Manaaki Whenua
Landcare Research

Statement of Corporate Intent
2019 – 2024

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 (2019–2024).

To those who 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 2019–2024.

Cover: View from Te Mata Peak in Hawke's Bay, looking towards Kahuranaki.

Back page: Looking towards Mt Erin in the Kohinurakau Range.

Photos by Brad White.

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Landcare Research New Zealand Limited (Manaaki Whenua)

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Chair and CEO overview

It is a pleasure to introduce our Statement of Corporate Intent (SCI), in which we set out our strategic priorities and plans for the period 2019 to 2024 to deliver our vision and core purpose, and our shareholders' expectations. Given the importance to New Zealand of the environmental issues core to our business, we expect increasing demand for the work of the Manaaki Whenua group (Manaaki Whenua), which includes our subsidiary Enviro-Mark Solutions Ltd (EMS) and our role as host of New Zealand's Biological Heritage National Science Challenge.

This SCI sets out how we will deliver on our Minister's expectations that Manaaki Whenua will build on its recent strong performance and continue to implement its strategic goals, work closely with key stakeholders and agencies to transform science into impact, and progress our property development programme and explore a Biosecurity Hub option at Mt Albert in Auckland.

In addition, the Minister expects bold and innovative science from the Crown Research Institutes (CRIs) to transition New Zealand's primary industries into higher-value products and exports, to improve the quality of fresh water, and to transition New Zealand to a low-carbon economy by 2050 while understanding climate change and its possible effects on New Zealand.

Manaaki Whenua's development and support for the Government's priorities in the next 5 years build on a strong foundation created in recent years through close engagement and alignment with those who use our science, developing a strong science talent base, building collaborative teams, and focusing on excellent science that delivers impact. Through our success in national competitive investment processes we are in a position to support Government priorities, industry needs, and Māori aspirations.

Launched in 2017, our *Strategy-22* continues to guide the development of our science, people, partnerships, infrastructure, and sustainability. In this SCI we describe our goals under *Strategy-22* and how these will evolve to reflect changes in the wider context, such as our recent collaborative work with the other CRIs to prepare for the 'future of work' and to enhance our engagement and co-innovation with Māori, which are discussed further in the 'Intent' section.

Collaboration is at the core of what we do. Through close relationships with our partners in government we align our work and capability with national priorities, including the Government's over-arching concept of well-being, which covers economic prosperity, social inclusivity, and environmental sustainability.

Diversity in our staff is also a strength that we seek to grow, and this will be a special focus area starting in 2019/20. Strong recruitment in recent years has brought many talented researchers from overseas to join our staff and enhance the limited New Zealand talent pool. Our percentage of Māori staff (5%) is high by comparison with similar organisations but still lags behind the general population (15%). We will join the other CRIs in making efforts to attract more Māori into science and related careers. While women comprise 47% of our staff and 44% of our Board and Executive, their under-representation among our scientists (36%) needs to be addressed.

A core tenet of Manaaki Whenua's sustainability is its ability to invest in staff and infrastructure. The 2020 financial year will see ongoing property redevelopment with the construction of a replacement building at the Lincoln campus (due for completion in late 2020) and continued work with the Ministry of Business, Innovation and Employment (MBIE), the Ministry for Primary Industries (MPI), Plant & Food Research, and ESR to evaluate concepts for an enlarged science centre at the Mt Albert site in Auckland. The Mt Albert site could become an international centre of expertise for plant and crop biosecurity, the importance of which is highlighted by the recent impacts of the kauri dieback and myrtle rust diseases, and the increasing risks likely as a result of climate change impacts. We will evaluate the concept, infrastructure and investment implications of moving our own operations from our site at Tamaki to the Mt Albert centre.

Manaaki Whenua has for many years built its capacity to integrate social, economic and Māori perspectives with our environmental science, and we will continue to do so. We will continue to focus on partnering with Māori to increase the value of our science to Māori, and will build tikanga into our internal culture and people's awareness. We enjoy ongoing engagement with over 100 Māori groups and organisations, and will prioritise relationships that can influence the direction and success of Māori land development and business based on biological resources.

We will also work with the Ministry of Foreign Affairs and Trade (MFAT) and the other CRIs to enhance the delivery of benefit from science to the Pacific Island countries, which are suffering the effects of climate change, weed invasion and low productivity.

The collaborative model of New Zealand's Biological Heritage National Science Challenge (BH-NSC), which includes 18 organisations in science, central and local government, has been shown to work well. It will continue to provide an example of aligned investment and collaboration for achieving national objectives. In June 2019 the BH-NSC will complete its first 5-year tranche of investment, and MBIE's Science Board reviewed and strongly supports the BH-NSC's performance and strategy for the second tranche. Manaaki Whenua supports the BH-NSC as host and principal provider of science capability and leadership.

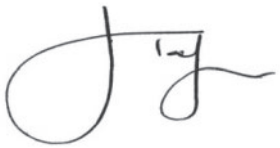
Effective capability is a blend of the right people, the right skills, the right team, and the right time to meet New Zealand's needs. As set out in their Statements of Core Purpose, CRIs are responsible for maintaining New Zealand's strategic science capability, but the current funding system in New Zealand creates uncertainty and ongoing challenges. In this SCI we talk of growing capabilities in areas such as social, economic and Māori science, and the challenge of doing this in a contestable-dominant funding system. We also touch on the impact of the decline in the real value of fixed funding over time due to the rate of inflation. Areas such as the national collections and databases continue to suffer from this decline, and we welcome MBIE's review of this area during the 2020 financial year.

Our subsidiary, Enviro-Mark Solutions Ltd (EMS), has grown its business in New Zealand significantly as businesses and public sector organisations respond to the Government's target of a low-carbon economy and to the Paris Agreement on climate change. As owner, Manaaki Whenua continues to invest in EMS as it contributes strongly to our core purpose and vision. Being owned by a CRI adds value and enhances EMS's credibility with its clients. EMS is developing a wider range of services, including assistance with the UN Sustainable Development Goals, to increase support for its clients.

Our 5-year financial plan reflects a positive science market outlook and the need to support the objectives of government and other sectors. Manaaki Whenua will continue to maintain financial viability and flexibility while meeting our shareholding Ministers' financial expectations. Return on equity before investment varies between 6.1% and 9.4% 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 approximately $7.7 million over the period in driving performance through our *Strategy-22* initiatives and investment in future leadership capability. This will deliver science system benefits where leadership of complex multi-party and multi-disciplinary programmes is needed, as well as creating long term economic value for Manaaki Whenua.



Jane Taylor
Chairman

Dr Richard Gordon
Chief Executive

About this document

Our Statement of Corporate Intent for the period 2019–2024 provides information for the reader, organised into three key sections.

Context

To provide the reader with a wider perspective, in this section we explore the strategic and operating environment within which Manaaki Whenua exists. We consider the priorities of our shareholder (the New Zealand Government), a changing workforce, trends in scientific research and technology, our role within the broader science ecosystem, and indicators for future investment.

Intent

We present our commitment to New Zealand through our strategic priorities outlined in our 5-year strategy, *Strategy-22*, our four ambitions for New Zealand and the aligned science priorities, and several key areas that all Crown Research Institutes consider important for the future of research in New Zealand to ensure our research benefits all New Zealanders.

Performance

Finally, we explain how we will measure our performance against our strategic intent, which includes review panels and advisory groups to provide guidance and to ensure we are producing high-quality impact for New Zealand. We also describe our framework for performance monitoring and reporting, and financial reporting, which we report against in our Annual Report.

Context

Manaaki Whenua exists within a complex ecosystem designed to deliver meaningful impact for New Zealand's environment. Our context begins with our Crown ownership and the expectations of our shareholding Ministers. The Government has laid out clear priorities for New Zealand that must inform our strategy and science priorities, and our Minister sets out expectations of CRIs annually. We share the challenges and opportunities in our operating environment with other New Zealand and international businesses. For example, technology and the workforce are changing, and we need to adapt to new ways of working and expectations, yet we have unique requirements to find the right science capabilities and build our capability in Māori research. Within New Zealand and worldwide such capabilities are a finite resource and in high demand. We need to be able to convince these people to join us. The science system has also become more complicated in response to the increasingly complex and 'wicked' problems we face, and Manaaki Whenua must navigate this complexity successfully. We see exceptional opportunities in integrating across the current science and science-user ecosystem, which is represented in our approach to partnerships.

Shareholder priorities

Government priorities

Manaaki Whenua is well placed to support the Government's priorities for well-being and the integration of production, sustainability and inclusivity. Our work focuses on achieving sustainable outcomes for the natural environment, which underpins both well-being and our productive economy.

Over two decades we have invested in RS&I capability that integrates social, economic, cultural and environmental themes. This capability is now in high demand, especially by the National Science Challenges, and our expertise will be valuable in developing national indicators of performance for well-being, including those relevant to Māori. We worked closely with the Ministry for the Environment and Statistics NZ on addressing gaps in the data for *New Zealand's Environmental Reporting Series: Our Land 2018* and *Environment Aotearoa 2019* and will continue to collaborate closely in this field.

Ministerial expectations of CRIs

In her Annual Letter of Expectations, the Hon Dr Megan Woods, Minister of Research, Science and Innovation, highlighted three critical areas of focus for CRIs: export value from the land, water quality, and a low carbon economy. In these areas Manaaki Whenua is adding value in the following ways.

Higher-value products from the land – we work increasingly with other CRIs to provide farmers with the tools and knowledge they need to ensure credibility and transparency in their environmental performance, to improve management of water, nutrients and greenhouse gas emissions, and to explore future uses for Māori-owned land.

Freshwater quality – we are a major contributor to the Our Land & Water National Science Challenge, our S-Map database supports the Overseer model for nutrient management, and nationally we lead work on understanding and preventing soil erosion. We also support the popular regenerative agriculture movement.

Low carbon economy – we created a new research portfolio focused on climate change mitigation and adaptation to ensure this important area has the necessary profile for us to continue providing science leadership in both greenhouse gas emissions and soil carbon inventory and management. Our subsidiary, EMS, is a lead contributor in our efforts towards this goal. We also work collaboratively with the other CRIs and MFAT on climate action for the Pacific Island countries.

Specific priorities for Manaaki Whenua

Building on Strategy-22 – in the section 'Strategy-22' we outline our key initiatives for the upcoming financial year, which build on work done to date, to deliver on our purpose and vision for New Zealand's land environment and to support Government priorities.

Collaboration – in the sections 'Partnering for impact', 'A better way of working (under Strategy-22)', and 'Our future capability' we discuss our approach and work on incorporating collaboration into all facets of our research to ensure it produces the greatest impact possible to benefit all New Zealanders.

Property redevelopments – our initiatives to progress the Lincoln redevelopment and explore the option of a Biosecurity Hub at Mt Albert are described in the section 'A better way of working'.

Strategic report-backs

In 2018 Manaaki Whenua worked with the other CRIs to explore two pivotal issues facing all CRIs: CRI workforce, and CRI–Māori partnership and co-innovation. The CRI workforce initiative looked at the future of work and key workforce challenges CRIs may face, based on current predictions of how work will evolve in the next 10 to 20 years and beyond. The CRI–Māori partnership and co-innovation initiative explored the need for increased Māori engagement and co-innovation across the science system, including challenges resulting from a high demand for and low number of Māori researchers.

Science, technology and investment trends

Open data – a valuable resource

Globally and domestically, data are increasingly seen as a significant asset. The Crown, shareholding Ministers, local government, the New Zealand public and New Zealand businesses expect open, accessible data to support open government and transparent decision-making, and to generate new value. Increasing the openness and availability of data is also seen as important for addressing global concerns about the decrease in public trust in science. Manaaki Whenua actively champions the role of open data in the science system and beyond, striving to add value to open data by developing tools and providing interpretation for government, and for the public and private sectors.

Digital and molecular technologies – changing the way science is done

New digital and molecular technologies are changing how we do science. Complex systems modelling, machine learning, artificial intelligence, big data, 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. Molecular technologies such as new gene-based technologies are also 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. We 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 the benefit of biosecurity and conservation efforts.

Science and society – social science and citizen scientists

Biodiversity, biosecurity and land-use issues sit equally in a social as well as a bio-physical system. In New Zealand this social system includes te ao Māori and the Treaty of Waitangi. Government, sector groups, and others focused on impacts increasingly look to employ social sciences to ensure they achieve their missions. The increased demand for social sciences includes research into and development of policy, processes and tools to engage with, understand and deal with human dimensions such as customs, values and attitudes, governance, and political and economic systems.

Within the social and bio-physical systems 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 to support national goals and grow opportunities for scientists to engage with communities, iwi and young New Zealanders on major environmental challenges – to solve them together and build trust.

Investment in science

Over the 2019–2024 period Manaaki Whenua anticipates a moderately positive outlook for investment in science. We expect moderate increases in investment from central and local government (including NSC tranche 2), as well as from some industry sectors, and modest commercial and international client revenue growth driven by an increased focus on the environment, climate change and well-being. These gains will be offset by inflation-driven erosion of some investment sources, notably the MBIE Strategic Science Investment Fund (SSIF). Since 2011 our SSIF Programme Platforms investment (and its forerunner, Core Funding), currently contracted through to 2024, has not been inflation adjusted. During this time increases of 8% in CPI and 21% in wages have occurred, equivalent to a decline of approximately $3.3 million to date in real value of the Programme Platforms investment ($17 million). MBIE contestable investment remains unpredictable.

Partnering for impact

Using integrated research to find solutions

New Zealand faces many environmental issues that will need an integrated research approach, bringing together transdisciplinary teams to address 'wicked problems' and consider environmental, social, cultural and economic aspects to find a solution. Single organisations are unlikely to have all the capability or the capacity for such research, so science has become much more collaborative. Manaaki Whenua seeks to take a 'right' team approach to collaboration and to developing the integrated research solutions needed by our partners. 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, climate change adaptation); returns from 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).

National Science Challenges

We have invested over two decades in RS&I capability that integrates social, economic, cultural and environmental themes. This capability is now much in demand, especially by the National Science Challenges. National Science Challenges take a collaborative approach to solving some of New Zealand's biggest issues. They present an opportunity to increase the stretch and impact of our research, and to provide an economy of scale for working with collaborators. Manaaki Whenua is proud to host one of New Zealand's 11 National Science Challenges, New Zealand's Biological Heritage (BH-NSC). We also contribute to Our Land & Water, Deep South, Resilience to Nature's Challenges, Science for Technological Innovation, Building Better Homes, Towns and Cities, and Sustainable Seas.

NEW ZEALAND'S BIOLOGICAL HERITAGE

Ngā Koiora Tuku Iho

National SCIENCE Challenges

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 Challenge'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 BH-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 MBIE to deliver the Challenge's work programme.

In August 2018 the Challenge had their very successful mid-term review, with $37.9 million subsequently confirmed for 2019–2024. Implementation of the Challenge's strategy for phase 2 is now underway. The Challenge has also received surge funding for kauri dieback ($8.75 million) and myrtle rust ($5 million) research in the form of a 3-year SSIF platform. Manaaki Whenua has engaged with BH-NSC to seek roles in scoping the research now needed to deliver on the Challenge's strategic outcomes. We are also keen to seek strategic alignment of our SSIF and other investments. 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 BH-NSC mission, and therefore build towards achieving its 'additionality', a key concept for this Challenge (www.biologicalheritage.nz).

Intent

Manaaki Whenua is committed to delivering on our purpose and vision. These statements capture why we exist and express our commitment to New Zealand to create a positive impact for our land environment through our science, research and technology. In our 5-year strategy, *Strategy-22*, we articulate how we will increase our impact through three strategic pillars to build an irresistible culture, a better way of working, and science for impact. These pillars support our science and technology priorities described in our four ambitions for New Zealand. In these ambitions we outline our goals to understand and preserve our unique biodiversity; protect our nation's biosecurity; support sustainable land, soil and water use; and ensure New Zealand is environmentally informed and able to take appropriate action on key environmental issues such as climate change.

Science for our land and our future

Ko te pūtaiao mō tō tātou whenua, mō āpōpō

•

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

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

WE WILL ENABLE NEW ZEALAND TO:

- Reverse the decline of native species, habitats and ecosystems
- Makuru ana ngā mahinga kai (gather food from abundant & flourishing areas)
- Increase the resilience of natural ecosystems

- Better respond to biosecurity threats
- Reduce pest, weed & disease impacts
- Kia tiakina ngā taonga tuku iho (better protect taonga species)

- Use land more sustainably
- He whenua koiora (better utilise resources for intergenerational well-being)
- Better protect & restore land and soil resources
- Reduce the impact of land use on water

- Kia tautokohia te kaupapa kaitiakitanga (better enable kaitiakitanga to be practised)
- Make better-informed environmental decisions
- Be more inclusive & effective in environmental policy, planning & governance
- Better adapt to climate change and mitigate its impact
- Be a more resilient society and economy

WE WILL DELIVER TO NEW ZEALAND THE KNOWLEDGE & TOOLS TO:

- Conserve and restore native terrestrial species, habitats & ecosystems
- Identify & characterise biota & ecosystems, and measure changes to support evidence-based responses

- Identify, characterise, monitor & control invasive species
- Use new and improved biosecurity tools and approaches

- Monitor, manage & mitigate key risks to land, soils & water
- Derive sustainable economic value from land resources
- Identify & characterise soil and land resources, & measure changes to support evidence-based responses

- Account for people's values, attitudes & behaviours in managing environments
- Mitigate the factors contributing to climate change & improve adaptation to its impact
- Operate businesses more sustainably

Understand, value & use te ao Māori & Treaty-informed approaches

Access accurate & integrated data, information & knowledge

Make robust & integrated longer-term natural resource policy, planning & investment decisions

Promote smart international environmental solutions & be a trusted partner

OUR STRATEGY

01. An irresistible culture

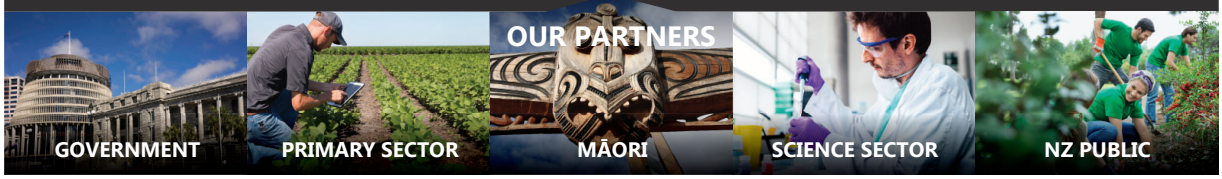
Our unique culture embraces mātauranga Māori as a complementary world view, and values leadership, diversity, and partnership as powerful tools for creating positive impacts for our land.

02. A better way of working

Our business is built on an efficient, sustainable and scalable operating model that ensures we can realise the greatest possible impact for New Zealand from every dollar invested.

03. Science for impact

Our research is highly valued as it delivers real world outcomes for NZ. Integrated and innovative science brings together multi-disciplinary teams, partners and the public to respond to the land environment issues that face all New Zealanders



Our purpose and vision

Science for our land and our future

Ko te pūtaiao mō tō tātou whenua, mō āpōpō

As an organisation of around 400 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 our 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.

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 and support the well-being of the people. This concept of wise land use forms the vision of Manaaki Whenua and is inherent in kaitiakitanga – custodianship of our natural taonga and resources for future generations.

Strategy-22

In 2017 we introduced a 5-year strategy to capture how we would deliver on our purpose and vision for New Zealand's land environment. Two years on we are making great progress and have simplified how we represent our strategy to focus on three key pillars for how we deliver impact.

STRATEGY 22

01 AN IRRESISTIBLE CULTURE

Our people

Our culture of empowerment comes from diverse talents, great leadership and communication. We bring together best teams and provide staff with career development. Everyone is 100% committed to health, safety and well-being.

Science working with mātauranga Māori

Our work and impacts are enriched when we build understanding between scientific and Māori worldviews. Mātauranga Māori stands alongside our science in providing insights into our land and our future for all New Zealanders.

02 A BETTER WAY OF WORKING

Our infrastructure

Our Collections and ICT support excellent research. Our sites provide great working environments, support our partnerships and are a base of interaction with New Zealanders.

Our sustainability

We invest wisely to deliver our strategy including financial resilience. We set challenging Sustainable Development Goals that reflect our vision.

Our partners

Our partnerships are enduring and are based on trust and mutual support. Through long term partnership we increase our capacity and achieve our ambitions.

03 SCIENCE FOR IMPACT

Innovative & Challenging

We are tackling greater science challenges with greater rewards for New Zealand. We actively seek and support innovation.

Strategic & integrated

We work on longer and larger scales and more complex problems, integrating across disciplines & stakeholders.

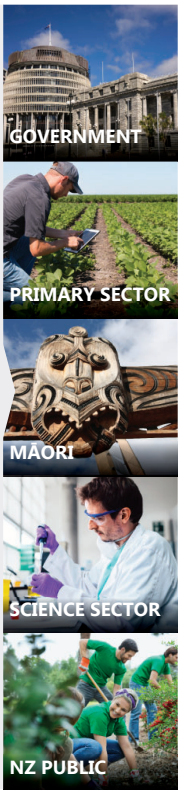
Valued & trusted

We are responsive to the needs of our clients and partners. We produce whole solutions with and for them. Our advice is trusted.

Engaged with all New Zealanders

We have a strong identity and we engage citizens in our research and speak with authority.

DELIVERING FOR OUR PARTNERS



An irresistible culture

Our unique culture embraces mātauranga Māori as a complementary world view to science, and we believe value can be derived from bringing both together. We value leadership, diversity and partnership as powerful tools for creating positive impacts for our land.

Key initiatives for FY2020 include:

- working with our people to define our culture in terms of the behaviours that will support delivery of *Strategy-22* (including a focus on diversity and inclusion)
- a wellness programme built on the participative enquiry project completed last year to understand the environment our people need in order to do their best work
- a diversity and inclusion programme using the annual staff survey and staff engagement groups to better understand what is important to our people, so that we can create and support a diverse and inclusive organisation
- continued work developing our capability for Māori-centred research (including additional capacity within our Manaaki Taiao research group), and the skills of non-Māori researchers for interacting with Māori landowners on projects
- continuing investment in our leadership development programmes for existing and aspiring future leaders, to increase their capability and plan for future succession
- initiating a Safety Differently programme to understand how work is performed and to involve our people in finding solutions so that we create a safety-first culture, and have the right processes in place to ensure the health and safety of our people, contractors, and visitors.

A better way of working

Our business needs to be built on an efficient, sustainable and scalable operating model that ensures we can realise the greatest possible impact for New Zealand for every dollar invested.

Key initiatives for FY2020 include:

- developing formal partnerships in New Zealand and overseas that enhance career pathways for our staff, complement our skill-sets, improve access to new developments in science, and increase our involvement in collaborative initiatives, including Blinc Innovation at Lincoln
- continuing the Lincoln redevelopment programme (Te Rauhītanga) to pioneer new ways of working that power exceptional science, better integration and a stronger, united culture
- completing the finance and project management system replacement project (Te Tūāpapa), to provide greater transparency and control over our core business processes
- a new technology infrastructure designed to support greater mobility and collaboration within and outside Manaaki Whenua
- continuing to evaluate the option of moving from our site at Tamaki to the Mt Albert centre, which involves working with our partners and collaborators to explore concepts for a Biosecurity Hub at the Mt Albert site
- collaborating with EMS to develop an integrated reporting approach using the Sustainable Development Goals as a framework.

Science for impact

Our research should be highly valued for delivering real-world outcomes for New Zealand. Integrated and innovative science brings together multi-disciplinary teams, partners and the public to respond to the land environment issues that face all New Zealanders.

Key initiatives for FY2020 include:

- the Science Den – an internal innovation fund with a novel governance model, where staff with innovative ideas can pitch for funds to develop their idea through a prototype phase
- Outside Thinking and Brilliant Writing – schemes to identify and fund innovative ideas we wish to test and refine through collaboration with other groups, nationally and internationally, followed by writing a synthesis paper to set the research agenda in the chosen areas for the next 5–10 years in a global context
- exploring the creation of a digital gift for New Zealanders that gives them a relevant and useful way to interact with an aspect of our science
- workshops at all Manaaki Whenua sites on integration tools and the initiation of a major new project where we 'learn by doing' (i.e. practise integrated research to investigate if this does enable us to provide some environmental solutions at larger scale)
- improving impact visibility in the project life cycle (planning, delivery, evaluation, reporting)
- working collaboratively with colleagues across the science and innovation sector, particularly through iPEN (the CRI-wide Impact Planning & Evaluation Network), to develop common frameworks and tools and to enhance our collective impact
- supporting the development of the New Zealand Research Information System (NZRIS), to better understand the outputs, outcomes and impacts of our research
- building a library of stories about our research to better demonstrate the impact (value) we deliver to New Zealand.

Our future capability

Workforce and the future of work

In 2018 the CRIs worked together to chart generic workforce issues and consider the 'future of work'. We looked at the challenge of maintaining a pipeline of new talent into science; the need to enhance diversity and inclusion of different groups; the impact of new technologies on the workplace and practices; the changing expectations of staff for their working lives; and the need to promote and communicate science in a 'post-truth' world.

A series of actions were agreed by the CRIs, and Manaaki Whenua is committed to implementing these collaboratively over the next 5 years:

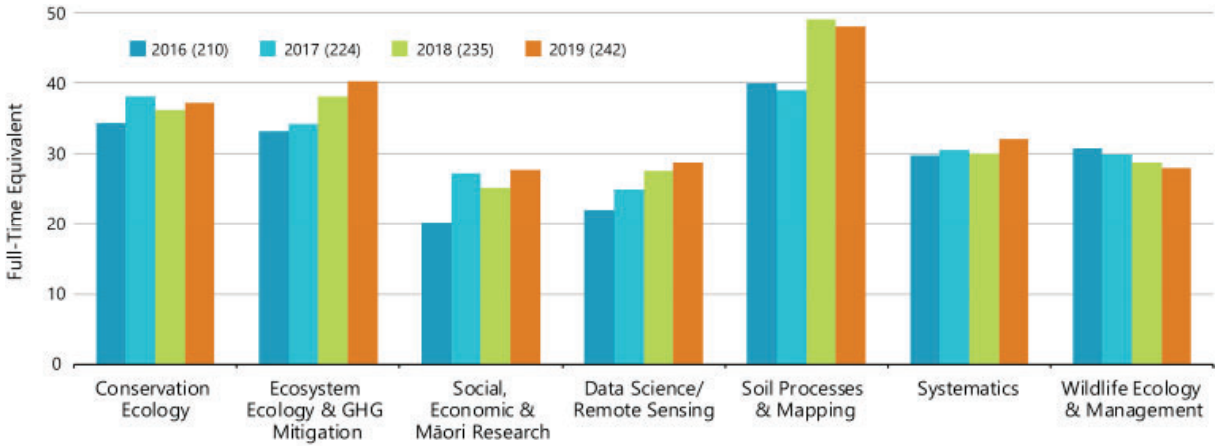
- fulfil the CRIs' role of maintaining New Zealand's strategic research and science capability, and lead national action on workforce futures with our principal stakeholders
- work with relevant stakeholders to meet the needs of emergent workforce members and support groups (women, Māori, overseas recruits) into senior leadership roles
- work with universities, NSCs, SSIF Platforms, the Natural Resources Sector, etc., to ensure resilient, system-wide science capability
- seek to co-invest in at-risk and emergent skills areas to ensure capability is fit for the future
- engage with Universities New Zealand to influence the qualifications and volume of research students in the pipeline for future RS&T demands
- work with MBIE, Immigration NZ and New Zealand Trade and Enterprise to ensure the New Zealand brand, salaries and science investment support New Zealand's ability to attract talent
- partner with major overseas organisations to create talent pipelines and career development opportunities for CRI staff
- work with MBIE to ensure the measurement of science excellence recognises both 'in industry' and 'in public sector' science and research experience
- work with industry, government and Māori organisations to provide opportunities for staff development (secondment, collaborative training, etc.)
- work with the Science Media Centre, Royal Society Te Apārangi, NSCs, etc. to increase the number of scientists confident to 'front' issues and communicate as 'trusted voices' among key communities.

Science capability

Manaaki Whenua sustains New Zealand's strategic science capability in the areas set by our Statement of Core Purpose (SCP). In the decade since the SCP was agreed we have developed complementary capability, especially in social, Māori and economic research, and the capability to support corporate sustainability through our Enviro-Mark Solutions subsidiary.

We invest in science capability through securing external investment related to research and science programmes. The risk with this method is being unable to invest in strategically important capability when we fail to secure external investment through the competitive bidding system. SSIF investment is an important mechanism to manage this risk by enabling us to sustain capability and capacity in key areas. However, without adjustments for inflation, the ability of SSIF investment to maintain capability decreases. In real terms, each year we lose the equivalent of four FTE of experienced scientist capability due to the impact of inflation.

In recent years Manaaki Whenua has been successful in seeking research and science investment, especially through the MBIE Endeavour Fund, and we have been able to grow science capability in areas important to New Zealand.



Science capability in key research areas over the past 4 years.

Our 5-year approach to strategic research and science capability can be summarised as:

- continue to grow our capacity in social, Māori and economic research, which are in significant demand in the New Zealand system
- provide for succession in core capability areas (as per the SCP) where senior staff are retiring
- collaborate and partner nationally and internationally to access talent, where this is more efficient than investing within Manaaki Whenua (e.g. digital skills and genomics)
- invest in new technologies and skills central to our national contribution (e.g. pedometrics, novel predator control technologies, environmental data science, transdisciplinary research).

Māori partnership

Manaaki Whenua has a long history of partnering with Māori groups and organisations. Over time the nature of this work has evolved from working with iwi and hapū on place-based issues (e.g. kiwi conservation and indigenous timber harvesting), to also working with a wider range of organisations and incorporations on land use, future foods, environmental indicators, and governance matters.

Over the last decade we have built a strong group of Māori scientists and strengthened the capacity of some non-Māori scientists to work competently with Māori groups. However, Māori are still only 5% of our total staff and we need to better reflect the proportion of Māori in the New Zealand population (around 15%).

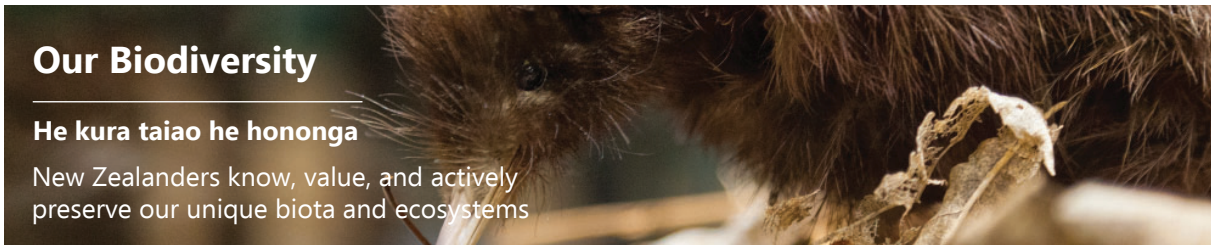
The 2018 CRI report to the Minister of Research, Science and Innovation on Māori engagement and co-innovation across the CRIs recognised the need to develop a pipeline of talent into CRIs in order to provide clear career pathways and support Māori-led research. The CRIs are committed to:

- creating a Representative Forum to facilitate CRI engagement with Māori organisations
- creating a training programme for non-Māori scientists to develop skills and confidence working in Māori settings
- training younger scientists to work with te ao Māori and mātauranga Māori as valid world views
- creating or modifying investment instruments to facilitate mātauranga Māori research and Māori leadership
- working with MBIE to reset the Vision Mātauranga funding mechanism to emphasise the unique innovation potential in science and mātauranga Māori working together
- collaborating with Te Puni Kōkiri and New Zealand Trade and Enterprise (NZTE) to profile science and mātauranga Māori links in the New Zealand story.

We will continue to build our capability and capacity in Māori-focused and Māori-led research, seek to support Māori students in science, and provide a clear pathway to senior leadership roles for Māori.

Our science and technology

Delivering on our purpose and vision 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.



Challenge

Aotearoa's rich biodiversity – from the smallest bacterium to the largest kauri tree – is under threat from pressures such as invasive species, climate change, land-use intensification and conversion, mining, and urban development.

Solutions

Discovering, protecting and restoring 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. These efforts rely on a deep understanding of ecosystem resilience, tipping points, and how various threats – from climate change through to invasive species – affect native species. Our aim is to provide the Department of Conservation (DOC), regional councils, conservation groups, and communities with the scientific foundations they need to protect the most threatened species and ecosystems.

Working together

We partner with DOC, MPI, the Ministry for the Environment, regional councils, iwi, wildlife sanctuaries, non-governmental and community groups, as well as business, to improve New Zealand's biodiversity management. We also contribute through major national initiatives such as BH-NSC and Predator Free 2050.

Knowledge assets

To reverse the decline, 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 contained within this critical infrastructure underpins our ability to actively manage our biodiversity.

Research priorities 2019–2024

- Investigate outcomes of different management regimes for species and ecosystem conservation.
- Support biocultural approaches to managing biodiversity.
- Increase understanding of ecosystem resilience and how to protect and improve it.
- Harness molecular ecology for preserving biodiversity.
- Measure and understand biodiversity change and its implications.
- Enhance and enable the identification and understanding of plants, arthropods, fungi, and bacteria.
- Manage and improve the collections and databases underpinning New Zealand's biodiversity system (including Ecogene).
- Develop and promote environmental information management and computing technologies (informatics).

Challenge

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.

Solutions

Manaaki Whenua will be innovative and explore new and challenging areas of science to help meet Biosecurity 2025, Predator Free 2050, and OSPRI goals, and to create a step-change in biosecurity management. We recognise this also requires understanding and creating social licence through effective engagement with New Zealand communities. Our research and support for other agencies focuses on border security for early detection and prevention, and control and eradication methods for invasive species, including mammalian pests.

Working together

We partner 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 BH-NSC.

Knowledge assets

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 New Zealand's ability to actively manage biosecurity threats and incursions.

Research priorities 2019–2024

- Develop tools and methods to beat weeds.
- Identify and develop weed biocontrol agents.
- Increase understanding of ecosystem resilience and how to protect and improve it.
- Support biocultural approaches to biosecurity.
- Guide and evaluate effective landscape-scale predator eradication.
- Develop safe and cost-effective vertebrate predator control tools and technologies.
- Support TB freedom and wildlife disease management.
- Harness molecular ecology for biosecurity.
- Enhance and enable identification and understanding of plants, arthropods, fungi, and bacteria
- Manage and improve the collections and databases underpinning New Zealand's biosecurity system (including Ecogene, our ecological genetics unit).
- Develop and promote environmental information management and computing technologies (informatics).

Challenge

Some of our most important natural resources have been over-allocated or have reached critical environmental thresholds because of unsustainable land-use practices. We need to protect the health and grow the resilience of our land, fresh water, and soils even as we use them to thrive and grow as a nation. This is even more challenging in the face of climate change.

Solutions

The demand for information and new tools to support effective management of land resources in New Zealand is urgent and growing. To improve how New Zealanders use land and soil resources, Manaaki Whenua will work to improve knowledge of the inherent variability and change of the land over time, and across catchments and landscapes (natural, managed and urban). We also want to understand how the land responds to human pressures, potential limits to land-use intensification and other development, and what drives natural resource management decisions. Our aim is to provide new and improved tools to meet these challenges and support sustainable land management and resource allocation.

Working together

We partner with a wide range of government, Māori, community and industry sector groups to achieve goals for New Zealand. This includes Natural Resource Sector agencies, local government, Beef + Lamb New Zealand, Fonterra, Federated Farmers, Hikurangi Enterprises, and Parininihi ki Waitotara (PKW). Our work closely aligns with the missions of several National Science Challenges, notably Our Land & Water.

Knowledge assets

By drawing on and enhancing the value of our Nationally Significant and other databases, such as S-map and Land Resource Information Systems (LRIS), our research increases the availability of authoritative information on New Zealand's land-based resources to more accurately understand and manage the pressures on our land and soils, improve environmental reporting, and deliver pathways to more sustainable land use.

Research priorities 2019–2024

- Integrate the management of carbon, water and nutrients.
- Protect and improve soil and ecosystem health.
- Understand erosion processes and manage sediment.
- Integrate land and water management, including implementation of catchment policy.
- Characterise soil attributes and their spatial variability (e.g. S-map).
- Generate credible spatiotemporal land-cover and land-use data (e.g. LCDB).
- Map and characterise ecosystem services, and enable scenario analysis.
- Integrate modelling of land resource information, including uncertainty and its implications.
- Deliver online multi-platform access for stakeholders to New Zealand land resource data.
- Enhance and enable identification and understanding of plants, arthropods, fungi, and bacteria.
- Develop and promote environmental information management and computing technologies (informatics).

Our Environment

Kia tiakina te taiao

New Zealand is an environmentally informed nation taking action together

Challenge

To really improve how we care for the environment, New Zealand needs better-informed people and more effective policy, planning, governance and decision-making processes that account for the complexity involved. Industry and business also need to operate in a resilient way within complex environmental limits. This includes supporting New Zealand's commitment to meet its international greenhouse gas obligations through a mix of domestic emissions reductions, the removal of carbon dioxide by forests and soils (where appropriate), and participation in international carbon markets.

Solutions

Manaaki Whenua's climate change research has a dual focus: first, measuring the stocks and flows of terrestrial green-house gases, and mitigating their impact on the environment and society; and second, how New Zealand can best mitigate and adapt to climate change by developing resilient communities and sectors.

We work to provide government, Māori, business and community groups with improved understanding and tools to take into account the socio-economic factors that enable policy implementation, good governance, effective decision-making, and iwi and community partnership, and how these support their endeavours to care for our environment. Central to this are te ao Māori and Treaty-informed approaches.

We work with the Ministry for the Environment, Statistics New Zealand and other agencies to provide New Zealanders with better information on the state and trend of their terrestrial environment, and the environmental, social and economic implications of their decisions. This work also contributes to New Zealand's international reporting obligations.

Working together

We work with a wide range of partners for this ambition, which connects with many of the initiatives in our other three ambitions. For our work in climate change mitigation we partner with several hundred diverse organisations and businesses through our subsidiary, Enviro-Mark Solutions Ltd. We also work with those central and local government agencies involved in understanding, mitigating and adapting to climate change. Our science direction and priorities in this ambition are closely aligned with the missions of several National Science Challenges, particularly Our Land & Water and Deep South.

Research priorities 2019–2024

- Understand environmental preferences, attitudes and behaviours.
- Understand and harness dynamic inter-relations between people and the environment.
- Inform and improve environmental policy and governance.
- Enable better-informed and more transparent resource management decisions.
- Map and characterise ecosystem services, and enable scenario analysis.
- Rangahau mō te kaitaki (research for the kaitiaki).
- Develop accurate quantification of and changes in terrestrial greenhouse gases (GHGs) and carbon stocks.
- Develop and evaluate cost-effective technologies to mitigate terrestrial GHG emissions.
- Determine the biophysical and socio-economic consequences of climate change.
- Develop and evaluate climate change responses/options.

ENVIRO-MARK SOLUTIONS

Enviro-Mark Solutions Ltd (EMS) provides internationally credible certifications for business and industry environmental performance through its Certified Emissions Measurement And Reduction Scheme (CEMARS), carboNZero, Enviro-Mark and Energy-Mark programmes. EMS works with over 400 organisations across most economic sectors. Its main customer bases are in New Zealand and the United Kingdom. It is a wholly-owned subsidiary of Manaaki Whenua, and was established as a business unit in 2006 and as a stand-alone entity in 2011. EMS 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 and Science Based Targets provider. EMS is B-Corp certified for the way it runs its business.

Fit with Manaaki Whenua strategy

EMS's widely recognised certification and related technical services enable organisations to improve their sustainable business practices, implement robust environmental management systems, and demonstrate credible carbon reduction or carbon neutrality with confidence. Through its certification programmes and associated technical services, EMS contributes to Manaaki Whenua's ambition 'Our Environment' by growing the number of organisations and sectors mitigating GHG emissions and implementing systems to operate within environmental limits. EMS adds value to its customers by ensuring its programmes are science based and aligned with international standards and best practice; providing assurance for environmental performance and climate action claims; mitigating environmental and climate risks, cost savings and efficiencies; building capability; improving systems; changing culture; and inspiring innovation.

Business direction

The current growth in uptake of EMS's certifications and related technical services reflects recognition of the urgency of the need for climate action by the business community in New Zealand and in overseas markets. EMS is playing a pivotal role in supporting New Zealand businesses to respond to emerging national climate change regulations and supply chain demands for carbon footprint information, Science Based Targets, and offsetting. Marketing, partnerships and technology are integral to the EMS strategy to respond to these rapidly developing market demands. EMS is actively developing relationships to extend the range and value of customers and sectors using our services. We have improved our software tools to gain efficiencies for our customers and auditors, and have extended our capability to ensure we remain competitive while developing new tools for the primary sector and supply chains.

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, EMS is actively developing and enhancing its alignment with global standards and initiatives, including the ISO GHG standards, CDP, and Science Based Targets. We are extending our environmental management system programmes to encompass the Agenda 30 Sustainable Development Goals to further support organisations to meet their social licence to operate. In its own operations, EMS is using the B-Corp process to improve the way the business operates and measures both profitability and the impact of its services.

Performance

Manaaki Whenua values the quality of our science and the role external reviews play in ensuring we continue to produce high-quality science of value to New Zealand. We use a range of approaches to confirm that our strategic direction is in line with the needs of New Zealand, and that we deliver the research and technology outcomes and impacts that benefit New Zealand. Our Board's Outcome Advisory Panel provides critical input into both our business strategy and our science priorities, ensuring these are well aligned with the needs of New Zealand and our partners. We are committed to regular external reviews of our research, which is an intrinsic part of our research process, as evidenced by our performance in peer-reviewed literature. We also conduct periodic reviews of our research portfolios with our Board's external Science Advisory Panel, and report on a number of financial and non-financial Key Performance Indicators fundamental to ensuring our long-term sustainability.

External review and input

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.

Commitment to research reviews

Excellence in the scientific research Manaaki Whenua carries out is fundamental to the success of the organisation. We also recognise that peer review is a valuable and necessary part of ensuring the quality of our research programmes. Starting in the second quarter of 2019/20, the Science Advisory Panel, supported by additional specific domain expertise, will review our four ambitions. The focus for the first review in November 2019 will be on the science excellence and quality of research planned for Our Biodiversity and Our Biosecurity. We will review Our land and Our Environment in 2020.

Each review will entail two parts: a written submission outlining the context, strategic direction and achievements of the research over the last 3 years, followed by a 2-day face-to-face meeting to discuss the future direction and opportunities for the research. After each review, the Science Advisory Panel will present their findings to the senior management and the Board.

Performance monitoring and reporting

In addition to the key focus areas mentioned previously under *Strategy-22* goals, key non-financial performance indicators 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	2016/17 actual	2017/18 actual	2019/20 target
End-user collaboration	Revenue per FTE from commercial sources ($000s)[1,3]	$49	$53.9	>$50
Research collaboration	Percentage of papers co-authored[1] (total)	89%	89.5%	90%
	Co-authored with other New Zealand organisations	27%	28.8%	25–30%
	Overseas co-authors	38%	34.6%	35–40%
	Both New Zealand and overseas co-authors[3]	23%	26.1%	25–30%
Technology and knowledge exchange	Commercial reports per scientist FTE[1]	0.8	0.71	0.7-0.8
	Availability of data from our SSIF-funded databases, collections and information systems (assessed by a variety of metrics appropriate to each; metrics online)	Increasing trends Refer to annual reports for detail		
	Response rate for requests to our SSIF-funded biological collections and associated infrastructure (specimen transactions, identifications, visits)	100%	97.9%	>95%
	New and improved products, processes and services	44	50	40
	Presentations to stakeholders and community groups	210	211	240
Science quality	Impact of scientific publications (mean citation score) [1,3]	3.1	3.2	2.9–3.3
Financial indicator	Revenue per FTE ($000s) [1]	$188	$205.3	>$200
Stakeholder engagement and feedback	Percentage of relevant end-users who have adopted knowledge and/or technology from Manaaki Whenua [2]	93%	91%	>90%
	Percentage of relevant funding partners and other end-users that have a high level of satisfaction in our ability to set research priorities [2]	71%	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 we are involved in [2,3]	84%	81%	>90%
	Staff invited to participate in stakeholder meetings or workshops	253	244	250
Vision Mātauranga	Number of positive strategic partnerships with iwi and Māori organisations in which we link science and mātauranga, and address Māori goals and aspirations[3]	84	93	90
Commercialisation	Number of new and existing licensing deals involving Manaaki Whenua-derived IP (including technologies, products and services)	9	26	20–25%
High-performance culture	Staff engagement in survey evaluations	74%	70%	>70%
	Staff retention rate	93.1%	91.5%	>90%

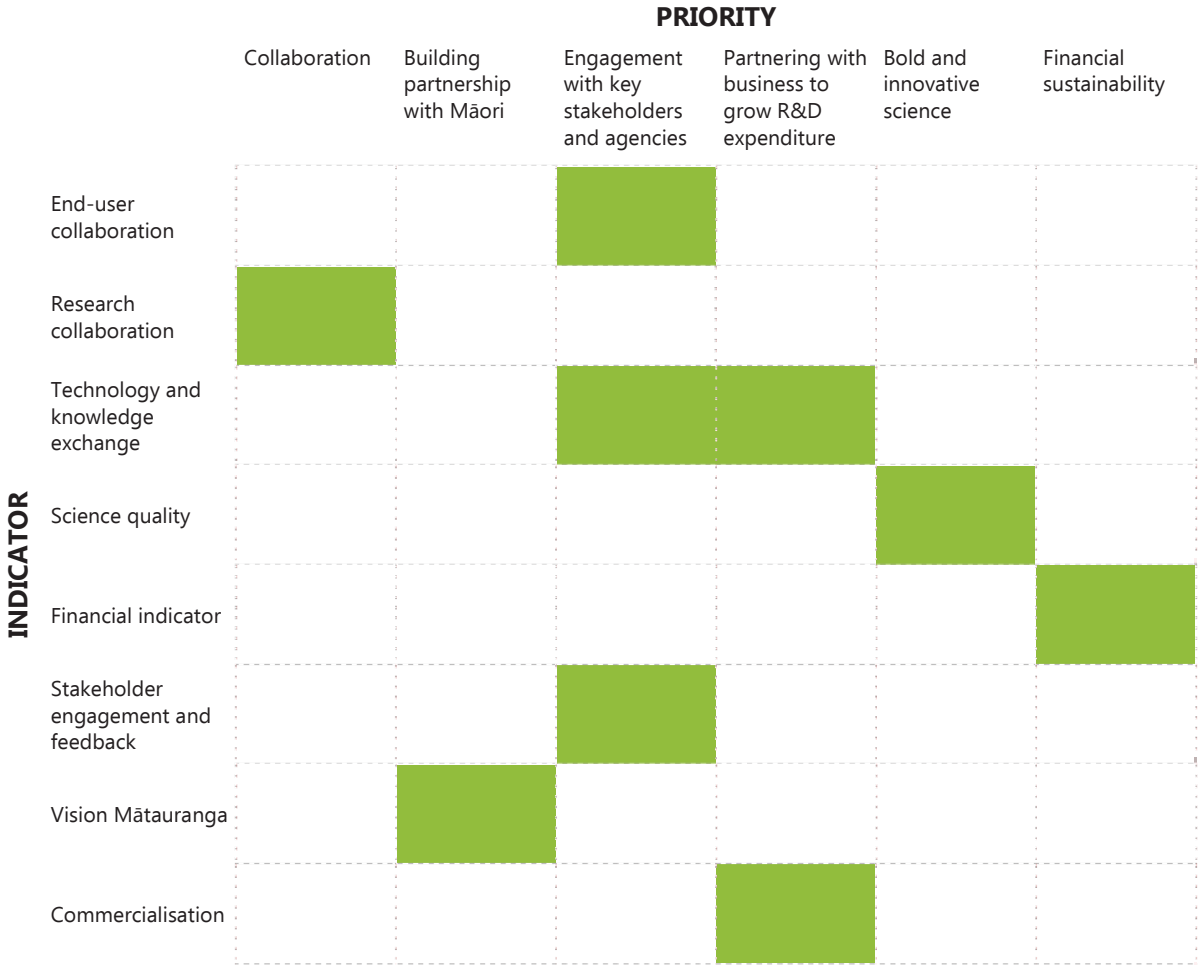
[1] Generic indicators as required by MBIE across all CRIs are at the Manaaki Whenua Group level; the rest are at Parent level.

[2] Data provided from the MBIE-commissioned biennial external client survey, July 2018. From 2019 Manaaki Whenua will replace the MBIE Stakeholder Survey with a formal mechanism to capture key stakeholder feedback.

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

Indicator alignment to Government priorities

As we are currently reviewing our indicators relating to diversity and well-being, they have not been included in the below table.



Financial reporting

Financial performance and position

The 5-year financial plan reflects steady revenue growth in 2020 and 2021, followed by consolidation in the later years as additional MBIE funding for Myrtle Rust and Kauri Dieback in the Biological Heritage National Science Challenge ends. This strong revenue performance positions us well to deliver sustainably on our purpose, and to drive several key strategic investments to enable our science impact into the future.

For the financial year ending 30 June	2018/19		2019/20	2020/21	2021/22	2022/23	2023/24
	Target	Forecast	Target	Target	Target	Target	Target
Revenue	86.0	85.7	93.6	103.2	103.1	103.0	106.0
EBIT[1]	2.1	2.7	2.4	3.6	3.3	3.6	3.8
Total assets	67.1	69.6	74.9	83.0	85.1	87.7	91.7
Capital expenditure	10.8	9.9	16.1	10.8	6.7	10.0	7.9
Dividend	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Equity ratio[2]	64%	63%	63%	61%	61%	63%	64%
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 2020 Manaaki Whenua's revenue is budgeted at $93.6 million, up by $7.9 million or 9% compared with the 2019 forecast. This increase is predominantly Endeavour funding, non-MBIE New Zealand clients and growth in the EMS subsidiary.

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 2020 is 9.4%. 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 $3.0 million in 2020. The RoE after investment in 2020 is 4.7%.

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.

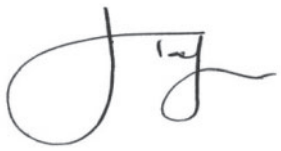
Cash flow and dividend

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 $6.8 million in 2020, which is forecast to increase through the 5 years of this SCI, with a predicted EBITDAF of $10.9 million in 2024.

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 2019

Appendix 1: Additional financial indicators

For the financial year ending 30 June	2018/19		2019/20	2020/21	2021/22	2022/23	2023/24
	Target	Forecast	Target	Target	Target	Target	Target
Operating margin[1]	7.1%	7.8%	7.3%	9.0%	9.9%	10.0%	10.3%
Profit/FTE	$14,718	$17,675	$15,232	$20,865	$22,768	$23,130	$24,398
Quick ratio[2]	1.89	1.93	1.32	1.21	1.34	1.34	1.46
Interest coverage[3]	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Profit volatility[4]	19.0%	18.8%	17.9%	17.7%	19.9%	20.8%	17.0%
Forecasting risk[5]	1.6%	3.3%	3.1%	3.0%	1.4%	0.2%	0.0%
RoE before investment	10.3%	14.2%	9.4%	9.3%	8.1%	6.2%	6.1%
RoE NPAT[6] (after investment)	4.6%	5.4%	4.7%	6.2%	5.5%	5.6%	5.5%
Revenue growth	8.0%	11.2%	9.2%	10.3%	-0.1%	0.0%	2.9%
Capital renewal[7]	2.7	2.5	3.6	1.9	1.0	1.5	1.1

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.

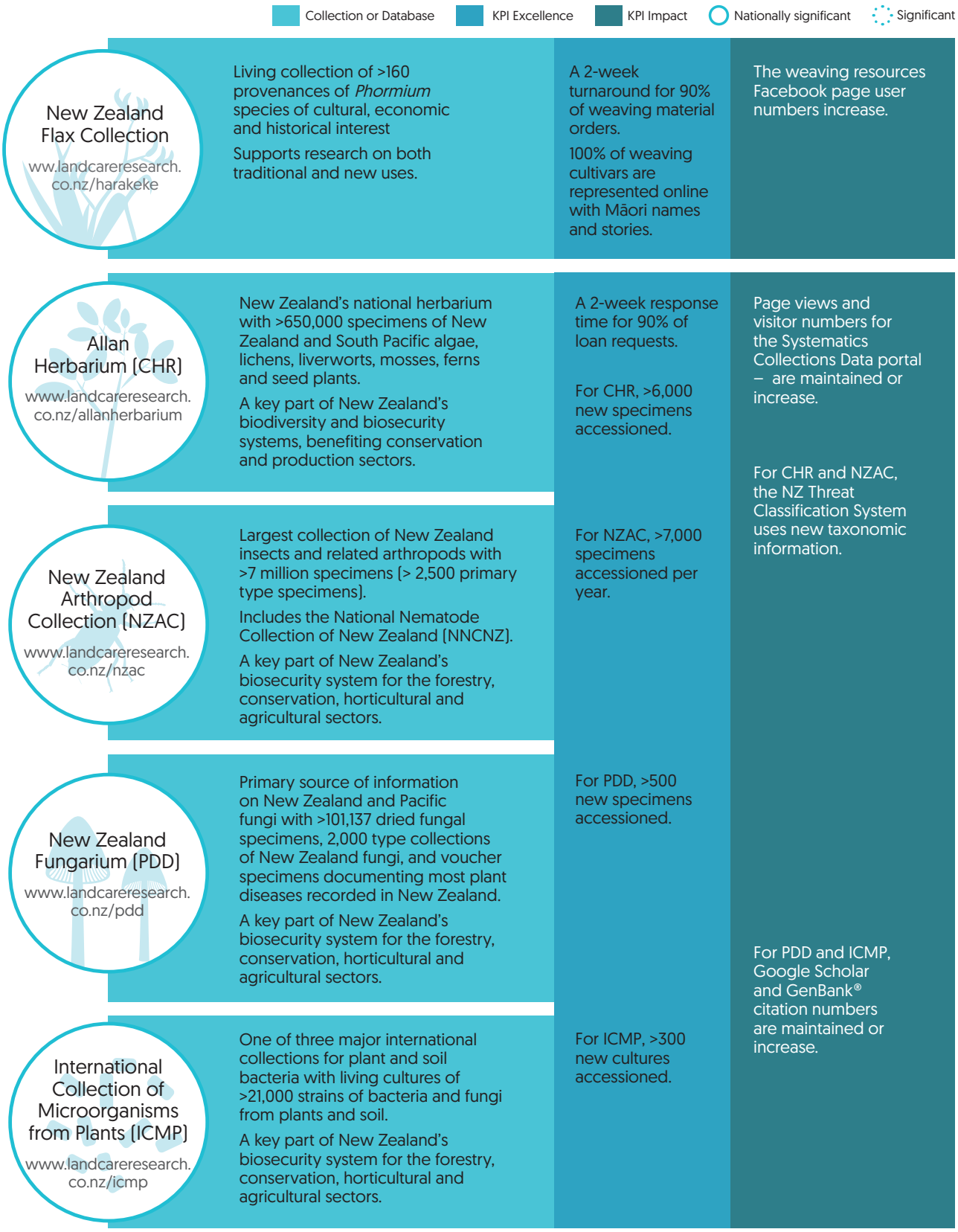
[5] Forecasting risk: 5-year average of return on equity, less forecast return on equity.

[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: Collections, databases and information systems

COLLECTIONS



DATABASES

Land Resource Information Systems (LRIS)

http://lris.scinfo.org.nz

Includes the New Zealand Land Resource Inventory (NZLRI), Land Use Capability (LUC) handbook, and Land Cover Database (see below).

Depicts general land characteristics (rock, soil, slope, erosion, and vegetation), a derivative general-purpose land evaluation (LUC), and a range of environmental, climatic, management and production attributes.

Service availability uptime is ≥90%.

Number of data sets provided online to users is maintained or increases.

User numbers (direct or indirect) are maintained or increase.

National Soils Database (NSD)

http://lris.scinfo.org.nz

Contains approximately 1,500 New Zealand soil profile descriptions, and analytical data on their chemical, physical, and mineralogical characteristics.

Soil samples are retained as a reference collection (National Soils Archive).

For NSD, more services added, and new data sets uploaded.

Data support environmental reporting and resource management instruments, and their implementation at the regional level.

Land Cover Database(LCDB)

https://lris.scinfo.org.nz

A multi-temporal, thematic classification of land-cover change across New Zealand dating back to 1996. Contains 33 mainland classes (35 including the Chatham Islands).

A key resource for use in national and regional state-of-environment monitoring, forest and shrubland inventory, biodiversity assessment, trend analysis, and infrastructure planning.

For LCDB, 5th time interval (2018/19) is released for users.

User confidence is maintained or increases.

S-map Online

https://smap.landcareresearch.co.nz

A national soil information system that integrates existing reports and digital information, and updates soil maps where existing data are of low quality, to provide comprehensive, quantitative soil information to support sustainable development and scientific modelling.

Used extensively by regional and central government, primary industry, and the finance, environment, and education sectors.

For S-map, the breadth of soil information for users is extended.

National Vegetation Survey (NVS) Databank

http://nvs.landcareresearch.co.nz

A national depository of plot-based vegetation survey data, comprising a physical archive and databank of records from >109,000 survey plots (incl. >25,000 permanent plots). Temporal coverage spans >70 years, and spatial coverage is from Northland to Stewart Island, the Kermadec and Chatham Islands, and from coastal to forests to high alpine.

A key part of New Zealand's biodiversity and biosecurity information infrastructure.

Requests for public domain data are met immediately (simple) or within 2 weeks (complex).

>20 new electronic data sets added annually.

Registered NVS users numbers are maintained or increase.

NVS data underpins national-scale plant biodiversity trend reporting.

Ngā Tipu Whakaoranga Database

http://maoriplantuse.landcareresearch.co.nz

Contains >2,400 records on Māori names and cultural uses of New Zealand native plants, fungi and algae.

Visitor numbers are maintained or increase.

Appendix 3: 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 4: 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 2018, was $42 million.

Glossary

BH-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	
EMS	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
MFAT	Ministry of Foreign Affairs and Trade	
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	
RS&I	Research, Science and Innovation	
SCI	Statement of Corporate Intent	
SCP	Statement of Core Purpose	www.landcareresearch.co.nz
SDG	UN Sustainable Development Goals	
SSIF	Strategic Science Investment Fund (MBIE)	www.mbie.govt.nz

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Holden Hohaia	General Manager, Māori Development
Dr Stephen Lorimer	General Manager, Development
Chris McDermott	General Manager, Brand & Communications
Dr Peter Millard	General Manager, Science
Graham Sevicke-Jones	General Manager, Science and Knowledge Translation
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