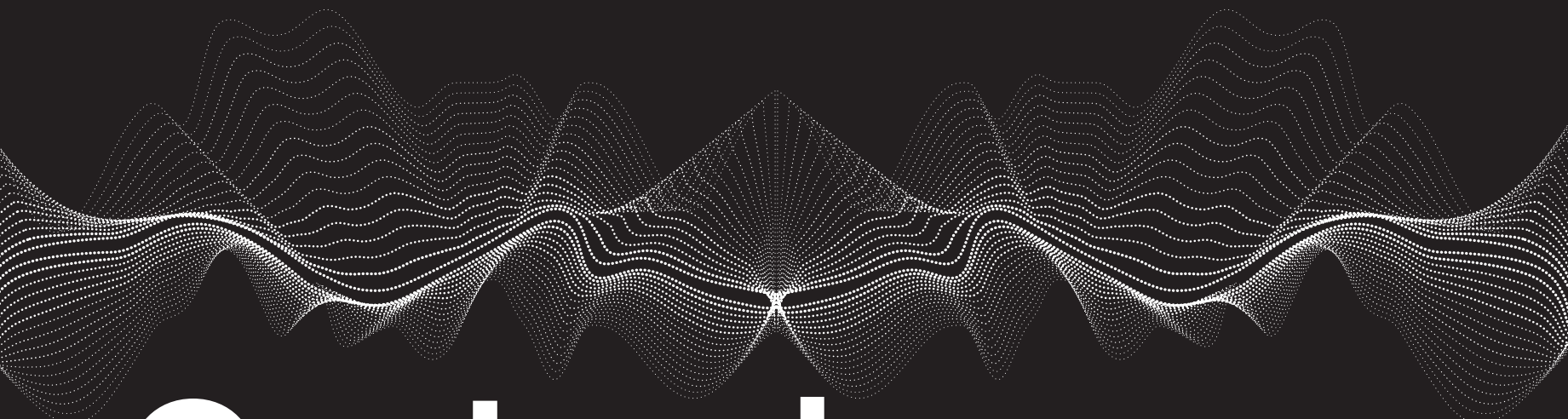




Manaaki Whenua
Landcare Research



Our Land, Our Future

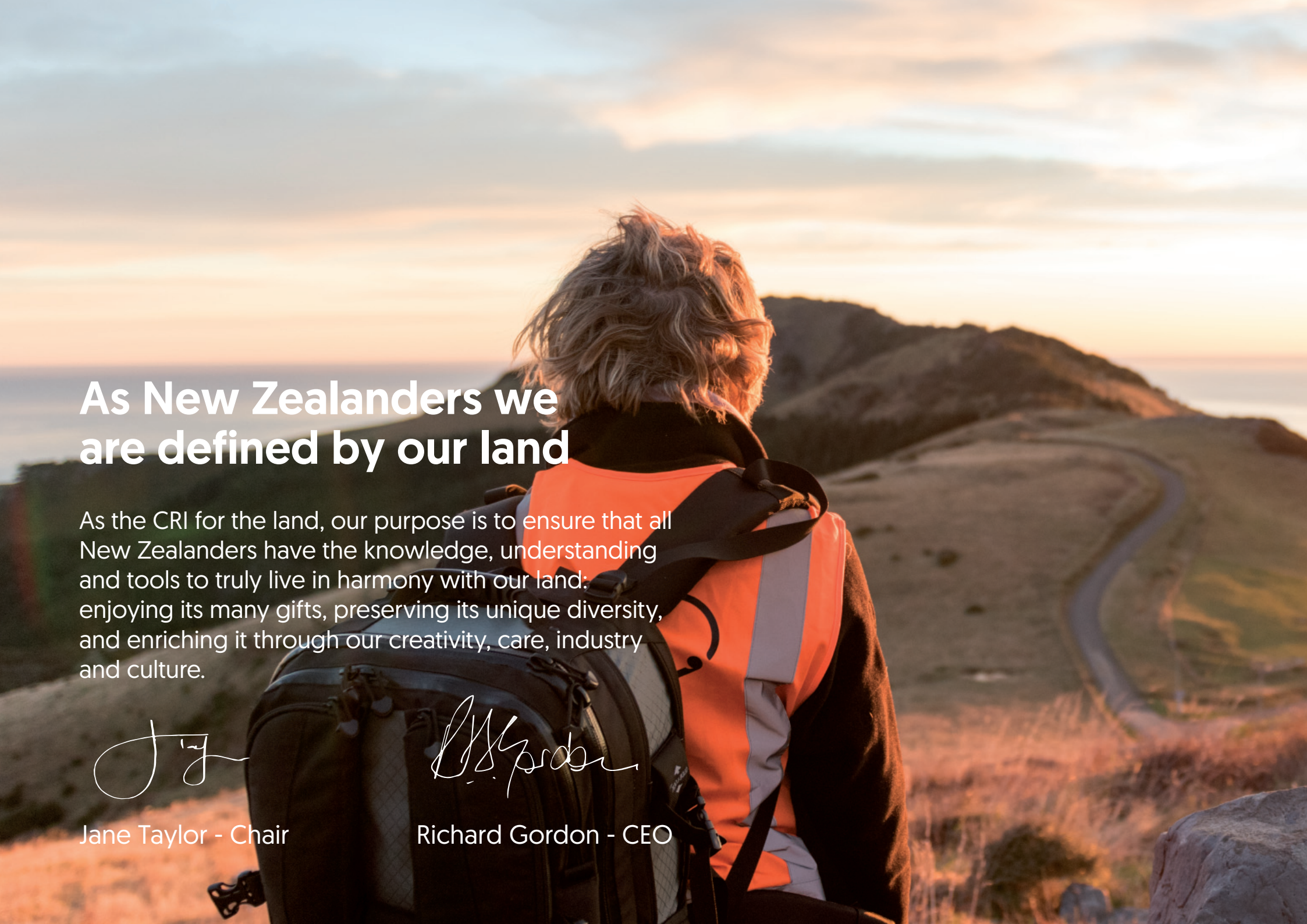
Tō tātou whenua,
mō āpōpō

G.40 Annual Report (2017)

PART 2

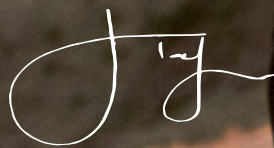
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Financials

ANNUAL
REPORT
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A person with a backpack is seen from behind, looking out over a vast landscape at sunset. The person is wearing a dark jacket and a bright orange safety vest. The landscape features rolling hills, a winding road, and a body of water in the distance. The sky is filled with soft, golden light from the setting sun.

As New Zealanders we are defined by our land

As the CRI for the land, our purpose is to ensure that all New Zealanders have the knowledge, understanding and tools to truly live in harmony with our land: enjoying its many gifts, preserving its unique diversity, and enriching it through our creativity, care, industry and culture.

A handwritten signature in white ink, appearing to read 'Jane Taylor'.

Jane Taylor - Chair

A handwritten signature in white ink, appearing to read 'Richard Gordon'.

Richard Gordon - CEO



PART 2

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Introduction

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This year we present our annual report in two parts. The first introduces our new brand, highlights some of our key science and research outcomes, and explores the strategy underpinning our work. This is part two of the Annual Report. Here we present our Directors' report, financial statements, and a detailed overview of our achievements through Core-funded work (as required by the Ministry of Business, Innovation and Employment).

PDF versions of part one and part two are available for download on the Manaaki Whenua – Landcare Research website, landcareresearch.co.nz.

Jane Taylor – Chair, Richard Gordon – CEO



OUR PURPOSE

Science for Our Land and Our Future

Ko te pūtaiao mō tō tātou whenua, mō āpōpō

OUR FOUR AMBITIONS FOR NEW ZEALAND

Our Biodiversity

We know, value and actively preserve our unique biota and ecosystems

Our Biosecurity

Our land is protected from invasive biological threats

Our Land

We use our land, soil and water resources wisely

Our Environment

We are an environmentally informed nation taking action together

OUR STRATEGIC FOCUS

World-class science

Our people

Real-world solutions through partnership & integration

Growing our impact sustainably

Science working with mātauranga Māori

Engaged with all New Zealanders

Our National Outcomes

With innovative science leadership and effective collaboration with our stakeholder partners to apply our research, we will:

- >> improve the measurement, management and protection of New Zealand's terrestrial ecosystems and biodiversity, including 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 from the terrestrial biosphere
- >> increase the ability of New Zealand industries and organisations to develop within environmental limits and meet market and community requirements.

National Outcome

Key Performance Indicators

Each of the four National Outcomes we report progress against comprise two defined Impact Areas. Here we report against two Key Performance Indicators for each Area. The first is a measure of Strategic Science Investment Funding (SSIF) funded work completed in the financial year. Note that delays are typically due to technical, staffing (e.g. illness, turn over), or weather issues. The second indicates the level of adoption / delivery to stakeholders of our science outputs.

On the next page we provide an overview of our investment by impact of SSIF (previously Core Funding) during the past 5 years.

KPI 1: SSIF funded research outputs on-track or completed

Target: 70–80%

KPI 2: Success measures for Research Focus Area key research initiatives achieved

Target: 80–90%

Outcome 1: Improved Biodiversity

1.1 Understanding New Zealand's Biodiversity	96%	100%
1.2 Improved Biodiversity Outcomes	71%	95%

Outcome 2: Sustainable Land Use

2.1 Understanding New Zealand's Land Resources	77%	95%
2.2 Sustainable Land Management	67%	100%

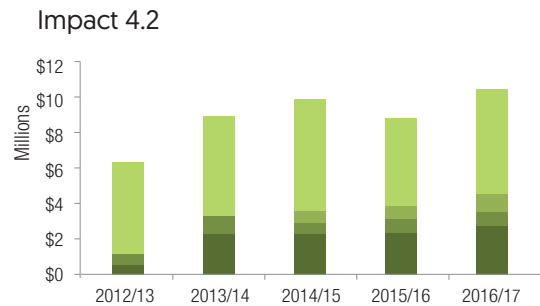
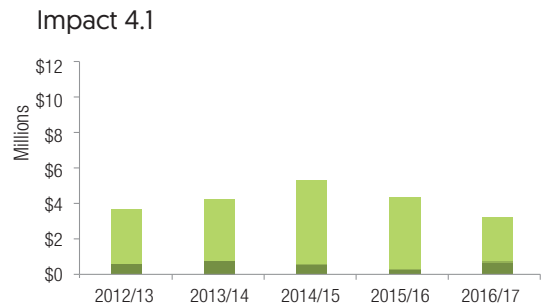
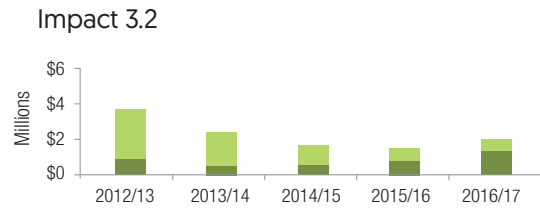
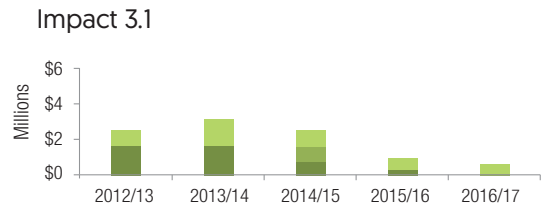
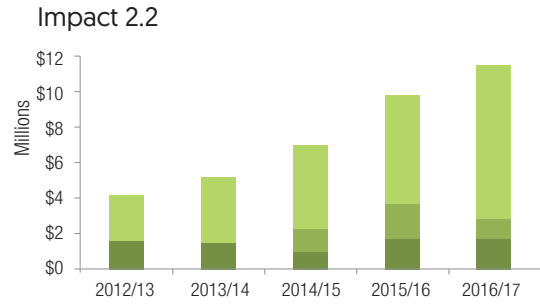
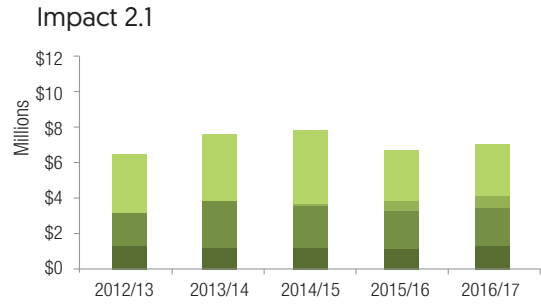
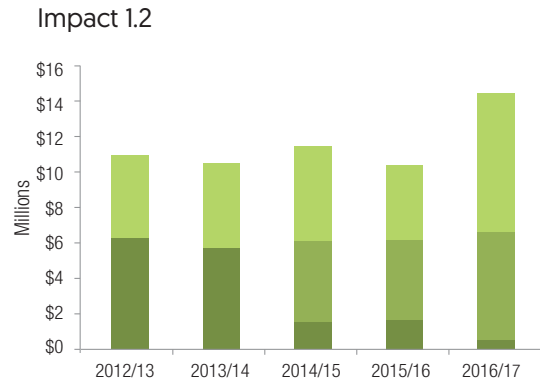
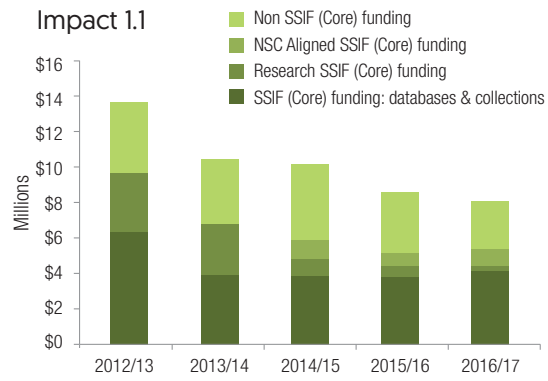
[Low volume, 2 out of 3 completed, the other delayed but will be completed]

Outcome 3: Greenhouse Gases Within Limits

3.1 Greenhouse Gases Trends	88%	95%
3.2 Reducing Greenhouse Gases	100%	90%

Outcome 4: Growth Within Limits

4.1 Better Environmental Decision-making	92%	80%
4.2 Optimised Environmental & Economic Outcomes	78%	87%



MBIE Strategic Science Investment Funding [previously Core Funding] Achievements 2016/17

Manaaki Whenua – Landcare Research received \$25.63 million MBIE SSIF (Core Funding) in 2016/17 for research to achieve:

- Outcome 1: Improved Biodiversity and Biosecurity**
Improve measurement, management and protection of New Zealand's terrestrial biodiversity, including in the conservation estate.
- Outcome 2: Sustainable Land Use**
Achieve the sustainable use of land resources and their ecosystem services across catchments and sectors.
- Outcome 3: Greenhouse Gases within Limits**
Improve measurement and mitigation of greenhouse gases from the terrestrial biosphere.
- Outcome 4: Growth within Limits**
Increase the ability of New Zealand industries and organisations to develop within environmental limits and meet market and community requirements.

Our MBIE SSIF investment and key 2016/17 achievements are shown in the following table.

MBIE SSIF [Core Funding] Investment (in \$M excl. GST)

Research activity	2016/17 (planned)	2016/17 (actual)
2016/17 Key Achievements		
ENHANCING BIODIVERSITY	\$4.96	\$5.00
End-users: DOC; MfE; MPI; MFAT; regional councils; non-governmental conservation organisations (NGOs); community conservation/restoration groups; IPBES – MEP; GEO BON; Environment Court; Parliamentary Commissioner for the Environment; Fonterra; Meridian Energy; researchers; universities; Māori; Tūhoe Tuawhenua Trust; Waikato Raupatu River Trust; consulting firms; community conservation groups; Banks Peninsula Conservation Trust; landowners/managers; QEII National Trust; Mackenzie Country Charitable Trust; philanthropists; Kiwis for Kiwi; Aotearoa Foundation; National Wetland Trust; policy makers; AsureQuality; Wildlife Enforcement Group; sanctuary managers; New Zealand Landcare Trust; Statistics New Zealand.		
Managing landscape-scale risks & threats – Outcome 1	\$0.56	\$0.54
<ul style="list-style-type: none"> Comprehensive stocktake of the state of New Zealand birds: Provided the first spatially explicit, nationally comprehensive, all-species, multi-decade analysis of the status and trends in New Zealand's avifauna. This informed the latest report from the Parliamentary Commissioner for the Environment and showed at a national scale the magnitude and urgency for conservation intervention. Understanding the influence of forest type and environment on pest control success: Developed a national forest classification based on rodent dynamics for predicting the conservation outcomes of management. We showed that environmental and biotic interactions produce predictable patterns of rodents related to mean annual temperature, latitude, elevation and forest type. This large-scale understanding has implications for targeting forest management regimes nationally. 		

Research activity 2016/17 Key Achievements	2016/17 (planned)	2016/17 (actual)
<ul style="list-style-type: none"> Grazing can maintain some rare ecosystems: Demonstrated that mammalian grazing can be important for preventing weed invasions and maintaining coastal turfs, a rare ecosystem often found on the fringes of production landscapes. In some circumstances mammalian grazing is required as a surrogate for the extinct native avian grazers that would have prevented the encroachment of taller vegetation. Our management recommendations are being implemented by DOC throughout New Zealand. 		
Iconic species – Outcomes 1 and 4	\$0.53	\$0.45
<ul style="list-style-type: none"> Non-invasive genetic tools for kiwi conservation: We have developed methods to recover DNA from kiwi faeces and shed feathers sufficient for population analysis and identification of individuals. This will reduce the need to capture or directly sample from birds, increasing the options for management in areas where there may be restrictions on taking blood or otherwise accessing material. New genetic tools for kauri: We have developed a genomic library as a resource for kauri conservation, and have screened <i>Agathis australis</i> and several other <i>Agathis</i> spp. with these markers. This work will be instrumental in managing kauri populations against threats such as kauri dieback. Conservation of New Zealand's third rarest tree won't be sufficient from cultivated plants: We have genotyped all remaining individuals of Bartlett's rata (Myrtaceae family), as well as representatives from plants in cultivation. We have shown that the amount of variation in cultivated material is substantially less than in the wild, meaning that <i>ex situ</i> conservation of the remaining wild plants is now even more critical following the arrival of myrtle rust. 		
Biodiversity management options – Outcome 1	\$0.52	\$0.54
<ul style="list-style-type: none"> Conservation victory for kōkako: Recent monitoring shows kōkako recovery has been successful beyond expectations, with the national population recovering from ~330 pairs in 13 relict populations in 1999 to 1,570 pairs in 22 populations in 2016. This was achieved by a consolidated conservation effort focused on pest control and translocations, underpinned by innovative, sound science. Storm petrel established on Little Barrier Island: We established a breeding colony of storm petrel on Little Barrier Island, which is crucial for documenting breeding 		

Research activity 2016/17 Key Achievements	2016/17 (planned)	2016/17 (actual)
<p>biology, dispersal, feeding range and identifying reliable genetic markers for sex determination. This enigmatic species has a high profile and scientific interest, providing important exposure for conservation efforts.</p> <ul style="list-style-type: none"> Understanding single predator species impacts: We determined that the biodiversity impact of mice when they are the only mammal present is less damaging to ecosystems than having all other pest mammals present, but they could be a serious threat to certain biodiversity such as insects and lizards. This will be underpinning information for decision making for several conservation programmes, including PFNZ 2050. 		
Ecosystem resilience – Outcome 1	\$1.39	\$1.38
<ul style="list-style-type: none"> Key wetland management resource: We launched our online wetland handbook, which provides best practice techniques for enhancement of cultural wetland values and will assist local authorities, research providers, and community groups in their understanding of cultural priorities for wetland restoration. Scientific limits for freshwater management: We provided further understanding of wetlands functioning for the National Objectives Framework under the National Policy Statement for Freshwater Management. Our advice will help ensure the policy direction and limits are appropriate and scientifically defensible. Climate scenarios re-visited: We used tree rings from sub-Antarctic <i>Dracophyllum</i> to demonstrate that climate has become more variable – but not necessarily warmer. This is important because much of the discussion on climate change focuses on the consequences of New Zealand getting warmer – we highlight that increasing variability will be at least as much of an issue and one that could have significant biological consequences. Conservation management in mixed landscapes: We contributed to an international study that disturbed ecosystems were more resilient if they were close to undisturbed similar ecosystems. This suggests that the nearby undisturbed ecosystems are reservoirs necessary for the re-assembly of disturbed ecosystems, which is important for conservation planning, especially in highly modified landscapes. 		

Research activity 2016/17 Key Achievements	2016/17 (planned)	2016/17 (actual)
Māori & biodiversity – Outcomes 1 and 4	\$0.35	\$0.36
<ul style="list-style-type: none"> Sampling of taonga: We are developing an ethical framework for sampling taonga species. This puts in place a strong ethical basis for our research projects that sample taonga Māori, including destructive sampling. Kaupapa Māori biodiversity monitoring: We have constructed the first kaupapa Māori biodiversity monitoring framework, incorporating Māori worldviews into ecosystem assessments. 		

Research activity 2016/17 Key Achievements	2016/17 (planned)	2016/17 (actual)
Interpreting biodiversity change – Outcomes 1 and 4	\$1.60	\$1.73
<ul style="list-style-type: none"> New Zealand's carbon storehouse: We published the first national-scale, unbiased assessment of carbon stocks and stock changes in New Zealand's natural forests and shrublands. This assessment forms the basis of international greenhouse gas reporting by MfE and national environmental reporting by MfE, MPI and DOC. Long-term possum effects: We published the first long-term (11-year) study to use caged enclosures to determine how possums affect ecosystem development. The rate of forest development was more rapid outside cages where possums browsed, which underscores that removing invasive herbivores can have unanticipated consequences. Economics of tree diversity loss: We demonstrated that the economic consequences of losing tree species richness could be as great as US\$500b p.a. globally. This work highlights the need for worldwide reassessment of forest management strategies and conservation priorities, and the influence of tree species diversity on other values, such as food production. eDNA biodiversity monitoring: We developed and published a framework for integrating molecular-based techniques into biodiversity monitoring programmes and presented plans for a virtual eDNA hub to the national eResearch community. This strengthens our position as a key integrator for a growing technology with wide application across several fields. World-leading biodiversity monitoring: We showcased our work to implement and integrate national terrestrial biodiversity indicators at the prestigious GEO BON Conference. Our use of an integrated set of indicators, measured systematically nationwide, was recognised as globally unique. 		

Research activity 2016/17 Key Achievements	2016/17 (planned)	2016/17 (actual)
MANAGING INVASIVES	\$3.79	\$4.28
<p>End-users: MPI; DOC; MFAT; FAO; OSPRI; researchers; New Zealand Defence Force; pest control companies; community conservation groups; businesses and industries; regional councils; Invasive Animals CRC; NZ and overseas universities; AgResearch; ZIP; Island Conservation.</p> <p>Beating weeds and Applied Weed Biocontrol – Outcomes 1 and 4</p>		
<ul style="list-style-type: none"> Continued analyses of the economic benefits of weed biocontrol in New Zealand. For example, alligator weed biocontrol is currently saving an estimated \$505,000/year in control costs in Auckland and Northland. Nevertheless, alligator weed control is still estimated to be costing land managers \$6.47 million/year in these areas. Even though the biocontrol agents are only reducing alligator weed control costs by 8%, the financial benefits well outweigh the original programme costs, with a benefit:cost ratio of 101:1. This analysis is globally almost unique in evaluating the costs of weed biocontrol when the agents are effective. Completed a study on optimising control methods for groundcover weeds in New Zealand, which prevent the regeneration of native bush, and demonstrated that it is possible to remove weeds while minimising damage to resident native species using a reduced rate of herbicide for weed control. For example, with the groundcover weed <i>Plectranthus</i>, a lower rate of herbicide effectively controlled the weed and resulted in a better outcome for native plant species richness compared to the full rate. If managers could reduce herbicide application rates without compromising the level of control achieved, significant cost savings and environmental benefits could be achieved. Successfully gained approval for biocontrol agents to be released against giant reed, and made the first field releases of tutsan agents. Produced quarterly issues of <i>Weed Biocontrol: What's New?</i> 	\$1.36	\$1.45

Research activity 2016/17 Key Achievements	2016/17 (planned)	2016/17 (actual)
Reducing Mammal Impacts – Outcomes 1 and 4	\$1.24	\$1.25
<ul style="list-style-type: none"> Working with Hawke's Bay Regional Council we: <ul style="list-style-type: none"> quantified the outcomes of low-cost, large-scale 'maintenance control' of mammalian predators across farmland completed pre-treatment biodiversity assessments in the Cape-to-City footprint and designed a method for integrated monitoring of pest abundance and biodiversity outcomes following predator control published an analysis of the levels of landowner participation required for effective large-scale predator control published baseline data on landowners' attitudes to pest control in the Cape-to-City area and across a broader region of the lower North Island, and synthesised the findings in a policy brief to Hawke's Bay Regional Council published an evaluation of the cost-effectiveness of camera traps and trained dogs for detecting feral cats. Published a rationale and a new method for predicting the trajectory of restoration and assessing its progress towards a predetermined state. Published a policy brief outlining key concepts that can assist in dealing with social and ecological tipping points in production systems. Published a report on the implications of climate change for managing mast-induced irruptions of mammalian pests in beech forests. Climate projections up to 2100 suggest mega-masts are likely to continue to occur episodically, requiring new policies for the provision of contingency funds to manage mast-induced irruptions of pests. Completed a pilot study demonstrating the potential for eDNA analysis to improve our ability to monitor changes in the species composition of invertebrate communities in forest canopies. 		

Research activity 2016/17 Key Achievements	2016/17 (planned)	2016/17 (actual)
Mammal Control Tools – Outcomes 1 and 4	\$0.44	\$0.58
<ul style="list-style-type: none"> Completed pen testing of the welfare performance of predator kill traps to enable councils and community groups to use traps that meet the NAWAC trap-testing guidelines. For Hawke's Bay Regional Council (Cape-to-City): jointly developed, tested and passed a kill trap that humanely kills ferrets and can be easily used by community volunteers. <ul style="list-style-type: none"> For Northland Regional Council: jointly developed, tested and passed a trap for killing feral cats. For Greater Wellington Council/NEXT: tested and passed a kill trap for ship rats. Progressed R&D of a rat-selective toxin [DR8], and worked with Orillion and international collaborators to test the sensitivity of a range of Asiatic rodents to the toxin. 		
TB Freedom – Outcome 4	\$0.40	\$0.46
<ul style="list-style-type: none"> Expanded the 'Proof of Freedom' utility into a flexible tool to inform the management of diverse eradication operations (e.g. electric ants and starlings). Demonstrated that 100% kill of possums is achievable with bait switching, due to survivors eating alternative bait. Trialled thermal imaging to increase the detection of feral pigs as sentinels for TB surveillance. Recoded the Spatial Possum Model to improve the modelling of possum contact rates, resulting in more credible estimates of TB freedom. Publication of decision theory applied to optimising the stopping rule for TB freedom in wildlife. This work provides a framework for OSPRI managers to calculate the costs and consequences of falsely declaring TB freedom, or of continuing surveillance. 		

Research activity 2016/17 Key Achievements	2016/17 (planned)	2016/17 (actual)
Strategic Developments – Outcomes 1 and 4	\$0.35	\$0.54
<ul style="list-style-type: none"> • Demonstrated that the recently discovered mite species on wasps is very distinct from mites associated with bees, giving confidence that using the mites as vectors of viral biocontrol agents will not negatively affect bees. • Demonstrated the importance of quality data and expert knowledge to biosecurity risk assessments, highlighting that lower-quality qualitative assessments overestimate the establishment and impact of invasive ants. • Demonstrated that the density and impact of exotic parasitoid wasps is primarily regulated by bottom-up processes [food] and less by top-down processes [landscape and habitat], highlighting implications for the EPA and the biosafety of intentionally introduced species. 		
CHARACTERISING LAND RESOURCES	\$3.87	\$4.14
<p>End-users: MPI; DOC; MfE; LINZ; PFR; NIWA; regional councils; Statistics NZ; Dairy NZ; educators; landowners; New Zealand public; data managers; researchers; AgResearch; Māori; Antarctica New Zealand; Antarctic Treaty countries; FAO; World Soil Data Centre; primary industries and sector groups (notably the fertiliser industry); Ravensdown; Balance Agri-Nutrients; Core Logic; Foundation for Arable Research; AsureQuality; Irrigation NZ; Fonterra; Api NZ; EMaR; OVERSEER®.</p>		
Soil mapping and modelling – Outcome 2	\$0.92	\$0.89
<ul style="list-style-type: none"> • Soil characteristics are the predominant determinant of nutrients and other contaminants leaching into waterways. Achievements that support the development of the next generation of regional plans and limit-setting under the National Policy Statement for Freshwater include: <ul style="list-style-type: none"> ○ a new soil water retention model in the S-map inference engine to predict soil water data for all the soils in the S-map database ○ a published paper describing a model to predict soil hydraulic conductivity in a high-impact journal ○ new mapping of Hawke's Bay, Waikato and inland Canterbury soils using digital soil mapping techniques. 		

Research activity 2016/17 Key Achievements	2016/17 (planned)	2016/17 (actual)
Data stewardship infoservices – Outcome 2	\$1.70	\$1.89
<ul style="list-style-type: none"> • Continued to provide access to our data through online services (Land Resources Information System, Our Environment, Soils Portal, etc.), including: <ul style="list-style-type: none"> ○ S-map Online (1,035,072 map views, 56,996 queries and 35,885 soil factsheet downloads) ○ access to soil data via OVERSEER® (40,200 requests through the inter-operable web service that automatically extracts S-map data for soil properties). • Designed, implemented and prepared for release in July 2017 a new soil description data collection tool to support data gathering in the soils-related MBIE programmes. The tool, with data stored in the new National Soils Data Repository, will support good practice data storage and management. • Developed and launched a simple-to-use online tool allowing regional councils, landowners and local community to compare pre- and post-satellite images to visualise the impacts of the Kaikōura earthquake (November). Subsequently the viewer was repurposed to show the effects of the Port Hills wildfires (February). Both cases leverage the new processing pipeline and the NESI High Performance Computing facility. 		
Ecosystem services state and trend – Outcome 2	\$0.48	\$0.52
<ul style="list-style-type: none"> • Characterised, scaled and modelled a range of ecosystem services (ES) to support: <ul style="list-style-type: none"> ○ beekeepers and Māori landowners to understand floral resources ○ MfE and Statistics NZ in assessing an ES-based framework for use with future iterations of Environment Aotearoa or the System of Environmental Economics Accounting ○ farmers and communities to understand options for improving ES (e.g. flood, sediment and nutrient mitigation) in the sensitive Hikurangi Catchment, co-funded through a partnership between Fonterra and DOC. 		

Research activity 2016/17 Key Achievements	2016/17 (planned)	2016/17 (actual)
Uncertainty and error – Outcome 2	\$0.34	\$0.30
<ul style="list-style-type: none"> Completed a soil profile simulation tool that enables the variability and error in estimates of key soil properties to be simulated, analysed and visualised. Simulations were then passed into a simple bucket model to calculate the impact of soil uncertainty on predictions of water demand for irrigation, and water yield under wilding pines. The fitness of the simulation tool was assessed by comparing results with a mechanistic model. 		
Land cover and land use – Outcome 2	\$0.43	\$0.54
<ul style="list-style-type: none"> Continued to collect Landsat and Sentinel satellite imagery, and improved methodologies to produce analysis-ready data, including the preparation of national mosaics for upcoming LUM (Land Use Map) and LCDB (Land Cover Database) revisions with MfE, and winter feed crop analysis with Environment Canterbury. Improved the methods used to analyse imagery and to determine paddock-level land use, including recognition of the progressive consumption of feed crops so that sub-paddock activity (over time) does not confuse the results when classifying the whole paddock. Developed a tool to simplify and streamline the analysis of ground truth information required to design classification rule sets for new areas. 		
MANAGING LAND & WATER	\$2.44	\$2.91
End-users: MPI; NIWA; Plant & Food Research; Scion; ESR; AgResearch; MfE; consulting firms; researchers; educators; DairyNZ; regional councils; Māori; Waikato–Tainui; Ngāti Porou; Ngāti Maniapoto Trust Board; Toimata Foundation; Ngā Tangata Tiaki o Whanganui; landfill operators; urban planners; Lake Taupō Protection Trust; primary industry and sector groups, notably the fertiliser and forestry industries; AGMARDT; FAR; Agrilink; universities.		
Soil–plant processes & management – Outcomes 2 and 3	\$1.72	\$1.78
<ul style="list-style-type: none"> Identified that reactive nitrogen [N] can be chemically converted to unreactive di-nitrogen gas [N₂] without forming the harmful greenhouse gas nitrous oxide [N₂O], indicating potential for new alternatives for reducing unwanted reactive N losses from the agricultural sector. 		

Research activity 2016/17 Key Achievements	2016/17 (planned)	2016/17 (actual)
<ul style="list-style-type: none"> Showed for the first time that N₂O fluxes from urine deposited on soil are strongly controlled by oxygen diffusivity in the soil, which will enable predictive models for N₂O emissions from our pasture systems to be improved. Demonstrated that more diverse pastures could reduce N leaching by up to 40% with no change in production and should have consistently lower inter-annual variance in productivity and be more productive in drier regions of NZ; and that there is potential to use plant functional traits to predict optimal mixes for NZ's intensively grazed pasture systems. Revealed significantly lower carbon, nitrogen, phosphorus and cadmium [Cd] stocks in irrigated versus adjacent dryland soils, which may have implications for the long-term sustainability of irrigated pastoral agriculture. Documented lower soil Cd under irrigated pastures, which is a positive result, although the offsite implications of increased Cd losses (milk/meat or leaching) were not quantified and remain an important research question. Developed the first annual greenhouse gas budgets for irrigated dairy pasture in NZ where all three major GHGs were measured continuously. Showed that soil carbon changes in grazed pastures are poorly quantified at the national scale, suggesting gaps may be best addressed by establishing a national framework and methodology for sampling soils, along with site-specific leveraging of previous studies. Participated in a USDA-led workshop that brought together land-use managers, researchers and academics from across the US to showcase NZ's progress in framing the concept of soil health and its application in the primary sector. Demonstrated significant environmental benefits in terms of dung removal and groundwater protection using dung beetles, suggesting they might be a useful tool for farmers to reduce a range of environmental effects. 		
Soil Contaminant Management – Outcome 2	\$0.05	\$0.08
<ul style="list-style-type: none"> Further assessments continue to demonstrate the risks of Cd leaching in agricultural soils, adding to the limited data available for NZ soils. We confirmed that irrigation can enhance Cd mobilisation and that cow urine inputs are potentially underestimated, even though Cd is mainly adsorbed to the surface soil. 		

Research activity 2016/17 Key Achievements	2016/17 (planned)	2016/17 (actual)
Erosion Processes & Management – Outcome 2	\$0.40	\$0.51
<ul style="list-style-type: none"> • Provided further evidence to validate the basis of the SedNetNZ model, and how it is enabling regional councils to estimate sediment loads and the effect of mitigation in reducing sediment loads for improving water quality. • Developed a method to use SedNetNZ to predict improved optical water quality because of reduced sediment loads from erosion mitigation, enabling regional councils to evaluate catchment management policy and implementation. • Showed that landslide hotspots identified from the distribution of semi-automatically detected landslides using object-based image analysis compare reasonably well with hotspots derived from manually mapped landslides, which will enable faster and cheaper determinations of storm-induced landslides. • Developed a method for quantifying volumes of river bank erosion using remote-sensing techniques, enabling improved parameterisation in sediment models used to determine catchment sediment loads. 		
Integrated Land & Water Management – Outcomes 2 and 4	\$0.27	\$0.54
<ul style="list-style-type: none"> • Further developed automated soil moisture sensors and wireless sensor networks to acquire soil moisture and soil water drainage data in real time, including developing a decision support tool for precision irrigation scheduling, enabling farmers and irrigators to understand and manage water use and drainage, thereby reducing the environmental risk from nutrient leaching. • Developed and presented a solution framework for a Smart Irrigation solution using farmer, modelled and environmentally sensed inputs, and marketed this solution to a multinational irrigation company. • Co-developed a draft implementation framework for supporting regional councils in their work to achieve land and water outcomes, with or without a regional plan in place, by developing indicators to support adaptive management and provide socioeconomic metrics (e.g. knowledge, attitudes, skills, aspirations, behaviours), which will help improve the efficacy and efficiency of future catchment planning. • Supported Unlocking Curious Minds research aimed at connecting Māori youth to the environment (Tūhonohono) through two environmental restoration projects. 		

Research activity 2016/17 Key Achievements	2016/17 (planned)	2016/17 (actual)
<ul style="list-style-type: none"> • Designed and developed a prototype device to extract tightly bound soil water to support eco-hydrological research on ultralow mobile soil water. • Established that experimental lysimeters of different designs can assess N leaching under different management regimes from urine patch and non-urine areas, enabling improvement in the quality of data used in nutrient budget models. • Supported Ngā Tāngata Tiaki o Whanganui in defining the information needed to begin implementing Te Awa Tupua, the Whanganui River settlement, and completion of a Whanganui catchment resource summary. 		
MITIGATING GREENHOUSE GASES	\$1.00	\$1.01
End-users: MfE; MPI; AgResearch; Scion; Plant & Food Research; regional councils; Ngāi Tahu; Massey University; LEARN; NZAGRC; GRA; Balance Agri-Nutrients; Fonterra; researchers; primary industries and sector groups, notably Beef + Lamb NZ; Parliamentary Commissioner for the Environment.		
Agricultural GHG Emissions, Mitigation, & Modelling – Outcome 3	\$0.63	\$0.63
<ul style="list-style-type: none"> • Improved the ammonia volatilisation simulation in the NZ-DNDC (DeNitrification DeComposition) model by better modelling the pH changes caused by urea hydrolysis in a urine patch. • Assessed the mitigation potential of bioenergy using marginal climate change impact potentials to quantify the climate change impacts that could be avoided. • Our evaluation of fractional ammonia loss from fertiliser (FracGASF) in the presence of a urease inhibitor [Saggar et al. 2013. Science of the Total Environment 465: 136-146] has been included in NZ's Greenhouse Gas Inventory since 2016. This has also been accepted into the IPCC Emission Factor Database [EFDB], which ratifies this research and recognises that our proposed emission reductions have the potential to be applied internationally. • Demonstrated, using novel stable isotope techniques, that reduced substrate availability in grazed pasture soils can decrease the temperature sensitivity and limit the rate of soil organic carbon turnover • Provided evidence that volcanic ash soils, even those with low rates of denitrification, can result in significant N₂O emissions where denitrifier genes nos:nir is low. 		

Research activity 2016/17 Key Achievements	2016/17 (planned)	2016/17 (actual)
Carbon Storage in Biomass and Soils – Outcome 3	\$0.37	\$0.38
<ul style="list-style-type: none"> Progressed work-flow development to select and relate soil data from Landcare Research lab databases with collected Vis-NIR spectra. Increased the national spectral library database to 7,600 for soil carbon and 702 for clay to support the development of prediction models. Developed a balanced sampling framework for monitoring soil organic carbon in New Zealand's managed grasslands 		
SUPPORTING BUSINESS AND POLICY	\$1.46	\$1.49
End-users: MPI; MfE; StatsNZ; Beef+Lamb NZ; Waikato Regional Council; Hawke's Bay Regional Council; Greater Wellington Regional Council; Taranaki Regional Council; Ngati Tahu Ngati Whaoa; Ngāti Kahungunu ki Wairarapa; Rangitāne o Wairarapa; Rekohu Moriori; Hokotehi Moriori Trust; Te Tumu Paeroa (the Māori Trustee); Scion; AgResearch; NIWA; Victoria University		
Biodiversity & ecosystem services in decision-making – Outcomes 1, 2 and 4	\$0.57	\$0.47
<ul style="list-style-type: none"> Mahinga Kai tool: Supporting the national freshwater objectives and demonstrating the holistic nature of Te Ao Māori, this mobile application enables users to assess the state of mahinga kai. The tool is designed for kaitiaki to measure progress away or towards iwi aspirations and outcomes as well as collect valuable environmental data while at the sites. Kaitiaki assess the state of the mahinga kai based on three attributes Taha Kikokiko (biophysical), Taha Whānau (social), and Taha Wairua (metaphysical). The aggregation of these scores provides a state of environment from A [excellent] to D [poor]. Iwi can then prioritise restoration programmes based on these states. Ngati Tahu and Ngāti Whaoa will be utilising this tool to support their planning. Using ES to support decisions: Recognising that monetary valuations are not appropriate for all ecosystem services, a review to determine how well different metrics and presentation styles can provide the necessary information to decision makers to balance the impacts and dependencies on ecosystem services. The review provides a clear pathway for how to ensure wider ecosystem services values are adequately captured, presented and used in future decision making 		

Research activity 2016/17 Key Achievements	2016/17 (planned)	2016/17 (actual)
<p>by central and regional government, and industry. Journal article: Wright WCC, Eppink FV, Greenhalgh S. 2017. Are ecosystem service studies presenting the right information for decision making? <i>Ecosystem Services</i> 25: 128-139.</p> <ul style="list-style-type: none"> Biodiversity Incentives: We developed a spatially explicit method for prioritising biodiversity incentives programmes in New Zealand. Data on bird occupancy for two different time periods across New Zealand (obtained from scientists within Landcare Research) was integrated with several other GIS-based maps to develop hotspots of vulnerabilities, threats and opportunities. Along with a review of biodiversity incentive programmes, this information will be used to inform the design of future incentive programmes for the greater protection of biodiversity across New Zealand. 		
Policy values & governance – Outcomes 1, 2 and 3	\$0.89	\$1.02
<ul style="list-style-type: none"> Leveraging Survey of Rural Decision Makers (SRDM): The SRDM focuses on commercial production and lifestyle farming across all primary industries and the 16 regions in New Zealand. The survey provides detailed information on demographics; values; land use, and land-use change; farm management; objectives; and network size and composition. The SRDM is used by industry, policy makers, and researchers to build a better picture of New Zealand's current primary industry and what it might look like in the future. Findings from SRDM analyses: <ul style="list-style-type: none"> Innovators may be the key to increasing the adoption of novel practices and technologies among farmers as they have a greater understanding of these practices and technologies. Innovators also have the largest networks through which these practices and technologies can be spread. The younger generation of farmers is more willing to meet heightened environmental and production goals, a promising sign for the future. While encouraging all farmers to increase production and engage in better environmental practices is desirable, it may be more efficient to engage younger farmers first. Greater reductions in soil erosion are more easily achieved when policy makers know the likelihood of practices being adopted and in what combinations. Hence, it is important to understand the characteristics of farmers who adopt certain management practices and which of these practices are adopted together. 		

Research activity 2016/17 Key Achievements	2016/17 (planned)	2016/17 (actual)
<ul style="list-style-type: none"> Farms with an identified successor are more likely to incur more debt and have greater on-farm investment, even after controlling for associated factors such as primary industry, region, total farm area, age of the decision maker, and gender, than farmers with no identified successor. Dairy farms, larger farms, and farms with female decision makers are all more likely to have made significant on-farm investments. Māori decision-making tools: With a selection of Māori organisations we reviewed Landcare Research (LR) modelling tools and data and are now better incorporating Māori values and decision-making processes into LR modelling tools (e.g. LUMASS, NZFARM, and ARLUNZ). We are integrating council-driven modelling work with Ecosystem Services and Māori values and aspirations to inform land use decisions. 		

CHARACTERISING LAND BIOTA

\$6.60 \$6.76

End-users: MPI; DOC; EPA; regional councils; CRIs; NZ and many overseas universities; other educators; museums; Te Papa; researchers; Better Border Biosecurity [B3]; New Zealand's Biological Heritage and other National Science Challenges; Māori and other New Zealanders; Tuhoe Tuawhenua Trust; Māori Vegetable Growers Collective; primary industry and sector groups.

Characterising Plants – Outcomes 1 and 4

\$2.60 \$2.42

- We progressed the discovery, description and interpretation of NZ's indigenous and naturalised flora.
 - Improved the eFlora information content for end-users (DOC, MPI, CRIs, universities) and the public [c. 102,000 page views] by adding over 1,000 diagnostic character images, new treatments for Nothofagaceae, six moss families and five fern families.
 - Provided identification guides and described new species of threatened grasses and liverworts, and completed editing for Flora of New Zealand Liverworts v3, which is essential information for DOC, MPI, EPA, MfE, universities and regional councils.
 - Submitted a paper disproving the suggestion that didymo (rock snot) is native to New Zealand, arguing it was recently introduced, and documented the presence of the lake snow organism in the North Island, which is vital information for MPI, DOC, EPA, MfE and regional councils.

Research activity 2016/17 Key Achievements	2016/17 (planned)	2016/17 (actual)
<ul style="list-style-type: none"> Clarified taxonomic concepts in, and revised, the taxonomically difficult genus <i>Cardamine</i>, a priority group for DOC. Added 4,500 specimens to the Allan Herbarium, and increased records and data quality in the Specimen Database [9,386 records added] and the Plant Names Database [932 records added]. Completed the digitisation of the first weed records, providing 3,000 images and essential information to DOC, MPI, regional councils and weed researchers. Identified c. 630 plants in response to queries related to biosecurity and biodiversity, including plants breaching border biosecurity, which is an essential service for DOC, MPI and regional councils. Progressed the enhancement and use of the NZ Flax and Living Plant Collections, and further developed the cultural plant use infobase Ngā Tipu Whakaoranga [75,000 page views from 23,000 visitors]; living collections were extensively used by Te Wānanga o Aotearoa students and supported wahakura programmes. Published two papers on the DOC priority genus <i>Myosotis</i> as progress toward its much-needed revision. 		

Characterising Invertebrates – Outcomes 1 and 4

\$1.78 \$1.80

- We progressed the discovery, description and interpretation of NZ's indigenous and naturalised terrestrial invertebrate fauna for utilisation by NZ biosecurity and biodiversity end-users.
 - Improved the online information content for end-users with 36,000 new records, and enhanced the web portal for NZ Land Invertebrates with new names, fact sheets, images and specimens. The NZ Arthropod Collection Specimen Database now includes over 100,000 records providing high-resolution information on the distributions of many threatened species.
 - Supported MPI biosecurity responses by co-funding a study on the systematics and diagnostics of invasive grass nematode species, allowing MPI staff to more effectively identify and respond to potential incursions. These species have been responsible for recent outbreaks in pasture and fields and triggered significant responses from MPI.

Research activity 2016/17 Key Achievements	2016/17 (planned)	2016/17 (actual)
<ul style="list-style-type: none"> Revised the DOC Threatened Species List for Hymenoptera (wasps, etc.) and stick insects and provided published taxonomic and molecular phylogenetic research on several invertebrate groups that contributed to the 2017 DOC Threatened Species Strategy. This information will enable DOC to more effectively target species and ecosystem conservation strategies. Published two Fauna of New Zealand contributions on key groups of moths and flies, providing diagnostic tools, biological knowledge, images and distribution information for biodiversity and biosecurity end-users. These publications provide the 'gold standard' in identification to biosecurity end-users. 		
Characterising Fungi & Bacteria – Outcomes 1 and 4	\$1.38	\$1.41
<ul style="list-style-type: none"> We progressed the discovery, description and interpretation of New Zealand's fungi and bacteria. <ul style="list-style-type: none"> Made significant progress in obtaining and delivering DNA sequences from specimens and cultures. Now over 12% of the International Collection of Microorganisms from Plants culture collection is sequenced, with over 100 genomes (all publicly available) enhancing the scientific utility of the collection to end-users such as MPI. Described a new bacterial genus for an important plant pathogen of sorghum, <i>Robbsia andropogonis</i>, separating this species from a group of human pathogenic bacteria. This recognition will ease regulatory requirements for conducting research with this pathogen. Developed identification keys for important groups of native mushrooms. These will facilitate identification by end-users and deliver useful and accurate fungal biodiversity information to citizen science projects such as NatureWatch. Disseminated fungal knowledge through media engagement, with three radio and two TV interviews, plus a newspaper interview, discussing fungal biology and biodiversity and the pathogen myrtle rust. Collected several species of rust fungi that have not been found since the 1930s, helping inform conservation decisions by DOC. 		

Research activity 2016/17 Key Achievements	2016/17 (planned)	2016/17 (actual)
<ul style="list-style-type: none"> Used our taxonomic data in a publication to improve understanding of shifts in function and network structure of the mycorrhizal communities associated with exotic compared to native host species. 		
Collections: Information, Access & Value – Outcomes 1 and 4	\$0.84	\$1.13
<ul style="list-style-type: none"> Characterising Land Biota Collections – Information, Access & Value. We progressed pan-organisation research initiatives. <ul style="list-style-type: none"> Engaged with the formal Landcare Research Characterising Land Biota Advisory Group and implemented agreed stakeholder priorities to underpin biosecurity and biodiversity management. Enhanced the linkage of our Collection specimens with the global DNA database GenBank by identifying and filling digitisation gaps, thus delivering higher confidence that the sequence is correct for biosecurity managers. Enhanced and released new versions of data management tools for specimen data and for taxonomic names. Completed the initial development phase of the Annotation Tool, which is used to manage the descriptive content in the eBiota and Māori Plant Use Infobases. Implemented and released the design for a new responsive design for the eBiota website to facilitate mobile use. Re-started a PhD on automated georeferencing of locality strings (supervisor: Kristin Stock, Massey University) to increase the accessibility of specimen data for spatial analysis and presentation. Provided co-funding support for Unlocking Curious minds projects on Winning the War on Weeds, Discovering Fungi, and Developing a Te Reo Resource on Indigenous Fungi. Enhanced access to collection and taxonomic information through the provision of data to the New Zealand Organism Register and the Global Biodiversity Information Facility. Provided support to the SMART Idea Project, Biosecure-ID, through the provision of additional images. 		

Strategic Focus Milestones

Increasing the value of our science

Develop at least two integrated research projects spanning environmental, social, economic and cultural elements of natural resource management.

Collaborative work with Hawke's Bay Regional Council has progressed well and we have co-designed an Implementation Framework. The framework was presented to six other regional councils, which are all interested in adopting the approach. We have now started work with the Greater Wellington Regional Council and a range of others to build on the progress made with Hawke's Bay.

Enhancing environmental information

Incorporate our research methodologies and datasets into at least two environmental indicators and support at least one major national policy initiative and/or Environmental Standard.

Manaaki Whenua–Landcare Research continues to support MfE and Statistics NZ to implement the National Environmental Reporting Act 2015. We are working closely with both agencies to support preparation of the first Land Domain report. Manaaki Whenua–Landcare Research will be a key provider of indicator data, interpretation, analysis and quality assurance. The Land Domain report will involve a synthesis of published science on New Zealand's land resources, and we expect to be a key peer reviewer.

We have continued to be an expert advisor on Te Ao Māori indicators for the land, and have worked closely with the

regional council Environmental Monitoring and Reporting technical advisory groups to develop standard methods and indicators in support of national-scale environmental reporting.

Manaaki Whenua–Landcare Research was nominated as the primary provider of science and research to the Collaborative Group (central and local government, primary sector and conservation interests, and iwi) recently established by MfE for possible development of a National Policy Statement on Indigenous Biodiversity.

Our erosion, sediment and soils-based science expertise has been central to the development and refinement of a National Environmental Standard on Plantation Forestry.

Improving freshwater management

Inform at least two processes under the National Policy Statement on Freshwater Management through our research and models.

Manaaki Whenua–Landcare Research continues to play an advisory role to support a number of processes in development to implement the provisions of the National Policy Statement on Freshwater Management. These include collaborative limit-setting processes in the Bay of Plenty; science and technical expertise in Hawke's Bay, Wellington and Northland; modelling the environmental and economic impacts of various freshwater policy options; and identification of key science needs in Southland. We produced two major policy briefs synthesising key

findings from two long-term water research programmes for central and regional government adoption, and delivered new science to inform specific limit-setting activities led by regional councils and involving iwi and communities in the areas of resource economics, soils, sediment/erosion, irrigation potential, microbial contaminants, Māori values, social science, and land use modelling. We also supported further freshwater policy development through senior-level participation on the Ministerial Advisory Group on Freshwater Allocation, and commissioned research for central government's Water Directorate.

Sustainable primary sector growth

Initiate at least one major new partnership and/or joint programme.

Manaaki Whenua–Landcare Research continues to progress opportunities to enhance the online Riparian Planner Tool, jointly developed with DairyNZ. We developed a strategic partnership with a key primary sector partner to supply high-quality soils data and information into a sector-led tool with the potential to reach 7,500 primary sector users in the future. We are also working with a property information provider to license our S-map soils information for products aimed at banks, valuers, rural real estate agencies and other rural-sector interests. Finally, we are exploring opportunities to enhance one of our online land resource information portals to support farmers to identify and meet stock exclusion requirements that may result from proposed national regulations.

Implementing Vision Mātauranga

Initiate at least one new major partnership and/or joint programme with Māori entities and agri-business.

This year we worked closely with Ngati Porou Miere, Te Atihau Whanganui Inc, Tuhoē Tuawhenua Trust (Manawa Honey Ltd), Tai Tokerau Honey and Te Taitokerau Miere Coalition as founding partners in a long-term [5-year] project to characterise the honey landscape. Some of the research areas developed were: characterising the floral traits of nectar-producing species; looking at environmental drivers of nectar production; modelling nectar flows on the landscape; developing engagement models for Māori agribusiness; and establishing the provenance and whakapapa of plant species. We will also be working with other iwi and Māori interests to contribute to a wider sampling of mānuka species and to build links with other possible end-users such as Ngāti Hine, Wakatu Inc, Maniapoto Trust, Ngāti Mutunga and Ngāti Pāhauwera.

BioHeritage Challenge

As a host, successfully fulfil all governance and support unit responsibilities.

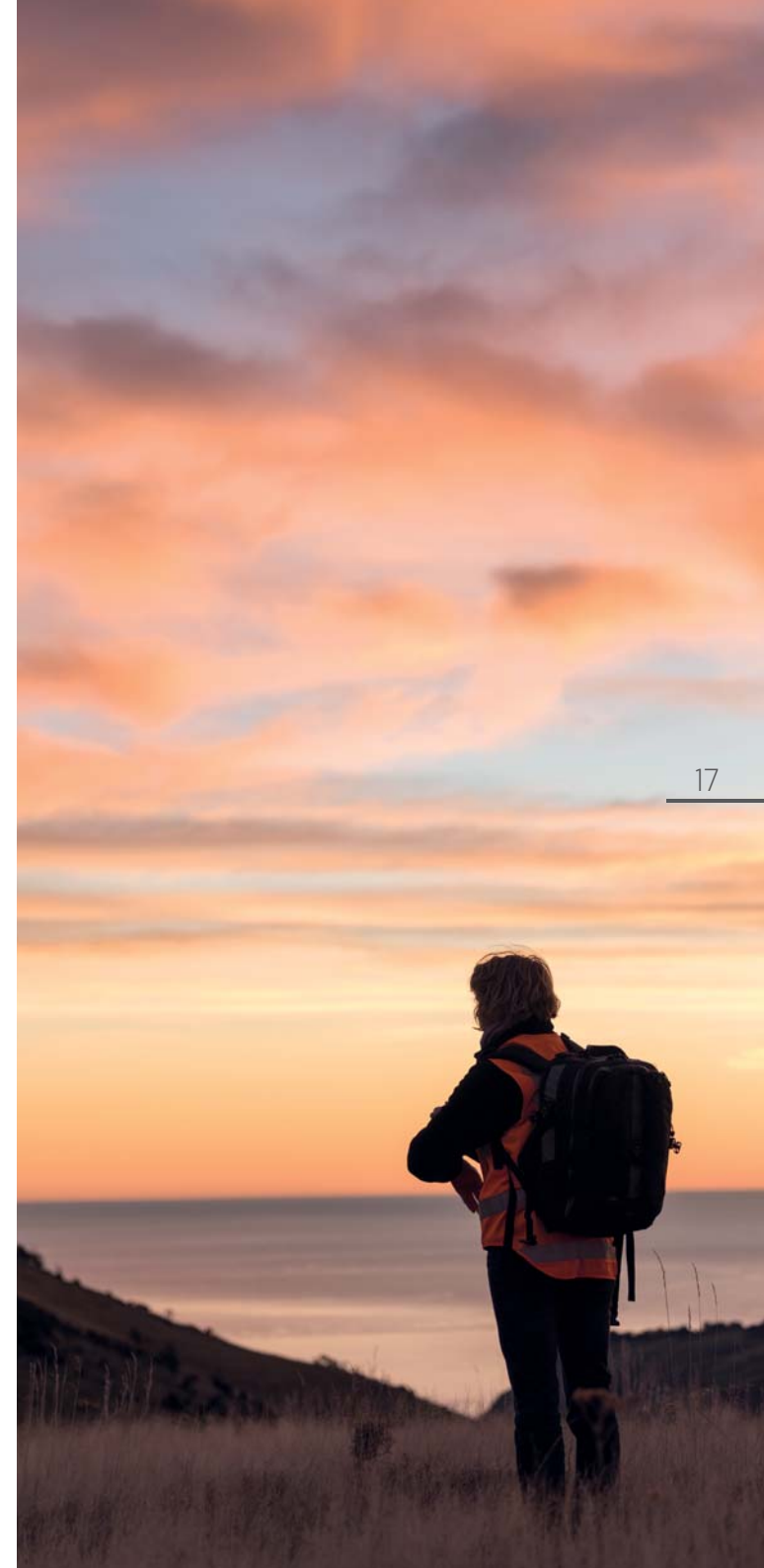
We fulfilled all responsibilities. The Challenge Governance Group chair reported quarterly to the Manaaki Whenua–Landcare Research Board on a set of accountability requirements and sought approvals from the Board as required under the Accountability and Delegations Framework. On behalf of the Board, Emily Parker acted in an

observer role on the Challenge Governance Group. A wide range of support services were provided, and governance and management costs were well under the 5% cap.

Lincoln Hub

MOU (or equivalent) signed with at least two private sector entities for joint R&D activities.

We worked closely with the Lincoln Hub to develop an opportunity pipeline for working with industry. The first opportunity we helped develop has now been signed and the work is ready to start. We also led the science in developing a second opportunity with a large irrigation company in the USA. An initial contract was signed and work completed, and we are awaiting final sign-off for a larger piece of work. We also worked closely with the Hub to develop further pipeline opportunities, including contributing to a week-long visit in the USA to scope opportunities with a range of firms.



Non-financial Performance Summary

	Indicator as per the SCI 2016-21	2016/17 Target	2016/17 Actual
End user collaboration	Revenue per FTE from commercial sources (\$000s) ¹	>\$55	\$49
Research collaboration	Percentage of papers co-authored ¹ – total	80%	89%
	Co-authored with other New Zealand organisations	30–35%	27%
	Overseas co-authors	30–35%	39%
	Both New Zealand and overseas co-authors	20-25%	23%
Technology and knowledge transfer	Commercial reports per scientist FTE ¹	0.80	0.77
	Availability of data from our Core-funded Databases, Collections and information systems (assessed by a variety of metrics appropriate to each; metrics online)	Increasing trends	Increasing trends
	Response rate for requests to our Core-funded biological collections and associated infrastructure (specimen transactions, identifications, visits)	>95%	100% service delivery ²
	New and improved products, processes and services	60	44
	Presentations to stakeholders and community groups	260	210
Science quality	Impact of scientific publications (mean citation score) ¹	2.9–3.3	3.2
Financial indicator	Revenue per FTE (\$000s) ¹	>175	188
Stakeholder engagement	Percentage of relevant end users who have adopted knowledge and/or technology from Manaaki Whenua –Landcare Research ³	>95%	
	Percentage of relevant funding partners and other end users that have a high level of confidence in our ability to set research priorities ³	>75%	No survey in 16/17
	Percentage of relevant national and international research providers that have a high level of confidence in our ability to form the best teams to deliver on its Impacts and Outcomes ³	>90%	
	Staff invited to participate in stakeholder meetings or workshops	230	253
Māori development	Number of partnerships with iwi and Māori organisations linking science and mātauranga to Māori goals and aspirations	18–23	84 ⁴
Commercialisation	Number of new and existing licensing deals of Manaaki Whenua – Landcare Research-derived IP (including technologies, products, services, and data licences)	7–14	9
High performance culture	Staff engagement in survey evaluations	>70%	74%
	Turnover of key science staff	3–5%	1.2%

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

² See Nationally Significant Databases and Collections (Part 1)

³ Data provided from the MBIE-commissioned biennial external client survey

⁴ Collation of the Kaupapa Māori, Māori-centred and Involving Māori VM indicators

Report of the Directors

For the year ended 30 June 2017

The Directors of Landcare Research New Zealand Limited are pleased to report that the Company fulfilled its obligations under the Crown Research Institutes Act 1992 for the year ended 30 June 2017. The disclosures relate to Landcare Research New Zealand Limited and its subsidiaries (the 'Group').

The Company is a private company limited by shares and incorporated in accordance with the Companies Act 1993.

Principal activity

The Group's principal activity is to provide scientific research that fulfils our Core Purpose in accordance the Crown Research Institutes Act 1992.

Operating results

Group revenue for the year increased to \$65.0 million from \$57.2 million in the previous year. The consolidated net surplus before taxation expense for the year was \$5.2 million and the consolidated net surplus after tax attributable to Parent Company shareholders was \$3.7 million. Return on equity was 10.4%, compared to the target of 2.8%.

Remuneration of Directors

Directors fees are set by the shareholding Ministers annually.

	2016/17	2015/16
	\$	\$
Jane Taylor	46,944	46,000
Chris Downs	23,472	23,000
Gavan Herlihy	23,472	23,000
Emily Parker	36,972	39,000
Paul Reynolds	53,340	28,750
Caroline Saunders	23,472	23,000
Steve Saunders	15,491	23,000
Victoria Taylor	-	47,000

These include fees for Paul Reynolds and Victoria Taylor as Chair of the subsidiary Enviro-Mark Solutions Limited and Emily Parker as a member of the BioHeritage National Science Challenge Governance Group.

Changes to Board composition

Steve Saunders retired from the Board on 28 February 2017.

Gavan Herlihy retired from the Board on 30 June 2017.

Subsidiaries

The Directors of the two subsidiary companies are:

Enviro-Mark Solutions Limited

Paul H S Reynolds
Richard F S Gordon
Nigel W Thomson

Landcare Research US Limited

Phil B S Hart
Nigel W Thomson

Directors' insurance

The Company has Directors' and Officers' insurance cover in respect of any act or omission in their capacity as a Director of the company. The Company has indemnified Directors and certain employees of the Company for costs and proceedings and for liabilities incurred by the employee in respect of any act or omission in his or her capacity as an employee of the Company. The indemnity for liabilities incurred does not extend to criminal liability or liability for breach of a fiduciary duty owed to the Company.

Dividends

No dividends have been declared or paid in respect of the 2017 financial year.

Directors' interests

Any business the Group has transacted with organisations in which a Director has an association has been carried out on a commercial 'arms-length' basis.

Compliance

The Directors confirm that the Company has operated in accordance with the Crown Research Institutes Act 1992 and the Companies Act 1993 during the year. The activities undertaken by the Company in the year are in accordance with the Statement of Core Purpose. No written direction was received from either shareholding Minister in the year.

No directors acquired or disposed of equity securities in the company during the year; and the Board has received no notices from directors of the company requesting to use company information received in their capacity as directors which would not otherwise have been available to them.

Donations

The Group has made various donations totalling \$nil during the year (\$nil in 2015/16).

Auditors

John Mackey of Audit New Zealand has been appointed as the audit service provider by the Auditor-General. The Auditor-General is the statutory auditor pursuant to section 14 of the Public Audit Act 2001 and section 21 of the Crown Research Institutes Act 1992. Their audit remuneration and fees are detailed in note 2 of the 'Note to the financial statements'.

Events subsequent to balance date

The Directors are not aware of any matter or circumstance since the end of the financial year not otherwise dealt with in this report that has, or may have, a significant effect on the operation of the Company.

Employee remuneration

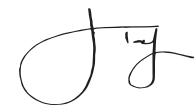
In accordance with section 152[1][c] of the Crown Entities Act 2004, the numbers of employees who received remuneration and other benefits totalling \$100,000 or more, in \$10,000 bands, during the year were:

Total Cost to the Group	Number of Employees	
	2016/17	2015/16
\$440,000 - \$449,999	1*	1*
\$240,000 - \$249,999	3	
\$230,000 - \$239,999	1	1
\$220,000 - \$229,999	1	2
\$210,000 - \$219,999	3	
\$200,000 - \$209,999	1	4
\$190,000 - \$199,999		
\$180,000 - \$189,999	1	1
\$170,000 - \$179,999		
\$160,000 - \$169,999	5	2
\$150,000 - \$159,999	2	
\$140,000 - \$149,999	8	7
\$130,000 - \$139,999	10	7
\$120,000 - \$129,999	10	7
\$110,000 - \$119,999	15	15
\$100,000 - \$109,999	31	24

* Chief Executive of Landcare Research New Zealand Limited.

This table includes 3 redundancy and termination payments to employees in 2016/17 (2015/16: 1).

Signed for and on behalf of the Board



Jane Taylor
Chair

22 August 2017



Paul Reynolds
Deputy Chair

22 August 2017

Audited Financial Statements

of Landcare Research New Zealand Limited

Consolidated statement of comprehensive income for the year ended 30 June 2017

		2017 Actual \$000s	2017 Budget \$000s	2016 Actual \$000s
	Note			
Revenue	1.	65,036	62,124	57,157
Finance costs	2.	23	151	21
Operating expenses	2.	59,850	60,655	54,085
Profit / (Loss) before tax		5,163	1,318	3,051
Income tax expense	22.	1,483	382	864
Profit / (Loss) after tax		3,680	936	2,187
Total comprehensive income		3,680	936	2,187

The accompanying notes form part of these financial statements.

Consolidated statement of changes in equity for the year ended 30 June 2017

	2017 Actual \$000s	2017 Budget \$000s	2016 Actual \$000s
Balance at 1 July	33,719	32,462	31,532
Total comprehensive income for the year ended 30 June	3,680	936	2,187
Balance at 30 June	37,399	33,398	33,719
Total comprehensive income attributable to:			
Owners of the Parent company	3,680	936	2,187
	3,680	936	2,187

The accompanying notes form part of these financial statements.

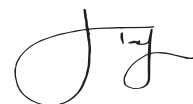
Consolidated statement of financial position

as at 30 June 2017

		2017	2017	2016
	Note	Actual	Budget	Actual
		\$000s	\$000s	\$000s
ASSETS				
Current assets				
Cash and cash equivalents	3.	17,706	8,459	8,982
Trade and other receivables	4.	7,064	8,064	6,818
Inventories		17	25	15
Other financial assets	3.	6,197	–	6,049
Finance lease receivable	5.	37	37	34
Total current assets		31,021	16,585	21,898
Non-current assets				
Property, plant and equipment	7.	30,294	35,481	30,241
Patents and intellectual property	8.	545	631	539
Intangible assets	9.	337	631	451
Finance lease receivable	5.	437	437	474
Total non-current assets		31,613	37,180	31,705
Total assets		62,634	53,765	53,603
LIABILITIES				
Current liabilities				
Trade and other payables	11.	7,605	7,690	5,868
Employee benefit liabilities	12.	4,174	4,096	4,068
Revenue in advance	13.	9,595	4,763	5,916
Tax payable		645	127	739
Derivative financial instruments	6.	–	–	12
Total current liabilities		22,019	16,676	16,603

		2017	2017	2016
	Note	Actual	Budget	Actual
		\$000s	\$000s	\$000s
Non-current liabilities				
Employee benefit liabilities	12.	617	691	682
Deferred tax liability	22.	2,599	3,000	2,599
Total non-current liabilities		3,216	3,691	3,281
Total liabilities		25,235	20,367	19,884
NET ASSETS		37,399	33,398	33,719
EQUITY				
Ordinary shares	14.	10,515	10,515	10,515
Retained earnings	14.	26,884	22,883	23,204
Total equity		37,399	33,398	33,719

The accompanying notes form part of these financial statements.



Jane Taylor
Chair
22 August 2017



Paul Reynolds
Deputy Chair
22 August 2017

Consolidated statement of cash flows

for the year ended 30 June 2017

	2017 Actual \$000s	2017 Budget \$000s	2016 Actual \$000s
Cash flows from operating activities			
Receipts from customers	68,163	61,701	63,194
Interest received	249	210	145
Payments to suppliers and employees	(54,188)	(55,700)	(49,830)
Interest paid	(23)	(151)	(21)
Tax refund / (paid)	(1,577)	(314)	(1,060)
Net cash generated from operating activities	12,624	5,746	12,428
Cash flows from investing activities			
Purchase and sale of short term investments	(148)	–	(6,049)
Proceeds from sale of property, plant and equipment	118	–	1
Purchase of property, plant and equipment	(3,739)	(7,392)	(2,870)
Purchase of intangible assets	(131)	(355)	(123)
Net cash used in investing activities	(3,900)	(7,747)	(9,041)
Cash flows from financing activities			
Drawdown (repayment) of borrowings	–	–	–
Net cash generated from (used in) financing activities	–	–	–
Net increase / (decrease) in cash	8,724	(2,001)	3,387
Cash, cash equivalents and bank overdrafts at beginning of the year	8,982	10,460	5,595
Cash, cash equivalents and bank overdrafts at end of the year	17,706	8,459	8,982

The accompanying notes form part of these financial statements.



Notes to the consolidated financial statements

for the year ended 30 June 2017

1 REVENUE

	2017 Actual \$000s	2016 Actual \$000s
Revenue from operations consisted of the following items:		
Research contracts funded by the Crown via Ministry of Business, Innovation and Employment		
SSIF	25,635	24,205
Other	17,630	9,136
Other New Zealand revenue	19,301	20,543
International revenue	2,044	3,000
<i>Interest revenue:</i>		
Bank deposits	382	223
Finance leases	44	50
Total interest	426	273
Total revenue	65,036	57,157

Revenue is measured at the fair value of consideration received.

Revenue from the rendering of services is recognised by reference to the stage of completion of the transaction at balance date, based on the actual service provided as a percentage of the total services to be provided. Income received for goods and services that have not yet been supplied to customers has been recognised as Revenue in Advance. Sales of goods are recognised when a product is sold to the customer.

Strategic Science Investment Fund (SSIF) from the Ministry of Business, Innovation and Employment (MBIE) is treated as a government grant and generally recognised in the year of receipt. The only exception is where MBIE gives prior written consent to carry over to the next financial year any part of the SSIF that will be allocated to specified long-term or large-scale research activities that require the accumulation of funds over two or more financial years to fully fund those activities.

Interest income is recognised using the effective interest method whereby the estimated future cash receipts are exactly discounted from the net carrying amounts through the expected life of the financial assets.

Dividends are recognised when the right to receive payment has been established.

Revenue recognition

The Group uses the percentage-of-completion method in accounting for its fixed-price contracts to deliver research services. Use of the percentage-of-completion method requires the Group to estimate the services performed to date as a proportion of the total services to be performed.

2 PROFIT BEFORE INCOME TAX

	2017	2016
	Actual	Actual
	\$000s	\$000s
<i>Profit before income tax has been arrived at after charging the following expenses:</i>		
Finance costs		
Interest on loans	23	21
Inventory write off	3	–
Employee remuneration	29,579	29,079
Restructuring costs	47	122
Superannuation contributions	1,152	1,178
Employee entitlements increase / (decrease)	48	(242)
Net bad and doubtful debts	(33)	33
Auditor's remuneration		
Audit New Zealand - audit services	118	141
Audit New Zealand - other services	1	1
Directors' fees	218	237
Depreciation and amortisation of property, plant, equipment and intangibles	3,863	4,262
Loss / (Profit) on sale of non-current assets	(114)	46
Operating lease rental	836	791
Cost of sales	405	489
Movement in inventory	(5)	(1)
Loss / (Profit) on foreign currency contracts fair value	–	12

Provisions

The Group recognises a provision for future expenditure of uncertain amount or timing when there is a present obligation (either legal or constructive), as a result of a past event, that probably expenditures will be required to settle the obligation, and a reliable estimate can be made of the amount of the obligation. Provisions are not recognised for future operating losses. Provisions are measured at the present value of the expenditures expected to be required to settle the obligation, using a pre-tax discount rate that reflects current market assessments of the time value of money and

the risks specific to the obligation. The increase in the provision due to the passage of time is recognised as an interest expense.

Borrowing Costs

Borrowing costs directly attributable to the acquisition, construction or production of a qualifying asset (i.e. an asset that necessarily takes a substantial period of time to get ready for its intended use or sale) are capitalised as part of the cost of that asset in accordance with NZ IAS 23 Borrowing costs (revised). All other borrowing costs are expensed in the period they occur.

Borrowing costs consist of interest and other costs that an entity incurs in connection with the borrowing of funds.

3 CASH AND CASH EQUIVALENTS

	2017	2016
	Actual	Actual
	\$000s	\$000s
Cash at bank and in hand	1,009	1,289
Short-term deposits	16,697	7,693
Total cash and cash equivalents	17,706	8,982
Other financial assets		
Short-term deposits	6,197	6,049

Cash and cash equivalents include cash in hand, deposits held at call with banks, other short-term highly liquid investments with original maturities of three months or less, and bank overdrafts. Bank overdrafts are shown within borrowings in current liabilities in the Statement of Financial Position.

The carrying value of short term deposits with maturity dates of three months or less approximates their fair value.

4 TRADE AND OTHER RECEIVABLES

	2017	2016
	Actual	Actual
	\$000s	\$000s
Trade debtors	4,981	6,063
Accrued income and sundry debtors	1,168	30
Prepayments	915	771
	<u>7,064</u>	<u>6,864</u>
Less provision for impairment of receivables	–	(46)
Total trade and other receivables	7,064	6,818
Total non-current portion	–	–
Total current portion of trade & other receivables	7,064	6,818

Movements in the provision for impairment of receivables are as follows:

As at 1 July	46	–
Movement in provision	(46)	46
As at 30 June	–	46

Age of trade debtors:

Current	4,150	5,194
Outstanding	831	869
Total trade debtors	4,981	6,063

Trade and other receivables are initially measured at fair value and subsequently measured at amortised cost, using the effective interest method, less any provision for impairment.

Loans are initially recognised at the present value of their expected future cash flows, discounted at the current market rate of return for a similar asset / investment. They are subsequently measured at amortised cost using the effective interest method. The difference between the face value and present value of expected future cash flows of the loan is recognised in the Statement of Comprehensive Income as a grant.

A provision for impairment of receivables is established when there is objective evidence that the Group will not be able to collect all amounts due according to the original terms of receivables. The amount of the provision is the difference between the asset's carrying amount and the present value of estimated future cash flows, discounted using the effective interest method.

The carrying value of trade and other receivables approximates their fair value. The carrying value of loans to related parties approximates their fair value.

Apart from the Ministry of Business, Innovation and Employment, which is Government owned, there is no concentration of credit risk to receivables outside the Group, as the Group has a large number of customers.

As of 30 June 2017, all overdue receivables have been assessed for impairment and appropriate provisions applied. Landcare Research holds no collateral as security or other credit enhancements over receivables that are either past due or impaired. The impairment provision has been calculated based on expected losses for Landcare Research's pool of debtors. Expected losses have been determined on review of specific debtors.

5 FINANCE LEASE

	2017	2016
	Actual	Actual
	\$000s	\$000s
Analysis of finance lease receivable		
Total minimum lease payments are receivable:		
Not later than one year	78	78
Later than one year and not later than five years	314	314
Later than five years	295	373
Total minimum lease payments	687	765
Future finance charges	(213)	(257)
Total present value of minimum lease payments	474	508
Present value of minimum lease payments are receivable:		
Not later than one year	37	34
Later than one year and not later than five years	188	172
Later than five years	249	302
Total	474	508
Current	37	34
Non-current	437	474
Total	474	508

A finance lease is a lease that substantially transfers to the lessee all risks and rewards incidental to ownership of an asset, whether or not title is eventually transferred.

At the commencement of the lease term, the Group recognises finance leases as assets and liabilities in the Statement of Financial Position at the lower of the fair value

of the leased item or the present value of the minimum lease payments. The amount recognised as an asset is depreciated over its useful life. If there is no certainty as to whether the Group will obtain ownership at the end of the lease term, the asset is fully depreciated over the shorter of the lease term or its useful life.

Finance lease receivable relates to the animal house facility. The building transferred to Lincoln University for nil in 2016. Landcare Research New Zealand Limited has the right to continue occupying the building for a further nine years to 2026 at a rent of \$1.00 per annum.

6 ACCOUNTING FOR DERIVATIVE FINANCIAL INSTRUMENTS AND HEDGING ACTIVITIES

	2017	2016
	Actual	Actual
	\$000s	\$000s
Derivative financial instruments		
Current asset/(liability) portion		
Foreign currency forward contracts	–	(12)
Total derivative financial instruments	–	(12)

The Group uses derivative financial instruments to cover the risk on foreign exchange. In accordance with its treasury policy, the Group does not hold or issue derivative financial instruments for trading purposes.

Derivatives are initially recognised at fair value on the date a derivative contract is entered into and are subsequently remeasured at their value. The Group does not designate derivatives as a hedging instrument and therefore accounts for derivative instruments at fair value through profit or loss. Changes in the fair value of derivative instruments are recognised immediately in the profit or loss.

7 PROPERTY, PLANT AND EQUIPMENT

2017	Land \$000s	Buildings \$000s	Plant & equipment \$000s	Library assets \$000s	Total \$000s
Cost at 1 July 2016	519	26,402	47,668	7,310	81,899
Accumulated depreciation and impairment charges	–	(9,424)	(36,071)	(6,163)	(51,658)
Net book value at the beginning of the year	519	16,978	11,597	1,147	30,241
Year ended 30 June 2017					
Net book value at the beginning of the year	519	16,978	11,597	1,147	30,241
Additions	1,400	39	1,709	507	3,655
Disposals and transfers	–	(112)	(2,459)	–	(2,571)
Accumulated depreciation on disposals and transfers	–	112	2,463	–	2,575
Current year depreciation	–	(754)	(2,366)	(486)	(3,606)
Net book value at the end of the year	1,919	16,263	10,944	1,168	30,294
At 30 June 2017					
Cost	1,919	26,329	46,918	7,817	82,983
Accumulated depreciation	–	(10,066)	(35,974)	(6,649)	(52,689)
Net book value at the end of the year	1,919	16,263	10,944	1,168	30,294

2016	Land \$000s	Buildings \$000s	Plant & equipment \$000s	Library assets \$000s	Total \$000s
Cost at 1 July 2015	519	26,532	45,967	6,829	79,847
Accumulated depreciation and impairment charges	–	(8,720)	(33,955)	(5,703)	(48,378)
Net book value at the beginning of the year	519	17,812	12,012	1,126	31,469
Year ended 30 June 2016					
Net book value at the beginning of the year	519	17,812	12,012	1,126	31,469
Additions	–	(14)	2,276	481	2,743
Disposals and transfers	–	(116)	(576)	–	(692)
Accumulated depreciation on disposals and transfers	–	69	523	–	592
Current year depreciation	–	(773)	(2,638)	(460)	(3,871)
Net book value at the end of the year	519	16,978	11,597	1,147	30,241
At 30 June 2016					
Cost	519	26,402	47,668	7,310	81,899
Accumulated depreciation	–	(9,424)	(36,071)	(6,163)	(51,658)
Net book value at the end of the year	519	16,978	11,597	1,147	30,241

Property, plant and equipment consist of:

- *Operational assets* – these include land, buildings, library books, plant and equipment, and motor vehicles.
- *Restricted assets* – these are collections and databases, held by the Group, that provide a benefit or service to the community and cannot be disposed of because of legal or other restrictions.
- *Capital work in progress* – this has been included within plant and equipment, and is not depreciated until ready for use.

Property, plant and equipment are shown at cost, less accumulated depreciation and impairment losses. Assets are not reported with a financial value in cases where they are not realistically able to be reproduced or replaced, and when they do not generate cash flows and where no market exists to provide a valuation.

Additions

The cost of an item of property, plant and equipment is recognised as an asset if, and only if, it is probable that the future economic benefits or service potential associated with the item will flow to the Group and the cost of the item can be measured reliably. In most instances, an item of property, plant and equipment is recognised at its cost. Where an asset is acquired at no cost, or for a nominal cost, it is recognised at fair value as at the date of acquisition.

Disposals

Gains and losses are determined by comparing the proceeds with the carrying amount of the asset. Gains and losses on disposals are included in the profit or loss.

Subsequent costs

Costs incurred subsequent to initial acquisition are capitalised only when it is probable that future economic benefits or service potential associated with the item will flow to the Group and the cost of the item can be measured reliably.

Depreciation

Depreciation is provided on the Group's property, plant and equipment, other than land, at rates that will write off the cost of the assets to their estimated residual values over their useful lives. All depreciable assets are depreciated on a straight-line (SL) basis. The residual value and useful life of an asset is reviewed, and adjusted if applicable, at each financial year end.

Depreciation rates

Buildings	1.67–10%
Plant and equipment	4–33%
IT equipment	25%
Motor vehicles	25%
Furniture and fittings	6.67–10%
Office equipment	20%
Finance lease assets	20%
Library books and periodicals	20–50%
Rare books collections	1%

Heritage assets

Heritage collection assets are those assets held for the duration of their physical lives because of their unique scientific importance. The Crown, when establishing Crown Research Institutes in 1992, transferred various national databases and reference collections to individual Institutes at nil value. Many of these databases and collections were specifically identified by the Foundation for Research, Science and Technology as being of significant national importance, and they have covenants attached to them restricting an Institute's ability to deal with them.

Landcare Research has the following nationally significant collections and databases that have been defined as heritage assets:

- The New Zealand Arthropod Collection (NZAC), including the New Zealand National Nematode Collection. (NZNNC) and associated database NZACbugs, BUGS bibliography and Pacific database.
- The New Zealand Fungal & Plant Disease Herbarium (PDD).
- The International Collection of Microorganisms from Plants (ICMP) and associated NZ Fungi Database.
- The Allan Herbarium.
- The National Vegetation Survey Databank (NVS).
- The 'Ngā Tipu Whakaoranga' Ethnobotany Database and New Zealand Flax and Living Plant collections.

Further details on these heritage assets are shown in the company's Statement of Corporate Intent pages 35 and 36.

The nature of these heritage assets and their significance to the science and research that Landcare Research undertakes make it necessary to disclose them.

No reliable valuation is able to be obtained for these assets, and so they remain at nil value.

A rare books collection, previously considered to be part of the reference collections, was introduced in 2002/03 on a market-value basis. This value has been accepted as deemed cost.

8 PATENTS AND INTELLECTUAL PROPERTY

	Actual \$000s
As at 1 July 2015	
Cost	566
Accumulated amortisation and impairment	(22)
Net book amount	544
Year ended 30 June 2016	
Opening net book amount	544
Additions	28
Disposals / transfers	(27)
Amortisation on disposals/transfers	(4)
Amortisation charge	(2)
Closing net book amount	539
As at 1 July 2016	
Cost	562
Accumulated amortisation and impairment	(23)
Net book amount	539

8 PATENTS AND INTELLECTUAL PROPERTY CONTINUED

	Actual \$000s
Year ended 30 June 2017	
Opening net book amount	539
Additions	16
Disposals / transfers	(2)
Amortisation charge	(8)
Closing net book amount	545
As at 30 June 2017	
Cost	577
Accumulated amortisation and impairment	(32)
Net book amount	545

Patents and intellectual property are capitalised on the basis of costs incurred. The useful life of trade marks is assessed as being indefinite as the trade mark is renewed every ten years by paying the applicable fee, and continues in use.

The Group has patents and trademarks amounting to \$545,000 (2016: \$539,000), which are carried at an indefinite life in the financial statements. These assets have not been impaired during the year (2016: no impairment write-down). Landcare Research has not recognised an impairment charge, as these assets are still used by the business.

9 INTANGIBLE ASSETS

	Actual \$000s
As at 1 July 2015	
Cost	5,742
Accumulated amortisation and impairment	(5,024)
Net book amount	718
Year ended 30 June 2016	
Opening net book amount	718
Additions	124
Disposals/transfers	(274)
Amortisation on disposals/transfers	274
Amortisation charge / impairment charge	(391)
Closing net book amount	451
As at 30 June 2016	
Cost	5,066
Accumulated amortisation and impairment	(4,615)
Net book amount	451
Year ended 30 June 2017	
Opening net book amount	451
Additions	131
Amortisation / impairment charge	(245)
Closing net book amount	337
As at 30 June 2017	
Cost	5,197
Accumulated amortisation and impairment	(4,860)
Net book amount	337

Software acquisition and website development costs

Acquired computer software licences are capitalised on the basis of the costs incurred to acquire and bring to use the specific software. Costs associated with maintaining computer software and websites are recognised as an expense when incurred. Costs that are directly associated with the development of software and websites for internal use by the Group are recognised as an intangible asset. Direct costs include the software development employee costs and an appropriate portion of relevant overheads.

The carrying value of an intangible asset with a finite life is amortised on a straight-line basis over its useful life. Amortisation begins when the asset is available for use and ceases at the date that the asset is derecognised. The amortisation charge for each period is recognised in the profit or loss. The useful lives and associated amortisation rates of major classes of intangible assets have been estimated as follows:

Computer software	4 years	25%
Intellectual property	3–20 years	5–35%

10 INVESTMENTS

Landcare Research New Zealand Limited has 100% interest in Landcare Research US Limited and Enviro-Mark Solutions Limited (previously called carboNZero Holdings Limited).

On 29 June 2016 Landcare Research New Zealand Limited subscribed for twenty percent of Lincoln Hub Limited. Landcare Research New Zealand Limited's share of the net assets of Lincoln Hub Limited was \$8,638 as at 30 June 2017.

The subsidiaries and associate company are unlisted companies, and accordingly, there are no published price quotations to determine the fair value of these investments; therefore, they are accounted at cost less impairment.

Landcare Research New Zealand Limited has a 49% share in Staron LLC. This Company is non-trading.

11 TRADE AND OTHER PAYABLES

	2017 Actual \$000s	2016 Actual \$000s
Trade payables	4,713	3,726
Amounts due to directors	–	(5)
GST & PAYE	461	925
Sundry creditors and accruals	2,431	1,222
Total trade and other payables	7,605	5,868

The carrying value of trade and other payables approximates their fair value.

Goods and Services Tax (GST)

All items in the financial statements are stated exclusive of GST, except for receivables and payables, which are stated on a GST-inclusive basis. Where GST is not recoverable as input tax it is then recognised as part of the related asset or expense.

The net amount of GST recoverable from, or payable to, the Inland Revenue Department (IRD) is included as part of receivables or payables in the Statement of Financial Position. The net GST paid to or received from the IRD, including the GST relating to investing and financing activities, is classified as an operating cash flow in the Statement of Cash Flows.

12 EMPLOYEE BENEFIT LIABILITIES

	2017 Actual \$000s	2016 Actual \$000s
Accrued pay	220	104
Annual leave	2,143	1,932
Long-service leave	1,013	1,084
Retirement leave	10	19
Time in lieu	115	130
Sick leave	55	60
Staff incentives and at risk payments	1,073	818
Holiday pay due to ex employees	110	473
Restructuring provision	52	130
Total employee benefit liabilities	4,791	4,750
<i>Comprising:</i>		
Current	4,174	4,068
Non-current	617	682
Total	4,791	4,750

The Holiday Pay due to ex-employees of \$110,000 has been provided for due to the payroll system incorrectly calculating annual leave payment rates. The provision is the maximum amount that is required to be paid out.

Entitlements that are payable beyond 12 months, such as long-service leave and retirement leave, have been calculated on an actuarial basis by Eriksen and Associates Limited as at 30 June 2017. The calculations are based on:

- likely future entitlements accruing to staff, based on years of service, years to entitlement, likelihood staff will reach the point of entitlement and contractual entitlements information; and
- present value of estimated future cash flows using the following key assumptions:
 - o Discount rates of 1.97 – 4.75% based on the risk-free rates as calculated from the yields on New Zealand Government Bonds
 - o Inflation factor of 3.0% was based on the expected long-term increase in remuneration of employees.

Staff incentives and at risk payments include a contracted profit share of \$600,000 [2016 \$392,000].

The Parent Company's Profit Share Policy establishes a contractual Profit Share Scheme which provides a means for staff to share in the Company's profits.

Short-term benefits

Employee benefits that the Group expects to be settled within 12 months of balance date are measured at nominal values based on accrued entitlements at current rates of pay. These include salaries and wages accrued up to balance date, annual leave earned to but not yet taken at balance date, retirement and long-service leave entitlements expected to be settled within 12 months, and sick leave.

The Group recognises a liability for sick leave to the extent that absences in the coming year are expected to be greater than the sick leave entitlements earned in the coming year. The amount is calculated based on the unused sick leave entitlement that can be carried forward at balance date; to the extent that the Group anticipates leave entitlements will be used by staff to cover those future absences.

The Group recognises a liability and an expense for bonuses where contractually obliged or where there is a past practice that has created a constructive obligation.

All actuarial gains and losses that arise subsequent to the transition date in calculating the Group's obligation with respect to long-service leave, retirement gratuities and sick leave are recognised as an expense in the profit or loss.

Superannuation schemes

- *Defined contribution schemes:* obligations for contributions to defined-contribution superannuation schemes are recognised as an expense in the profit or loss as incurred.
- *Defined benefit schemes:* the Group makes contributions to the Government Superannuation Fund, which is a multi-employer defined benefit scheme. Insufficient information is available to use defined benefit accounting, as it is not possible to determine from the terms of the scheme the extent to which the profit or loss will affect future contributions by individual employers, as there is no prescribed basis for allocation. The scheme is therefore accounted for as a defined contribution scheme.

Long-service leave, retirement leave, and sick leave

Entitlements that are payable beyond 12 months, such as long-service leave, retirement leave, and sick leave, have been calculated on an actuarial basis. The calculations are based on likely future entitlements accruing to staff, based on years of service, years to entitlement, payment history, the likelihood that staff will reach the point of entitlement, and contractual entitlements information.

13 REVENUE IN ADVANCE

	2017 Actual \$000s	2016 Actual \$000s
MBIE public good science funding	8,145	4,537
Commercial contracts	1,450	1,379
	9,595	5,916

The carrying value of revenue in advance approximates fair value.

14 EQUITY

	2017 Actual \$000s	2016 Actual \$000s
Retained earnings		
As at 1 July	23,204	21,017
Profit / (loss) for the year	3,680	2,187
As at 30 June	26,884	23,204
Share capital		
As at 1 July	10,515	10,515
As at 30 June	10,515	10,515

The issued capital of the company is 10,515,000, fully paid up, and equally ranking shares.

The shares have no par value.

No Dividends were paid during the year ended 30 June 2017. [2016: \$0].

15 CAPITAL MANAGEMENT

The Group's capital is its equity, which comprises retained earnings and other reserves. Equity is represented by net assets.

The Group is subject to the financial management and accountability provisions of the Crown Research Institutes Act 1992, which imposes certain restrictions in relation to borrowings, acquisition of securities, issuing guarantees and indemnities and the use of derivatives.

The Group manages its equity as a by-product of prudently managing revenues, expenses, assets, liabilities, investments, and general financial dealings to ensure the Group effectively achieves its objectives and purpose, while remaining a going concern

16 RECONCILIATION OF NET PROFIT / (LOSS) AFTER TAX TO NET CASH FLOW FROM OPERATING ACTIVITIES

	2017 Actual \$000s	2016 Actual \$000s
Profit / (loss) after tax	3,680	2,187
<i>Add / (less) non-cash items:</i>		
Depreciation and amortisation	3,863	4,262
Movement in non-current employee entitlements	(65)	(12)
Increase / (decrease) in deferred tax	6	(380)
<i>Add / (less) items classified as investing or financing activities:</i>		
Gain / (Loss) on sale of non-current assets and investments	(114)	–
Gain / (loss) in fair value of financial assets	(12)	52
Movement in finance lease receivable	34	94
<i>Add / (less) movements in working capital items:</i>		
Inventory	(2)	1
Trade and other receivables	(158)	1,940
Interest receivable	(89)	(28)
Trade and other payables	1,696	160
Employee benefit liabilities	106	(146)
Revenue in advance	3,679	4,298
Net cash inflow / (outflow) from operating activities	12,624	12,428

17 CAPITAL COMMITMENTS AND OPERATING LEASES

	2017 Actual \$000s	2016 Actual \$000s
Capital commitments		
Estimated capital expenditure contracted for at balance date but not paid or provided for	546	91
Operating lease commitments - Lessee		
<i>Lease commitments under non-cancellable operating leases:</i>		
Within one year	604	689
Later than one year and not later than two years	312	481
Later than two years and not later than five years	552	894
Later than five years	3,056	3,212

In addition to the above the Parent has \$0.7m committed to New Zealand eScience Infrastructure.

Operating lease commitments - Lessor

<i>Lease commitments under non-cancellable operating leases:</i>		
Within one year	755	784
Later than one year and not later than two years	696	745
Later than two years and not later than five years	1,999	2,018
Later than five years	14,739	15,297

Group as a lessee

An operating lease is a lease that does not substantially transfer all the risks and rewards incidental to ownership of an asset. Lease payments under an operating lease are recognised as an expense on a straight-line basis over the lease term. Lease incentives received are recognised evenly over the term of the lease as a reduction in rental expense.

Group as a lessor

Leases in which the Group does not transfer substantially all the risks and rewards of ownership of an asset are classified as operating leases.

18 CONTINGENCIES

Commitments and contingencies are disclosed exclusive of GST. The Group is not aware of any significant contingent liabilities as at balance date (2016: nil).

19 RELATED PARTY TRANSACTIONS

Landcare Research New Zealand Limited is the ultimate parent of the Group and controls three entities, being Landcare Research US Limited, Enviro-Mark Solutions Limited, and Manaaki Whenua Research Trust (MWRT).

MWRT is incorporated under the Charitable Trusts Act 1957 and is registered as a charitable entity under the Charities Act 2005. The Trust is controlled by Landcare Research New Zealand Limited and was formed on 9 February 2016.

MWRT audit fees to Audit New Zealand of \$1,812 (GST exclusive) have been paid by the Controlling Entity, Landcare Research New Zealand Limited. MWRT Trustees Liability insurance of \$1,635 (GST exclusive) has been paid by the Controlling Entity, Landcare Research New Zealand Limited.

MWRT's Controlling Entity, Landcare Research New Zealand Limited has provided accounting services to the Trust at no cost.

Intercompany transactions between Landcare Research New Zealand Limited and its Subsidiaries and Controlled Trust are transacted on a commercial basis. No transaction between companies within the Landcare Research Group took place at nil or nominal value during the year, apart from the provision of accounting services to the Trust as stated previously.

The following transactions were carried out with related parties:

	2017 Actual \$000s	2016 Actual \$000s
<i>Enviro-Mark Solutions Limited:</i>		
Services provided to Enviro-Mark Solutions Limited	129	168
Products and services provided by Enviro-Mark Solutions Limited	15	28
Loan outstanding	(446)	(215)
Intercompany current account receivable / (payable)	1,113	826
Impairment of investment / receivable in subsidiary	49	–
Services provided by Enviro-Mark Solutions Limited - payable	10	11
Products and services provided to Enviro-Mark Solutions Limited - receivable	12	14
<i>Landcare Research US Limited:</i>		
Intercompany current account receivable / (payable)	(71)	(71)
<i>Lincoln Hub Limited:</i>		
During the year Landcare Research New Zealand Limited has contributed \$200,000 towards operating expenses of Lincoln Hub Limited.		
Landcare Research New Zealand Limited has capitalised Landcare Research US Limited for a sum of USD 50,000, but the amount has been held by the Parent company pending requirement, and will be paid out on request.		
Key management personnel compensation		
Salaries and other short-term employee benefits	3,017	2,684

Key management personnel includes Directors, Chief Executive Officer and other senior management personnel.

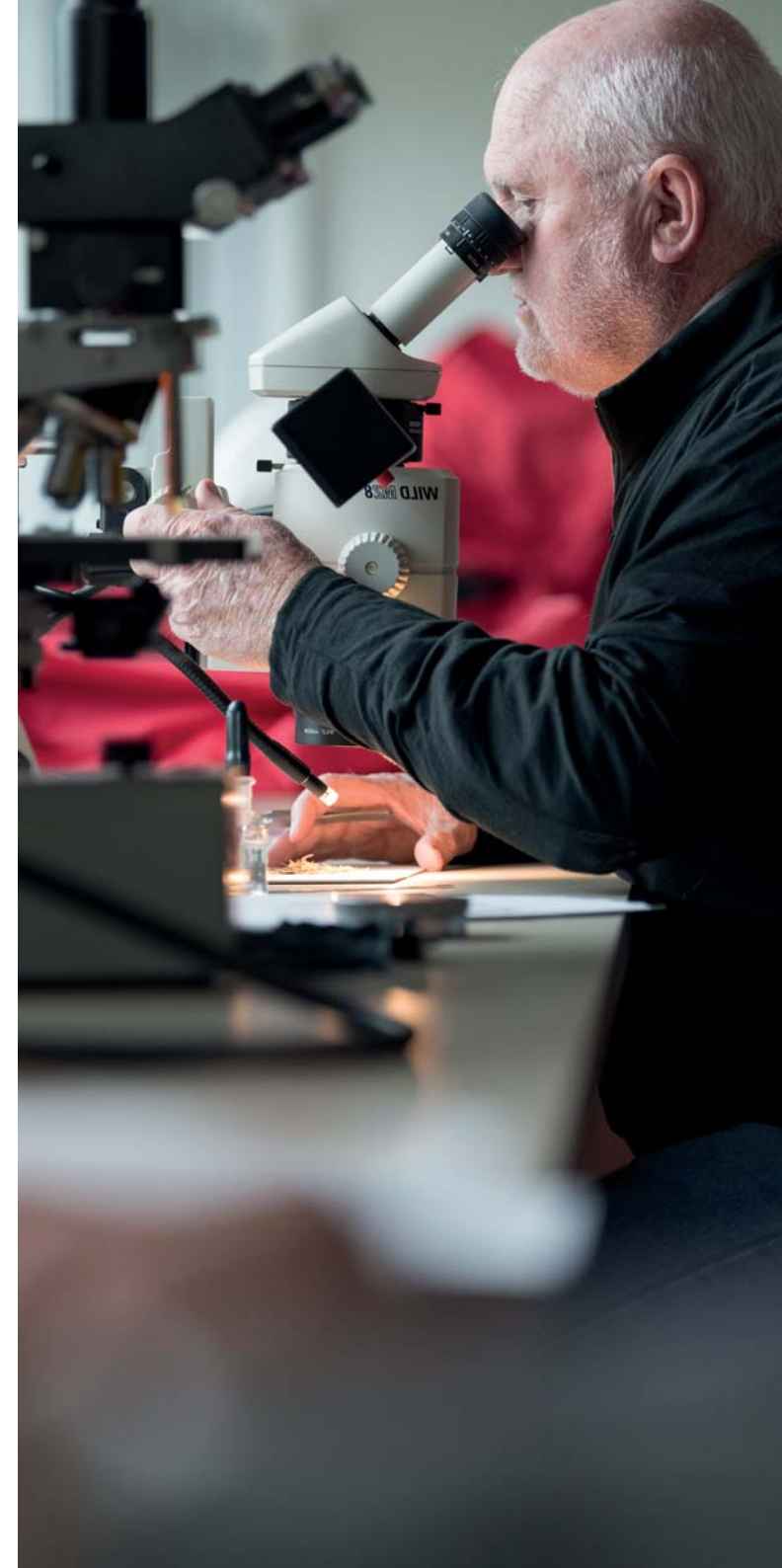
During the year Director remuneration payments (including expense reimbursements) were made to the following entities at the request of the Directors and relate exclusively to Director remuneration payments that would have otherwise been paid directly to the existing Directors.

	2017	2016	2017	2016	2017	2016
	Services received from \$000s	Services received from \$000s	Services provided to \$000s	Services provided to \$000s	Amounts (Payable to)/Receivable \$000s	Amounts (Payable to)/Receivable \$000s
Hall Family Trust	–	26	–	–	–	–
The Commonwealth Scientific & Industrial Research Organisation	24	23	–	–	–	–

In conducting its activities Landcare Research New Zealand Limited is required to pay various taxes and levies (such as GST, FBT, PAYE and ACC levies) to the Crown and entities related to the Crown. The payment of these levies and taxes, other than income tax, is based on the standard terms that apply to all tax and levy payers.

Landcare Research New Zealand Limited also supplies and purchases goods and services from entities controlled, significantly influenced or jointly controlled by the Crown. Sales to and purchases from these entities during the year ended 30 June 2017 were:

	2017	2016	2017	2016	2017	2016
	Services received from \$000s	Services received from \$000s	Services provided to \$000s	Services provided to \$000s	Amounts (Payable to)/Receivable \$000s	Amounts (Payable to)/Receivable \$000s
Crown entities, SOEs and government departments	12,306	7,327	56,929	47,679	(573)	876



20 FINANCIAL ASSETS

	2017 Actual \$000s	2016 Actual \$000s
Financial assets		
Financial assets at fair value through profit and loss		
Foreign exchange forward contracts	–	(12)
Loans and receivables		
Cash and cash equivalents	17,706	8,982
Trade receivables	4,981	6,063
Sundry debtors and accruals	1,168	30
Financial liabilities		
Other financial liabilities		
Trade payables	4,713	3,726
Sundry creditors and accruals	2,431	1,222

The Group classifies its financial assets into the following three categories: financial assets at fair value through profit or loss, loans and receivables, and financial assets at fair value through other comprehensive income. The classification depends on the purpose for which the investments were acquired. Management determines the classification of its investments at initial recognition and re-evaluates this designation at every reporting date.

Financial assets and liabilities are initially measured at fair value plus transaction costs unless they are carried at fair value through profit or loss, in which case the transaction costs are recognised in the profit or loss.

The fair value of financial instruments traded in active markets is based on quoted market prices at the balance sheet date. The quoted market price used is the current bid price. The fair value of financial instruments that are not traded in an active market is determined using valuation techniques. The Group uses a variety of methods and makes assumptions that are based on market conditions existing at each balance date. Quoted market prices or dealer quotes for similar instruments are used for long-term

debt instruments held. Other techniques, such as estimated discounted cash flows, are used to determine fair value for the remaining financial instruments.

The three categories of financial assets are:

- *Financial assets at fair value through profit or loss*
This category has two sub-categories: financial assets held for trading, and those designated at fair value through profit or loss at inception. A financial asset is classified in this category if acquired principally for the purpose of selling in the short term, or if designated as so by management. Derivatives are also categorised as held for trading or are expected to be realised within 12 months of the balance sheet date. After initial recognition they are measured at their fair values. Gains or losses on remeasurement are recognised in the profit or loss. Financial assets in this category include foreign currency forward contracts.
- *Loans and receivables*
These are non-derivative financial assets with fixed or determinable payments that are not quoted in an active market. After initial recognition they are measured at amortised cost using the effective interest method. Gains and losses when the asset is impaired or derecognised are recognised in the profit or loss. 'Trade and other receivables' are classified as loans and receivables in the Statement of Financial Position.
- *Financial assets at fair value through other comprehensive income*
Financial assets at fair value through other comprehensive income are those that are designated as fair value through other comprehensive income or are not classified in any of the other categories above. This category encompasses:
 - Investments that the Group intends to hold long term but that may be realised before maturity.
 - Shareholdings that the Group holds for strategic purposes. The Parent's investments in its subsidiaries are not included in this category as they are held at cost (as allowed by NZ IAS 27 Consolidated and Separate Financial Statements), whereas this category is to be measured at fair value.
 - Investment in Kiwi Innovation Network Limited.

After initial recognition, these investments are measured at their fair value. Gains and losses are recognised directly in other comprehensive income except for impairment losses, which are recognised in the profit or loss. In the event of impairment, any

cumulative losses previously recognised in other comprehensive income will be removed from other comprehensive income and recognised in the profit or loss even though the asset has not been derecognised. On derecognition, the cumulative gain or loss previously recognised in other comprehensive income is recognised in the profit or loss.

Impairment of financial assets

At each balance sheet date the Group assesses whether there is any objective evidence that a financial asset or group of financial assets is impaired. Any impairment losses are recognised in the profit or loss.

21 IMPAIRMENT OF NON-FINANCIAL ASSETS

Non-financial assets that have an indefinite useful life are not subject to amortisation and are tested annually for impairment. Assets that have a finite useful life are reviewed for impairment whenever events or changes in circumstances indicate that the carrying amount may not be recoverable. An impairment loss is recognised for the amount by which the asset's carrying amount exceeds its recoverable amount. The recoverable amount is the higher of an asset's fair value less costs to sell and value in use.

Value in use is depreciated replacement cost for an asset where the future economic benefits or service potential of the asset are not primarily dependent on the asset's ability to generate net cash inflows and where the entity would, if deprived of the asset, replace its remaining future economic benefits or service potential. The value in use for cash-generating assets is the present value of expected future cash flows.

If an asset's carrying amount exceeds its recoverable amount the asset is impaired and the carrying amount is written down to the recoverable amount. The total impairment loss is recognised in the profit or loss.

22 INCOME TAX

	2017 Actual \$000s	2016 Actual \$000s
Components of tax expense		
Current tax	1,429	1,237
Adjustments to current tax in prior years	39	8
Deferred tax expense	15	(381)
Income tax expense	1,483	864

	2017 Actual \$000s	2016 Actual \$000s
Relationship between tax expense and accounting profit		
Profit / (loss) before tax	5,163	3,051
Tax at 28%	1,446	854
Non-deductible expenditure	24	11
Non-taxable income	–	(10)
Deferred tax adjustment	(18)	–
Prior-year adjustment	31	9
Total income tax expense	1,483	864

Deferred tax assets / (liabilities)	Property, plant and equipment \$000s	Employee entitlements \$000s	Other provisions \$000s	Total \$000s
Group				
Balance at 1 July 2015	(3,810)	794	31	(2,985)
Charged to profit / (loss)	269	133	(16)	386
Balance at 1 July 2016	(3,541)	927	15	(2,599)
Charged to profit / (loss)	94	(84)	(10)	–
Balance at 30 June 2017	(3,447)	843	5	(2,599)

Income tax expense in relation to the profit or loss for the period comprises current tax and deferred tax.

Current tax is the amount of income tax payable based on the taxable profit for the current year, plus any adjustments to income tax payable in respect of prior years. Current tax is calculated using rates that have been enacted or substantively enacted by balance date.

Deferred tax is the amount of income tax payable or recoverable in future periods in respect of temporary differences and unused tax losses. Temporary differences are differences between the carrying amount of assets and liabilities in the financial statements and the corresponding tax bases used in the computation of taxable profit. Deferred tax *liabilities* are generally recognised for all taxable temporary differences. Deferred tax *assets* are recognised to the extent that it is probable that taxable profits will be available against which the deductible temporary differences or tax losses can be utilised. Deferred tax is not recognised if the temporary difference arises from the initial recognition of goodwill, or from the initial recognition of an asset and liability in a transaction that is not a business combination, and at the time of the transaction affects neither accounting profit nor taxable profit. Deferred tax is recognised on taxable temporary differences arising on investments in subsidiaries and associates, and interests in joint ventures, except where the Company can control the reversal of the temporary difference and it is probable that the temporary difference will not reverse in the foreseeable future. Deferred tax is calculated at the tax rates that are expected to apply in the period when the liability is settled or the asset is realised, using tax rates that have been enacted or substantively enacted by balance date.

Current tax and deferred tax are recognised against the profit or loss, except to the extent that they relate to a business combination, or to transactions recognised in other comprehensive income or directly in equity.

23 FINANCIAL INSTRUMENT RISKS

The Group has a series of policies to manage the risks associated with financial instruments. The Group is risk averse and seeks to minimise exposure from its treasury activities. Treasury and cash management policies approved by the Board do not allow any transactions that are speculative in nature to be entered into.

Market Risk

Price risk

Group price risk is the risk that the value of a financial instrument will fluctuate as a result of changes in market prices. The Group is not exposed to price risk as it does not hold financial assets held at fair value through other comprehensive income and/or profit/loss.

Currency risk

Group currency risk is the risk that the value of a financial instrument will fluctuate due to changes in foreign exchange rates. The Group operates internationally and is exposed to foreign exchange risk arising from various contract exposures, primarily with respect to the US dollar, Australian dollar, Euro, and UK pound. Currency risk arises when future commercial transactions, recognised assets, and recognised liabilities are denominated in a currency that is not the entity's functional currency.

As at 30 June 2017, if the US dollar had weakened/strengthened by 10% against the New Zealand dollar with all other variables held constant, profit after tax for the year would have been \$2,000 (2016: \$5,000) higher/lower, mainly as a result of foreign exchange gains/losses on translation of US-dollar-denominated trade payables and receivables and the US dollar bank account.

As at 30 June 2017, if the Australian dollar had weakened/strengthened by 10% against the New Zealand dollar with all other variables held constant, profit after tax for the year would have been \$7,000 (2016: \$10,000) higher/lower, mainly as a result of foreign exchange gains/losses on translation of Australian-dollar-denominated trade payables and receivables and the Australian dollar bank account.

At 30 June 2017, if the Euro had weakened/strengthened by 10% against the New Zealand dollar with all other variables held constant, profit after tax for the year would have been \$7,000 (2016: \$0) higher/lower, mainly as a result of foreign exchange gains/losses on translation of Euro-denominated trade payables and receivables.

At 30 June 2017, if the UK pound had weakened/strengthened by 10% against the New Zealand dollar with all other variables held constant, profit after tax for the year would have been \$1,000 (2016: \$3,000) higher/lower, mainly as a result of foreign exchange gains/losses on translation of UK-pound-denominated trade payables and receivables.

The Group foreign exchange management policy is to cover the risk on any foreign currency transactions greater than \$50,000.

Interest rate risk

Cash flow interest rate risk is the risk that the cash flows from a financial instrument will fluctuate due to changes in market interest rates. Short-term bank deposits that receive variable interest rates expose the Group to cash flow interest rate risk.

Contractual maturity analysis of financial liabilities, excluding derivatives

The table below analyses the Group's financial liabilities into relevant maturity groupings based on the remaining period at balance date to the contractual maturity date. Future interest payments on floating rate debt are based on the floating rate on the instrument at balance date. The amounts disclosed are the contractual undiscounted cash flows and include interest payments.

	Carrying amount \$000s	Contractual cash flows \$000s	Less than 1 year \$000s	1–2 years \$000s	2–5 years \$000s	More than 5 years \$000s
2016						
Group						
Creditors & other payables	5,868	5,868	5,868	–	–	–
Total	5,868	5,868	5,868	–	–	–
2017						
Group						
Creditors & other payables	7,605	7,605	7,605	–	–	–
Total	7,605	7,605	7,605	–	–	–

Credit risk

Credit risk is the risk that a third party will default on its obligation to Landcare Research, causing Landcare Research to incur a loss. Landcare Research has a significant concentration of credit risk with the Ministry of Business, Innovation and Employment; however, the risk is mitigated as this entity is also Government owned. The Group's maximum exposure to credit risk is the amount of Receivables.

Liquidity risk

Liquidity risk is the risk that the Group will encounter difficulty raising liquid funds to meet commitments as they fall due. Prudent liquidity risk management implies maintaining sufficient cash and the availability of funding through an adequate

amount of committed credit facilities. The Group aims to maintain flexibility in funding by keeping committed credit lines available.

24 BUDGET FIGURES

The budget figures are those in the Statement of Corporate Intent approved by the shareholding Ministers at the beginning of the year. The budget figures have been prepared in accordance with NZ GAAP, using accounting policies that are consistent with those adopted by the Group for the preparation of the financial statements.

25 EXPLANATION OF SIGNIFICANT VARIANCES AGAINST BUDGET AND BETWEEN YEARS

There were the following significant variances:

- Statement of Comprehensive Income*
June 2017 result was impacted by significantly higher revenue than budgeted due to success in the 2016 MBIE funding rounds and uplift in Science Challenges and Commercial activity.
- Statement of Financial Position*
Cash on hand and short-term deposits increased substantially over budget and prior year due to delays in capital expenditure, and revenue received in advance of work being performed.

26 EVENTS AFTER THE BALANCE SHEET DATE

On 10 August 2017 Landcare Research New Zealand Limited's shareholding Ministers accepted and consented Landcare Research's business case for the redevelopment of the Godley building at the Lincoln site. The redevelopment will commence in February 2018 at a projected cost of \$15m.

Preparation Disclosures

Reporting entity

Landcare Research New Zealand Limited is a Crown Research Institute governed by the Crown Research Institutes Act 1992, Crown Entities Act 2004, Companies Act 1993 and the Public Finance Act 1989. The Landcare Research Group ('the Group') consists of Landcare Research New Zealand Limited and its subsidiaries, Landcare Research US Limited (100% owned) and Enviro-Mark Solutions Limited (100% owned). Landcare Research New Zealand Limited and Enviro-Mark Solutions Limited are incorporated and domiciled in New Zealand; Landcare Research US Limited is incorporated and domiciled in the USA.

These audited financial statements of the Group are for the year ended 30 June 2017 and were authorised by the Board of Landcare Research New Zealand Limited on 22 August 2017.

Nature of Activities

The core purpose of the Group is to drive innovation in New Zealand's management of terrestrial biodiversity and land resources in order both to protect and to enhance the terrestrial environment and grow New Zealand's prosperity.

Basis of preparation

The financial statements of the Group have been prepared in accordance with New Zealand generally accepted accounting practice. The financial statements comply with NZ IFRS, and other applicable financial reporting standards, as appropriate for Tier 1 for-profit entities. The financial statements also comply with IFRS.

The accounting policies set out below have been applied consistently to all periods presented in these financial statements.

The consolidated financial statements have been prepared on a historical cost basis, with the exception of derivative financial instruments that have been measured at fair value. The financial statements are presented in New Zealand dollars, the functional

currency of the Group, and all values are rounded to the nearest thousand dollars (\$000).

Foreign currency transactions are translated into the functional currency, using the exchange rates prevailing at the dates of the transactions. Foreign exchange gains and losses resulting from the settlement of such transactions are recognised in the profit or loss.

Adoption of new and revised standards

None of the new standards effective after 1 July 2016 had a material effect on the Group.

Standards, amendments and interpretations issued but not yet effective:

Standard/Interpretation	Effective for annual reporting periods beginning on or after	Expected to be initially applied in the financial year ending
NZ IAS 7 Statement of Cash Flows disclosure	1 January 2017	30 June 2018
NZ IFRS 15 Revenue from Contracts with Customers	1 January 2018	30 June 2019
NZ IFRS 16 Leases	1 January 2019	30 June 2020

The above standards and interpretation are not expected to have a material impact on the financial results. Except for the impending changes noted above there are no other standards or interpretations applicable to the Group that have been issued but are not yet effective.

Subsidiaries

Where the Group has the capacity to control the financing and operating policies of an entity, so as to obtain benefits from its activities, all such entities are consolidated as subsidiaries within the Group financial statements. This power exists where the Group controls the majority voting power on the governing body, or where such policies have been irreversibly predetermined by the Group, or where the determination of such policies is unable to materially impact the level of potential ownership benefits that arise from the activities of the subsidiary.

The Group measures the cost of a business combination as the aggregate of the fair values, at the date of exchange, of assets given, liabilities incurred or assumed, in exchange for control of the subsidiary plus any costs directly attributable to the business combination. Any excess of the cost of the business combination over the Group's interest in the net fair value of the identifiable assets, liabilities and contingent liabilities is recognised as goodwill. If the Group's interest in the net fair value of the identifiable assets, liabilities and contingent liabilities recognised exceeds the cost of the business combination, the difference will be recognised immediately in the profit or loss.

Basis of consolidation

The purchase method is used to prepare the consolidated financial statements; this involves adding together like items of assets, liabilities, equity, income and expenses on a line-by-line basis. All significant intragroup balances, transactions, income and expenses are eliminated on consolidation.

Landcare Research New Zealand Limited's investment in its subsidiaries is carried at cost less impairment in its 'Parent entity' financial statements.

Critical accounting estimates and assumptions

In preparing these financial statements the Group has made estimates and assumptions concerning the future. These estimates and assumptions may differ from the subsequent actual results. Estimates and judgements are continually evaluated and are based on historical experience and other factors, including expectations or future events that are believed to be reasonable under the circumstances. The estimates and assumptions that have a significant risk of causing a material adjustment to the carrying amounts of assets and liabilities within the next financial year are discussed below.

Critical judgements in applying the Group's accounting policies

Management has exercised the following critical judgements in applying the Group's accounting policies for the year ended 30 June 2017:

1. Leases classification

Determining whether a lease agreement is a finance or an operating lease requires judgement as to whether the agreement transfers substantially all the risks and rewards of ownership to the Company.

Judgement is required on various aspects that include, but are not limited to, the fair value of the leased asset, the economic life of the leased asset, whether or not to include renewal options in the lease term, and determining an appropriate discount rate to calculate the present value of the minimum lease payments. Classification as a finance lease means the asset is recognised in the Statement of Financial Position as property, plant and equipment, whereas for an operating lease no such asset is recognised.

The Group has exercised its judgement on the appropriate classification of property and equipment leases and has determined that one lease arrangement is a finance lease.

2. Patents and intellectual property impairment

The Company has exercised judgement on the impairment assessment of patents and intellectual property. Determination as to whether and how much an asset is impaired involves director and management estimates on highly uncertain matters such as local and international changes in legislation, the continuation of existing customers with existing contracts, the outlook for global and local markets, and the level at which future contracts are based on assumptions that are consistent with the company's business plan and long-term decisions.

Changes in accounting policies

There were no changes in accounting policy during the financial year.

Changes in accounting estimates

A review of the useful life of the Godley building on the Lincoln site has been carried out and its useful life has been realigned to our best estimate. Additional depreciation of \$289k has been included in the accounts for the year ended 30 June 2017.



Statement of Responsibility

The Directors are responsible for presenting financial statements for each financial year that give a true and fair view of the financial position of Landcare Research New Zealand Limited (the Company) and its subsidiaries (the Group) and of the financial performance and cash flows for that period.

The Directors consider the financial statements of the Group and the Company have been prepared using appropriate accounting policies consistently applied and supported by reasonable judgements and estimates, and that all relevant financial reporting and accounting standards have been followed.

The Directors are responsible for establishing and maintaining a system of internal control designed to

provide reasonable assurances as to the integrity and reliability of the financial reporting.

The Directors believe that proper accounting records have been kept, which enable, with reasonable accuracy, the determination of the financial position of the Group and facilitate compliance of the financial statements with the Companies Act 1993.

The Directors believe that they have taken adequate steps to safeguard the assets of the Group and to prevent and detect fraud and other irregularities.

The Board of Directors of Landcare Research New Zealand Limited approved and authorised the financial statements for the year ending 30 June 2017 for issue on 22 August 2017.

A handwritten signature in black ink, appearing to read 'Jane Taylor'.

Jane Taylor
Chair

22 August 2017

A handwritten signature in black ink, appearing to read 'Paul Reynolds'.

Paul Reynolds
Deputy Chair

22 August 2017

Audit Report

AUDIT NEW ZEALAND

Mana Arotake Aotearoa

INDEPENDENT AUDITOR'S REPORT

To the readers of Landcare Research New Zealand Limited's Group Financial statements for the year ended 30 June 2017

The Auditor-General is the auditor of Landcare Research New Zealand Limited Group (the Group). The Auditor General has appointed me, John Mackey, using the staff and resources of Audit New Zealand, to carry out the audit of the financial statements of the Group on his behalf.

Opinion

We have audited the financial statements of the Group on pages 21 to 42, that comprise the statement of financial position as at 30 June 2017, the statement of comprehensive income, statement of changes in equity and statement of cash flows for the year ended on that date and the notes to the financial statements that include accounting policies and other explanatory information.

In our opinion, the financial statements of the Group:

- present fairly, in all material respects:
 - its financial position as at 30 June 2017; and
 - its financial performance and cash flows for the year then ended; and
- comply with generally accepted accounting practice in New Zealand in accordance with New Zealand Equivalents to International Financial Reporting Standards and International Financial Reporting Standards.

Our audit was completed on 25 August 2017. This is the date at which our opinion is expressed.

The basis for our opinion is explained below. In addition, we outline the responsibilities of the Board of Directors and our responsibilities relating to the financial statements, we comment on other information, and we explain our independence.

Basis for our opinion

We carried out our audit in accordance with the Auditor-General's Auditing Standards, which incorporate the Professional and Ethical Standards and the International Standards on Auditing (New Zealand) issued by the New Zealand Auditing and Assurance Standards Board. Our responsibilities under those standards are further described in the Responsibilities of the auditor section of our report.

We have fulfilled our responsibilities in accordance with the Auditor-General's Auditing Standards.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Responsibilities of the Board of Directors for the financial statements

The Board of Directors is responsible on behalf of the Group for preparing financial statements that are fairly presented and that comply with generally accepted accounting practice in New Zealand.

The Board of Directors is responsible for such internal control as it determines is necessary to enable it to prepare financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the financial statements, the Board of Directors is responsible on behalf of the Group for assessing the Group's ability to continue as a going concern. The Board of Directors is also responsible for disclosing, as applicable, matters related to going concern and using the going concern basis of accounting, unless the Board of Directors has to cease operations, or has no realistic alternative but to do so.

The Board of Directors' responsibilities arise from the Crown Research Institutes Act 1992.

Responsibilities of the auditor for the audit of the financial statements

Our objectives are to obtain reasonable assurance about whether the financial statements, as a whole, are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinion.

Reasonable assurance is a high level of assurance, but it is not a guarantee that an audit carried out in accordance with the Auditor-General's Auditing Standards will always detect a material misstatement when it exists. Misstatements are differences or omissions of amounts or disclosures and can arise from fraud or error. Misstatements are considered material if, individually or in the aggregate, they could

reasonably be expected to influence the decisions of readers taken on the basis of these financial statements.

For the budget information reported in the financial statements, our procedures were limited to checking that the information agreed to the Group's statement of corporate intent.

We did not evaluate the security and controls over the electronic publication of the financial statements.

As part of an audit in accordance with the Auditor-General's Auditing Standards, we exercise professional judgement and maintain professional scepticism throughout the audit. Also:

- We identify and assess the risks of material misstatement of the financial statements, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for our opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.
- We obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances but not for the purpose of expressing an opinion on the effectiveness of the Group's internal control.
- We evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by the Board of Directors.
- We conclude on the appropriateness of the use of the going concern basis of accounting by the Board of Directors and, based on the audit evidence obtained,

whether a material uncertainty exists related to events or conditions that may cast significant doubt on the Group's ability to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in our auditor's report to the related disclosures in the financial statements or, if such disclosures are inadequate, to modify our opinion. Our conclusions are based on the audit evidence obtained up to the date of our auditor's report. However, future events or conditions may cause the Group to cease to continue as a going concern.

- We evaluate the overall presentation, structure and content of the financial statements, including the disclosures and whether the financial statements represent the underlying transactions and events in a manner that achieves fair presentation.
- We obtain sufficient appropriate audit evidence regarding the financial statements of the entities or business activities within the Group to express an opinion on the consolidated financial statements. We are responsible for the direction, supervision and performance of the Group audit. We remain solely responsible for our audit opinion.

We communicate with the Board of Directors regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that we identify during our audit.

Our responsibilities arise from the Public Audit Act 2001.

Other Information

The Board of Directors is responsible for the other information. The other information comprises the information included on pages 1 to 20, 43, 46 to 48 but

does not include the financial statements, and our auditor's report thereon.

Our opinion on the financial statements does not cover the other information and we do not express any form of audit opinion or assurance conclusion thereon.

In connection with our audit of the financial statements, our responsibility is to read the other information. In doing so, we consider whether the other information is materially inconsistent with the financial statements or our knowledge obtained in the audit, or otherwise appears to be materially misstated. If, based on our work, we conclude that there is a material misstatement of this other information, we are required to report that fact. We have nothing to report in this regard.

Independence

We are independent of the Group in accordance with the independence requirements of the Auditor General's Auditing Standards, which incorporate the independence requirements of Professional and Ethical Standard 1 [Revised]: Code of Ethics for Assurance Practitioners issued by the New Zealand Auditing and Assurance Standards Board.

Other than the audit and the assurance engagement performed, we have no relationship with or interests in the Group.



John Mackey
Audit New Zealand
On behalf of the Auditor-General
Christchurch, New Zealand

Financial Indicators (MBIE)

Financial key performance indicators as required by MBIE (not part of the Audited Financial Statements).

<i>For year ending 30 June:</i>	Actual 2017	Business Plan 2017
Efficiency:		
Operating margin	13.3%	8.2%
Operating margin per FTE	\$26,001	\$16,174
Risk:		
Quick ratio	2.42	1.34
Interest coverage	375	34
Operating margin volatility	48.2%	17.7%
Forecasting risk	2.7%	0.4%
Tailored rate of return:		
ROE before investment	11.4%	4.5%
Return on equity (ROE) (based on NPAT)	10.4%	2.8%
Growth/investment:		
Revenue growth	13.6%	8.1%
Capital renewal	1.0	2.0

Operating margin:

$\text{EBITDAF} \div \text{Revenue}$, expressed as a percentage. (EBITDAF is EBIT before depreciation, amortisation and fair value adjustments.)

Quick ratio:

$[\text{Current assets} - \text{Inventory} - \text{Prepayments}] \div [\text{Current liabilities} - \text{Revenue in advance}]$.

Interest coverage:

Interest is the cost of debt and financial leases. Interest cover = $\text{EBITDAF} \div \text{interest}$. (EBITDAF is EBIT before depreciation, amortisation and fair value adjustments.)

Forecasting risk:

5-year average of return on equity less forecast return on equity.

Return on equity:

$\text{NPAT} \div \text{Average shareholders' funds}$, expressed as a percentage. (NPAT: net profit after tax.)

Shareholders' funds:

Includes share capital and retained earnings.

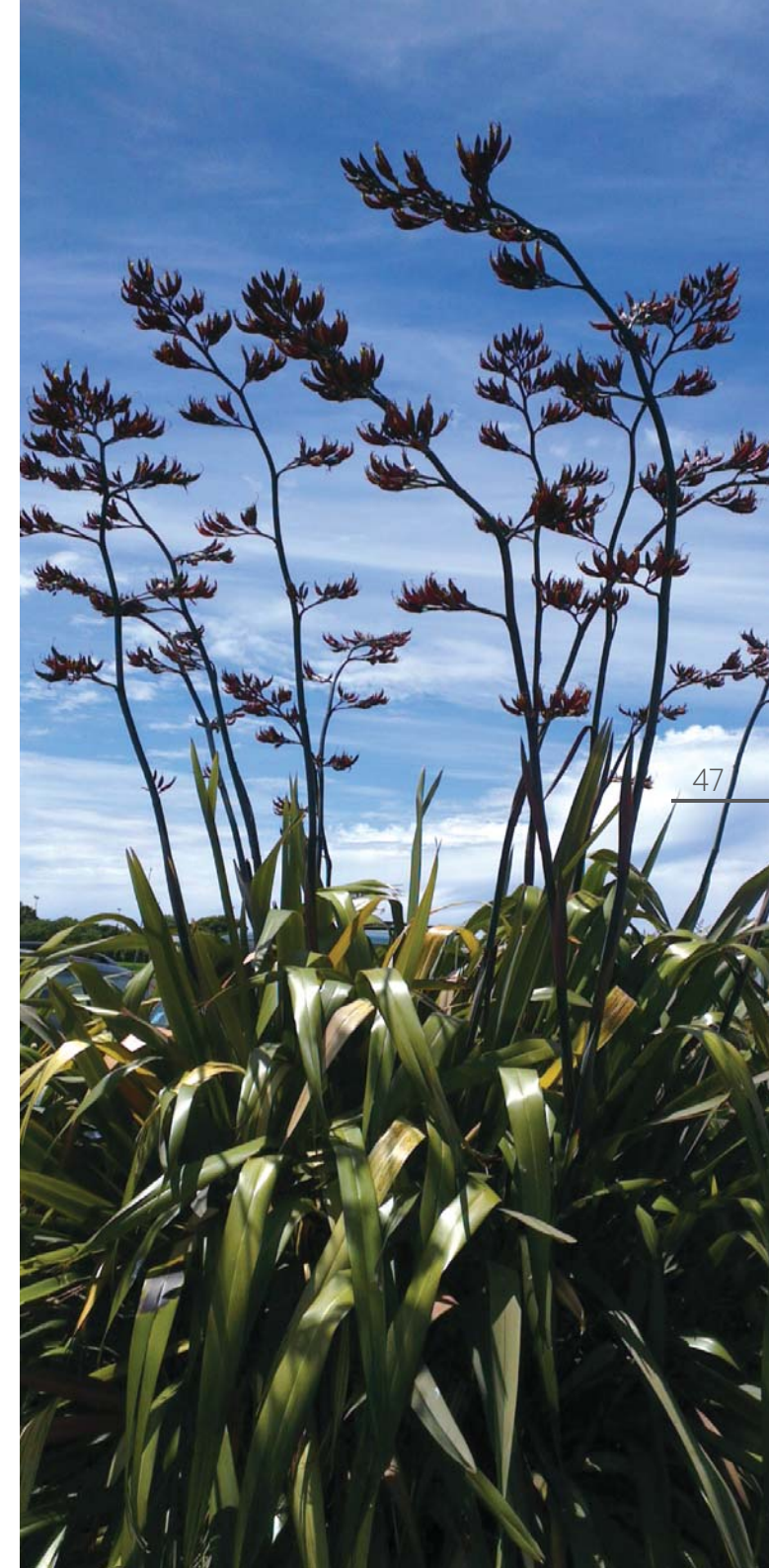
Capital renewal:

$\text{Capital expenditure} / \text{Depreciation expense plus amortisation expense}$.



Glossary & Guide to Acronyms

ACC	Accident Compensation Corporation	www.acc.co.nz
Biological Heritage NSC	Biological Heritage National Science Challenge	www.biologicalheritage.nz
DOC	Department of Conservation	www.doc.govt.nz
EBITDAF	Earnings before income tax before depreciation, amortisation and fair value adjustments	
FOMA	Federation of Māori Authorities (Me Uru Kahikatea)	www.foma.org.nz
KPI	key performance indicators	
LINZ	Land Information New Zealand	www.linz.govt.nz
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
Natural resources sector (NRS)	Comprises the core government agencies responsible for the management and stewardship of New Zealand's natural resources; regional councils are stakeholders	http://nrs.mfe.govt.nz
NPAT	Net profit after tax	
NSSI	National Statement of Science Investment	www.mbie.govt.nz
OLWNSC	Our Land and Water National Science Challenge	www.ourlandandwater.nz
OSPRI	Operational Solutions for Primary Industries (TBfree New Zealand Ltd and NAIT Ltd are wholly owned subsidiaries)	www.ospri.co.nz
RMA	Resource Management Act	www.mfe.govt.nz/rma
RSNZ	Royal Society of New Zealand	www.royalsociety.org.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
TPK	Te Puni Kōkiri	www.tpk.govt.nz



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