



LIVING LAKE SYMPOSIUM

Te Waihora/Lake Ellesmere 2013 - measure to manage

Lincoln University (November 7 & 8, 2013)

PROGRAMME

The Waihora Ellesmere Trust is delighted to
welcome you to the
fourth Living Lake symposium.

Many thanks to all our sponsors and to all the
people who have contributed to the planning and
organising of this symposium.



waihora ellesmere
trust

Day 1 –Thursday November 7th
Chaired by Prof. Jenny-Webster-Brown

8.00am	Registration desk opens	
9.00am	Mihi whakatau Opening of symposium	Te Taumutu Rūnanga Craig Pauling, Ngāi Tahu Hon Amy Adams, Minister for the Environment, MP for Selwyn
9.40am	Session 1 Keynote address – Setting the Scene	Clive Howard-Williams (NIWA)
10.15am	Morning tea	
10.45am	Session 2 Measure to manage..... Introducing the symposium	Ken Hughey Lincoln (University/WET) & Ken Taylor (ECan)
11.00am	Governance & management	David Perenara O'Connell (ECan)
11.15am	Current lake level management	Dan Harrison/Leigh Skerten (ECan)
11.30am	Land cover and land use	Kirsty Johnston/Ian Brown (ECan)
11.45am	Economy	Ken Hughey (WET/LU), Mayor Kelvin Coe, Selwyn
12.00pm	Recreation	Ken Hughey (WET/LU)
12.30pm	Lunch	
1.30pm	Fish & Game's involvement	Emily Moore (F&G)
1.45pm	Session 3 Water	Tim Davie (ECan)
2.15pm	Ground water fauna	Graham Fenwick (NIWA)
2.25pm	Vegetation	Philip Grove (ECan)
2.40pm	Lake wildlife	Ken Hughey (WET/LU), Anita Spencer (DOC), Fraser Maddigan (DOC)
3.00pm	Afternoon tea	
3.30pm	Session 4 Fish	Hamish Rennie (LU) Anita Spencer (DOC)
3.45pm	Cultural health	Gail Tipa (Ngai Tahu)
4.15	Instruction for planting/BBQ	
4.25	Day 1 ends – make own way to the lake (some transport can be arranged if required)	
5pm - 8pm	Planting at the lake, talks from experts, BBQ dinner	Ngāi Tahu/DOC

Day 2 –Friday November 8th Chaired by Ian Whitehouse

8.00am	Registration desk opens	
9.00am	Welcome	
9.05am	Recap of Day 1	Ken Hughey, (WET/LU) & Ken Taylor, (ECan)
9.20am	Session 1 – Keynote 2 Managing the Rotorua Lakes	Andy Bruere (EBOP)
9.50am	Session Selwyn-Waihora sub regional section of the CLWRP	Pat McEvedy & other zone committee members
10.10am	Morning tea	
10.40am	<u>Community Initiatives</u> TAK WET Te Waihora Management Board	Brooke Turner (TAK) Brett Painter (WET) TWMB
11.10am	<u>Primary sector initiatives</u> Fonterra/DOC Partnership - –Synlait - Leading With Pride™ DairyNZ – Sustainable Dairying Water Accord CPWr Enhancement Scheme	Leana Hunt/Richard Suggate (Fonterra/DOC) David Williams (Synlait) Shirley Hayward (DairyNZ) Susan Goodfellow (CPW)
11.40am	<u>Council programmes</u> ECan SDC CCC	Jo Abbott (ECan) Andrew Mactier (SDC) Paul Devlin (CCC)
12.00pm	Lunch	
1.00pm	Session 3 <u>Central Govt/local/Ngai Tahu partnership</u> Whakaora Te Waihora –	Amanda Ward (WTW), Tim Davie (ECan, WTW science team leader)
1.45pm	<u>Other management and research</u>	Jenny Webster-Brown (Waterways Centre), James Griffiths, Robin Smith, Craig Alexander (DOC)
2.30	Summary of main themes emerging from both days The take home messages	Jenny Webster-Brown
2.45	Closing remarks, poroporoaki	
3.00pm	Refreshments & networking	
3 - 4.30pm	Networking/socialising Waihora Ellesmere Trust - 10th anniversary - cutting of the cake! Te Waihora Art Exhibition - presentation of awards	Kelvin Coe, SDC Mayor

Day 1 –Thursday November 7th , 2013
Chaired by Jenny-Webster Brown

9:40 am **Keynote address – Setting The Scene**
Dr Clive Howard-Williams & Scott Larned (co- author)
National Institute of Water and Atmospheric Research Ltd
Clive.Howard-Williams@niwa.co.nz

We've seen from previous Symposia that Te Waihora and its catchment are influenced by a complex set of both physical and governance challenges and impacts. Taking a high level view of the catchment, we will recap the the past Symposia and look again at the implications arising from them.

The intentions for this symposium, with its subtitle "Measure to Manage", will be considered, including looking at information from the latest initiatives from the Zone Committees and ECan planning framework. If one of our aims is to strengthen links between science, management and the community, the key question in mind will be - how effective are these interventions?

We will then provide a closer look at one special issue - the catchment's Lowland Streams, looking at the issues associated with them and addressing what is proposed for these, and what are the solutions for the future to better manage the inflows to the lake.

10:45 am **Measure to Manage.....**
Ken Hughey - WET/Lincoln University & **Ken Taylor** - Environment Canterbury
Ken.Hughey@lincoln.ac.nz and ken.taylor@ecan.govt.nz

Introducing the symposium and the State of the Lake and Environs report.

11:00am **Governance & Management**
David Perenara O'Connell - Environment Canterbury
David.Perenara-O'Connell@ecan.govt.nz

A walk through the complex interrelationships of the many agencies and groups engaged in the governance and management of Te Waihora and its catchment.

11:15am **Lake Level Management**
Dan Harrison and Leigh Skerten - Environment Canterbury
dan.harrison@ecan.govt.nz and leigh.skerten@ecan.govt.nz

Originally Te Waihora/Lake Ellesmere opened naturally when the lake water overtopped the beach crest at a level of approximately 4m amsl. In pre-European times local iwi opened the lake at Taumutu to reduce flooding and facilitate fish migration. The lake is still opened at Taumutu in 2013, nowadays using heavy machinery. Among other things, sea swells, tides, wind direction, and water level determine whether an opening will be successful. Environment Canterbury engineering staff will explain what a successful lake opening involves and some of the challenges faced.

11:30 am **Land use and land cover: Te Waihora/Lake Ellesmere**
– State of the Lake 2013
Kirsty Johnston with Ian Brown, Michael Fletcher, Zach Hill, Ognjen Mojsilovic and Howard Williams - Environment Canterbury kirsty.johnston@ecan.govt.nz

Catchment land use and land cover, past, present and future, are inextricably linked with the state of Te Waihora/Lake Ellesmere and its environs. For state of the lake reporting it is important to consider land not simply from the perspective of its economic value, but also from the perspective of the pressures that arise from deriving such value, and our responses to these. A state of the lake report should include indicators giving useful detail of land cover, land use and land use intensity.

We determine changes in land indicators using the Land Cover Database, AgriBase®, resource consent information and Statistics New Zealand agricultural data. A minimum set of land indicators for on-going state

of the lake reporting is recommended. Improvements are suggested to enhance our understanding of what land related drivers and activities across the catchment influence the state of the lake.

11:45am Economy

Ken Hughey - WET/Lincoln University Ken.Hughey@lincoln.ac.nz

Selwyn District has been chosen as the basis for measuring economic performance, which is appropriate as many of the drivers of change associated with the lake are linked to the district and its ongoing development. Thirteen indicators, variously linked to pressures, state and responses, are identified and reported on. The indicators range from GDP to the economic value of recreational use of the lake – changes over time are reported where possible on an annual basis. Recommendations about ongoing monitoring and reporting biennially are made.

Kelvin Coe, mayor of Selwyn District Council, will also talk about economic growth in Selwyn and how the council is ensuring impacts on the environment are minimised.

12:00pm Recreation

Ken Hughey - WET/Lincoln University Ken.Hughey@lincoln.ac.nz

Key activities associated with Te Waihora/Lake Ellesmere are boating, trout fishing, game bird hunting, cycling, bird watching and walking. Current use levels are around 27,000 user days annually. Numbers of users are much less now than in the 1920s-1970s, partly due to huge declines in boating and trout angling - for trout angling this is because of a huge reduction in trout numbers. The most recent growth activity is cycling due to development of the Little River Rail Trail. Conflicts exist between users, i.e., year-round hunting of Canada geese because of the Government's decision to change the status of that species conflicts with bird watching (and bird conservation). Improved monitoring is needed so that the benefit of proposed management interventions, e.g., improved kayaking facilities, can be tracked.

1:30pm Fish & Game's involvement in the Te Waihora/Lake Ellesmere catchment

Emily Moore - Nth Canterbury Fish & Game emoore@fishandgame.org.nz

Fish & Game plays a varied role in the Te Waihora/Lake Ellesmere catchment. The organisation regulates the recreational harvest of gamebirds and sportsfish, and carries out population monitoring of these species. In addition Fish & Game manages maimais on the lake, helps to protect habitat for wildlife and facilitates access to hunting and fishing locations. The presentation will delve briefly into all of these aspects.

1:45pm Water - surface water & groundwater

Tim Davie - Environment Canterbury tim.davie@ecan.govt.nz

The catchment of Te Waihora/Lake Ellesmere stretches across the Canterbury plains and up to the foothills. This presentation will cover Environment Canterbury's water quality and quantity monitoring programmes, including the lake, main tributaries, and the groundwater. It includes a brief look at recreational water quality and algal blooms in the lake. Pressures on water quality and quantity, and the current response to these, will also be covered.

2:15pm Groundwater biodiversity: managing in a measurement vacuum?

Graham Fenwick - National Institute of Water and Atmospheric Research Ltd
Graham.Fenwick@niwa.co.nz

Alluvial aquifers throughout the world contain significant biodiversity that performs important ecosystem functions, especially enhancing water quality. Despite its high value for the region and its people, the Selwyn River aquifer system's biodiversity is very poorly defined making it difficult to meaningfully measure and assess its biodiversity status and ecosystem condition. Thus, managing this aquifer's very valuable water resources requires implementing plans and policies that recognise and value groundwater's biodiversity, functional ecology and ecosystem services.

2:25pm Lake margin vegetation

Philip Grove, Environment Canterbury Philip.grove@ecan.govt.nz

The importance of Te Waihora lake shore vegetation and wetland habitats is recognised in the revised Water Conservation Order. Repeat surveys of extent and type of lake shore vegetation can be used to monitor trends in its state, and so allow an assessment of both pressures on the lake shore vegetation and effectiveness of response actions. Results of the next lake shore survey, planned for 2017, will help show what progress has

been made towards achieving the stated goals of protection and restoration of indigenous vegetation of the lake margin and tributary streams.

2:40pm Lake wildlife

Ken Hughey - WET/Lincoln University Ken.Hughey@lincoln.ac.nz

The international standing of the birdlife of Te Waihora/Lake Ellesmere is well known, but much less known are the lizard and terrestrial and aquatic invertebrate fauna associated with Kaitorete Spit and the lake and its other environs. Counts of nine indicator species for birdlife are reported based on February-year total wetland bird counts during the period 1985-2013. The overall picture is one of a 'healthy' bird fauna at the lake although more effort is required to measure the benefits of predator control and also the state of the bittern population. Three of four lizard species being monitored on Kaitorete Spit appear to have healthy populations and work is being undertaken on two flightless moth species. Little is known about the population ecology of the 'lake fly' – while a 'pest' to cyclists it may well be pivotal in the food chain of many birds and fish?

Kaituna River great Australasian grebe protection project

Anita Spencer - Department of Conservation aspencer@doc.govt.nz

Australasian crested grebes have traditionally nested on high country lakes each summer and only used lowland waterways for over wintering, however, in 2005 this behaviour changed and the endangered grebes were reported nesting at Harts Creek and the Kaituna River. The Department of Conservation has been undertaking small scale predator control on the Kaituna River since 2007 to protect its population of nesting Australasian crested grebes from predation.

Kaitorete Spit – that land of eternal change

Fraser Maddigan - Department of Conservation fmaddigan@doc.govt.nz

Kaitorete Spit forms the north-eastern margin of Te Waihora and is one of the finest examples of intact indigenous coastal dune habitat remaining in New Zealand. It contains diverse threatened plant and animal species including numerous nationally and locally endemic plants, invertebrates and reptile species in a habitat that retains exceptional naturalness. The area is actively managed by the Department of Conservation to protect these values. This talk covers the recently established predator control and monitoring programme that aims to reduce the impact of introduced mammalian predators on the species that call the spit home.

3:30pm Native Fish and Fisheries

Hamish Rennie - Lincoln University Hamish.Rennie@lincoln.ac.nz

Forty-seven resident or migratory species of fish have been recorded in Te Waihora or its tributaries. Shortfinned eels and flounder are the most important commercially and appear to be sustainably harvested. Habitat and catch are actively managed (e.g., through the lake opening regime, closed areas and Tiaki and Quota Management Systems), but there is a need for a monitoring programme which gathers data on size, distribution and abundance of key species, including pests, and their critical habitat parameters.

Canterbury mudfish surveys

Anita Spencer - Department of Conservation aspencer@doc.govt.nz

Canterbury mudfish are one of New Zealand's most endangered fish and have the top threat ranking of nationally critical. In 2011 and 2012 the Department of Conservation employed Dr Leanne O'Brien to survey new areas for mudfish in an effort to increase our knowledge of their population size and distribution. The focus was on historic records such as some of the waterways that flow into Te Waihora.

3:45pm Te Waihora - Cultural Health

Gail Tipa

The focus of this presentation is a Report Card for the cultural health of the Te Waihora catchment, which encompasses a broad variety of landforms, landscapes, historic and contemporary uses, and flora and fauna – all of which underpin and influence the cultural identity of Ngāi Tahu whanui. We acknowledge that the catchment is highly significant to its many residents and communities, some of whom have underway long-running restoration programmes. In effect the cultural perspective given is a manawhenua perspective.

Report Cards are a valuable tool for tracking and communicating catchment condition to residents, tangata whenua, stakeholders, and decision-makers. The basic steps used to prepare this report were to:

- Identify the goals and objectives for the catchment as previously articulated by manawhenua;
- Select indicators for each objective that correspond to these goals and objectives.

The Report Card summarizes the status of key indicators in the catchment to measure catchment condition. Report Card values range from 1, reflecting poor condition / process, to 5, reflecting excellent condition / process, for each indicator within each sub-catchment. The scores awarded confirm that there are a number of concerns with respect to catchment health, but it also acknowledges that there are a number of initiatives underway.

The framework (based on goals and objectives) for this report card is "interim". The Te Waihora Management Board has signalled they are keen to engage in a participatory process over the 1-2 years to develop a report card framework for the catchment.

Day 2 –Friday November 8th 2013
Chaired by Ian Whitehouse

9:20am Keynote Address - How Far Can We Go?

Andy Bruere, Lake Operations Manager, Bay of Plenty Regional Council

Andy.Bruere@envbop.govt.nz

Is it important to act early to stop the deterioration of our lakes and rivers or do we have sufficient tools to recover any lake from the effects of eutrophication? Once a lake has become eutrophic is the process of recovery complicated by internal nutrient recycling? Through the process of lake recovery will we experience a transition from one problem to a new challenge on community expectations?

In the 1960s and 70s Lake Rotorua was being labelled as polluted due to the discharge of poorly treated waste water reaching the lake. An early study of Lakes Rotorua and Rotoiti from 1967 formed an initial basis for understanding that Lake Rotorua was starting to change. In 1990 after much community debate sewage effluent from Rotorua City was treated via an advanced nutrient stripping process before being discharged by irrigation to the forest. Generally this was seen as the main action to save Lake Rotorua. However, it wasn't until the late 1990s that catchment land use was identified as a significant contribution to the decline in Lake Rotorua and other lakes around the district. About this time other lakes started to experience regular algal blooms that affected peoples use, enjoyment and perception of our lakes.

Our experience to date with the Rotorua programme is that with a range of restoration tools, success depends on the specific lake "behaviour", and the performance of some techniques has been unexpectedly spectacular.

We have now gained experience using different monitoring, modelling and restoration techniques. Our success is not only on the application of technology but also the engagement with our community who fund the projects. This requires an empathy with their perceptions of the important lake values and is often more encompassing than just water quality improvement.

Although we have some lakes in NZ that are seriously eutrophic, on a world scale many of our issues are relatively small and with the proper understanding of the science issues and community commitment we have an ideal platform to bring our lakes back from the edge.

9:50am CWMS ZIP and Selwyn-Waihora sub regional section from CLWRP
Pat McEvedy & other zone committee members

This presentation will describe the Selwyn Waihora "solution package". To deliver the Canterbury Water Management Strategy (CWMS) in Selwyn Waihora the Zone Committee is recommending a package to improve cultural and environmental outcomes in the lake and catchment while maintaining farm viability and economic growth. This solution package has been developed through engagement with a wide range of interests on options and pathways. This solution package is detailed in the Selwyn Waihora ZIP Addendum which has been endorsed by Environment Canterbury, Selwyn District Council and Christchurch City Council. The policies and rules to enable the solution package will be in the Selwyn Waihora sub-regional section of the proposed Canterbury Land and Water Regional Plan. This is expected to be notified in January 2014.

10:40am **Community Initiatives**

Three years on, is the Canterbury Plantout succeeding?

Brooke Turner - Te Ara Kakariki www.kakariki.org.nz

The Canterbury Plantout is a platform for conservation partners to jointly restore sites in the Selwyn River/Waikirikiri catchment. The Plantout is unique, as a collaborative landscape-scale approach to the reintroduction of native plant communities. Success has been monitored through planting and volunteer numbers going from 30 volunteers planting 1000 native plants in 2009 to 540 volunteers planting 8500 native plants in 2013.

This has been achieved thanks to our 2013 gold sponsors Whakaora Te Waihora, Ministry for Environment, silver sponsors WWF New Zealand, Fonterra, Canterbury Community Trust, and bronze sponsors Selwyn District Council, Environment Canterbury and The Isaac Conservation and Wildlife Trust.

Sustainable Drain Management Project

Brett Painter Waihora Ellesmere Trust brett.painter@ecan.govt.nz

The Sustainable Drain Management Project, a project initiated and led by Waihora Ellesmere Trust (WET), brought together a team from WET, Environment Canterbury, Selwyn District Council, Ngāi Tahu, Lincoln University, and the local community to develop a shared understanding of the drainage network – the current management practices, the scale and nature of issues associated with drains, and potential solutions. The project has included assisting landowners with riparian restoration planning and producing a range of resources. Details and resources are available from the WET website www.wet.org.nz.

TWMB Restoration programme Te Waihora Management Board

Since 2008 Te Waihora Management Board (TWMB) has managed and undertaken restoration activities at Te Waihora. These restoration efforts have helped to improve eco-cultural values at a number of sites on the lake margin, as well as enhancing the visitor experience and providing excellent demonstration sites.

11:10am **Catchment initiatives involving the Primary Sector**

Sustainable Dairying Within Healthy Ecosystems – Fonterra- Department of Conservation Partnership

Richard Suggate - Department of Conservation rsuggate@doc.govt.nz

Leana Hunt - Fonterra leana.hunt@fonterra.com

Fonterra and DOC have a common interest in protecting the health of New Zealand's waterways, so that all New Zealanders can benefit from the quality of our water and natural habitats. Fonterra and DOC are working together in 5 key catchments across New Zealand, sharing joint coordination of a \$20 million community investment fund over 10 years. Together, they will jointly administer and allocate funds to protect sensitive catchments and show how a sustainable dairying industry can exist alongside healthy, resilient ecosystems that together enrich the lives of all New Zealanders. Fonterra and Department of Conservation are working with farmers and the community around Te Waihora to identify opportunities to bring this vision to life in the catchment.

Synlait Milk, Leading With Pride™

David Williams - Synlait Milk Ltd David.Williams@synlait.com

In 2013 Synlait Milk launched their internationally accredited ISO 65 dairy farm assurance system called Lead With Pride™. Lead With Pride™ recognises and financially rewards milk suppliers that are certified as achieving dairy farming excellence by AsureQuality under the Lead With Pride™ system.

Suppliers must meet and in some cases exceed criteria about industry best practice across the four pillars of dairy farming: Environment, Animal Health and Welfare, Milk Quality and Social Responsibility. In return certified Lead With Pride™ suppliers are paid a financial incentive above the standard milk price depending on the certification level they are awarded.

Sustainable Dairying Water Accord

Shirley Hayward - DairyNZ Shirley.Hayward@dairynz.co.nz

A new set of national good management practice benchmarks aimed at lifting environmental performance on dairy farms has been agreed between DairyNZ and dairy companies, with the support and input from a wide range of industry stakeholders including Federated Farmers.

This Water Accord is a new, broader and more comprehensive commitment than the previous Clean Streams Accord that ended in 2012. It includes commitments to targeted riparian planting plans, effluent management, comprehensive standards for new dairy farms and measures to improve the efficiency of water and nutrient use on farms.

Read more: http://www.dairynz.co.nz/page/pageid/2145879933/Sustainable_Dairying_Water_Accord

Central Plains Water Enhancement Scheme

Susan Goodfellow - Central Plains Water Limited sgoodfellow@cpwl.co.nz

Measure to manage reflects the underlying philosophy of the Central Plains Water Ltd (CPWL) consents and the scheme environmental protocol, which require CPWL to monitor and measure water use, application and discharge of nutrients, ground and surface water level and quality monitoring. CPWL have commenced monitoring of water, and have commenced obtaining baseline nutrient data from shareholders. Compliance required by irrigators is outlined in CPWL's Water Use Agreement. CPWL shareholders/irrigators understand that CPWL have the ability to cut of water supply if any default is not remedied in a timely manner.

After 13 years of development, the Central Plains Water Ltd surface water irrigation scheme is ready to start construction.

11:40am Regional and District Council Programmes

Immediate Steps/Biodiversity project (CWMS Regional Committee Te Waihora Flagship project)

Jo Abbott - Environment Canterbury jo.abbott@ecan.govt.nz

The Immediate Steps (IMS) fund was set up as part of the Canterbury Water Management Strategy (CWMS) to fund 'on the ground' actions to protect and restore the region's biodiversity. The Regional Committee chose Te Waihora as one of their three 'flagship' projects, contributing over half a million dollars of IMS funds over a 5 year period. This project now sits within the wide Whakaora Te Waihora programme. The IMS funded component is split predominantly between planting and willow and weed control. These projects are now underway and the presentation will provide an update on progress.

Selwyn District Council – on the ground initiatives

Andrew Mactier Selwyn District Council Andrew.Mactier@selwyn.govt.nz

Selwyn District Council carries out a range of activities that assists in mitigating the adverse effects of development and which have a positive impact on the health and biodiversity of Te Waihora/Lake Ellesmere. These include stormwater management, land drainage management and a contestable natural environment fund aimed at protecting and enhancing indigenous natural biodiversity values within the District. Since 2006 the Fund has allocated over \$250,000 to 72 distinct projects within the whole district, with the majority being in the Te Waihora/Lake Ellesmere catchment. Recent years have seen an increase in the number of applications for projects re-establishing areas of native plantings.

Christchurch City Council Programmes

Paul Devlin Christchurch City Council Paul.Devlin@ccc.govt.nz

A significant portion of Te Waihora/Lake Ellesmere lies within the Christchurch City Council (CCC) area and is classified as a significant site under the District Plan. CCC undertakes various work programmes around the lake, including vegetation and bird monitoring, and pest control.

1:00pm Whakaora Te Waihora (WTW)

Amanda Ward - WTW Project Manager & **Tim Davie** - Environment Canterbury, WTW science team leader

Whakaora Te Waihora is a joint programme between Ngāi Tahu and Environment Canterbury. It is a shared commitment to the restoration and rejuvenation of the mauri and ecosystem health of Te Waihora. Initial funding was obtained based on the Joint Cultural and Ecological Restoration Plan (2011), which outlined the first five years of work. Key work streams include biodiversity (planting of native species, restoration work), science investigations and various Extension programmes. The first full year of work, focused on specific areas within the Te Waihora catchment, is completed with significant inroads made against planned milestones. Work is on track to meet 2013–2014 targets, including planning for the application for additional funding to move the programme into the next phase. Regular Whakaora Te Waihora up-dates will be provided on the website: tewaihora.org.

1:45pm Other Management and Research

An Overview of University Research on Te Waihora/Lake Ellesmere and its Catchment: 2011-2013

Jenny Webster-Brown Waterways Centre for Freshwater Management

Jenny.webster-brown@canterbury.ac.nz

Both Lincoln and Canterbury universities have active research programmes on Te Waihora/Lake Ellesmere, its tributaries and the neighbouring lake, Wairewa/Lake Forsyth. This research has largely been undertaken by postgraduate students, under the supervision of academic staff involved in various aspects of water systems research, and much has been achieved that is of direct relevance to lake restoration and management. The key results of research over the last two years are captured in this summary, updating the review presented in 2011, and the reference documents will be included in the new Te Waihora meta-database being constructed over the 2013/14 summer.

Recent university research of relevance to Te Waihora/Lake Ellesmere has included research on the evolution of the management regime for the lake, changing community attitudes towards the lake environment, the effectiveness of riparian restoration on farm drains and relationship between habitat condition and productivity, the nutrient limit setting approach, cyanobacteria and toxin generation, and the behaviour of phosphorous in coastal lake systems. A summary of proposed university research and initiatives will also be briefly described.

DOC's Willow Control Programme - reducing the willow pressure, protecting Te Waihora/Lake Ellesmere freshwater wetlands

James Griffiths, Robin Smith and Craig Alexander - Department of Conservation

jgriffiths@doc.govt.nz, rsmith@doc.govt.nz & calexander@doc.govt.nz

Exotic grey (*Salix cinerea*) and crack (*S. fragilis*) willow are major ecological weeds of freshwater wetland, riparian and lakeshore habitats. Between the early 1980s and 2007 grey and crack willow at Te Waihora increased from 67 ha to 170 ha. In 2012 DOC, Ngāi Tahu and Environment Canterbury prepared a Te Waihora Weed and Willow Control Strategy. With Immediate Steps Biodiversity funding DOC embarked on a control programme on public conservation land primarily focused on outlier and scattered willow and control in sites of highest ecological value. Both ground based and aerial control was employed. Output and outcome monitoring were initiated as part of the programme.

The Next Living lake Symposium is planned for November 2015 – we hope to see you there.

Thank you to

Our partners:

The Living Lake Symposium 2013 is hosted by the Waihora Ellesmere Trust with support from Environment Canterbury, Ngāi Tahu, Lincoln University, Department of Conservation, Christchurch City Council, Fish & Game NZ, and Selwyn District Council.



Department of
Conservation
Te Papa Atawhai



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- Bronze Sponsors:
Central Plains Water Ltd; Ngāi Tahu Property; Te Whāriki



NGĀI TAHU Property

The symposium organising team

In particular: Ken Hughey, Kirsty Johnston, Adrienne Lomax, Robin Smith, Andy Spanton, Ken Taylor, Amanda Ward, Rebecca Ward, Ian Whitehouse, and Belinda Whyte, plus the many other helpers and volunteers.

Thank you to Te Ara Kākāriki for lending us plates and utensils for the BBQ, to Leeston Playcentre for help with the catering, and thank you to Straight 8 Estate for their kind donation of wine.

Have you visited the Art Exhibition Te Waihora, Expressions of the Living Lake?

Please take a few minutes to view the paintings, photographs, sculptures and Maori art forms entered in this exhibition by local artists. You can vote for the 'People's Choice' award, to be presented on Friday afternoon.

Thanks to Creative Communities, Selwyn District Council for their support and to the organising team of volunteers, in particular: Bronwen Jones, Judith Kidd, Brian Reid, and Clare Ryan, plus a number of other helpers. And finally, thanks to our Art Award sponsors – ASB, Te Waihora Management Board, and the Smiths.

