

# The Toxoplasmosis Programme

## Addressing the threat of toxoplasmosis to Māui dolphins

### Why are we investing funding in Toxoplasmosis?

Toxoplasmosis is a recognised cause of death for Māui and Hector's dolphins, and it is unmanaged and poorly understood. Apart from death, infection with the parasite may also cause sub-lethal conditions in dolphins, resulting in them being more vulnerable to other threats.

Māui dolphins are at critical risk of extinction and have been classified under the New Zealand Threat Classification System as Nationally Critical; there are only an estimated 54 adults left. While the Māui dolphin's future is precarious, experts consider the dolphin can still be saved if additional management actions are taken promptly to address human-induced threats.

Since 2008, significant progress has been made in managing key threats, including set net and trawl fishing. Management of fisheries risks is ongoing including through on-vessel cameras in the inshore fleet. However, continued population decline, and eventual extinction, of the Māui dolphin is expected if the threat from toxoplasmosis is not reduced.

The overarching goal of the Department of Conservation's Toxoplasmosis Programme is to reduce the extinction risk for Māui dolphin from toxoplasmosis. Toxoplasmosis is a disease caused by the parasite *Toxoplasma gondii*. The parasite can only reproduce in the gut of cats, and the parasite's eggs (oocysts) are released into the environment in cat faeces. Other animals (e.g., sheep, mice) can carry the parasite, but do not shed the parasite's eggs into the environment.

The parasite's eggs can persist in the environment for at least two years and may be transported long distances from their source. Runoff from land transports the eggs from cat faeces into the marine environment through streams, rivers, and stormwater systems. Dolphins are likely infected with the parasite after they ingest food or water contaminated with oocysts.

The Toxoplasmosis Programme is carrying out studies to better understand the options and pathways to reducing, controlling, or limiting oocyst loading into dolphin habitat. These studies will inform the delivery of programmes that will be put in place with support from iwi, experts, stakeholders, and the public.

### How the Science Plan was developed

A series of workshops were held with stakeholders, and dolphin and toxoplasmosis experts in 2020 and 2023 aiming to refine research objectives and prioritise research gaps (workshop reports available [here](#)). The resulting draft [Hector's and Māui dolphin Toxoplasmosis Science Plan 2021](#) provides guidance to decision makers in DOC on the direction and focus of the science work of the Budget 22-funded Toxoplasmosis Programme. Ongoing communication with experts (via the Technical Advisory Group), stakeholders and a governance group will ensure the science programme remains robust and relevant.

## Summary of the Toxoplasmosis Programme’s research

Theme	Research priorities
Magnitude of the impacts of toxoplasmosis to Hector’s and Māui dolphins?	<ul style="list-style-type: none"> <li>• Increase the understanding of the parasite (<i>Toxoplasma gondii</i>) in the dolphins through recovery of dead bodies for necropsy</li> <li>• Increase the recovery rates of dead dolphins</li> </ul>
Risk factors for <i>Toxoplasma gondii</i> infection in Hector's and Māui dolphins. What increases the risk?	<ul style="list-style-type: none"> <li>• Develop tools for the detection and quantification of the parasite eggs (oocysts) in the environment and conduct spatial analyses to identify spatial and temporal parasite ‘hotspots’.</li> </ul>
Understanding the <i>Toxoplasma gondii</i> genotypes: presence, distribution, and prevalence in NZ and the genotype(s) fatal to dolphins	<ul style="list-style-type: none"> <li>• Increase understanding of the risk of <i>Toxoplasma gondii</i> genotypes in the New Zealand context – in catchments and coastal environment (including infective prey).</li> <li>• Optimise sampling and detection of toxoplasma from environmental matrices.</li> </ul>
Understanding cats and their role in the spread of <i>Toxoplasma gondii</i> and the opportunities for management	<ul style="list-style-type: none"> <li>• Improve knowledge of owned and un-owned (feral and stray) cat populations – abundances, distribution, their relative oocyst shedding rates, and genotypes of <i>Toxoplasma gondii</i> parasite they carry.</li> <li>• Develop appropriate tools to manage the different cat category populations at different scales.</li> <li>• Improve understanding of feral and domestic cats and their pest prey to improve management for controlling the <i>Toxoplasma gondii</i> parasite.</li> </ul>
Tools to evaluate management	<ul style="list-style-type: none"> <li>• Develop tools to evaluate effectiveness of management intervention.</li> </ul>
Partnerships and Governance	<ul style="list-style-type: none"> <li>• Develop adaptive governance structures for addressing the Toxoplasmosis issue.</li> <li>• Co-develop a programme of work with iwi that empowers iwi aspirations to develop initiatives for the protection of the dolphins and ki uta ki tai conservation towards reducing oocyst loading to the marine environment.</li> </ul>