



Manaaki Whenua
Landcare Research

2018
-23

STATEMENT OF CORPORATE INTENT



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Statement of Corporate Intent 2018–2023

Landcare Research New Zealand Limited (Manaaki Whenua)

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He Kupu Whakamihi

Ki o tātou tini mate kua wheturangitia ki te pō, moe mai rā i te okiokinga roa. Ki a tātou e mahue mai nei ki te ao tūroa hei manaaki tonu, hei tiaki tonu i te whenua me ngā momo koiora kanorau katoa o runga, tēnā tātou katoa. Anei e whai ake nei te Tauākī Whakamaunga Atu a Manaaki Whenua mo ngā tau e haere ake nei (2018–2023).

To those that have gone before us and who now adorn the night sky as stars, we acknowledge you and trust you rest easily in the long sleep. To those of us who still reside here in the world of the living and who continue to nurture and care for the whenua and the many and varied life forms upon it, we acknowledge and greet you also. We present here the Statement of Corporate Intent for Manaaki Whenua for the years 2018–2023.

Chair and CEO overview

Introduction

We are pleased to introduce our Statement of Corporate Intent (SCI) for the period 2018–2023. It sets out how we will achieve our purpose – ‘science for our land and our future’ – and in doing so work with the Government and our key partners to achieve their ambitions and goals.

We have embarked on the strategic pathway set out in our 5-year strategic plan for 2017–2022, Strategy 22, in which we aim to be:

- respected and valued nationally and globally for the excellence and relevance of our research
- a credible and trusted voice contributing evidence in matters of public concern
- recognised for tackling hard issues and science, and for being innovative, responsive and adaptable in our approach
- an employer of choice, attracting and retaining exceptional talent
- a preferred partner of Māori
- a household name, known for unique stories that inform, inspire and engage the public
- an integrator, skilled in bringing together multidisciplinary teams and stakeholders to solve complex issues
- financially sustainable and using integrated reporting against our sustainable development goals.

Impact, outcomes and partners’ priorities

Our approach is partnering for impact, and our partners are the New Zealand Government (our owners), the science sector, Māori, industry and the public. We know that science and research alone cannot deliver social impact: we need to work alongside our partners and play leading, challenging, informing and supporting roles. The outcomes of our science and research must be timely and fit for purpose – from engaging public groups, to playing a role in global scientific efforts directed at global challenges that affect New Zealand, such as climate change.

We will work to support our partners’ priorities in the areas of:

- climate change mitigation and adaptation, and transition to a low-carbon economy
- regional strengths, both current and potential, building on natural capital, ecosystem services and land-use potential
- innovative solutions for our industries, enabling them to operate within environmental limits and address market and community expectations
- innovative technologies, including those sourced from our indigenous biodiversity and novel land uses

- effective response to biosecurity incursions, and resilience to weed, disease and pest impacts
- freshwater quality and related land uses.

Science goals

We are committed to enhancing our science and research through co-innovation with our partners, with a focus on:

- innovative and challenging science that pushes boundaries for ourselves and our partners, and addresses the increasing complexity of the challenges faced by society (e.g. climate change, new technologies, uncertainty and social licence)
- valued and trusted science that is sought out by our partners and developed with them to add value to our environment, communities and economy
- strategic and integrated science that links across partners and disciplines, and embraces larger scales (in time and space)
- science and research that are engaged with all New Zealanders, through Citizen Science and enhanced two-way communication
- science that engages with mātauranga Māori (traditional knowledge) to enrich our mutual understanding and sustainable use of natural resources.

Science capability

Crown Research Institutes hold two-thirds of the nation's publicly funded science and research capability outside of the health and ICT sectors. Manaaki Whenua takes seriously its responsibility to maintain and grow capability, both in science and in research, in areas of national priority. Our recent capability growth (12% in full-time equivalents) has been possible because of the revenue growth from our principal customers. We will continue to address skill succession as staff retire; gender, age and cultural diversity; and the development of skills in areas of new science and technology. We will also invest in the leadership skills needed for effective collaborative, multi-disciplinary and complex programmes.

Partnerships

The majority of our work is conducted in multi-organisation contracted collaborations. New entities are taking collaboration to a new level in New Zealand science. Special examples are the National Science Challenges (NSCs), which are preparing for their second period of 5-year investment (Tranche 2). Manaaki Whenua is proud to host the New Zealand's Biological Heritage NSC, whose goals are aligned with our own goals in the biodiversity and biosecurity areas. We will support this NSC through its transition to Tranche 2, with our Board and Executive working closely with the NSC Governance Group and management.

We also contribute to five other NSCs, to Predator Free 2050, and to the Lincoln Hub (He Puna Karikari). All are vehicles for new forms of collaboration and partnership that allow organisations to achieve more, faster, and more efficiently than through business-as-usual pathways.

Our concept of partnership under Strategy 22 also enables us to access complementary skills without the risk associated with internal investment in those new skills. Increasingly we bring our R&D skills into partnerships with operational and policy agencies, and team up with organisations that provide product development and commercial skills.

Māori engagement

We have research interactions with over 100 Māori entities and have developed our capacity for Māori-centred research by growing our group of Māori scientists and others with the confidence to work in a Māori environment. The number of our projects with high Vision Mātauranga content will continue to rise as we focus on growing skills in co-innovation with Māori groups. We value the

opportunities to work alongside Kāhui Māori groups in the NSCs, and with Māori groups at the centre of growing opportunities for the Māori economy and land development.

People and culture

We are a people business, and we depend on the scientific and relationship skills of our people. We are focused on building a culture that attracts, nurtures and celebrates these skills, and on providing a workplace that meets our people's needs and ensures they go home safe and well each day.

Infrastructure

Major infrastructure projects in the 2018–23 period include building and ICT developments to enhance our working environment and partnerships. Our Lincoln redevelopment project aims to create science- and research-friendly spaces that are also a destination for visiting and collaborating groups – from science, industry and the public – and that build on the Lincoln Hub collaboration. In parallel with the Lincoln redevelopment we are preparing a business case for the future of our site at Tamaki in Auckland, in collaboration with the Ministry for Primary Industries (MPI) and partners with whom we may co-locate in future.

Sustainability and global goals

Our business is sustainability, and our major contribution to sustainable development is through the impact of our science and research, and their value to our partners. Our subsidiary, Enviro-Mark Solutions Ltd (E-MS), provides services to a large number of clients in New Zealand and overseas to manage and certify their environmental performance. Carbon emissions managed under the E-MS programmes amount to three times New Zealand's total annual emissions.

Our science and research go beyond sustainability and operating within environmental limits, to proactively restoring natural capital and ecosystem services. Together with E-MS we are exploring the United Nations Sustainable Development Goals as a framework for us and other organisations to use for stocktake and planning strategies, goals, and progress towards a future that is not only sustainable but restorative.

Financial plan

The 5-year plan reflects a positive science market outlook with demand for support of government and other sector objectives. Manaaki Whenua will continue to maintain financial viability and flexibility while meeting our shareholding Ministers' financial expectations. Return on equity before investment varies between 7.4% and 10.3% during the 5-year period.

There is significant financial risk in the outcomes of major research bidding rounds, especially the MBIE Endeavour Fund. We mitigate this risk by developing funding proposals with high end-user engagement, high science excellence and high relevance.

The plan enables us to re-invest \$5.5 million over the period in driving performance through our Strategy 22 initiatives. We plan for an additional \$1 million per annum investment in future leadership capability, which will deliver science system benefits where leadership of complex multi-party and multi-disciplinary programmes is needed, as well as financial return for Manaaki Whenua.



Jane Taylor
Chairman



Dr Richard Gordon
Chief Executive

Strategic context

Operating environment

Several significant, system-level changes in the way New Zealand thinks about and manages its economy and natural resources have informed Manaaki Whenua's strategic direction and priorities. The changes are far-reaching, have major implications for the country's science needs for land use, and reflect both the new technologies available and the changing way New Zealanders think about and engage with science every day. Below we outline key influences shaping our strategy.

The environment in ascendance: In response to both growing societal concerns and strengthening market opportunities, government priorities include a suite of environmentally centred initiatives, with a focus on climate change, freshwater quality, and biodiversity protection (including active biosecurity management of high-impact plant diseases such as myrtle rust and kauri dieback). The Billion Trees initiative and several regional growth initiatives also have an environmental focus. All are areas aligned with Manaaki Whenua's core business, and they present opportunities to lead the thinking on, and deliver proactive solutions to, these major issues of the day.

Growing importance of the Māori economy and culture in our work: A recent report puts the size of the Māori economy at \$50 billion, with around one-third of that (\$15 billion) held by Māori collectives (including post-settlement governance entities, Māori land trusts and Māori incorporations). These assets are largely land based and concentrated in the primary industries. Manaaki Whenua is well placed to work with these entities to respectfully and authentically leverage mātauranga Māori and land-based assets for community well-being.

A renewed focus on well-being and higher living standards: New Zealand is now pursuing a more holistic approach to economic development focused on growing the country's human, social, natural, financial and physical capital, which together represent New Zealand's prosperity. Achieving higher living standards for New Zealanders and delivering intergenerational well-being will require a strengthened evidence base on all aspects of the environment that sustain life and human activity.

This shift aligns with the United Nations' Sustainable Development Goals and is likely to drive greater demand for high-quality data, along with research into the pressures on our environment and ways to reduce human impact. Manaaki Whenua has a leadership role to play in bringing together our own biophysical, social, economic and cultural research to support more effective assessments of our natural capital, and insights into how best to transition to a more sustainable future.

The rise of 'hard' ecological limits: New Zealand continues to transition from a focus on environmental regulation to protect human health, to one that also protects ecological values and natural capital through limit-setting. Manaaki Whenua has a key role to play to:

- ensure defensible, science-based limits are based on best knowledge
- provide independent, science-based assessment of whether ecological limits are being met in line with regulation
- understand how cumulative limits 'add up' in terms of New Zealand's environmental performance.

The rise of people-centred environmental decision-making, management and governance: Communities are increasingly involved in governance models, setting ecological limits and assessing the potential economic, social and/or cultural trade-offs involved in meeting those limits. Manaaki Whenua will have a key role in ensuring that the way integrated scientific information is presented supports community and iwi decision-making.

The rise of consistent, globally comparable environmental performance measures: New Zealand has committed to measuring and reporting on the state of and trends in its environment, as well as the effectiveness of conservation and resource management legislation, regulation, policy and operational

practices. Manaaki Whenua can lend its expertise to develop and implement indicators, methods, and reporting and assurance frameworks for government and, increasingly, to support primary sector and Māori landowner aspirations for sustainable land management.

The opportunity to diversify and 'NZ-ify' value streams from land: Rapid development of synthetic proteins (meat and milk) in offshore laboratories and plant-based proteins to respond to the growing need for vegan- and vegetarian-friendly protein sources is both a risk and an opportunity for New Zealand. The opportunity lies in enabling environmentally sustainable, higher-value primary sector production in traditional value streams, and helping identify new, diverse value streams from the land, including natural products, novel foods, and other bioactives developed from our native plants and other species.

Science sector trends

The rise of open data expectations: Globally and domestically data is increasingly seen as an asset that can unlock significant value. The Crown, shareholding Ministers and end-users in both the public and private sectors expect more open, accessible data to support open government and transparent decision-making, and to generate new value. Manaaki Whenua plays a leading role in open data, acting as a champion in the science system.

The rise of citizen science: The New Zealand public are increasingly using communication technology and social media to do their own science, including data collection and analysis. Citizen scientists and professional scientists can work together in support of national goals. The opportunity for Manaaki Whenua to engage with communities, iwi and young New Zealanders on major environmental challenges – and solve them together – is growing.

The rise of digital technologies: Informatics, complex modelling, and big data-driven and high-performance computing approaches can help deliver research in valuable new ways. Large-scale data collection and analysis are increasingly facilitated by new technology such as drones, LiDAR sensing, and remote-sensing methods. Manaaki Whenua will improve digital access to, and automated interpretation of, data from our collections, and investigate new artificial intelligence approaches to better mine the value of digitised biological information for biosecurity and conservation benefit.

The rise of molecular technologies: As an example, new gene-based technologies are having a major impact on research horizons across the science system. Given our high level of science excellence and our mission-led approach to research delivery, Manaaki Whenua will evaluate – and, where appropriate, adapt – these new technologies for New Zealand circumstances.

New Zealand's Biological Heritage National Science Challenge

New Zealand's economic, environmental and cultural prosperity are heavily dependent on our biological heritage, elements of which are in decline or at risk from exotic threats. The Biological Heritage NSC's mission is to reverse this decline through national partnerships that bring together researchers from across institutions and disciplines to transform the way we manage biodiversity, improve biosecurity, and enhance resilience to harmful organisms.

Manaaki Whenua is the host for the Biological Heritage NSC, which has a total of 18 collaborating parties. Challenge parties span the research community, government agencies, non-government organisations, business, Māori, and the public. Manaaki Whenua is contracted by the Ministry of Business, Innovation and Employment (MBIE) to deliver the Challenge's work programme. Over \$25 million was committed to the Challenge over the first 5 years (2014–19), with substantial further funding provided by Challenge partners, including Manaaki Whenua. We lead two of the three Challenge research programmes and provide operational support to the Challenge's governance and management.

Following a governance and management review, changes were made to how the Challenge uses its advisory groups. With the Challenge projects nearly all underway and funding allocated, the focus on

monitoring and review is increasing. The process will empower project teams to adapt their projects in response to initial progress and findings, and to changes in the external landscape (e.g. key initiatives like Predator Free 2050 and Biosecurity 2025, or new funding from industry, philanthropic organisations and other government programmes). This year will be important as the Challenge works with its parties to clarify research priorities and gaps to shape the direction of research aligned with the Challenge mission, and therefore build towards achieving its 'additionality', a key concept for this Challenge (www.biologicalheritage.nz).

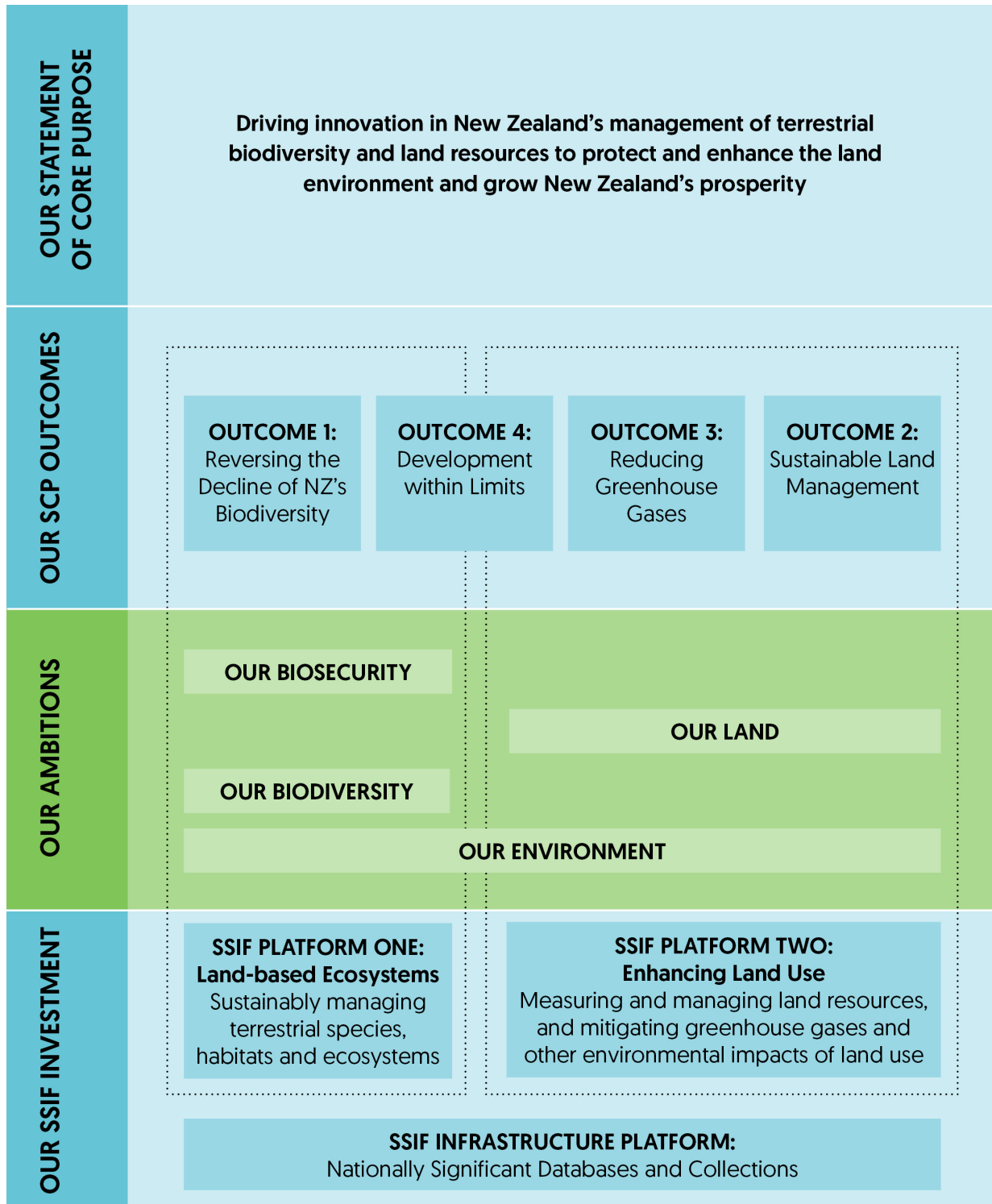
The Lincoln Hub – He Puna Karikari

The Lincoln Hub aims to deliver innovative, land-based research and precinct opportunities to grow a sustainable land-based sector, both in New Zealand and internationally. The Hub is a key part of Manaaki Whenua's strategy to increase our scientific impact through working with the primary sector as it aims to operate within environmental limits and meet the expectations of its customers and local communities. Our science and our experience with the regulatory environment are highly relevant to these needs. By working through the Lincoln Hub we seek to:

- secure project opportunities, including overseas, by working collectively with Hub partners and shareholders, beyond what can be achieved through the usual pathways
- enhance outcome benefits to New Zealand and financial return on investment for the shareholders
- enhance co-location at Lincoln of relevant global and New Zealand businesses at different stages of maturity (from start-ups to well-established organisations)
- secure investment capital as a result of the Hub accessing a wider suite of funder, investor and user connections.

We will continue to invest resources and effort to support Lincoln Hub initiatives to achieve these aims.

Manaaki Whenua's purpose and priorities



SCP = Statement of Core Purpose; SSIF = Strategic Science Investment Fund

Our vision

Kia matomato te tupu a Tāne, a Rongo, a Haumia-Tiketike

Let it be that the land and all its fruits may flourish

Acknowledging the unique and special relationship that Māori have with Aotearoa, their land and the environment, we draw on a uniquely Māori perspective of the world around us.

Tāne, Rongo and Haumia-Tiketike are tamariki (children) of Rangi, our sky father, and Papa, our earth mother. Together they hold dominion over the forests, cultivated and uncultivated food, and the land-based realms they exist within. If we use the land wisely, the domains of Tāne, Rongo and Haumia-Tiketike will be in balance. This concept of wise land use is a core purpose of Manaaki Whenua and is inherent in kaitiakitanga – custodianship of our natural taonga and resources for future generations.

Our purpose

Our land, our future

Tō tātou whenua, mō āpōpō

As an organisation of around 330 scientists, researchers and experts we are dedicated to ensuring New Zealanders have the knowledge, understanding and tools they need in order to live in harmony with this land – to enjoy its many gifts, preserve its unique diversity, and enrich it with creativity, care and culture.

Our Statement of Core Purpose (SCP) is to drive innovation in New Zealand's management of terrestrial biodiversity and land resources to protect and enhance the terrestrial environment and grow New Zealand's prosperity. Under the Crown's SCP for Manaaki Whenua, we are mandated to:

- improve the measurement, management and protection of New Zealand's terrestrial ecosystems and biodiversity, including those in the conservation estate
- achieve the sustainable use of land resources and their ecosystem services across catchments and sectors
- improve the measurement and mitigation of greenhouse gases in the terrestrial biosphere
- increase the ability of New Zealand industries and organisations to develop within environmental limits and meet market and community requirements.

Our ambitions

Delivering on our purpose means delivering exceptional research, science and technology spanning a wide array of disciplines. Our four ambitions for New Zealand are designed to present our work in a meaningful way that all New Zealanders can understand and support.

1. **Our Biodiversity:** We know, value and actively preserve our unique biota and ecosystems.
2. **Our Biosecurity:** Our land is protected from invasive biological threats.
3. **Our Land:** We use our land, soil and water resources wisely.
4. **Our Environment:** We are an environmentally informed nation taking action together.

External advisory panels

Our **Outcome Advisory Panel** consists of senior representatives from key stakeholder organisations in central and local government, industry and business, the primary sector and iwi, and is a key mechanism for ensuring our science direction is responsive to the needs of our major sector partners. The Panel meets with our Senior Leadership Team and provides high-level strategic advice to our Board of Directors.

Our **Science Advisory Panel** has an important role in evaluating scientific quality. The Panel meets annually to review our performance, future research directions and capability needs to ensure our research is both excellent and relevant, and that we are taking advantage of key developments in international science. Each year the Panel is asked to concentrate on specific areas for review. These reviews take place in advance of our annual review of the Strategic Science Investment Fund (SSIF) funding allocation.

Engaging with our partners

We engage regularly with our major sector partners through a variety of activities (e.g. Policy Link seminars, Regional Roadshows, joint workshops and hui, annual priority-setting processes), and through contributions on various sector advisory groups. These engagements are supplemented by formal co-design and co-innovation approaches that bring together major end-users with researchers early on to review and refine the proposed research direction and ensure it delivers on user needs.

Longer-term research direction

This year we have taken a new approach to setting our science direction to enable a longer-term view of our research, science and technology priorities, and to invest in them accordingly.

Using a structured 'intervention logic' framework we have a clearer line of sight between our everyday work and our Ambitions, and can easily sum up the benefits we deliver to New Zealand. We can also better articulate how our work contributes to relevant national priorities (including those set through the National Science Challenges) and societal outcomes, such as:

- use our land, water and soil resources in a resilient, sustainable and efficient manner
- confidence in our environmental credentials supports the economy
- new and diverse opportunities for land-based economies are realised
- make robust and integrated longer-term natural resource planning and investment decisions
- the mauri of the land is strengthened, enhancing the mana of tangata whenua
- protection and resilience of priority species, habitats and ecosystems are improved.

Our science direction for 2018/19 also reflects the priorities set in the Minister's Annual Letter of Expectations. Manaaki Whenua is working to contribute to the seven priority research areas identified:

- transitioning to a low-carbon economy by 2050
- innovative, knowledge-intensive technologies that could disrupt existing industries or create new ones
- regional strengths, both existing and potential
- resilience to natural hazards
- understanding climate change, its drivers and possible effects on New Zealand
- biosecurity challenges – countering kauri dieback and myrtle rust, and piloting alternatives to 1080
- improving the quality of New Zealand's freshwater.

In the next section we provide an overview of our research direction and 3-year research priorities for each of our four Ambitions for New Zealand.

Ambition 1 – Our Biodiversity

We know, value and actively preserve our unique plants, animals and ecosystems

Overview

Aotearoa has a rich biodiversity that is under threat from invasive species, climate change, land-use intensification and conversion, urban development, and other pressures. Discovering, protecting and restoring this precious taonga – our natural biodiversity and the ecosystems that support it – require exceptional science and infrastructure, real-world tools and solutions, and the support and participation of New Zealanders.

Our biodiversity is in decline. To reverse this trend, we must first better understand our native and introduced species. The biological Nationally Significant Collections and Databases hosted by Manaaki Whenua on behalf of New Zealand form an ever-growing repository of native and invasive species. The knowledge these assets contain underpins our ability to actively manage our biodiversity.

We work with the Department of Conservation (DOC), the Ministry for Primary Industries (MPI), regional councils, iwi, wildlife sanctuaries, non-governmental and community groups, and business to improve New Zealand's biodiversity management. We also contribute through major national initiatives, including the Biological Heritage, Deep South, and Resilience to Nature NSCs, with whom we have closely aligned our science direction and priorities.

SSIF investment in this area is anticipated to be \$7–8 million.

Relevant national priorities

Under this Ambition our research, science and technology contribute to the priorities and goals set out in the following strategies, policies, plans and initiatives:

- New Zealand Biodiversity Strategy (2000)
- Conservation and Environment Science Roadmap (2017)
- Environment Domain Plan (2013)
- National Environmental Reporting Act (2015)
- Regional Council Research, Science and Technology Strategy (2016)
- National Policy Statement for Freshwater Management (2014)
- New Zealand Antarctic and Southern Ocean Science Directions and Priorities (2010–2020)
- The Living Standards Framework (2015)
- NZ Open Data Charter (2018)
- Draft National Kiwi Recovery Plan (2017–2027)
- forthcoming draft National Policy Statement on Indigenous Biodiversity.

Ambition 2 – Our Biosecurity

Our land is protected from invasive biological threats

Overview

The unique diversity of life in Aotearoa and our ability to live off the land are constantly threatened by invasive weeds, pests and diseases. Controlling these threats and maintaining our biosecurity require vigilance, innovation and commitment.

Manaaki Whenua will need to be innovative and explore new and challenging areas of science to help meet TBfree, Predator Free 2050, and Biosecurity 2025 goals. Our research focuses on border security for early detection and prevention, and control methods for established invasive species, as well as control of mammalian pests. While innovative technologies can provide great opportunities, we recognise the need to understand the social licence for new and emerging control methods, requiring a focus on effective engagement with New Zealand communities.

The biological Nationally Significant Collections and Databases hosted by Manaaki Whenua on behalf of New Zealand form an ever-growing repository of native and invasive species, and underpin our ability to actively manage biosecurity threats and incursions.

We work with a wide range of government, Māori, community and private sector groups to achieve biosecurity goals for New Zealand, as well as contributing to major national initiatives such as Better Border Biosecurity and Predator Free New Zealand. Our science direction and priorities are closely aligned with the missions of several National Science Challenges, particularly the Biological Heritage NSC.

SSIF investment in this area is anticipated to be \$7–8 million.

Relevant national priorities

Under this Ambition, our research, science and technology contribute to the priorities and goals set out in the following strategies, policies, plans and initiatives:

- New Zealand Biosecurity Strategy (2000)
- Biosecurity 2025
- Predator Free 2050
- National Pest Management Plan for Bovine TB (2016)
- Primary Sector Science Direction (2017)
- Conservation and Environment Science Roadmap (2017)
- New Zealand Wilding Conifer Management Strategy (2015–2030)
- myrtle rust and kauri dieback management operations
- MPI Science Strategy (2016)
- Regional Council Research, Science and Technology Strategy (2016)
- various regional growth strategies and action plans
- Environment Domain Plan (2013)
- NZ Open Data Charter (2018).

Ambition 3 – Our Land

We use our land, soil and water resources wisely

Overview

Finding a healthy balance with our land and ecosystems is key to ensuring future prosperity. We can protect the health of our land, freshwater and soils even as we use them to thrive and grow as a nation.

Demand for information and new tools to support effective management of land resources in New Zealand is urgent and growing. Some of our most important natural resources have been over-allocated or have reached critical environmental thresholds because of unsustainable land-use practices. To improve how we use land and soil resources, New Zealand needs improved knowledge of the inherent variability and change of the land over time, across catchments and landscapes (natural, managed and urban). We must understand how the land responds to human pressures, potential limits to land-use intensification and other development, and what drives natural resource management decisions. This work closely aligns with the missions of several National Science Challenges, notably the Our Land and Water NSC.

New and improved tools are required to meet these challenges and support sustainable land management and resource allocation. This will improve the primary sector's economic and environmental performance, and support the provision of wider ecosystem services.

SSIF investment in this area is anticipated to be \$5–6 million.

Relevant national priorities

Under this Ambition our research, science and technology contribute to the priorities and goals set out in the following strategies, policies, plans and initiatives:

- various regional growth strategies and action plans
- He kai kei aku ringa – The Māori Economic Development Strategy and Action Plan
- Primary Sector Science Direction (2017)
- Conservation and Environment Science Roadmap (2017)
- MPI Science Strategy (2016) and other associated MPI strategies (e.g. soils, cadmium)
- Regional Council Research, Science and Technology Strategy (2016)
- The Living Standards Framework (2015)
- National Environmental Standards for Plantation Forestry
- National Policy Statement for Freshwater Management (2014)
- Environment Domain Plan (2013)
- National Environmental Reporting Act (2015)
- The New Zealand Story
- NZ Open Data Charter (2018).

Ambition 4 – Our Environment

We are an environmentally informed nation taking action together

Overview

New Zealanders are proud of our clean, green image and aspire to lead the world by example, but we are increasingly aware of how fragile our environment can be. To really improve how we care for the environment we need reliable data and indicators, decision-making processes that account for the complexity of our environment, and practical action.

We can only sustain economic development if industries and businesses operate in a resilient way within complex environmental limits, and balance the needs of multiple and diverse stakeholders, including national and local government, Māori, the private sector, and local communities. Manaaki Whenua recognises the importance of engaged decision-making. Increasingly we design our work to support Māori, business and community groups to be a part of making decisions on the future uses of and values relating to their environment, such as supporting community decision-making on freshwater limits.

Part of caring for the environment is New Zealand's commitment to meet its international greenhouse gas obligations. New Zealand will meet its responsibility targets through a mix of domestic emissions reductions, the removal of carbon dioxide by forests, and participation in international carbon markets. Our research focuses on measuring and modelling the environmental and economic impacts of emissions reduction, and developing effective mitigation options for reducing net emissions.

We also support the commitment of a large number of New Zealand (and UK-based) companies to reduce their greenhouse gas emissions and create a low-carbon economy. Our subsidiary, Enviro-Mark Solutions Ltd, offers a set of solutions to meet companies' evolving needs so that they can make credible claims when reporting on their sustainable business practices nationally and internationally.

Our science direction and priorities are closely aligned with the missions of several National Science Challenges, particularly the Our Land and Water and Deep South NSCs.

SSIF investment in this area is anticipated to be \$4–5 million.

Relevant national priorities

Under this Ambition our research, science and technology contribute to the priorities and goals set out in the following strategies, policies, plans and initiatives:

- New Zealand's 2030 climate change commitment (2015)
- National Policy Statement for Freshwater Management (2014)
- The New Zealand Story
- The Living Standards Framework (2015)
- various regional growth strategies and action plans
- He kai kei aku ringa – The Māori Economic Development Strategy and Action Plan
- Primary Sector Science Direction (2017)
- Conservation and Environment Science Roadmap (2017)
- Regional Council Research, Science and Technology Strategy (2016)
- Environment Domain Plan (2013)
- National Environmental Reporting Act (2015)
- NZ Open Data Charter (2018).

Our research priorities

As discussed earlier, our research contributes to a number of science outcomes, which are needed to support the delivery of the outcomes our major partners are working to achieve. For each science outcome we have a 3-year view of the research direction and priority areas.

Science outcome	Research priority areas
Climate change impacts are managed and mitigated	<ul style="list-style-type: none"> • Understanding climate change impacts and adaptation • Carbon stocks in soils and landscapes • Greenhouse gas emissions – estimates and mitigation • Modelling carbon and nitrogen dynamics
Key risks to land, soils and water are managed and mitigated	<ul style="list-style-type: none"> • Integrated management of carbon, water and nutrients • Integrating concepts of soil health • Supporting the implementation of the National Policy Statement • Erosion and sediment – process and modelling
Local, national and international environmental reporting obligations are met	<ul style="list-style-type: none"> • Land monitoring and environmental indicators • Soils, carbon monitoring and indicators • Vegetation and biodiversity indicators • Business, economic, and sustainability indicators
New, sustainable economic value from the land is identified and developed	<ul style="list-style-type: none"> • Bioactives from NZ native species • Natural products from NZ native species • Alternative (non-meat) proteins for human consumption • Land-use options for catchments / land blocks • Honey ecosystems
Key risks to natural and production ecosystems on land are managed and mitigated	<ul style="list-style-type: none"> • Novel technologies/approaches for smarter, cost-effective weeds, pests and disease management • Risk analysis of new technologies/approaches to control weeds, pests and diseases • Large-scale approaches to resilience, risk and ecosystem management • Optimising biodiversity/biosecurity investment • Social aspects of risk and ecosystem management, including Māori aspirations
People engage sustainably with the environment and practise kaitiakitanga	<ul style="list-style-type: none"> • Engagement of citizens in environmental stewardship • Improve knowledge transfer
Improved access to accurate and integrated data, information and knowledge	<ul style="list-style-type: none"> • Maintenance and enhancement of science systems • Delivery of our data, information, knowledge • Big data analytics • Integrated data and modelling services
Improved identification and characterisation of biota, soil and land resources	<ul style="list-style-type: none"> • Maintenance and enhancement of collections • Identification and characterisation of NZ biota • Identification and characterisation of NZ soils, land cover and land use
Improved understanding of people's values, attitudes and behaviours	<ul style="list-style-type: none"> • Techniques to elicit environmental preferences, attitudes, and behaviours • Integrating the human dimension in policy and management objectives
Te ao Māori and Treaty-informed approaches are understood, valued and used	<ul style="list-style-type: none"> • Kaupapa Māori frameworks • Co-governance, co-management and co-planning approaches

Strategy 22

Strategy 22 is Manaaki Whenua's organisational strategy for the 5-year period from 2017 to 2022. At its heart, Strategy 22 will develop and sustain our high-performance culture and enable us to deliver on our Ambitions. The main elements of Strategy 22 are set out below.

Foundation goals

Our people

Our ability to deliver our exceptional science, research and real-world solutions is entirely dependent on our ability to attract and retain the best scientists, researchers, technicians and support staff that New Zealand and the world have to offer.

Capability planning and development

In the current stable funding environment our focus is to increase capability in key areas of strategic importance and market demand. This is done within a 'whole of science system' context, recruiting directly in areas where Manaaki Whenua is the national lead and forming collaborative partnerships with leading providers in other areas. The strength of our collaborative influence is demonstrated by our high rate of subcontracting for new MBIE Endeavour funding (35% on average).

Key focus areas for 2018/19

- Leadership development, with an emphasis on effective coaching for high performance and career development. This is supplemented by our Future Leaders programme, which provides for succession planning and builds a longer-term leadership pipeline.
- With the rising influence of the Māori sector on environmental decision-making, our role as integrator is highly valuable. We will continue to equip more of our staff with the skills to improve achievement of this sector's aspirations.
- Continue to increase our internal capacity for kaupapa Māori research.
- Continue to collaborate very strongly through National Science Challenges, most notably the Biological Heritage, Our Land and Water, Nature's Challenges, Sustainable Seas, and Deep South NSCs.

People and culture strategy

The core of our people strategy is an employee value proposition focused on six key deliverables delivered through a 5-year strategy to drive improved engagement and our desired organisational culture:

- great management
- fantastic work environment
- trust in leadership
- meaningful work
- career growth
- an irresistible culture.

In the first year of our 3-year strategy for workplace safety, health and wellbeing we focused on strengthening adherence with recent legislative changes. During the next 2 years we will focus on staff well-being and building a stronger safety culture.

With the disestablishment of the ACC Workplace Safety Management Practices framework, Manaaki Whenua embarked on achieving certification against the AS/NZ 4801 standard. We have also

maintained our ISO14001 environmental management system certification and aim to integrate these two systems when the soon-to-be released ISO45001 health and safety standard is published.

Key focus areas for 2018/19

- Support new ways of working, through our Lincoln redevelopment programme.
- Develop a new staff orientation programme and invest in technology solutions to simplify and integrate both our people and health & safety systems and procedures.
- Continue our successful and comprehensive Māori capability programme, which includes an experiential noho marae stay, and Treaty of Waitangi and cultural competency training. Extend this to add diversity and inclusion initiatives that promote a greater sense of belonging and improved engagement.
- Continue support of young students from lower-decile schools through our participation in the First Foundation programme.
- Improve driver safety and enhance current well-being initiatives by developing a holistic well-being programme focusing on physical, emotional and mental wellbeing that will identify the best approach for investing in enhancing a positive workplace where our people thrive.

Our partners

Manaaki Whenua is working to develop strategic partnerships that increase our national impact, while enabling us to focus on our core business of research, science and technology. Strategic partnerships enable effective and efficient outcomes, such as product development (e.g. predator controls and land-use tools); policy support (e.g. land and water goals); returns from very innovative science (e.g. genomics, artificial intelligence); increased well-being from regional and Māori land development; and sustainable science capability (e.g. access to emergent and specialist skills).

As a Crown Research Institute we believe Manaaki Whenua has an important role to play in partnering with iwi entities to identify and help realise shared cultural and community aspirations for our land and environment. This is in keeping with the principle of partnership under Article II of the Treaty of Waitangi, and suggests that the role iwi could play in our work is likely to gain increased significance as Aotearoa moves towards more co-governance and co-management arrangements in the land and natural resources sector.

The period 2018–2023 will see the National Science Challenges complete their ‘first tranche’ activities and establish second tranche programmes. They will demonstrate the value of greater partnership for higher-risk, higher-reward outcomes. We will continue our strong support of the Biological Heritage NSC, which we host, and will also work in close partnership with related entities, including Predator Free 2050, the New Zealand State-Owned-Enterprise Orillion, and the new SSIF Genomics Platform. Aligning with these initiatives will greatly facilitate the delivery of national goals.

We will seek to increase our alignment and partnerships with several other NSCs, especially Our Land & Water and the University-led Centres of Research Excellence, where such partnerships can enhance collaboration for national impact.

Partnership for international opportunities is also a feature of our strategic plan. The Lincoln Hub, He Puna Karikari, will continue to create opportunities beyond what could be achieved by the five Hub partners alone. We will seek industry investment in science and innovation, where the Hub can be the ‘shop-front’ for New Zealand science. Economic and environmental benefits to New Zealand will be much more significant than the revenue for the partners, either individually or collectively. Shared developments in infrastructure and collaborative research will result in opportunities for New Zealand businesses that serve the primary sector and also lead to better management of New Zealand’s land and water resources.

We will continue to seek greater alignment and efficiencies in supporting members of the government’s Natural Resources Sector – those departments whose mandate includes the natural environment. This scope includes national State of Environment Reporting and climate change

mitigation and adaptation. What we can offer to support Pacific nations in our core areas of research, science and technology will be enhanced by a closer working relationship with the Ministry of Foreign Affairs and Trade and with Pacific nation agencies, including the SPC (Secretariat for Pacific Communities), with whom we have a collaboration agreement.

To secure New Zealand's future science capability across the system we will continue to develop partnerships with agencies leading science in areas relevant to our scope, notably in predator control, soils and land, carbon, bio-discovery, and spatial informatics (sensing and visualising data). Antarctic science will continue as a major priority as we build our partnership with Antarctica New Zealand and support its roles in international Antarctic science policy and leading the Antarctica SSIF platform.

We have long worked with universities to grow capabilities and support the training of emerging scientists. We will continue our commitment to our joint graduate school with the University of Auckland, with five of our scientists holding professorial or associate professorial part-time roles.

Key focus areas 2018/19

- Actively supporting the National Science Challenges and fulfilling our role as host of the Biological Heritage NSC.
- Working in close partnership with Predator Free 2050, the new SSIF Genomics Platform and Orillion Ltd.
- Actively supporting the Lincoln Hub and development of the cooperative precinct at Lincoln.
- Building our partnership with members of the government's Natural Resources Sector, the Ministry of Foreign Affairs & Trade, and Antarctica New Zealand.
- Developing partnerships with other research, science and technology agencies in New Zealand and overseas.

Our infrastructure – facilities and technology

Manaaki Whenua is focused on creating fit-for-the-future buildings, workspaces, ICT and science equipment. Our workspaces will evolve to reflect the changing needs of science and the expectations of a new generation of staff. To enhance our impact, we will pursue co-location with relevant organisations, where appropriate.

Our buildings and facilities need to be fit for purpose and supported by smart systems and processes to deliver effective research and outcomes in the future, and to enable our people to carry out their work. Manaaki Whenua has an ongoing programme to upgrade buildings and research infrastructure at all our sites.

Over the next 5 years we will continue to make significant investment in our IT infrastructure to protect our data, support and enable high-quality science, and improve the resilience of systems. Manaaki Whenua works closely with other Crown Research Institutes to adapt best ideas and ensure IT systems are suitable, affordable over the long term, secure, and take into account the very rapid innovation occurring in this sector.

Key focus areas for 2018/19: 1. facilities

- Te Rauhitanga – Lincoln redevelopment: we are pioneering new ways of working that power exceptional science, better integration and a stronger, united culture. Our key priority is to redevelop aspects of the Lincoln site to provide modern, fit-for-purpose facilities for our people. The reconstructed area will be designed to cater for our people, and enable co-location of staff from Lincoln Hub partners and co-creation with science users. We will also continue to house and support the Biological Heritage NSC.
- Tamaki: we located our facilities on the University



of Auckland campus at Tamaki to further our collaborations with the University. Following the University's decision to divest and move away from their Tamaki campus, we have initiated a process with MPI (a key partner co-located with us at Tamaki) to consider future location options within Auckland.

Key focus areas for 2018/19: 2. technology

- Further develop capabilities and infrastructure to enable exploitation of big data.
- Enhance technology to support productivity, effective project and information management, and science data management planning.
- Upgrade cyber security and IT system resilience.
- Enhance collaboration tools to enable better connectivity for devices and the ability to connect securely with external partners for easier collaboration – this is essential to enable greater staff mobility and utilisation of collaborative spaces expected in the new facilities.

Collections and databases

Manaaki Whenua is custodian for almost a third of New Zealand's Nationally Significant Databases and Collections. These include biological resources (e.g. reference species collections), cultural knowledge, and soil and land resources. They are important scientific, cultural and historical public good assets. These collections provide base knowledge critical to improving the conservation of New Zealand's land-based biodiversity, including species of importance to Māori. They also provide important reference collections for identifying biosecurity risks.

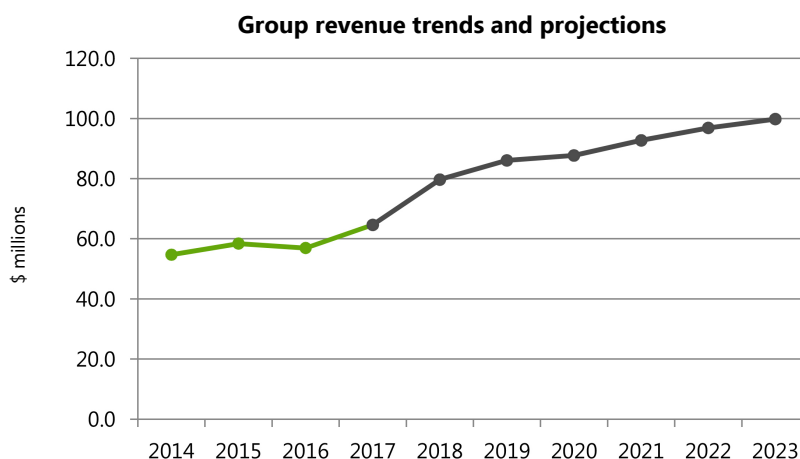
We have made significant progress in digitising (and putting online) science information, images and other valuable information from our collections. This information is easily accessed and is being used in conservation, biosecurity, land management and environmental sustainability in New Zealand. We will continue to invest in this activity over the next 5 years.

Our sustainability

Our contribution to the future of New Zealand is underpinned by a sustainable business model that balances social, economic and environmental impacts. While sustainability is a core tenet of our culture and business, it is also critical to ensure our continued positive impact for New Zealand. Our long-term financial management is designed to optimise our funding performance over time, ensuring we can both deliver on immediate research needs, but also make longer-term investments in critical science and business infrastructure.

Financial resilience

The 5-year financial plan reflects a step-change in activity during recent years resulting from the success in recent funding rounds, a lift in commercial revenue, and our leadership of the Biological Heritage NSC. This is followed in the out years by modest but steady revenue growth, reflecting market, science system, and government priorities that align well with Manaaki Whenua's core business.



Sustainability reporting

Our research is focused on helping New Zealand to live more sustainably with our land, but we are also end consumers of New Zealand's resources and choose to lead the way in mitigating and measuring our own impact on the environment.

Key focus areas for 2018/19

- Diversify our revenue sources to limit exposure to changes in economic and policy conditions relating to our major sources of revenue.
- Upgrade our systems and upskill our staff to improve project management and risk identification.
- Continue to work with a wide range of organisations to understand the United Nations Sustainable Development Goals and implement pathways to achieving them.

Science goals

Innovative & Challenging

To ensure progress against our Ambitions we are actively promoting and enhancing a research culture of innovation. Establishing a successful innovation culture will require engaging with our major stakeholders to help scope the mission of our research (through the 'Valued & Trusted' goal), then engaging with our staff to set the research agendas to deliver on the mission. We are developing a science culture (a right team approach) where individuals work to their strengths, which requires further integration in our research (through the 'Strategic & Integrated' goal). This will increase the impact of our research, ensuring the best ideas are adopted quickly to deliver more tangible benefits for New Zealand.

Innovative & Challenging will deliver a growing output of highly cited papers across all our disciplines, stronger international collaborations with leading groups, and many highly skilled people from within New Zealand and overseas wanting to collaborate with or work for us. We will invest SSIF funding in high-risk, high-reward science, and our growing reputation for excellent and relevant research and strong, positive collaborations will make us the research provider of choice across our major sectors. This will allow us to increase the impact of our research at a national and sometimes international scale.

Key focus areas for 2018/19

- Outside thinking: learn from others and stimulate ideas through workshops, sabbaticals (inwards and outwards) and regular horizon scanning.
- Building our capability: identify key skills gaps and build the capability of our staff for innovative and challenging science.
- Brilliant writing: support key, high-impact science publications (e.g. critical reviews, syntheses and/or opinion papers) that will pave the way for innovative and challenging science. Provide time out for authors (especially early to mid-career) for reading and writing.
- Great science ideas: create a 'digital space' or similar mechanism for developing, sharing and testing innovative ideas at an early stage.
- Science Den: support a pipeline of truly innovative and challenging science projects with a seed-fund, new innovation tools (e.g. agile, rapid prototyping and lean start-up), and a dedicated governance model.

Valued & Trusted

Manaaki Whenua works hard to understand what creates value for our clients, and engages proactively to align our research effort to maximise that value. We aim to be responsive to our clients' and partners' needs, and to have a growing reputation for our co-innovation approaches, where key clients

work alongside us to set research priorities and co-design 'user-ready' solutions. We appreciate that our clients are champions of Manaaki Whenua's work and help us to communicate the value of our science to New Zealand's future. Together we will create new value by building on client-led initiatives and adapting new technologies.

Much of our environmental research is for the public good, and benefits New Zealand and New Zealanders. We work closely with central and local government stakeholders to develop and share high-priority science expertise to help develop key policy, legislation and regulation. We also collaborate with a variety of Māori, primary- and private-sector organisations to make sure our research, tools and technology effectively support the sustainable development and wise management of New Zealand's land resources.

At its heart the Valued & Trusted goal aims to further lift the relevance and impact of our research, accelerating progress towards our Strategy 22 Ambitions. Valued & Trusted also aims to build Manaaki Whenua's role as a trusted advisor to our major sector stakeholders. To achieve these aims, we will focus on delivering three strategic shifts:

- a clearer line of sight between our research, and the value and impacts it will deliver
- a widening of our value perspective, from customer to stakeholder, and from revenue to impact
- a more strategy-led, coordinated engagement with major sector stakeholders.

Key focus areas for 2018/19

- Refresh and finalise our Impact and Evaluation framework so that we can better articulate and quantify the value of our work.
- Identify and scope impact stories to serve as a basis for future impact evaluation case studies.
- Embed leading indicators of science value in our research planning processes.
- Further progress our client responsiveness programme.
- Deepen and extend our co-innovation approaches and culture.

Strategic & Integrated

Individual science disciplines produce essential knowledge, methods and tools, many of which have underpinned significant technological progress during the last centuries. However, discipline-based science is unable to solve the 'grand challenges' associated with global sustainability, or even the sustainability of Aotearoa. Manaaki Whenua needs to balance its need for excellence within the disciplines we lead in New Zealand against a growing need not only to integrate disciplines but also to lead the practice of integrated research in New Zealand. We will fail in our role to help New Zealand deliver on its four Ambitions unless we adopt an integrated approach that treats complex socio-environmental systems with the respect they deserve.

Environmental challenges such as climate change and the loss of biodiversity are complex, and solutions must reflect that complexity. This means multiple disciplines must be brought together to address the economic, social and environmental aspects. Challenges must be addressed across a range of spatial scales – local, regional, national, and even global.

Different world views will also be relevant and goals will be needed over different time scales, from the next year to the next several generations. We call the bringing together of all these dimensions 'integration', and it is a hallmark of Manaaki Whenua's approach.

Key focus areas for 2018/19

- Grow leadership capability in integrative science.
- Establish a community of practice for integrative science.

Science working with mātauranga Māori

Manaaki Whenua's core purpose (wise land use, preserving and enhancing biodiversity, and protecting Aotearoa from biosecurity threats) is strongly aligned with Māori perspectives of kaitiakitanga and custodianship of our land as a taonga for future generations. Māori can provide Manaaki Whenua with a critical cultural licence to help gain broader societal support for our work, and through a closer relationship with Manaaki Whenua make significant progress towards achieving their own aims.

We also have much to learn from the interface between science and mātauranga Māori. In Aotearoa indigenous perspectives of environmental health are based on up to 1,000 years of experiential wisdom and inter-generational observation. As part of our operating ethos we:

- engage Māori, both at an early stage in designing projects and throughout the projects in which they have an interest
- take a holistic view that recognises the interconnectedness of people and all the elements in our ecosystems, as reflected in our value 'manaaki whenua – manaaki tangata'
- invest in people's skills to get the most from working together and communicating in ways that are meaningful to all cultures.

Key focus areas for 2018/19

- Increase SSIF investment in science and research of direct relevance to Māori.
- Increase investment in dedicated Māori PhDs and emerging Māori researchers.
- Build internal Māori researcher capability.
- Establish a programme for staff to visit marae to increase engagement skills.
- Review and prioritise existing relationships, and identify critical capability gaps.
- Establish a regular engagement forum with iwi and Māori interests.

Engaged with All New Zealanders

Our science and research need to be communicated to people who can put it into practice – New Zealand industry, national and regional government, Māori, fellow scientists, and the wider New Zealand public.

Engaging New Zealanders in our science will create opportunities to work with new communities from across New Zealand. It will increase our relevance in the minds of New Zealanders – who ultimately give us our mandate to operate – but we also see it as our responsibility to help New Zealanders answer some of the huge environmental questions they face every day.

Our aspiration is for Manaaki Whenua to become much more of a household name. This will be a huge challenge, but we know that the work we do is of direct relevance to New Zealanders. Our focus for 2018/19 will be to raise awareness of our work through bringing our amazing stories to life.

Key focus areas for 2018/19

- Use video and imagery to share our stories through external communications targeting traditional and social media platforms.
- Build on a rich history of citizen science projects to ensure we deliver maximum impact through these initiatives.
- Develop a proactive, objective and independent voice for Manaaki Whenua that contributes to public discussion of key land environment issues.
- Refresh our website and social media presence as the two key engagement channels with the potential to reach all New Zealanders.
- Leverage opportunities such as events to build new and reinforce existing partnerships and relationships that will help us create even greater impact for New Zealand.

Enviro-Mark Solutions

Enviro-Mark Solutions Ltd (E-MS) provides environmental certification for business and industry through its Certified Emissions Measurement And Reduction Scheme (CEMARS), carboNZero, and Enviro-Mark and Energy-Mark programmes. E-MS works with over 400 organisations across most sectors of the economy, and has its main customer bases in New Zealand and the UK. It is a wholly owned subsidiary of Manaaki Whenua, established as a business unit in 2006 and as a stand-alone entity in 2011. E-MS is accredited for its carbon certifications by the Joint Accreditation System of Australia and New Zealand (JAS-ANZ), licensed by the UK Environment Agency, and is a CDP-accredited (formerly the Carbon Disclosure Project) verification provider.

The E-MS programmes and certification services are widely recognised as being among the most robust and credible available globally. These tools enable organisations to improve their sustainable business practices, demonstrate carbon reduction or carbon neutrality, and implement robust environmental management systems. Through its service to New Zealand businesses, E-MS contributes to Manaaki Whenua's Ambition 'Our Environment'. Through its programmes and services E-MS adds value to its customers by providing assurance for environmental performance claims, through cost savings and efficiencies, building capability, improving systems, changing culture, and inspiring innovation. E-MS services are increasingly sought by companies to meet governance and investor requirements, and it will continue to grow its market presence and develop new certification offerings to meet market demand.

Marketing, partnerships and technology are integral to the E-MS forward strategy, especially in scaling up for growth in the New Zealand and overseas markets. E-MS will develop relationships to extend the range and value of customers using our services. We will continue to develop our software tools to gain efficiencies for our customers and auditors, extend capability and remain competitive. Suitable international markets for growth are anticipated to be in those countries where governments and businesses are responding to compliance and voluntary developments arising from the 2015 Paris Climate Change Agreement and its ongoing development and implementation. Through international engagement, E-MS will also maintain its high level of knowledge of, influence on and alignment with such global standards and initiatives as the ISO GHG standards, and CDP and Science Based Targets. We will extend our environmental management system programmes to encompass the Agenda 30 Sustainable Development Goals and to meet the needs of the primary sector.

E-MS provides a number of other related environmental services, including training, audit against the relevant standards, gap analyses, development of specific greenhouse gas calculators and emissions factors, assessment of the integrity of carbon credits, and supply chain assessment for carbon and environmental impact.

Although E-MS is a stand-alone company with separate premises in Auckland, it shares facilities and resources at our Lincoln and Wellington sites, and follows the same accounting and general business, good employer and EEO practices and processes as the parent company.



Performance monitoring and reporting

In addition to the key focus areas mentioned previously under Strategy 22 goals, key non-financial performance indicators (KPIs) for Manaaki Whenua are listed in the table below. Indicators for operational areas such as good employer, health and safety, and our environmental performance can be found on our website: www.landcareresearch.co.nz/about/sustainability

Indicator	Measure	2017/18 actual	2018/19 target
End-user collaboration	Revenue per FTE from commercial sources (\$000s) ^{1,3}	\$49	\$58
Research collaboration	Percentage of papers co-authored ¹ (total)	89%	90%
	Co-authored with other New Zealand organisations	27%	25–30%
	Overseas co-authors	38%	30–35%
	Both New Zealand and overseas co-authors ³	23%	30–35%
Technology and knowledge transfer	Commercial reports per scientist FTE ¹	0.8	0.8
	Availability of data from our SSIF-funded databases, collections and information systems (assessed by a variety of metrics appropriate to each; metrics online)	Refer 2017 annual report	Increasing trends
	Response rate for requests to our SSIF-funded biological collections and associated infrastructure (specimen transactions, identifications, visits)	100%	>95%
	New and improved products, processes and services	44	60
	Presentations to stakeholders and community groups	210	275
Science quality	Impact of scientific publications (mean citation score) ^{1,3}	3.1	2.9–3.3
Financial indicator	Revenue per FTE (\$000s) ¹	\$188	\$192
Stakeholder engagement	Percentage of relevant end-users who have adopted knowledge and/or technology from Manaaki Whenua ²	93%	>95%
	Percentage of relevant funding partners and other end-users that have a high level of confidence in our ability to set research priorities ²	71%	>75%
	Percentage of stakeholders involved in a specific research team/partnership that have a high level of confidence in our ability to form the best team for the collaboration they were involved in ^{2,3}	84%	>90%
	Staff invited to participate in stakeholder meetings or workshops	253	280
Vision Mātauranga	Number of positive strategic partnerships with iwi and Māori organisations in which we are linking science and mātauranga, and which address Māori goals and aspirations ³	84	90
Commercialisation	Number of new and existing licensing deals involving Manaaki Whenua-derived IP (including technologies, products and services)	9	8–14
High-performance culture	Staff engagement in survey evaluations	74%	>70%
	Staff turnover rate	6.9%	5–7%

¹ Generic indicators as required by MBIE across all Crown Research Institutes are at the Landcare Research Group level; the rest are at Parent level.

² Data provided from the MBIE-commissioned biennial external client survey 1617.

³ Common with or related to SSIF Programmes Investment Contract key performance indicator(s).

Financial reporting

Financial performance and position

The 5-year financial plan reflects the step-change in activity experienced in 2017 and 2018 followed by consolidated growth. This strong revenue performance positions us well to deliver sustainably on our purpose, and to drive a number of key strategic investments to enable our science impact into the future.

For the year ending 30 June:	2018		2019	2020	2021	2022	2023
	Target	Forecast	Target	Target	Target	Target	Target
Revenue	78.9	79.7	86.0	87.7	92.7	96.9	99.8
EBIT ¹	2.9	6.1	2.1	2.5	3.6	4.5	5.0
Total assets	68.3	66.8	67.1	69.3	72.6	76.6	80.6
Capital expenditure	12.4	4.3	10.8	15.3	16.1	12.3	9.2
Dividend	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Equity ratio ²	56%	61%	64%	66%	67%	68%	69%
Gearing ³	0%	0%	0%	0%	0%	0%	0%

Explanatory notes to table:

¹ EBIT: earnings before interest, financial lease charges and tax, and after committed business development expenditure and technology service expenditure.

² Equity ratio: average shareholders' funds ÷ average total assets.

³ Gearing: interest-bearing debt ÷ interest-bearing debt + shareholders' funds, expressed as a percentage.

In 2019 Manaaki Whenua's revenue is budgeted at \$86.0 million, up by \$6.3 million compared with the 2018 forecast. The Biological Heritage NSC and MBIE research involve considerable revenue subcontracted to partner organisations, so the underlying net revenue increase for Manaaki Whenua in 2019 is \$3.9 million.

Return on equity

Manaaki Whenua must continue to be flexible in responding to changes in the external environment and pursuing strategic opportunities. In determining a rate of return to shareholders, we use the following principles.

- The rate of return on equity (RoE) needs to ensure the financial sustainability of the organisation.
- The Board proposes a lower RoE so that it can support the databases and collections and strategic investments, which will enhance science, provide benefit to New Zealand and underpin future value.
- The targeted RoE will be reviewed by the Board over the planning period as other strategic investment opportunities with long-term benefits are presented.

Manaaki Whenua's RoE before investment in 2019 is 10.3%. The RoE before investment recognises that continued reinvestment of surpluses in strategic investment opportunities will create long-term benefits. We intend to reinvest surpluses with an EBIT impact of \$3.4 million in 2019. The RoE after investment in 2019 is 4.6%

Balance sheet

Manaaki Whenua's science requires an ongoing investment in scientific equipment if we are to secure revenue and be financially sustainable. Beyond this underlying capital spending requirement, the priority for 2019 and 2020 is to redevelop aspects of the Lincoln site to provide modern fit-for-purpose facilities for our people.

Cash flow and dividend

Manaaki Whenua expects to continue to deliver steady operating cash flows, with earnings before income tax before depreciation, amortisation and fair value adjustments (EBITDAF) of \$6.1 million in 2019, which is forecast to remain at similar levels through the 5 years of this SCI, with a predicted EBITDAF of \$11.9 million in 2023.

Based on the strategic capital investment needs identified above, no dividends are planned during the period of this SCI. However, the Manaaki Whenua Board will review this annually.

Risks

There is forecasting uncertainty associated with Manaaki Whenua revenue budgets. There are risks and opportunities for competition and disruptive technologies with the potential to affect capability and future business sustainability. Manaaki Whenua is confident its plans remain robust, and we will actively monitor and respond to any emerging risks.



Jane Taylor
Chairman



Dr Paul Reynolds
Deputy Chair

30 June 2018

Appendix 1: Additional financial indicators

	2019	2020	2021	2022	2023
Operating margin ¹	7.1%	9.2%	11.3%	11.6%	11.9%
Profit/FTE	\$14,718	\$19,450	\$25,342	\$27,104	\$28,785
Quick ratio ²	1.89	1.37	0.93	0.80	0.90
Interest coverage ³	N/A	N/A	N/A	N/A	N/A
Profit volatility ⁴	19.0%	16.8%	19.3%	22.5%	25.4%
Forecasting risk ⁵	1.6%	1.5%	1.4%	0.0%	-1.0%
RoE before investment	10.3%	8.9%	9.2%	9.7%	7.4%
RoE NPAT ⁶ (after investment)	4.6%	4.6%	5.8%	6.7%	6.9%
Revenue growth	8.0%	1.9%	5.7%	4.5%	3.0%
Capital renewal ⁷	2.7	2.8	2.4	1.8	1.3

Explanatory notes to table:

¹ Operating margin: EBITDAF ÷ revenue, expressed as a percentage and per FTE (EBITDAF is earnings before income tax before depreciation, amortisation and fair value adjustments).

² Quick ratio: (current assets – inventory – prepayments) ÷ (current liabilities – revenue in advance).

³ Interest cover: EBITDAF ÷ interest paid.

⁴ Profit volatility: the standard deviation of the past 5 years' profit, scaled by average profit.

⁵ Forecasting risk: 5-year average of return on equity, less forecast return on equity.

⁶ Return on equity: NPAT ÷ average shareholders' funds, expressed as a percentage (NPAT is net profit after tax). Shareholders' funds include share capital and retained earnings.

⁷ Capital renewal: capital expenditure ÷ depreciation expense + amortisation expense.

Appendix 2: Investment trends by SCP outcomes

Under the Crown's Statement of Core Purpose (SCP) for Manaaki Whenua, we are mandated to deliver four outcomes:

Outcome 1: Improve the measurement, management and protection of New Zealand's terrestrial ecosystems and biodiversity, including those in the conservation estate.

Outcome 2: Achieve the sustainable use of land resources and their ecosystem services across catchments and sectors.

Outcome 3: Improve the measurement and mitigation of greenhouse gases from the terrestrial biosphere.

Outcome 4: Increase the ability of New Zealand industries and organisations to develop within environmental limits and meet market and community requirements.

Over the past 5 years Manaaki Whenua evolved the allocation of SSIF investment across outcomes, as driven by our strategy. A small amount of SSIF investment to Outcome 1 was realigned to support Outcome 2, reflecting the increased focus on supporting biodiversity preservation and enhancement through more sustainable land management practices on private land. SSIF investment in research directly aligned to Outcomes 1 and 3 was realigned to more integrated research supporting sustainable land management outcomes (Outcomes 2 and 4), including on private and Māori land. The reduction in investment in Outcome 3 recognised that sustainable management of productive land and soils also drives improved management of greenhouse gases and soil carbon.

Manaaki Whenua considers its current SSIF allocation across outcomes to align well with national priorities and National Statement of Science Investment (NSSI) signals. The relatively large allocation of SSIF investment to Outcome 1 continues to reflect our national leadership in public-good biodiversity and biosecurity research, and our custodianship of several biologically based Nationally Significant Databases and Collections. Manaaki Whenua does not expect to change the investment allocation across outcomes over the coming year.

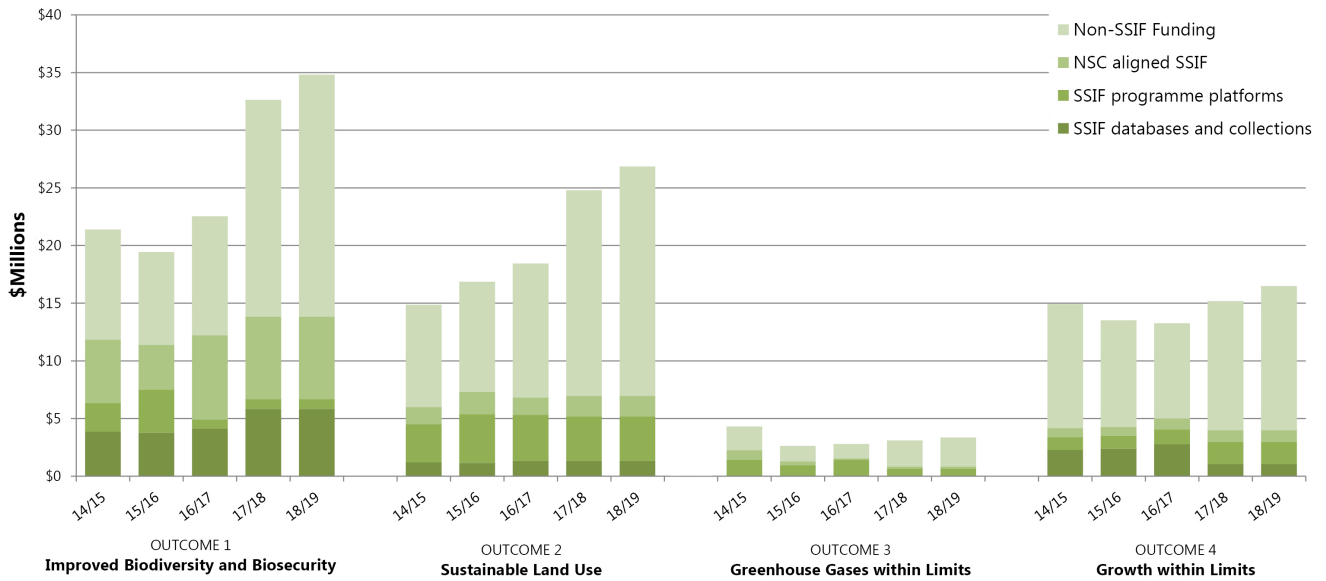
Within outcomes we shift our investment in response to the priorities and goals set out in the NSSI, key roadmaps, strategies, policies, plans and initiatives (e.g. national priorities listed under Ambitions 1–4). For 2018–23 this will include:

- basic research and knowledge generation in areas with critical national knowledge gaps (e.g. soils, ecosystem services, the integrated carbon-nitrogen-water cycle) and social processes (e.g. how to ensure trade-off decisions in resource management are well understood)
- higher-stretch research in critical areas and a focus on novel technologies (e.g. to achieve predator-free goals, and greater cost-effectiveness and accuracy in remote-sensing and sensor networks)
- finding meaningful and cost-effective ways to assess environmental quality in New Zealand – for state of environment reporting, to inform communities and consumers, to underpin government and private sector decision-making, and to provide assurance to stakeholders, from iwi through to the OECD
- developing new, finer-scale and more integrated tools, technologies and approaches while scaling up research, tools and technology developments for application at much larger scales in order to achieve (and be able to demonstrate) landscape-scale outcomes
- social, economic and cultural research and big data approaches that place people at the heart of research, given that many of the barriers to solutions are human-made
- focusing on delivering benefit to Māori interests, including Māori agribusiness and post-settlement entities

- more integrated solutions for users, better bringing together land, water, biota, and social, cultural and economic factors to improve the resilience and adaptability of ecosystems across catchments and sectors.

More details are available in the 'Our Research Priorities' section. Manaaki Whenua will continue to review investment signals annually to determine research priorities and ensure the allocation of investment between outcomes remains optimal. This in turn ensures we respond to changing national priorities and unpredictable events (e.g. a biosecurity emergency), and take advantage of new and emerging science areas and technologies.

Investment trends in our four legislative SCP outcomes over 5 years (18/19 is indicative).



Appendix 3: Nationally significant collections, databases and information systems

New Zealand Arthropod Collection (NZAC)

- The largest collection of New Zealand land invertebrates (insects and related arthropods), with >7 million specimens. Earliest collections date from the 1880s. Many specimens from the South Pacific.
- Over 2,500 primary type specimens.
- Includes the National Nematode Collection of New Zealand (NNCNZ).
- Online via the New Zealand Land Invertebrates website, a searchable online information system.
- A key part of New Zealand's biosecurity system for the forestry, conservation, horticultural and agricultural sectors.

<http://nzac.landcareresearch.co.nz>

<http://fnz.landcareresearch.co.nz>

<http://www.landcareresearch.co.nz/resources/collections/nncnz>

<http://nzinverts.landcareresearch.co.nz>

<http://scd.landcareresearch.co.nz>

New Zealand Fungarium (PDD)

- The primary source of information on New Zealand and Pacific fungi. All data fully searchable online.
- 100,000 dried fungal specimens, including 2,000 type collections of New Zealand fungi.
- Contains voucher specimens documenting most plant diseases recorded in New Zealand.
- A key part of New Zealand's biosecurity system for the forestry, conservation, horticultural and agricultural sectors.

<http://www.landcareresearch.co.nz/pdd>

<http://scd.landcareresearch.co.nz>

<http://nzfungi2.landcareresearch.co.nz>

<http://virtualmycota.landcareresearch.co.nz>

<http://fungalguides.landcareresearch.co.nz>

International Collection of Microorganisms from Plants (ICMP)

- Living cultures of more than 20,000 strains of bacteria and fungi from plants and soil.
- One of three major international collections for plant and soil bacteria.
- All information is fully searchable online.
- A key part of New Zealand's biosecurity system for the forestry, conservation, horticultural and agricultural sectors.

<http://www.landcareresearch.co.nz/icmp>

<http://scd.landcareresearch.co.nz>

<http://nzfungi2.landcareresearch.co.nz>

National Vegetation Survey (NVS)

- The national repository for plot-based vegetation survey data collected, with over 60 years of data.
- Physical archive and databank of records from >103,000 survey plots, including >21,000 permanent plots.
- Broad geographic coverage, from Northland to Stewart Island, the Kermadec and Chatham Islands.
- Broad ecosystem coverage, from coastal to forests to high alpine.
- Survey data can be deposited with NVS for management and is also available by request.
- A key part of New Zealand's biodiversity and biosecurity information infrastructure.

<http://nvs.landcareresearch.co.nz/>

Allan Herbarium (CHR)

- New Zealand's national herbarium, with >640,000 specimens of New Zealand and South Pacific algae, lichens, liverworts, mosses, ferns and seed plants collected in New Zealand. (The oldest samples collected during Captain Cook's first voyage to New Zealand, 1769–1770.)
- Online access available.
- A key part of New Zealand's biodiversity and biosecurity systems, of benefit to both conservation and productive sectors.

www.landcareresearch.co.nz/allanherbarium

<http://nzflora.landcareresearch.co.nz>

www.landcareresearch.co.nz/floras_guides

www.nzherbaria.org.nz

<http://scd.landcareresearch.co.nz>

National New Zealand Flax Collection

- A living collection of over 160 provenances of *Phormium* species of cultural, economic and historical interest.
- Supports research on both traditional and new uses of *Phormium*.

www.landcareresearch.co.nz/harakeke

Ngā Tipu Whakaoranga – Māori plant use database

- Online access to >2,050 records on Māori names and cultural uses of New Zealand native plants, fungi and algae.

<http://maoriplantuse.landcareresearch.co.nz/>

Land Resource Information System (LRIS), including New Zealand Land Resource Inventory (NZLRI) and Land Use Capability (LUC)

- A national database depicting general land characteristics (rock, soil, slope, erosion and vegetation), a derivative general-purpose land evaluation (land-use capability), and a range of environmental, climatic, management and production attributes.

www.landcareresearch.co.nz/resources/data/lris

<https://lris.scinfo.org.nz>

<https://lris.scinfo.org.nz/layer/412-lcdb-v40-deprecated/>

National Soils Database (NSD)

- A 'point' database containing descriptions of approximately 1,500 New Zealand soil profiles, together with analytical data on their chemical, physical, and mineralogical characteristics.
- Information is obtained from physically sampling and observing the soil on site. Soil samples are retained as a reference collection.

Appendix 4: Business policies

We operate in accordance with the purpose and principles as stated in the Crown Research Institutes Act 1992 and have statutory obligations under other acts, including the Companies Act 1993 and Crown Entities Act 2004. Our business policies include the following.

Dividend policy

The Board will notify the shareholding Ministers within 3 months of the end of each financial year of:

- the amount of dividend (if any) recommended to be distributed to the shareholders
- the percentage of tax-paid profits the dividend represents
- the rationale and analysis used to determine the amount of dividend.

In determining the amount of surplus funds, consideration will be given to:

- shareholder policies on dividends and capital structure
- providing for strategic and capital investment requirements (including equity investments) without recourse to the Crown for equity injections to the company
- working capital requirements (including subsidiaries/businesses in which equity is held)
- the ongoing financial viability of the company, including its ability to repay debt
- the extent of debt financing in relation to the prudent borrowing capacity of the company
- obligations of the Directors under the Companies Act 1993 and other statutory requirements.

With the projected profitability and capital requirements of the organisation in the course of this planning period, we are not projecting to pay dividends to the Shareholder.

Risk policy

Manaaki Whenua has risk management and compliance processes in place and operating effectively across the agency. The risk management framework identifies, classifies, reports on and mitigates business risk. Risk reporting to the Audit and Risk Committee and the Board is done every 6 months, or as a risk arises.

Accounting policies

A summary of our accounting policies is included in our Annual Report. The current Annual Report can be found on our website: <http://www.landcareresearch.co.nz/about/sustainability/annual-reports/>

Shareholder consent for significant transactions

The Board will obtain prior written consent from the shareholding Ministers for any transaction or series of transactions involving full or partial acquisition, disposal or modification of property (buildings, land and capital equipment), and other assets with a value equivalent to or greater than \$10 million or 20% of the Company's total assets (prior to the transaction), whichever is the lesser.

The Board will obtain the prior written consent of shareholding Ministers for any transaction or series of transactions with a value equivalent to or greater than \$5 million or 30% of the Company's total assets (prior to the transaction) involving:

- acquisition, disposal or modification of an interest in a joint venture, partnership or similar association
- acquisition or disposal, in full or in part, of shares or interests in a subsidiary, external company or business unit
- transactions that affect the Company's ownership of a subsidiary or a subsidiary's ownership of another entity
- other transactions that fall outside the scope of the definition of the Company's core business or that may have a material effect on the Company's science capabilities
- intellectual property transactions, which, wherever possible in advance, will be notified in the quarterly reports to shareholding Ministers.

Appendix 5: Other matters required by the Crown Research Institutes Act 1992

Activities where shareholder compensation is required

Where the Government wishes Manaaki Whenua to undertake activities or assume obligations that will result in a reduction of the organisation's profit, or net worth in terms of investment in research, the Board will seek compensation sufficient to allow the organisation's position to be restored.

No requests for compensation are currently under consideration.

Other matters specifically requested by the shareholder

Section 16(3) of the Act requires Manaaki Whenua to furnish an estimate of the current commercial value of the Crown's investment.

The Board is satisfied that the net asset position (or total equity) is a reasonable proxy for the commercial value of the Group. The net asset position, as shown in accordance with the Company's accounting policies for 30 June 2017, was \$37.4 million.

Directory

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Dr Paul Reynolds (Deputy Chair)
Ngarimu Blair
Dr Chris Downs
Prof Emily Parker
John Rodwell
Prof Caroline Saunders
Hon. Kate Wilkinson

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Dr Fiona Carswell	Chief Scientist
Justine Daw	General Manager, Partnerships
Holden Hohaia	General Manager, Māori Development
Dr Stephen Lorimer	General Manager, Development
Chris McDermott	General Manager, Brand & Communications
Dr Peter Millard	General Manager, Science
Nigel Thomson	General Manager, Corporate Services

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AUDITORS: Audit New Zealand on behalf of the Auditor-General
SOLICITORS: Buddle Findlay

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Glossary

ACC	Accident Compensation Corporation	www.acc.co.nz
Biological Heritage NSC	New Zealand's Biological Heritage National Science Challenge	www.biologicalheritage.nz
CDP	Carbon Disclosure Project	
CEMARS	Certified Emissions Measurement And Reduction Scheme	
DOC	Department of Conservation	www.doc.govt.nz
EBITDAF	Earnings before income tax before depreciation, amortisation and fair value adjustments	
EEO	Equal Employment Opportunities	
E-MS	Enviro-Mark Solutions Ltd	www.enviro-mark.com/home
GHG	Greenhouse gas	
JAS-ANZ	Joint Accreditation System of Australia and New Zealand	
KPI	Key performance indicator	
MBIE	Ministry of Business, Innovation and Employment	www.mbie.govt.nz
MfE	Ministry for the Environment	www.mfe.govt.nz
MPI	Ministry for Primary Industries	www.mpi.govt.nz
NSC	National Science Challenge	
Natural resources sector (NRS)	Comprises the core government agencies responsible for the management and stewardship of New Zealand's natural resources, and includes regional council stakeholders	http://nrs.mfe.govt.nz
NPAT	Net profit after tax	
NSSI	National Statement of Science Investment	www.mbie.govt.nz
SCI	Statement of Corporate Intent	
SCP	Statement of Core Purpose	www.landcareresearch.co.nz
SSIF	Strategic Science Investment Fund (MBIE)	www.mbie.govt.nz