Research Strategy and Toxoplasmosis update

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27 October 2022

Department of Conservation
Te Papa Atawhai

New Zealand Government

New Zealand’s Hector’s and Māui dolphin populations are resilient and thriving throughout their natural range

Ensure Hector’s and Māui subpopulations are thriving or increasing, supported by an enduring, cohesive, and effective threat management programme across New Zealand

Hector's and Māui dolphin Threat Management Plan

How we protect the dolphins: TMP science objectives

- Improve knowledge of anthropogenic threats to Hector's and Māui dolphins.
- Identify and prioritise new research and management measures, to inform management responses to threats to the dolphins.
- Reduce the risk to the dolphins from the parasite *Toxoplasma gondii* to near zero.

Hector's and Māui Dolphin Research Strategy 2021

Annual review

- The 2022 review has been undertaken internally by DOC and MPI and the Research Strategy is still considered fit for purpose.
- Following the Minister for Oceans and Fisheries recent decisions on the South Island fisheries measures, the upcoming IWC review of the TMP risk assessment, and delivery of research results over 2022 and 2023, it is envisaged that a more in-depth review of the strategy will be appropriate towards the second half of 2023.
- We are proposing to conduct this more in-depth review at a workshop in August 2023.

Hector's and Māui Dolphin Research Strategy 2021

Annual review

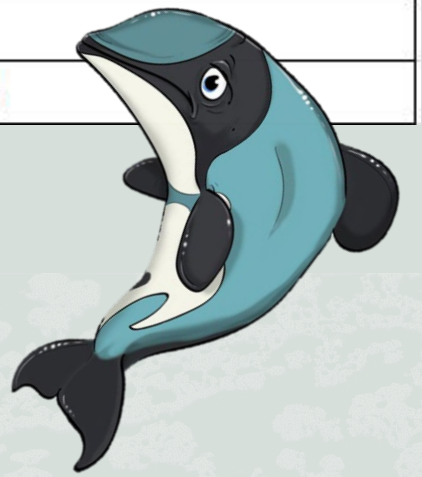
- We are aware that the Research Strategy does not incorporate mātauranga Māori, or address partnership aspirations with Māori.
- This is an area that needs development, and that must happen in partnership with Māori.
- We are looking to encourage discussion on this through this forum and the proposed new South Island Forum, as well as through other engagement we undertake through the TMP.
- Budget 2022 funding for Toxoplasmosis work that will come online in 2023 offers new opportunities.

Hector's and Māui Dolphin Research Strategy 2021

Annual review

- We have updated our website to reflect research progress against the Research Strategy. As new research is completed it will be added here.
- https://www.doc.govt.nz/our-work/protecting-species/protecting-marine-species/our-work-with-maui-dolphin/maui-dolphin-research/
- Some pieces of work have suffered delays because of ongoing impacts of Covid-19
- New research on tourism impacts, and consideration around emerging threats will be areas to consider as part of the review in 2023.

Updated Genetic analysis of Hector's dolphin samples within NZCeTA
Population estimate for Hector's dolphins from Otago using photo ID
Revealing Māui diet through stable isotope analysis of samples from biopsy
Revealing Hector's dolphin diet from top of the South Island through stable isotope analysis of samples from biopsy
Necropsy programme
Improving the estimation of population risk to Hector's and Māui dolphins (*Cephalorhynchus hectori*) using carcass data, focussing on toxoplasmosis
Improving age estimation of Hector's and Māui dolphins from tooth samples
Sample collection, Laboratory preparation, storage, and archiving of tissues for Toxoplasma related disease screeening
Extraction of high quality DNA from existing samples from vulnerable Hector's and Māui dolphin population
Examination of kinship relationships in Māui dolphin population through ddRAD sequencing.
Novel technologies to monitor Māui and Hector's dolphin abundance, spatial distribution, behaviour, and/or reproductive success.
Novel technologies to mitigate the risk of dolphin capture in inshore trawl fisheries
Local-scale spatial distribution modelling of Hector's dolphins in key areas, to improve risk management



TMP project list

International Whaling Commission

Review

- The IWC Scientific Committee has offered to assemble a group of independent experts to review the Maui dolphin science and government agencies have committed to funding it.
- Our intent is to use this review to ensure that future management decisions continue to be supported by the best available information.
- The exact timing of the conclusion of the review is dependent upon the scheduling of the next in-person IWC Scientific Committee meeting, which we should know about soon.

Toxoplasmosis

Update

- DRAFT Hector's and Māui Dolphin Toxoplasmosis Science Plan 2021
- Budget 2022 –$4.88 Million for 3 years from July 2023
- Coordination
- Research
- Mātauranga
- Trialling management solutions

Hector's and Māui dolphin Toxoplasmosis Science Plan

Summary

- The plan provides a framework for all researchers, partners, and government agencies to understand the priority needs for research for the management of the parasite *Toxoplasma gondii* and the disease toxoplasmosis.
- Emphasising the urgent need to reduce the risk to Māui dolphins from the parasite.
- The plan also demonstrates the need to coordinate research activities.
- Guide investment

Theme	Priority research
1. Magnitude of the risk of toxoplasmosis in Hector's and Māui dolphins?	Improve understanding of the parasite in the dolphins through recovery of dead bodies for necropsy.
2. Risk factors for T. gondii infection in Hector's and Māui dolphins. What increases the risk?	Develop tools for the detection and quantification of oocysts in the environment, particularly in aquatic systems, and conduct spatial analyses to identify spatial and temporal 'hot spots'.
3. Understanding the T. gondii genotypes: presence, distribution, and prevalence in NZ and the genotype(s) fatal to dolphins	Increase knowledge of T. gondii genotypes in the New Zealand context – particularly within the Waikato and Manukau catchments, and coastal environment (including infective prey).
4. Understanding cats and their role in the spread of T. gondii and the opportunities for management	Improve knowledge of feral and domestic cat populations – abundances, distribution, their relative oocyst shedding rates, and genotypes of T. gondii they carry.
	Develop appropriate tools to manage the different cat category populations at different scales.
	Improve understanding of feral and domestic cats and their pest prey to improve management for controlling the T. gondii parasite
5. Characterising and monitoring potential control/mitigation methods and broader questions	Develop an understanding of the total economic burden of Toxoplasmosis to New Zealand

Questions

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