Restoring Wetlands Research Programme Update 1: October 2010 - June 2011

Bev Clarkson

The following is a summary of achievements during the first 9 months of our 6-year wetland research programme funded by MSI (formerly FRST). For further information email Bev Clarkson at clarksonb@landcareresearch.co.nz.

Planning Meeting

We held our inaugural planning meeting on 11 November 2010 at Landcare Research, Hamilton. There were 28 attendees, including the research team, Steering Advice Group (Advisory Group), major end users, and others interested in restoring wetlands. The meeting focused on planned research over the six years of the programme, the role of the Advisory Group, and the draft Research Plan. It also covered current freshwater directions and initiatives in New Zealand that provide opportunities for synergy and collaboration with our programme research.

Research Plan

This is now completed and available for dissemination. It outlines the critical steps, main deliverables, responsibilities of wetland programme members and partners, and summarises individual tasks by year. Thanks to all for the valued input.

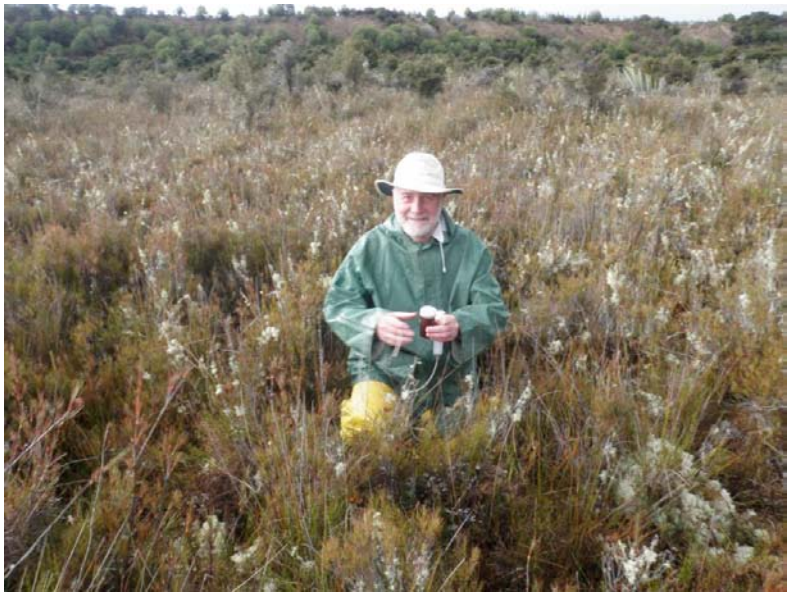
Fertiliser Experiment

Chris Tanner, Kerry Bodmin, Scott Bartlam, Bev Clarkson and James Sukias harvested our fertiliser experiment after 3.5 years. The experiment was set up to determine whether wetlands along a successional gradient are N- or P- or co-limited as Northern Hemisphere studies have shown early successional wetlands are N- limited and late successional wetlands are P-limited. The experiment will also test the efficacy of the N:P ratio as an indicator of N- or P- or co-limitation This is based on NH studies in wetlands which have shown N:P<13 indicates N-limitation, N:P>16 indicates P-limitation, and N:P 13–16 indicates co-limitation or no limitation. We have three study sites: Toreparu Swamp (near Raglan) - early succession; Whangamarino fen (near Meremere) - mid succession; Kopuatai Bog (Hauraki Plains) - late succession. The samples are currently being analysed.

Scott helping with fertiliser experiment harvest, Toreparu

International Collaboration/ Sabbatical Visitor

Professor Tim Moore, an internationally renowned peatland researcher from McGill University, Montreal, Canada was on sabbatical leave at Landcare Research, Hamilton from January to April 2011. Several collaborative projects were undertaken, including harvesting a 5-year litter bag experiment set up during his last visit in 2006. The experiment investigated the rates of litter decomposition of the important peat forming plant litters in wetlands representing different successional (and nutrient) phases and including litter from a Northern Hemisphere wetland species (*Typha latifolia*) to allow NH comparisons. Results showed surface decomposition rates decreased from early to late successional species, and buried decomposition rates increased from early to late successional sites, and decreased as % saturation increased, similar to NH wetlands. More disturbingly, the results indicate that any lowering of the water table (an on-going threat in New Zealand wetlands) speeds up decomposition, which can lead to significant increases in carbon being released, thus potentially contributing to global warming.



Tim Moore taking water samples in Southland peatlands

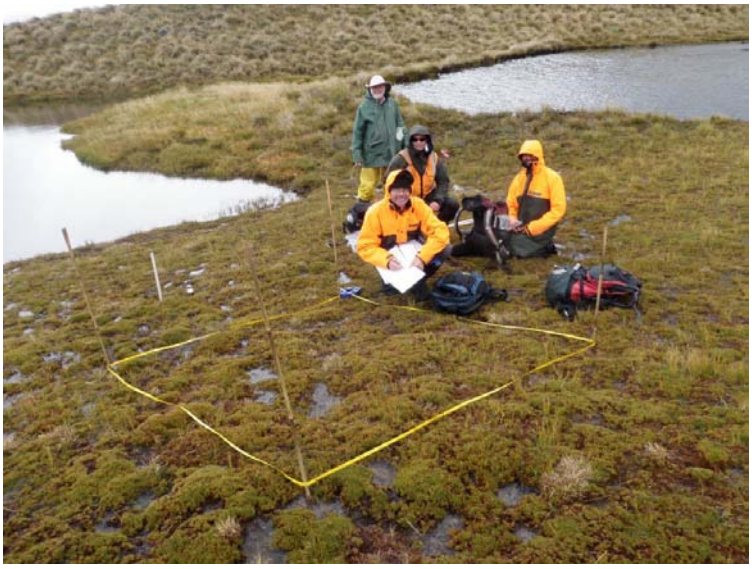
C exchange PhD Scholarship

This was advertised internationally and generated significant interest from several high quality candidates. The successful applicant was Jordan Goodrich from University of New Hampshire, USA, who has an excellent background in biogeochemistry research in peatlands for his MSc. Jordan will be undertaking a 2-week Fluxnet summer school (flux measurements, modelling, remote sensing etc) in Colorado in early July and he will then start his fieldwork in Waikato bogs (Kopuatai) in September 2011. Thanks to Dave Campbell and the rest of the University of Waikato team for organising this.

Southland Wetlands Visit

Several wetland programme members visited Southland in February to collaborate on various wetland projects. These included sampling new wetlands to add to our NZ wetlands database, completing a FENZ/WONI wetland mapping exercise with local DOC and Environment Southland staff, as well as field visits and discussions of wetland issues, assessing possibilities for new Ramsar nominations, and how to best integrate the DOC Arawai Kakariki project at Awarua/Waituna into our wetland

programme. Southland is without doubt a stronghold for NZ wetlands, with the cluster of the extensive and unique wetlands in the Te Anau basin deserving recognition as being internationally significant. Thanks to Brian Rance, Hugh Robertson, Chris Rance, George Ledgard, Sanjay Thakur, Bonnie Rowell, Hamish Ogilvie, Scott, Tim and others who organised and participated in the visit.



Tim, Brian, Scott and Sanjay sampling the cushion bog on Mt Burns, Fiordland National Park

Whangamarino Experiment

Kerry Bodmin, Corinne Watts, Scott Bartlam, Danny Thornburrow, Alastair Suren, Janine Welch, Bev Clarkson, Matt Brady and Kevin Hutchinson set up a BACI design (Before-After-Control-Impact) experiment at Whangamarino (aligned with the DOC Arawai Kakariki project) on determining the effects of willow control on vegetation and invertebrates (aquatic and terrestrial), with the long-term goal of restoring wetland biodiversity. This year we are conducting baseline surveys before the spraying by DOC of half the experimental block in February 2012.

One of Corinne's malaise traps set up at Whangamarino for sampling invertebrates

Waikato-Tainui Research Progress

There has been good progress on research collaborations with Waikato-Tainui over the past few months thanks to Cheri van Schravendijk and the rest of the Waikato Raupatu River Trust team. We have attended hui with Huakina Management Committee and Waahi Whanui Trust to introduce the wetland programme and initiate discussions on research opportunities. We participated in an inspirational 2-day waananga with Nga Muka at Maurea Marae (Rangiriri) in which mana whenua shared their history with programme members and our DOC partners, who, in turn, shared their research relevant to the Whangamarino/Rangiriri rohe. Fruitful discussions resulted in several potential restoration projects and collaborations. We thank Moko Tauariki and the Maurea Marae committee and whanau for organising the wananga, and thanks also to presenters and participants.

Some of the attendees of the waananga at Maurea Marae. Photo: Chris Tanner

Waikato-Tainui Technical Training Scholarships

Cheri has also been busy organising a 1-year Certificate of Technology course at WINTEC specialising in wetland technical skills for tribal members. The wetland programme, through the Waikato-Tainui subcontract, is providing 2 scholarships for students to gain wetland skills through work placements with programme members and partners. The successful candidates are Joshua Ormsby and Jonathon Brown, and they start their course in July 2011. We look forward to working with Joshua and Jonathon over the next 12 months.

Student Research International Collaboration

In January-February 2011 we hosted MSc student, Lars Hansen, from Aarhus University, Denmark. Brian Sorrell, our ex wetland programme member, is Lars' supervisor. Lars is investigating the influence of different fertiliser applications (N, P, N+P, 0) on photosynthetic rates of wetland species (mainly *Typha orientalis*, *Phormium tenax*) at Toreparu Swamp, aligned with our long-term fertiliser experiment. Thanks to Scott Bartlam for providing field and technical assistance.