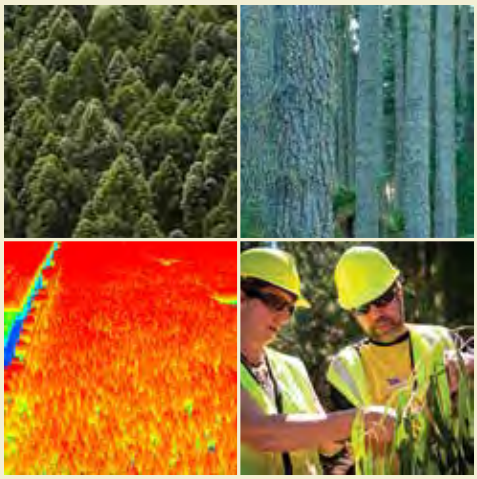
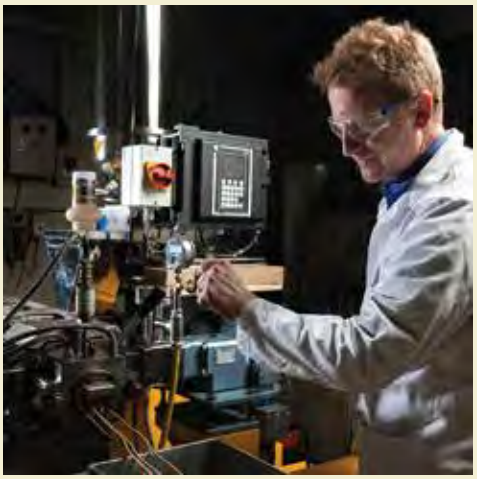
SCION
forests · products · innovation

Annual Report 2015
Reports and Financial Statements






SCION
forests · products · innovation

Industry focus

Added value

Regional development

Annual Report 2015
Reports and Financial Statements

Presented to the House of Representatives pursuant to section 44 of the Public Finance Act 1989.

Our Annual Report is presented in two parts - Highlights (Part A) and Reports and Financial Statements (Part B). Together both documents fulfil our annual reporting responsibilities under the Crown Research Institutes Act 1992.

Highlights is an illustrated document containing the Chairman and CEO report, descriptions of our research performance, science outreach, communities and staff awards.

Our Annual Report is also available in digital format at www.scionresearch.com/annualreports

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GOOD EMPLOYER AND EQUAL OPPORTUNITIES

Scion is strongly committed to being a Good Employer and an advocate for Equal Employment Opportunities (EEO). We believe our achievements over the past year reflect our dedication to this commitment. Our practice is constantly evolving, and we implemented initiatives that aim to keep us at the top of our game. This effort was recognised when we received, for the second consecutive year, 100% compliance with the requirements of the Human Rights Commission Annual Report Review and first equal ranking among 91 employers.

Scion delivers on the Good Employer obligations and the key elements principally through our Board Good Employer Policy and our Equal Employment Policy, along with our management policies, programmes and practices.

Our progress against the seven key elements over the 2014-15 financial year is set out below:

Good Employer Key Element	Scion's Good Employer delivery 2014-15
Leadership, accountability and culture	• Quarterly leadership development programme continued with two industry CEOs joining as guest speakers. • L&D Programme delivered to all employees including Radical Collaboration, Resilience Training and Getting Organised. • Māori Focus Cohort engaged with collaborative initiatives to help deliver Scion's Māori Plan. • Strong engagement with Scion's new organisational values from staff and leaders. • Climate survey completed by 99% of staff with an 80% engagement result.
Recruitment, selection and induction	• Key contributor to Rotorua Career Expo with 160 students registering for a competition to spend a day with a scientist. • Hosted Bay of Plenty Career Advisors, together with school visits/ engagements. • 46 interns hosted throughout the year and 30 university students employed during the summer.
Employee development, promotion and exit	• Refreshed Future Leaders programme launched. • New Tertiary Study Support Policy written; 10 employees supported with further tertiary education. • Reasonable turnover rate of 8.3%. • 18 promotions for employees through the Scion Job Progression process.
Flexibility and work design	• Policies updated following amendments to the Employment Relations Act with 15 employees approved for changes in hours to accommodate lifestyle choices. • Seven employees took parental leave; four employees received ex-gratia payment upon return from parental leave and five employees took extended leave without pay.
Remuneration, recognition and conditions	• Timely completion of CEA negotiations with a three-year term agreed. • Maintained regular Partnership for Quality meetings with PSA Union. • Scion Science Excellence Award awarded posthumously to Roger Newman.
Harassment and bullying prevention	• New Problem Resolution and Unacceptable Behaviour Policy prepared with strong alignment to Scion values and Worksafe's "Guide for preventing and responding to workplace bullying". • Positive 11.62% EAP usage compared to national average of 8.20%.
Safe and healthy environment	• No serious harm incidents. • 91 employees participated in the Scion flu vaccination programme. • All employees attended a Health and Safety Expo programme. • Completed all actions from independent self-audit for compliance with the HSNO Code of Practice. • Retained ACC WSMP Tertiary Accreditation. • Retained Enviro-Mark Bronze Certification.

1. Leadership, accountability and culture

Central to Scion's strategy is the continuous development of all our people and our leadership cohort. A quarterly leadership development programme gives all tier one to three leaders (CEO, executive managers and senior managers) the opportunity to connect and learn. Guest speakers included Lain Jager (CEO, Zespri) and Paul McGilvary (CEO, Tatua Co-operative Dairy Company) who shared their vast experience in commercial management and the role of innovation within their organisations. A two-day workshop was held in May on the SMASH (Strategies for Market Shaping) programme from Auckland University and will be followed up by a further workshop in September. These workshops are an in-depth introduction to developing effective customer value propositions and strategies on how to shape markets.

Implementing the Scion values was key to embedding Scion's vision for a high-performing and customer-focused culture. Recognition initiatives were rolled out across the organisation to acknowledge positive demonstration of the values in action, together with inclusion of the values as key components within the organisation's annual performance review process, quarterly CEO awards and the Scion Annual Awards.

A climate survey was completed in February 2015 with a 99% completion rate and 80% engagement score. Overall, the results were highly positive and pleasingly reflected the culture development work of recent years at Scion. Teams reviewed their own results and developed work plans to support their team focus areas for improvement. The Executive Management Team will monitor progress against these focus areas.

2. Recruitment, selection and induction

Our recruitment and selection practices are free from discrimination and support our Equal Employment Policy to ensure that we recruit the best person for the job. We reject the use of terms that may infer discrimination in our advertising, and our recruitment panels follow the principles of the Human Rights Act 1993, particularly the 13 areas of discrimination. The Science New Zealand careers website, a pan-CRI (Crown research institute) collaboration, has helped us attract a much larger and more diverse pool of candidates seeking employment.

Scion's induction programme is an essential element in successfully 'settling in' employees. Our process is guided by a self-directed "Induction Passport" which engages the employee with all key personnel, processes and policies. This includes attendance at a whakatau, hosted by the Executive Management Team. Welcoming our new employees within this context of Scion's tikanga recognises our commitment and respect of Te Arawa and the whenua beneath our feet at the Rotorua campus.

We continued community initiatives that create both public awareness and interest in a career in science, technology, forestry and Scion. This included participation in the Rotorua Lakes Council Excel programmes; regular interactions with education institutes and schools; strong attendance in the local career expo; and hosting CATE (Careers Advisors and Transition Educators). In addition, we also hosted 46 international interns throughout the year and during the summer period, temporarily employed 30 New Zealand university students.

3. Employee development, promotion and exit

Our refreshed Future Leaders programme was launched to help develop high potential employees to progress into leadership positions within the next five years. Selected by the Executive Management Team, following nominations by team managers, this group of 28 employees (39% female) engaged with the leadership cohort during their quarterly leadership programme, progressed their individual development plans and received priority access to learning and development.

The Scion performance framework is aligned with Scion's strategy. It comprises our ACE Performance Review, learning and development programmes, professional conferences, industry secondments and job progression; and it is available for all employees to expand their capability and performance. All employees are expected to have at least one development goal and one health and safety goal within their annual work plan. The latter links to a range of initiatives implemented to build a stronger safety culture at Scion.

The Scion Progression Panel meets quarterly and plays a key role in staff recognition and development in capability. The Progression Panel consists of 11 staff from varied roles and levels across Scion, of which six are females, plus a PSA union delegate and two general managers. During 2014-15 we promoted 18 employees via the Progression Panel process.

Our employee turnover rate remained reasonable at 8.3%. We completed exit interviews and surveys with departing employees to identify opportunities for improvement. The past year's survey results were generally highly positive of the individuals' experiences at Scion with 91% considering Scion a great place to have worked and 100% confirming

Scion demonstrates a commitment to the Scion values. Reasons for leaving were: voluntary 61%, involuntary 30% and retired 9%. Employees who resigned indicated their reasons as: family 12%, new career 48%, not a good fit 12%, lifestyle 4%, remuneration 16%, returning home overseas 16% or leaving to study 4%.

During 2014-15, Scion supported 10 tertiary study applications from employees including two Masters, six PhDs and two others. Scientist Marie Joo Le Guen from our Biopolymer and Chemicals Team successfully completed her PhD.

4. Flexibility and work design

Central to Scion's employee value proposition is our recognition of work-life balance. This ethos goes hand in hand with our location in the Bay of Plenty, particularly being situated alongside the Whakarewarewa Forest and Redwoods. Our onsite secure bike storage and dog-friendly policy mean our employees often visit the forest during their lunch breaks.

As we build a culture that is flexible and adaptable to the operating environment, we recognise the benefit of supporting employees who wish to alter their working hours. Over the past year, 11 female employees increased their hours and three females and one male decreased their working hours.

During the year, seven employees took unpaid parental leave (two males and five females) with three males and one female receiving the parental leave *ex-gratia* payment (six weeks of salary) six months following their return to work. This benefit is provided to both female and male employees in support of the dual responsibility for parenting.

In addition, five employees (three males, two females) were granted extended leave without pay (greater than one month).

5. Remuneration, recognition and conditions

Scion's Remuneration Policy does not discriminate between male and female employees. Remuneration is based on job band and remuneration ranges are based on the external market surveys produced by Hay Group. Salary increases relate to a combination of PIR (Position-in-Range) and performance review (using the Scion ACE process).

An independent remuneration consultant completed an annual review for Scion to assess potential gender equity issues with remuneration, promotion and performance assessments. No significant issues were apparent in the review, although we kept a watch on supporting high performing/high potential mid-level female scientists.

Scion continued to work closely with the PSA Union under a Partnership for Quality Programme. We utilised this forum for discussions around morale, health and safety, operating environment and matters potentially affecting Scion employees. This is a respected forum and likely a key contributor to the smooth negotiation of the Collective Agreement that expired in 2014 and was agreed for a further three-year term with minor adjustments.

Throughout the year additional support was provided to 98 employees for bereavement and/or sick leave beyond legislative entitlements. One employee accessed the long-term illness benefit, funded by Scion's insurer.

The third Scion Annual Awards were awarded in October 2014 at an all-staff meeting. The key award for Science Excellence was awarded posthumously to Roger Newman. Roger was a highly regarded Principal Scientist and widely admired by the science community. He passed away unexpectedly in July 2014. Professionally and personally he is very much missed at Scion.

Recognition for employees is also supported through both Scion and team communication tools such as team meetings, Treehouse (our staff intranet) and "Scion Connections" newsletter. These enable sharing and recognition of the great work of our colleagues as well as extending awareness of our employee capabilities.

Scion's commitment to the development of our workplace has included significant investment in facilities and equipment in recent years, and staff are benefiting from a high-quality, safer work environment. The upgrade has extended to world-class laboratories, comfortable bathrooms and cafeteria, lockable bike storage and general infrastructure, equipment and grounds.

6. Harassment and bullying prevention

Scion's newly developed Problem Resolution and Unacceptable Behaviour in the Workplace Policy states that: *The purpose of this policy is to promote a workplace that upholds the mana of all employees. To encourage an environment in which our Scion values of Collaboration, Excellence, Innovation and Manaakitanga are positively demonstrated each day. This policy is also intended to support Scion to provide a safe and healthy workplace and to provide constructive direction in situations where unacceptable behaviour or employment relationship problems may occur.*

Scion takes any complaints of bullying or harassment seriously and acts immediately to investigate any concerns. The Worksafe "Guide for preventing and responding to workplace bullying" is a key document listed on the policy to support our processes, aiding both leaders and employees.

Our Learning and Development Programme includes training programmes on problem resolution and communication skills to promote a healthy workplace, for example, Crucial Conversations and Radical Collaboration courses. In addition, all employees completed a Safe Behaviour module during the year as part of the Scion Health and Safety (H&S) Expo. The module focused on increasing awareness of one's own behaviour and the potential impact on others when behaviours are perceived as bullying and/or harassment. The Scion policy and Worksafe guide were central to this training session.

Employees at Scion may access the Employee Assistance Programme (EAP) for support around personal or workplace matters. Over the past 12 months, 36 employees have accessed EAP reflecting a positive usage rate of 11.62% compared to the national average of 8.20%. Our Christchurch staff have indicated a preference for an onsite presence through our Vitae provider. Providing this support is reassuring for management located in Rotorua, particularly with some staff still affected by post-earthquake challenges.

7. Safe and healthy environment

Scion has a strong commitment to continuous improvement in H&S as demonstrated by successfully passing the ACC WSMP Tertiary Accreditation audit. To continue best practice at Scion we are closely following developments in the H&S environment across New Zealand and initiating improvements through communications, reporting, training, engagement and leadership. The inclusion of Directors with our safety culture development was valuable. Directors engaged with H&S as a standing item on the Board's monthly agenda, visited sites with significant hazards, participated in emergency drills and extensively contributed to the revision of the Scion H&S Policy as well as Emergency Response Plan.

To support good practice induction with H&S, all induction procedures were reviewed and refreshed to represent Scion's commitment to, and expectation of, new employees. This included a revised induction programme for summer students, all new permanent employees meeting within their first week for a one-on-one induction with the General Manager People & Performance, production of an induction H&S video (including for contractors and visitors) and revised area induction procedures.

Another key delivery for H&S was the compulsory attendance of all employees to Scion's H&S Expo. The programme delivered learning modules on safety culture (including updates on the new operating landscape and legislation), hazard and risk management, safe behaviour, wellness and Scion's vehicle policy (a high-risk area for the organisation). Employees were highly engaged with the programme, which we believe contributed to the pleasing trends in improved H&S metrics, along with regular communications of H&S.

We completed the year with no serious harm incidents, 34 incidents (41 in 2013-14), and 52 near misses reported (56 in 2013-14).

During the year, 91 staff received a company-paid influenza vaccination.

Work Place Profile at 30 June 2015

Total staff	Total permanent employees - 323 (169 males and 154 females)
FTEs	Full time equivalent employees total – 282.5 (excludes staff on leave without pay)
Disability	3.5% of employees are recorded as disclosing a disability
Age	24% of employees are in the under 40-years age group, 27% are in the 40 to 49 years age group and 49% in the 50 years and over age group
Māori	Māori represent 7% of permanent employees
Nationality	18% of employees are recorded as disclosing a nationality other than New Zealander or Māori, and represent 23 nationalities
Pacific Islander	No employees are recorded as disclosing a Pacific Island nationality

ENVIRONMENTAL PERFORMANCE

Scion supports long-term economic growth of New Zealand through research programmes that target more efficient use of renewable and non-renewable resources and lower impact production systems. In our day-to-day activities and operations, Scion keeps a close eye on its environmental performance, and this is reflected in our Environmental Performance Policy, which was updated in June 2015. The policy addresses the effect of our business activities on climate change, water resources, future land use, waste reduction, local community and financial viability.

We are committed to monitoring and improving our environmental performance. On-going data collection enables us to robustly measure performance against the environmental indicators set out in the policy.

In line with this commitment, Scion joined the Enviro-Mark programme in 2011 and we are working towards Enviro-Mark Silver Certification this calendar year for the Rotorua site.

Environmental Impacts per year	10/11	11/12	12/13	13/14	14/15
Total employees for all sites	313	294	298	284	287
FTEs for Rotorua site only	291	276	274	259	261
Total energy (kWh/FTE) Rotorua site only	30,204	31,548	34,659	33,878	35,535
Domestic air travel (km/FTE) all sites	2,161	1,534	2,669	2,888	2,866
Trans-Tasman air travel (km/FTE) all sites	901	357	1,203	980	720
International air travel (km/FTE) all sites	5,707	6,146	11,459	8,761	13,087
Total tCO_2eq/FTE (on an "all sites" basis)	6.8	6.5	7.7	6.9	8.1
Organics diverted (kg/FTE) Rotorua site only	5	5	6	7	7
Paper recycled (m^3/FTE) Rotorua site only	0.1	0.2	0.2	0.2	0.2
Cardboard recycled (m^3/FTE) Rotorua site only	0.4	0.4	0.5	0.5	0.5
Waste to landfill (m^3/FTE) Rotorua site only	8	9	6	5	5
Water usage (L/FTE) Rotorua site only					280,315

Operation of an on-site recycling programme has continued. This diverts food waste, plastic and glass bottles, aluminium and steel cans, and scrap metal from landfill. Recycling of building demolition materials also increased this year.

Energy usage per FTE increased owing to greater electricity usage across the year and an increase in gas usage for heating during the latter part of the year. Carbon dioxide equivalent (CO_2e) emissions per FTE also increased this year because of increases in international air travel (which includes higher than normal numbers of international staff recruits) and energy usage in comparison with the 2013-14 year. International air travel overall for Scion increased by 1,258,466 km and energy usage at the Rotorua site increased by 475,640 kWh. Video conferencing is used extensively including for interviews of overseas candidates and for several Board meetings.

Improvements to water metering are being made to better understand types and levels of water use.

INFRASTRUCTURE INVESTMENT

Scion is proud of its Rotorua campus facilities, having refurbished an aging block of laboratories in 2012 and continued to invest in new equipment and science instruments.

During the past year, the design phase for a new wood processing wing and pilot plant zone commenced. The new wing will accommodate the timber engineering workshop and laboratories for pulp, packaging, composites, timber drying and timber preservation.

Examples of capital expenditure investment in 2014-15 included:

Insectary

A new, stand-alone building to rear and study live insects was completed in December on the Rotorua campus. The insectary was designed in-house and has given our entomology team a dedicated and secure environment to carry out research that uses live insects. For example, biocontrol work requires rearing populations of pests like the eucalyptus tortoise beetle and the parasitoid wasps that prey on them. 'Insect-friendly' spaces are also needed so that entomologists can look at insects in logs, in flight, their attraction to different traps and lures and during many other aspects of their life cycle.

UAV technology

Purchase of an unmanned aerial vehicle (UAV) enables Scion to capitalise on technological advancements in the field of remote sensing. UAV technologies and associated rapid data collection capabilities are an active area of research, and the craft will change the way in which remote sensing is undertaken in forests. The UAV carries a LiDAR (light detection and ranging) unit as well as a camera that captures various images and pictures allowing for improved decision making for foresters. Flying this technology results in reduced costs, improved access to data for small- and medium-scale forestry operations and provides increased precision of imagery because the craft is able to fly close to objects of interest. http://www.scionresearch.com/aerial-robotics

Disc scanning (for measuring wood quality)

This expenditure enables Scion to develop a new phenotyping platform with high resolution wood property mapping. The phenotyping platform will provide information on the internal and external characteristics of individual trees and relate these data to site characteristics and genetic pedigree. Developing our wood quality assessment platform will help to overcome one of the key challenges with wood quality research, which is the cost and scale of sampling.

Traditional methods of sampling have involved the collection of cores from the tree, which constitute a tiny volume fraction of the stem and do not permit the internal variation in wood properties (a key determinant of end product performance) to be identified. The new automated sampling system will enable larger numbers of trees to be analysed, which will provide a better understanding of the variability in wood properties within and between trees.

Fluidised bed micro-reactor system

This versatile instrument is capable of carrying out fast experiments at high temperature (up to 500°C) and high pressure. Investment in the fluidised bed micro-reactor enables several experiments per day involving different types of processes, conditions and feedstocks. Different size reactors can be introduced in a hot fluidised sand bed, achieving very high heating rates (as fast as 300°C/min), significantly reducing the effect of heating time on the experimental results. Examples of experiments that can be carried out in this system are hydrothermal liquefaction of biomass or wet oxidation of biosolids.

The reactors are attached to a robotic arm that is operated from a separate control room. All the desired steps are operated from the control room by inserting the recipe into the software. The system carries out the experiments automatically, and they can be monitored from the control room using the software and the camera inside the experimental room. The features of the system have been designed and implemented to achieve a high level of safety, significantly reducing any possible harm to the operator.

Laboratory accreditation

Scion's Forest Health Reference Laboratory achieved IANZ Certificate of Accreditation. The newly gained International Organisation for Standardisation/International Electrotechnical Commission (ISO/IEC) 17025:2005 for Biological Testing accreditation provides recognition that the lab is meeting internationally accepted standards of quality, performance, technical expertise and competence.

CORE FUNDING INVESTMENT

Intermediate Outcome 1 Maximise the value and profitability of commercial forests and their ecosystem services			
Alignment to Statement of Core Purpose Improve the value and productivity of the New Zealand forestry sector	**Alignment to Sector Priorities** New Zealand Forest Owners Association and New Zealand Farm Forestry Association	**Investment as per the SCI 2014-15** $3.3 million	**Investment Actual** $3.3 million

Radiata pine development

Radiata pine represents 90% of New Zealand's commercial forest estates. Ensuring that New Zealand has an on-going supply of improved plant material to enhance its productivity, its health and the quality of the wood is of critical importance to our $5 billion export industry. Scion has allocated core funding to ensure that New Zealand has 'state of the art' technologies providing the best of plant material for the future: specifically, to sustain a platform focused on genetic gain, and identifying and delivering plant material that is resistant to forest diseases.

Radiata pine breeding and sequencing

The continuing focus of this programme is to develop genomic selection for the key commercial species, where genetic gain can be delivered twice as fast as quantitative breeding alone. Industry has noted "Shortening the breeding and deployment timeline by 50% has a major financial impact and can result in three fold increases in NPV" (Dr John Butcher, CEO, Radiata Pine Breeding Company Limited).

Our work has underpinned a new programme with the Radiata Pine Breeding Company, where industry has invested over $500,000 per annum to take advantage of the additional gain these technologies deliver.

Scion continues to build on the radiata pine partnership by supporting publication of research that will lead to programme development and technical up-skilling for our forestry industry, and we continue to build the sequencing of the radiata pine genome.

Capability gained through this programme is also being applied to other tree species.

Radiata pine deployment

Through this programme we have developed and tested *in vitro* screening techniques to build greater species resistance to red band and red needle cast disease caused by *Dothistroma* and *Phytophthora*.

Propagation of radiata pine hybrids is providing new options for cold elevated sites and is now being commercialised through an industry partner. Tissue culture of radiata pine hybrids is more difficult, and proving this pipeline possible is vital for the future success of any hybrid. We have shown that a tissue culture pipeline can be developed for *Pinus attenuata* x *P. radiata* hybrids. With this success we will move onto more challenging hybrids that will provide opportunities to extend the range of properties and resistance genes, future-proofing the New Zealand pine industry. Scion has also strengthened its collaboration in Europe through Neiker-Tecnalia to enable New Zealand to leverage off these substantial international research programmes.

Biotechnology approaches to forest productivity

Scion has taken a leading role in the science and understanding of biotechnology applications, such as genetic modification (GM) and new breeding technologies, in forestry for New Zealand. Biotechnology approaches have the potential to make step changes in production forestry through improvements that increase productivity. It can also address some important social licence to operate issues such as reducing the incidence of wildings and could be applied in future to achieve disease resistance. Scion's approach is to evaluate the option for use of such technologies, by generating and providing robust science to inform commercial forestry companies, the public and to support policy development. Importantly, Scion is making a substantial contribution to international science in biotechnology and leverages that knowledge for New Zealand's benefit (this also supports IO6).

The core funding allocated to this project in 2014-15 underpinned the facilities and clonal collections held in cryopreservation that are used in Scion's development and testing of biotech trees. Scion continued to improve tissue culture pipelines and techniques to enable development of this technology.

Scion demonstrated proof-of-concept in a field trial of herbicide resistant trees and from this, evaluated the utility of using GM trees to improve management practices. The outcomes were a business case showing a reduction in establishment costs when using GM herbicide resistant trees.

Three different genes were transformed in radiata pine that have been predicted (based on current literature) to significantly improve growth rates in trees. These are still at the tissue culture stage.

Ecosystem services

Forests provide substantial non-timber values (ecosystem services) such as sustaining biodiversity, enhancing air and water quality, and providing recreational activities and international and local tourism. The challenge for owners of these forests is two-fold: to quantify and monetise ecosystem services; and thereby improve the profitability of forestry as a land use.

Understanding these values is increasingly important given the national initiative to undertake a natural capital assessment across New Zealand, and local and regional initiatives that aim to account for, and mitigate, the effects of different land practices on water quality or other ecosystem services. Scion's use of core funding to build capability in this area expanded our participation in these national and international initiatives.

In 2014-15 Scion, with additional support from a firm and a regional council, reported on the complementarities between dairy and forestry. This study included all the downstream stages along the supply chain, and quantified the importance of the forestry industry to the regional economy and how it would be affected by current rates of deforestation and the exclusion of forest ecosystem services (e.g. nitrogen and carbon) from policy formulation. The results were presented to the Waikato and Waipa Healthy Rivers/Technical Group for a firm. Scion was also able to provide the underpinning support and data to enable development of a regional input/output model by Market Economics Limited.

Scion has shown that the contribution of ecosystem services (e.g. avoided nitrogen leaching and carbon sequestration) to forestry enhances its profitability and provides an environmentally sound alternative that complements pastoral activities. It helps dairy farmers cope with price uncertainty and production limits under environmental policies (e.g. National Policy Statement for Freshwater Management and Emissions Trading Scheme). In effect dairy and forestry should not be considered simply as alternative land use options. They are highly complementary, collectively reducing economic uncertainty and strengthening environmental outcomes.

Scion's work in ecosystem services is now being actively communicated to policy and industry stakeholders. It is challenging historic paradigms of how forestry and other land use options can work together and informing the debate around triple bottom line reporting of sustainable land use.

Precision forestry

Modern technology, such as using 'big-data' approaches, remote sensing and the use of unmanned aerial vehicles (UAVs), is at last enabling the precision forestry aspiration to be realised. Scion is using core funding to validate many of these tools and identify how they can be applied to develop the next generation of forest management systems.

During the past year we have proven that lower resolution LiDAR data can be used to provide high-quality harvest inventory information for woodlots with savings of about 33% over current practice. This puts technologies historically only available to larger forestry companies, in reach of woodlot owners. With an increasing amount of forest resource in smaller woodlots the benefits are wide reaching.

A range of different remote sensing approaches (e.g. council-acquired aerial photographs, satellite imagery, UAVs, and GoPro cameras) are now being evaluated. Their application with UAVs is now being tested and will be a substantial part of the 2015-16 programme. A validation of the KNN (K Nearest Neighbour) sampling approach using low resolution LiDAR was undertaken on Matakana Island providing very accurate inventory of the forests for the local iwi.

Another opportunity is the application of big data and advanced information systems to traceability. International markets are increasing pressure on manufacturers to verify source and other material qualities of their products. Scion has investigated technologies such as RFIDs (radio-frequency identification) and worked closely with a global tracking company (GS1) to validate the potential to increase traceability and improve efficiency along the supply chain for the forest industry, e.g. removal of many of the duplicated steps such as measurement. Even simple savings, such as elimination of one log measurement, could mean savings of up to $230 million per annum to the industry. This work has enabled approaches to be validated and industry support for a larger industry-led programme to be explored.

The national forestry Permanent Sample Plot database and collection

Scion's Permanent Sample Plot (PSP) system represents New Zealand's most comprehensive database on growth and yield for key plantation species. It represents a very long-term measurement of tree growth, and relating growth to site and genotype. The PSP system underpins many of the national decision support systems used by growers and most of Scion, government and research programmes ranging from tree improvement, growth and yield modelling, silviculture, wood quality, carbon and climate change, and biomass energy.

Although such programmes pay to access data, they do not contribute to the cost of collecting and maintaining the database. However, its value to New Zealand is very substantial. For example, a recent study quantifying realised genetic gain for growth used historical data from research trials established as far back as 1978. The historical investment that has been made in measuring these trials over their lifetime is estimated at $2.7 million. Given the long-term nature of forest growing, and the enormous spread of stakeholders in the industry (over 11,000 growers), it is important to have continuity of data on growth and yield that are applicable to current genotypes and silviculture regimes.

Most research trials span multiple funding cycles, and it is often difficult for new programmes to sustain continuity in managing this critical data. The big goal for the PSP system is to have confidence that trials and growth plots will continue to be monitored over time so they will provide the quantitative data that underpins much of our forest growing research.

A small amount of core funding has been invested to support this nationally important database to ensure ongoing integrity of data collection. Greater promotion of its value has seen one firm provide some direct additional investment to assist this aim. Core funding investment contributed to two important outputs: (1) quantification of realised genetic gain for growth in radiata pine; and (2) benchmarking productivity in radiata pine thereby determining the gap between current productivity, attainable productivity and potential productivity. These have provided forest managers with much needed quantitative information on how genetics and silviculture can increase productivity. Without the historical data held in the PSP system, neither of these two analyses would have been possible. The investment that has been made in collecting data from research trials and growth monitoring plots over time is estimated at more than $9 million. In addition, core funding enabled Scion to automate calculation of the 300 Index and 500 Index, which are two important national measures of forest productivity.

Intermediate Outcome 2 **Increase the profitability of solid wood processing through customer solutions and supply chain innovations**			
Alignment to Statement of Core Purpose Improve the value and productivity of the New Zealand wood products sector	**Alignment to Sector Priorities** WoodCo Strategy WPMA Vision 2050	**Investment as per the SCI 2014-15** $3.4 million	**Investment Actual** $3.4 million

The focus for core funding in wood products and processing is to create underpinning knowledge so that the industry can continue to enhance the performance of products that best fit with the needs of high value (and profit) markets. Aims are: to improve the proportion of each log converted to saleable products, such as through understanding wood quality and the increased use of residues; to provide robust technical information to address any licence to operate issues; to support increasing the diversity of the wood products portfolio that New Zealand can offer; and to sustain capability to support current and evolving industry needs and to trouble shoot industry problems. The key outcomes for 2014-15 are:

Wood and water interaction

Scion's internationally leading platform in understanding the interactions between wood and water at a cellular level has been continued and expanded. In the past year, three manuscripts on the topic have been accepted for publication, with further ones in the pipeline. The work also led to an invitation to participate in two European Union Cooperation in Science and Technology (COST) Actions. An additional focus was on using the knowledge created to develop laboratory-scale drying and product enhancement solutions for typically hard to dry species such as indigenous species and some eucalypt species. The interactions between water and wood impact dimensional stability, which is the most important performance property of wood. This knowledge underpins the value-adding steps of developing new wood products and informs new approaches to wood drying and wood modification.

During the dewatering process, not only water but potentially valuable chemicals are removed from wood. To explore this further and recognise that trees are biofineries (even before leaving the forest), differing tree species and tissues including leaves and bark, as well as sapwood and heartwood, were extracted by supercritical CO_2 and analysed by nuclear magnetic resonance and mass spectroscopies. With recent upgrades in automated sampling systems and electronics and detection limits, Scion's solution state NMR instrument is capable of collecting sample data in a matter of minutes, allowing for the high throughput analysis of hundreds of samples per week. This allows us to rapidly screen extract samples taken from trees to evaluate potential chemical compounds of worth.

High-performance wood products

Scion has continued its work in developing high performance wood products (such as very durable and stable wood) using the novel patented dewatering technique to remove water from wood in combination with new wood modification approaches. Two new modified wood products based on radiata pine have been developed and are now undergoing trial evaluation and further patent protection. Although radiata pine is an excellent all round timber, these modifications will enable production of cost-effective wood products for some of the highest value wood products markets such as outdoor applications.

Extension to drying and stabilising other wood species (see also below)

Many of the highest value international markets are demanding naturally durable wood such as some eucalypt species. The challenge with such high-value timbers, including many of New Zealand's indigenous species, is drying them in a way that provides high timber recovery and enhances wood material properties like stability. Scion used the knowledge developed through this wood-water platform, supported by core funding, to develop an understanding of changes in water-wood fibre and the stress/strain relationships within the wood. This is providing valuable insights in developing a drying system for these very hard to dry species and helped develop a new 'along the value chain' industry partnership focussing on eucalypts, Douglas-fir and cypresses.

This potential drying solution is applicable also to some indigenous species such as tōtara and beech; and is part of a programme with MPI, Northland Inc, Tanes Tree Trust and iwi in developing greater economic returns from plantation tōtara.

Wood preservation treatment options

Scion is continuing to develop options to address an important market issue, e.g. wood treatment options that avoid the use of highly toxic chemicals such as copper-chrome-arsenic (CCA) formulations. Radiata pine, New Zealand's dominant commercial species, is non-durable, substantially restricting its applications in the market place such as in any application exposed to the outside environment. Scion has developed a bio-based chemical option, able to be delivered into the wood in water emulsions. Initial evaluation suggests this will meet the challenging demand for above-ground applications. During the year, further scale up trials were completed, and six long-term durability trials are underway in New Zealand and Hawaii. Data from this work are critical to providing certainty over product performance.

New wood product value chains from non-radiata pine exotic species

Douglas-fir, eucalypts and cypresses collectively represent about 10% of the New Zealand commercial forest plantation. They are better suited to some sites than radiata pine and provide special material properties such as stiffness and natural durability, which are highly sought after in some national and international markets. The stakeholder group for these species is typically smaller commercial companies or farm foresters seeking to exploit niche markets and/or address special site needs such as riparian planting.

Scion has aligned core funding to the Forest Growers Levy Trust to provide support to forest growers and individuals involved in forestry, such as farm foresters, to ensure a continuing and improving supply of plant material. This year the major thrust has been phenotyping *Eucalyptus nitens* to inform production of the next

generation of plant material, and providing a branching and density model for Douglas-fir to include in Forecaster (the industry standard decision support tool) for better prediction of future yields.

The major outcome for this year was to support industry in building a substantial programme across the value chain focusing on developing high-value products for these three species. Although the underpinning work was initiated in July 2014, it was not until July 2015 that the programme was officially launched with a total commitment from industry and MBIE of $1.4 million per annum over seven years. The target for this programme is to see new exports of high-value products of at least $300 million per annum by 2030 underpinned by expanded forest planting of these species.

New wood product species - indigenous forests and wood products

Indigenous forests have the potential to provide multiple values to New Zealand. Although mostly associated with conservation estates, the volume in small planted woodlots is also extensive although their exploitation for economic value is very small. Scion, in conjunction with MPI, Northland Inc. and Tane's Tree Trust, has shown that tōtara in Northland could generate over $100 million of economic outcomes in that region alone. Such use of indigenous woods complements its contribution to the environment and to social and cultural outcomes. Commercial use will increase the resilience of the species, thus ensuring it is a part of the New Zealand landscape for many generations to come.

Scion's core funding has supported a genetics and breeding programme for several indigenous species, e.g. the development of tissue culture protocols for kauri. These techniques have been fundamental in the co-development of an *in vitro* root screening platform that seeks to screen kauri for resistance to kauri dieback. This underpins a larger national programme (Healthy Trees, Healthy Future) with several agencies, including iwi from Te Tai Tokerau, seeking solutions for kauri dieback.

The core funding in this area has enabled co-development of propagation techniques of a range of indigenous plants now being commercialised with an industry partner.

A significant aspect of the establishment of new resources of indigenous species is the cost, ease and success of planting stock. This programme established a comparison of nursery containers against bare-rooted seedlings for kauri, tōtara, manuka, and one *Pittosporum* species. The results indicate that seedlings better suited to 'industrial scale' propagation and establishment can be grown in shorter time frames and with fewer resources.

The growth and yield model for kauri was published indicating a greater production potential than originally estimated or envisaged.

The hosting of an intern from New Caledonia, now employed by SudForet, has opened the opportunity for international collaboration around the development of an Oceania *Agathis* forestry opportunity.

Role of wood in new buildings

Buildings remain one of the biggest markets for wood products in New Zealand and internationally. It is of national importance that we expand the role that wood can play in modern buildings due to environmental credentials and demonstrated excellent performance in earthquake situations. However, there are increasing demands on how the components and materials in buildings perform such as acoustic and energy performance, durability of the materials, and ease and resilience of construction and construction techniques.

This part of the programme has focused on supporting industry in ensuring wood is accurately described in terms of its performance, 'green' credentials and the development of building components and systems to enhance the value of wood in construction nationally.

The outcomes of this project in 2014-15 are:

Developing Urban Equilibrium - a strategy to address climate change by using timber-based building materials and components that contribute to sequester and store carbon, and reduce greenhouse gas (GHG) emissions. The strategy aims to maintain a balance between humanity and the natural environment, which in New Zealand is reflected in the traditional Māori kaitiakitanga principles of stewardship. Scion was engaged by an industry partner to develop the concept of urban equilibrium, evaluating the contribution of 'massive timber construction' technologies to balance urban carbon emissions. Urban Equilibrium presents a strategy to assist GHG mitigation while meeting a city's future growth need. When this was applied to Auckland's forecasted urban growth, the target of reducing Auckland's carbon emissions by 40% could be achieved 25% faster than planned.

Value chain optimisation

The forest industry operates across a value chain that includes such components as growing, haulage, processing, shipping, marketing and ending with the final customer. Less tangible activities include managing risk, international financial transactions and biosecurity impacts, addressing market trends and so on. Value chains are a complex series of highly inter-related activities.

Optimising the complex forest industry value chain will reduce costs (e.g. more efficient shipping, products getting to sub-optimal markets). More importantly, it can play a major role in increasing value capture to improve forecasting of prices and markets and address the New Zealand forest industry's biggest challenge, which is to increase confidence to invest at each part of the value chain. Such investment will increase the amount of the forest cut that is processed within New Zealand and help to maximise production of high margin products. Value chain applications in other industries have shown substantial gains, e.g. auto manufacturing industry and textile industries, but there has been little application in the forest industry particularly at a pan sector level.

To build collaboration and strengthen capability, Scion is now supporting one Master's student at Massey University, and a new project was initiated with Lincoln University into supply chain integrity.

Two international experts in value chain optimisation were recruited in the 2014-15 year, and a log price market outlook tool was developed that is now being used by industry. Workshops with 40 industry attendees enabled industry to more fully participate with Scion on identifying opportunities in forest logistics, mill supply dynamics and port operations where productivity enhancements can be made.

The Woodscape tool, developed with assistance of core funding, enables companies to identify options and intervention points that, if overcome, will increase confidence for companies to invest in new wood processing options in New Zealand. This tool continues to be used by industry to assist in strategic planning.

Intermediate Outcome 3

Expand opportunities in the wood fibre, pulp, biopolymer, packaging and biochemical industries

Alignment to Statement of Core Purpose	Alignment to Sector Priorities	Investment as per the SCI 2014-15	Investment Actual
Improve the value and productivity of the New Zealand wood products sector and bio-material industries	WoodCo Strategy, WPMA Vision 2050, Packaging Council strategy, packaging industry, polymer, pulp and paper and biobased/renewable chemicals	$4.5 million	$4.5 million

High-value products from low-value biological industries' processing streams

Scion continued to invest in its programme in converting low-value biopolymer rich streams into valuable plastics/polymers (bioplastics).Taking low-value biological materials from, for example, waste streams from biological processing industries and developing these into higher value products creates multiple beneficial outcomes for New Zealand. Firstly it increases the intrinsic value of the by-products of current primary processing operations, secondly it creates new high-value biomaterials and bioproducts manufacturing industries for a large and growing international market and thirdly it provides biomaterials and bioproducts that add value to New Zealand's other export industries such as high-value food.

Scion's focus is on de-risking new technologies and creating bioproducts from New Zealand forest-produced materials through development of prototypes and pilot plant scale processing, expanding options for manufacturing and new exports. Scion also explores fundamental problems to be overcome in bringing these materials to market. An important part of the programme is interaction with industry and the ultimate end users.

A key recognition of Scion's role in developing bioproducts from trees was seen in the contracting of Scion by MBIE to explore establishing closer relationships with German research organisations, and in targeting of collaborative

research by VTT (Finland) and VITO (Belgium). In addition, core funding supported staff in building collaborations relating to packaging, biorefineries, nanotechnology and 3D printing.

In 2014-15, Scion successfully ran a pilot scale fermentation process producing polyhydroxy alkanoate (PHA) directly from pine woody residues. This enables application development of the PHAs using whole cell biomass without the need for purification. An important outcome was the establishment of a reliable source of fermentation-derived polymers to support evaluation of the materials and product applications using pine sugars. This programme complements other programmes at Scion focused on utilisation and product development of bio-derived polymers. This includes proof-of concept production of thermo-formable composites using the biomass that incorporates the PHA, and successful evaluation of these products in some applications and verifying their recyclability

Scion and NZBio jointly held an inaugural symposium on industrial biotechnology that brought together research and industry interested in building industrial biotechnology options for New Zealand manufacture and export using biobased building blocks.

The new biodegradation facility developed through the core funded programme is a world class facility. It has played an important role for Scion to develop international relationships such as with Open-Bio and KBBPPS (Knowledge Based Bio-based Products' Pre-Standardization). This enables Scion to leverage knowledge from these larger programmes for New Zealand benefit. Having access to the knowledge and the networks developed in the Open-Bio project is important to understand and overcome standardisation related market barriers for New Zealand companies now working with us (see also IO6).

Converting 'wastes' into high-value products

Hemicellulose fragments are part of the pulp and paper by-product streams. This project is developing an invention to remove fibre fragments from liquid waste streams and thus produce a very high fibre rich solution that is then able to be used to develop a range of products from composites to chemicals. Alternatively some hemicelluloses may be deliberately removed, leaving a fibre that may perform better in particular applications. Scion is also developing a means to remove resins from pulp and paper waste streams that can be used as a precursor for a range of new chemicals.

Further work has been undertaken in evaluating removing copper-chrome-arsenic (CCA) from woodchips. CCA contaminated waste is a major disposal issue for New Zealand. The current project is indicating that a very high level of CCA can be removed from such contaminated waste proving better options to use both materials. This will be piloted with an industry partner in 2015-16.

Scion's break-through technology to deconstruct the organic component of waste streams (TERAX™) is a continuing focus. Core funding has been used to broaden the application of the platform technology, specifically the application to the organic fraction of municipal organic wastes with some initial work showing promise. The ability to reduce landfill by conversion of the organic component into high-value products is potentially a very large economic and environmental opportunity for New Zealand.

Enhancing the resilience of fibre processing industries and fibre composites manufacturing

This part of Scion's core funding has been used to develop high-value new generation biocomposites. Globally a hunt is on for options to lightweight materials such as glass fibre, while maintaining performance and also benefitting at end of life. Scion has developed a world leading approach to integrating polymers and wood-fibre to produce a high performing product able to be developed into complex three dimensional shapes with an excellent sustainability foot print and yet able to be processed in standard industrial manufacturing equipment. This is licensed for manufacture in several countries. During 2014-15 Scion continued to develop the functionality of this product platform with an emphasis on property enhancement such as impact resistance. Scion has also continued to develop new ways of manufacturing the composites to enhance formability and processing speed. This new generation of composites can directly replace many plastics in high-volume applications that require light weighting such as car interiors, or high-value applications such as bespoke furniture providing enhanced overall product performance and meeting the increasing needs of markets where a positive sustainability profile is essential.

High-value products from lignin

Lignin, representing about a quarter of the composition of wood, is currently seen as a low-value product arising from wood processing and is burnt for its energy content. Intrinsically it has the potential to directly substitute for petrochemicals. The challenge is to be able to isolate lignin in a useful form and overcome processing challenges

typically associated with the high level of variability of materials arising from plant sources. Applications include lignin fibres that can be converted to carbon fibres, or used in polymer blends, for moulded or extruded products and in developing industrial resins for applications ranging from coatings to adhesives. Overcoming processing challenges could lead to high-value industries in New Zealand turning our forests into feedstocks for biorefineries. During the 2014-15 year, Scion continued to explore product options and ways to overcome these processing challenges:

We developed a lignin nanofibre / carbon nanofibre platform for producing carbon fibre mats from industrial lignin. Firms are now engaged and commercial evaluation is being undertaken. Initial applications are with battery electrodes and in conductive mats.

New aromatic polyesters are being developed by using synthetic biology to re-engineer new production strains for modifying lignin. This approach creates lignin-derived aromatic monomers and oligomers which become the base for new high performance engineered plastics produced through biotechnology. Scion's work in developing epoxy resins, through utilisation of lignin derivatives formed by hydrogenolysis, is now the basis of an international collaboration with VITO to develop new opportunities to produce lignin oligomers. One application has demonstrated that addition of lignin derivatives to epoxies results in more flexible epoxy resins. Other products are being explored that could replace oil-based chemicals in multiple industrial applications.

A field trial is underway to test to proof-of-concept that GM trees with modified lignin can reliably perform under industry relevant conditions. The trial will allow us to determine whether the expected improvement in pulping efficiencies (and hence costs and the generation of new biochemicals) can be achieved in the field in older plants.

Packaging

Packaging plays an important role in New Zealand's export industry. It enables more efficient manufacturing, contains the product, protects products throughout the supply chain and is used as a communication tool to distributors and consumers. This means it is important for Scion to build capability to support the development of new packaging technologies and to build industry platforms aligned to the growth of export markets.

Wood fibres and plastics are an important source of materials for many packaging applications with the advantage of meeting international market requirements for low environmental impact branding. However, their functionality does not always meet those of packaging solutions made from non-renewables such as oil-based products. For example, corrugated boxes are sensitive to moisture, and PLA (polylactic acid) does not have the same gas barrier properties as PET (polyethylene terephthalate).

In the past year, Scion continued to use core funding to develop new technologies that can increase shelf life, improve the mechanical properties of packaging to protect products along the supply chain and improve the efficiency of both packaging manufacturing and use of packaging. This work provides New Zealand centric solutions that give firms a competitive advantage in materials, product support and new intellectual property.

The packaging core funding investment in 2014-15 delivered the following outcomes:

A bio-based coating shows superior performance in acting as a gas and water barrier. This coating is being evaluated for international protection. Evaluation trials with a firm using a corrugated paper printing press were successful. The coating passed its first evaluation and is now ready for further assessments.

A major programme is now underway to address box creep under load, an important generic industry issue. This will help New Zealand manufacturers develop solutions to this packaging challenge. Scion's specially designed cool room (built in 2013-14 to accurately control temperature and cycle humidity) is used in this work. The cool room is the only facility of its kind in New Zealand, and one of very few globally, providing truly independent test evaluation capability for New Zealand firms. The creation of this facility was strongly encouraged by end-users.

Scion has been undertaking industry-wide consultation in packaging and, as a result, industry investment in packaging is growing as firms seek to leverage off the capabilities being developed at Scion and its R & D partners.

Intermediate Outcome 4 Increase New Zealand's energy security through the use of forest biomass, clean technologies and industrial symbiosis			
Alignment to Statement of Core Purpose Increase renewable energy production and energy security by growing New Zealand's ability to produce sustainable bioenergy and liquid biofuel products	**Alignment to Sector Priorities** New Zealand Bio-energy Strategy WoodCo strategy WPMA Vision 2050.	**Investment as per the SCI 2014-15** $3.5 million	**Investment Actual** $3.5 million

Energy, its cost, availability and, increasingly, source (renewable or non-renewable) is of critical importance to any economy. Part of Scion's Core Purpose is to '*increase renewable energy production and energy security by growing New Zealand's ability to produce sustainable bioenergy and liquid biofuel products*'.

The forest industry currently produces about 10% of New Zealand's total energy supply. Expansion of production, increased efficiency and material utilisation (including maximum use of a tree through biorefining approaches) creates substantial direct economic advantage to forest-based industries, and also seeds new manufacturing firms creating benefit to New Zealand. This will increase New Zealand's ability to use renewable energy directly and support the Government's aim to reduce greenhouse gas emissions and reduce sovereign risk through New Zealand's exposure to imported energy sources.

Scion's core funding in bioenergy in 2014-15 focused on providing the underpinning technologies necessary to support the above and leverage international research capability for direct New Zealand benefit.

Scion continued to contribute to several workshops and exchanges (Bioenergy Association of New Zealand, Advanced Biofuels Research Network, IEA (International Energy Association) Bioenergy, IRENA (International Renewable Energy Agency)/United Nations Economic and Social Commission for Asia and the Pacific, MBIE German exchange) to maintain national and international connections and to support national fora in bioenergy and related fields. We supported a senior staff member to participate in an expert advisory role for the Royal Society in Climate Change Mitigation and as a board member on BANZ. Scion participated in a United Nations Asia-Pacific forum on biomass availability for bioenergy and is helping to develop the next phase of the IEA Bioenergy programme.

New and strengthened international collaborations were established within the programme. These included INRA (French National Institute for Agricultural Research), Korea Institute of Energy Research and Curtin University in Australia. By leveraging off much larger international programmes, Scion has been able to secure access to state of the art knowledge in important areas such as pyrolysis and hydrogen upgrading.

Scion's capabilities in bioenergy supported four industry partners to develop their bioenergy strategies and new firms. National linkages with New Zealand universities were also strengthened, particularly via jointly-supervised students with Canterbury, Otago and Waikato Universities.

The programme work has led to several firms and an iwi investing in a new programme in industrial symbiosis that started in 2015.

Bioenergy research directly links to our work in developing high-value chemicals from woody biomass. This is part of validating biorefining in New Zealand with the ability to produce high-value products from our forest resources, strengthen existing manufacturing processes and develop new firms. To that end, Scion is developing cost-effective pre-treatment approaches to convert cellulose/hemi-cellulose components into sugar precursors and also capture lignin as a valuable co-product. The focus is to de-risk this technology.

Scion has developed a fast pyrolysis unit and established a fluidised bed micro-reactor. We are planning to develop hydrogen upgrading equipment to validate thermochemical means to develop drop-in fuels for end-users, such as Air New Zealand, Z-Energy and KiwiRail (shipping), who want to reduce their carbon footprint.

We initiated a programme to develop a New Zealand biofuels roadmap. Input was secured from many stakeholders for this, including Energy Efficiency and Conservation Authority, Ministry of Transport, MBIE, Air New Zealand, Carter Holt Harvey and others.

Intermediate Outcome 5

Protect and enhance market access and improve risk management in the forest industry including for forest health and preparedness for biosecurity incursions, fire and climate change

Alignment to Statement of Core Purpose	Alignment to Sector Priorities	Investment as per the SCI 2014-15	Investment Actual
Protect and enhance market access and improve risk management in the forestry industry and enhance New Zealand's opportunity to benefit from forestry based ecosystem services to improve global market position of the industry and the environmental sustainability of forestry production in New Zealand	New Zealand Forest Owners Association, Ministry for Primary Industries	$2.8 million	$2.8 million

Biosecurity

Protecting our forests from biosecurity incursions and fire, sustaining the health of our forests and ensuring phytosanitary related matters do not impact on our export trade are priority areas for the forest industry. Scion's core funding in this area sustains capability of national importance, enables development of leading tools and new capabilities, ensures international linkages are sustained and supports future planning. In all these activities, Scion and the forestry industry are strongly connected with substantial industry and government (Ministry for Primary Industries (MPI), Department of Conservation and regional and other authorities) co-funding. Key outcomes for 2014-15 included:

Prevention of new pests

Surveillance of the pathways pests use to enter New Zealand is critical to develop strategies and interventions to minimise pest incursion. Earliest detection, increased probability of eradication, reducing cost without increasing risk to enable greater coverage and increased confidence are critical drivers for New Zealand's pest border security approach. Scion reviewed the costs for all 1,911 area units (e.g. vessels, cargo, container, passenger arrivals, used vehicles,) for input into a forest biosecurity surveillance optimisation model. Using Bayesian Intelligence models Scion developed a risk map for the New Zealand Forest Owners Association (FOA). Further development of this is in hand, with focus on implementation of a new surveillance system. This new system will involve integrating the FOA and MPI surveillance systems into one and addressing some of the operational issues that will arise, i.e. resource allocation, funding, and publicity, continuing the focus to maximise effectiveness of our pest interception approaches.

Scion is providing input into development of a new standard for phytosanitary measures for sea containers that will be considered at a special International Plant Protection Convention Commission on Phytosanitary Measures session to be held in Rome in 2016. For MPI, this will allow reallocation of inspection effort from wood packaging to other pathways that are higher risk thereby increasing the probability of intercepting a damaging new pest before it establishes.

Management of existing diseases and threats

Elimination of red needle cast disease (*Phytophthora pluvialis)* on trees is an important national and industry priority. Phosphite in the form of Agri-fos 600 is being tested to control this disease. There was concern that it was interfering with adjuvants and that was affecting uptake into the plant thereby affecting efficacy. Scion confirmed that high rates of Agri-fos 600 (>6 kg/ha) rapidly caused degradation of all adjuvants tested. Evaluation of an alternative phosphite, Foschek, used at higher rates (up to 24 kg/ha) has been successfully applied without adjuvant degradation occurring. An aerial spray trial will now be undertaken in 2016, bringing New Zealand one step closer to a chemical control for red needle cast. Copper is also showing promise as an alternative chemical control agent and will be tested in the field trial. Preliminary studies looking at chemotaxis (chemical stimuli that could attract or repel *Phytophthora* zoospores) also showed promise as another method to reduce impact of *Phytophthora* in both natural ecosystems and plantations.

Scion has evaluated 460 radiata pine genotypes for susceptibility to red needle cast with some showing resistance. The genotypes are aligned with breeding populations so industry can readily deploy this material on disease prone sites once it is produced in commercial quantity. An effector-delivery system for determining effector function to screen pines for resistance to pathogens was developed as part of a Scion-supported PhD study. This led to *Phytophthora*-based functional genomics projects for *P. pluvialis*.

Kauri dieback (*Phytophthora agathadicida*) remains a substantial threat to one of New Zealand's most iconic species. In conjunction with MPI and with several collaborators, we compiled a conceptual plan of research to develop a decision support tool to aid in the management of kauri dieback to achieve the following outcomes: (1) predicting likely spread of *P. agathadicida* and where it might establish, (2) optimising allocation of resources to areas most at risk to new infestation, and (3) identifying management interventions that are most likely to maintain area of freedom. These three objectives will be delivered in a robust, consistent and defensible manner. In July 2015, the plan was submitted to the kauri dieback programme for consideration.

Aerial spraying is an important way to apply control media for a range of needs. Spray models are critical tools to ensure that spray drift is minimised. The AGDISP™ Spray Model is the model most employed for aerial spraying of forests. However, there is concern that the roughness of the forest canopy is creating turbulence and may be responsible for the AGDISP™ not accurately predicting aerosol spray drift. To validate this Scion undertook a large field trial using the University of South Carolina's backscatter LiDAR to measure the aerosol droplet cloud drift over a pine plantation. The data collected will result in a modification of the AGDISP™ model and an improvement of its prediction of drift. Damage caused by spray drift will be minimised while at the same time spray operations will be optimised. The work is also being published and is enhancing Scion's international reputation in this important area.

Market protection

The continued use of terbuthylazine and hexazinone for weed control on Forest Stewardship Council (FSC) certified land is important for the New Zealand forestry industry and to secure their licence to operate within FSC accreditation criteria. FSC certified produce commands a premium in some markets. Scion has demonstrated and reported that this chemical has little to no impact to soil and water quality in Pumice soil. This work was key to supporting continued use of terbuthylazine and hexazinone on FSC certified land and possibly supported their removal from the list of FSC prohibited herbicides. Auckland Council developed best operational practice standards for use of terbuthylazine and hexazinone in the Auckland Council drinking water supply catchments negating adverse publicity from some ratepayers.

A prototype landscape model of forest insect abundance was developed and presented to the industry group focusing on reducing the use of methyl bromide as a fumigation chemical (STIMBR) and MPI. A national network of forest insect traps collected over 700,000 insects within forests and at key export ports over two and a half years. The basic concept of not treating export produce over times when insects are not abundant was accepted, however, more data are needed. A new online data visualisation tool makes abundance data available in a secure format to stakeholders. Data from the trapping network led to an extension of the post fumigant exposure period at Northport to 21 days in winter, bringing consistency to post fumigation log handling procedures throughout New Zealand, reducing logistical problems and saving cost at the port. A phytosanitary treatment-free winter period will save the forest produce export sector direct costs and reduce methyl bromide use.

Fire protection

Loss from fire and the increasing risk of fire in New Zealand forests and rural landscape is a serious issue for New Zealand and this is expected to increase as temperatures rise and weather becomes more variable owing to climate

change. Scion has developed New Zealand-specific algorithms for determining the seasonal die-off of grasslands from satellite imagery to improve the national Fire Weather System. The methodology developed by Scion's Rural Fire Research Team for identifying wildfire prone areas was accepted by the Fire Service Commission. The NZ Fire Service used this to produce a GIS application for mapping the rural-urban fire interface, and this application is being rolled out to rural fire authorities for validation and uptake. Fire models developed by the Scion team were used in wildfires management in Blenheim and elsewhere to predict fire movement. This allowed fire managers to deploy resources to where they were most needed. The result was saved property (and potentially life), faster control of the wildfire and cost savings.

Herbarium

Core funding has enabled the maintenance and growth of the National Forest Herbarium, a nationally significant database and collection under Scion's stewardship. During 2014-15, the herbarium fielded 326 requests for plant identification. The herbarium continues to acquire new specimens from various sources, including specimens sent for identification, particularly from biosecurity surveys of sites considered at high risk of incursions, and research reference specimens. Targeted collecting each year is focusing on cultivated trees. New distribution records for existing collections were also undertaken. A total of 794 specimens were added to the collection during the year.

The internet remains an important means of popularising/mainstreaming the herbarium's activities. The acquisition of a HerbScan frame, high resolution scanner and photographic equipment has enabled Scion to image and place online, specimens in the collection. All new accessions are imaged. Scion's aim is to have the entire collection imaged within five years. During the year, 1200 specimens were imaged.

Scion has supported the Ministry for Primary Industries (MPI) by developing an approach upon which MPI and collaborators can develop techniques to determine honey floral types through chemical fingerprinting. The DNA and pollen samples provide an additional source of material for developing molecular or palynological techniques for identifying honey floral types.

Intermediate Outcome 6

Ensure the forest industry's licence to operate (and reputation) through workers' safety and capabilities, verifiable environmental performance, product traceability and modern standards; and, by anticipating long-term change

Alignment to Statement of Core Purpose	Alignment to Sector Priorities	Investment as per the SCI 2014-15	Investment Actual
Protect and enhance market access and improve risk management in the forestry industry	New Zealand Forest Owners Association, Ministry for Primary Industries	$0.2 million	$0.2 million

Safety in forestry harvesting

Continuing to improve safety in the forestry industry is an important industry-wide issue. Scion has invested core funding to underpin the industry's priorities in safe work practices. This is important for two reasons: to ensure worker safety and more broadly, to enhance the industry's licence to operate.

An important part of this core funding investment is to work with industry and support its evolving safety and human factors strategies. Scion has recruited new capability in human factors science. In addition to this wider plan, a major review on "Human Factors in Forestry and Allied Industries" is currently underway and is scheduled to be completed in December 2015; substantial stakeholder engagement has been undertaken; and linkages to national programmes in fire research, robotics and health and safety have been established. These collectively help inform the industry plan and ensure excellent alignment between Scion's activities and the industry plan. Importantly, an introductory meeting and relationship has already been established with the Forest Industry Safety Council National Director.

Scion has completed fieldwork and analysis in a project measuring the exposure of chainsaw operators to carbon monoxide (CO) during motor manual operations. The outcomes showed a broad variation in CO output in chainsaws of a similar age. CO concentration around the chainsaw user was also affected by wind speed and undergrowth

density. During the study, it was discovered that New Zealand standards allow for considerably higher CO concentrations than the World Health Organisation. Advice from ESR was sought for the most applicable exposure standards for forest workers, and a report is in preparation.

Supporting tāonga species

Scion also invested a small amount of core funding to regenerate white ngutukaka, an endangered and important tāonga species. The material Scion propagated was planted in secure locations in New Zealand. This work utilised Scion's leading-edge expertise in nursery propagation.

Informing the GM debate

Scion has input into the national debate on New Zealand policy on genetic modification technologies by presenting to industry and policymakers an authoritative robust scientific perspective on alternative biotechnologies through workshops and seminar presentations. Scion also contributed to judicial hearings in the local government sector and the national and regional debate on biotechnology.

Standards for wood products, packaging and new biobased products

Scion has continued to provide independently sourced data for industry that enables review and updating of many of the New Zealand and Australasian standards that incorporate the use of wood to ensure their ongoing ease of use and relevance to modern timber use, design and safety.

Scion has built a relationship with international food contact testing agencies to enable development of new packaging technologies and their uptake, and established a food contact testing facility on site. In addition Scion has been part of the Knowledge Based Bio-based Products' Pre-Standardization (KBBPPS) External Advisory group guiding establishment of new bioproduct standards and their tests. In the past year, under a new programme (Open-Bio), Scion together with GNS provided feedback on newly designed bioproduct standards protocols used for identification of carbon source used in bioproducts.

CORPORATE GOVERNANCE

Scion's Board of Directors is appointed by its shareholding Ministers, the Minister of Science and Innovation and the Minister of Finance. All members of the Board are independent. The responsibility of the Board is to guide and monitor the business of Scion and its subsidiaries including:

- reviewing and approving Scion's strategy and Statement of Corporate Intent;
- adopting policies of corporate conduct (including risk management and delegations of authority) and ensuring that systems and procedures are in place to carry out those policies;
- adopting annual operating and capital plans, and budgets;
- monitoring performance against key objectives and budgets on a monthly basis;
- ensuring Scion proactively meets all health and safety requirements;
- evaluating the performance of the Chief Executive; and
- reviewing and improving the effectiveness of the Board.

The Board operates in accordance with Scion's Constitution. It has up to seven directors who meet 11 times over the year either in person or by video conference. The Chief Executive and Chief Financial Officer (who is also the Company Secretary) attend all meetings. The Board may retain independent advisers, including independent legal counsel or other experts, as it deems appropriate. The Strategic Advisory Industry and Science Panels, established in 2011 as part of the CRI Taskforce reforms, assess one or two of Scion's Intermediate Outcomes (IOs) each year and, respectively, report to the Board on the relevance, quality and impact of the science undertaken within these. The Board's Strategic Advisory Māori Panel (Ngā Rangatira Rōpu) provides input to Scion's Te Papa Tipu (Māori) plan and its effective implementation.

The Board has two standing committees, the Audit and Risk Committee and the Remuneration and Organisation Committee. These meet twice yearly but may meet more regularly if the need arises.

The function of the Audit and Risk Committee is to assist the Board in discharging its responsibilities regarding financial reporting, regulatory conformance and matters of risk management. The committee is the liaison point for internal and external auditors, assesses the performance of financial management (the investment cases for major items of capital expenditure), reviews audit findings, the annual financial statements and interim financial information, and has oversight of the development and review of policies to ensure compliance with statutory responsibilities.

The function of the Remuneration and Organisation Committee is to assist the Board in the establishment and regular review of remuneration and organisation policies and practices, and to assist the Board in discharging its responsibilities relating to the appointment, remuneration setting and review of Scion's Chief Executive. The committee also approves the appointment and remuneration of senior executives and inputs into and monitors achievement of the annual Health and Safety Plan.

Each committee is composed of no less than three members of the Board, appointed by the Board from time to time; and meets at least twice annually and intersessionally as required. While the Chair of the Board is an ex-officio member of each committee and has full voting rights, s/he may not be Chair of the Audit and Risk Committee.

All Directors are entitled to attend all committee meetings. Each committee establishes annual work plans and undertakes an annual review of its objectives and responsibilities, and its terms of reference. Each committee also makes regular reports to the Board.

The Board's risk management policy and procedures involve formal reporting by management of the most significant risks Scion is exposed to, and the Board regularly monitors management of those risks. There is also regular monitoring and reporting on progress in meeting recommendations made by external auditors.

DIRECTORS' REPORT

Principal Activities

New Zealand Forest Research Institute Limited (trading as Scion) is a company registered under the Companies Act 1993. Our principal activity is to conduct research in accordance with the purpose and principles specified in Sections 4 and 5 of the Crown Research Institutes Act 1992 (the Act). Scion has met all the obligations under the Act for the year ended 30 June 2015.

Scion is a commercially focused science and technology company, delivering solutions to both commercial and Crown clients. While the principal research facility is located in Rotorua our co-location with the School of Forestry at the University of Canterbury provides access to complementary capabilities on the campus and postgraduate students.

Scion has two wholly-owned subsidiaries (Te Papa Tipu Properties Limited and Forest Research Holdings Limited), is a 50% shareholder in Terax 2013 Limited and is a 50% partner in Terax Limited Partnership, and has a 33% shareholding in an associate company Biopolymer Network Limited. Scion is a member of the research consortium WQI Limited with a 5.05% shareholding.

- Te Papa Tipu Properties Limited owns the Group's land assets.
- Forest Research Holdings Limited is a non-operating shelf company.
- Terax 2013 Limited is the general partner for Terax Limited Partnership.
- Terax Limited Partnership is a limited partnership jointly owned by Scion and Rotorua District Council and has been set up to commercialise a waste minimisation process.
- Biopolymer Network Limited is an incorporated joint venture whose purpose is to create technologies for advancing the utilisation of renewable bio-based materials in industrial applications.
- WQI Limited is a consortium that carries out research focused on wood quality, appearance and stability that can affect the performance of the wood, and to develop effective segregation methods and technologies that allow the industry to gain maximum value from their timber resource.

Summary of Group Financial Results to 30 June 2015

	2015 $000	2014 $000
Operating revenue	47,340	48,137
Surplus before taxation	3,370	3,874
Taxation expense	940	978
Net surplus attributable to the shareholders	**2,430**	**2,896**
Equity		
Issued and paid up capital	17,516	17,516
Retained earnings	16,971	14,541
Reserve	61	61
Total equity	**34,548**	**32,118**

Scion's strategy focuses on delivering science and technologies in the following key areas:

- Commercial forestry
- Wood products and processing
- Wood fibre, biopolymer and biochemical industries
- Risk and adaptation
- Licence to operate
- Bioenergy and energy security though forest biomass.

The Statement of Corporate Intent maps out the strategic framework for Scion to achieve outcomes aligned to its Statement of Core Purpose, and the New Zealand Government's overarching objective for Crown Research Institutes to lead the country's economic growth with improved environmental, social and cultural outcomes; in particular increase export earnings to the equivalent of 40% of GDP by 2025.

Scion's science and commercial focus is strongly aligned with the opportunities being presented locally, nationally and globally, and when brought together, will continue to enable Scion to provide leadership on issues of local, national and global significance.

Remuneration and Compensation

Remuneration and compensation included performance awards, superannuation benefits, and KiwiSaver subsidy. Some other benefits were not quantified and are therefore excluded, including staff parking, home telephone, and membership of relevant professional societies.

Bands	Number in Each Band
$470,000 – $479,999	1
$250,000 – $259,999	2
$240,000 – $249,999	1
$220,000 – $229,999	1
$210,000 – $219,999	1
$170,000 – $179,999	1
$160,000 – $169,999	1
$150,000 – $159,999	1
$140,000 – $149,999	3
$130,000 – $139,999	3
$120,000 – $129,999	8
$110,000 – $119,999	7
$100,000 – $109,999	14

During the year ended 30 June 2015, $195,901 was paid to 8 employees in relation to cessation of employment with Scion (2014: $843,998 to 20 employees). Cessation payments included $87,761 of retirement benefits (2014: $258,550).

Dividend

No dividend was recommended for the year ended 30 June 2015 (2014: $0k).

Director Profiles

Mr Anthony (Tony) Nowell CNZM (Chair) is a professional company Director and Founding Director of Valadenz Limited, a trade and export development company. Previously he was the CEO of Zespri International, and positions he held before then included Managing Director of Griffin's Food Limited and Regional Vice President of Sara Lee Asia. Mr Nowell brings extensive experience in corporate management, governance and international trade and development to the Board. He is currently Chair of Wellington Drive Technologies Limited and a board member of New Zealand Food Innovation Auckland Limited, Food Standards Australia New Zealand and the Export Advisory Board of Business New Zealand. Mr Nowell recently retired as Deputy Chair of Leadership New Zealand and represents New Zealand on the APEC Business Advisory Council (ABAC) and the APEC Policy Partnership for Food Security (PPFS). He has previously chaired the New Zealand Food and Grocery Council, the New Zealand Food and Beverage Taskforce and the New Zealand Packaging Accord Governing Board.

Mrs Judith Stanway (Deputy Chair), a Fellow of the New Zealand Institute of Accountants, is a partner of BDO Rotorua Limited and until recently was the Chair of BDO New Zealand Limited, a New Zealand wide Chartered Accountancy and Business Advisory firm. Mrs Stanway is also a Fellow of the New Zealand Institute of Directors and a Director of Wharerata Forest Limited, Te Papa Tipu Properties Limited and a number of private companies. She has also chaired the Lakes District Health Board and been a Director of Te Puia. Mrs Stanway lives in Rotorua, has worked with the forestry sector for many years and has wide experience in tourism and with charitable organisations and was a Director of the Charities Commission. Judith was also chosen as 2012 Rotorua Business Person of the Year.

Ms Elizabeth Chambers (Director) is a Chartered Member of the Institute of Directors (New Zealand) and the founder of Carbon Match, New Zealand's first online trading platform for emissions units acceptable under the New Zealand ETS, primarily serving the energy and forestry sectors. Ms Chambers has a strong interest and practical experience in the development and harnessing of environmental markets, building on her background in finance. Her career to date has included time at PwC, Cameron Partners and Climate Change Capital, a London-based carbon fund. She has advised energy majors, forestry companies and landowners in relation to their carbon market exposure. She holds a Masters in Utilities Regulation from the London School of Economics and Political Science, a Bachelor of Arts in German and a Bachelor of Commerce with first class honours in Finance from Victoria University. Ms Chambers is also a mother to two young daughters.

Mr Sheldon Drummond (Director) has served on the New Zealand Forest Owners Association Executive for three terms. He is the General Manager Forests for Juken New Zealand Limited as well as sister company First Light Mushroom Limited. Mr Drummond has a good appreciation of radiata pine processing and marketing as well as forest management in New Zealand and worldwide. He is instrumental in a number of operational and policy improvements within the New Zealand forest industry especially in the field of health and safety. Mr Drummond is a long standing member of the Eastland Wood Council and maintains a keen participation in local and national forest issues. He has extensive contacts and relationships throughout the industry and government.

Ms Colleen Neville (Waikato-Tainui) (Director) is the Rotorua based Chief Executive Officer of Te Arawa Group Holdings Limited. She is a chartered accountant and has 16 years' experience in a range of financial roles for national and international companies. Ms Neville has governance experience as a Director of Te Arawa Tourism Limited and Te Kakano Whakatipu Limited. She is a former Vice-Chair of Te Reo Irirangi o Te Arawa, former trustee of a large sheep and beef cattle farming trust, and former Director of the Rotorua Public Health Organisation.

Dr Barry O'Neil (Director) is currently Chief Executive of Kiwifruit Vine Health, the organisation leading the response to the bacterial vine disease Psa-V. Dr O'Neil is also a Director of Biosecurity NZ Limited, a company specialising in biosecurity consultancy, and is an independent Director on the Bio-Protection Research Centre based in Lincoln, an independent Director of Horticulture NZ, and is on the governance group of Our Biological Heritage National Science Challenge. He has significant biosecurity and leadership career experience from several years in senior management and leadership roles in government, working in New Zealand and overseas. His experience includes policy and international standard setting and trade negotiations; and operational biosecurity risk-management activities involving the border, surveillance, response and eradication. Dr O'Neil also owns a kiwifruit orchard in Katikati.

Dr Brian Rhoades (Director) is a business adviser and professional director with extensive management and governance experience. Dr Rhoades started his career as a lecturer in mechanical engineering at the University of Canterbury, moved into manufacturing and company management with the AHI/Carter Holt Harvey Group, and is a former Chief Executive of Sealord Products Limited. He has served on the boards of a broad range of listed and unlisted companies and not-for-profit organisations; and is currently Chairman of Ngai Tahu Seafood Limited and World of Wearable Art Limited, Director of the New Zealand Engineering, Manufacturing and Food Processing Industry Training Organisation (Competenz) and principal of Brian L Rhoades and Associates Limited. Dr Rhoades holds BE (Hons) and PhD degrees in Mechanical Engineering and is a Fellow of IPENZ and the Institute of Directors. Dr Rhoades' term concluded on 30 June 2015.

Changes in Directors

Dr Brian Rhoades' term concluded on 30 June 2015.

Directors' Interests

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

Directors' Remuneration

	Scion 30 June 2015	Te Papa Tipu Properties Ltd 30 June 2015	Terax 2013 Ltd 30 June 2015	Total 30 June 2015
Tony Nowell	56,332			56,332
Judith Stanway[1]	37,500	4,000	8,000	49,500
Elizabeth Chambers	28,500			28,500
Sheldon Drummond	28,500			28,500
Colleen Neville	28,500			28,500
Barry O'Neil[2]	30,500			30,500
Brian Rhoades	28,500			28,500
Total	**$238,332**	**$4,000**	**$8,000**	**$250,332**

[1] Chair Audit and Risk Committee

[2] Chair Remuneration and Organisation Committee

Use of Company Information

During the year no notices were received from members of the Board requesting to use Scion information received in their capacity as Directors which would not otherwise have been available to them. Additions to the Interests Register are noted in the profiles above.

The State of the Company's Affairs

A commentary on the year's performance is outlined in the Chair's and Chief Executive's Report and in the opinion of the Directors, the state of the company's affairs continues to be satisfactory and the outlook bright.

Auditor

In accordance with Section 21 of the Crown Research Institutes Act 1992, the Office of the Auditor General is Auditor for the Company and, pursuant to Section 29 of the Public Finance Act 1977, has appointed Ernst & Young to undertake the audit on its behalf.

Directors' Indemnity and Insurance

Scion has insured all Directors and the Directors of its subsidiaries against liabilities to other parties (except to Scion or a related party of Scion) that may arise from their position as Directors. The insurance does not cover liabilities that may arise from criminal actions.

For and on behalf of the Board
Tony Nowell CNZM
Chair

27 August 2015

Statement of Responsibility

The following statement from the Board is made in accordance with Section 155 of the Crown Entities Act 2004:

1. The Board is responsible for the preparation of the annual financial statements and the judgements used in these.

2. The Board is responsible for establishing and maintaining a system of internal control designed to provide reasonable assurance as to the integrity and reliability of the financial reporting.

3. In the opinion of the Board, the annual financial statements for the year ended 30 June 2015 fairly reflect the financial position and operations of the New Zealand Forest Research Institute Limited.

Tony Nowell CNZM
Chair

Judith Stanway
Director

27 August 2015

PERFORMANCE TARGETS

	Actual 2015	Budget 2015	Actual 2014
Efficiency:			
Operating margin	14.8%	12.0%	14.9%
Operating margin per FTE	$24,283	$19,275	$25,171
Risk:			
Quick ratio	1.86:1	1.25:1	1.66:1
Interest coverage	N/A	N/A	N/A
Operating margin volatility	22.6%	12.6%	19.2%
Forecasting risk	1.5%	0.7%	(0.5%)
Growth/Investment:			
Adjusted return on equity	7.4%	5.6%	9.0%
Revenue growth	(2.1%)	2.5%	5.8%
Capital renewal	1.1x	1.5x	1.2x

Formula for the above calculations can be found at:
http://www.msi.govt.nz/get-connected/crown-research-institutes/2015-cri-toolkit/section-3/#performance-targets

NON-FINANCIAL INDICATORS

Scion 2015 Customer Survey

Towards the end of the financial year Scion carried out an in depth interview with several customers to gain a deeper understanding of strengths and issues.

Overall, survey participants appeared to be quite satisfied with Scion's performance and their relationships with Scion. While the methodology was less structured than a quantitative survey, the in-depth conversations provided candid and fulsome feedback and several common themes emerged.

Scion's reputation with all participants was strong. All spoke very highly of Scion staff and their responsiveness, and praised the quality and relevance of work. Participants also were satisfied with the quality of reporting and other client communications, and several commented that there had been a noticeable improvement in project delivery in recent years.

Several participants considered that Scion could provide more application-specific know-how to hardware and equipment manufacturers to accelerate development of new products for the forestry sector. Some feedback on Scion's IP policy indicated outcomes could be more beneficial for all parties if the policy allowed greater flexibility. An interesting observation from one participant was that Scion is a great untapped knowledge resource that could benefit investors with the technical aspects of due diligence. Participants' views on the New Zealand R&D funding system highlighted an opportunity for Scion to facilitate applications for Callaghan Innovation project grants for clients.

There was general satisfaction with the value Scion brings and Scion's rates were considered to be within expectations and comparable with similar organisations.

This informal survey was valuable, and actions are planned to help address the common issues raised.

Non-financial targets

	Indicator name	Measure	Frequency	2014	Target	Actual
CRI generic indicators	End user collaboration	Revenue per FTE ($) from commercial sources	Quarterly	$66k	$62k	$64k
	Research collaboration	Number of peer reviewed publications with collaborators	Quarterly	60	≥80	84
	Technology & knowledge transfer	Commercial (commissioned) reports	Annually	180	>200	286
	Science quality	Impact of scientific publications	Annually	H=46.7 C=6.75	H index 50 Citations 7	H=53.57 C=7.66
	Financial indicator	Revenue per FTE ($)	Quarterly	$154k	$161k	$164k
	Stakeholder engagement	Relevant funding partners and other end users (number and percent) that have a high level of confidence that Scion sets research priorities relative to the forest industry and biomaterials sector National and international research providers (%) who have a high level of confidence in Scion's ability to assemble the most appropriate research team Relevant end-users (%) who have adopted knowledge and/or technology from Scion	Biennial Biennial Biennial	2013 N=50; 77% 85% 94%	MBIE survey n>30; >85% >85% >90%	MBIE survey not conducted Refer to Scion customer survey above
Scion strategic indicators	Māori economic development	Partnerships (number and value) established with Māori entities to support economic development through the forest industry	Quarterly	6, $1.0m	n>5; >$1.0m	11, ~$700k
	Accelerated commercialisation	Technologies in Scion's pipeline (number and co-investment ($)); projects that progress to the business case stage (case studies)	Quarterly	21 $400k 6	25 $600k; Cases ≥4pa	13 $871k 5 cases
	Internationalisation	Joint research and technology development programmes and staff exchanges with Scion's international strategic partner organisations	Six monthly	4 N/A	>5 1	15 3
	People & culture	Staff recruitment and retention (quality and days to fill); leadership development (assessment); good employer (EEO rating); health & safety; and internal staff satisfaction survey (biennial)	Annual & Biennial	Qualitative 43 days 6 0	Qualitative <50 days EEO rating 0 Zero harm	58 days T2F 8.3% turnover Good Employer #1 equal 0 serious harm; 0 LTI 80% engagement score

INDEPENDENT AUDITOR'S REPORT

TO THE READERS OF
NEW ZEALAND FOREST RESEARCH INSTITUTE LIMITED GROUP'S
FINANCIAL STATEMENTS
FOR THE YEAR ENDED 30 JUNE 2015

The Auditor-General is the auditor of New Zealand Forest Research Institute Limited. The Auditor-General has appointed me, Susan Jones, using the staff and resources of EY, to carry out the audit of the financial statements of the group, consisting of New Zealand Forest Research Institute Limited and its subsidiaries (collectively referred to as 'the group'), on her behalf.

Opinion

We have audited the financial statements of the group on pages 32 to 58, that comprise the statement of financial position as at 30 June 2015, 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 2015; and
  - its financial performance and cash flows for the year then ended; and
- comply with generally accepted accounting practice in New Zealand and have been prepared in accordance with New Zealand equivalents to International Financial Reporting Standards and International Financial Reporting Standards.

Our audit was completed on 27 August 2015. This is the date at which our opinion is expressed.

The basis of our opinion is explained below. In addition, we outline the responsibilities of the Board of Directors and our responsibilities, and we explain our independence.

Basis of opinion

We carried out our audit in accordance with the Auditor-General's Auditing Standards, which incorporate the International Standards on Auditing (New Zealand). Those standards require that we comply with ethical requirements and plan and carry out our audit to obtain reasonable assurance about whether the financial statements are free from material misstatement.

Material misstatements are differences or omissions of amounts and disclosures that, in our judgement, are likely to influence readers' overall understanding of the financial statements. If we had found material misstatements that were not corrected, we would have referred to them in our opinion.

An audit involves carrying out procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on our judgement, including our assessment of risks of material misstatement of the financial statements whether due to fraud or error. In making those risk assessments, we consider internal control relevant to the group's preparation of the financial statements that fairly reflect the matters to which they relate. We consider internal control 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.

An audit also involves evaluating:

- the appropriateness of accounting policies used and whether they have been consistently applied;
- the reasonableness of the significant accounting estimates and judgements made by the Board of Directors;
- the adequacy of all disclosures in the financial statements; and
- the overall presentation of the financial statements.

We did not examine every transaction, nor do we guarantee complete accuracy of the financial statements. Also, we did not evaluate the security and controls over the electronic publication of the financial statements.

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

Responsibilities of the Board of Directors

The Board of Directors is responsible for the preparation and fair presentation of financial statements for the group that comply with generally accepted accounting practice in New Zealand, New Zealand equivalents to International Financial Reporting Standards and International Financial Reporting Standards.

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

The Board of Directors is responsible for such internal control as it determines is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error. The Board of Directors is also responsible for the publication of the financial statements, whether in printed or electronic form.

Responsibilities of the Auditor

We are responsible for expressing an independent opinion on the financial statements and reporting that opinion to you based on our audit. Our responsibility arises from section 15 of the Public Audit Act 2001.

Independence

When carrying out the audit, we followed the independence requirements of the Auditor-General, which incorporate the independence requirements of the External Reporting Board.

Other than the audit, we have no relationship with or interests in the Group.

Susan Jones
EY
On behalf of the Auditor-General
Auckland, New Zealand

GROUP STATEMENT OF COMPREHENSIVE INCOME
FOR THE YEAR ENDED 30 JUNE 2015

	Note	ACTUAL 2015 $000	BUDGET (unaudited) 2015 $000	ACTUAL 2014 $000
Revenue	2 (a)	**47,340**	49,124	48,137
Other Income/(Expenditure)	2 (b)	**54**	0	577
Expenditure	3 (a)	**(43,901)**	(46,635)	(44,780)
Finance Costs	3 (b)	**(1)**	0	(1)
Share of Profit/(Loss) of Associates	14 (b)	**(122)**	0	(59)
Profit Before Tax		**3,370**	2,489	3,874
Tax Expense	9	**(940)**	(722)	(978)
Profit after tax attributable to the shareholders of the parent company		**2,430**	1,767	2,896
Other comprehensive income		**0**	0	0
Fair Value Gain on Heritage Assets (Net of tax)	10	**0**	0	0
Total comprehensive income for the period attributable to the shareholders of the parent company		**2,430**	1,767	2,896

The accompanying notes form part of these financial statements.

GROUP STATEMENT OF CHANGES IN EQUITY

FOR THE YEAR ENDED 30 JUNE 2015

	Ordinary Shares	Asset Re-valuation Reserve	Retained Earnings	Total	Ordinary Shares	Asset Re-valuation Reserve	Retained Earnings	Total
	2015 $000	2015 $000	2015 $000	2015 $000	2014 $000	2014 $000	2014 $000	2014 $000
GROUP								
Balance as at 1 July	**17,516**	**61**	**14,541**	**32,118**	**17,516**	**61**	**11,645**	**29,222**
Profit for the period	0	0	2,430	2,430	0	0	2,896	2,896
Other comprehensive income	0	0	0	0	0	0	0	0
Total comprehensive income	**0**	**0**	**2,430**	**2,430**	**0**	**0**	**2,896**	**2,896**
Transactions with owners in their capacity as owners:								
Shares issued	0	0	0	0	0	0	0	0
Dividends paid	0	0	0	0	0	0	0	0
Balance as at 30 June	**17,516**	**61**	**16,971**	**34,548**	**17,516**	**61**	**14,541**	**32,118**

The accompanying notes form part of these financial statements.

GROUP STATEMENT OF FINANCIAL POSITION
AS AT 30 JUNE 2015

	Note	ACTUAL 2015 $000	BUDGET (unaudited) 2015 $000	ACTUAL 2014 $000
Equity				
Share capital	5	17,516	17,516	17,516
Retained earnings	5	16,971	14,987	14,541
Revaluation reserve	5	61	61	61
		34,548	32,564	32,118
Non-Current Liabilities				
Provisions	6	439	505	404
Defined benefit plan	7(a)	898	1,152	875
Deferred tax liability	9(d)	1,957	2,091	2,117
		3,294	3,748	3,396
Current Liabilities				
Trade and other payables	8	7,682	8,462	7,793
Provisions	6	235	128	190
Defined benefit plan	7(a)	62	61	155
Tax payable		489	128	52
		8,468	8,779	8,190
Total Equity and Liabilities		46,310	45,091	43,704
Non-Current Assets				
Property, plant and equipment	10	30,353	33,680	30,241
Biological assets	11	466	745	504
Intangible assets	12	511	392	427
Investments in associates	14	313	194	285
Other investments		30	0	0
		31,673	35,011	31,457
Current Assets				
Cash and cash equivalents	15	7,744	2,468	3,637
Trade and other receivables	16	6,437	7,462	8,201
Inventories	17	456	150	409
		14,637	10,080	12,247
Total Assets		46,310	45,091	43,704

The accompanying notes form part of these financial statements.

For and on behalf of the Board, who authorised the issue of these accounts on 27 August 2015.

Chair

Director

GROUP STATEMENT OF CASH FLOWS
FOR THE YEAR ENDED 30 JUNE 2015

	Note	ACTUAL 2015 $000	BUDGET (unaudited) 2015 $000	ACTUAL 2014 $000
Cash Flows from Operating Activities				
Cash was provided from:				
Receipts from customers		47,843	48,402	46,792
Receipts from sale of harvest produce		240	0	433
Interest received		264	89	92
		48,347	48,491	47,317
Cash was applied to:				
Payments to employees		24,163	25,335	25,305
Payments to suppliers		14,840	17,238	15,760
Interest paid		1	0	1
Income tax paid		662	539	1,010
		39,666	43,112	42,076
Net cash flows from operating activities	19	8,681	5,379	5,241
Cash Flows from Investing Activities				
Cash was provided from:				
Proceeds from sale of fixed assets		18	0	0
		18	0	0
Cash was applied to:				
Purchase of property, plant and equipment		4,216	5,080	3,796
Purchase of intangibles		211	120	196
Additional investment in associate		165	0	150
		4,592	5,200	4,142
Net cash flows used in investing activities		(4,574)	(5,200)	(4,142)
Net Increase (Decrease) in Cash Held		4,107	179	1,099
Add opening cash brought forward		3,637	2,289	2,538
Ending Cash Carried Forward	15	7,744	2,468	3,637

The accompanying notes form part of these financial statements.

1. Statement of Accounting Policies

Reporting Entity

New Zealand Forest Research Institute Limited is a Crown Research Institute registered under the Companies Act 1993. The registered office is Te Papa Tipu Innovation Park, 49 Sala Street, Rotorua. The financial statements consists of New Zealand Forest Research Institute Limited and its subsidiaries (the group).

New Zealand Forest Research Institute Limited (the Company) is a reporting entity for the purposes of the Financial Reporting Act 2013. It is domiciled and incorporated in New Zealand and is wholly owned by the Crown.

The Financial Statements of New Zealand Forest Research Institute Limited for the year were authorised for issue in accordance with a resolution of the directors on the date as set out on the Statement of Financial Position.

The activities of New Zealand Forest Research Institute Limited include a range of research and development programmes aimed at using plant-based renewable resources and waste streams to create new materials, energy sources and environmentally sustainable products and processes.

New Zealand Forest Research Institute Limited trades as Scion and these names have identical meaning in this report.

1.1 Summary of Significant Accounting Policies

a) Basis of Preparation

The financial statements have been prepared in accordance with generally accepted accounting practice in New Zealand (NZ GAAP) and the requirements of the Companies Act 1993 and the Financial Reporting Act 2013. The financial statements have also been prepared on a historical cost basis, except for forestry assets, derivatives, carbon credits and certain heritage assets that have been measured at fair value.

The financial statements are presented in New Zealand dollars and all values are rounded to the nearest thousand dollars ($000).

b) Statement of Compliance

The financial statements have been prepared in accordance with NZ GAAP. They comply with New Zealand equivalents to International Financial Reporting Standards, and other applicable Financial Reporting Standards, as appropriate for profit-oriented entities. The financial statements comply with International Financial Reporting Standards (IFRS).

c) Basis of Consolidation

The consolidated financial statements comprise the financial statements of the Group and its subsidiaries as at 30 June. Control is achieved when the Group is exposed, or has rights, to variable returns from its involvement with the investee and has the ability to affect those returns through its power over the investee. Specifically, the Group controls an investee if and only if the Group has:

- Power over the investee (i.e. existing rights that give it the current ability to direct the relevant
- activities of the investee)
- Exposure, or rights, to variable returns from its involvement with the investee, and
- The ability to use its power over the investee to affect its returns

When the Group has less than a majority of the voting or similar rights of an investee, the Group considers all relevant facts and circumstances in assessing whether it has power over an investee, including:

- The contractual arrangement with the other vote holders of the investee
- Rights arising from other contractual arrangements
- The Group's voting rights and potential voting rights

The Group re-assesses whether or not it controls an investee if facts and circumstances indicate that there are changes to one or more of the three elements of control. Consolidation of a subsidiary begins when the Group obtains control over the subsidiary and ceases when the Group loses control of the subsidiary. Assets, liabilities, income and expenses of a subsidiary acquired or disposed of during the year are included in the statement of comprehensive income from the date the Group gains control until the date the Group ceases to control the subsidiary.

All intra-group assets and liabilities, equity, income, expenses and cash flows relating to transactions between members of the Group are eliminated in full on consolidation.

c) Basis of Consolidation (cont.)

A change in the ownership interest of a subsidiary, without a loss of control, is accounted for as an equity transaction. If the Group loses control over a subsidiary, it:

- Derecognises the assets (including goodwill) and liabilities of the subsidiary
- Derecognises the carrying amount of any non-controlling interests
- Derecognises the cumulative translation differences recorded in equity
- Recognises the fair value of the consideration received
- Recognises the fair value of any investment retained
- Recognises any surplus or deficit in profit or loss
- Reclassifies the parent's share of components previously recognised in OCI to profit or loss or retained earnings, as appropriate, as would be required if the Group had directly disposed of the related assets or liabilities.

d) Associate Companies

These are companies in which the group holds substantial shareholdings but does not have control and in who's commercial and financial policy decisions it participates.

Associate companies have been reflected in the consolidated financial statements on an equity accounting basis which shows the group's share of surpluses in the Consolidated Statement of Comprehensive Income and its share of post-acquisition increases or decreases in net assets, in the Consolidated Statement of Financial Position.

e) Intangible Assets

Intangible assets acquired separately are capitalised at cost and those acquired from a business combination are capitalised at fair value as at the date of acquisition. Following initial recognition, the cost model is applied to the class of intangible assets.

The useful lives of these intangible assets are assessed to be either finite or indefinite.

Where amortisation is charged on assets with finite lives, this expense is recognised in profit and loss.

Intangible assets created within the business are not capitalised and expenditure is charged to profit and loss in the year in which the expenditure is incurred.

Intangible assets are tested for impairment where an indicator of impairment exists, and in the case of indefinite life intangibles, annually, either individually or at the cash generating unit level. Useful lives are also examined on an annual basis and adjustments, where applicable, are made on a prospective basis.

A summary of the policies applied to the group's capitalised intangible assets is as follows:

	Software
Useful lives	Finite
Method used	4 years – Straight line
Type	Acquired
Impairment test/Recoverable amount testing	Amortisation method reviewed at each financial year-end; Reviewed annually for indicators of impairment

Gains or losses arising from de-recognition of an intangible asset are measured as the difference between the net disposal proceeds and the carrying amount of the asset and are recognised in the profit and loss when derecognised.

Carbon Credits

New Zealand emission reduction units (NZU's) are recognised when the Group controls the units, provided that it is probable that economic benefits will flow to the Group and the fair value of the units can be measured reliably. Control of the NZU's arises when the Group is entitled to claim the NZU's from the government.

NZU's are initially measured at fair value on entitlement as an intangible asset unless the Board have determined they are held for sale, in which case they would be recorded at fair value as inventory.

Following initial recognition, the intangible asset is measured at fair value when the Board of Directors consider there is an active market for the sale of NZU's. NZU's determined as held for sale at recognition and recorded as inventory, are subsequently measured at the lower of cost and net realisable value.

The liability arising from the deforestation of eligible land is measured using the market value approach. A liability exists and is recognised on pre-1990 forests if the land use changes from forestry.

f) Biological Assets

Biological assets consist entirely of tree plantations which are measured at fair value less any point of sale costs. Gains and losses arising on initial recognition or change in fair value, less estimated point of sale costs, are included in profit and loss in the period in which they arise.

The fair value of tree plantations is determined by an independent valuer.

The valuation method for immature trees is the net present value of future net harvest revenue less estimated costs of owning, protecting, tending and managing trees. For mature trees fair value is deemed to be the net harvest revenue value.

g) Property, Plant and Equipment

All items of property, plant and equipment are valued at the cost of purchase from the Crown as at 1 July 1992 adjusted for subsequent additions at cost, disposals, depreciation and impairment. Plant and equipment are recorded at cost less accumulated depreciation. Land and capital work in progress are recorded at cost. Some library books have been identified as heritage assets and are recorded at fair value as determined by an independent valuer. Valuations are obtained every five years or more often where circumstances indicate that a significant change in fair value has occurred.

Expenditure incurred on property, plant and equipment is capitalised where such expenditure will increase or enhance the future benefits provided by the asset. Expenditure incurred to maintain future benefits is classified as repairs and maintenance.

When an item of property, plant and equipment is disposed of the difference between the net disposal proceeds and the carrying amount is recognised as a gain, or loss, in profit and loss.

Depreciation is provided for using the straight-line method to allocate the historical cost, less an estimated residual value, over the estimated useful life of the asset.

The useful lives of the major classes of assets have been calculated as follows:

Buildings and Land Improvements	40–60 years
Plant and Equipment	4–15 years
Furniture and Fittings	10 years
Motor Vehicles	3–7 years
Library Books and Periodicals	20 years

h) Recoverable amount of non-current assets

At each reporting date, the group assesses whether there is any indication an asset may be impaired. Where an indicator of impairment exists, the group makes a formal estimate of recoverable amount. Where the carrying amount of an asset exceeds its recoverable amount the asset is considered impaired and is written down to its recoverable amount.

Recoverable amount is the greater of fair value less costs to sell and value in use. It is determined for an individual asset, however, if the asset's value in use cannot be estimated to be close to its fair value less costs to sell, and it does not generate cash inflows that are largely independent of those from other assets or groups of assets, it is determined for the cash-generating unit to which the asset belongs.

In assessing value in use, the estimated future cash flows are discounted to their present value using a pre-tax discount rate that reflects current market assessments of the time value of money and the risks specific to the asset.

i) Trade Receivables

Trade receivables are initially recognised at fair value and subsequently valued at amortised cost less impairment allowance.

Collectability of trade receivables is reviewed on an ongoing basis. Debts that are known to be uncollectible are written off when identified. An allowance for doubtful debts is raised when there is objective evidence that it is probable the group will not be able to collect the debt. Financial difficulties and payment defaults without explanation are considered objective evidence of impairment.

j) Inventories

Consumable stores are valued at the lower of cost, on a weighted average price of stock on hand, and net realisable value.

Nursery stocks are valued at lower of cost or net realisable value. Changes in net realisable value are recognised in the profit and loss account in the period in which they occur.

k) Research Costs

Research costs are expensed in the period incurred.

l) Provisions and Employee Benefits

Provisions are recognised when the group has a present obligation (legal or constructive) as a result of a past event, it is probable that an outflow of resources embodying economic benefits will be required to settle the obligation and a reliable estimate can be made of the amount of the obligation.

Provisions are measured at the present value of management's best estimate of the expenditure required to settle the present obligation at the Statement of Financial Position date using a discounted cash flow methodology.

(i) Wages, Salaries and Annual Leave

The liability for wages, salaries and annual leave recognised in the Statement of Financial Position is the amount expected to be paid at balance date. Provision has been made for benefits accruing to employees for annual leave in accordance with the provisions of employment contracts in place at balance date.

(ii) Long Service Leave

The liability for long service leave is recognised and measured as the present value of expected future payments to be made in respect of services provided by employees up to the reporting date using the projected unit credit method. Consideration is given to expected future wage and salary levels, experience of employee departures, and periods of service. Expected future payments are discounted using market yields at the reporting date on national government bonds with terms to maturity and currencies that match, as closely as possible, the estimated future cash outflows.

(iii) Defined Benefit Plan

The defined benefit plan is unfunded. The cost of providing benefits under the defined benefit plan is determined using the projected unit credit actuarial valuation method. Actuarial gains and losses are recognised in the profit and loss account in the period in which they arise.

The defined benefit liability recognised in the Statement of Financial Position represents the present value of the defined benefit obligations.

Long service leave and defined benefit plan provisions are based on an actuarial valuation.

m) Leases

The determination of whether an arrangement is or contains a lease is based on the substance of that arrangement at inception date.

Group as a Lessee

Operating lease payments, where the lessors effectively retain substantially all the risks and benefits associated with ownership of the leased items, are included as an expense in the profit and loss in equal instalments over the lease term.

Group as a Lessor

Leases in which the group retains substantially all the risks and benefits of ownership of the leased asset are classified as operating leases. Initial direct costs incurred in negotiating an operating lease are expensed as incurred.

n) Cash and Cash Equivalents

Cash and short-term deposits in the Statement of Financial Position comprise cash at bank and in hand and short-term deposits with an original maturity of three months or less.

For the purposes of the Statement of Cash Flows, cash and cash equivalents consist of cash and cash equivalents as defined above, net of outstanding bank overdrafts.

o) Goods and Services Tax (GST)

All items in the financial statements are stated net of GST, with the exception of trade receivables and payables, which are inclusive of GST invoiced.

p) Foreign Currencies

Functional and presentation currency

Both the functional and presentation currency of New Zealand Forest Research Institute Limited and its subsidiaries is New Zealand dollars.

Transactions and balances

Transactions in foreign currencies are initially recorded in the functional currency by applying the exchange rates ruling at the date of the transaction. Monetary assets and liabilities denominated in foreign currencies are retranslated at the rate of exchange ruling at the Statement of Financial Position date.

Non-monetary items that are measured in terms of historical cost in a foreign currency are translated using the exchange rate as at the date of the initial transaction. Non-monetary items measured at fair value in a foreign currency are translated using the exchange rates at the date when the fair value was determined.

q) Revenue Recognition

Research Revenue

Research revenue from both Government and commercial sources is recorded when earned based on the percentage of work completed. Percentage of work completed is based on management judgement, after considering costs incurred and other contracted commitments. Work completed but not invoiced is recorded as accrued revenue while work invoiced but not completed is recorded as revenue in advance.

Government revenue includes revenue received from the Ministry for Science and Innovation in the form of Core Funding, Public Good Science and Technology investment, and Preseed Accelerator Fund programmes. Funding includes both devolved and milestone related programmes. Government revenue has only been recognised after all appropriate conditions have been met.

Sale of Goods

Revenue is recognised when the significant risks and rewards of ownership of the goods have passed to the buyer. Risk and reward are considered passed to the buyer at the time of delivery.

Interest Revenue

Interest revenue is recognised when earned based on applicable interest rates applied to the group's cash deposit balances.

r) Taxation

The income tax expense charged to the profit and loss includes both the current year's provision and the income tax effects of temporary differences calculated using the liability method.

Tax effect accounting is applied on a comprehensive basis to all temporary differences. A debit balance in the deferred tax account, arising from temporary differences or income tax benefits from income tax losses, is only recognised if it is probable there will be taxable profits available in the future against which the deferred tax asset can be utilised.

Subsequent realisation of the tax benefit is subject to the requirements of income tax legislation being met.

s) Borrowing Costs

Borrowing costs are recognised as an expense when incurred except for those borrowing costs determined as 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).

t) Interest-bearing Loans and Borrowings

All loans and borrowings are initially recognised at the fair value of the consideration received net of issue costs associated with the borrowing.

After initial recognition, interest-bearing loans and borrowings are subsequently measured at amortised cost using the effective interest method. Amortised cost is calculated by taking into account any issue costs, and any discount or premium on settlement.

For the purpose of valuing bank borrowings, the bank interest rate is taken as the discount rate. As such the bank borrowings are carried at the value of the debt with the bank.

u) Trade and Other Payables

Trade and other payables are carried at amortised cost and due to their short term nature they are not discounted. They represent liabilities for goods and services provided to the group prior to the end of the financial year that are unpaid and arise when the group becomes obliged to make future payments in respect of the purchase of these goods and services. The amounts are unsecured and are usually paid within 60 days of recognition.

1.2 Significant Accounting Judgements, Estimates and Assumptions

a) Revenue Recognition

Revenue is recognised based on the percentage of work completed on a project basis. Percentage of work completed is based on management judgement after considering such things as hours completed, costs incurred, milestones achieved, costs to complete and actual results to date.

b) Heritage Assets

The group holds several heritage assets which have significant value due to being both rare, and having importance to the nation. Where a heritage cost can be measured reliably they are revalued at least every five years and included as part of property plant and equipment.

Due to the nature of some heritage assets, management does not believe they can be valued reliably. These assets have been identified and disclosed. Details of heritage assets can be found in note 10 and 21.

c) Biological Assets

The group's biological assets consist of tree plantations. These are valued at the net present value of future net harvest revenue less estimated costs of owning, protecting, tending and managing trees. The valuation process includes several judgements and estimations around discount rates, future costs, and future prices. Management used the experience of a registered forestry valuer to reduce the risk of misstatement resulting from these judgements and estimates.

d) Defined Benefit Scheme

The group operates an unfunded defined benefit plan. Significant assumptions used involving the plan include the discount rate and future salary increases as set out in the notes to the financial statements. Management used the experience of a registered actuary to reduce the risk of misstatement resulting from these judgements and estimates.

1.3 Accounting Standards Issued but not yet Effective

The following standards have had changes that have been issued but not yet made effective:

	Date Applicable for Scion
• NZ IFRS 5 Non-Current Assets Held for Sale	1 July 2016
• NZ IFRS 7 Financial Instruments – Disclosures	1 July 2016
• NZ IFRS 9 Financial Instruments (2014)	1 July 2018
• NZ IFRS 10 Consolidated Financial Statements	1 July 2016
• NZ IFRS 12 Disclosure of Interest in Other Entities	1 July 2016
• NZ IFRS 15 Revenue from Contracts with Customers	1 July 2017
• NZ IAS 1 Presentation of Financial Statements	1 July 2016
• NZ IAS 16 Property, Plant and Equipment	1 July 2016
• NZ IAS 19 Employee Benefits	1 July 2016
• NZIAS 26 Accounting and Reporting by Retirement Benefit Plans	1 July 2015
• NZ IAS 28 Investments in Associates and Joint Ventures	1 July 2016
• FRS-44 New Zealand Additional Disclosures	1 July 2015

The group has chosen not to apply the changes in the above standards prior to their effective date. While these standards are applicable to the group they are not expected to have a material impact on our accounts.

In addition under the Annual Improvements to NZ IFRS programme, amendments have been made to the following standards, effective 1 July 2016, that affect Scion but are not seen to have a material impact on the financial statements.

- NZ IAS 41 Agriculture

		ACTUAL 2015 $000	ACTUAL 2014 $000
2.	**Revenue and Other Income**		
	(a) Revenue		
	Government research revenue	28,789	27,557
	Commercial research revenue	16,838	18,763
	Software product sales and maintenance	155	674
	Commercial lease revenue	740	655
	Sale of trees	382	291
	Royalty	142	99
	Interest revenue	294	98
		47,340	48,137
	(b) Other Income/(Expenditure)		
	Change in fair value of plantation trees	0	57
	Change in fair value of trees sold	0	355
	Change in fair value of trees contracted for sale	0	151
	Change in fair value of carbon credits	54	14
		54	577
3.	**Expenditure and Finance Costs**		
	(a) Expenditure		
	Personnel remuneration and expenses	23,737	24,318
	Other personnel related costs	489	415
	Contractors and subcontractors	5,869	5,958
	Consumables	961	1,646
	External services	3,195	3,293
	Travel and accommodation	1,495	1,441
	Lease and rental costs	241	327
	Depreciation	3,701	3,030
	Amortisation	181	271
	Loss on disposal of fixed assets	12	8
	Loss on revaluation of trees	38	0
	Impairment of assets	397	231
	Reversal of impairment	(14)	(23)
	Premises	2,623	2,392
	Directors' fees	250	253
	Restructuring costs	196	502
	Doubtful debt provision	(7)	(2)
	Unrealised exchange fluctuations	0	1
	Other	537	717
		43,901	44,780
	(b) Finance Costs		
	Bank loans and overdraft interest	1	1
		1	1
4.	**Auditor's Remuneration**		
	Amounts paid or due and payable to the auditors for:		
	Auditing financial statements		
	Parent entity auditor	120	117
		120	117

5. Equity

New Zealand Forest Research Institute Limited has authorised, issued and paid up capital of 17,516,000 (2014: 17,516,000) ordinary shares. Shares do not have a par value.

All shares have equal rights with respect to voting, dividends and distribution on winding up. There are no restrictions on the distribution of dividends or repayment of capital.

No dividends were declared or paid to shareholders during the year (2014: $0).

The asset revaluation reserve is used to record increments and decrements in the fair value of heritage book assets. Movements in the asset revaluation reserve are not reclassified to the profit and loss in subsequent periods.

Capital Management

Scion is 100% Crown owned. Scion completes a five year plan on an annual basis and as part of that five year plan, any capital requirements for the future. When managing capital, management's objective is to ensure the entity continues as a going concern while balancing its financial goals of delivering returns in line with market cost of capital, with its public good goals of reinvesting in science that will benefit New Zealand. Management uses total equity as capital. The group has no externally imposed capital requirements.

6. Provisions

The group has provisions for long service leave and restructuring. The long service leave provision totals $553k at June 2015 (2014: $484k) and was valued by an actuary.

The group has a restructuring provision of $121k at June 2015 (2014: $110k).

The provisions are made up as follows:

	ACTUAL 2015 $000	ACTUAL 2014 $000
Current Provision	235	190
Non-Current Provision	439	404
	674	594

Movement in each class of provision during the year is as follows:

	Long Service Leave	Restruct -uring	TOTAL	Long Service Leave	Restruct -uring	TOTAL
		2015			2014	
	$000	$000	$000	$000	$000	$000
Balance 1 July	484	110	594	629	94	723
Provision reversed during the year	0	(55)	(55)	0	(4)	(4)
Amounts used during the year	(66)	(55)	(121)	(79)	(90)	(169)
Provisions made during the year	111	121	232	(50)	110	60
Discount rate adjustment	24	0	24	(16)	0	(16)
Balance 30 June	553	121	674	484	110	594

7. Pension Plans

a) Defined Benefit Plan

Scion operates an unfunded final salary defined benefit plan. The level of benefits provided depends on the member's length of service and salary at retirement age. The plan is closed to new members and will cease when all current members have either retired or left the group. There are no assets backing the unfunded liability.

The cost of providing benefits under the defined benefit plan is determined using the projected unit credit actuarial valuation method. Actuarial gains and losses are recognised in the Profit and Loss account. Past service cost is recognised immediately.

The defined benefit liability recognised in the Statement of Financial Position represents the present value of the defined benefit obligation.

	ACTUAL 2015 $000	ACTUAL 2014 $000
Net plan expense		
Current service cost	33	32
Interest cost on benefit obligation	51	58
Net actuarial gains recognised in the year	(18)	(108)
Net plan expense/(income)	66	(18)

The net plan expense is included in the Personnel remuneration and expense line in Note 3(a) Expenditure.

	Defined Benefit Plan				
	2015 $000	2014 $000	2013 $000	2012 $000	2011 $000
Benefit liability included in the Statement of Financial Position					
Present value of defined benefit obligation	960	1,030	1,264	1,509	1,250

	ACTUAL 2015 $000	ACTUAL 2014 $000
Changes in the present value of the defined benefit obligation are as follows:		
Opening balance	1,030	1,264
Current service cost	33	32
Interest cost	51	58
Actuarial gains recognised in the year	(18)	(108)
Benefits paid	(136)	(216)
Closing balance	960	1,030
Current provision	62	155
Non-current provision	898	875
	960	1,030

7. Pension Plans (cont.)

a) Defined Benefit Plan (cont.)

The history of experience adjustments is as follows:

	2015 $000	2014 $000	2013 $000	2012 $000	2011 $000
Experience adjustments on plan liabilities	(75)	(59)	(103)	(39)	(9)

The principal actuarial assumptions used in determining the defined benefit plan obligations are shown below:

	2015 $000	2014 $000
Discount rate	4.29%	4.95%
Future salary increases	4.50%	4.50%

At 30 June a change in the assumed rates of salary growth and resignation rates, all other assumptions remaining unchanged, would affect the balance of the liability as follows:

	ACTUAL 2015 $000	ACTUAL 2014 $000
Current liability	960	1,030
Salary growth		
Reduction of 1% per annum	892	958
Increase of 1% per annum	1,035	1,100
Resignation rates		
150% of assumed rates	926	992
50% of assumed rates	995	1,061

Interest rate assumptions are based on Treasury's published risk free discount rates.

b) Defined Contribution Plan

During the period defined contributions totalling $657k (2014: $652k) were made to the Government Superannuation Fund and KiwiSaver.

8. Trade and Other Payables

	ACTUAL 2015 $000	ACTUAL 2014 $000
Trade payables	4,370	3,550
Other payables	1	0
Employee payables and accruals	2,157	2,725
Revenue in advance	1,154	1,518
	7,682	7,793

The carrying amount disclosed above is a reasonable approximation of fair value. Trade creditors are non-interest bearing and are normally settled within 60 days.

	ACTUAL 2015 $000	ACTUAL 2014 $000
9. Income Tax		
(a) Income Tax Expense		
The major components of income tax expense in the Statement of Comprehensive Income are:		
Current income tax		
Current income tax charge	1,094	969
Adjustments to prior year current income tax charge	5	(167)
	1,099	802
Deferred income tax		
Deferred tax expenses/(income) related to prior year	10	75
Relating to origination and reversal of temporary differences	(169)	101
	(159)	176
Income tax expense/(income) reported in the Statement of Comprehensive Income	940	978
(b) Amounts charged or credited directly to other comprehensive income		
Deferred income tax related to items charged (credited) directly to other comprehensive income		
Net gain on revaluation of heritage assets	0	0
(c) Reconciliation between the aggregate tax expense recognised in the Statement of Comprehensive Income to tax expense calculated at the statutory income tax rate		
Accounting profit before income tax	3,370	3,874
Tax at the statutory income tax rate of 28% (2014: 28%)	944	1,085
Adjusted by:		
Prior year income tax	13	(92)
Entertainment	11	10
Non-deductible legal fees	0	6
Other	(28)	(31)
Income tax expense	940	978
(d) Deferred income tax relates to the following:		
Deferred tax liabilities		
Property, plant and equipment	(2,768)	(2,965)
Nursery inventory	(125)	(23)
Harvest tree stocks	0	(87)
Standing timber	(130)	(141)
	(3,023)	(3,216)
Deferred tax assets		
Patents and trademarks	189	170
Payroll provisions	772	783
Provision for doubtful debts	11	23
Income in advance	70	98
Other	24	25
	1,066	1,099
Net Deferred Tax Asset/(Liability) per Statement of Financial Position	(1,957)	(2,117)

The group has no unused tax losses (2014: $0k).

10. Property, Plant and Equipment

GROUP	Land & Improvements $000	Buildings $000	Plant & Equipment $000	Furniture & Fittings $000	Motor Vehicles $000	Books & Periodicals $000	Capital Work in Progress $000	Total $000
At 1 July 2014								
Carrying amount net of accumulated depreciation and impairment at 1 July 2014	**1,839**	**16,239**	**9,661**	**1,058**	**363**	**251**	**830**	**30,241**
Additions	0	228	2,547	20	117	0	1,315	4,227
Transfers from CWIP	0	43	538	0	0	0	(581)	0
Disposals	0	(4)	(19)	0	0	0	(4)	(27)
Impairment provision made	0	(251)	(34)	0	0	0	(112)	(397)
Reversal of impairment provision	0	10	0	0	0	0	0	10
Depreciation expensed	(55)	(1,139)	(2,298)	(91)	(118)	0	0	(3,701)
Carrying amount net of accumulated depreciation and impairment at 30 June 2015	**1,784**	**15,126**	**10,395**	**987**	**362**	**251**	**1,448**	**30,353**
At 30 June 2015								
Cost or fair value	2,220	23,260	40,851	2,755	812	251	1,560	71,709
Accumulated depreciation and impairment	(436)	(8,134)	(30,456)	(1,768)	(450)	0	(112)	(41,356)
Net carrying amount	**1,784**	**15,126**	**10,395**	**987**	**362**	**251**	**1,448**	**30,353**

Books and periodicals include some library books classified as Heritage Assets. The group engaged Rowan Gibbs, an antiquarian bookseller of 37 years' experience of Smith's Bookshop Limited to determine the fair value of the heritage library books as at 30 June 2013. Fair value is the amount for which the books could be exchanged between a knowledgeable willing buyer and a knowledgeable willing seller in an arms-length transaction as at valuation date. Fair value is determined by reference to recent prices realised at national and international auctions and prices being asked for by specialist dealers for comparable items. Refer to note 21 regarding other heritage assets. The heritage asset library books have been valued at $82,008 (2014: $82,008).

Scion recognised an impairment loss of $251k on buildings which are not tenanted and the company considers that they are unlikely to be tenanted in the foreseeable future (2014: $231k). The recoverable amount of $0 is the buildings value in use. In addition an impairment of $112k was made for building work in progress where future progress is not finalised and an impairment of $34k on plant and equipment that has no future benefit. Scion made no other impairment provisions and reduced provisions where depreciation on an asset has continued to be recognised.

NOTES TO AND FORMING PART OF THE FINANCIAL STATEMENTS
FOR THE YEAR ENDED 30 JUNE 2015

10. Property, Plant and Equipment (cont.)

GROUP	Land & Improvements $000	Buildings $000	Plant & Equipment $000	Furniture & Fittings $000	Motor Vehicles $000	Books & Periodicals $000	Capital Work in Progress $000	Total $000
At 1 July 2013								
Carrying amount net of accumulated depreciation and impairment at 1 July 2013	**1,610**	**17,868**	**8,061**	**207**	**389**	**251**	**1,301**	**29,687**
Additions	272	538	2,499	87	70	0	513	3,979
Transfers from CWIP	0	132	688	47	0	0	(919)	(52)
Reclassifications	10	(1,548)	680	858	0	0	0	0
Disposals	0	(5)	(62)	(4)	(1)	0	(65)	(137)
Impairment provision made	0	(231)	0	0	0	0	0	(224)
Reversal of impairment provision	0	7	16	0	0	0	0	16
Depreciation expensed	(53)	(522)	(2,221)	(137)	(95)	0	0	(3,028)
Carrying amount net of accumulated depreciation and impairment at 30 June 2014	**1,839**	**16,239**	**9,661**	**1,058**	**363**	**251**	**830**	**30,241**
At 30 June 2013								
Cost or fair value	1,933	24,172	36,676	1,738	633	251	1,301	66,704
Accumulated depreciation and impairment	(323)	(6,304)	(28,615)	(1,531)	(244)	0	0	(37,017)
Net carrying amount	**1,610**	**17,868**	**8,061**	**207**	**389**	**251**	**1,301**	**29,687**
At 30 June 2014								
Cost or fair value	2,220	23,269	38,779	2,743	695	251	830	68,787
Accumulated depreciation and impairment	(381)	(7,030)	(29,118)	(1,685)	(332)	0	0	(38,546)
Net carrying amount	**1,839**	**16,239**	**9,661**	**1,058**	**363**	**251**	**830**	**30,241**

11. Biological Assets

Biological assets consist of tree plantations. The group has 73.2 hectares of trees planted initially for experimental purposes. When experiments are completed, they are classified as biological assets. Trees will be harvested when they reach maturity.

	ACTUAL 2015 $000	ACTUAL 2014 $000
Carrying amount 1 July	504	745
(Loss)/Gain from changes in fair value less estimated point-of-sale costs	(38)	340
Contracted for sale during the year and moved to inventory	0	(581)
Carrying amount 30 June	466	504

The above biological assets are level 3 in the fair value hierarchy.

The group has tree plantations at three locations:

(a) 31 hectares of immature Radiata Pine is located at Puruki. The trees were planted for experimental purposes. The group has a forestry right which expires in 2067.

(b) 5.5 hectares of Mexican Cypress are located at Tikokino. The trees were planted for experimental purposes. The Mexican Cypress has a clear fell date of June 2033.

(c) 34.5 hectares of immature Radiata Pine is located at Mamaku plus 2.2 hectares of mature Sitka Spruce. The trees were planted for experimental purposes. The group has a forestry right which terminates when the trees are harvested or in 2024, whichever is the earlier.

The tree plantations were valued as at 30 June 2015 by PF Olsen Limited, an independent forestry management and consultancy company.

The valuation method for immature trees is the net present value of future net harvest revenue less estimated costs of owning, protecting, tending and managing trees. For mature trees fair value is deemed to be the net harvest revenue value.

Fair value is sensitive primarily to log prices. Significant increase (decreases) in log prices would result in a significantly higher (lower) fair value.

12. Intangible Assets

	ACTUAL 2015 $000	ACTUAL 2014 $000
Software		
Opening balance		
At cost	3,618	3,500
Less accumulated amortisation	(3,270)	(3,016)
Opening net carrying amount 1 July	348	484
Opening carrying amount 1 July	348	484
Additions	211	135
Current year amortisation	(181)	(271)
Closing carrying amount 30 June	378	348
Closing balance 30 June		
At cost	3,817	3,618
Less accumulated amortisation	(3,439)	(3,270)
Closing net carrying amount 30 June	378	348

		ACTUAL 2015 $000	ACTUAL 2014 $000
12.	**Intangible Assets (cont.)**		
	Carbon Credits		
	Carrying amount 1 July	79	4
	Purchase of credits	0	61
	Increase/(Decrease) in fair value	54	14
	Carrying amount 30 June	133	79
	Total intangible assets 30 June	511	427

13. Investments in Subsidiaries

	Shares	Percentage Held 2015	Percentage Held 2014	Balance Date
Subsidiaries				
Te Papa Tipu Properties Limited	100	100%	100%	30 June
Atlas Technology Limited	100	0%	100%	30 June
Forest Research Holdings Limited	100	100%	100%	30 June

Te Papa Tipu Properties Limited was incorporated on 25 March 2004. The company owns the group's land assets.

Atlas Technology Limited did not trade and was voluntarily de-registered in August 2014.

On 27 May 2014 New Zealand Forest Research Institute Limited acquired 100% of the shares of Forest Research Holdings Limited for nil consideration. The company was acquired for the purpose of holding investments in Scion Terax technologies. The fair value of the assets acquired was nil. It has not traded to the year ended 30 June 2015.

New Zealand Forest Research Institute Limited is the registered holder of 100% of the shares of Future Forests Research Limited however these shares are held in trust for the members and therefore it has not been treated as a subsidiary for consolidation purposes.

All subsidiaries are incorporated in New Zealand.

		ACTUAL 2015 $000	ACTUAL 2014 $000
14.	**Investments in Associates**		
	(a) Investment Details		
	Biopolymer Network Limited	240	212
	Terax 2013 Limited	0	0
	Terax Limited Partnership	73	73
		313	285

New Zealand Forest Research Institute Limited has a 33.33% (2014: 33.33%) shareholding in Biopolymer Network Limited, a company carrying on research, development and commercialisation of biopolymers.

New Zealand Forest Research Institute Limited has a 50% shareholding in Terax 2013 Limited. The company was incorporated in February 2012. Terax 2013 Limited manages Terax Limited Partnership in which Scion also has a 50% interest. Terax Limited Partnership was registered on 8 April 2013.

The group's proportion of voting power held in each associate is the same as its ownership interest.

All of the companies are incorporated in New Zealand.

	ACTUAL 2015 $000	ACTUAL 2014 $000
14. Investments in Associates (cont.)		
(b) Movements in the carrying amount of the group's investments in associates		
Opening carrying amount of investments	285	194
Current year investment in associates	150	150
Current year share of increase/(decrease) in net assets of associates	(122)	(59)
Closing carrying amount of investments	313	285
(c) Summarised financial information		
The following table illustrates summarised financial information relating to the group's associates:		
Extract from the associates' Statement of Financial Position:		
Current assets	1,102	1,042
Non-current assets	250	299
	1,352	1,341
Current liabilities	501	560
	501	560
Net assets	851	781
Share of associates' net assets	313	285
Extract from the associates' Statement of Comprehensive Income:		
Revenue	4,005	4,373
Net Profit	(240)	(85)

There are no known contingent liabilities relating to Associates.

15. Cash and Cash Equivalents		
Cash on hand	8	10
Bank	1	244
Call deposits	2,181	1,375
Short term deposits	5,554	2,008
	7,744	3,637

Cash at bank earns interest at 0.70% on daily credit balances over $250,000 (2014: 0.72%). Deposits earn interest at rates ranging from 3.40% to 4.35% (2014: 3.25% to 3.3%). For the purposes of the Statement of Cash Flows, Cash and Cash equivalents are equivalent to Cash and Cash equivalents presented in the Statement of Financial Position.

16. Trade and Other Receivables

	ACTUAL 2015 $000	ACTUAL 2014 $000
Trade receivables	4,794	5,312
Allowance for impairment loss	(37)	(83)
Other debtors	41	11
Prepayments	567	764
Accrued revenue	608	712
Related party receivables:		
Associates	352	291
Other related parties	112	1,194
Carrying amount 30 June	6,437	8,201

(a) The carrying amount disclosed above is a reasonable approximation of fair value due to the short term nature of the receivables.

(b) Allowance for Impairment Loss
Trade receivables are non-interest bearing and are generally on 30–60 day terms. A provision for impairment loss is recognised when there is objective evidence that a trade receivable is impaired. A decrease in the allowance for impairment loss of $46k (2014: impairment loss decrease of $3k) has been recognised for specific debtors. The allowance is included in a separate line item in Note 3 (a) Expenditure.

Movements in the allowance for impairment loss were as follows:

	ACTUAL 2015 $000	ACTUAL 2014 $000
Opening balance 1 July	83	86
Reversal of prior year provision	(11)	(3)
Charge for the year	1	0
Bad debts written off	(36)	0
Closing balance 30 June	37	83

At 30 June, the ageing analysis of trade receivables is as follows:

	Total $000s	0-30 Days CNI* $000s	0-30 Days CI* $000s	31-60 Days CNI* $000s	31-60 Days CI* $000s	61-90 Days PDNI* $000s	61-90 Days CI* $000s	+91 Days PDNI* $000s	+91 Days CI* $000s
2015	4,794	4,367	0	183	0	118	0	89	37
2014	5,312	4,893	0	261	0	44	0	31	83

* Current not impaired (CNI)
* Past due not impaired (PDNI)
* Considered impaired (CI)

(c) For related party terms and conditions refer to Note 23.

17. Inventories

	ACTUAL 2015 $000	ACTUAL 2014 $000
Consumable stores (at cost)	9	16
Nursery stock	447	83
Tree stocks contracted for sale	0	310
Closing carrying amount	456	409

Consumable stores recognised as an expense for the year are $67k (2014: $38k). The expense has been included in the "consumables" line item in Note 3 (a). Consumable inventory write-down in the period was $0k (2014: $12k).

18. Financial Instruments

Financial Instruments include:

Loans and Receivables
Cash and cash equivalents
Trade receivables
Other debtors
Related party receivables

Other Financial Liabilities
Trade payables
Other payables
Related party payables

All the above financial instruments apart from derivative financial instruments are measured at amortised cost. Due to their short term nature their carrying amount is a reasonable approximation of their fair value.

All financial instruments held at fair value are Level 2.

Management have not identified any concentrations of risk for any of the below risk categories.

Liquidity Risk

The group's objective is to maintain a balance between continuity of funding and flexibility through the use of a bank debt facility and a bank overdraft. Management monitors, on a monthly basis, our free capacity within the debt facility and our forecasted ability to pay for that debt.

Trade payables ($4,370k) are non-interest bearing and are normally settled within 60 days. The company and group liabilities all have contractual maturities of less than 120 days.

Credit Risk

Financial instruments that potentially subject the group to credit risk consist of bank balances and accounts receivable. The group generally does not require any security.

Significant new non-Government customers are credit checked. Trade receivable ageing is reviewed monthly and all aged trade receivables are followed up. Credit stops are used for non-paying customers.

Maximum exposures to credit risk as at balance date are:

	ACTUAL 2015 $000	ACTUAL 2014 $000
Current account	1	244
Call and short term deposits	7,735	3,384
Trade receivables	4,757	5,230
Other debtors	41	11
Related party receivables	464	1,485

The above maximum exposures are net of any provision for impairment on these financial instruments.

18. Financial Instruments (cont.)

Market Risk

Market risk on financial instruments comprise the following three types of risk:

Interest Rate Risk

The group's exposure to market interest rates relates primarily cash deposits. Cash and cash equivalents have increased during the year to a year ended 30 June 2015 group balance of $7,744k (2014: $3,637k).

	ACTUAL 2015 $000	ACTUAL 2014 $000
Cash in hand	8	10
Current account	1	244
Call deposits	2,181	1,375
Short term deposits	5,554	2,008
	7,744	3,637

The current account is managed at low levels and interest returns on the current account are not material. Cash funds in excess of our current requirements are invested in short-term bank deposits to attract improved interest returns. At 30 June 2015 bank call and short term deposits were earning interest at rates between 3.40% and 4.35% (2014: 3.25% and 3.30%).

At 30 June 2015, if interest rates moved as indicated in the table below, with all other variables being held constant, post-tax profit and equity would have been affected as follows:

Judgement of reasonably possible movements in interest rates	2015		2014	
	Change in Interest Rate	Effect on Post Tax Profit & Equity $000	Change in Interest Rate	Effect on Post Tax Profit & Equity $000
	+1%	56	+2%	52
	-1%	(56)	-1%	(26)

Management has taken account of Reserve Bank of New Zealand indications of future interest rate movements in the Official Cash Rate and various other market indicators and after considering these indicators, believe the interest rate changes are reasonable and possible.

Currency Risk

Only small balances are held in currencies other than New Zealand dollars, materially all in debtors. Collection on all these debtors is expected within 60 days resulting in minimal foreign exchange risk.

Other Price Risk

Other price risk primarily relates to the market price of financial instruments. As Scion does not trade in financial instruments there is no perceived risk in this category.

	ACTUAL 2015 $000	ACTUAL 2014 $000
19. Reconciliation of operating surplus after taxation with cash flows from operating activities		
Reported surplus/(loss) after taxation	2,430	2,896
Add (less) non-cash items:		
Depreciation (Refer note 3 and 10)	3,701	3,030
Amortisation	181	271
Impairment provision	383	208
Movement in deferred tax (Refer note 9)	(159)	183
Revaluation of biological assets	38	(57)
Foreign exchange movement in hedging contracts	0	5
Fair value of carbon credits	(54)	(14)
	4,090	3,626
Add (less) items classified as investing activity:		
Investment purchases included in payables	(15)	0
(Gain) loss on disposal of property, plant and equipment	12	10
Share in associate company (profit)/loss	122	59
Capital related items in creditors	(10)	(6)
Move harvested biological assets to inventory	0	298
	109	361
Movements in working capital items:		
(Increase)/Decrease in debtors and prepayments	1,764	(679)
(Increase)/Decrease in inventories	(48)	(69)
Increase/(Decrease) in creditors and accruals	(101)	(678)
Increase/(Decrease) in taxation payable	437	(216)
	2,052	(1,642)
Net cash flows from operating activities	8,681	5,241

20. Contingencies

Treaty of Waitangi Issues

Two verified land claims affecting the group currently exist:

(i) Ngati Whakaue – covering the whole Rotorua Campus

(ii) Ngati Wahiao – covering the southern end of the Rotorua Campus

No reliable estimates can be made of the impact of these contingencies.

21. Heritage Assets

The company has identified its library, herbarium and germplasm collections as heritage assets. For the herbarium and germplasm collections the Directors believe that there is no practical basis upon which to reliably value these collections. For the library refer to note 10.

22. Commitments

Operating Lease Commitments – Group as Lessee:

The group has entered into commercial leases on certain motor vehicles and items of office equipment. The leases have lives of three or four years with renewal options included in the motor vehicle leases only. There are no restrictions placed on the lessee by entering into these leases. In addition the parent company leases land from its subsidiary Te Papa Tipu Properties Limited.

Future minimum rentals payable under non-cancellable operating leases as at 30 June are as follows:

	ACTUAL 2015 $000	ACTUAL 2014 $000
Lease commitments under non-cancellable operating leases:		
Within one year	28	58
One to five years	53	81
	81	139

Operating Lease – Group as Lessor:

The group has entered into commercial property leases for buildings and land. These non-cancellable leases have remaining terms of up to 7.25 years on buildings and 30 years on land leases. All leases include a clause to enable upward revision of the rental charge at a specified review date of between one and five years basis according to prevailing market conditions.

Future minimum rentals receivable under non-cancellable operating leases as at 30 June are as follows:

	ACTUAL 2015 $000	ACTUAL 2014 $000
Within one year	340	223
One to five years	468	475
Greater than five years	570	413
	1,378	1,111

Capital Commitments

Capital expenditure contracted for at balance date but not provided for	121	43

23. Transactions with Related Parties

(a) Parent

New Zealand Forest Research Institute Limited is wholly owned by the New Zealand Government (the ultimate parent). All transactions with the Government, Government departments and agencies and Government entities are conducted at arms-length. Government Public Good Science funding and Capability funding comprises close to 50% of research revenue earned by Scion.

	ACTUAL 2015 $000	ACTUAL 2014 $000
(b) Subsidiary Companies of Parent		
Te Papa Tipu Properties Limited		
Charge for services	76	76
Payment of Rent	(398)	(382)
Net Paid on behalf	231	147
Amount (payable)/receivable at balance date		
– Intercompany account	91	182

	ACTUAL 2015 $000	ACTUAL 2014 $000
23. Transactions with Related Parties (cont.)		
(c) Associates of Parent		
Biopolymer Network Limited		
Supplied goods and services	1,779	1,733
Received goods and services	(1)	0
Receivable at balance date	167	191
Terax 2013 Limited		
Services provided	177	184
Receivable at balance date	35	42
Terax Limited Partnership		
Services provided	68	2
Receivable at balance date	16	0
(d) Other Related Parties		
WQI Limited		
Supplied goods and services	243	459
Received goods and services	(9)	(19)
Receivable at balance date	134	58
Future Forests Research Limited		
Services provided	726	5,339
Goods received	(40)	(1,824)
Receivable at balance date	112	1,194

New Zealand Forest Research Institute Limited has a 5.05% shareholding in WQI Limited (2014: 8.47%). The company's policy is to record such investments at fair value but these shareholdings have not been recorded in the financial statements as their value is not considered to be material to the group. Refer to Note 13 for details on the company's shareholding in Future Forests Research Limited and Note 14 for shareholdings in associates.

Other

The group's transactions during the year and year end balances with other parties are as follows:

i) *New Zealand Forest Owners Association Incorporated*
Provided services totalling $2,790k (2014: $545k) and received services totalling $2k (2014: $2k). The amount receivable at year end was $842k (2014: $493k). There was no payable at year end (2014: $0k).

ii) *Competenz*
Provided services totalling $43k (2014: $43k). The amount receivable at year end was $5k (2014: $2k). No services were received during the year (2014: $0k). There was no payable at year end (2014: $0k).

iii) *Juken New Zealand Limited*
Provided services totalling $213k (2014: $92k). No services were received during the year (2014: $8k). The amount receivable at year end was $83k (2014: $33k). There was no payable at year end (2014: $0k).

iv) *Te Arawa Group Holdings Limited*
Provided services totalling $4k during the year (2014: $0k). The amount receivable at year end was $4k. (2014: $0k).

v) *Waiariki Institute of Technology*
Provided services totalling $25k (2014: $8k). Services totalling $30k were received (2014: $0k). There was no receivables or payables at year end (2014: receivables of $0k and payables of $0k).

vi) Bio-Protection Research Centre
Provided services totalling $31k (2014: $0k). The amount receivable at year end was $36k. (2014: $0k).

23. Transactions with Related Parties (cont.)

Other (cont.)

vii) *Grow Rotorua Limited*

Provided services totalling $22k (2014: $17k). No services were received (2014: $0). The amount receivable at year end was $1k (2014: $1k). There was no payable at year end (2014: $0k).

Mr Sheldon Drummond, a director of New Zealand Forest Research Institute Limited, is a director of New Zealand Forest Owners Association Inc and an employee of Juken New Zealand Limited. Dr Brian Rhoades, a director of New Zealand Forest Research Institute Limited, is a director of Competenz. Mr Barry O'Neil, a director of New Zealand Forest Research Institute Limited, is a director of Bio-Protection Research Centre. Ms Colleen Neville, a director of New Zealand Forest Research Institute Limited, is the CEO of Te Arawa Group Holdings Limited.

Dr Warren Parker, CEO of New Zealand Forest Research Institute Limited, is a director of Future Forests Research Limited, Grow Rotorua Limited and Te Papa Tipu Properties Limited.

Mr Rob Trass, CFO and Company Secretary of New Zealand Forest Research Institute Limited, is an Audit and Risk Committee member at Waiariki Institute of Technology.

Terms and conditions of transactions with related parties

Outstanding balances at year end are unsecured and interest free. No guarantees are provided or received for any related party receivables or payables.

No related party debts were written off during the year (2014: $0k) and no impairment allowance has been raised for any of these debts.

24. Key Management Personnel

	ACTUAL 2015 $000	ACTUAL 2014 $000
Short term employee benefits	2,094	2,144
KiwiSaver employee benefits	19	17
	2,113	2,161

BOARD OF DIRECTORS

Mr Tony Nowell CNZM – Chair
Ms Elizabeth Chambers
Mr Sheldon Drummond
Ms Colleen Neville
Dr Barry O'Neil
Dr Brian Rhoades (retired 30 June 2015)
Mrs Judith Stanway

Mr Rob Trass (Company Secretary)

EXECUTIVE MANAGEMENT

Dr Warren Parker – Chief Executive Officer

Dr Russell Burton – General Manager, Research and Investments
Dr Elspeth MacRae – General Manager, Manufacturing and Bioproducts
Mr Steve Sopora – General Manager, Business Development and Commercialisation
Dr Brian Richardson – General Manager, Forest Science
Mrs Keri-Anne Tane – General Manager, People and Performance
Mr Rob Trass – Chief Financial Officer

AUDITORS

Susan Jones
Ernst & Young, Auckland, on behalf of the Auditor-General

BANKERS

ANZ Bank of New Zealand

SOLICITORS

Bell Gully, Auckland

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