



# Interim set net measures to protect Maui's dolphins

## Final Advice Paper

June 2012

## **Executive Summary**

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### **Background**

1. On 2 January 2012 an accidental mortality of a dolphin considered by the Ministry for Primary Industries (MPI), at the time, likely to be a Maui's dolphin, occurred in a commercial set net off Cape Egmont, Taranaki. In addition to this mortality, new research has been published estimating the Maui's dolphin population over one year of age to be 55 individuals.
2. In response to this new information, you and the Minister for Conservation directed officials to bring forward the review of the Hector's and Maui's dolphin Threat Management Plan (TMP) and to prioritise completion of the Maui's portion of the TMP in 2012. You also directed officials to consult and provide advice to you on whether interim measures are necessary to manage the risk to Maui's dolphins from set nets (recreational and commercial) south of the current set net ban while the TMP review is undertaken. This paper provides you with advice and analysis of submissions to inform this decision.
3. Since consultation, a stranded dolphin was found on an Opunake beach, just south of where the accidental January mortality occurred. Preliminary DNA tests indicate this dolphin to have DNA characteristics more consistent with a Hector's dolphin than a Maui's dolphin. Further tests are being undertaken to confirm this, but will take another month.
4. Given the preliminary DNA findings from the Opunake stranding, MPI now considers there to be less likelihood that the January mortality was likely a Maui's dolphin. On balance, MPI concludes the subspecies identity (i.e. a Hector's or a Maui's dolphin) of the January mortality to be uncertain and equivocal.
5. The purpose of the Fisheries Act 1996 (the Act) requires you to provide for utilisation of fisheries resources while ensuring sustainability. "Ensuring sustainability" is defined to include the avoiding, remedying and mitigating of any adverse effects of fishing on the aquatic environment. The environmental principles also require you to take into account the principle that associated or dependant species should be maintained above a level that ensures their long term viability.

### **Preferred option**

6. Taking into account a range of factors that inform the likelihood and consequence of any Maui's dolphin mortality from set net fishing in the defined area, MPI recommend that interim measures are necessary. MPI notes there is considerable uncertainty related to the January mortality and Maui's dolphin distribution south of the current set net ban. However, given the small size of the Maui's dolphin population and the consequence of any mortality to the population, MPI recommends, interim measures are necessary to manage the risk to Maui's dolphins.

7. MPI recommends you implement the following package of measures (Option 4) to manage the risk to Maui's dolphins from set nets in the area from Pariokariwa Point to Hawera:
  - i. Extend the recreational and commercial set net ban from Pariokariwa Point south to Hawera with an offshore boundary of 2nm
  - ii. Prohibit the use commercial set nets between 2nm and 7nm without an observer onboard.
  - iii. Additionally observers will:
    - Report start and end position of nets between 2 and 7nm from shore;
    - Report dolphin sightings to DOC allowing DOC to obtain biopsy information for such sightings.
  - iii. Fishers will be asked to voluntarily assist DOC in the obtaining of biopsy information where this is appropriate.
  - iv. Fishers existing policy of not setting nets when dolphins are sighted will be endorsed and encouraged.
8. This option balances the need to manage the interim risk to Maui's dolphins and gather more certain information on dolphin presence in the area. This information gathering opportunity during the interim period will be used to inform your decisions on the TMP review.
9. MPI's preferred option provides a collaborative framework for industry to work with government agencies to actively manage fishing impacts on Maui's dolphins, whilst providing further opportunities to gather information.
10. MPI recommends that the costs of observer coverage be covered by the crown in the interim, thereby enabling industry to continue to receive economic benefits from the utilisation of fisheries. These costs are able to be met within existing baselines.
11. A set net closure out to 2nm will not remove all of the potential risk to Maui's dolphins. This option will also have an economic impact on industry. MPI estimates the annual impact of this option to be \$419,578 with potential flow on future value impacts of approximately \$1.95 million.

#### Alternative options

12. MPI also considered a range of alternative options. The full range of options considered by MPI is outlined below. These options are available to you should your assessment of the risk to Maui's dolphins from set nets differ from MPI.

Option	Description
Option 1	Status quo, do not extend set net ban
Option 2	<ul style="list-style-type: none"> <li>• Status quo, do not extend set net ban,</li> <li>• Prohibit the use commercial set nets out to 7nm without an observer onboard               <ul style="list-style-type: none"> <li>- with information gathering package for</li> </ul> </li> </ul>



	commercial fishers
<b>Option 3</b>	Extension of set net ban to Hawera offshore to 2nm
<b>Option 4</b>	<u>Preferred option:</u> <ul style="list-style-type: none"> <li>• Extension of set net ban to Hawera offshore to 2nm</li> <li>• Prohibit the use commercial set nets between 2 and 7nm from shore without an observer onboard <ul style="list-style-type: none"> <li>- with information gathering package for commercial fishers</li> </ul> </li> </ul>
<b>Option 5</b>	Extension of set net ban to Hawera offshore to 4nm

13. Overall, MPI does not consider the alternative options to Option 4 to provide the same balance between managing the risk to Maui's dolphins while gathering more information in light of uncertainties.

#### Next steps

14. Following your decision MPI intends to take urgent steps to implement your decision. This will include working with your office to develop a communications plan to announce your decision.
15. The measures you decide on will come into effect 28 days after notification in the gazette and will remain in place while the TMP is reviewed and the nature of any permanent restrictions is decided.
16. A process for review of the Maui's portion of the TMP is underway. This review will provide MPI and DOC with an opportunity to assess all threats including other fishing areas and methods that present a threat to Maui's dolphins. The intent of the TMP is to develop management strategies and/or research that will support the recovery of the population. The outcome of this review may result in more relaxed or stricter controls being placed on the fishing industry.

## Recommendations

17. MAF recommends that you:

### Background

- a) **Note** that the purpose of any interim measures is to manage the risk of mortality to Maui's dolphins from recreational and commercial set nets in the interim while review of the Hector's and Maui's dolphin Threat Management Plan is undertaken.
- b) **Note** that you have obligations under the Act to avoid, remedy or mitigate adverse effects on the aquatic environment and that the long term viability of associated or dependant species should be maintained.
- c) **Note**, MPI considers interim measures necessary based on an assessment of the likelihood and consequence of a Maui's dolphin mortality occurring in the proposed area.

Noted ✓

Noted ✓

Noted ✓

### Preferred option

- d) **Note** that given the uncertainty around Maui's dolphin presence in the proposed area a balance between sustainability and utilisation is needed.
- e) **Agree** that the package of measures as defined in **Option 4** is warranted to manage the risk to Maui's dolphin from set net fishing in the proposed area. Option 4 proposes to:
  - i. Extend the recreational and commercial set net ban from Pariokariwa Point south to Hawera with an offshore boundary of 2nm
  - ii. Prohibit the use of commercial set nets between 2nm and 7nm without an observer onboard.
  - iii. Additionally observers will:
    - Report start and end position of nets between 2 and 7nm from shore;
    - Report dolphin sightings to DOC allowing DOC to obtain biopsy information for such sightings.
  - iii. Fishers will be asked to voluntarily assist DOC in the obtaining of biopsy information where this is appropriate.
  - iv. Fishers existing policy of not setting nets when dolphins are sighted will be endorsed and encouraged.

Noted ✓

~~Agreed/Not Agreed~~

- f) **Agree** that the observer coverage is not cost recovered as a fisheries service.
- g) **Note** that separate advice will be provided on the cost recovery of observer coverage for this activity as part of advice on the 1 October Fisheries Service Cost Recovery Levy Order.

~~Agree/Not Agreed~~

#### Alternative options

- h) **Indicate** should you wish to take a more cautious or relaxed set of measures, which of the following approaches you would like MPI to implement:

Option 1 – Status quo, do not extend set net ban;

~~Agreed/Not Agreed~~

Option 2 – Status quo, but prohibit the use commercial set nets out to 7nm without an observer onboard and in addition implement information gathering package.

~~Agreed/Not Agreed~~

Option 3 - Extension of set net ban to Hawera offshore to 2nm; and

~~Agreed/Not Agreed~~

Option 5 – Extension of set net ban to Hawera offshore to 4nm.

~~Agreed/Not Agreed~~

#### Next steps

- i) **Note** following your decision MPI will prepare the decision letter, gazette notification and communications strategy to announce your decision.
- j) **Note** that the measures you choose will come into effect 28 days after notification in the Gazette.
- k) **Note** the measures you agree to will remain in place while the TMP is reviewed (Nov 2012) and the nature of any permanent restrictions is decided.
- l) **Note** the TMP review will provide you with advice relating to wider considerations in regard to managing fishing interactions with Maui's dolphins and provide a whole of government response to their threat management.

Noted ✓

Noted ✓

Noted ✓

Noted ✓

- m) **Note** subject to the outcome of the TMP review this may result in more relaxed or stricter controls being placed on fishing industry.

**Noted**



Andrew Doube  
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Hon David Carter  
Minister for Primary Industries

10 / 16 / 2012

## Introduction

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18. On 13 March 2012, you and the Minister for Conservation announced that the review of the Maui's portion of the Hector's and Maui's dolphin Threat Management Plan (TMP) would be brought forward and undertaken in 2012. In addition you asked officials to consult on whether measures were necessary in the interim to further protect Maui's dolphins while this review was being undertaken.
19. The purpose of this paper is to provide you with advice to aid your decision on whether interim measures are necessary to further protect Maui's dolphins. The scope of this paper is limited solely to consideration of interim measures to protect Maui's dolphins from the effects of set net fishing (commercial and recreational) in the area south of the current set net ban. Any interim measure you decide on will remain in place while review of the Maui's portion of the TMP is undertaken.
20. The review of the TMP, this year, will provide MPI and DOC with an opportunity to assess all threats to Maui's dolphins with the view to develop management strategies and/or research that will support the recovery of the population.

### *Summary of submissions*

21. On 14 March 2012 MPI consulted with stakeholders on the need for interim measures. The paper presented a single option:
  - Extend the recreational and commercial set net ban from Pariokariwa point to Hawera, offshore to 4 nautical miles (nm). See Appendix One for map.
22. The consultation paper also noted that other options may be proposed by submitters, particularly in regard to the offshore extent of the extension. The consultation paper noted alternative offshore limits to the 4nm proposed option (i.e. 2nm and 7nm) that some stakeholders have focused on in their submissions.
23. The four week consultation period ended on 11 April 2012. 32,187 submissions were received, this included:
  - i. 31 submissions opposing any extension of the set net prohibition between Pariokariwa point to Hawera (hereafter referred to as the proposed area).
  - ii. 5 submissions supporting the option presented in the consultation paper – Extension of the set net ban in the proposed area, offshore to 4nm.
  - iii. 24,448 submissions suggesting protection measures greater than the option presented in the consultation paper:
    - 1,217 submissions supporting extension of the set net ban in the proposed area, offshore to 7nm.
    - 23,231 submissions suggesting a range of options to support protection of Maui's dolphins. This included set net and trawl prohibitions within the 100m depth contour and in harbours,



- increased monitoring and education of fishers and protection of a corridor between the Hector's and Maui's dolphin populations.
- iv. 7,703 submissions supporting general protection of Maui's dolphins with no specific option supported.
- v. A further 117 submissions were received on the impacts of mining which have not been considered as part of this advice.

*Factors to be considered*

24. The degree of risk of fishing related mortality relates to the likelihood and consequence of an encounter with fishing gear. An understanding of the following factors is crucial to your decision on whether management action is necessary based on likelihood and consequence:
- i. Your statutory obligations under the Act
  - ii. Biological information on Maui's dolphins including:
    - Abundance and trend
    - Offshore and southern distribution
    - Vulnerability of the population to human-induced mortality
  - iii. Set net fishing activity, including:
    - Susceptibility of the population to fishing-related mortality
    - Characterisation of the fishery.

**Statutory Obligations**

25. MPI proposes to implement any decision you make in regard to the options outlined in this paper under section 11 of the Act.
26. Section 11(1) of the Act allows you 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. You must also take into account existing controls under the Act and the natural variability of the stock concerned.
27. Under section 11(3)(d) you may set or vary the fishing methods that may be used in any area.
28. Section 11(4)(b) of the Act allows sustainability measures to be set by notice in the Gazette or by making regulations under s 298. MPI proposes that the Gazette Notice process be used so that the extra time involved in making regulations is avoided. Any Gazette Notice restrictions would stay in place while the TMP is reviewed and the nature of any permanent restrictions is decided. It is proposed that a 28 day period be allowed between the publication of any Gazette notice restrictions and the coming into force of those restrictions. This will allow time for the restrictions to be publicised and any adjustments necessary to be made.
29. Section 5 of the Act requires any person, exercising or performing functions, duties or powers under the Act to act in a manner consistent with:
- i. New Zealand's international obligations relating to fishing, specifically the management of fishing related threats to protected species;

- ii. The provisions of the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992.
- 30. Section 11(2) and 11(2A) contain additional statutory considerations. MPI has undertaken an analysis of such considerations, where relevant, (see Appendix Two for this analysis) and considers the options in this paper to be consistent with these obligations.
- 31. In making any decision under the Act you must bear in mind and conform to the purposes of the Act. The purpose is set out in section 8 as being to provide for the utilisation of fisheries resources while ensuring sustainability. "Ensuring sustainability" is defined to include the avoiding, remedying or mitigating of any adverse effects of fishing on the aquatic environment. The aquatic environment would include Maui's dolphin.
- 32. You must take into account the environmental principles set out in section 9 of the Act. The environmental principles require you to take into account the principle that "associated or dependent species should be maintained above a level that ensures their long-term viability"; that biological diversity is maintained and that habitat of particular significance for fisheries management should be protected. The term "long term" viability is defined in the Act as meaning there is a low risk of collapse of the species and the species has the potential to recover to a higher biomass level.
- 22 Under section 10 of the Act you must take into account the information principles in of the Act these being that:
  - i. decisions should be based on best available information;
  - ii. decision makers should take into account any uncertainty in the available information;
  - iii. decision makers should be cautious when information is uncertain, unreliable or inadequate, and;
  - iv. the absence of, or any uncertainty in, any information should not be used as a reason for postponing or failing to take any measure to achieve the purpose of the Act.

### **Biological Information on Maui's dolphins**

- 33. Maui's dolphins (*Cephalorhynchus hectori maui*) were identified as a subspecies of Hector's dolphins in 2002. Prior to this they were considered to be a geographically separate population of Hector's dolphins. Hector's and Maui's dolphins are not visually distinct and can only be differentiated through genetic testing or skeletal analysis.
- 34. Maui's dolphins are protected species listed under the Marine Mammal Protection Act 1978. They are endemic to New Zealand and one of the world's rarest dolphins. Maui's dolphins are classified as 'nationally critical' and 'critically endangered' by the Department of Conservation and the International Union for the Conservation of Nature (IUCN).
- 35. The following biological characteristics of Maui's dolphins make them vulnerable to the effects of human-induced mortality, including fishing-related mortality. Maui's dolphins:

- i. Become sexually mature at a relatively late age (about 7-9 years)
- ii. Are relatively short lived (about 20 years)
- iii. Have a low reproductive rate (a female has a single calf every 2-3 years)
- iv. Favour shallow waters less than 100 m deep and have a localised inshore distribution (i.e. an overlap with many human coastal activities)
- v. Have a small population (and consequently may have few breeding females).

## Abundance

### **Available information on Abundance**

- The most recent abundance (or population size) estimate for Maui's dolphin is 55 individuals over 1 year old with 95% confidence (c.i.) that the population is between 48 and 69 individuals over 1 year old (Hamner et al.).<sup>1</sup> The Hamner et al. abundance estimate was calculated using genetic mark recapture analysis methods.
- The Hamner et al. analysis also provided an estimate of population decline of 3 percent per annum, but the decline could not be confirmed with 95% confidence.
- The Hamner et al. abundance estimate is lower than the previous abundance estimate which estimated the population to be 111 individuals (95% confidence interval (c.i.): 48–252; Slooten et al.).<sup>2</sup> However, the methods used in the two studies are not directly comparable.
- The findings of recent research are consistent with Maui's dolphin having a small population that is probably declining.

### *Submitter comments*

36. The Seafood Industry Council (SeaFIC), Te Ohu Kaimoana (TOKM) and other industry representatives submit that the two population estimates, noted above, are not directly comparable to indicate population decline because different methodologies were used.
37. Industry submitters also argue the Hamner et al. research has not undergone appropriate peer review and therefore the accuracy of the information is not assured.
38. S. Dawson, Associate Professor in the Department of Marine Science at the University of Otago, submits that while the surveys are not strictly comparable,

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<sup>1</sup> Hamner, R.M.; Oremus, M.; Stanley, M.; Brown, P.; Constantine, R.; Baker, C.S. 2012: Estimating the abundance and effective population size of Maui's dolphins using microsatellite genotypes in 2010–11, with retrospective matching to 2001–07. Department of Conservation, Auckland. 44 p

<sup>2</sup> Slooten, E., Dawson, S.M., Rayment, W.J., Childerhouse S.J., 2005. ,Distribution of Maui's dolphins, *Cephalorhynchus hectori maui*. New Zealand Fisheries Assessment Report 2005/28. 21 p.

the results are consistent in indicating that the Maui's dolphin population is very small and suggests a recent decline in abundance.

#### *Ministry analysis*

39. MPI acknowledges that the Hamner et al. abundance estimate and the Slooten et al. abundance estimate are not directly comparable to indicate population decline.
40. Although there is some uncertainty around historical abundance estimates, information suggests that the Maui's dolphin population has declined from higher levels of abundance<sup>3</sup>.
41. There is uncertainty about the rate and magnitude of the decline of the Maui's dolphin population.
42. The Hamner et al. research has undergone peer review processes both externally and within DOC with participation from MPI. MPI has confidence in the research findings and is satisfied with the peer review process undertaken.

#### **Offshore and Southern Distribution**

##### ***Available information on offshore and southern distribution***

##### **Distribution south**

- Maui's dolphin distribution in the area south of the current set net prohibition is uncertain because sighting data in this area is limited and has varying degrees of reliability.
- The core range of Maui's dolphins is between Kaipara and Raglan Harbours (north of the proposed area) based on current research.
- The most southern research sighting of a Maui's dolphin south was just south of the Mokau River (north of the proposed area).
- Public sightings of dolphins have been reported to DOC throughout the Taranaki area. (See Appendix Three). Dolphin sightings on the WCNI are generally referred to as Maui's dolphins in the DOC sightings database.<sup>4</sup> However, genetic evidence from Hamner et al. has identified the presence of two Hector's dolphins on the WCNI among Maui's dolphins. This affects the certainty that sightings made are of Maui's dolphins.
- The southern boundary of the proposed extension at Hawera is approximately 79km from where the January mortality (described below) occurred. Research from Hamner et al. established that the home range of Maui's dolphins is

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<sup>3</sup> Pilcher & Baker (2000) and Pilcher (2002).

<sup>4</sup> Prior to identification of the Maui's dolphin subspecies in 2002, Maui's dolphin sightings and mortalities on the WCNI were generally recorded as North Island Hector's dolphins. Since 2002 the terms North Island Hector's dolphin and Maui's dolphins have been considered synonymous.



greater than previously believed. The maximum distance travelled by a single individual alongshore was 80 km, and several moved in the order of 30-40 km.

### Distribution offshore

- Research and sighting information suggests that Maui's dolphins are most prevalent in the area between shore and 4nm.
- There have been seven aerial research surveys across six years that included areas beyond 4nm on the WCNI. These surveys sighted five separate occurrences of dolphins outside 4nm, these were:

Distance offshore	Date	Source
4.05 nm	October 2007	Rayment & Du Fresne 2007
4.3 nm	May 2008	Childerhouse 2008
4.49 nm	August 2006	Scali et al. 2006
6.18 nm	June 2009	Stanley 2009
6.87 nm	August 2006	Scali et al. 2006

- There are uncertainties associated with some of the above research data, in particular you should note uncertainty around the Scali et al. 2006 survey where the researcher highlighted a number of concerns with the validity of the findings.<sup>5</sup>
- Best available information suggests that dolphins are present in the area beyond 4nm from shore although the extent of their presence in this area is unknown.

### January dolphin mortality

- An accidental dolphin mortality was reported by a fisher in a commercial set net off Cape Egmont (south of New Plymouth) within 2 nm from shore, on 02/01/12 (hereafter referred to as the January mortality).
- The mortality was reported by the fisher to be a Hector's dolphin.
- Hector's and Maui's dolphins are not visually distinct and as the carcass was not retained for necropsy or genetic analysis, it cannot be confirmed whether the dolphin mortality was a Hector's or a Maui's dolphin.
- Based on information available at the time, MPI considered the January mortality *likely* to be a Maui's dolphin.<sup>6</sup>
- An unrelated dolphin stranding, which died of natural causes, was discovered on 26 April 2012 south of where the January mortality occurred (Kina Beach near Opunake). Preliminary DNA tests were undertaken to determine whether this dolphin is a Hector's or a Maui's.

<sup>5</sup> Concerns included: the relatively high number of Maui's dolphin sightings in one flight when sea conditions were not perfect and that many of the sightings happened further offshore than expected. The researcher also noted a high inconsistency between observers, suggesting that inexperience of some of the surveyors may have contributed to these inconsistencies and to the uncertainty around the findings in general.

<sup>6</sup> Here we use the term 'likely' in the sense of the Fisheries Assessment Plenary guidelines, to mean a 60-90% likelihood that the January capture was a Maui's dolphin. Therefore, MPI accepted that there is a 10-40% likelihood the January capture could have been a Hector's dolphin.



- Preliminary DNA results state that the Opunake specimen has DNA characteristics more consistent with a Hector's dolphin than a Maui's. However this assessment is not confirmed and further tests are underway. These tests will take at least another month to complete.
- In addition, DNA tests were run on tissue from a stranded dolphin found in the Manukau harbour in October 2011, the preliminary DNA results again indicate this specimen to have characteristics more consistent with a Hector's dolphin.

*Submitter comments*

43. Submitter comments regarding the southern distribution of Maui's dolphins included:
- i. Environmental groups, including Forest and Bird, EDS and WWF, submit that numerous public sightings, some unverified and some verified should be sufficient proof that dolphins are present in the Taranaki area.
  - ii. S. Dawson submits that the very few beachcast dolphins found in the New Plymouth area since 1990 suggest that Maui's have become very rare in the southern end of their range. Very rare does not imply absent, however.
  - iii. Industry (SeaFIC, TOKM, Challenger, Sanfords, Egmont Seafoods) submit that there is insufficient research information to establish the presence of Maui's dolphins in the area south of the current protection area and make the following points to support this:
    - There is no aerial sighting data or DNA sampling of Maui's dolphins in the area south of Pariokariwa Point
    - The farthest south research sighting of a Maui's dolphin was at the Mokau river
    - Intensive surveying by DOC in 2009, 2010 and 2011 failed to find Maui's dolphins south of Raglan.
44. Submissions on the offshore distribution of Maui's dolphins were only received from environmental groups and public stakeholders. They submit that research has found that Maui's dolphins prefer waters within the 100m depth contour and therefore represents the dolphins offshore distribution.<sup>7 8</sup>
45. Submissions relating to the January mortality included:
- i. SeaFIC submit that MPI's determination that the January mortality was likely a Maui's dolphin was not based on careful consideration of all relevant information. SeaFIC contends the January mortality was more likely a Hector's dolphin based on the following:
    - Maui's dolphins have not been sighted by researchers south of the existing prohibition zone and are almost exclusively found north of Raglan Harbour

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<sup>7</sup> Du Fresne, S., & Mattlin, R. (2009). Distribution and abundance of Hector's dolphin (*Cephalorhynchus hectori*) in Cloudy and Clifford Bays. Final report for NIWA project CBF07401.28pp.

<sup>8</sup> Slooten, E., Rayment, W., Dawson, S.M. (2006). Offshore distribution of Hector's dolphins at Bank's Peninsula: Is the Bank's Peninsula Marine Mammal Sanctuary large enough? *New Zealand Journal of Marine and Freshwater Research*. 40: 333-343.

- The overlapping ranges of the two subspecies, both current and historic range.
  - Research establishing that Maui's dolphins are located "almost exclusively in the area north of Raglan harbour."
  - There have been no sightings of Maui's dolphins as far south as where the incident occurred.
  - Hector's dolphin distribution overlaps with the whole current range of Maui's dolphins and the area where the incident occurred.
- ii. Challenger Finfisheries Management Company submits that the location where the incident occurred is closer to the South Island Hector's dolphin population (167km to Farewell Spit) than the core range of Maui's dolphins (245km to the Waikato river). Therefore it is conceivable that the dolphin capture was a Hector's.

#### *Ministry analysis*

46. Sightings and stranding data has been used to determine the southern and offshore extent of the Maui's dolphin range. There is, however, uncertainty in this information due to the following factors:
- i. Sightings data collected by DOC varies from reliable research sightings to the least reliable type of sighting, public sightings.
  - ii. Use of sightings data is problematic because it is unknown whether the dolphin sighted is a Hector's or Maui's dolphin; and because the Maui's dolphin subspecies was only identified in 2002, sightings prior to this were considered to be North Island Hector's.
47. Distribution South: The farthest south research sighting was made near the Mokau river, north of New Plymouth. There have been public sightings of dolphins south to Cape Egmont. While the reliability of public sightings varies<sup>9</sup> there have been verified public sightings in the proposed area including video evidence. However, it cannot be confirmed whether these are Hector's or Maui's. See Appendix Three for maps plotting sightings recorded in the DOC sightings database.
48. The most southern sighting of a Maui's dolphin, confirmed through biopsy, was north of Raglan and hence north of the proposed area and within the current set net prohibition boundary.
49. There have also been public sightings of dolphins on the Kapiti coast, the Waiarapa Coast and in the Wellington Harbour. These sightings are generally considered to be Hector's dolphins. One sighting in the Wellington Harbour was biopsied and confirmed to be a Hector's dolphin.
50. MPI therefore considers information on Maui's dolphin presence in the area south of the current set net prohibition to be uncertain and that the limited

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<sup>9</sup> The reliability of public sightings is effected by the ability of the public to accurately identify a Hector's or Maui's dolphin from other dolphin species and the accuracy of the location point that is reported, among other factors.

sightings and strandings data in this area suggests that Maui's dolphin presence in the proposed area is rare and infrequent.

51. Distribution Offshore: Research establishing that dolphins prefer waters within the 100m depth contour has only been undertaken for Hector's dolphins. It is unknown how significant the 100m depth contour is to the distribution of Maui's dolphins. Maui's dolphins are closely related to Hector's and may have similar habitat preferences. However, it is difficult to detect the limits of a dolphin's range when they are at low abundance.
52. Research sightings data of WCNI Hector's/Maui's dolphins suggests that they are more prevalent in the area between shore and 4nm, but have been sighted through aerial surveys as far offshore as approximately 7nm. The offshore distance of the 100m depth contour varies in the proposed area; the closest inshore that it tracks is approximately 7nm. See Appendix Five for map.
53. January Mortality: MPI is aware that the dolphin was reported by the fisher to be a Hector's. However, visual identification alone is not sufficient to determine whether the dolphin was a Hector's or a Maui's.
54. The Opunake stranding and subsequent preliminary DNA results suggest this specimen to have DNA characteristics more consistent with a Hector's dolphin. This provides supporting information that dolphins are present south of the current set net ban, but increases the uncertainty as to whether the dolphins present in this area are Hector's or Maui's dolphins.
55. Findings from Hamner et al. has also established that Hector's dolphins are present on the WCNI, however biopsy data to date confirms that the majority of dolphins on the WCNI are Maui's.
56. There is increasing uncertainty, in light of the preliminary DNA results from the Opunake stranding, as to whether the January mortality was a Maui's dolphin. MPI has revised its assessment that the January mortality was *likely*<sup>10</sup> to be a Maui's and now considers the subspecies identity of the January mortality to be more equivocal. See Appendix 4 for more information

### **Vulnerability of population to human-induced threats**

#### ***Available information the vulnerability of the population to human-induced threats***

- Potential Biological Removal (PBR) analysis is intended to provide an indication of the vulnerability of Maui's dolphins to human-induced impacts.
- The PBR analysis estimates the maximum number of human-induced dolphin mortalities, which may occur while allowing the stock to reach or maintain its optimum sustainable population (OSP) size with high probability.

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<sup>10</sup> Here we use the term 'likely' in the sense of the Fisheries Assessment Plenary guidelines, to mean a 40-60% likelihood that the January capture was a Maui's dolphin.

- DOC has commissioned an updated Potential Biological Removal (PBR) estimate based on the new population abundance from independent researchers.
- A preliminary assessment by MPI suggests that the new PBR will mean the population can sustain 1 human-induced mortality every 10 to 23 years.<sup>11</sup>

#### *Submitter comments*

57. Forest and Bird and public submissions noted that the PBR estimate, taking into account the recent mortality is reason, alone, for immediate action to protect Maui's dolphins. They emphasised that human-induced impacts should be reduced to zero and that no other Maui's dolphin mortality from human induced impacts can occur in the next 23 years.
58. S. Dawson submits the US PBR model is not intended for small populations as it does not consider Allee effects<sup>12</sup>, and does not properly deal with demographic stochasticity<sup>13</sup> at low population sizes. He also notes that the PBR includes *all* human-induced threats and therefore fishing captures of Maui's dolphins must cease in order for the population to persist, let alone recover.

#### *Ministry analysis*

59. PBR modelling offers some guidance to you on the effect that human-induced mortality may have on a population. The PBR analysis suggests that Maui's dolphins can only sustain very low levels of human-induced mortality from all sources of impact. However, there are limitations as noted by S.Dawson.
60. 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 mortalities.
61. MPI also notes also that PBR analysis assumes a population target size of OSP. While OSP is recognised as a good target population size because it results in the maximum productivity of a population, it is not a legislated target. Instead, you should take into account that associated and dependent species should be maintained above a level that ensures their long term viability (section 9(a)). There is no information as to what population size may constitute the long-term viability level for Maui's dolphin.

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<sup>11</sup> This preliminary assessment of PBR (Wade 1998) assumes the following input values: a minimum abundance estimate of 48 (the lower 20th percentile (log-normal) of the estimate from Hamner et al. 2012), a recovery factor of 0.1 (Taylor et al. 2003), and a maximum net productivity rate of either 0.018 (Slooten and Lad 1991) or 0.04 (Wade 1998).

<sup>12</sup> 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 depensation or Allee effects and are particularly important for social animals, like dolphins.

<sup>13</sup> Demographic stochasticity refers to fluctuation 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.

## Susceptibility of the population to fishing-related mortality

### *Available information on the Susceptibility of the population to fishing-related mortality in set nets*

- Dolphins are known to be susceptible to being entangled in set nets because:
  - Dolphins have been observed entangled in set nets;
  - Dolphin distribution overlaps with commercial and amateur set net fisheries;
  - Dolphins are also not able to detect monofilament nets which make them susceptible to entanglement, and;
  - Dolphins need to surface to breathe so they are susceptible to drowning if caught in set nets.
- There have been 45 reported Hector's/Mauī's dolphin mortalities between 1921 and April 2012 on the WCNI.
- Reported mortalities probably only provide an indication of the nature of the threats from fishing to the dolphins, as the cause of death is established for only 11 of the 45 reported mortalities.
- Of the 45 reported mortalities between 1921 and 2012, there are 3 known set net related mortalities, and 3 other mortalities show evidence of net marks or other indications of interaction with fishing with nets.

### *Submitter comments*

62. Set net and trawl fishing is recognised by the majority of environmental, academic and public submitters to be the greatest known human threat to Maui's dolphins.
63. They also submit that reported mortalities in fishing gear are likely to be under reported. EDS submits there is little incentive for fishers to report such incidents because by doing so they may jeopardise their ability to continue fishing.
64. Industry do not dispute that Maui's dolphins are susceptible to fishing-related mortality from set nets but they do not consider there to be a risk to Maui's dolphins in the area south of the current closure on the basis that they do not consider Maui's dolphins to be present in the area south of the current closure and that the January mortality was a Hector's dolphin.

### *Ministry analysis*

65. MPI recognises that fishing is the greatest known human-induced impact on Maui's dolphins, but that there is also little information available on other human-induced threats impacting on the population.
66. There maybe an incentive for fishers to under report fishing interactions with protected species. However, the reporting of the dolphin mortality in January, as discussed in the previous section, is testament to the fact that many fishers can and do responsibly report accidental captures.
67. MPI notes the risk to Maui's dolphins in the proposed area is dependent on the degree to which fishing activity and dolphin distribution overlaps. These factors



are described in separate sections on this paper (Distribution and Characteristic of the fishery)

### **Characterisation of the fishery**

#### ***Available information on the characteristics of the fishery***

- The commercial set net fishery between Pariokariwa Point and Hawera primarily targets blue warehou, rig and school shark.
- There have been between 6-8 commercial set net vessels operating within the proposed area in most recent years.
- Fishing effort is concentrated within 4nm of the shore. For the most 12 month period (April 11 – Mar 12) 88% of effort has been within 4nm from shore (with 54% of this within 2nm from shore)
- The level of recreational set net activity occurring in the proposed area cannot be quantified. Recreational set net fishing is a culturally important activity for a number of New Zealanders that rely on it for food and leisure.

#### ***Submitter comments***

68. SeaFIC submits there are 6 commercial set net fishers in the area principally fishing within 0-4nm from shore. In the 0-4nm zone set netters target:
- i. Blue warehou between June and October from New Plymouth to Opunake;
  - ii. Blue warehou between October and December north of New Plymouth;
  - iii. Rig between September and January north of New Plymouth; and
  - iv. Rig between November and March from New Plymouth to Hawera,
  - v. School shark is caught in deeper water further offshore and is weather dependent.
69. Challenger Finfisheries Management Company submit similar conclusions to SeaFIC. It submits that blue warehou and rig is almost exclusively taken by set net with some catch taken as bycatch in the trawl fishery.
70. Both submitters have noted that effort has shifted in the past fishing year due to changes to the set net prohibition north of Pariokariwa Point. This has resulted in increased effort in the proposed area in the last year.
71. No submissions were received on the characteristics of the recreational set net fishery.

#### ***Ministry analysis***

72. MPI considers comments from industry to provide supportive and additional information on the characteristic of the set net fishery. MPI has noted that there may have been a shift in effort in the last fishing year and has taken this into account when estimating the economic impacts of the options.

### **Assessment of need for interim measures**

#### **Submitter comments**

73. Industry submissions are supportive of measures that will provide for the long term viability of Hector's and Maui's dolphins. However, industry considers that extension of the current set net prohibition is unlikely to support recovery of the population or address factors that they consider to be impacting on this population.
74. Industry submits there is no justification for imposing additional prohibitions on commercial set netting based on the following points:
- i. There is no conclusive evidence that the Maui's dolphin population has declined in the last decade, although a small decline appears possible;
  - ii. The January dolphin capture was just as likely, if not more likely to be a Hector's dolphin and such a determination would not have lead to this management response from government;
  - iii. There is no evidence to suggest Maui's dolphins frequent the proposed area; and
  - iv. It is unknown what threats may be impacting on the Maui's dolphin population. Research is needed to determine the extent of other threats i.e. the impacts of disease and increasing predation.
75. Instead, industry representatives, such as TOKM, Challenger and SeaFIC recommend a collaborative approach is needed to manage threats to Maui's dolphins, involving those industries likely to be impacted. They also submit that more research is needed to establish the range and habitat of Maui's dolphins, the impact of disease and other threats to the population and on intervention techniques that will support recovery of the population (i.e. breeding programmes, translocation and satellite tagging).
76. Environmental groups and the public submit that given the small population size a precautionary approach to the management of Maui's dolphins is warranted with urgency. They say that while the current fishing prohibitions have reduced the risk to Maui's dolphins the remaining risk is unsustainable and will not support recovery of the Maui's dolphin population.

### Ministry analysis

77. The objective of any interim measure is to manage the risk to Maui's dolphins from set nets in the proposed area while MPI and DOC review the Maui's portion of the TMP. You directed officials to consult and provide advice on this matter in light of the following factors:
- i. New research estimates the size of the Maui's dolphin population to be 55 individuals over 1 year of age (95% c.i. 48-69).
  - ii. An accidental dolphin mortality occurred in a commercial set net off Cape Egmont (within the proposed area) on 2 January 2012. At the time, MPI advised, based on information available, that this mortality was *likely* to be a Maui's dolphin.
78. The dolphin stranding near Opunake on 26 April and associated preliminary DNA results has reduced the likelihood that the January mortality was *likely* to be a Maui's dolphin. MPI, now consider the subspecies identity (Hector or Maui) of the January mortality to be uncertain and equivocal.

79. There is no immediate requirement to introduce measures to protect Hector's dolphins in this area. They are currently protected in their core range. The effectiveness of current management for Hector's will be assessed as part of the wider TMP review.
80. Previously only less reliable public sightings (as compared to research sightings) have suggested that dolphins are present south of the current closed area. The previous Minister considered this information insufficient to close the area. The recent stranded dolphin near Opunake, the January mortality, new confirmed public sightings and anecdotal reports from industry confirm dolphins are present south of the current closure. However, there is a likelihood that at least some of these dolphins may be Hector's rather than Maui's.
81. MPI consider that the proximity of the area to the core range of Maui's dolphins means there remains potential for Maui's dolphins to occasionally range further south than the current closure. However, 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 mortality occurring is very low.
82. The consequence of any fishing-related mortality to the Maui's dolphin population is high. Given the current population estimate mortality to the population will have a significant consequence by slowing or preventing the population increasing in size. If the January mortality was a Maui's, this mortality poses a serious risk to the rebuild of the population.
83. MPI considers there to be significant uncertainty in information used to inform MPI's assessment of risk as presented in this paper, particularly in regard to Maui's dolphin presence in the proposed area and the subspecies identity of the January mortality. The information principles in the Act provide you with guidance on how to respond to uncertain information. The principles require you to be cautious where information is uncertain and to not use the absence of, or uncertainty in, any information as a reason for postponing or failing to take any measure to achieve the purpose of the Act.<sup>14</sup>
84. While the Act does not refer to a precautionary approach, the Court of Appeal<sup>15</sup> has recognised that a precautionary approach is available to the Minister when considering the extent to which utilisation 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.<sup>16</sup>
85. MPI considers, noting the uncertainty described above, that given the consequence of any mortality to the population you are entitled to implement interim measures which include restrictions on fishing activity. Notwithstanding

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<sup>14</sup> See paragraph 30.

<sup>15</sup> *Squid Fishery Management Co v Minister of Fisheries* [13 July 2004, CA39/04, at paragraph 79]

<sup>16</sup> *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, at paragraph 19.

this you can take a different view of the level of risk to Maui's dolphins based on the information presented in this paper.

86. The option you choose depends on your view of the acceptable level of risk of mortality occurring in the interim period while the TMP is under review given the consequence to population of such a mortality.

*Response to submitter comments*

87. In response to industry comments, MPI does not consider fishing to be the only human-induced threat impacting on the population. The extent of the impact from other human-induced threats is unknown. Fishing is, however, the greatest cause of human-induced mortality for Maui's dolphins, where cause of death is known.
88. MPI agrees that more information and research is needed on other threats and options available to promote the recovery of this population. In addition MPI consider information is needed on Hector's dolphin presence on the WCNI and the relationship of these animals to the Maui's dolphin population. These issues are however better addressed through the TMP review and do not address the current risk to dolphins from set nets in the interim.<sup>17</sup>

## **Analysis of the Options**

### **Options proposed by submitters**

89. Industry submitted that spatial restrictions on set nets in the proposed area were not necessary in light of the uncertainty regarding risk. While industry note they are supportive of measures that will provide for the long term viability of Hector's and Maui's dolphins they consider that there is insufficient information to suggest that extension of the set net closure is necessary.
90. Alternative short-term measures proposed by industry were:
- i. Code of practice for reporting sightings of Maui's dolphins to DOC and avoiding setting nets in areas when dolphins are sighted
    - Set net fishers operating out of New Plymouth have already adopted this code of practice.
  - ii. Use of independent onboard observers to monitor and report sightings of and interactions with Maui's dolphins.
    - Industry has submitted that they are receptive to carrying Ministry observers, provided they are able to carry an observer under Maritime Safety regulations and that the cost of any observer coverage is borne by the crown.
  - iii. Use of mitigation devices, such as acoustic pingers, may be an effective device which could provide for continued utilisation of set nets
    - Industry has already taken steps to determine whether pingers can easily be used with their current gear and winches they

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<sup>17</sup> As part of the TMP review a risk assessment will be undertaken to assess and prioritise all known threats (human and non-human) to the population. The process will involve relevant stakeholder groups.

estimate the cost of pingers to be \$100 for every 100m length of net. On average, this equates to \$3000 per net.

91. Three submissions proposed extension of the set net ban to Hawera and offshore to 4nm. Submissions in support of this option were from members of the public who support protection measures for Maui's dolphins.
92. 1,206 submitters proposed extension of the set net ban to Hawera and offshore to 7nm. This included submissions from environmental groups, academics and a significant number of national and international public submissions.
93. These submitters consider that set nets should be banned out to the 100m depth contour, which at a minimum is consistent with a 7nm offshore boundary. They also argue that protection must extend beyond the normal or core boundaries of Maui dolphin distribution in order to support recovery of the population.
94. 23,231 submitters proposed extension of the set net ban to Hawera and offshore to the 100m depth contour. Again, this included submissions from environmental groups, academics and public submissions. These submitters consider the 100m depth contour to be consistent with current knowledge on the distribution of Hector's and Maui's dolphins. They also argue the other options are inadequate to support recovery of the population.
95. Submitters that proposed the 7nm and 100m depth contour options also proposed observer coverage as a supplementary measure for those fishers operating outside the spatial closure you choose. These submitters consider it is insufficient to rely on fisher information in relation to reporting mortalities of protected species, like Maui's dolphins.
96. Other supplementary measures proposed by submitters in regard to restrictions on set nets included prohibiting their use within WCNI harbours (i.e. in the Manukau, Kaipara, Kawhia and Raglan harbours) and protection of the area that separates Maui's dolphins from the South Island Hector's dolphin populations (referred to by submitters as the marine corridor). They consider that protection of this area will support connectivity between the populations which may provide an important role in the recovery of the Maui's dolphin population.
97. A large number of submitters consider there to be a risk to Maui's dolphins from trawling outside of the current closures based on their offshore and southern distribution. They propose extension of the trawl closures and/or increased observer coverage on inshore trawl vessels where Maui's dolphins are present.



### Options proposed by the Ministry

98. MPI proposes the following management options for your consideration:

Option	Description
<b>Option 1</b>	Status quo, do not extend set net ban
<b>Option 2</b>	<ul style="list-style-type: none"> <li>• Status quo, do not extend set net ban,</li> <li>• Prohibit the use commercial set nets out to 7nm without an observer onboard               <ul style="list-style-type: none"> <li>- with information gathering package for commercial fishers</li> </ul> </li> </ul>
<b>Option 3</b>	Extension of set net ban to Hawera offshore to 2nm
<b>Option 4</b>	<u>Preferred option:</u> <ul style="list-style-type: none"> <li>• Extension of set net ban to Hawera offshore to 2nm</li> <li>• Prohibit the use commercial set nets between 2 and 7nm from shore without an observer onboard               <ul style="list-style-type: none"> <li>- with information gathering package for commercial fishers</li> </ul> </li> </ul>
<b>Option 5</b>	Extension of set net ban to Hawera offshore to 4nm

99. The spatial closures above apply to both commercial and recreational fishers. The information gathering package to accompany observer coverage described requires the following:

- i. Additionally observers will:
  - Report start and end position of nets between 2 and 7nm from shore;
  - Report dolphin sightings to DOC allowing DOC to obtain biopsy information for such sightings.
- v. Fishers will be asked to voluntarily assist DOC in the obtaining of biopsy information where this is appropriate.
- vi. Fishers existing policy of not setting nets when dolphins are sighted will be endorsed and encouraged.

#### *Preferred option*

100. As noted in the previous section MPI considers management action warranted to protect Maui's dolphins in the proposed area. MPI's preferred option is Option 4. This option prohibits recreational and commercial set net fishing in the proposed area offshore to 2nm with additional restrictions on commercial fishers operating between 2 – 7nm from shore for information gathering purposes.

101. MPI considers Option 4 to represent the best option given the significant uncertainty in information on whether and how often Maui's are present in the proposed area. This option also balances the need to manage the interim risk to Maui's dolphins and gather more certain information on dolphin presence in

the area. This information gathering opportunity during the interim period will be used to inform your decisions on the TMP review.

102. A spatial closure out to 2nm in the proposed area will manage the risk to Maui's dolphins in the near inshore area where the January mortality occurred. It will not however, remove all of the risk to Maui's dolphins, if they are present in the area. This is because a 2nm offshore boundary does not cover the Maui's dolphin known offshore distribution.
103. As part of the information gathering package 100% observer coverage would be required in the proposed area between 2 – 7nm from shore. Observer coverage will not prevent any dolphin mortalities from occurring. Instead it will provide independent monitoring and reporting of fishing interactions with and sightings of Maui's dolphins. MPI would also work with DOC on finding opportunities for taking biopsies of any of the dolphins sighted so that subspecies identification could be made.
104. In regard to the ability of these vessels to carry an observer, 4 of the 8 vessels operating in the proposed have taken observers in the past and MPI consider at least one other capable of carrying an observer. Those other vessels, if currently unable to carry an observer due to maritime safety regulations, would be expected to take the necessary steps to ensure they were able to if they wished to continue fishing in the area.

105. Observer coverage is typically cost recovered from the fishing industry. MPI recommends, in the interim only, that the costs of observer coverage be met by the crown. If you agree not to recover costs from industry, this may create a precedent for other cost recovered observer services. However, MPI considers this appropriate due to the uncertainty in information and because there is an urgent need to gather information on dolphin distribution which is not related to activity of fishing. MPI estimate the cost of mandatory observer coverage in the proposed area to be between \$86,400 and \$314,000 a year.<sup>18</sup> These costs will be able to be met within existing baseline. There may be a consequential reduction in crown revenue because available observer cost recovery days will reduce. Covering the cost of observer coverage will avoid any additional operational costs being imposed on industry while we await the outcome of the TMP review.

*Alternative proposed options*

106. While noting MPI's preferred option, you are entitled take a different approach depending on your assessment of the level of risk set net fishing poses to Maui's dolphins and how this risk should be managed.
107. If you consider there is a very low likelihood of mortality and that this likelihood does not warrant interim measures to restrict fishing then you would choose Option 1 (status quo) or Option 2 (status quo with information gathering

<sup>18</sup> Estimate based on a cost of \$800-\$1000 per day observer cost and fishing event data from the 12 month period between 1 April 2011 and 30 March 2012.



package). Option 1 and 2 defers any decision to restrict the use of set nets through closures until the review of the TMP. However if you considered it necessary to gather further information to inform these future decisions you would choose Option 2.

108. If you consider there to be a likelihood of a mortality to Maui's dolphins that is unacceptable in the interim, you should choose to implement a spatial restriction as defined in either Options 3, 4 or 5, noting that Option 4 is the preferred option and is described above. The option you choose would depend on the degree to which you think the risk of mortality should be managed given available information on the likelihood and consequence of a mortality and the impact on utilisation.
109. Option 3 prohibits set nets with 2nm from shore, the costs and benefits of such an offshore boundary are described in paragraph 101. Option 5 prohibits set nets offshore to 4nm. This option would be appropriate if you considered it necessary to reduce the likelihood of mortality in the offshore area where dolphins are most prevalent.

#### **Ministry analysis of other options proposed by submitters**

110. MPI do not consider the following options proposed by submitters to be appropriate interim measures at this time. These matters will be considered as part of the TMP review.

##### *7nm offshore boundary of set net ban*

111. MPI recognises that an offshore boundary of 7nm takes into account information on Maui's dolphin distribution which shows they can, at times, range as far offshore as 7nm and is also consistent with the current set net ban to the north of the proposed area. However, MPI consider that given the uncertainty in information and the impact on utilisation this measure is not appropriate in the interim.

##### *Protection of Harbours and the "Corridor"*

112. In regard to submitter proposals for protection of harbours and the marine corridor MPI consider these measures to be outside the scope of this paper and do not directly relate to the area under consideration.

##### *100m depth contour*

113. MPI does not consider protection of Maui's dolphins out to the 100m depth contour to be an appropriate interim measure. MPI consider the likelihood of a mortality occurring beyond 7nm to very low given that the dolphin population is very small, there have been no reliable sightings of Maui's dolphins beyond 7nm (although Hector's dolphins have been seen out to the 100meter contour in the South Island).
114. An offshore boundary at the 100m depth contour also extends significantly further offshore in some parts of the proposed area than what was discussed in the consultation paper. This means that parties affected by this option may not

have been given an opportunity or considered it necessary to submit during consultation. As a result if you did consider this option warranted you would be required to re-consult on this option

#### *Mitigation – Pingers*

115. MPI and DOC have investigated the use of pingers in the past and consider the efficacy of these devices to be unproven for Maui's or Hector's dolphins. Pingers have proven to be effective for some cetacean species but have not been effectively tested on Hector's or Maui's dolphins. It is also not known what undesired impacts pingers may cause, for example exclusion of the dolphins from their natural habitat and foraging areas.
116. It is therefore unknown what benefits these devices would provide which could result in unnecessary costs being imposed on industry. If requiring the use of pingers in this area, data collection on the efficacy of this practice would also be required. Requiring the use of pingers in this area will not be sufficient to determine whether or not pingers are effective. This is because given the low likelihood of an encounter and the limited period of time for interim measures there will not be sufficient evidence to inform a robust conclusion.

#### *Monitoring – Trawl*

117. Trawl nets are identified in the TMP as posing a threat to Hector's and Maui's dolphins. While there have been no known mortalities of Maui's dolphins in trawl nets there have been 15 Hector's dolphin mortalities attributed to trawlers in DOC's incident database.
118. On the WCNI trawling is banned within 2nm from the shore from Maunganui Bluff (north of the Kaipara Harbour) to Pariokariwa Point (north Taranaki) and out to 4nm between the Manukau harbour and Port Waikato. When these closures were put in place in 2008 the then Minister recognised that trawling did not pose as great a threat to Maui's dolphins and hence chose to manage the threat only in the near inshore areas where they are most prevalent.
119. MPI does not consider further restrictions on the trawl fishery necessary in the interim. However if you were concerned about this threat you could choose to direct officials to prioritise targeted observer coverage of the trawl fishery on the WCNI while the review of the TMP is being undertaken.

#### **Economic Impacts of the Options**

120. In response to concerns raised by industry submitters, particularly SeaFIC, the economic impacts identified in the consultation paper have been reviewed by MPI. The following changes have been made:
  - i. Catch data from 1 April 2011 to 30 March 2012 has been used to account for shift in effort from changes to the set net prohibition in 2010/11.
  - ii. Long term losses have been included to acknowledge that the interim measures may result in long term impacts on the commercial fishery.

121. The revised economic impacts are presented in the table below. The estimated costs represent the value of the set net fishery to the greater New Zealand economy. See Appendix Six for a more detailed economic analysis.

	Option 1	Option 2	Option 3	Option 4	Option 5
<b>Annual Value impact</b>	-	-	\$419,578	\$419,578	\$660,698
<b>Capitalised future value Impact</b>	-	-	\$1,535,962	\$1,535,962	\$2,360,850
<b>Sub total = Cost to industry</b>	-	-	<b>\$1,955,540</b>	<b>\$1,955,540</b>	<b>\$3,021,850</b>
<b>Observer costs (covered by crown)</b>	-	\$86,400 - \$314,000/yr	-	\$86,400- \$314,000/yr <sup>19</sup>	-

*Submitter comments on the economic impacts*

122. SeaFIC has undertaken its own economic impact analysis of Option 5. SeaFIC estimates the impacts on fishers and processors from Option 5 to be:
- the loss of 25 seagoing jobs;
  - the loss of 40 on-land processing jobs;
  - some further jobs losses in industries servicing fishing;
  - the closure of New Plymouth as a fishing port;
  - an annual aggregate demand impact of approximately \$15million; and
  - an added economic impact of over \$13.5 million on Taranaki and New Zealand.
123. SeaFIC submit that the methodology used by MPI to estimate long term value loss is not appropriate and that the Treasury methodology should be used which assumes a 20 year loss.
124. Commercial set net fishers have also submitted that Option 5 may force them to close down their business which will have a significant impact on themselves, their staff, families and investments.
125. Industry also submits there is limited ability to change to other methods, such as long-lining, because this is not a viable method for those species efficiently caught by set net (i.e. Blue Warehou and Rig). Changing methods also imposes additional cost on fishers, Challenger and McDougall estimate that it would cost \$35,000 to change from set net to long-lining and the method is seasonal and less effective than set nets.

<sup>19</sup> Note that it is unlikely that the interim measures will be in place for a full year, therefore these estimates are likely to be over estimates.



126. Industry submits that FMA8 quota owners will be impacted as a large portion of the present fishery will not be utilised to catch the species predominately caught by set netting within the proposed closed area.
127. Environmental groups submit that there will be counter economic impacts on brand New Zealand, the tourism Industry and the international export of fish products if decline or extinction of Maui's dolphins were to occur.
128. ECO submits that other values in addition to economic considerations must be considered, including option value and bequest<sup>20</sup> and existence values<sup>21</sup>. These values can easily outweigh economic values.

### *Ministry Analysis*

129. The primary difference between MPI and SeaFIC's economic impact analysis is the catch data used to estimate the value of set net catch coming from the proposed area and the multipliers used to calculate the long term economic impacts (net present value). MPI is confident in the methodology it has used; which has been applied to previous decisions including those implemented through the development of the TMP in 2008.<sup>22</sup> See Appendix Six for a full analysis of the economic impacts and comparison with SeaFIC's estimates.
130. MPI does not consider all income losses to be permanent; therefore the Treasury methodology is inappropriate. MPI consider that some of the capital and labour that is displaced will find employment elsewhere in the economy. These movements to other employment will not be immediate, so there can be significant transition costs and this is provided for in MPI's methodology. Nevertheless, impact estimates using the Treasury methodology are provided in Appendix Six and do indicate a larger impact.
131. MPI estimates there to be at least six set net operators fishing out of New Plymouth that will be directly affected by the proposed options. Depending on the offshore extent of the option you choose these operators may not be able to continue fishing outside of the proposed options (further offshore or south) in a way that provides the same economic return and/or ensures the safety of the crew and vessel. This means that these fishers may not be able to continue fishing and that there may be flow on effects to quota owners.
132. There will be a significant impact on New Plymouth Licensed Fish Recievers (LFRs) as a result of the proposed new set net ban options. The catch from the six fishers described above accounts for approximately 40% of the total catch and landings value received by Egmont Seafoods Limited and between 55% and 67% of the catch and landings value received by Ocean Pearl Fisheries Limited.

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<sup>20</sup> The current generation places value on ensuring the availability of biodiversity and ecosystem functioning to future generations.

<sup>21</sup> This is the benefit, often reflected as a sense of well being, of simply knowing marine biodiversity exists, even if it is never utilised or experienced, people simply derive benefit from the knowledge of its existence

<sup>22</sup> See Appendix Six for a full analysis of the economic impacts and comparison with SeaFIC's estimates.

### **DOC preferred option**

133. DOCs preferred option for protection of Maui's dolphins on the West Coast of the North Island is a set net ban out to 7 nm. See appendix 7 for full comments from DOC. DOC does not believe that the options proposed in the current paper adequately reduce risk to the dolphins.
134. DOC is of the view that the options proposed in the paper are inadequate and that none of the proposed options put forward in this paper reflect;
- i. The best available information on the biology of the dolphins, or.
  - ii. The level of support for protection measures greater than 4 nm.

### **Conclusion**

135. MPI recommends you implement the following package of measures (Option 4) to manage the risk to Maui's dolphins from set nets in the area from Pariokariwa Point to Hawera:
- i. Extend the recreational and commercial set net ban from Pariokariwa Point south to Hawera with an offshore boundary of 2nm
  - ii. Prohibit the use commercial set nets between 2nm and 7nm without an observer onboard.
  - iii. Additionally observers will:
    - Report start and end position of nets between 2 and 7nm from shore;
    - Report dolphin sightings to DOC allowing DOC to obtain biopsy information for such sightings.
  - vii. Fishers will be asked to voluntarily assist DOC in the obtaining of biopsy information where this is appropriate.
  - viii. Fishers existing policy of not setting nets when dolphins are sighted will be endorsed and encouraged.
136. This option balances the need to manage the interim risk to Maui's dolphins and gather more certain information on dolphin presence in the area. This information gathering opportunity during the interim period will be used to inform your decisions on the TMP review.