# Acoustic monitoring of *Cephalorhynchus hectori* off the West Coast North Island, New Zealand

*February 2016 – April 2019*

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## Abstract

*Cephalorhynchus hectori* (Hector's dolphin) are an endangered species endemic to New Zealand waters. *Cephalorhynchus hectori maui* (Māui dolphin) are a subspecies of Hector's that inhabit the west coast of the North Island and are currently listed as Critically Endangered by the International Union for Conservation of Nature (IUCN) and Nationally Critical by the Department of Conservation. Much of their population decline is a result of human activity. To improve existing knowledge on the distribution of Māui and Hector's dolphins, spatial information was gathered using click detector devices called C-POD's. These were deployed at various locations along the West Coast of the North Island, New Zealand. This report summarises data from one deployment offshore from Hamilton's Gap, south of the Manukau Harbour and multiple deployments offshore from Manukau Harbour and various Taranaki locations from February 2016 to April 2019. The location with the highest amount of high frequency click detections was 0.91 km offshore from Hamilton's Gap during summer. A large number of detections was also found at the M2 C-POD located 8.0 km offshore from Manukau Harbour with a decreased number of detections with increasing distance offshore. Detections were also made as far south as the Tapuae coastal area in Taranaki region, but we are unable to determine whether these are from Hector's dolphins moving north or the Māui dolphins moving south. These data suggest that the dolphins tend to inhabit waters nearer to the shore, with higher activity in the Manukau Harbour region, in the current core of the Māui dolphin range.

## Introduction

The coastal waters of New Zealand are home to many marine mammal species, including the endemic *Cephalorhynchus hectori hectori* (Hector's dolphin), which primarily inhabit the coastal waters around the South Island of New Zealand (Dawson et al., 2004; Slooten et al., 2004, 2005). The sub-species, *Cephalorhynchus hectori maui* (Māui dolphin), inhabits the west coast of the North Island (Baker et al., 2002). Māui dolphins are the smallest and rarest dolphin in the world and are listed as Nationally Critical under the New Zealand Threat Classification System and Critically Endangered by the International Union for the Conservation of Nature (Reeves et al., 2013, Baker et al., 2019). Estimates have suggested that 95.5% of human-induced mortality in Māui dolphins was due to entanglement or bycatch in trawl or gill nets (Currey et al., 2012). The current population estimate is 63 (95% CI 57 – 75) individuals over one year of age with a restricted range, compared to historical distribution, that is now centred around the Manukau to Port Waikato region (Baker et al., 2016, Slooten et al., 2005). More recently Hector's dolphins originating from South Island sub-populations have been found in groups with Māui dolphins in their core range for periods of up to six years. However, there is currently no evidence for interbreeding, but there is the potential for it to occur (Hamner et al., 2014a; Baker et al. 2016).

A Marine Mammal Sanctuary extends out to 12 nautical miles offshore from Maunganui Bluff to Oakura Beach (Appendix A) with current restrictions and prohibitions to activities such as fishing, mining and seismic surveying. The first Threat Management Plan for Hector's and Māui dolphins was implemented in 2008 to ensure the long-term survival of their population by reducing impacts from human activity (Currey et al., 2012). The Māui dolphin portion of the Threat Management Plan was later reviewed in 2012 after public sightings and a fisheries related mortality of a Māui or Hector's dolphins in the Taranaki coastal area. An updated Potential Biological Removal analysis estimated that Māui population could only sustain one human-induced mortality every 10 - 23 years without affecting the population's ability to rebuild to a sustainable level (Hamner et al., 2014b).

In order to understand how we can best protect Māui dolphins, and increase their population to a sustainable level, more long-term and extensive information must be gathered to inform management. Outside of the core range where surveys are conducted to determine abundance and habitat use (e.g. Hamner et al., 2014b; Baker et al., 2016; Oremus et al., 2012; Derville et al., 2016), visual sightings of Māui dolphins are rare due to the fact that these dolphins themselves are rare and that there are fewer visitors to these remote and rough areas of coastline. Therefore, there is a need for an alternative way of detecting them.

Underwater acoustic devices called C-PODs and T-PODs detect odontocete click trains in the range of 20 – 160 kHz, which includes the high frequency (120 – 125 kHz) echolocation clicks that Māui and Hector's dolphins emit when foraging (Dawson, 1991; Rayment et al. 2011). These bioacoustic data are logged 24 hours of the day, and across time periods of several months. This enables a more intensive temporal data set to be gathered compared to aerial or boat-based surveys, which are limited to short time periods only during daylight hours, are weather dependent and resource intensive. It is not currently possible to distinguish differences between Māui or Hector's dolphin echolocation patterns, nor through visual observations of these dolphins in the wild which provides challenges when interpreting acoustic or sightings data in areas outside the core range for both subspecies (Rayment et al., 2011), but either could be present (e.g., Taranaki region). Nonetheless, information from underwater acoustic technology can be used to determine the extent of Māui or Hector's dolphin occurrence, reveal areas of importance in remote locations and enhance our understanding of the temporal and spatial distribution of these mammals throughout their range.

## Aim

To investigate the spatial and temporal distribution of Māui and/or Hector's dolphins in the Manukau and Taranaki coastal regions using C-POD technology.

## Methods

To investigate the occurrence of Māui and/or Hector's dolphins at sites along the Manukau and Taranaki coastal regions of the west coast, North Island, underwater bioacoustics devices called C-PODs were used. C-PODs detect odontocete click trains in the range of 20 – 160 kHz. Each C-POD sits one to two meters above an attached float, anchored by a 30 – 35 kg weight at the base (Fig. 1). This positions the C-POD approximately three to four metres above the seabed.

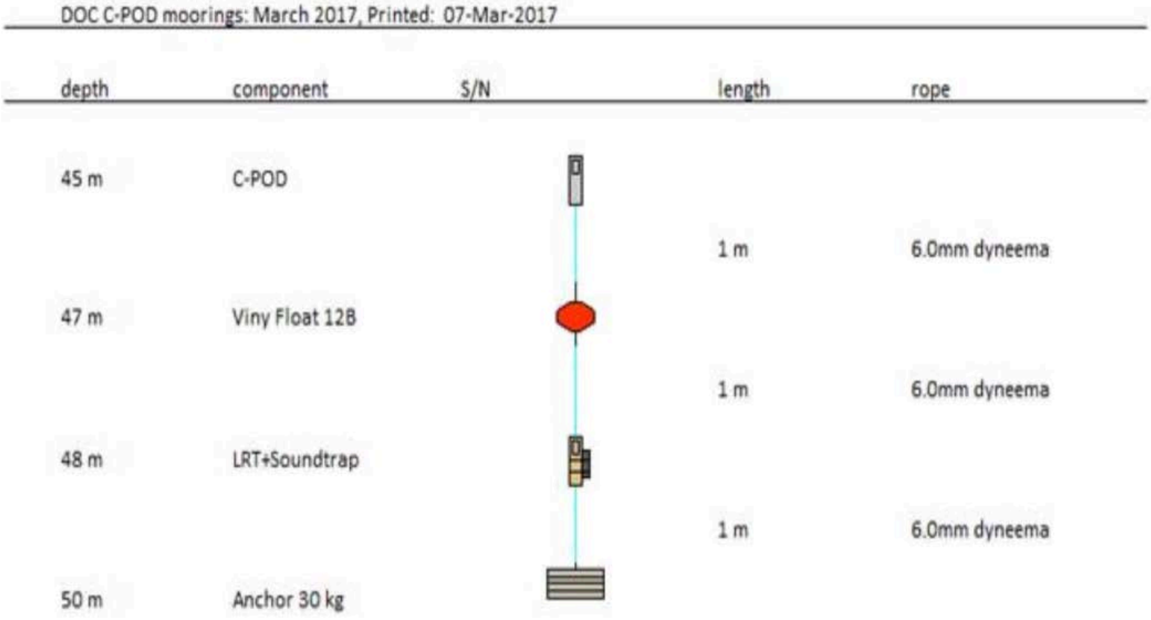


Fig. 1: Set-up of an underwater bioacoustic C-POD device with anchor placed on seabed (NIWA, 2018).

Table 1: Offshore mooring site location and distance from shore.

| Mooring Site | Distance Offshore |
|---|---|
| HG1 | 0.91 km |
| M1 | 1.9 km |
| M2 | 8.0 km |
| M3 | 10.1 km |
| M4 | 12.1 km |
| M5 | 14.1 km |
| M6 | 16.1 km |
| M7 | 18.2 km |
| M8 | 19.9 km |
| M9 | 2.8 km |

*Hamilton's Gap and Manukau:*

A total of nine deployment sites had C-POD devices deployed in a straight line offshore from Hamilton's Gap, south of the Manukau Harbour entrance (Fig. 2 and Table 1). Unfortunately, some C-PODs were not retrieved due loss from high tidal flows and sediment movement, most notably *'M1' and 'M9'* that were nearshore deployments (NIWA, 2018).

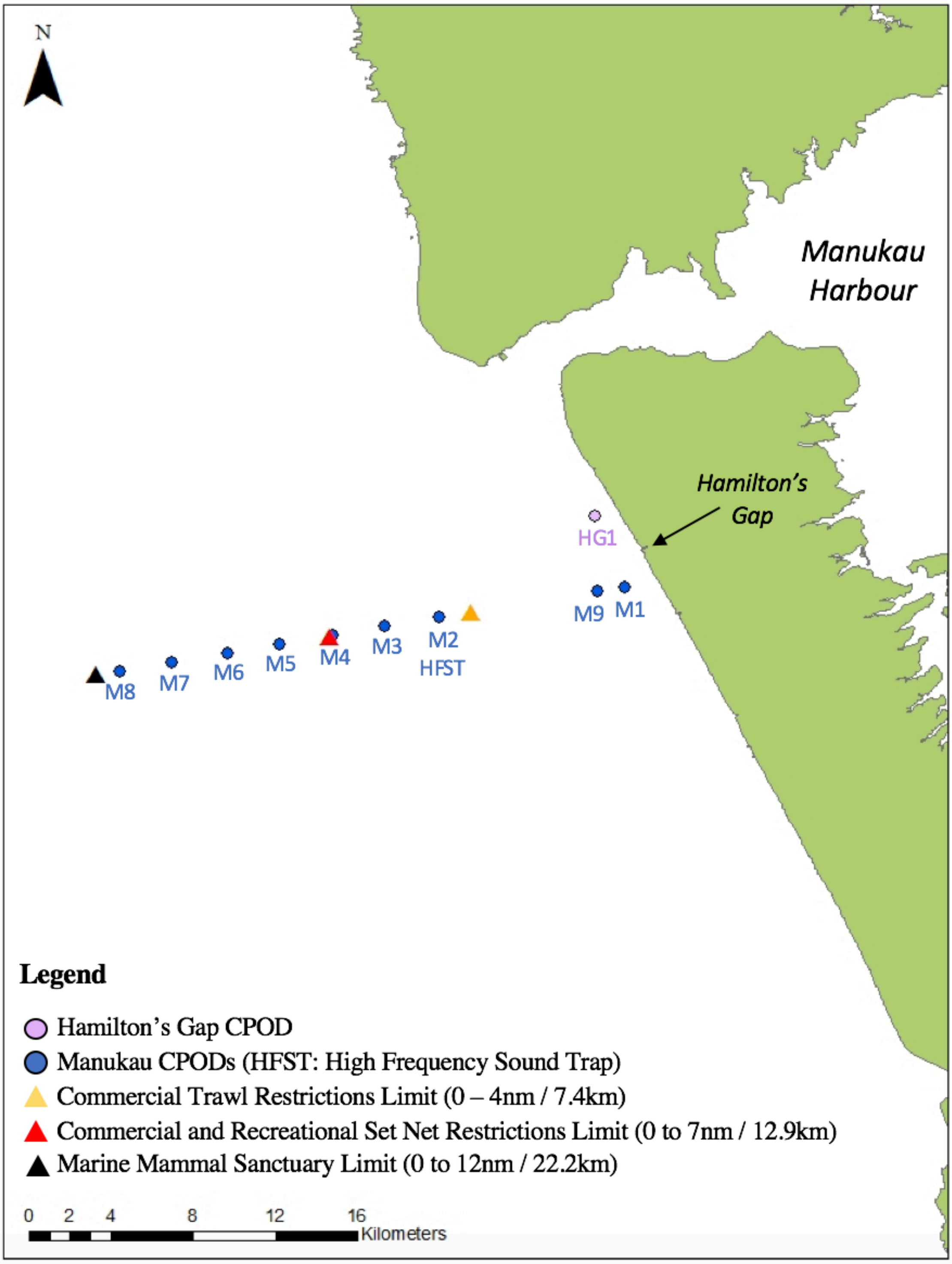


Fig. 2: Locations of mooring sites where C-PODs were placed offshore from Hamilton's Gap: HG1, 0.91 km and from Manukau Harbour: M1 1.9 km offshore; M9 2.8 km; M2 8.0 km; M3 10.1 km; M4 12.1 km; M5 14.1 km; M6 16.1 km; M7 18.2 km; M8 19.9 km, with limits of protection zones.

The first deployment took place from February 10th 2016 to March 7th 2016, where one C-POD was deployed at 'HG1' (Fig. 2).

The second deployment took place from June 29th 2017 to November 14th 2017. C-PODs deployed and retrieved successfully were located at mooring sites *'HG1,' 'M2,' 'M3,' 'M4,' 'M5,' 'M6,' M7'* and *'M8'* (Fig. 2; Table 1 and 2). A high frequency sound trap device was also deployed at *'M2'* as a reference to check the ability of the C-POD to pick up bioacoustics sound. The C-POD placed at *'M8'* was unable to be analysed due to technical problems.

The third deployment took place from November 15th 2017 to May 5th 2018. C-PODs deployed and retrieved successfully were located at moorings sites *'M2,' 'M3,' 'M4,' 'M6'* and *'M7'* (Fig. 2).

The fourth deployment took place from May 4th 2018 to September 6th 2018. C-PODs deployed and retrieved successfully were located at *'M4,' 'M6'* and *'M7'* (Fig. 2).

*Taranaki:*

During the course of this project a total of 11 individual C-POD deployments were made at various locations along the coast of Taranaki and Whanganui approximately 2 km offshore (Fig. 3). There were four deployments for periods of four to six months between November 18th 2016 and April 16th 2019 (Table 1 and 2). Unlike the Manukau deployments, all C-PODs were retrieved from these four deployments.

Table 2. Summary of the C-POD deployments across seven sites in the Taranaki and Whanganui region.

| Deployment | Time period | Location |
|---|---|---|
| 1 | November 18 2016 –May 4 2017 | Tongaporutu, New Plymouth Airport, Whanganui River |
| 2 | January 15 –July 3 2018 | Tongaporutu, Motunui |
| 3 | July 9 2018 –December 14 2018 | Tongaporutu, Parininihi |
| 4 | December 7 2018 –April 16 2019 | Awakino, Tongaporutu, Parininihi, Tapuae |

Fig. 3: Locations of C-POD deployments from November 2016 to April 2019, placed approximately 2 km offshore in the coastal areas of Taranaki and Whanganui, New Zealand (Google Earth Pro, 2019).

## Data Analysis

The data from each C-POD were downloaded and verified using C-POD.exe 2.064 software. The data were processed using the KERNO classifier and the train filter set to high quality. These filters improve the classification of detections and allow discrimination between species based on their click parameters. The KERNO classifier groups the data into four categories; Narrow Band High Frequency clicks (NBHF), other cetaceans, Sonar, and Unclassified source (e.g. Weak Unknown Train Sources). Māui and Hector's dolphins have high frequency, narrow-band clicks (NBHF) with frequencies of between 120 - 125 kHz (Thorpe & Dawson, 1990). It is highly likely these detections of NBHF clicks are Māui or Hector dolphins echolocation clicks.

The data were then manually analysed by looking through the file and ensuring the classifications were correct and re-classifying any false positives. The verified data from all C-PODs was exported as detection positive minutes (DPM) and then run through Matlab software to produce click plots (see *Appendix C* for summary data for all C-PODs deployed).

## Results: Hamilton's Gap and Manukau

### *Hamilton's Gap: Deployment One*

Hamilton's Gap had the highest number of high quality NBHF detections across all mooring sites for this study. The large majority of the detections occurred during daylight hours, with a large cluster occurring during the middle of February to the beginning of March 2016 (Fig. 4). The highest daily total DPM was on the March 03rd 2016, with over 400 detections (Fig. 5). The number of detections appears to increase gradually during the study period; from February to early March 2016 (Fig. 5).

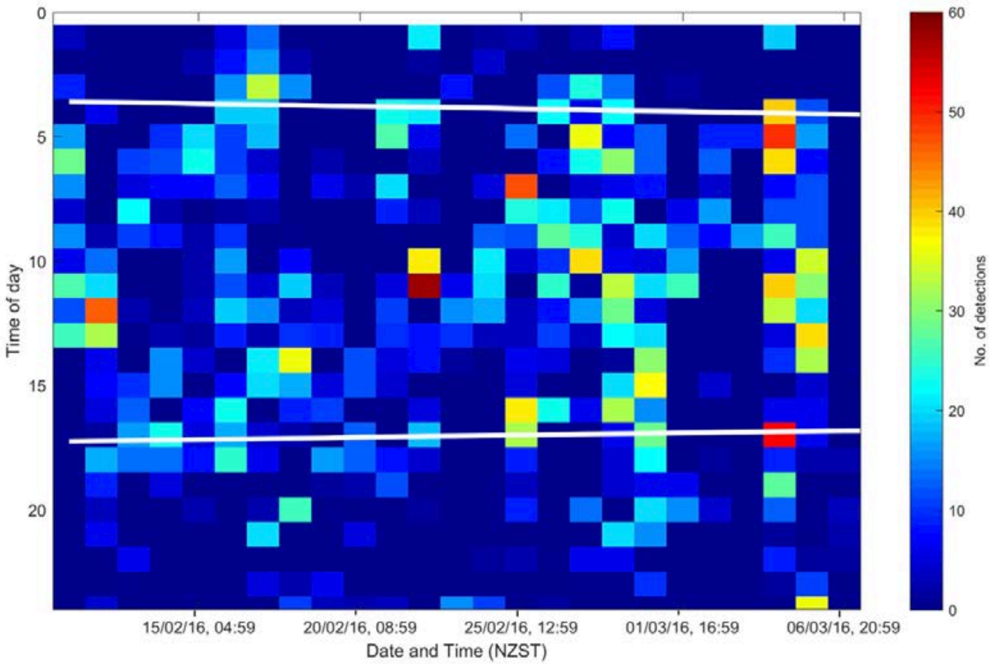


Fig. 4: Detection positive minutes (DPM) for high quality NBHF clicks from the February 10th 2016 00:59 NZST to the March 06th 2016 23:59 NZST at Hamilton's Gap C-POD (HG1). Upper white line represents sunrise time and lower white line represents sunset time.

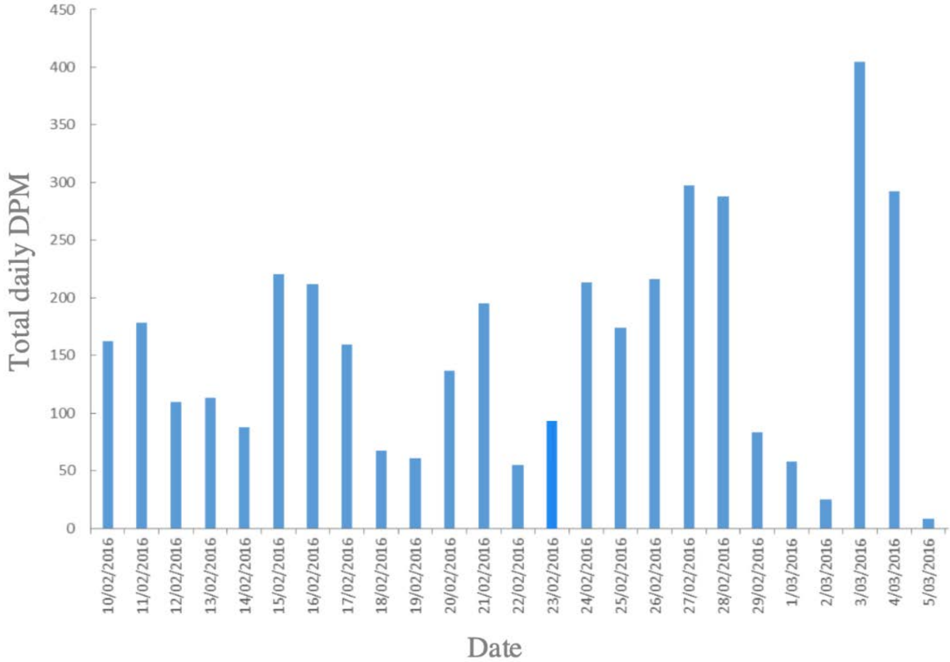


Fig. 5: Total amount of daily NHBF detection positive minutes (DPM) at the C-POD located at the Hamilton's Gap mooring site (HG1) from 10/02/2016 00.59 NZST to 05/03/2016 24:0023:59 NZST.

***Offshore Manukau Harbour: Deployments Two, Three & Four***

The highest number of high quality NBHF DPM were made on the C-POD located at Mooring Two (M2) during deployment two from July 2017 to November 2017 (Fig. 6; Table 3). The C-POD located at Mooring Three (M3) also had a large number of DPM during deployment two and the highest number of DPM during deployment three (Table 4). Overall, the number of DPM appears to decrease significantly from November 2017 onwards. This was largely due to the fact that there were fewer C-PODs deployed with each successive deployment, due to their loss or damage. For example, deployment 4 (Table 5) only three C-PODs were deployed compared to nine in deployment two.

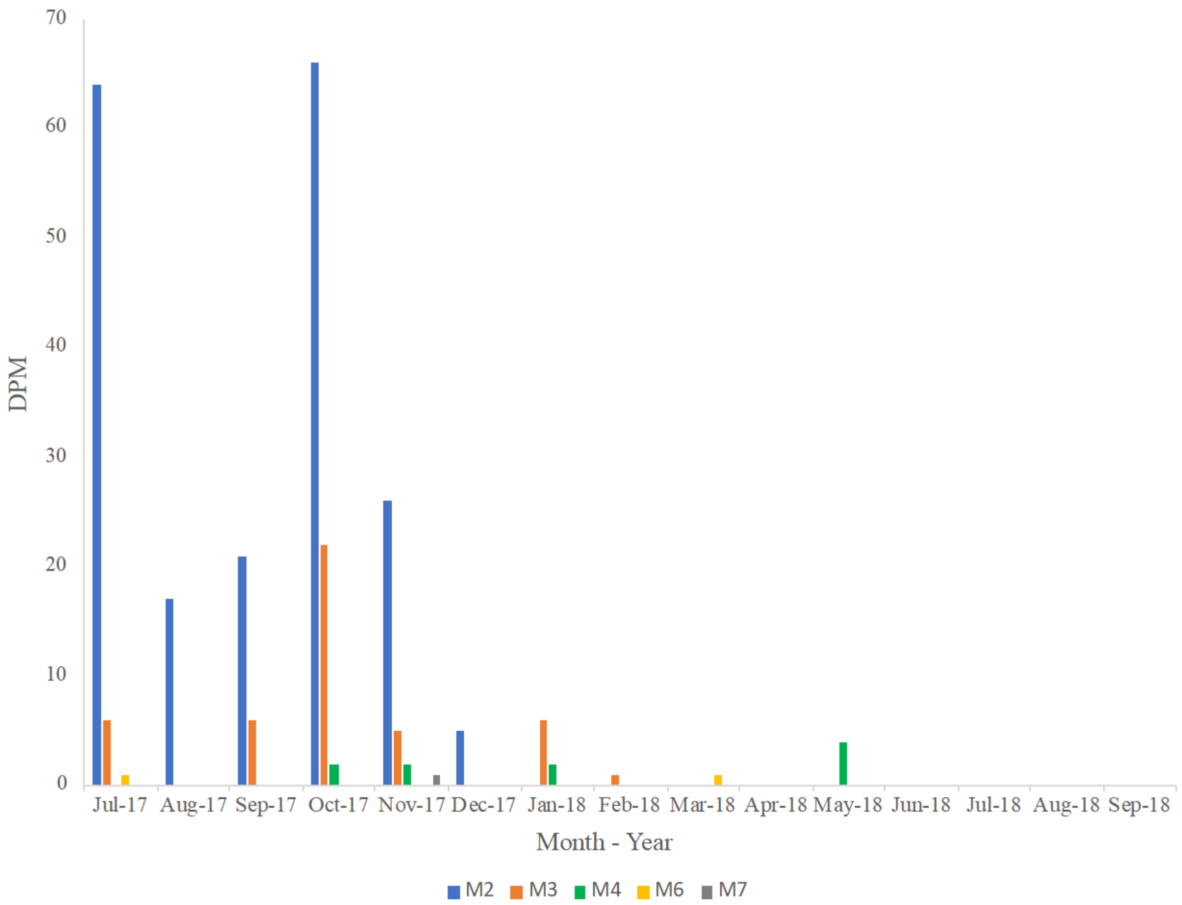


Fig. 6: Number of high quality NBHF detection positive minutes (DPM) per month across all three deployments of C-PODs at mooring sites offshore from Manukau Harbour from July 2017 to September 2018.

Table 3: Number of high quality NBHF detection positive minutes (DPM) per month for C-PODs placed at mooring sites during deployment two from June 06th 2017 to November 15th 2017. C-PODs located at the nearshore locations (M1 and M9) were not found. The C-POD located at M8 experienced technical difficulties.

| Mooring Site | July 2017 | August 2017 | September 2017 | October 2017 | November 2017 |
|---|---|---|---|---|---|
| M2 | 64 | 17 | 21 | 66 | 26 |
| M3 | 6 | 0 | 6 | 22 | 5 |
| M4 | 0 | 0 | 0 | 2 | 2 |
| M5 | 0 | 0 | 0 | 0 | 0 |
| M6 | 0 | 0 | 0 | 0 | 0 |
| M7 | 0 | 0 | 0 | - | - |

Table 4: Number of high quality NBHF detection positive minutes (DPM) per month for C-PODs placed at mooring sites during deployment three from November 15th 2017 to May 05th 2018.

| Mooring Site | November 2017 | December 2017 | January 2018 | February 2018 | March 2018 | April 2018 | May 2018 |
|---|---|---|---|---|---|---|---|
| M2 | 0 | 5 | 0 | 0 | 0 | 0 | 0 |
| M3 | 0 | 0 | 6 | 1 | 0 | 0 | 0 |
| M4 | 0 | 0 | 2 | 0 | 0 | 0 | 0 |
| M6 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| M7 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |

Table 5: Number of high quality NBHF detection positive minutes (DPM) per month for C-PODs placed at mooring sites during deployment four from May 04th 2018 to September 06th 2018.

| Mooring Site | May 2018 | June 2018 | July 2018 | August 2018 | September 2018 |
|---|---|---|---|---|---|
| M4 | 4 | 0 | 0 | 0 | 0 |
| M6 | 0 | 0 | 0 | 0 | 0 |
| M7 | 0 | 0 | 0 | 0 | 0 |

### *Mooring Two - Deployment two and three*

Overall, the C-PODs located at mooring two (M2) had the greatest number of DPM. The highest number recorded within one hour was 8 DPM, on July 31st 2017 at 22:59 NZST and also on the August 03rd 2017 at 04:59 NZST (Fig. 7). These values contribute to a cluster of high number of detections from the middle of July to early August (Fig. 7). From January 2018 onwards there were no detections made (Fig. 7). The majority of detections were recorded during the night (Fig. 7).

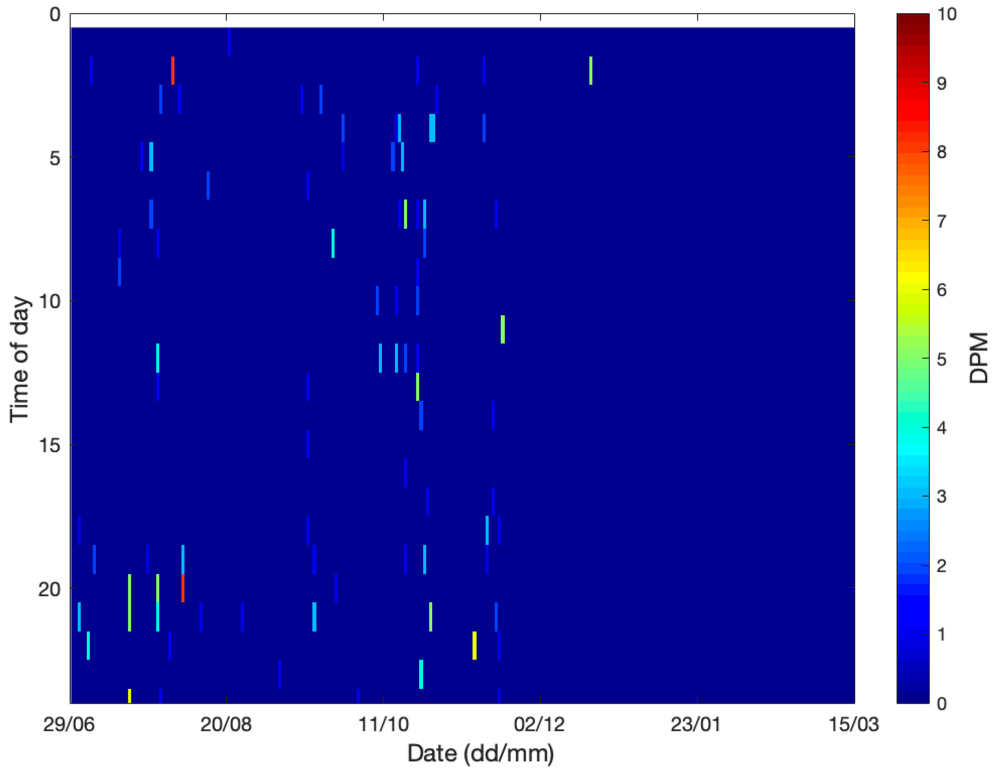


Fig. 7: DPM for high quality NBHF click trains detected on C-PODs located at Mooring Two (M2) offshore from Manukau Harbour C-PODs from June 29th 2017 00:59 NZST to the March 15th 2018 00:59 NZST.

### *Mooring Three - Deployment two and three*

The highest DPM recorded on C-PODs deployed at Mooring Three (M3) occurred in October 2017 (Fig. 8). A total of 5 DPM were recorded in January 2018, after a gap of no detections in November and December 2017 (Fig. 8). Similar to Mooring Two, the majority of the detections were recorded during the night (Fig. 8).

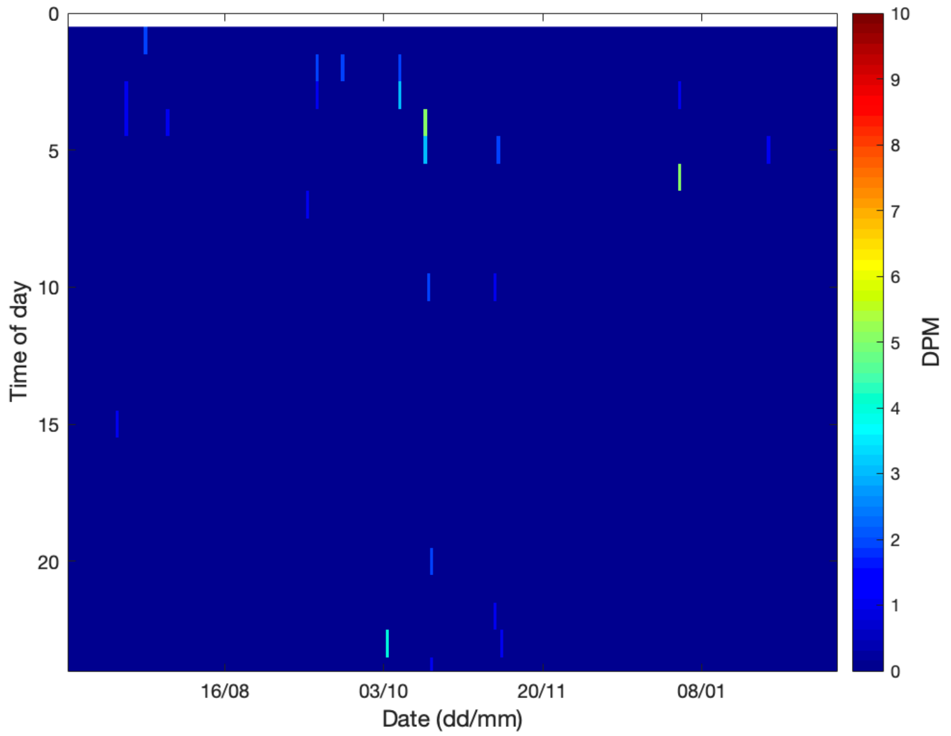


Fig. 8: Detection positive minutes (DPM) for high quality NBHF click trains detected on C-PODs located at Mooring Three (M3) offshore from Manukau Harbour C-PODs from June 29th 2017 00:59 NZST to the February 25th 2018 21:59 NZST.

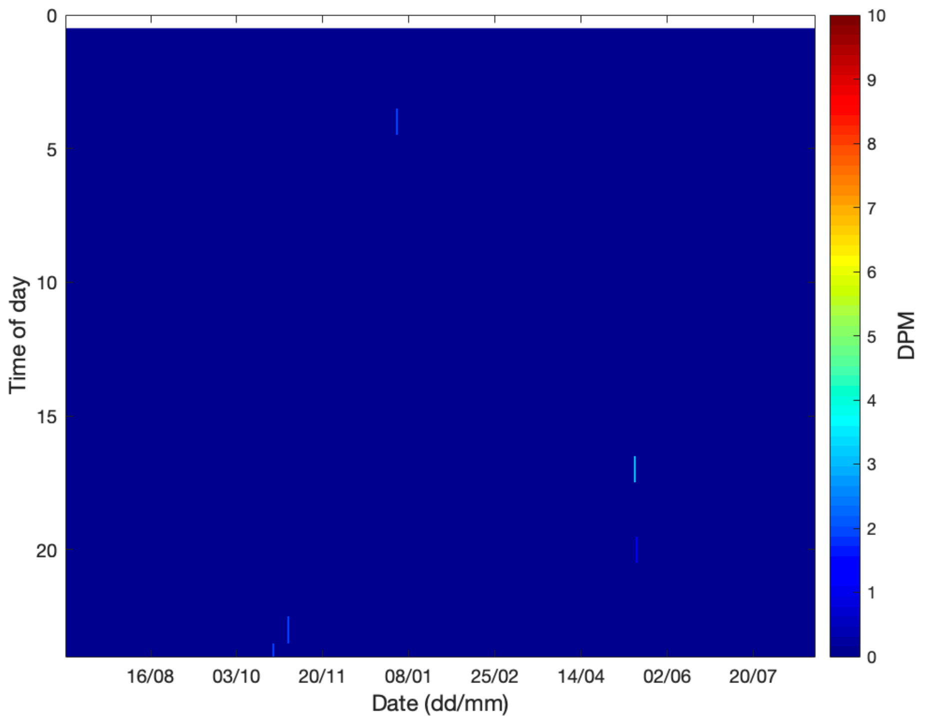


Fig. 9: Detection positive minutes (DPM) for high quality NBHF click trains detected on C-PODs located at Mooring Four (M4) offshore from Manukau Harbour C-PODs from the June 29th 2017 00:00 NZST to the September 06th 2018 13:59 NZST.

### *Mooring Four - Deployment two, three & four*

There was a total of 10 DPM made at the C-PODs located at Mooring Four (M4) across deployments two, three and four (Fig. 9).

### *Mooring Six - Deployment three*

During deployment three, the C-POD located at Mooring Six (M6) recorded 1 DPM during March 2018 (Fig. 10).

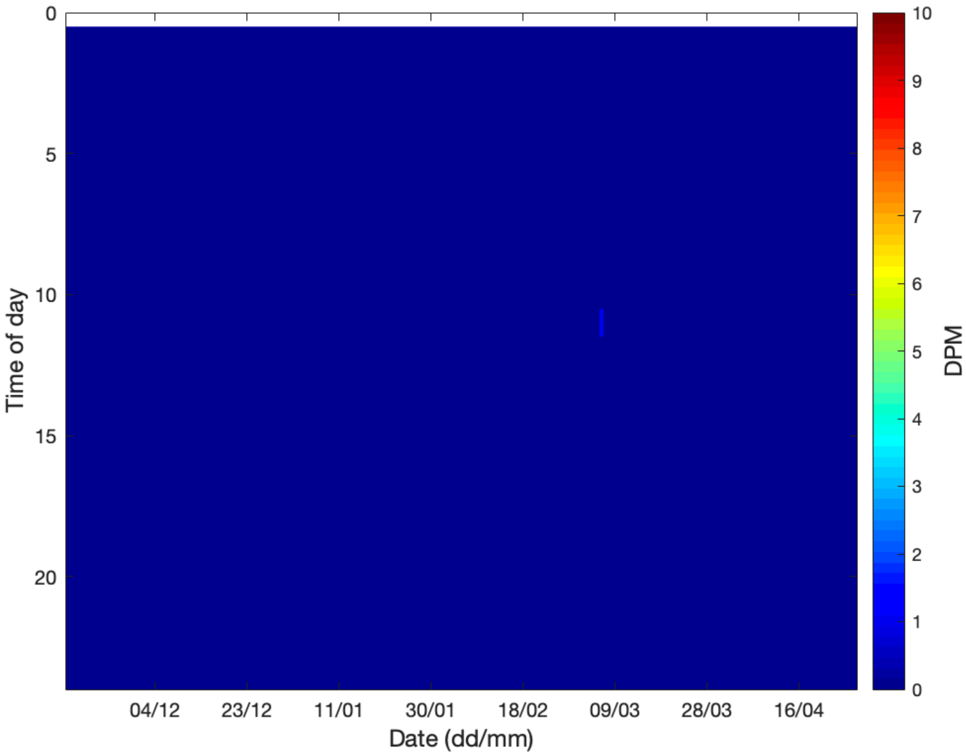


Fig. 10: Detection positive minutes (DPM) for high quality NBHF click trains detected on C-PODs located at Mooring Six (M6) offshore from Manukau Harbour from November 15th 2017 15:59 NZST to May 05th 2018 23:59 NZST.

### *Mooring Seven - Deployment three*

During deployment three, the C-POD located at Mooring Seven (M7) recorded 1 DPM during November 2017 (Fig. 11).

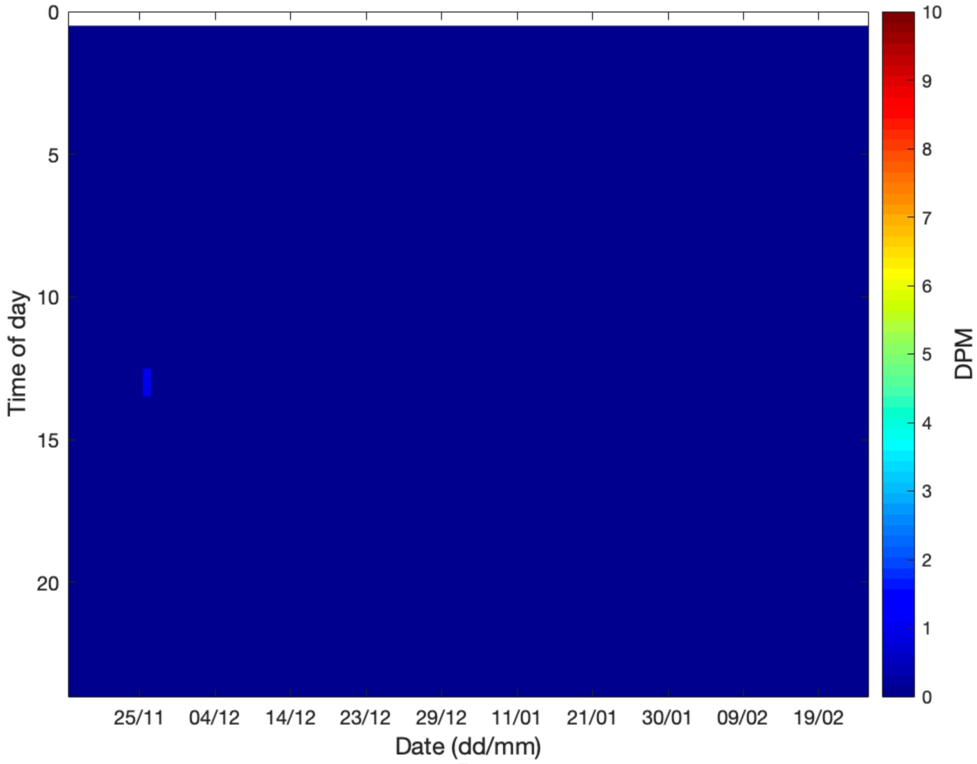


Fig. 11: Detection positive minutes (DPM) for high quality NBHF click trains detected on C-PODs located at Mooring Seven (M7) offshore from Manukau Harbour from the November 15th 2017 15:59 NZST to the March 28th 2018 14:59 NZST.

## Results – Taranaki

A total of 31 DPM were found at CPODs deployed at the Tongaporutu mooring site from the November 2016 to November 2018 (Fig. 12). One DPM was recorded at the CPOD located at Tapuae mooring site during December 2018 (Fig. 12).

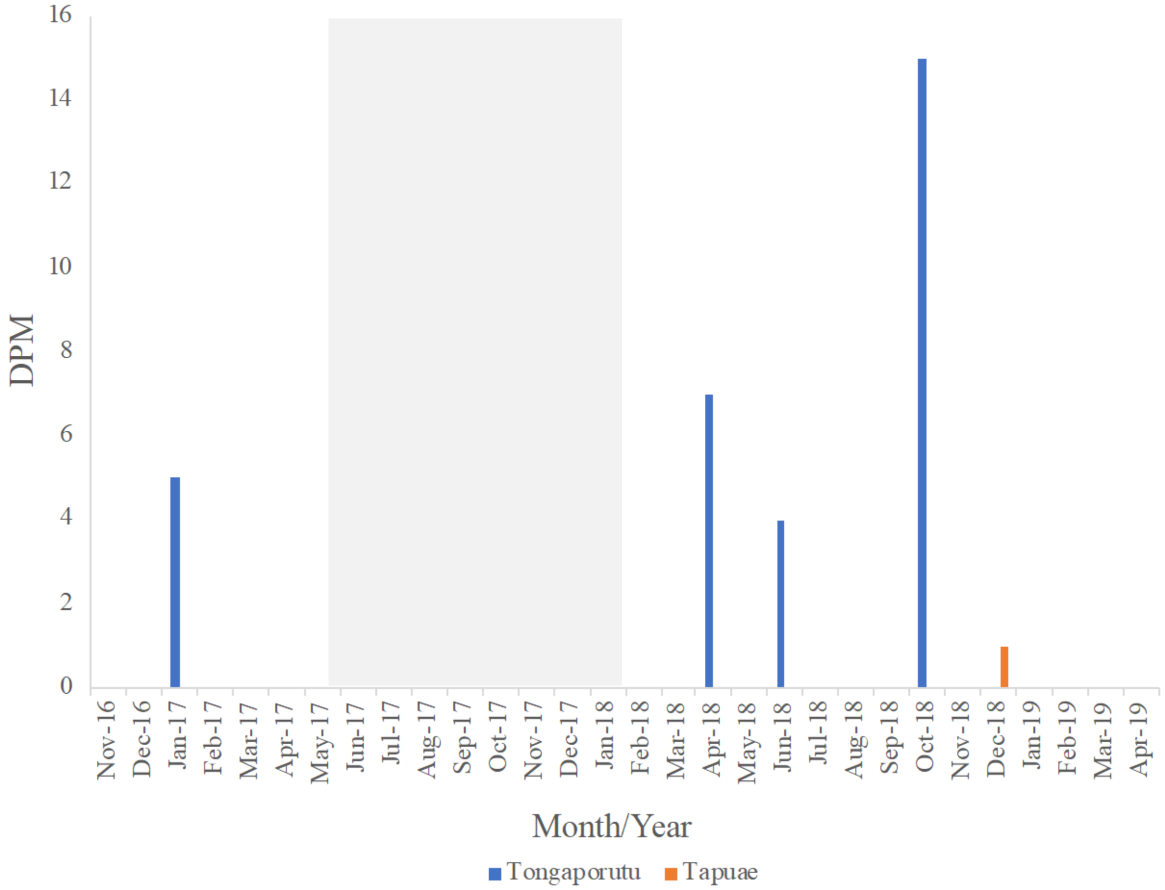


Fig. 12: Summary data for CPODs containing valid DPM for high quality NBHF acoustics for deployments at two sites in the Taranaki region from November 2016 to April 2019. The grey shaded area denotes a gap between deployments where there were no CPODs in the water.

There were no high quality NBHF detections recorded on C-PODs located at the Awakino, Parininihi, Motunui, New Plymouth Airport and Whanganui River deployment sites from November 2016 to April 2019.

### *Deployment Location B: Tongaporutu*

During the first deployment a total of five DPM were recorded in January 2017 on the C-POD deployed offshore from Tongaporutu (Fig. 13). During the second and third deployment a total of 26

DPM for were recorded from mid-April to early October (Fig. 13). There were no detections found at Tongaporutu during the fourth deployment.

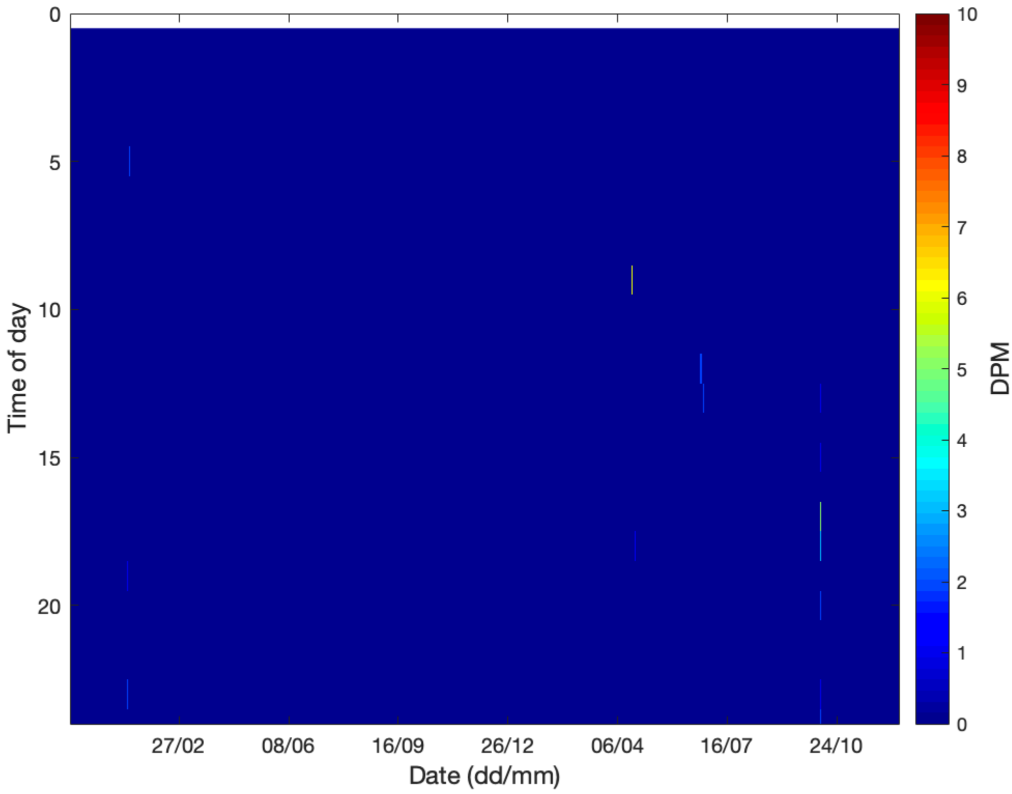


Fig. 13: Detection positive minutes (DPM) for high quality NBHF click trains detected on C-PODs located at Tongaporutu mooring site offshore from Taranaki from the 18/11/2016 17:59 NZST to the 14/12/2018 06:59 NZST.

### *Deployment Location F: Tapuae*

During a deployment from the 07/12/2018 10:01 NZST to the 16/04/19 09:40 NZST, one DPM was recorded during December 2018 on the C-POD deployed at Tapuae (Fig. 14).

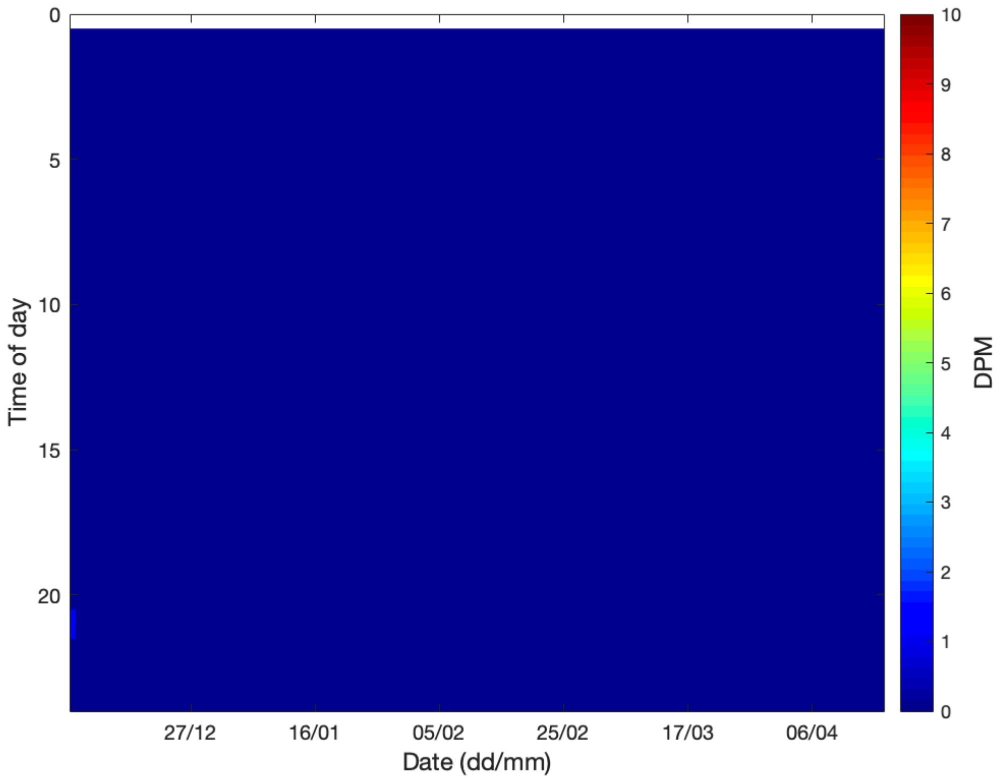

Fig. 14: Detection positive minutes (DPM) for high quality NBHF click trains detected on C-PODs located at Tapuae mooring site offshore from Taranaki from the 07/12/2018 10:59 NZST to the 16/04/2019 11:59 NZST.

## Discussion

Current research on Māui dolphin distribution outside of their core range is limited, so the acoustic information presented here enhances our understanding of the species' spatial and temporal movement patterns. At the Hamilton's Gap C-POD (HG1, 0.91km offshore) there were a large number of detections consistent with visual survey data from previous research (e.g., DuFresne, 2010; Oremus et al., 2012). At mooring locations M2 (8.0 km offshore) and M3 (10.1 km), where high DPM were recorded, the opposite occurred, where there were a greater number of detections during the night. This may indicate a diurnal pattern, either associated with inshore-offshore movements as seen with some Hector's dolphins (Dawson et al., 2013), or associated with predation of nocturnal prey in offshore waters.

Due to the loss of the nearshore C-PODs (M1, 1.9km and M9, 2.8km offshore) (NIWA, 2018) we are limited in providing insights into nearshore presence of the dolphins throughout the winter months. We report high levels of detections at the Hamilton's Gap C-POD in the core of the Māui dolphin range, with mooring two (M2, 8 km) and three (M3 10.1 km) C-PODs showing significantly higher detections compared to all the other offshore sites, in particular during the winter-spring months. This is consistent with the pattern of offshore movements in winter by Hector's dolphins in the South Island (e.g., Rayment et al., 2010; MacKenzie ad Clement, 2014; Bräger and Bräger, 2018; Brough et al., 2019) so this pattern may also occur in Māui dolphins. Overall, the number of detections decreased with increasing distance offshore with the furthest offshore detection in November 2017 at mooring M7 (18.2 km).

We provide evidence of Māui or Hector's dolphin activity in the coastal waters of Tongaporutu, Taranaki during winter-spring indicating their presence as far south as Tapuae (Fig. 12; Fig. 14). Data from the Department of Conservation sightings database also indicates that dolphins occur in the Taranaki area. There has been one verified sighting of a Māui or Hector's dolphin off the coast of Patea, just north of the Whanganui River deployment location for this project (Department of Conservation, 2018).

## Limitations:

The main limitation to this research is that we cannot differentiate between Māui and Hector's with acoustic data alone, as both emit similar echolocation clicks (Dawson, 1991; Rayment et al. 2011). Genetic sampling is currently the only method available to determine species identification of living dolphins. We are confident that all of the NBHF detections are from Māui or Hector's dolphins as there are no other marine mammals in New Zealand waters that emit such high frequency sound.

Acoustic detections are less reliable if the C-POD is not orientated in an upright position, which occurs due to waves or high current flows. This unreliability is due to the cone of insensitivity with its base centred on the lid at one end of the C-POD. Therefore, when the C-POD lies horizontally, shallow water animals approaching from the lid end will not be detectable until they are closer. When taking into consideration the angle of the C-POD, this may decrease the reliability of the data gained in this study. This could be a small effect, however all detections presented in this report have been verified through critical analysis of the C-POD angle and physical characteristics of the click data (including e.g., frequency, bandwidth, inter click rate and envelope). High quality NBHF detections from the KERNO classification process that did not confidently satisfy all the critical factors required were removed from the data.

A further limitation was difficulty in accurately classifying species due to the high background sound levels on the C-POD nearshore at Hamilton's Gap. There were many clicks trains that the KERNO classifier had labelled as NBHF, but upon verification it was found that these detections had very wide bandwidths and very low number of cycles (N). Indicating that there may have been interference from another source. Approximately 30% of the NBHF detections had these unusually wide bandwidths and low number of cycles (N).

This research has revealed the usefulness of C-PODs in detecting rarely sighted dolphins in offshore waters within their core range as well as remote parts of their range. With infrequent sightings of Hector's or Māui dolphins in the Taranaki region, there has not been the opportunity to confirm the species identity and acoustics is unable to discern which species is echolocating. There are suggestions that the dolphins' may have seasonal or possibly diel patterns in inshore and offshore movements but more research is required before we can be confident in these findings.

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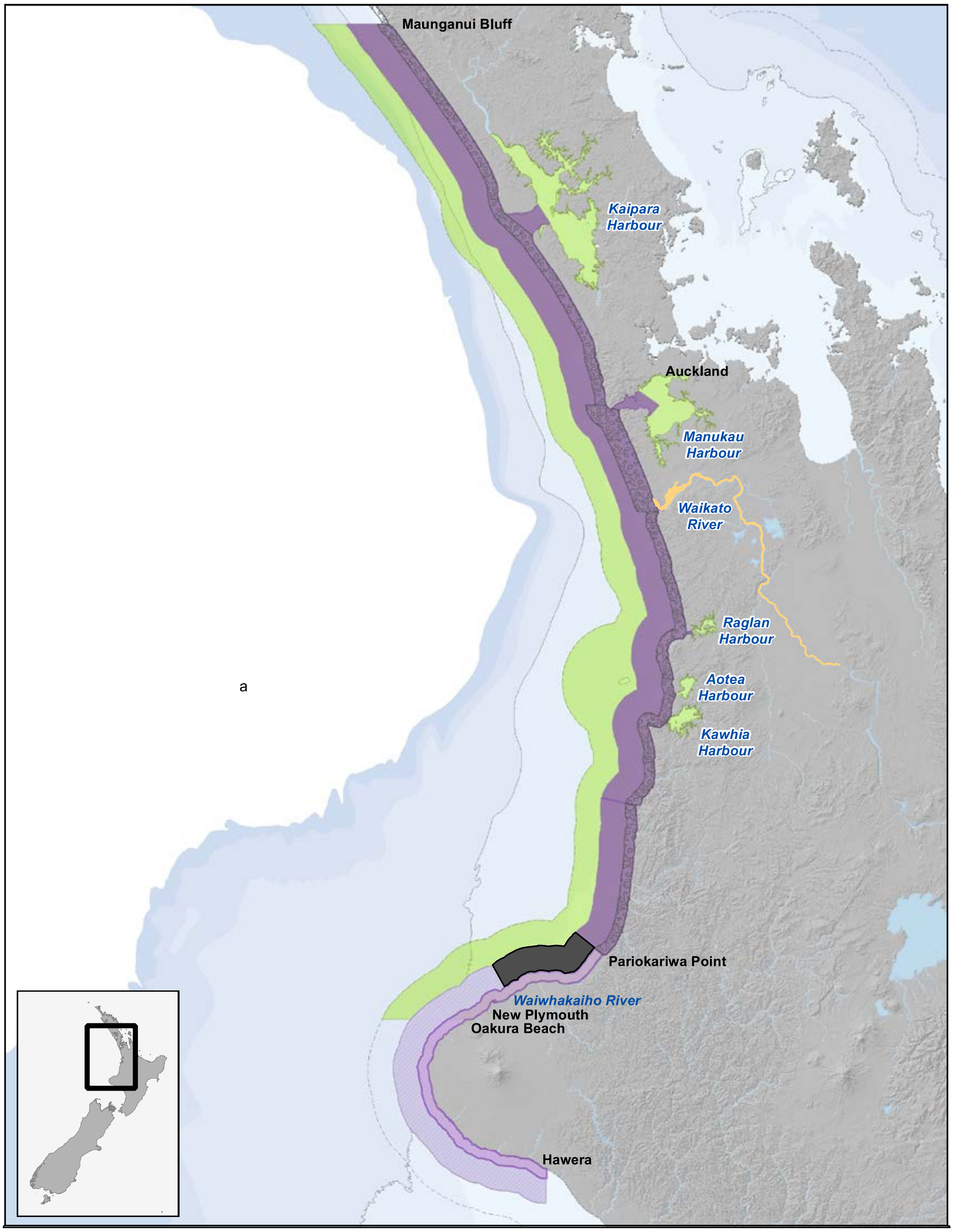
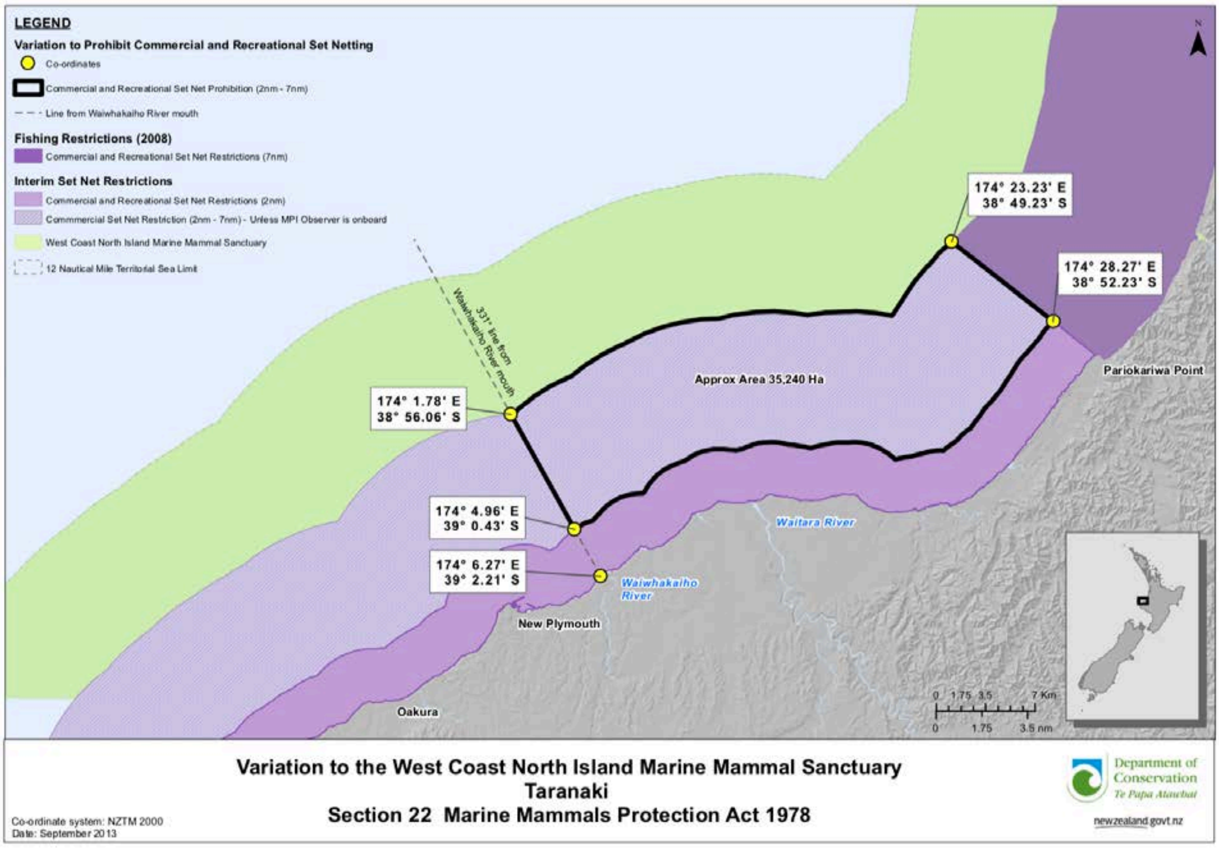
*Appendix A:* Protection measures under the Marine Mammals Protection Act 1978 and the Fisheries Act 1996 along the West Coast of the North Island, New Zealand (Department of Conservation 2017b).



*Appendix B:* Details of commercial and recreational set net restrictions in the Taranaki Coastal area (Department of Conservation, 2013).



*Appendix C:* Summary data for Hamilton's Gap, Manukau Harbour, Taranaki and Whanganui River C-PODs. Missing data due to technical errors.

| **C-POD Mooring & Approx. distance offshore** | **CPOD Number** | **Deployment date (dd/mm/yy)** | **Deployment Latitude** | **Deployment Longitude** | **Total NBHF clicks found** | **Total Clicks in CP1 file** | **Clicks per day (NBHF)** | **DPM per day (NBHF)** | **File duration analysed (days/hours / minutes)** | **Acoustic duration (days/hours/ minutes)** | **Mean Temp (°C)** | **Mean Angle** | **N** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HG1 (0.9km) | POD2721 | 10/03/16 | 37.11687 | 174.5513 | 61,928 | 31,667,561 | 2,445 | 38.57 | 79d 17h 19m | 25d 7h 56m | 22 | 12 | 1934 |
| M1 (1.9km) | - | 28/06/17 | -37.148 | 174.564 | - | - | - | - | - | - | - | - | - |
| M9 (2.8km) | - | 28/06/17 | -37.150 | 174.552 | - | - | - | - | - | - | - | - | - |
| M2 (8.0km) | POD2714 | 28/06/17 | -37.161 | 174.483 | 10,001 | 4,584,595 | 52 | 1.01 | 193d 22m | 193d 21m (99%) | 16 | 31 | 380 |
| | POD1533 | 15/11/17 | -37.161 | 174.483 | 354 | 44,199,805 | 1.55 | 0.02 | 227d 19h 27m | 227d 19h 26m (99%) | 1 | 1 | 8 |
| M3 (10.1km) | POD2715 | 28/06/17 | -37.165 | 174.459 | 1,816 | 5,313,358 | 9.40 | 0.20 | 193d 2h 11m | 193d 2h 10m (99%) | 16 | 33 | 75 |
| | POD1534 | 15/11/17 | -37.165 | 174.459 | 378 | 5,153,743 | 3.70 | 0.07 | 102d 2h 3m | 102d 2h 2m (99%) | 12 | 6 | 13 |
| M4 (12.1km) | POD2716 | 28/06/17 | -37.169 | 174.436 | 150 | 32,771,702 | 0.78 | 0.02 | 193d 2h 24m | 193d 2h 23m (99%) | 16 | 30 | 3 |
| | POD1560 | 15/11/17 | -37.169 | 174.436 | 56 | 30,763,506 | 0.54 | 0.01 | 101d 2h 11m | 101d 2h 10m (99%) | 16 | 30 | 1 |
| | POD1796 | 04/05/18 | -37.169 | 174.436 | 140 | 74,365,735 | 1.12 | 0.04 | 124d 16h 25m | 124d 16h 24m (99%) | 14 | 4 | 0 |
| M5 (14.1km) | POD2722 | 28/06/17 | -37.173 | 174.413 | 0 | 31,888,354 | 0.00 | 0.00 | 180d 21h 28m | 180d 21h 27m (99%) | 15 | 22 | 0 |
| M6 (16.1km) | POD1796 | 28/06/17 | -37.177 | 174.390 | 0 | 74,431,350 | 0.00 | 0.00 | 191d 7h 44m | 191d 7h 43m (99%) | 14 | 25 | 0 |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | POD1559 | 15/11/17 | -37.177 | 174.390 | 41 | 107,017,429 | 0.23 | 0.02 | 180d 3h 38m | 180d 3h 37m (99%) | 15 | 9 | 0 |
| | POD1797 | 04/05/18 | -37.177 | 174.390 | 0 | 71,582,685 | 0.00 | 0.00 | 102d 6h 43m | 102d 6h 42m (99%) | 15 | 3 | 0 |
| M7 (18.2km) | POD1797 | 28/06/17 | -37.181 | 174.366 | 0 | 21,254,665 | 0.00 | 0.00 | 105d 5h 31m | 105d 5h 30m (99%) | 13 | 29 | 0 |
| | POD1298 | 15/11/17 | -37.181 | 174.366 | 14 | 31,912,338 | 0.13 | 0.01 | 104d 23h 36m | 104d 23h 35m (99%) | 11 | 2 | 0 |
| | POD1781 | 04/05/18 | -37.181 | 174.366 | 0 | 84,774,150 | 0.00 | 0.00 | 103d 44m | 103d 43m (99%) | 14 | 4 | 0 |
| M8 (19.9km) | - | 28/06/17 | -37.185 | 174.343 | - | - | - | - | - | - | - | - | - |
| Awakino | POD2714 | 07/12/18 | -38.40 282 | 174.36 021 | 381 | 8,842,042 | 2.10 | 0.03 | 181d 22h 59m | 181d 20h 3m (99%) | 18 | 5 | 9 |
| Tongaporutu | POD2721 | 18/11/16 | -38.48 907 | 174.34 255 | 0 | 63,745,369 | 0 | 0 | 123d 8m | 101d 3h 11m | 17 | 1 | 0 |
| | POD2720 | 15/01/18 | -38.48 907 | 174.34 255 | 1,169 | 8,502,305 | 10.25 | 0.10 | 138d 2h 22m | 114d 44m (82%) | 18 | 5 | 44 |
| | POD2720 | 09/07/18 | -38.48 907 | 174.34 255 | 475 | 6,782,063 | 0.9 | 0 | 157d 19h 50m | 105d 23h 57m (67%) | 16 | 6 | 0 |
| | POD2722 | 07/12/18 | -38.48 907 | 174.34 255 | 0 | 3,337,588 | 0 | 0 | 130d 1h 34m | 130d 1h 33m (99%) | 19 | 12 | 0 |
| Parininihi | POD2718 | 09/07/18 | -38.52 737 | 174.30 569 | 0 | 33,543,903 | 0 | 0 | 59d 19h 58m | 10d 20h 5m (18%) | 9 | 49 | 0 |
| | POD2721 | 06/12/18 | -38.52 737 | 174.30 569 | 0 | 107,232,670 | 0 | 0 | 30d 9h 59m | 25d 12h 25m (83%) | 19 | 2 | 0 |
| Motunui | POD2718 | 15/02/18 | -38.58 146 | 174.17 814 | 0 | 77,406,789 | 0 | 0 | 138d 2h 39m | 113d 23h 54m (82%) | 18 | 2 | 0 |
| Taranaki Airport | POD2721 | 18/11/6 | -38.58 965 | 174.10 738 | 0 | 63,745,369 | 0 | 0 | 123d 8m | 101d 3h 11m | 17 | 1 | 0 |
| Tapuae | POD2716 | 07/12/18 | -39.03 566 | 174.00 552 | 26 | 9,320,351 | 0.2 | 0.01 | 130d 2h 7m | 130d 2h 6m (99%) | 19 | 15 | 0 |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Whanganui River | POD2719 | 21/12/16 | -39.56 613 | 174.57 395 | 0 | 4,347,236 | 0 | 0 | 95d 23h 21m | 95d 15h 29m (99%) | 18 | 12 | 0 |