



SCIENCE COUNTS!

The Department of Conservation's Strategic Science and Research Priorities

2011–2016



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Foreword

In 2001 the Department of Conservation (DOC) launched *Science Counts!* to provide a clear framework for DOC's scientific research directions and needs. Two further editions were published in 2002 and 2003 (see www.doc.govt.nz/publications/science-and-technical/products/leaflets-and-factsheets).

Science Counts! includes information on consolidated national strategic science and research portfolios, programmes and priority actions. Furthermore, it intends to illuminate a way for external science purchasers and providers to identify where DOC, as a key stakeholder and end-user, is heading in order to secure investment and capability synergies. This has been a success, with *Science Counts!* proving useful in the mapping of research priorities to establish the Foundation for Research, Science and Technology's (FRST) Outcome-Based Investments, all eight of which had DOC as a foundation partner.

It is timely to update our current priorities given recent changes to the New Zealand science system. These changes included the CRI (Crown Research Institute) Taskforce implementation exercise, the amalgamation of the Ministry of Research, Science and Technology (MORST) and FRST into a new Ministry of Science and Innovation (MSI), plus DOC's own strategic re-positioning. While the strategic horizon is 5 years, most actions will deliver to a 10-year outcome target.

DOC has developed an Outcomes Model that links DOC's activities, including research and evaluation, to outcomes, through combined outputs and outcome objectives. The science and research priorities identified here are mapped against the relevant research and evaluation clusters in the model. These clusters circumscribe the drivers of research in each sector. Linkages are also made here with the relevant MSI Investment Classes (taken from FRST's Environment Sector Investment Plan 2010–2012).

DOC is obliged to give effect to the principles of the Treaty of Waitangi through Section 4 of the Conservation Act 1987 and, consistent with FRST's Vision Mātauranga Strategy (www.frst.govt.nz/funding/research/visionmatauranga), DOC will explicitly develop and link its research to priority areas that contribute to unlocking the innovation potential of Māori knowledge, resources and people.

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Natural Heritage

1 Understanding and managing agents of biodiversity decline and change

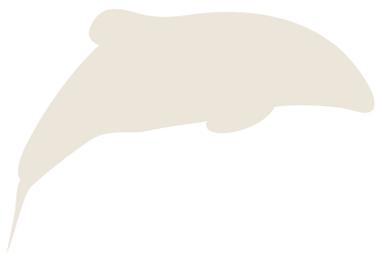
This will be achieved through:

- 1.1 New tools for invasive freshwater fish and weed surveillance, control and eradication¹
- 1.2 New, innovative and socially acceptable tools to detect and kill mammal pests and weeds (mechanical, chemical, genetic)²
- 1.3 Monitoring methodologies of toxin impact on non-target species²
- 1.4 Techniques to transform weed-dominated landscapes to native-dominated landscapes²
- 1.5 Safety and efficacy outcomes of aerial pest control in terrestrial and aquatic environments^{2,3}
- 1.6 Assessing implications of a changing climate on biodiversity and adaptive management measures⁴
- 1.7 Identifying and modelling climate change impacts on key sites (e.g. coastal, freshwater and alpine ecosystems) and species, and assessing potential adaptation responses, e.g. increases in pest abundance and range⁴
- 1.8 Monitoring rates of change that exceed adaptive capacity of both species and ecosystems⁴
- 1.9 Meeting of minds and hearts: engaging critics in pest control planning and the application of new technologies²
- 1.10 Distinguishing between anthropogenic and natural agents of change and interpreting cumulative effects^{3,4}

2 Developing classification systems and measurement and assessment methodologies to enhance reporting on biodiversity change

Systems and methodologies include:

- 2.1 National and local scale status and trend measures for organisms other than birds and mammals²
- 2.2 New detection and monitoring techniques for high priority taxa²
- 2.3 Innovative measures or proxies of biodiversity condition that facilitate local, regional, and national reporting of trends and responses to changes in land and water-use, and biodiversity management^{2,3}
- 2.4 Developing minimum area, quality or ecosystem intactness indicators for the retention of necessary biodiversity and ecosystem services²
- 2.5 Identifying potential marine indicator species, or factors, to assist monitoring of status and trend, ecosystem function and condition³
- 2.6 National approaches to the design and establishment of marine reserve and marine protection networks, and criteria for assessing effectiveness³



3 Establishing the linkages between biodiversity, ecosystem services and prosperity

These include:

- 3.1 Explicit linkages between biodiversity, ecosystem processes, ecosystem services and the benefits to human wellbeing and prosperity¹
- 3.2 Resilience and ecosystem service provision in estuaries and near coastal ecosystems, and how this links to human wellbeing and prosperity³
- 3.3 Disturbance regimes in seral landscapes and the consequences for ecosystem services²

4 Improving tools and practices to manage species and ecosystem outcomes

This will be achieved by:

- 4.1 Improving restoration and rehabilitation methodologies for wetlands and threatened fish¹
- 4.2 Defining critical low-flows and water abstraction implications to threatened ecosystems and species¹
- 4.3 Improving how the management of species and ecosystems is prioritised, and improving optimisation methodologies for performance and responses to persistent or emerging pressures¹
- 4.4 Developing in-situ, real-time environmental monitoring technologies¹
- 4.5 Developing a generalised freshwater ecosystem recovery model that evaluates stability through resilience¹
- 4.6 Applying cost/benefit assessment methodologies to biodiversity scenarios of changing land and natural resource use^{1,3}
- 4.7 Undertaking integrated modelling of the long-term persistence of threatened species and habitats²
- 4.8 Developing models and methodologies for enhancing ecosystem resilience and restoration, including exploring ecological thresholds²
- 4.9 Evaluating phylogenetic diversity at the ecosystem and landscape level and demonstrating its value in rebuilding indigenous biodiversity²
- 4.10 Using reproductive technologies to increase productivity of threatened taxa²
- 4.11 Identifying biodiversity hotspots in marine habitats and performing inventories on these sites³
- 4.12 Developing frameworks for functional connectivity to achieve a 'mountains-to-sea' catchment approach that identifies implications for management³
- 4.13 Initiating a comprehensive threat inventory of, and develop a mapping system for, marine and coastal waters (including invasive species, diseases, and sedimentation)³

5 Connecting community, tangata whenua and business expectations, and opportunities

This will be achieved by:

- 5.1 Encouraging green development: providing methodologies to mobilise private sector investment to mitigate biodiversity loss¹
- 5.2 Defining ways in which conservation land and biodiversity each benefit from national carbon accounting^{3,4}
- 5.3 Promoting the value and economic benefit of conservation to New Zealanders, including knowledge, attitudes, awareness, barriers to change¹
- 5.4 Coming up with ways to encourage businesses, communities and individuals to provide more recreation opportunities on public conservation land
- 5.5 Developing indicators to assess how much visitor activities and destinations benefit communities, individuals and conservation



Recreation



6 Increasing conservation's role in recreation and tourism

This will be achieved through:

- 6.1 National approaches to understanding visitor demand for recreation and tourism and the expectations of recreation customers
- 6.2 Using outcome evaluation and methodologies to assess visitor satisfaction and the delivery of products and services
- 6.3 Finding out what it takes to get people involved in conservation activities and what barriers exist to participation
- 6.4 Evaluating the accessibility of destinations and other factors affecting the quality of a visitor's experience

Historic Heritage

7 Understanding the importance of heritage places that DOC manages

This will be achieved by:

- 7.1 Assessing the relative heritage value within a group of comparable heritage sites

8 Applying best practice management of heritage places

This will be achieved by:

- 8.1 Developing guidance on interpretation and monitoring of the condition of heritage materials such as concrete, timber and metal
- 8.2 Analysing trends and performance in heritage preservation technology

9 Assessing the public's engagement in heritage places

Engagement will be assessed through:

- 9.1 Trends and effectiveness of visitor engagement at heritage sites

Corporate Social

10 Assessing social research needs in support of organisational development

This will be achieved through:

- 10.1 Understanding the needs of Commercial Business Unit customers and stakeholders and barriers to the interpretation of the Core Conservation Message
- 10.2 Supporting investigations around key organisational strategic programmes such as the Business Improvement Programme
- 10.3 Undertaking futures scenarios on prioritisation and value for money
- 10.4 Further development of DOC's Outcomes Model, Education Strategy 2010-2030 and Plan Blue
- 10.5 Building relationships with tangata whenua in a post-Treaty settlement world

References

Ministry of Science and Innovation Investment Classes

- 1 Land and Freshwater Resources
- 2 Terrestrial (land-based) Ecosystems
- 3 Marine Ecosystems
- 4 Climate and Atmosphere

