatory observer coverage between the 2 and 7 nautical mile area to be between $334 010 and $526 000 a year for the next two years. The cost of observer coverage has been made using the following assumptions:

- An estimate of 526 days fished per year[136].
- Observer costs of $635 (average) and $1000 (maximum) per day.

Non-commercial impact
The value of recreational set net fishing is unable to be quantified, but MPI notes there are recreational fishers that have been impacted since the interim measures came into effect. MPI considers recreational set net fishers are less likely to set net beyond 2 nautical miles from shore or travel further south to continue to set net.

Keeping the interim measures are likely to result in recreational set net fishers having to: travel further afield to be able to continue to use that method, switch to alternative fishing methods, or be displaced out of the fishery all together (if they are unable to travel or diversify). These impacts may result in additional costs being incurred (for example, fuel, purchase of new gear, reliance on purchasing rather than catching their own fish, increased time away from friends and family).

6.6.5.2 Option 2

Option 1 (Map 6.2) would put the interim measures in place via regulation to:

- prohibit commercial and amateur set net fishing between 0 and 2 nautical miles offshore from Pariokariwa Point to Hawera;
- prohibit the use of commercial set nets between 2 and 7 nautical miles offshore from Pariokariwa Point to Hawera without an observer onboard the vessel, and;
- require observer services to be cost-recovered from industry beginning 1 October 2013.

The differences between Option 1 and 2 is that:

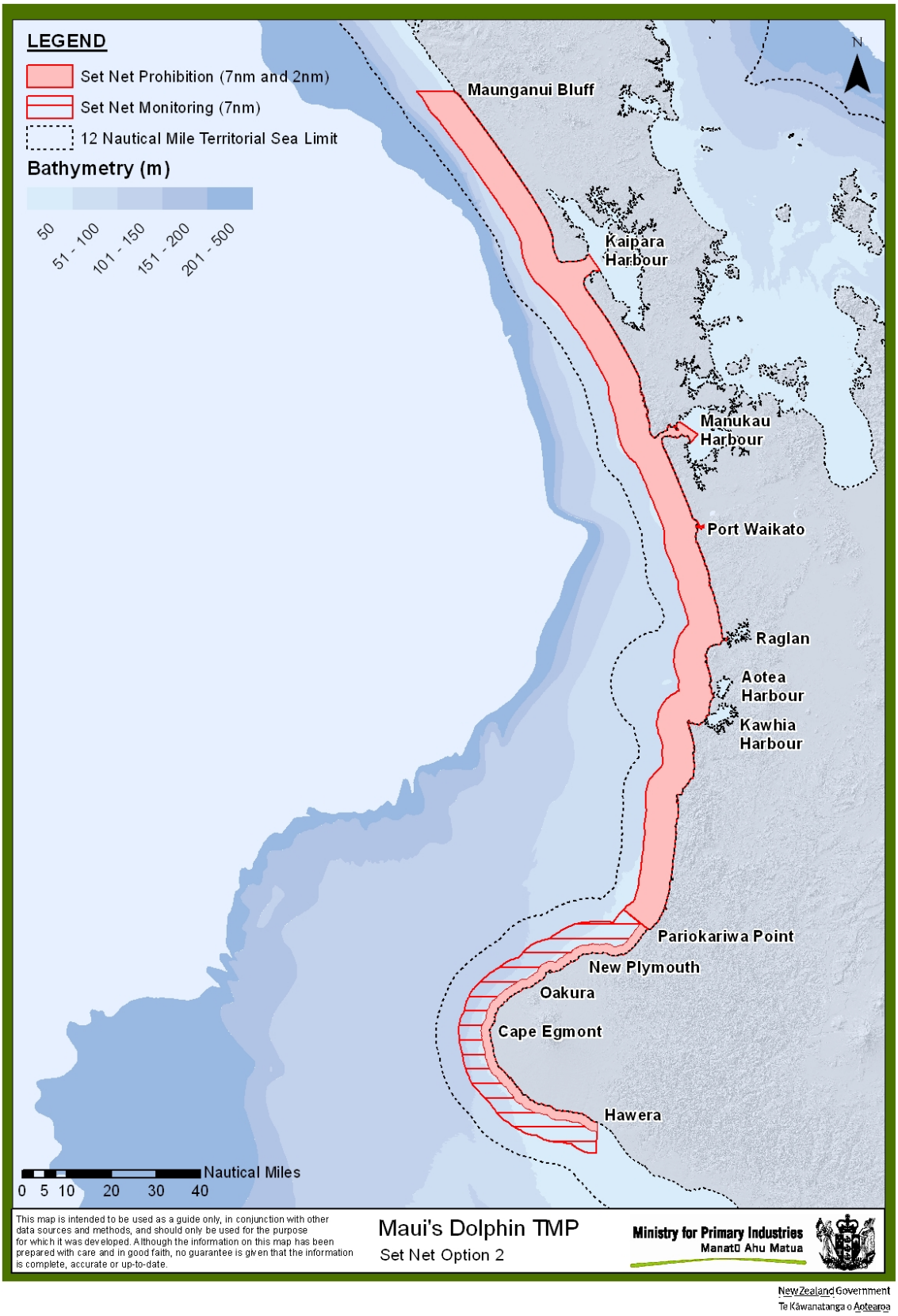
- observer coverage is paid for by industry through the cost-recovery levies, and
- from a technical perspective, Option 2 will provide better consistency with the pre-existing set net ban laws and accessibility of the law to stakeholders (they will be consolidated in one place under the same regulations) because the measures will be put into the Statutory Regulation Series.

Observer coverage is typically cost recovered from the fishing industry from quota owners based on the area and fishstocks that are relevant to the fishing vessels in question. Allowing set net activity to continue beyond the 2 nautical mile boundary means residual risk remains to any Maui's dolphin should they travel beyond 2 nautical miles. Because Hector's and/or Maui's dolphins have been present in the area and the consequence of an interaction is high, MPI needs to be able to detect with certainty whether an interaction with a Maui's occurs. To do so 100% observer coverage and long-term monitoring are required.

The penalty provisions will remain the same under both Option 1 and 2.

MPI would continue, under Option 2, to work with DOC on finding opportunities for taking biopsies of any Hector's and/or Maui's dolphins sighted to verify subspecies identity.

[136] Calculated based on the average annual number of trip days from 2008/09 to 2010/11 between Pariokariwa Point and Hawera 0 to 7 nautical miles offshore.



Map 6.2. Proposed commercial and amateur set net restrictions for Option 2 off the west coast of the North Island.

Effectiveness
Option 2 is as effective as Option 1 in terms of removing the residual risk to Maui's dolphins in the inshore area where the January mortality occurred. Residual risk would remain for any dolphins that travel further offshore than 2 nautical miles.

Impact on fishers
Option 2 will make permanent the impact on commercial and amateur set net use opportunities since the restrictions were put in place as interim measures. The primary cost associated with Option 2 is the economic impact on the fishing industry and the wider economy.

Economic impact
MPI estimates that the same vessels and proportion of the fishery would be affected as discussed in Option 1. Therefore, the estimates of potential displacement or loss of landings in Option 1 and 2 are the same.

Observer coverage
Option 2 also requires the same level of observer coverage as outlined in Option 1 to enable commercial set netting to continue between 2 and 7 nautical miles from shore. The same limitations would apply to those vessels able to, or not currently able to carry an observer.

However, in putting in place the current measures via regulation MPI considers the costs of this observer coverage should be covered by industry. MPI proposes that cost recovery observer services for this area come into effect for 1 October 2013.

MPI acknowledges cost-recovery of observer coverage from industry will impact the economic return the fishers receive from the fishery. Option 2 balances the long term need to manage the risk to Maui's dolphins and gather more certain information, while enabling set netting to continue.

MPI estimates the cost of mandatory observer coverage between 2 and 7 nautical miles to be between $334 010 and $526 000 a year and uses the same assumptions as outlined in Option 1.

Non-commercial impact
MPI considers the impact of Option 2 on recreational fishers to be the same as discussed in Option 1.

6.6.5.3 Option 3

Option 3 (Map 6.3) would:

- prohibit commercial and amateur set net fishing between 0 and 4 nautical miles offshore from Pariokariwa Point to Hawera;
- prohibit the use of commercial set nets between 4 and 7 nautical miles offshore from Pariokariwa Point to Hawera without an observer onboard the vessel, and;
- require observer services to be cost-recovered from industry.

Option 3 is a more biologically conservative option given the Taranaki area is outside Maui's dolphin core range and the overall number of Maui's is very small. Option 3 is appropriate if it is considered it necessary to reduce the residual risk of a set net related mortality in the offshore area where Hector's and/or Maui's dolphins observed off the WCNI are most

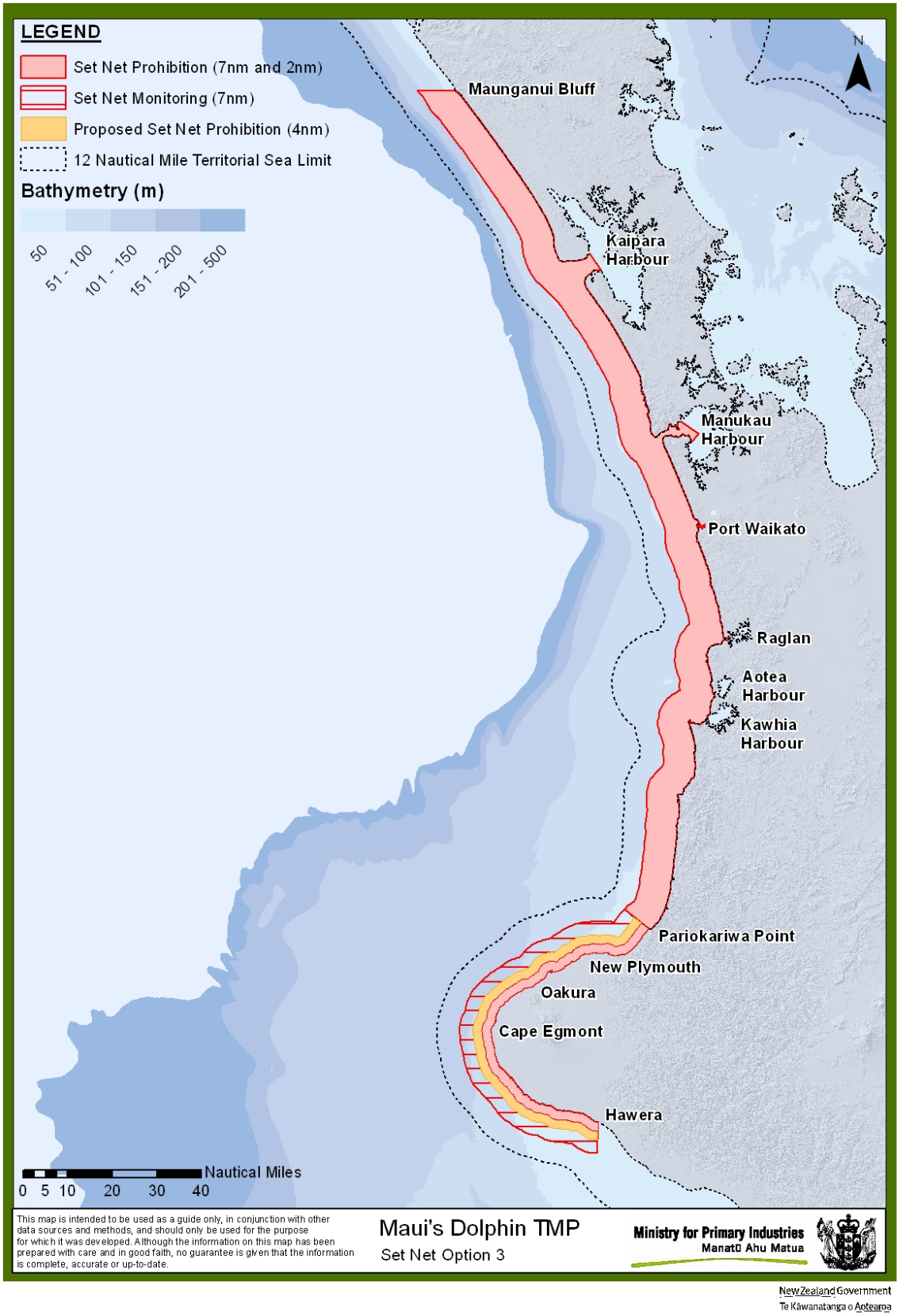
prevalent (between 0 and 4 nautical miles). This option removes a greater level of residual risk in the area south of Pariokariwa Point than Option 1 and 2.

As with Options 1 and 2, 100 percent observer coverage betwee 4 and 7 nautical miles would not prevent any dolphin mortalities from occurring. Instead, observer coverage would provide independent monitoring and reporting of fishing interactions with, or sightings of, Hector's and/or Maui's dolphins beyond 4 nautical miles.

MPI would continue to work with DOC to find opportunities for taking biopsies of any Hector's and/or Maui's dolphins sighted to verify subspecies identity.

Effectiveness

A spatial closure out to 4 nautical miles will provide the Minister with greater certainty that risks to Maui's dolphins south of Pariokariwa Point will be avoided. Option 3 the offshore range where Maui's and/or Hector's are most frequently observed (between 0 and 4 nautical miles), including the area where the January mortality occurred. Residual risk would remain for any Maui's dolphin that is present and travels offshore beyond 4 nautical miles. MPI considers there is a lower level of residual risk beyond 4 nautical miles where dolphin presence has been observed but the extent of their presence is unknown.



Map 6.3 Proposed commercial and amateur set net restrictions for Option 3 off the west coast of the North Island, including 100% observer coverage and an extension of the set net prohibition from 2 to 4 nautical mile.

Impact on fishers

Option 3 would have the greatest impact on commercial and amateur fishers in the Taranaki area. The primary cost associated with Option 3 is the economic impact on the fishing industry and the wider economy.

Economic impact

MPI estimates 6-8 commercial vessels and a large proportion of set net fishery from Pariokariwa Point to Hawera would be affected. The ability for commercial set net fishers to adjust their fishing behaviour by moving further offshore beyond 4 nautical miles may be constrained. The species mix caught between 4 and 7 nautical miles offshore may not align with their annual catch entitlement (ACE) packages, which enable them to target and land certain species (most commonly found between 0 and 4 nautical miles from shore) without financial penalties.

Catch effort and landings data have been used to estimate the value of set net landings coming from the area and the potential volume of landings that would be lost or displaced. A detailed analysis of the economic impacts can be found in Appendix 4.

The potential economic impacts of Option 3:

Estimated using landings data from 1 April 2011 to 30 March 2012	
Annual Value Impact	$885 932
Capitalised Future Value Impact	$3 162 581
Subtotal = Cost to Industry	$4 048 513

These estimates should be treated as indicative because they do not fully account for the ability of fishers to shift their effort outside of the closed area, noting that the remaining set net closures off the WCNI has already resulted in a large area loss. In addition, fishers are already affected by the interim measures in place between 0 and 2 nautical miles offshore, which would be captured by the estimates above.

Observer coverage

MPI considers that those currently carrying an observer under the interim measures could also do so under Option 3. However, the costs associated with observer coverage under Option 3 may be less than estimated in Option 1 and 2. The area of observation is smaller (between 4 and 7 nautical miles offshore) and a closure out to 4 nautical miles may mean continuing set net activity between 4 and 7 nautical miles would not be cost effective if the species mix does not align with fishers' ACE packages.

MPI estimates an average of 206 fishing days per year (between 2008/09 – 2010/11) has occurred between 4 and 7 nautical miles. However, MPI is unable to estimate potential displacement of fishers into this area from the 2 to 4 nautical mile zone, or whether they would be shut out of the fishery, if the set net ban is extended out to 4 nautical miles.

In the absence of information on displacement or removal from the fishery MPI will estimate the cost of mandatory observer coverage between 4 and 7 nautical mile area using the average number of fishing days per year in the entire 0 to 7 nautical mile area. Under this scenario MPI estimates the cost of observer coverage to be no more than $334 010 to $526 000 a year using the following assumptions:

- An estimate of 526 days fished per year[137].
- All fishing effort will transfer from the 0 to 4 nautical mile area into the 4 to 7 nautical mile area.
- Observer costs of $635 (average) and $1000 (maximum) per day.

The costs of observer coverage under Option 3 would be cost-recovered from the industry, which will impact the economic return the fishers receive from the fishery. Option 3 maintains the requirement to gather more information on dolphin presence and potential interactions with set net fishing beyond 4 nautical miles offshore. MPI considers the likelihood of interactions between 4 and 7 nautical miles is low, and smaller than the likelihood of interactions in Option 2, but the consequence of an interaction remains very high.

Non-commercial impact
The value of recreational set net fishing is unable to be quantified. However, it is likely that Option 3 would remove virtually all recreational set net activity in the region.

MPI considers the increased costs in travelling further afield (particularly offshore beyond 4 nautical miles) would make the activity cost-prohibitive. Recreational vessels are generally smaller and there would likely be logistical and safety issues preventing them from doing so. Fishers will be required to change their fishing method, which could change the costs associated with being able to continue to recreationally fish. For some species, set net is the most practical method to successfully target them leaving few alternatives to continue to catch certain species or force them to target different species that may be less desirable.

Questions for tangata whenua and stakeholder consideration

- Is the *status quo* an accurate reflection of your experience?
- Where in your experience is coastal set net activity around the Taranaki most concentrated based on target species, and what is its potential overlap with Maui's dolphin distribution?
- Are there any additional or different problems that should be addressed?
- Are there any alternative options that need to be considered?
- Have the key features of each option been accurately set out?
- Have the impacts and benefits of the options been identified and accurately described?
- What is the nature and extent of how the management options might have a social, cultural, or economic impact on iwi circumstances?
- How would the options impact on your set net activities and are there opportunities to continue using this method outside the area where the restrictions are proposed?
- Are there other comments you would like to make about the options proposed?

[137] Calculated based on the average annual number of trip days from 2008/09 to 2010/11 from Pariokariwa Point to Hawera between 0 and 7 nautical miles offshore.

6.7 WCNI HARBOURS' SET NET FISHERY

6.7.1 Characterisation of the fishery

Commercial Set Net Activity

- Commercial set net fishery in the harbours primarily targets flatfish, rig and mullet
- Most fishing effort in the Raglan and Kawhia harbours does not include reporting by position (that is including latitude and longitude).
- Fishing effort in the Kaipara and Manukau harbours can be quantified because they are distinct statistical reporting areas, although there is uncertainty as to where in those harbours fishing activity occurs.
- Where position information is available in the Manukau Harbour it suggests a high intensity of set net activity along the boundary of the current set net restrictions. However this information is highly uncertain given the low level of reporting by position.
- There have been a maximum of 44 and 64 commercial set net vessels operating within the Kaipara and Manukau harbour, respectively, in the last three years.

Customary Set Net Activity

- The level of customary set net activity in the west coast North Island harbours cannot be quantified. However, MPI recognises that set net fishing is a culturally important activity for customary fishers.

Recreational Set Net Activity

- The level of non-commercial set net activity between Pariokariwa Point and Hawera cannot be quantified. Recreational set net fishing is a culturally important activity for many New Zealanders that enjoy leisurely or rely on for sustenance fishing

Commercial and non-commercial set netting occurs in all west coast harbours (Kaipara, Manukau, Raglan, Aotea[138] and Kawhia). The main set net target species in the harbours are flatfish, rig and grey mullet. Virtually all parts of all the harbours are fished, from intertidal upper reaches to the deeper channels towards the entrances. However, the available information suggests that where set net effort occurs in the harbours is influenced by the species being targeted.

6.7.1.1 Commercial fishers

MPI has characterised and analysed the main set net fisheries in the WCNI harbours. This analysis has been used to identify the number of fishers that will possibly be affected by the proposed options and the nature of effects on catch and value.

6.7.1.2 Customary fishers

MPI has little information on the level of customary set net activity in WCNI harbours. MPI welcomes tangata whenua to comment on the importance of set net as method used for customary fisheries, the taonga species that are targeted within the harbours and where in the harbours this activity most often occurs.

6.7.1.3 Recreational fishers

MPI has little information on the level of recreational set net activity in WCNI harbours, and

[138] No commercial fishing occurs in Aotea Harbour because a mātaitai is in place.

welcomes stakeholder information on this. Due to inherent data limitations, any quantitative estimates of the level of recreational activity with set nets will be very inexact.

MPI recognises that set netting is a popular recreational activity. MPI welcomes stakeholders' specific comments on the nature and extent of how the proposals might have an impact on their individual circumstances.

6.7.2 Maui's dolphin distribution

For the WCNI harbours, Hector's and/or Maui's dolphins have been most frequently observed near or in the entrance channels of harbours. In Raglan Harbour there have been some research and public sightings near the entrance, and a couple of sightings by government officials within the harbour entrance beyond the current set net restriction boundary. There has been a research sighting at each of the mouths of the Kawhia and Aotea Harbours, in addition to some public and government sightings.

In the Manukau Harbour, all public and research sightings, acoustic detections, and reported strandings have occurred in the entrance channels within the existing set net restriction boundary. In the Kaipara Harbour, public sightings are concentrated at the entrance channel of the harbour. There has been one acoustic-detection[139] of a Hector's or Maui's dolphin in the Kaipara Harbour along a channel approximately 10 km south of the entrance beyond the closed set net area. MPI acknowledges there are limitations in the range of acoustic detectors. However, since the 2008 review of the TMP the information resulting from acoustic detection surveys (from 2005 to 2008) has undergone scientific peer review.

There is no information to indicate the extent and frequency of Maui's dolphin movements into and within the harbours. As already noted, public sighting reports of Hector's and/or Maui's dolphins are limited to the harbour entrance areas despite extensive boating activity inside the harbours. MPI considers the limited sightings reports support the suggestion that Hector's and/or Maui's dolphins' use of these harbours is likely rare and infrequent. The harbours are large, however, and lack of data does not necessarily mean absence of dolphins.

6.7.3 Residual risk from existing commercial and amateur set net prohibitions and restrictions

Commercial and amateur set netting in the WCNI harbours is currently prohibited inside the entrances to the Kaipara, Manukau, and Raglan Harbours, and Port Waikato river mouth (Map 6.4).

MPI is unable to quantify the residual risk to Maui's dolphins given the uncertainty in the distribution information of Maui's dolphins in WCNI harbours. The limited data available suggests Hector's and/or Maui's dolphins are more likely to be observed in the harbour entrance channels (rather than well inside the harbours), and their presence in these channels is rare and infrequent. MPI notes an acoustic detection of a Hector's and/or Maui's dolphin has been recorded inside the Kaipara Harbour along one of the channels, and two government sightings have been reported in the entrance channel of the Raglan Harbour beyond the current set net restriction boundaries.

Using a qualitative assessment, MPI considers some residual risk remains given the proximity of the harbours to the Maui's dolphins' core range, and their occasional movements into and beyond the harbour entrance channels. MPI considers the risk is greater where the intensity

[139] Acoustic detection is when the noises (echolocation signals) the dolphins (in this case Hector's and Maui's) make were recorded in the harbour.

of set net activity is high and its proximity to where dolphins have been most commonly observed, which increases the likelihood of an interaction occurring. However, given that the harbours are outside their core range and the overall number of Maui's dolphins is very small, MPI consider the likelihood of interactions with set net activity in the harbours to be low.

The risk assessment report indicated that residual risk remains along the boundary of the current set net ban in the Manukau Harbour based on Maui's dolphin distribution and location of set net activity. However, MPI notes that there is limited position information of set net activity available under the current reporting regulations. Therefore, the level of residual risk to dolphins should they swim beyond the entrance where they have been sighted and acoustically detected is unknown.

MPI invites stakeholders to comment on the areas of these WCNI harbours most used based on target species, and the intensity of their activity in those areas.

6.7.4 Need to act

There is uncertainty about Maui's dolphin presence in the WCNI harbours beyond the entrance channels where they have been detected, the location of set net activity in the harbours, and where the two are most likely to overlap. This uncertainty makes it difficult to quantify the residual risk in these harbours.

The information principles in the Act provide the Minister with guidance on how to respond to uncertain information. MPI considers, given the consequence of any mortality to the population as discussed above (but noting the uncertainty also discussed above) that management measures to address the residual risk from set net activity in the WCNI harbours should be considered. Notwithstanding, the Minister can take a different view of the level of risk to Maui's dolphins based on the information presented in final advice that will include comments and information received in submissions.

6.7.5 Management Options

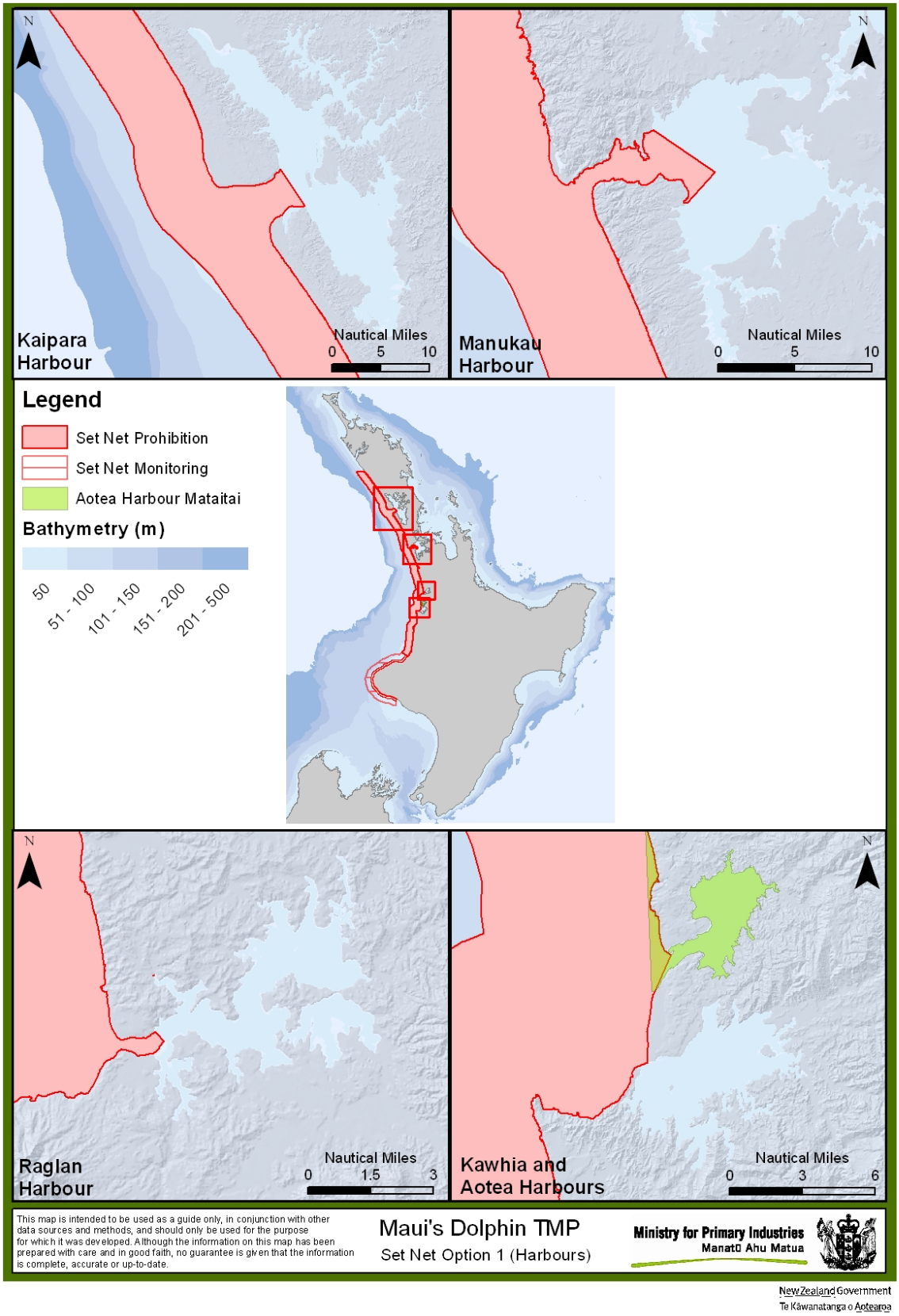
MPI is consulting on the following management options to manage the threats of commercial and amateur set net activity in the WCNI harbours on Maui's dolphins.

Commercial and Amateur Set Netting (WCNI Harbours)	
Option 1	*Status quo:* Keep existing management
Option 2	Improve information on Maui's dolphin distribution and set net activity in the west coast North Island harbours, with a focus in the Manukau Harbour.
Option 3	• Extend the existing set net ban in the entrance of the Manukau Harbour further into the harbour. • Improve information on Maui's dolphin distribution and set net activity in the west coast North Island harbours, with a focus in the Manukau Harbour.

6.7.5.1 Option 1 (Status quo)

Option 1 would keep the current management measures in place for WCNI harbours (Map 6.4). The Minister may consider that the residual risks of fishing-related mortality from set net fishing in the harbours are acceptable and that further measures to avoid, remedy or mitigate the effects of fishing-related mortality on Maui's dolphins are not currently required.

The *status quo* remains a valid option given uncertainty over the nature and extent of Maui's dolphin distribution and use of the harbours, the vulnerability of the dolphins to fishing-related mortality from set net activity in the harbours, and the impact on fisheries users.



Map 6.4. Current (*status quo*) commercial and amateur set net restrictions within the west coast North Island harbours.

6.7.5.2 Option 2

Option 2 would keep the current management measures for the WCNI harbours (Map 6.4 shown above) and improve information in two areas:

- Maui's dolphin use of the WCNI harbours, with a focus in the Manukau Harbour, and;
- where commercial and amateur set net activity is occurring in the harbours.

MPI recognises the importance of improving information on Maui's dolphin distribution in the harbours to improve management of fishing-related threats to the population. In particular, there is insufficient information to quantify the degree of overlap between Maui's dolphins and set net activity in the harbours.

Given the information available suggests that Maui's dolphin presence is the harbours is rare and infrequent, improving information on dolphin distribution and set net activity is important. Option 2 proposes to focus improving this information initially on the Manukau Harbour given the risk assessment identified it as an area where there may be a high degree of overlap with set net activity and its proximity to the core distribution of Maui's dolphins.

Option 2 is appropriate if the Minister considers the level of risk posed by set net activity in the harbours is acceptable, and collection of quantitative information on the nature of that risk is a priority.

Effectiveness

Option 2 will not mitigate risk of Maui's dolphin entanglement with set nets, but will improve information on the nature and extent of any risk posed by set net activity within the WCNI harbours.

MPI would investigate ways of improving information on Maui's dolphin presence in the harbours, including how far, how often, and where in the harbour they may be present. As a first step, MPI considers the annual planning and review process (proposed in Section 8 of this paper) as an appropriate framework to identify possible research projects or monitoring programmes to support the collection of this information.

MPI invites stakeholders to comment on education or public awareness initiatives that may provide additional ways to improve information on Maui's dolphin distribution and use of the harbours and how that can be incorporated into the research and monitoring frameworks.

Impact on fishers

In order to improve information on set net activity in the harbours MPI considers a range of tools could be used. MPI would collaborate with industry on the design of any tools to improve fine spatial scale reporting to ensure it provided meaningful information to inform management.

One approach to improving information on set net activity in the harbours is to require set net vessels (regardless of their size) to provide the latitude and longitude positions of their activity within the harbours, include start and end positions of their nets. This information would allow MPI to identify the areas where fishing intensity is greatest in comparison to Maui's dolphin distribution.

MPI invites stakeholders to comment on whether such information could be provided using currently available reporting forms, whether the current reporting forms would need to be modified, or whether the information could be provided in an additional reporting form.

MPI invites industry participants to comment on the feasibility of requiring finer special scale reporting, and if applicable, additional methods of improving location of set net activity in the west coast North Island harbours.

6.7.5.3 Option 3

Option 3 (Map 6.5) builds on the importance of improving information outlined in Option 2 and proposes to also remove some residual risk to Maui's dolphins. This option would extend the existing set net closure in the Manukau Harbour to encompass an area where the deep water channel(s) extend into the harbour[140], and improve information on dolphin distribution and use of the harbours as well as potential overlap with set net activity. The proposed extension is being considered because:

- of the harbour's proximity to the core distribution of Maui's dolphins;
- the greatest number of sightings of Hector's and/or Maui's dolphins in a WCNI harbour have occurred in the entrance channel of the Manukau Harbour, and;
- there is intense set net activity in the channels along the boundary of the current set net restrictions, which is close to the areas where dolphins have been observed.

It is uncertain if, how often, and for how long Maui's dolphins may enter the Manukau Harbour. Distribution information (sightings and acoustic detections) suggests presence of Hector's and/or Maui's dolphins in the entrance channel of the Manukau Harbour is intermittent and infrequent.

This option is a more biologically conservative option that would remove risk to the dolphins should they travel beyond the current set net ban boundary in the Manukau harbour. Option 3 is appropriate if the Minister considers it necessary to take a more cautious approach and extend the set net closure in the Manukau Harbour where Maui's dolphins may occasionally visit, while also improving information on Maui's dolphin distribution and use of WCNI harbours and where set net activity occurs.

MPI invites stakeholder comments on whether set net bans in the entrances of the other WCNI harbours should also be extended.

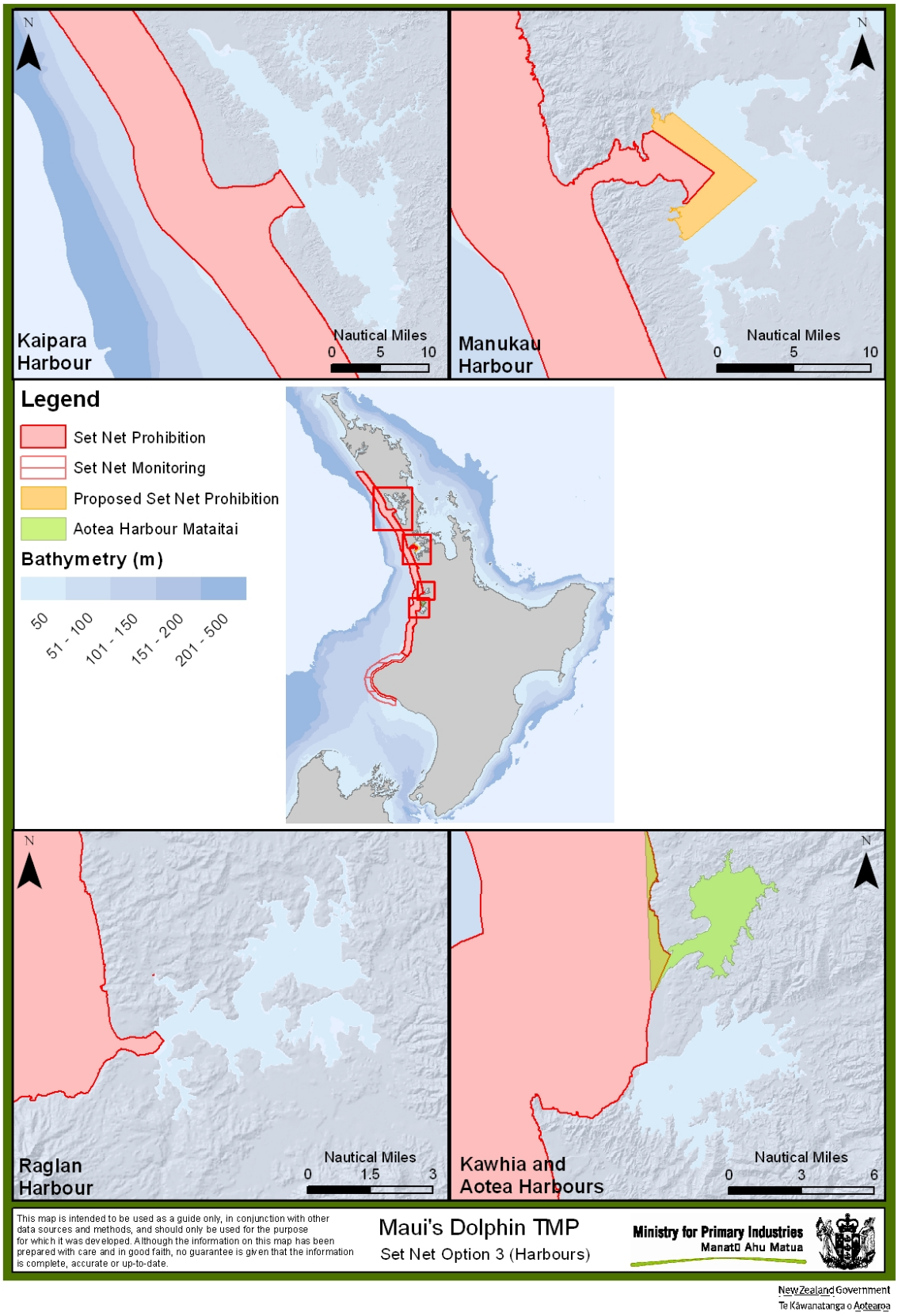
Effectiveness

MPI is unable to quantify the residual risk to Maui's dolphins in the Manukau Harbour given the uncertainty in their distribution or use of the harbour and therefore their vulnerability to set net activity in the area.

Using a qualitative assessment MPI considers an extension of the set net ban further into the Manukau Harbour would lower the risk of Maui's dolphin entanglement with set nets if they do venture beyond the harbour entrance channel and, if so, are more likely to remain in the channels when they do.

Residual risk would remain for any Maui's dolphin that travels further into the harbour beyond the proposed extended set net ban boundary. Residual risk also remains for any Maui's dolphin that travels beyond the current set net closures in the Kaipara, Raglan or Kawhia harbours.

[140] The proposed area encompasses the majority of channels where water depth is ≥ 10 metres. Northern position coordinates of 36°58.12'S, 174°38.67'E , eastern coordinates of 37°02.47'S, 174°45.58'E (on a light buoy in Papakura Channel), and southern coordinates of 37°06.36'S, 174°40.12'E (Matakawau Point). The additional area coverage is approximately 66 km^2.



Map 6.5. Proposed extension of the commercial and amateur set net prohibition in the Manukau Harbour (Option 3).

Impact on fishers

Option 3 would impact on commercial and amateur fishers currently operating just along the boundary of the set net closure in the Manukau Harbour. The primary cost associated with Option 3 is the economic impact on the fishing industry and the wider economy.

Economic impacts

There are on average 32 commercial fishers that set net in the Manukau Harbour. Due to the limited position information on where these fishers operate in the harbour, MPI has estimated the potential impact of Option 3 by assuming 100 percent of the rig fishery would be affected. MPI has assumed the set net fishery that operates in the channels that extend into the harbour from the entrance primarily targets rig. Rig is the most valuable fishery in the Manukau Harbour based on the proportion of the rig fishstock (SPO 1) that is harvested in the harbour and MPI's estimate of fish prices (see Appendix 4).

However, MPI considers that the aggregate impact of this option may differ. Undoubtedly a small proportion of the flatfish and mullet fisheries may remain uncaught and some portion of the rig fishery may continue to be caught as bycatch in the set net activity that continues beyond the ban area. Fishers may also still target the harbour mullet fisheries using ring nets and the harbour flatfish with flatfish nets. Assuming the extension of the set net ban mainly impacts the rig fishery then MPI estimates 6 - 8 fishers will be most impacted.

The potential economic impacts of Option 3:

Estimated using landings data from 1 October 2010 to 30 September 2011 for Manukau Harbour	
Annual Value Impact	$442 999
Capitalised Future Value Impact	$1 054 843
Subtotal = Cost to Industry	$1 497 842

These estimates should be treated as indicative because they do not fully account for the ability of fishers to shift their effort further into the harbour, noting that the remaining set net closure area has already resulted in a large area loss where certain fish species may be best targeted (that is, in the channels where water depth is >10 metres).

Non-commercial impact

The value of recreational set net fishing is unable to be quantified. MPI cannot determine the extent of the impact on recreational set net fishers operating near the entrance of the Manukau Harbour.

Recreational set net fishers in the harbour mainly target species like grey mullet, flatfish, and rig. MPI consider those fishers targeting rig are likely to be most affected this option given they are often caught in the deeper channels. Best available information suggests mullet and flounder are targeted further in the harbour, or that alternative fishing methods could be used to continue fishing these species in the proposed set net ban area.

However, MPI also notes that some recreational fishers may have difficulty in accessing species that they cannot catch effectively using a different type of gear. People who normally fish in the area will have to travel to fish so fishing costs may increase, and any shift in commercial effort may result in increased competition between commercial and recreational fishers in a smaller area.

Questions for tangata whenua and stakeholder consideration

- Is the *status quo* an accurate reflection of your experience?
- Where in your experience is set net activity in the WCNI harbours most concentrated based on target species, and what is its potential overlap with Maui's dolphin distribution?
- What proportion of your catch of key target species (rig, flatfish, grey-mullet, yellow-eyed mullet, and kahawai) do you estimate would be impacted from the proposed set net ban extension?
- Are there any additional or different problems that should be addressed?
- Are there any alternative options that need to be considered?
- Have the key features of each option been accurately set out?
- Have the impacts and benefits of the options been identified and accurately described?
- What is the nature and extent of how the management options might have a social, cultural, or economic impact on iwi circumstances?
- How would the options impact on your set net activities and are there opportunities to continue using this method outside the area where the restrictions are proposed?
- Are there other comments you would like to make about the options proposed?

6.8 WCNI TRAWL FISHERY

6.8.1 Characterisation of the WCNI trawl fishery

Available information

- The trawl fishery along this coast primarily targets trevally, snapper, and gurnard .
- There are approximately 30 trawl fishers operating 39 vessels on the WCNI.
- Vessels greater than 46 m in length cannot trawl inside 12 nm where fishing-related management measures are proposed.
- Trawl positioning information suggests comparatively higher trawl activity along the coast:
    - Between 2 and 7 nautical miles offshore
        - North of the Kaipara Harbour, and
        - Between Raglan and Kawhia;
    - Between 4 and 7 nautical miles offshore between the Kaipara and Manukau harbours, and;
    - Between 2 and 4 nautical miles between New Plymouth and Oakura.

6.8.2 Maui's dolphin distribution

Maui's dolphins are most prevalent in the area between 0 to 4 nautical miles offshore from the Manukau Harbour and south of Port Waikato. Genetic sampling has identified live Maui's alongshore between the Kaipara Harbour and Raglan, and a stranded Maui's dolphin in Albatross Bay near Kawhia. Research sightings of Hector's and/or Maui's dolphins have been observed as far south as the Mokau River.

Aerial surveys suggest that Hector's and/or Maui's dolphins observed off the WCNI are most abundant between the shore and 4 nautical miles offshore (from Kaipara Harbour to Raglan), but that they make infrequent visits beyond 4 nautical miles. The extent of their presence beyond 4 nautical miles is unknown. There is limited information to confirm whether the dolphins' distribution changes seasonally (that is, more concentrated in the inshore within 4 nautical miles over summer, and more dispersed offshore in winter).

6.8.3 Residual risk from existing commercial trawl prohibitions and restrictions

Commercial trawling is prohibited between 0 and 2 nautical miles offshore between Maunganui Bluff and the Manukau Harbour, and Port Waikato to Pariokariwa Point (Map 6.5). Between the Manukau Harbour and Port Waikato trawling is prohibited between 0 and 4 nautical miles offshore. Trawling is also prohibited in all WCNI harbours.

There have been no reported Maui's dolphin interactions with trawlers but trawling activity does overlap with Maui's dolphins range. Trawling is also known to catch other dolphin species off the WCNI and Hector's dolphins in South Island waters (albeit South Island trawlers have a higher probability of catching a Hector's dolphin due to higher dolphin abundance). MPI cannot determine if the absence of reported mortalities necessarily equates to the absence of trawl-related mortalities because monitoring of the WCNI trawl fleet is low.

Commercial trawling occurs along the entire WCNI, although where fishing effort is concentrated depends on the season and species being targeted. Any Maui's dolphin coming into the areas where trawl activity occurs may be at risk of entanglement. MPI considers that most trawling activity is highly concentrated outside 4 nautical miles where Maui's dolphins

are less frequently observed. The risk assessment concluded the risk posed by trawl to be less than that of set nets, but still estimated as likely to exceed the PBR.[141]

Despite the lower level of residual risk from trawl activity, the consequence of any fishing-related mortality to the Maui's dolphin population is high. MPI considers the likelihood of an entanglement dependent on where Maui's dolphins are likely to occur and the intensity of trawl activity in that area, and the likelihood of entanglement where the two overlap.

The risk assessment indicated that for the inshore trawl fisheries residual risk remains between the boundary of the trawl fishery closures areas (that extend to 2 or 4 nautical miles offshore) and 7 nautical miles offshore, particularly towards the centre of dolphin distribution (from Raglan Harbour entrance to the Kaipara Harbour entrance). This is supported by trawl positioning information that shows trawl activity is concentrated in these areas.

6.8.4 Need to act

MPI considers there to be uncertainty from the threat posed by trawling within Maui's dolphin range. This uncertainty makes it difficult to quantify the residual risk.

As discussed previously, the information principles in the Act provide the Minister with guidance on how to respond to uncertain information. MPI considers, given the consequence of any mortality to the population as discussed above (but noting the uncertainty also discussed above) that management measures to address the residual risk from trawl activity off the WCNI should be considered. Notwithstanding, the Minister can take a different view of the level of risk to Maui's dolphins based on the information presented in final advice that will include comments and information received in submissions.

[141] Currey et al. (2012)

Map 6.5. Current (*status quo*) trawling prohibitions along the coast off the WCNI.

6.8.5 Management options

MPI is consulting on the following management option to manage the threats of commercial trawling on Maui's dolphins.

Commercial Trawling	
Option 1	*Status quo*: Keep existing management.
Option 2	Put in place extensive monitoring coverage in the commercial trawl fishery between 2 and 7 nautical miles offshore from Maunganui Bluff to Pariokariwa Point.
Option 3	• Extend the trawl ban from 2 to 4 nautical miles offshore from Kaipara Harbour to Kawhia Harbour. • Put in place extensive monitoring coverage in the commercial trawl fishery between 2 and 7 nautical miles offshore from Maunganui Bluff to Pariokariwa Point.

MPI has characterised and analysed the main trawl fisheries between Maunganui Bluff and Pariokariwa Point. This analysis has been used to identify the number of fishers that will possibly be affected by the proposed options and the nature of effects on catch and value.

6.8.5.1 Option 1 (Status quo)

Option 1 would keep the current management measures (Map 6.4 shown above). The Minister may consider that the risks of fishing-related mortality from trawling are acceptable and that further measures to avoid, remedy or mitigate the effects of fishing-related mortality on Maui's dolphins are not necessary now. The *status quo* remains a valid option given uncertainty over the nature and extent of the impact of fishing-related mortality from trawling on Maui's dolphins and the impact on fisheries users.

6.8.5.2 Option 2

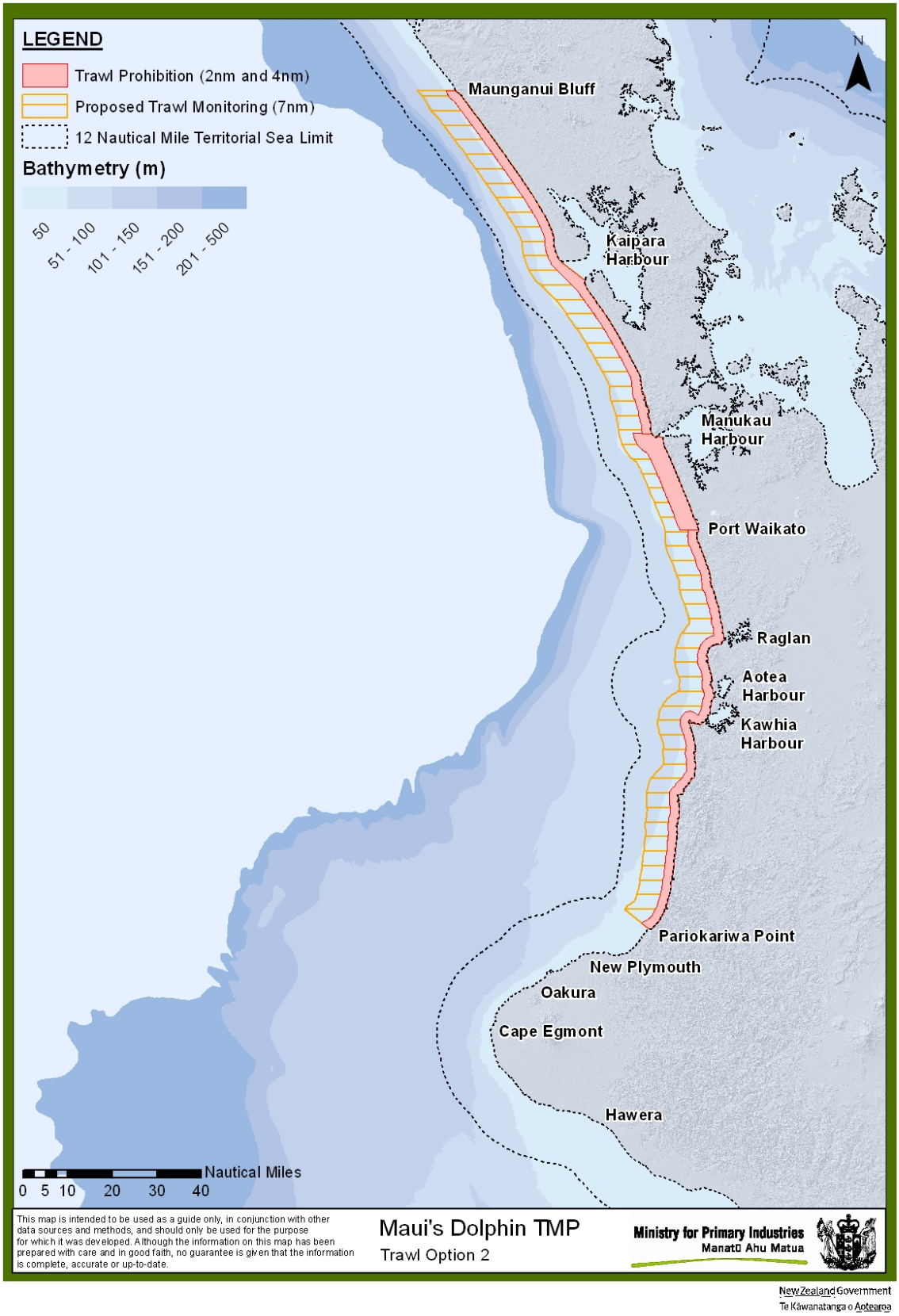
Option 2 (Map 6.5) would put in place an extensive monitoring programme in the commercial trawl fishery between 2 and 7 nautical miles offshore between Maunganui Bluff and Pariokariwa Point. Option 2 is appropriate if the Minister considers:

- trawlers pose a low risk to Maui's dolphins;
- the level of risk from trawl activities is acceptable, and;
- collection of quantitative information on the nature of that risk is a priority.

MPI considers extensive monitoring coverage would be required because of the low likelihood of an interaction between Maui's dolphins and trawl gear. The consequence of any trawl-related mortality to the population would be high, and there is a need to ensure that any such mortality could be detected.

Given that there have been no reported or observed Maui's dolphin mortalities from trawlers, MPI recommends monitoring coverage as a valid option for the Minister to consider. Further controls on trawlers could be considered in the future if monitoring information indicates risk to Maui's dolphins from this method.

Option 2 balances the need to reduce the uncertainty in the risk trawling poses to Maui's dolphins, by gathering more certain information on dolphin presence and potential interactions with trawl nets, while enabling trawling to continue.



Map 6.5. The proposed area requiring extensive monitoring coverage in the west coast North Island commercial trawl fishery (Option 2).

Effectiveness

Option 2 will not mitigate risk of entanglement with trawl nets, but will provide quantitative information on the nature and extent of any risk posed by trawlers to the Maui's dolphin population. Observer coverage or electronic monitoring provides independent observations and reporting of fishing interactions with and sightings of Hector's and/or Maui's dolphins in the area.

Impact on fishers

Observer coverage

There are approximately 21 fishers operating about 28 vessels (< 46 metres) off the WCNI between Maunganui Bluff and Pariokariwa Point (between 2 and 7 nautical miles offshore) that would require monitoring. The primary impact associated with Option 2 is the costs associated with observer coverage.

The overall impact of Option 2 on commercial fishers is difficult to quantify because MPI is unable to confirm the extent to which individual vessels are reliant on having access to the area between 2 and 7 nautical miles offshore as part of their fishing operations. Some vessels may opt out of monitoring costs by refraining from trawling inside the proposed monitoring zone. MPI cannot determine what proportion of vessels may refrain from fishing inside the monitoring zone and what impact this might have on the value of the WCNI trawl fishery.

MPI would collaborate with industry on the design of any monitoring programme to ensure it provided meaningful coverage to inform management as well as identify cost efficiencies. This includes identifying alternative approaches, if effective, to gain the information MPI requires.

In the absence of information on opting out of the area where monitoring coverage would be required, and as the details of any monitoring programme are yet to be worked out, MPI has estimated the potential costs using a number of assumptions:

- An estimate of 1238 days fished per year all of which are monitored[142].
- Observer costs of $635 (average) and $1000 (maximum) per day.

Using those assumptions, MPI estimates the maximum cost to be between $786 130 to $1 238 000 per year. These costs would cost-recovered from the industry, and may impact the economic return some fishers receive from the fishery. MPI notes Option 2 may impact on smaller scale fishers and vessels disproportionately when compared with larger fishing companies.

[142] Calculated based on the average annual number of trip days in the commercial trawl fishery from 2008/09 to 2010/11 between Maunganui Bluff to Pariokariwa Point, and 2 to 7 nm offshore.

6.8.5.3 Option 3

Option 3 (Map 6.6) would:

- extend the trawl ban from 2 to 4 nautical miles offshore from Kaipara Harbour to Kawhia Harbour, and;
- put in place extensive monitoring coverage in the commercial trawl fishery between 2 and 7 nautical miles offshore from Maunganui Bluff to Pariokariwa Point.

Option 3 is appropriate if the Minister considers it necessary to immediately remove additional residual risk from trawling to Maui's dolphins in the alongshore and offshore range where Maui's have been confirmed since 2000 and Hector's and/or Maui's are most frequently observed. Option 3 is a more biologically conservative measure than Option 2.

Independent observations/monitoring outside the proposed trawl ban area would provide quantitative information on the nature and extent of any residual risk posed by trawling to Hector's and/or Maui's dolphins in areas where sightings have been less frequent.

Effectiveness

A spatial closure out to 4 nautical miles will remove the risk of trawlers interacting with Maui's dolphins in the alongshore area where their presence has been confirmed since 2000[143]. The 4 nautical mile offshore boundary provides greater coverage of the known offshore distribution of Hector's and/or Maui's dolphins that have been observed off the WCNI.

Risk of entanglement with trawl gear would remain outside the area of the closure. MPI cannot quantify the nature of any remaining risk to Maui's dolphins beyond 4 nautical miles in this area because of the uncertain distribution information and uncertainties about whether there is any interaction with trawl gear. However, putting in place extensive monitoring coverage outside the proposed trawl prohibition area will provide quantitative information on the nature and extent of any remaining risk.

Impact on fishers

Option 3 will have the greatest impact on commercial trawl fishers. The primary cost associated with Option 3 is the economic impact on the fishing industry and the wider economy. The overall impact of Option 3 is difficult to quantify because the extent to which individual vessels are reliant on access to the proposed closed area, and the remaining area where monitoring would be required, is unknown.

[143] Genetic sampling has confirmed live Maui's dolphins between the Kaipara Harbour and Raglan, and a single stranded Maui's dolphin near Kawhia (Albatross Bay).

Map 6.6. The proposed areas requiring 100% monitoring coverage and an extension of the trawl prohibition from 2 to 4 nautical miles, in the WCNI trawl fishery (Option 3).

Economic impact
MPI estimates that 12 fishers and 12 vessels will be directly affected by extending the trawl ban out to 4 nautical miles from Kaipara Harbour to Kawhia. Those fishers and vessels that are displaced from extending the trawl ban are likely to have to either shift their effort (offshore or alongshore) and/or be unable to harvest their target species. The species mix caught beyond 4 nautical miles offshore or further alongshore may not align with their annual catch entitlement (ACE) packages, which enable them to target and land certain species (in the area being closed) without financial penalties.

MPI has estimated the potential economic impacts of Option 3 (see Appendix 12 for detailed analysis), including an estimated cost of observer coverage:

Estimated using landings data from 1 October 2010 to 30 September 2011	
Annual Value Impact	$515 108
Capitalised Future Value Impact	$2 042 241
Subtotal = Cost to Industry	$2 557 348

These estimates should be treated as indicative because they do not fully account for the ability of fishers to shift their effort outside the proposed closed area. MPI notes that some fishers and smaller vessels may be disproportionately impacted compared with larger fishing companies. If fishers cannot modify their fishing activities and are unable to fish outside the proposed closed area, the value of quota for some stocks targeted may decrease.

Observer coverage
MPI considers the ability of, and limitations on, vessels fishing outside the closed area to carry an observer on board are the same as discussed in Option 2. Cost-recovery from the industry for any observer coverage would also apply.

In the absence of information on displacement or removal from fishery with the proposed closure MPI will assume the cost of a monitoring will be no more than the range outlined in Option 2. That is between $786 130 and $1 238 000 per year.

Questions for tangata whenua and stakeholder consideration

- Is the *status quo* an accurate reflection of your experience?
- Where in your experience is commercial trawling activity off the WCNI most concentrated based on target species, and what is its potential overlap with Maui's dolphin distribution?
- Are there any additional or different problems that should be addressed?
- Are there any alternative options that need to be considered?
- Have the key features of each option been accurately set out?
- Have the impacts and benefits of the options been identified and accurately described?
- What is the nature and extent of how the management options might have a social, cultural, or economic impact on iwi circumstances?
- How would the options impact on your trawl activities and are there opportunities to continue trawling outside the area where the restrictions are proposed?
- Are there other comments you would like to make about the options proposed?

6.9 OTHER VOLUNTARY OR STATUTORY MEASURES

MPI is open to considering other measures that may aid in avoiding, remedying, or mitigating the effects of fishing on Maui's dolphins. Some of the management measures discussed below have been proposed in previous submissions on fishing-related threats to Maui's. MPI considers some of these proposals to be more effective in either reducing uncertainty, or useful in mitigating fishing-related interactions with Maui's dolphins, than others.

Some of these measures may be more effective if instituted under a voluntary rather than regulatory framework. For example, industry can adopt codes of practice with suitable governance and reporting requirements rather than being regulated by the Crown. Other measures may require regulatory implementation to be effective.

MPI invites tangata whenua and stakeholders to comment on the management measures discussed below and whether there are other measures not discussed that MPI should consider.

6.9.1 Alternative gear or fishing methods

MPI is aware that some of the management options will affect the ability of some fishers to harvest certain target species. The legal definition of set netting is very broad and encompasses most fishing methods and gear that enmesh fish.

MPI notes that in referring to set nets, the focus has been on methods that may cause entanglement and death of Maui's dolphins. MPI invites stakeholders to comment on alternative gears or modification of current fishing methods that could be considered to reduce the risk of mortality to Maui's dolphins from entanglement in fishing gear.

6.9.1.1 Ring netting

MPI recognises that ring netting, which is included in the legal definition of set netting may not need to be prohibited to avoid, remedy, or mitigate the effects fishing on Maui's dolphins because of the way the gear is deployed.

Ring netting is a common fishing method used to target mullet and kahawai in the Manukau and Kaipara Harbours. Ring netting has been described[144] as:

> *"where the boat circles a school of fish with a wall of net... lay the net round in a circle or C shape. The net has a series of floats on the top and a lead-line along the bottom to keep it upright in the water. Once the fish are encircled you use the boat to panic them into the net; then haul the net into the boat."*

This method requires the net being in the water for only a short amount of time, under constant attendance. MPI acknowledges that ring netting is prohibited where most set net bans are in effect because of the way set net is defined in the regulations. That is, a set net "includes a gill net or other sort of net that acts by enmeshing, entrapping, or entangling fish."

If ring netting is a suitable method for targeting some species along the coast it could be considered for exemption from the coastal or other WCNI harbour set net prohibitions as well. MPI invites stakeholders to comment on how excluding the activity of ring netting from the set netting prohibition:

[144] *New Zealand Federation of Commercial Fishermen Inc et al* v *Minister of Fisheries and Chief Executive of Ministry of Fisheries* High Court, Wellington, 23 February 2010, CIV 2008-485-2016, para 174).

- Would impact fishers' ability, or enable them to continue, to harvest their target species
- May create unintended consequences and increase the residual risk to Maui's dolphins, and
- Whether it is suitable to exclude ring netting from the set net prohibitions in WCNI harbours only or along the coast as well.

6.9.1.2 Drag netting

MPI notes that drag netting or beach seining is another alternative method capable for targeting mullet and potentially flatfish.

A drag net or beach seine net means any net or part of a net (including any warp, rope, chain, material, or device used in conjunction with, or attached to, the net) that—

(a) has a buoyancy system on the top edge; and
(b) is weighted on the bottom edge; and
(c) is operated by surrounding any fish and being drawn over the bed of any waters or through any waters to the shore

MPI invites stakeholder to comment on the usefulness of this method to target some species that may be affected by the proposed set net restrictions.

MPI invites stakeholder comments on fishing methods that are encompassed in the legal definition of set netting, but may not be a threat to Maui's dolphins. MPI will provide advice to the Minister, incorporating information from stakeholders on possible non-harmful fishing methods, which may be excluded from regulations on set net restrictions.

6.9.2 Other monitoring or mitigation measures

6.9.2.1 Reporting Requirements

MPI acknowledges that the use of the latitude and longitude co-ordinate data to establish the location of commercial set net activity is not exact and could be improved. Under current set net reporting requirements:

- vessels smaller than six meters are not required to report the latitude and longitude of their start positions of their net;
- most vessel operating in harbours fall within six meters in length and therefore only record the statistical reporting area in which they operate;
- vessels that are required to report the latitude and longitude of their start position are only required to be accurate to plus or minus one nautical mile;
- latitude and longitude reporting of set net activity only indicates the start position of the net;
- vessels which set more than one net are not required to report a position of any additional net, if it is set within 2 nautical miles of the first net, and;
- vessels that are required to report the latitude and longitude of their start position do not have to report the end position of each set net.

This reporting framework may not, given the length of nets used, be a true indicator of the spatial area the nets are set in (for example, a 3 km net may start outside 2 nautical miles from shore but most is laid within 2 nautical miles from shore). The uncertainty in where set net effort is being concentrated along the coast or within WCNI harbours (as discussed in Section

6.7.5.2) makes it difficult for MPI to better assess the residual risk that remains for Maui's dolphins based on their distribution and overlap with fishing effort. The lack of reporting information also makes it difficult to assess the impact of any proposed management measures on industry.

MPI proposes that all commercial set net operators off the WCNI be required to report the start and end position of their nets to improve assessment of fishing intensity, spatial coverage and potential overlap with dolphin distribution.

MPI invites stakeholders to comment on improving the current reporting requirements by providing more fine scale information.

6.9.2.2 Modifying fishing behaviour

MPI invites stakeholders to comment on practical restrictions on fishing behaviour that could be considered to reduce the likelihood of a Maui's dolphin becoming entangled in set or trawl nets. These restrictions could be considered under a regulatory and/or voluntary (that is, a code of practice) framework. MPI notes there are logistical, compliance and practical issues that would need to be considered for each proposal.

To reduce the risk of fishing-related mortality from set netting, MPI invites stakeholders to comment on the following mitigation measures:

- Reduction in total length and/or number of set nets that can be deployed at any one time.
- Compulsory set net attendance.
- Reduction in soak times.
- Seasonal closures.
- Including a 'watch period' under voluntary codes of practice to ensure no dolphins are in the area before a net is set.
- Proper setting of gear, including:
    - avoiding setting of set nets prior to poor weather setting in, which may cause gear to break free increasing risk of entanglements, and;
    - proper disposal of broken gear or torn nets as they can be a hazard resulting in entanglement or ingestion of the debris.

MPI notes that mitigation measures for set net activity may differ between recreational and commercial fishers. Primarily because of the scale of effort, commercial fishers may be economically and spatially precluded from compulsory net attendance due to the number and size of the nets they have set. For example mandatory set net attendance of a net that may be 1000 metres in length would not necessarily lower risk of entanglement because it would be difficult to recover the set net at a speed that would ensure mortality did not occur. For recreational fishers they have noted in the past that mandatory set net attendance may raise safety concerns or result in unpractical constrains that would reduce overall fishing success.

MPI considers reductions in soak times would be difficult to monitor and enforce. There would be limited ability for fishery officers to determine how long a net was in the water for and whether or not it had been attended in a given time frame. Even if soak times were reduced MPI considers it likely that in some instances the net would just be reset more often; thereby, not actually reducing any residual risk posed by the nets.

To reduce the risk of fishing-related mortality from trawling, MPI invites stakeholders to comment on whether maximum headline heights, for example, would be an alternative mitigation measure.

6.9.2.3 Use of acoustic pingers as a mitigation tool

The use of pingers to reduce interactions between Hector's dolphins and set nets has been investigated and MPI considers the efficacy of these devices to be unproven for Maui's dolphins. Pingers have proven to be effective for some cetacean species but have not been conclusively established as effective for Maui's or Hector's dolphins. It is also not known what undesired impacts pingers may cause, for example exclusion of the Maui's dolphins from their natural habitat and foraging areas.

MPI considers any benefits these devices would provide to be unknown and unclear, which could result in unnecessary costs being imposed on industry. If the use of pingers was required off the WCNI, data collection on the efficacy of this practice would also be required. However, such data collection is unlikely to be feasible given the small population size of Maui's dolphins. Requiring the use of pingers alone would not be sufficient to determine whether or not pingers are effective in reducing the risk of fishing-related mortality from set nets.

6.9.3 Extended protection boundaries

6.9.3.1 Protection within the 100 metre depth contour

MPI considers the likelihood of an interaction between a Maui's dolphin and trawl or set net fishing activity beyond 7 nautical miles to be low. There have few reliable sightings of Hector's and/or Maui's dolphins beyond 7 nautical miles (as discussed in Section 4.1.9.3).

The small population size of Maui's dolphins means that they are likely to have a contracted range. A contracted range can be appropriately managed at a spatial scale that isn't as extensive as may have been (or would be) required if the population was larger and distributed across a wider range. MPI considers improving information on dolphin distribution, fishing activity, and the potential for overlap will enable the spatial scale of management measures to be reviewed, if required, as new information becomes available.

6.9.3.2 Closure of all WCNI harbours

MPI considers there is uncertainty about the distribution of Maui's dolphins in WCNI harbours. Available information suggests Hector's and/or Maui's dolphins:

- are occasionally present in the Kaipara Harbour entrance;
- have been in the Kaipara Harbour beyond the boundary of the set net prohibition;
- are occasionally present in the entrance of the Manukau Harbour near the boundary of the set net prohibition, and;
- have been present in the Raglan Harbour entrance.

MPI cannot determine how often or for how long Maui's dolphins travel to and remain in these entrances, or travel beyond the entrances. MPI would expect more regular evidence, particularly in the Kaipara and Manukau Harbours, if Maui's dolphins frequently travelled into the harbours. The Minister can consider what, if any, other measures are necessary to lessen the likelihood of an entanglement to an acceptable level in light of the distribution information of dolphins observed in the WCNI harbours.

MPI considers a closure of all WCNI harbours to set net fishing is a very risk adverse approach in light on information about the distribution of dolphins, and the impacts on fishers would be substantial.

6.9.3.3 Protection within the 'Corridor'

MPI notes that the presence of two live female Hector's dolphins and the two stranded Hector's (that may have made contact pre mortem) from the South Island off the WCNI is the first documented contact between these two subspecies. While there is potential for interbreeding that may enhance the genetic diversity of the Maui's dolphin population, there is currently no evidence of mating between these subspecies.

MPI supports continued research to determine if there are mixing between Maui's and South Island Hector's populations, which could have implications for the potential recovery of Maui's dolphins.

6.9.4 Research, monitoring and public involvement

6.9.4.1 Research

MPI considers there is a need to improve the level of information necessary to define and monitor any residual risk to the Maui's dolphin population. Where there is an overlap between Maui's dolphins range and activities that threaten them, a high priority needs to be given to gathering more information on the status of the population.

Key information needs and suggested improvements to the research planning framework for Maui's dolphins are discussed in Section 8.

6.9.4.2 Monitoring

When selecting management measures that do not eliminate risk to Maui's dolphins, MPI considers more monitoring is required to verify the effectiveness of the chosen management measure. The greater the residual risk, the greater the imperative for increased monitoring.

The extent of fishing-related impacts on Maui's dolphins is unknown. This is primarily due to limited information on the level of fishing-dolphin interactions and trends in Maui's dolphin abundance; both of which make it difficult for MPI to determine the extent to which fishing has had, is having, or will have, an adverse effect.

The absence of documented fishing-related Maui's dolphin mortalities since 2008 in the presence of current management measures does not necessarily equate to absence of fishing-related mortalities. Documented fishing-related mortality is likely to underestimate total fishing-related mortality[145].

There are incentives to report mortalities (for example, legal obligations and penalties) but there is a lack of independent monitoring to detect compliance. There are also incentives for under reporting of fishing-related mortalities because they could result in more management measures that impact on fishing opportunities. However, the reporting of the January mortality in a commercial set net, as discussed above, is testament to the fact that many fishers can and do responsibly report accidental captures. MPI also expects there may be incidents where fishers were unaware their nets had entangled dolphins.

For these reasons MPI has presented options proposing 100 percent monitoring coverage off the WCNI in the set net fishery off the Taranaki coast and extensive coverage in the trawl fishery. MPI considers a high level of, and long-term commitment to, monitoring coverage is required because of the small size of the Maui's dolphin population and the low likelihood of fishing-related interactions. Further details on what would need to be considered in the

[145] See Currey et al (2012) for further information.

development of a monitoring programme are discussed in Section 8.

6.9.4.3 Collaboration

MPI considers that the ability to improve information available to define and monitor fishing-related risk to Maui's dolphins requires a collaborative approach among tangata whenua and stakeholders.

MPI is committed to enabling and partnering with tangata whenua and stakeholders to achieve the most effective means of reducing risk to the Maui's dolphin. Details on how various groups may want to participate in such initiatives are discussed in Section 8.

6.10 TIMEFRAME FOR IMPLEMENTING MEASURES

The Minister will consider in making his decision, the speed at which any other measures (if applicable) are introduced. The Minister could choose a management option and introduce the measures over a time period to allow for adjustment by users – particularly if measures put in place are onerous in terms of cost. In considering an appropriate transition time period the Minister would need to consider the:

- urgency of the problem, including the effects of fishing-related mortality on Maui's dolphins,
- effectiveness of current measures (risk to dolphins during the period while measures were introduced), and
- effects on fisheries resource users through mitigated impacts on use

The Minister could also choose to phase in measures by putting in place a less onerous option for a certain time period and replacing that with a higher level of mitigation at a later specified date.

6.11 CONCLUSION

The Minister is free to choose a mix of management options but should, given the uncertainty in information on biological risk, carefully consider the impact on use when determining the appropriate options.

Depending on the nature and extent of the threat from different fishing methods to the Maui's dolphin population, the Minister could choose a higher level of risk mitigation for methods that pose the highest threat. The Minister could also choose a lower level of risk mitigation for methods that pose a lesser threat to the population. That is, the level of mitigation that the Minister considers necessary may vary between the:

- type of fishing activity;
- balance struck between utilisation and sustainability, and;
- need to ensure viability (including biological diversity) of the Maui's dolphin population.

MPI notes the Act does not oblige the Minister to reduce the risk of fishing-related mortalities to zero. However, the susceptibility of the Maui's dolphin population to fisheries-related impacts suggests the Minister should be cautious determining the degree of acceptable risk of fishing-related mortality.

The options presented consider the need to manage the risk to Maui's dolphins and/or gather more certain information on dolphin presence as well as interactions between dolphins and fishing-related threats.