

2022 research priorities – Postgraduate Scholarships.

The priorities for this year are listed under the five outcomes taken from Te Mana o te Taiao | Aotearoa NZ Biodiversity Strategy 2020. The scholarship applicants will need to ensure that their research addresses one or more of these priorities.

We welcome either a mainstream science and/or Mātauranga Maori approach to any of the research priorities below.

Outcome 1: Ecosystems, from mountain tops to ocean depths, are thriving

Key theme: Ecosystem protection

1. Application of seafloor photogrammetry for habitat mapping, habitat characterisation, and determining habitat/species distributions
2. Role of fire in non-forested threatened ecosystems (e.g., shrub and grassland)
3. Increased sedimentation as a driver of change in ecosystems at the terrestrial-aquatic interface (particularly freshwater and coastal environments classed as 'significant')
4. Honeybee impacts on threatened native insects and ecosystems
5. Better tools for surveillance and monitoring (e.g., eDNA and detection dogs) of pest species (e.g., cats, koi carp)
6. Better tools for control/eradication (e.g., non-target impact of toxins) of pest species (e.g., sea urchins, *Caulerpa*)
7. Vegetation responses following weed control
8. Extent of impact of a particular pressure (e.g., feral pigs) to threatened ecosystems

Outcome 2: Indigenous species and their habitat across Aotearoa NZ and beyond are thriving

Key theme: Species protection

9. Best practice and efficient ways to propagate and/or translocate nationally threatened plant species
10. Improving our understanding of the ecology and threats of Nationally Critical species
11. Testing adaptive management tools for our 'species on the brink' with a focus on small-bodied fauna (e.g., lizards, large invertebrates)
12. Control methods for pest species that are not included in Predator Free 2050 (aquatic/ terrestrial weeds, invasive freshwater fish, wasps, feral cats, feral pigs, hedgehogs, mice)
13. Outcome monitoring tools for threatened cryptic or data-deficient species
14. Enhanced spatial and temporal resolution & remote sensing/tracking of our threatened species – especially low-carbon methods (e.g., data networks, drone tracking)
15. Using eDNA for demographics and individual monitoring (e.g., species of interest, pest detection, non-target effects of control tools, PAPP)
16. Development of new technologies/techniques for monitoring and management of existing/emerging diseases in our threatened species

17. Determining the environmental tolerances around threatened freshwater species (e.g., flows, contaminants, habitat loss)

Outcome 3: People's lives are enriched through their connection with nature

Key theme: Human/cultural dimension

18. Better understanding of how the human dimensions (e.g., attitudes, values, behaviours) of pet ownership (e.g., cats, dogs) influence pet-wildlife interactions
19. Development and application of human dimensions research to better connect nature conservation goals with urban values
20. Cultural caring capacity at place - kaitiaki (how to establish, monitor and report on this concept)
21. Collaborative development of communication and messaging between laypeople and experts (around risk and behaviour messaging)
22. Whitebait compliance behaviour
23. Measuring the cultural, social, and economic benefits/enrichment from restored river systems
24. Direct impact on threatened species through anthropogenic emissions (e.g., sound, light, waste)
25. How compliance and law enforcement efforts translate into ecological benefits for ecosystems
26. Quantifying the socio-economic value of Marine Protected Areas (MPA), including for fisheries management in a New Zealand context

Outcome 4: Treaty partners, whānau, hapū and iwi are exercising their full role as rangatira and kaitiaki

Key theme: Mātauranga Māori and governance

27. Exploring how the DOC/iwi engagement model is working for iwi (connecting to work that is already underway at DOC)
28. Impact of the "[WAI 262 Best Practice Guide \(external site\)](#)" on DOC's research partnerships
29. Enhanced understanding of the resilience of mahinga kai and taonga species, and pathways to recovery
30. Evaluating DOC's partnership model with mana whenua for our Nga Awa (priority river restoration) and Migratory Species programmes
31. Understanding Section 4 implementation of the Conservation Act (giving effect to te Tiriti) – how has DOC's approach changed since the landmark case *Ngai Tai ki Tamaki v Minister of Conservation* and what have any such changes delivered and why?

Outcome 5: Prosperity is intrinsically linked with thriving biodiversity

Key theme: Climate change and ecosystem services

32. Assessment of the vulnerability of major components of coastal ecosystems (e.g., tidal wetland ecosystems, beaches) to sea-level rise and confining development and infrastructure (e.g., coastal hardening)
33. Develop and test conceptual models for how protected areas reduce harmful effects of non-climate stressors so that healthy ecosystems can better withstand climate impacts

34. Evaluate how biological communities respond to marine heatwaves (which taxa have positive, negative, or neutral responses, and the timescales of response)
35. Model marine species' environmental requirements and map changes in their distributions through space and time in response to climate change predictions
36. Exploring how combined 'climate change' and 'conservation' messages support biodiversity outcomes
37. Potential for restoring conservation land to achieve biodiversity and climate outcomes (especially peatlands/wetlands)
38. Forecast terrestrial/aquatic weed distribution under climate change
39. Map marine ecosystem services and develop richness analyses to identify areas that support a greater or lesser delivery of ecosystem services

Research Priorities of our partners

Environmental Protection Authority (EPA) Priorities

40. Better understand the species missing from eDNA reference libraries that would aid in assessing changes to the marine environment in response to permitted activities in the Exclusive Economic Zone. Identification of priority species missing from reference databases and sequencing of DNA.
41. Review the evidence for the use of specific colours in vertebrate toxic agents to minimise off-target impacts on other species.
42. Use of spatial information on land use, topography and climate to improve ecotoxicological modelling of the environmental fates of chemicals in New Zealand
43. Chemical fate and compost – characterising hazardous substances in commercially produced compost and assessing impacts on food production.
44. Review the use of social impact assessment in consenting processes in New Zealand

Kauri Protection priorities – Biosecurity NZ - MPI

Funding will be offered to an applicant in the following thematic areas related to building a bridge between research and operational management for the protection of kauri:

45. Surveillance, detection, diagnostics and pathways of the pathogen *Phytophthora agathidicida* and disease of kauri
46. Biology of kauri and *Phytophthora agathidicida*
47. Ecosystem impacts of diseased kauri
48. Te Ao Māori approaches to understanding and managing *Phytophthora agathidicida* and disease of kauri
49. Building public/community engagement and social license specific to kauri ora goals
50. Control and management of *Phytophthora agathidicida* and disease of kauri