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Maui dolphin: 2018 update on New Zealand's research and management approach

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Māui dolphin: 2018 update on New Zealand's research and management approach

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ABSTRACT

Māui dolphins (*Cephalorhynchus hectori maui*), a sub-species of New Zealand's endemic Hector's dolphin (*C. hectori*), are critically endangered. Numbering 63 individuals (95% CI: 57–75) over 1 one year of age, Māui dolphins showed evidence of population decline (1.5-2.0% per year from 2001-16), although there is some evidence of stabilisation more recently (from 2010-11 to 2015-16). As part of the review of New Zealand's Hector's and Māui dolphin Threat Management Plan (TMP) in 2018, a program of ongoing data collection and research, including a spatially explicit multi-threat risk assessment, is underway. This paper outlines data collection over the past 12 months and the research being undertaken to inform the review of the TMP. The TMP will be released for public consultation later in 2018.

KEYWORDS: conservation biology, fisheries management, Māui dolphin, risk assessment, threat status.

INTRODUCTION

In 2014 the IWC Scientific Committee made the following request (IWC 2015; p. 58): "The Committee urges the New Zealand Government to commit to specific population increase targets and timelines, and respectfully requests that reports be provided annually on progress towards conservation goals." In subsequent years, the New Zealand Government provided information on the current status of Māui dolphins, including abundance, trends, threat status, and risk assessment (SC/66a/SM/3, SC/66b/SM/12, and SC/67a/SM15). The following is an update on New Zealand's research and management approach since last year's report.

CURRENT MANAGEMENT

Current Management Measures

A range of protection measures have been put in place for the Māui dolphin since 2003. A summary of the current measures is illustrated in Figure 1. Over 6,200 square kilometres of coastal waters are closed to set net fishing activity and 1,702 square kilometres to trawl fishing activity.

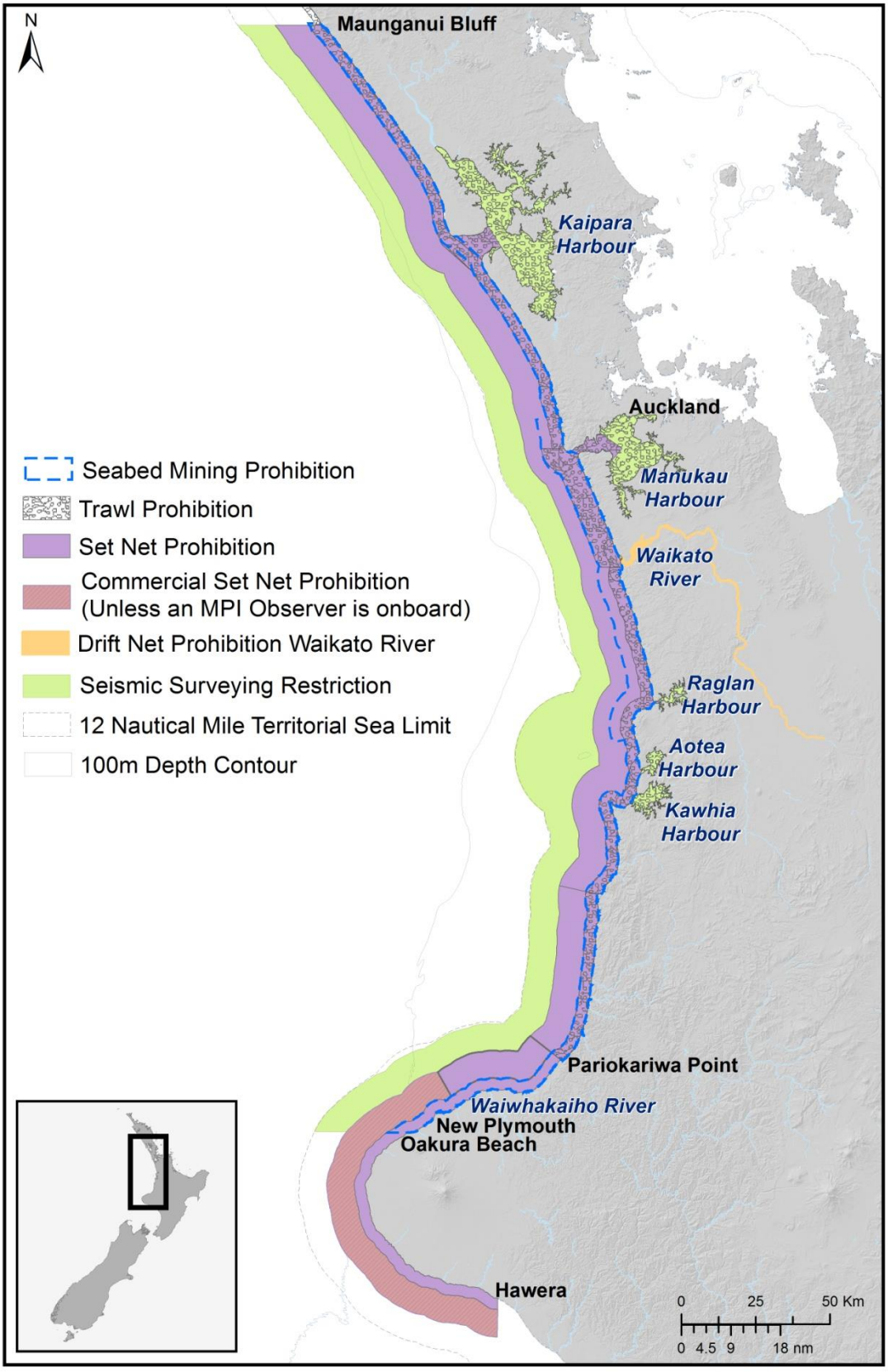


Figure 1: Current spatially-defined protection measures for Māui dolphin.

2017-2018 DATA COLLECTION

Sightings[1]

There have been 50 sightings of Māui/Hector's dolphins off the North Island reported directly to the Department of Conservation (DOC), or to DOC via the World Wildlife Fund, or the Hector's dolphin sightings app in the 12-month reporting period to Jan 31, 2018. No DNA samples were obtained and therefore sub-species identity is not certain for any of these sightings.

The majority of sightings were on the stretch of coastline between the Raglan Harbour entrance in the south and the Kaipara Harbour entrance to the north. There was one reported sighting north of the Kaipara, one in Hawke's Bay, two in the Bay of Plenty, and one in the Hauraki Gulf (Figure 2). 60% of the sightings were independently validated as being reliably a Hector's or Māui dolphin (i.e. they received a validation score of 1 or 2[2]), 4% were validated as consistent with a Hector's or Māui dolphin, but outside the known current range of either sub-species (validation score 3), and 32% are pending validation. One sighting (2%) lacked enough information to definitively determine whether the dolphin was a Māui or Hector's (validation score 5ii) and one interview (2%) was unable to be conducted (validation score 5iii).

Necropsies[3]

A single dead Māui or Hector's dolphin was reported on the North Island in the 12-month reporting period to Jan 31, 2018. The dolphin was found beachcast near Port Waikato in January 2018. Post-mortem examination showed the dolphin had suffered multiple bite wounds prior to death, consistent with shark bites. Confirmation of sub-species is dependent upon genetic testing, which will be completed later this year, and results posted on the DOC website.

Captures

There have been no observer-reported or fisher-reported captures of Māui dolphins in commercial fisheries in the 12-month reporting period to March 31, 2018.

Observer coverage

Mandatory Ministry for Primary Industries (MPI) observer coverage is required on all commercial set net vessels operating around the Taranaki region outside the existing set net closures, within 2-7 nm from shore between the Waiwhakaiho River and Hawera (i.e. target coverage area). The required level of observer coverage in the target coverage area is 100%. In the 11-month period from March 2017 to January 31st, 2018, observer coverage in the Taranaki set net fleet was 95.5%, with 84 of the 88 set net fishing days in the target coverage area being observed. The four unobserved days are suspected to be effort that actually occurred outside the area but appear to be inside the area due to the coarse resolution of current catch and effort reporting. These events are being investigated by MPI.

MPI observer coverage is also focused in areas adjacent to the existing trawl closures along the West Coast North Island area, within 2-7 nm from shore between Maunganui Bluff and Pariokariwa Point (i.e. the target coverage area). In the 11-month period ending January 31st, 2018, observer coverage in the West Coast North Island trawl fleet in the target coverage area was 88.3%, with 294 of the 333 trawl fishing days being observed. Outside of this target coverage area, an additional 114 trawl fishing days were observed.

Ship strike

There have been no reported ship strikes of Māui dolphins in the 12-month reporting period to Jan 31, 2018.

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[1] Māui dolphin sightings reported to DOC are displayed online quarterly at www.doc.govt.nz/mauisightings.
[2] The process for validating Māui and Hector's dolphin sightings is described online at http://www.doc.govt.nz/Documents/conservation/native-animals/marine-mammals/mauis-validation-system.pdf.
[3] Māui and Hector's dolphin incidents reported to DOC are displayed online quarterly at http://www.doc.govt.nz/dolphinincidents.

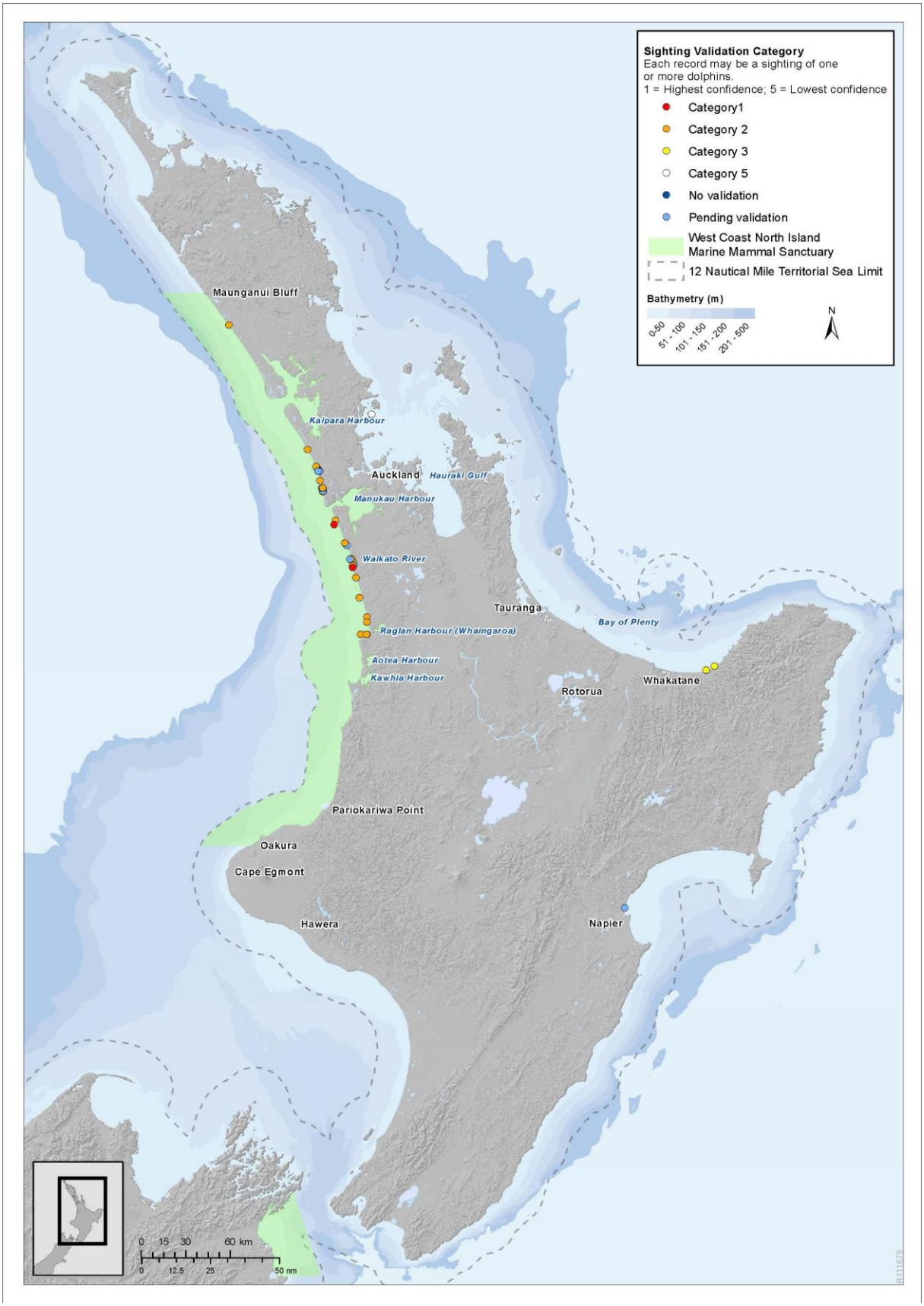


Figure 2: Sightings of Māui/Hector's dolphins off the North Island reported to the Department of Conservation in the 12-month reporting period to Jan 31, 2018.

CURRENT RESEARCH

Current research projects

A species-specific Māui-Hector's spatially explicit multi-threat risk assessment is currently underway to inform the review of the Hector's and Māui dolphin Threat Management Plan later this year. The risk assessment methodology is based on New Zealand's Spatially Explicit Fisheries Risk Assessment (SEFRA) approach, which is described in MPI (2018). Under this method, the encounter rate between protected species and fishing effort is estimated as a function of the spatial overlap between fishing effort and the animal's spatial distribution; capture rate per encounter is estimated from fisheries observer data. Risk is then represented as a ratio between the estimated number of captures and a 'Population Sustainability Threshold' (PST) representing the ability of the population to sustain removals, analogous to the PBR approach of Wade (1998). The risk assessment methodology was independently peer-reviewed by a panel of international experts in June 2017 (Lonergan et al 2017). The panel concluded the SEFRA was a high-quality method that been carefully thought out and implemented.

A preliminary multi-species implementation of the SEFRA method for all New Zealand marine mammals (Abraham et al. 2017) estimated a much lower level of fishing-related mortality for Māui dolphins that had been previously estimated. Previous Māui dolphin risk estimates (i.e. Currey et al. 2013), in the absence of adequate observer coverage to directly estimate Māui dolphin capture rates, relied on expert knowledge to subjectively estimate fishery-related deaths. Since that time new aerial survey results for South Island Hector's dolphins (where captures have been historically observed) have made it possible to empirically estimate Hector's dolphin catchability. Assuming that species catchability per encounter will be the same for Māui dolphins as for Hector's dolphins, we were able to obtain empirical estimates of Māui dolphin risk for the first time using the SEFRA method. The current species-specific Māui-Hector's implementation of the SEFRA method will utilise updated biological parameters informed by population-specific demographic models, updated dolphin spatial distributions, and estimation of both fisheries- and non-fisheries threats; new research to inform each of these three inputs is in progress and will be reviewed in April-May 2018.

Results of work still under review suggest that relative fisheries risk to Māui dolphins has declined as a consequence of spatial management measures put in place since 2002, but new absolute risk estimates will only be available when all new results are integrated together, at a multi-threat risk assessment workshop scheduled for July 2018. The workshop will also allow the evaluation of risk associated with alternate potential management scenarios, to inform potential risk management responses to address both fishery and non-fishery threats, and to estimate associated consequences for the long-term viability of different dolphin sub-populations. These assessment results will inform consultation on an updated Threat Management Plan later in 2018. Full details of the Hector's and Māui dolphin specific risk assessment, and results, will be submitted to the Scientific Committee in 2019.

DOC undertook three aerial surveys between December 2017 and March 2018, covering the area from Awakino (north Taranaki) to Hawera (south Taranaki). No Māui/Hector's dolphins were observed on these surveys. Several boat surveys were also undertaken from November 2017 through January 2018, covering the areas from Awakino (north Taranaki) to Opunake (south Taranaki). No Māui dolphins were observed on these surveys.

In February 2018, in collaboration with the Harbers Family Foundation, Oregon State University and the University of Auckland, DOC participated in photo ID surveys of Māui/Hector's dolphin. During these surveys, an unmanned aerial vehicle was used to film and photograph the dolphins to improve estimates of group size and to better understand the use of the surf-break habitat.

Starting in 2017, DOC and MPI have undertaken a project to deploy Cetacean - Porpoise Detectors (C-PODs) and soundtraps in a line running offshore out to 12 nm from Hamilton's Gap (where Māui dolphins are regularly sighted). The acoustic devices were first deployed in June 2017 and will remain in the water until June 2018. Preliminary results from the period June-November 2017 indicate that Māui or Hector's dolphin click trains were detected on devices deployed at approximately 8, 10 and 12 km from shore. No detections were recorded on devices deployed at approximately 14, 16 or 18 km from shore. Two devices deployed approximately 3 km from shore were lost, and the C-POD deployed 20 km from shore malfunctioned and did not record data. The final results, due in July 2018, will contribute to improved estimation of the spatial distribution of Māui and Hector's dolphins on the west coast of the North Island, to inform improved estimation of risk under current and potential future/alternate threat management scenarios.

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