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New Zealand Freshwater Sciences Society Newsletter

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Introduction to the Society

The New Zealand Limnological Society was formed at a meeting in Christchurch in January 1968. It was renamed the New Zealand Freshwater Sciences Society[1] (NZFSS) in 2005 to reflect the broad interests of the membership. Its fundamental aims since inception have been to promote a common meeting ground for freshwater workers in New Zealand and to encourage and promote the exchange of news and views among them. In particular, a newsletter and a list of research workers and their interests is compiled and circulated at least once per year and an annual conference is held. The 2006 subscription is $40.00 per annum (student/unwaged/retired persons rate is $10.00 per annum; life membership is $1000.00).

The committee for 2005-2007 is:

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[1] NZ Freshwater Sciences Society is the trading name of the New Zealand Limnological Society (Incorporated)

Editorial

Welcome to the 43rd edition of the Freshwater Sciences Society Newsletter.

Thanks as always to all those who managed to get their contributions to me. I know it's not an easy task for the organisational coordinators to round up the science news of colleagues. It does seem that no matter how much notice is given, the deadline for contributions is hard to meet. I guess it's important to remember what the purpose of this newsletter is – to give society members the chance to tell other members about their science activities for the past year. If you're unable to attend the conference, then this is a pretty good way of informing a large number of people in one hit (we have around 350 members). So if you've not been able to contribute this time round, give some thought to doing so next time.

You'll find details of all members towards the back of the newsletter. Please check to see we've got your latest contact and research details correct. Contact Brian Sorrell (b.sorrell@niwa.co.nz) with any changes. It's important that we maintain an up-to-date listing of all society members.

Happy reading and I look forward to seeing you all in Rotorua.

Ngaire Phillips

Newsletter Editor, New Zealand Freshwater Sciences Society

From the web

Currently the webpages are mostly being used to access conference information and for online registration/abstract submission. With the frequent email updates, the bulletin board has hardly been used this year. I would like to start revamping parts of the webpages soon so if there is any new information members would like to see posted online, please let me know. Any ideas would be much appreciated!

Cheers,

David

President's comment

The public profile of science in water management is likely to remain high in the immediate future. The Government's Sustainable Programme of Action on freshwater management is now at a critical stage, with detailed plans being made by officials and interested parties, with varying inputs from scientists. Research and management 'experts' in water quality and standards, water flow and level setting and outlining methods of prioritising water bodies of importance are hard at work drafting possible National Environmental Standards or National Policy Statements. Many of these people are Society members; with this year's conference being a good opportunity to consider some of the issues confronting these advisors to Government. Some hard decisions will need to be made on the framework and to see how freshwater protection can be aligned with economic development; especially over water allocation, the utility of market mechanisms and the vexed question of limits on land uses to protect water quality from diffuse source contamination.

Concerns about freshwater management are growing in the wider community. Social research led by Professor Ken Hughey from Lincoln University indicates that New Zealanders are more likely to cite a decline in the quality of lakes and rivers over the last 5 years by comparison with any other environmental issues. New Zealanders perceive our waters should be swimmable and fishable; they are increasingly concerned to find that our waters may not be.

Those attending our annual conference will hear from the members of the Rotorua Lakes Water Quality Society, which is a citizen's body determined to make improvements in water management in their area. Canterbury's Water Rights Trust has also emerged from citizen's concerns with the demise of lowland water bodies there. The most recent citizen's initiative appears to be a groundswell of concern about water quality in the Manawatu. This initiative is unusual in the extent of involvement from scientists leading, providing information on and publicly expressing views on these issues.

Clearly freshwater science will receive impetus from central and local government in the light of these concerns. Many issues, such as water quality decline in the major North Island lakes, were predicted by researchers one or more decades ago, as long term issues needing to be addressed. That they were not dealt with then shows that for action to occur, the issues need to be seen as politically important. That opportunity now exists; politicians want to know what can be done to address the concerns raised. There has never been a better time for science to carefully and succinctly summarise the issues and best practicable options to address these. Many of us have opportunity to engage with this process; who is better qualified to do so? I leave you with the thought of how you will contribute to better freshwater management in your dealings with government, industry and the community.

Neil Deans

President

New Zealand Freshwater Sciences Society

Research news

Crown Research Institutes

Cawthron Institute

Joe Hay has now finished building his house and is back in action at work with a variety of projects including assisting Horizons Regional Council with flow management decisions, modelling the impacts of didymo on trout populations, and providing advice on environmental flow regimes for the Waimea Water Augmentation committee. Joe also presented evidence on the habitat requirements of dwarf galaxias at the hearing relating to TrustPower's application for a hydro scheme on the Wairau River.

John Hayes has just returned from a successful whitebaiting trip to the West Coast, and is getting back into a large number of projects including the didymo impacts work, Wairau Hearing, Canterbury strategic water study, stream habitat assessment methods and various other hydro-development proposals around the country. He has also been assisting **Ian Jowett** with the preparation of a guide to instream habitat modelling and providing advice to several regional councils on flow regimes and water allocation management. Amongst all that John has been trying to keep abreast of his FRST research commitments related to the 'Salmonid fisheries and supporting ecoystems' programme. He and **Joe Hay** have been developing rainbow trout habitat suitabilility criteria for instream habitat modelling (IFIM) with heaps of support from Hawke's Bay Regional Council and Hawke's Bay Fish and Game. John and Joe have also been continuing another objective: a long-term study of juvenile brown trout population dynamics in a tributary of the Motueka River to determine the effects of low flows, flow variability, food supply and water temperature on trout growth, survival and production.

Dean Olsen has been at Cawthron for just over a year now and quickly become involved in a wide variety of projects ranging from various consent monitoring jobs through to presentation of evidence at the TrustPower Wairau hearing. He has also continued his interest in groundwater-surface water interactions working with **Roger Young, Tim Davie** (Landcare Research), **Timothy Hong** (GNS) and **Joseph Thomas** (Tasman District Council) as part of the Motueka Integrated Catchment Management (ICM) project. Dean is also assisting **John Stark** with work on flow variability and biotic indices as part of NIWA's Water Allocation programme.

Aaron Quarterman continues to provide technical support to the Freshwater/Coastal group at Cawthron and is developing his skills in GIS.

Karen Shearer has been heavily involved in the didymo impacts work with **John Hayes** and **Joe Hay**. In particular, she has been looking at variations in invertebrate drift between river reaches with extensive, minor and no didymo. Karen has also been working on a several biomonitoring jobs, often relating to oxidation pond discharges. Karen also continues to manage the invertebrate sample processing laboratory at Cawthron.

John Stark has been busy preparing a user guide to the MCI with MfE funding and has submitted a manuscript to NZJMFR describing the MCI-sb - a new biotic index for NZ's

soft-bottomed streams. Both of these efforts have been in collaboration with **John Maxted** (ex ARC now South Florida Water Management District). John has also been conducting work for Meridian Energy on macroinvertebrate communities in the Waitaki River, in collaboration with **Alastair Suren,** and is continuing research on the effects of flow variability and season on biotic indices in collaboration with NIWA's Water Allocation FRST programme.

Yvonne Stark continues her role in the laboratory, processing invertebrate samples from around the country. She is ably assisted by four part-timers (**Bernie Babe, Anne Biggs, Pam Pask, & Barry Thomas**). Much of this work is related to SoE samples for Regional Councils, although there are always samples related to specific projects.

Rowan Strickland continues to manage Cawthron's Coastal/Freshwater group and has been instrumental in providing the Freshwater staff with permanent office accommodation after spending the last few years in Portacoms. Despite the demands of the management team, Rowan is still involved with the NIWA scientific dive courses and contributes to various other projects including some recent work on fish passage through tide gates.

Susie Wood is continuing work on her FRST funded postdoc in collaboration with **Prof. David Hamilton, Prof Craig Cary and Andreas Rueckert** (Waikato University). Work to date has focused on developing and comparing molecular tools to assess and quantify changes in cyanobacterial community dynamics of lakes.

Roger Young continues to explore the use of functional indicators for measuring river ecosystem health. Some recent work has involved interpreting dissolved oxygen records from ARC's continuous monitoring network, relating dissolved oxygen dynamics with river health in the Motupipi River (Golden Bay), and assessing the utility of wood decomposition rates for monitoring the effects of point source discharges. Roger is looking forward to being involved in interagency projects on indicators of successful stream restoration and linking measures of human pressure with freshwater ecosystem integrity. Over the last year Roger has assisted several councils with flow management, water quality issues and SoE reporting. Roger also continues his involvement in various studies conducted as part of the Motueka ICM research project and has enjoyed acting as the 'participation coach' in an online discussion group involving scientists, resource managers and the wider community. Other ICM initiatives have included further meetings of the 'learning group' on sediment sources, movement and impacts, involvement with Motueka iwi on scientific and cultural indicators of river health, and research on fish movement and groundwater/surface water interactions.

Compiled by Roger Young

Landcare Research, Auckland

Stephen Moore is part of the urban team based at the Tamaki office of Landcare Research. He continues to assess the effects of urban development in the Auckland Region, but his sampling area has recently expanded somewhat to Brunei and Papua New Guinea. The Brunei project was a study of the state of the country's major water supply river with MWH, and will be followed up by further studies in other major rivers. The PNG project was an assessment of the effects of the oil palm industry on freshwater life in the West New Britain and Northern Provinces.

The steady supply of invertebrates from samples sent to Stephen from all over NZ, and from the overseas trips has kept him locked away in the photomicroscope room for long periods. Images of all taxa identified during these projects will appear on the Landcare Research web site www.landcareresearch.co.nz .

Compiled by Stephen Moore

NIWA Christchurch

Barry Biggs has taken up a new position on the NIWA Executive as General Manager - Environmental Information & International. This involves developing new areas of focus for NIWA in the development of environmental information systems and services. This covers activities that range from climate to freshwaters to ocean processes. Pacific and Asia are the main focus of the International portfolio and involves developing many community and governmental partnership arrangements for funding and studies. This has already involved several trips off-shore...and this will likely increase over the next year. Evenings and weekends are taken up with a heavy involvement in planning and guiding studies for Biosecurity NZ's response on didymo, as well as contributing to many ecohydraulics studies. Barry is also joining with Ian Jowett to organise and chair the 6th International Symposium on Ecohydraulics in Christchurch next February with over 400 attendees expected.

Eric Graynoth is studying the instream flow requirements of shortfin and longfin eels using both GIS based regression models and GAM's based on nocturnal habitat preferences. He is also developing a freshwater eel population simulation model for fisheries scientists, eel managers and iwi. Recent studies have provided further evidence that longfin eel recruitment is declining in the West Coast, Southland and Otago. Field work in the Waipara River in Canterbury on the impacts of summer low flows on the diet and food consumption rates of seven species of native fish has concluded and he is now analysing the results for presentation at the Ecohydraulics Symposium in February.

Roddy Henderson's main freshwater interests centre on his low flow model that he presented at the Nelson conference. He has spent most of his time recently working on the Regional Riskscape system with other NIWA and GNS colleagues, or engaged in commercial work on a variety of potential hydro development investigations. The major one of these was the Meridian North Bank Tunnel Concept work, with submissions to the Waitaki Catchment

Water Allocation Board, and stakeholder workshops. A number of small and medium Envirolink projects have been initiated in the area of water resource assessment, and are proving very rewarding as a mechanism for fostering communication between research and application, and keeping us in touch with real world problems.

Don Jellyman is heading up a joint NIWA-Ngai Tahu research programme on Te Waihora (Lake Ellesmere), developing Cultural Health Indicators of the status and well-being of the lake, investigating the food web dynamics, and the impact of timing of lake openings on recruitment of eels and flounders. Three migratory longfin female eels were tagged with pop-up tags, and released in May 2006 - unfortunately all three tags ascended earlier than programmed (as the tethers broke), but we obtained an excellent time series of diel swimming depths. A particle dispersal model of eel larval drift in the South Pacific (being developed with Melissa Bowen, NIWA, Wellington) is showing much promise in delimiting probable spawning areas of eels. Much of Don's time this past year has been involved with impacts of potential hydro schemes, and group management.

Karen Robinson has spent most of the past year working on *Didymosphenia geminata*. This has involved experimental work for Biosecurity NZ on potential chemicals for eradication or control, and sampling and identification for NZ-wide surveys tracking its spread, as well as routine monitoring for didymo for BNZ and other organisations. If not didymo, then other routine algae identification has also been underway, as well as some freshwater mesozooplankton work.

Brian Sorrell's research interests continue to focus on shallow aquatic environments. This includes species-environment models for macrophytes, algae and invertebrates, as well as restoration ecology, in wetlands (with **Bev Clarkson** at Landcare Research, and **Alastair Suren** and **Donna Sutherland**). Lake ecology work includes work on the role of littoral macrophyte productivity and decomposition on nutrient cycling, and factors leading to macrophyte stress and collapse in switches from macrophyte to algal dominance. He has also spent much of the last year on a range of consultancy projects on lakes and wetlands, including reviewing lake water quality for MfE, as well as providing advice on environmental effects of wetland conversions and wetland restoration for DoC and other clients.

Bob Spigel has been working with **Brian Sorrell** and **Donna Sutherland** on the role of littoral vegetation in Lake Okareka. He has measured onshore-offshore temperature gradients and carried out a small dye release to try and understand circulation patterns that control nutrient exchange between the littoral and pelagic regions of the lake. Quantitative studies of these kinds of circulations are relatively few in number and have only been undertaken relatively recently. Of particular interest in Lake Okareka has been the role that boat lanes, cut by some residents through alongshore bands of *Eleocharis sphaecelata*, have in modifying onshore - offshore water movements. Preliminary work indicates that the modifications can be substantial, with most of the exchange being short-circuited through the boat lanes rather than filtering through the littoral vegetation. Bob has also been doing some work related to hydrodynamic influences on water colour and clarity in Lake Maraetai, and on intermittent thermal stratification in the Waiau arm of Lake Manapouri. Both of these systems present challenging opportunities for study of unique and fascinating hydrodynamic phenomena.

Compiled by Brian Sorrell

Bob Wilcock continues to coordinate the water quality aspects of the dairy catchments project, "Best Practice Dairy Catchments for Sustainable Growth" and has published a series of papers this year describing that work. Work on emissions of the greenhouse gases N_2O and CH_4 from lowland streams in agricultural catchments shows that at times they are potent sources of these gases with fluxes similar to wetlands. A summary of this work will be presented at NZFSS in Rotorua, this year.

John Quinn has continued his work on forestry effects on stream habitat and biota with **Dave Rowe** and **Aslan Wright-Stow** and has been involved in hearings on consents for pine forest harvesting on the Coromandel. He has maintained work on the long-term sustainable land management project at Whatawhata, with **Mike Dodd** (AgResearch) and **Brian Smith**, **Glenys Croker** and **Kerry Costley,** that now has data for five years post implementation and is showing some positive trends in economic and stream condition. **Jennifer Tank** (Notre Dame University, USA) visited Hamilton for 3 months over summer and worked with John and **Fleur Matheson** on fine sediment effects on nitrogen removal processes in Whatawhata experimental streams. **John** completed the first phase of the "Farms and waterway values" project (Dairy InSight) involving development of conceptual models of the links between dairy farm activities and waterway values in four catchments. The core science team included **Bob Wilcock** (NIWA), **Ross Monaghan** and **Keith Betteridge** (both of AgResearch) and regional council staff from Southland (**Scott Crawford**, and **Michelle White**), West Coast (**Jonny Horrox**), Canterbury (**Adrian Meredith**) and Taranaki (**Gary Bedford**). Stakeholder input was incorporated in these conceptual models and an initial Bayesian Belief Network was developed for the Bog Burn Catchment in Southland. John, **Steph Parkyn,** and **Sally Hobson** (AgFirst) ran a series of 13 woolshed workshops around the country on managing the effects of farm intensification on water. He also continued working with the steering group on Te Awa O Waitao Restoration project (involving **Landcare Trust** and **Tauranga iwi**), which has begun riparian fencing and planting along the lower part of the stream. This aims to learn more on how to merge western science and traditional Maori knowledge by supporting the local people in their restoration project.

Richard Storey is in his third year studying the ecology of intermittent streams on the Ruataniwha Plains of central Hawke's Bay. He spent last summer examining survival of invertebrate larvae and eggs in dry streambed sediments, surveying other dry season refuges (seeps, hyporheic zone, etc) and monitoring adult aquatic insect numbers at intermittent sites. He is now analysing these and last year's benthic data, and hopes soon to begin a new chapter of the research programme modelling the abundance and distribution of intermittent streams.

Mike Scarsbrook is making good progress with research into groundwater ecosystems in porous and karstic aquifers. A survey of springs and cave resurgences around Waitomo was completed over the summer and he has also initiated studies assessing tourism/recreation impacts on aquatic communities in caves. Mike and **Graham Fenwick** have completed a seasonal study of groundwater communities in shallow wells along the Selwyn River. Mike has been heavily involved with national State of the Environment reporting in the last year.

Sandy Elliott, **Rob Davies-Colley** and **Graham McBride** are conducting modelling studies of the transmission of Campylobacter through farmed landscapes, under contract to ESR. This is part of an overall effort to better understand the "delivery chain" of these pathogenic zoonotic bacteria from animals to humans.

Kit Rutherford has returned from CSIRO, Canberra, and leads the catchment nutrient modelling work in Rotorua and Taupo. The team, which includes **Dan Rucinski** and **Sanjay Wadhwa,** has completed development of a new model, ROTAN (ROtorua and TAupo Nitrogen model) for nitrogen generation and delivery to lakes which is being calibrated and tested in collaboration with AgResearch, Aqualinc, GNS – Science, Environment B.o.P and Environment Waikato. While in Australia, Kit worked on catchment water quality models and the effects of salinity on macroinvertebrates.

Rob Davies-Colley continues with research on aspects of water quality and habitat of streams and rivers, including faecal contamination and other impacts of livestock access, (with **John Nagels, Rebecca Stott** and others), stream shade modelling (with Kit Rutherford), large wood in streams (with **Mark Meleason**, ex NIWA), and the benefits (to water quality and habitat) of livestock exclusion and riparian restoration. A developing interest is the mobilisation of faecal contamination during floods (including work reported at NZFSS 2006) as it affects, particularly, shellfish aquaculture in estuaries. Rob is working on riparian management and water quality topics in Landcare Research's Integrated Catchment Management (ICM) research programme, centred on the Motueka River Catchment. He has made a foray back into aquatic optics with a study of light attenuation in New Zealand rivers 'piggy-backed' on the national rivers water quality network (reported at NZFSS 2006), and an optical modelling study with **Chuck Gallegos** (Smithsonian Environmental Institute of optically 'extreme' NZ lakes Pukaki and Tekapo *versus* Brunner and Hochstetter. He also works on disinfection in sustainable wastewater treatment "eco-technologies" (ponds and wetlands), and leads the 'Aquatic Pollution' Group at NIWA, Hamilton.

Aslan Wright-Stow has been working on a variety of projects including continuing research into the effects of exotic forestry harvesting with **John Quinn**. Aslan is continuing his work looking at the effects of CMA applied to the Desert Road and SW Central Plateau as a de-icing agent, and has been working on the impacts of dam maintenance (de-silting and deliming) at Masterton. He was awarded a technical training award to study for four weeks at the University of Lyon, France, in operational use of various groundwater sampling equipment, and information on development of sampling equipment specific to biodiversity assessment. This has lead to work on spring and karst systems in the Waikato. Aslan has become a scientific diver which has given him opportunity to work on a range of marine and lakes projects.

The Aquatic Plant Group continue a focus on freshwater biosecurity under the leadership of **John Clayton**, with current programmes to intercept future weed threats, commercialize a potential weed biocontrol agent, and further methods to manage existing freshwater pests. John and **Tracey Edwards** are refining the LakeSPI method to assess lake condition, while also implementing the standard method in additional regions. **Deb Hofstra** is overseeing work on a promising biocontrol agent for submerged weeds, together with John and Tracey. **Paul Champion** continues to refine weed risk assessment and surveillance methods for freshwater biosecurity, together with providing national level guidance on weed legislation (National Plant Pest Accord) and a Biosecurity Strategy for Freshwaters (Biosecurity NZ). **Rohan Wells** is investigating didymo control logistics, ways to assess and protect natural lake values, the

potential for native plant alternatives for the aquarium/pond plant trade, as well as providing on-going weed control expertise. **Fleur Matheson** is involved in exploring nutrient transformations and loss at different sites and aquatic conditions and identifying the sediment requirements for healthy seagrass growth in estuaries. **Aleki Taumoepeau** has had one foot in saltwater, undertaking marine biosecurity checks at ports, and the other foot in freshwater, continuing as a key field person and developing sonar tools for macrophyte surveys. **Paula Reeves** has returned on a part-time basis for wetland and consent-related consultancy, while also being a full-time mum! **Mary de Winton** has been rounding up new macrophyte records for FBIS (NIWA's Freshwater Biodata Information system), bringing the total NZ lakes surveyed to c. 300. Data analyses are planned to explore relationships between macrophyte development, weed status and physical parameters, to investigate trends of weed spread and impacts.

Steph Parkyn had an exciting trip to the USA earlier this year to work on freshwater crayfish trapping techniques with **Bob DiStefano** and **Charlie Rabeni** in Missouri, and **Alan Covich** in Georgia, and she witnessed the rusty crayfish invasion in Wisconsin while visiting the Trout Lake Research Station with **Jake VanderZanden**. While in Georgia, she designed a (potentially) world first (patent pending) Coke Can Crayfish Catcher Contraption at an institute funded by Coca Cola. Back home, she has also been trialling koura harvesting traps in Lake Taupo with **Ian Kusabs,** locals from Ngati Tuwharetoa, and a team from NIWA. The three year programme of research on headwater streams values and functions for **ARC** has been finalised this year. Steph looks forward to catching up with Regional Council scientists in her new role as Envirolink coordinator for NIWA.

Ngaire Phillips has been involved in a range of different projects and is making a big effort to reduce the diversity of things she works on. One of her main projects over the last year has been the joint Te Arawa/NIWA project developing a sustainable management framework for mahinga kai species (koura, kakahi, smelt, koaro and tuna). Last year the project team (including **Dave Rowe, Steph Parkyn, John Quinn, Chris Hickey, Travey Edwards, Jacques Boubee, John Clayton**) undertook a review of existing knowledge and developed conceptual models of our understanding of factors influencing the distribution and abundance of these species in the Te Arawa lakes. These models highlighted specific information gaps, which are being filled in part this year through targeted research. More recently Ngaire has developed and delivered to consultants (with **Stephen Moore**) a workshop on the Stream Evaluation Method, which involves a functional approach to assessing stream integrity. The SEV method was developed by Dave Rowe and others in conjunction with ARC. Ngaire continues to potter away on manuscripts for species traits papers. Finally her population genetics research will expand from it's current estuarine focus to freshwater this year through an NIWA Innovation Seed Fund. She will use Sphaerid bivalves to examine an hypothesis relating to multi-generational contaminant effects.

Jim Cooke has recently left NIWA after 29 years and has taken up a position with Beca in Welliington.

Compiled by Stephanie Parkyn

Fish and Game New Zealand

Auckland Waikato Region

Ben Wilson was fortunate to attend the American Fisheries Society conference at Lake Placid in New York on a Fish and Game Staff scholarship, presenting a paper on juvenile trout recruitment in the Awakino River and a poster on perch impacts in Lake Ototoa. He also attended a workshop training fisheries personnel in avoiding the spread of aquatic invasive species in field activities. He has provided a useful summary of the many papers of interest to fisheries staff from the 2000 fisheries personnel present and more than 1300 presentations.

Eastern Region

Rob Pitkethley has been continuing the intensive Rotorua lakes fishery monitoring surveys through the creel surveying and "Datawatch" mark recapture programme. These programmes have become hugely valuable now that the extensive water quality remediation works are beginning to occur on the Rotorua Lakes. The 25-year time series for the Datawatch programme, and up to 40 year series for the creel surveys are providing a very robust base-line data set so that effects of the various water treatment options on fisheries can be evaluated. The fisheries team has been expanded with **Matt Osborne** joining the Eastern staff in March after completing his MSc at Waikato. Matt has been very involved in the creel survey work over the winter and assisting with the various stream trout trapping projects.

The increasing efforts on water quality remediation in the Rotorua lakes has resulted in the Eastern staff being involved in a large number of externally directed research projects on the lakes. Fisheries surveys of the Ohau Channel have been organised with **Matt Riceman** from the University of Waikato, and staff have assisted with the collection of trout and smelt otolith samples for micro-chemistry work. Fish & Game staff were also very involved with the NIWA run project using acoustic tags to track how rainbow trout use cold water inflows in Lake Rotorua over the 2005-06 summer.

Matt McDougall has been modelling abiotic and biotic covariates to determine effects of management on waterfowl survival. Productivity and survival estimates have been utilised to predict population change along with aerial and ground based trend counts.

John Meikle has been busy with wetland development and restoration throughout the region. Wetland restoration works have been completed both within Fish & Game Wildlife Management Reserves and on a number of private land sites. Funding applications for riparian restoration have also been successful and lead to works being completed on Bay of Plenty rivers and streams.

Hawke's Bay Region

Iain Maxwell has been busy and completed an investigation into the impacts of drain management on the production of waterfowl in the BOP and Hawke's Bay and is now working with the Hawke's Bay Regional Council implement the findings of the study. He has also been working with Hawke's Bay Regional Council and Cawthron in an assessment of North Island

stony river bed habitats for salmonids. This study aims to develop suitability curves for use with habitat simulations to establish robust minimum flows. Fish & Game staff from both Hawke's Bay and Eastern regions have assisted NIWA to collect trout otoliths as part of a prefeasibility investigation for a hydro proposal by Meridian on the lower Mohaka river.

Wellington and Taranaki Regions

Peter Taylor advises that some of the research being undertaken by Fish and Game includes on trout counts, where we are trialing a new approach to our trout counts by randomly selecting 1 to 3 drift-dive transects from rivers receiving >200 angler days. The objective is to test the hypothesis that trout populations remain stable over time. Selection has been stratified according to river repeat divability (size, clarity) and length. Transect length is at least 500m or covering at least 3 pool:run:riffle sequences. In the Rangitikei River headwater length and weight trout tag data has been supplied during this project (1993-98) to **Matthew Schofield**, Otago University, for growth and movement analysis. Matthew is hopeful to complete his thesis shortly. Peter has worked with **Mark Webb**, from Central South Island F&G, to develop an Angler Diary report card for anglers to record river flow/clarity in relation to the angler's perceived fishability of the river. The purpose of this dairy is to establish preferred angling flows, which are of increasing interest in resource management.

Nelson Marlborough Region

Neil Deans and **Lawson Davey** have been very busy with the hearing into the application by Trustpower for a run-of-the-river hydro scheme on the Wairau River in Marlborough. This hearing commenced in early June and is forecast to end in mid-late November. Much of the freshwater expert evidence has been disputed, from the hydrology to invertebrate, fisheries and wading bird information. A notable exception has been the periphyton data, which has largely been accepted. Lack of technical agreement between parties will make the decisionmakers' task more difficult.

A related issue has been a review of the information for the Branch River hydro scheme, where Trustpower is likely to review the effectiveness of the fish pass and enhanced flow regime in maintaining adequate trout and eel numbers upstream of a hydro diversion weir. This would precede trout stocking trials.

Neil Deans sits on the Waimea Water Augmentation Scheme committee which is investigating water augmentation options in the Waimea basin south of Richmond, which has had water over-allocation issues for over 20 years.

Neil Deans is also involved with the Sustainable Development Programme of Action freshwater investigations on behalf of Fish and Game at a national level, in conjunction with the Ministry for the Environment, regional councils and other agencies.

Fish and Game staff are also assisting the Cawthron Institute with trout growth and movement investigations in the Rainy River, an upper tributary of the Motueka River. Detailed drift diving data will probably continue for at least the next two years to provide a good dataset to compare with sediment investigations in the Motueka.

Rhys Barrier has been continuing to provide freshwater advice to landowners seeking biodiversity protection on their private land, with funding from the Department of Conservation. **Vaughan Lynn** has been enjoying the freshwater environments of other countries on 3 months leave, including salmon fishing in Alaska.

West Coast Region

Numerous projected power proposals on the West Coast are taking some effort for Fish and Game on the Coast.

Canterbury Regions

Davor Bejakovich, together with **Sjaan Charteris** of DOC, has been advocating regional councils make better provision for fish screening, which appears to be getting some traction. **Jason Holland** and **Bridget Pringle**, Fish and Game resource officers in Canterbury, have been making initial submissions on the long awaited initial hearings of the Canterbury region's Natural Resources Regional Plan.

Otago Region

Staff have been involved with setting up a joint venture trout hatchery with Oceana Gold. The hatchery is now up and running with phenomenal growth rates seen in the hatchery reared fish. Fish have been released into ponds and reservoirs for events such as "take a kid fishing" day's and to stock waterways near urban centres.

We have been heavily involved with biosecurity work to identify and help prevent the spread of Didymo in the Otago Fish & Game Region. We have been involved with the Taieri Trust organising and assisting with school riparian planting days along waterways. We have also been working with the Otago Regional Council to develop strategies to protect instream ecosystem values from inappropriate gravel extraction methodology.

We have been advocating for a review of the Tenure Review process and the apparent inconsistency of outcomes with regard recreational and access values. We have a meeting planned in the near future with the Parliamentary Commissioner for the Environment to discuss our concerns. We have also been refining the backcountry licence to protect the backcountry fishing experience in the Greenstone River. Although quite controversial when first implemented it appears to have wide acceptance now.

We have been undertaken fishery assessments in the Nevis River and as a result of this work Fish & Game have lodged an amendment to the Kawarau Conservation Order which, if successful, will prohibit dam construction in the valley. Pioneer Generation want to build a 45 MW power station on the river. Liaison with other agencies is helping to protect and develop wetlands, particularly in Central Otago where there are few natural wetland areas remaining.

Southland

The drift diving programme to assess populations of large trout continued last summer with counts made on the Oreti, Mararoa, Mataura, Waiau and Aparima rivers. Brown trout over

40cm in length in the Upper Oreti and Mataura have increased over the last 10 years, from about 5 per km to 30 per km in the Oreti and from 10 to 50 per km in the Upper Matarua.

Despite didymo affecting the Mararoa River, rainbow trout there have not declined in the lower reaches over the past 3 years, with counts of 20 large rainbow trout per km being made last summer compared to a count of 5 per km prior to didymo. Numbers of trout in the middle reaches where didymo is most prolific are lower at 10 per km. However in the lower Waiau where a longer record exists the numbers of 20-40cm trout declined from a high of 120 per km to 20 per km after two years of didymo infestation. Surprisingly numbers of large trout remained about the same.

Brown trout in the middle reaches of the Aparima River occur at a density of about 70 per km, which is relatively high for the size of the stream.

Long term monitoring of trout spawning abundance in the Waituna stream showed a slight increase on the average number of redds this winter.

Trout abundance in the Upper Waiau was estimated by drift diving and found to be very high with counts of over 1200 trout per km in the reach downstream of Lake Te Anau outlet. Farther downstream numbers varied between 600 and 200 per km. these counts are likely to be amongst the highest in the country. The upper Waiau, although controlled as part of the Manapouri Power Scheme has a mean flow of about 350 cumecs. Meridian have managed the flows in the recent past to protect trout spawning and it appears that this has been beneficial, although no long term record of the trout population in this river exists.

Stuart Sutherland and **Bill Jarvie** have been assisting NIWA and Cawthron to collect data on characteristics of didymo growth in the Oreti and Mararoa Rivers over the past year. These data will be used in reports that will eventually be released by Biosecurity New Zealand.

Compiled by Neil Deans

Consultancies

Kingett Mitchell Ltd.

Ian Boothroyd, **Richard Montgomerie, Greg Burrell, Nick Carter Richard Allibone, Katherine Muchna, Annabel Barnden and Scott Speed** are all involved in freshwater activities at Kingett Mitchell Ltd, based in Auckland and Christchurch. **Ian Boothroyd** continues his research on the taxonomy and ecology of Chironomidae. The past year has seen Ian further develop his key to the New Zealand chironomid larval fauna, as well as continuing to collect and prepare descriptions of new species from around New Zealand. The focus of Ian's work has been the subfamily Orthocladiinae but Ian is also resolving some of the more problematic chironomid genera such as *Polypedilum* and the Tanypodinae. Understanding the effects of urbanisation on streams in Auckland and Wellington continues to be a significant focus of Ian's recent work and he has been working on pressure-state-response and other frameworks for sustainable urban environments. This work has led to other projects on urban sustainability. Other projects include assessments of effects of hydro-electric and wind power developments, residual flows, treated wastewater discharges, water abstractions

and catchment management plans. Ian is now an accredited independent commissioner and sits on hearings that are involved with making decisions on applications for resource consents.

Ian is also involved in research into the ecology and food webs of geothermal ecosystems, and has recently returned from Iceland where he has established a collaborative project on the ecology of geothermal ecosystems with the University of Iceland. He is also researching macroinvertebrate grazing on biofilms in streams in association with Gillian Lewis in the School of Biological Sciences at the University of Auckland.

Ian is also employed as a Senior Lecturer in the School of Geography and Environmental Science at the University of Auckland. He is responsible for teaching and research in the freshwater sciences and supervises a number of students (see University of Auckland).

Richard Montgomerie has now returned to Auckland after being largely responsible for establishing our office in Christchurch. Richard has been involved in a number of consenting issues and is involved in many studies for the dairy industry and meatworks, and more recently the monitoring of gold-mining activities on the Coromandel Peninsula.

Greg Burrell is based in our Christchurch office and much of his current work involves ecological assessments for irrigation and energy projects (hydro and wind), and assessing effects associated with residential developments. Greg has become increasingly involved with instream habitat assessments and modelling, and has recently completed a review of minimum flows for a number of South Canterbury streams for Environment Canterbury.

Nick Carter is based in our Auckland office and assists with a variety of project work around the country. Nick is involved in algal, habitat, invertebrate and fishery surveys. In particular Nick is involved in new and existing mining developments, assessments of effects of hydro-electric developments, assessments for residual flows, treated wastewater discharges and water abstractions. Nick is also frequently asked to assess the permanence (cf. intermittent) of waterways in the Auckland region.

Richard Allibone joined Kingett Mitchell during the year and has returned to his former stomping grounds in Dunedin where he is based within our Dunedin office. Richard has been involved in a number of projects working in all parts of the country, including assisting DOC with some native fish management.

Katherine Muchna assists Ian with his research work and is involved in many freshwater ecological surveys and has commenced a part-time MSc at the University of Auckland.

Annabel Barnden also joined our Christchurch office during the year, after working with us as a summer student. Annabel assists Greg with his project work but is increasingly involved in projects around the country.

Scott Speed continues his range of interests including estuarine surveys and the impacts of mining on freshwater resources. In collaboration with Ian, Scott continues his work on the control of nuisance chironomids at a variety of locations throughout New Zealand. In particularly, Scott has been involved in assisting Ian and other staff with new techniques for the control of nuisance midges and mosquitoes that have involved laboratory and field trials.

Private Consultants

Ian McLellan

I am continuing my work on NZ and South American Plecoptera and Thaumaleidae (Diptera) and I am also involved in the construction of a web-based key to adult and larval New Zealand Stoneflies with **Steve Pawson**. Other tasks have been the identification of Plecoptera material and assisting various individuals with their studies.

I am making good progress at present on the Systematics of Gondwanan Thaumaleids but material is always difficult to get. They are usually overlooked because of their minute size (adults 2 mm) and their habitat (thin films of water in seepages and splash zones). I would appreciate any material that members may have.

Regional Councils/Territorial Local Authorities

Auckland Regional Council (ARC)

John Maxted shoes have proven difficult to fill as we seek to find a committed freshwater ecologist keen to take up the challenge of protecting Auckland's unique freshwater systems from urbanisation and rural intensification. A vacancy exists for a senior freshwater ecologist with a benthic invertebrate speciality to join the Environmental Research team. A diverse range of tasks await including managing the extensive freshwater monitoring programme, implementing recently completed research projects (1: ephemeral stream classification, value and extent; 2: Stream environmental evaluation), managing the freshwater component of the regional plan appeals, undertaking new research on the cumulative impacts of ephemeral stream loss, plus much much more. If you are keen to know more give Grant Barnes a call on tel: 09 366 2000.

We are soon to release our latest research on Stream Ecosystem Evaluation: a method for scoring the ecological performance of Auckland Streams. This collaborative multi-year project involved scientists from ARC, NIWA, Landcare Research and Massey, Lincoln and Auckland universities. The project commenced with an economic analysis of the application of mitigation to offset environmental impacts from land development and concluded with a new functional based assessment method for determining current, impacted and restored ecological values of Auckland's streams. Implementation of this new research was recently undertaken with the first of a number of workshops for environmental consultants on the application of the new techniques.

Hot off the press is another large body of research on the spatial extent, hydrology, ecology and contaminant processing of small headwater streams in the Auckland Region. The work undertaken by NIWA may lead to changes to the way these small systems are managed.

You can obtain these reports soon from the ARC website:

http://www.arc.govt.nz/arc/publications/technical-publications/

Compiled by Grant Barnes

Environment Canterbury (Ecan)

The Environmental Quality Water Team at Environment Canterbury (Canterbury Regional Council) has undergone some restructuring this year with a rename (to Surface Water Resources and Ecosystems (SWRE) and amalgamation with our hydrology colleagues.. The team is still managed by **Ken Taylor** and the water quality team comprises scientists **Adrian Meredith**, **Shirley Hayward** (surface waters), **Lesley Bolton-Ritchie** (coastal waters), analyst **Robyn Croucher,** and technicians **Julie Edwards**, **Zella Smith, Rochelle Lavender** (on parental leave), **Susannah Vesey**, and **Fay Farrant**.

Adrian Meredith continues to run the regional water quality monitoring programmes, regional stream health monitoring programmes, and investigations of 'living streams', and stream restoration programmes. These include a water quality monitoring network of 90 streams and rivers, a lakes network of 21 high country lakes, a region wide macroinvertebrate and habitat monitoring programme of 140+ sites (based loosely on USEPA Rapid Bioassessment Protocols), and investigations in catchments that are either degraded through intensified agricultural areas, or are the focus of community group activities. The water quality network has now been running for 14 years and the biological network for 7 years. New programmes initiated over this past year have been extending monitoring through the Waitaki catchment and inland Mackenzie Basin where there are widespread proposals for irrigation and intensification. ECan also continues to develop a monitoring programme for the streams and lakes of the main Chatham Island, as part of a contract to the Chatham Islands Council. A baseline of 5 sampling trips have been conducted, a report is being produced, and a long term monitoring strategy developed in this novel environment. A huge focus is the continued scoping or development of large scale irrigation schemes across the Canterbury Region.

Shirley Hayward continues to run monitoring and investigation programmes on Lakes Ellesmere (Te Waihora) and Forsyth (Te Wairewa) and their tributaries, programmes looking at irrigation effects in the Amuri basin, management of freshwater bathing beach monitoring programmes, pesticide monitoring, and assessing issues such as EDC's (endocrine disrupting compounds), stormwater management, and flow issues in catchments such as the Waipara, Hurunui, Waiau and Pareora Rivers. Shirley also continues her interest in algae and periphyton, and has been increasingly involved in coordinating ECan's role in the ongoing 'Didymo' surveys and surveillence in the central South Island.

Lesley Bolton-Ritchie continues to extend the marine component of our programmes, reviewing the coastal water quality and ecology monitoring programmes. Mudflat ecology of estuaries such as the Ashley, Avon-Heathcote, and Okains Bay estuaries have occupied a lot of her fieldwork.. She also maintains the marine bathing beach programme, and deals with an increasing number of ocean outfall discharges in the region.

The ecological field and lab work is currently managed by **Susannah Vesey,** while **Rochelle Lavender** is currently on parental leave. Fieldwork is still primarily conducted each summer by Canterbury University School of Biological Sciences students (this year having included **Susannah Vesey, Laura Drummond, Matt Dwyer, and Stephen Kitto)**.

The year has been another one with continuing pressure on water resources for irrigation, and public scrutiny of our freshwaters, and the state of rivers, streams, lakes and aquifers. The allocation of water resources in Canterbury has and will remain a dominant theme with challenges to major strategies for management of the plains rivers and aquifers (which supply the lowland springfed streams). The central government's Waitaki Water Allocation Plan has become operative and requires consideration of large allocations of water is the upper and lower Waitaki catchment. Applications for further large irrigation schemes have also arisen in south, mid and central Canterbury, as well as the ongoing consideration of groundwater allocations and surface and groundwater relationships. These pressures all continue to focus most of our efforts on the changing pressures and state of our water resources, particularly in irrigated areas.

Compiled by Adrian Meredith

Environment Waikato (EW)

Kevin Collier spent a large part of the summer probing the murky depths of Hamilton's urban streams with **Johlene Kelly**, **Bruno David**, **Mike Lake**, **Brenda Aldridge** and **Brendan Hicks** to identify ecological and biodiversity values within the city's streams. We found a surprising diversity of fish and invertebrates at some sites, including giant kokopu and some uncommon adult caddisflies, particularly in one catchment which now has a stream care group associated with it (see www.streamcare.org.nz). **Jono Tonkin** and **Amy Macdonald** also contributed to this study by carrying out a Functional Assessment of Reach Quality analysis at these sites. Kevin also collaborated with **Roger Young** to investigate the utility of functional indicators for non-wadeable stream monitoring, and with **Mike Joy** in an ongoing project to investigate effects of future change scenarios on stream ecosystem health. Work was also carried out to assess trends in macroinvertebrate metrics at long-term monitoring sites, and to further develop a multivariate-multimetric index for Waikato streams which was the subject of a paper presented at the recent NABS conference in Alaska. Along with **Mark Hamer**, Kevin has also commenced a study of aquatic invertebrates in the Waikato River using artficial substrates to evaluate any changes since the work of **Mark Davenport** 25 years ago.

Johlene Kelly has been involved reigniting EW's lakes work. The lake level setting project seeking to maintain minimum levels in the Waikato's peat lakes has progressed with a new weir being installed on Lake Rotomanuka. There are still many more lakes to protect but monitoring is continuing to ascertain minimum levels in over 10 peat lake systems. EW is also looking towards alternative methods to monitor lakes other than traditional water quality chemical parameters. A pilot study is to be undertaken this coming summer looking at a range of lakes (10 in total) and investigating what methods may be suitable to apply to the diversity of the Waikato region's lakes. In addition, Johlene has been summarizing investigations on fish passage issues that have been undertaken in the region over the last 5 years. In excess of 1500 structures were assessed for their severity of impact on fish passage. A ranking

system has been applied to these results and is being used as a management tool to work with roading authorities to prioritise structures for remediation. A best practice guide has also been prepared by EW for use in providing valuable information to authorities during construction of new waterway structures. A report on the results of the survey of fish passage in selected districts of the Waikato will be published shortly. **Johlene Kelly** has recently left the freshwater team at Environment Waikato and is now working for Queen Elizabeth II Trust and others. **Keri Neilson** has taken Johlene's position at Environment Waikato.

Compiled by Kevin Collier

Greater Wellington Regional Council (GW)

The 2005-06 year has been a little quieter than last year for Greater Wellington's resource science disciplines following completion of the Council's second State of the Environment report in December. This report was supported by a technical report on surface water quality and ecology – a revised version prepared by **Juliet Milne** and **Alton Perrie** was finally completed in February and will feed into the review of our Regional Policy Statement.

Contracts for the supply of sampling and analytical services in relation to various aspects of surface water quality monitoring have been let for 2006-2009.

Alton Perrie has been working on a fish monitoring strategy for the Wellington region and is continuing to conduct surveys in areas where we have limited fish information.

Juliet Milne and **Bruce Croucher** have continued with investigations into the effects of stormwater discharges on urban streams. This work has included surveys of streambed contaminant concentrations and assessments of contaminants in stream waters during first-flush storm events. This information will be fed into the review of stormwater rules in our Regional Freshwater Plan.

Greater Wellington has been helping to introduce fish passes on streams in the region. Most recently, in partnership with Wellington City Council and Capacity (the company responsible for managing streams and drainage within Wellington City), two fish passes have been provided along the Kaiwharawhara Stream. These passes will enable a relatively diverse range of native fish present in the lower reaches of the catchment to make their way to various headwater streams.

Last summer thick mats of benthic cyanobacteria affected selected reaches on several of the region's rivers popular for contact recreation. In response to the situation – which resulted in at least four dog deaths and severe restrictions to river users, **Howard Markland** oversaw the development of a draft "Toxic Algae Bloom Protocol", prepared in conjunction with Regional Public Health and local councils. More recently, **Laura Watts** has assisted in developing an automated warning system that detects when river flow conditions may be conducive to benthic cyanobacteria proliferations.

To help in the process of preparing water allocation strategies and reviewing the minimum flow policies in the Regional Freshwater Plan, **Laura Watts** has now completed a working version of a Framework for Instream Flow Assessment in the Wellington region. Valuable feedback on the process was received from Fish and Game and Department of Conservation. The framework sets out an approach for identifying all values associated with a waterway and for planning scientific investigations into instream flow requirements.

The Regional Freshwater Plan for the Wellington region has now been changed to incorporate minimum flow and core allocation policies for the Mangatarere River in the Wairarapa. Work is continuing with respect to developing water allocation strategies for other high-priority catchments in the Wairarapa, in particular Otukura Stream, Tauweru River, and Parkvale Stream.

The Environmental Monitoring and Investigations Department have completed a thorough review of the hydrological monitoring network. One aim of the review was to improve linkages between the hydrological and water quality monitoring programmes. Several recommendations of the review therefore relate to installing flow monitoring stations at Rivers State of the Environment sampling locations, to aid in the interpretation of water quality data.

Compiled by Juliet Milne

Hawke's Bay Regional Council (HBRC)

In the last year, HBRC have been busy with the following projects

1. Sensitive Receiving Environments of Hawke's Bay
2. Surface Water Quality Monitoring Strategy
3. Fish Monitoring
4. Dealing with cyanobacteria blooms
5. Dairy Consent Condition review
6. Meridian Proposal to generate electricity from the Mohaka River
7. Annual SOE summary
8. Pakuratahi Land Use Study
9. Biodiversity Strategy
10. Guidelines for the assessment of ecological effects for freshwater
11. Instream Flow assessments

The above projects are briefly outlined below.

Sensitive Receiving Environments of Hawke's Bay

Recently HBRC contracted GHD to come up with a strategy to determine sensitive receiving environments to pollution. It's a fairly simple classification system that gives areas a ranking according to:

- Proximity of the water body to possible dischargers (eg. industrial areas = higher risk than a forest park)
- Biodiversity values of the water body (eg. Ahuriri Estuary has a high biodiversity valued compared to Muddy Creek)
- Capacity to absorb or dissipate contaminants (eg. a gravel estuary with good tidal flow is lower risk than a muddy bottomed estuary with poor tidal flow as there are less fine silts for contaminants to adhere to and a better flushing capacity)

Using GIS, the sensitive, not so sensitive and more robust receiving environments have been mapped which will be of use to our consents and planning teams and in the formation of new stormwater policy.

Fresh Water Quality Monitoring Strategy

HBRC's fresh water quality monitoring strategy has been approved and includes a lakes monitoring programme. The monitoring programme commenced in September 2006 and will see 8 lakes (Kaweka, Runanga, Oingo, Tutira, Opouahi, Rotonuiaha, Waikaremoana and Waikareiti) monitored on a rotational basis over the coming years. Monitoring will include monthly water physicochemistry and LakeSPI surveys will be conducted every 3 years.

Fish monitoring has also been included in the strategy (in conjunction with macroinvertebrates, periphyton and the usual physical chemical testing) and also includes the lakes (undertaken at the lakes once every 5 years).

Fish Monitoring

Fish monitoring for the 05/06 year commenced on November 11 and we surveyed 20 sites. Next year we will establish a core number of sites for the region that will be monitored on a rotational basis.

Cyanobacteria Blooms

We have had a few cyanobacteria blooms over the last year. The most obvious was that which occurred at Lake Tutira in December 2005. It was *Anabema planktonica* and it took a number of months before we could give the all clear with respect to safe bathing. We have been working with the public health unit on a protocol of what authority does what in the event of a bloom. Its third draft is now complete and both agencies are happy with the outcome

Dairy monitoring

We recently reviewed some monitoring data for one of our larger dairy operations in Central Hawke's Bay. Monitoring has shown that nitrate nitrogen concentrations have been increasing

at the bores within the effluent irrigation area and downstream of the farm since monitoring began (1997). The nutrient budget for the farm also showed that the N inputs to the farm were exceeding the 150 kg/ha/yr stipulated in our plan. As a result of this the farming operation has requested for a change in consent conditions such that:

1. less supplementary feed (Watties food waste) is brought into the farm; and

2. the effluent is spread over a wider area.

Although nitrate nitrogen concentrations have been increasing since monitoring commenced concentrations have actually been declining in the last two years at the effluent irrigation bore. We expect this declining trend to become evident downstream (at a neighbours farm) within the next two to three years and we also expect that, given the change in farming practices, the declining trend should continue.

Meridian Proposal

Meridian is currently scoping the possibility of generating electricity from the lower Mohaka River. At this stage it is just a feasibility study so we have not received any resource consent application, however we have had some initial discussions with Meridian.

Annual SOE Update

The 2005 update focused on a few case studies including:

- Water quality trends in the Mohaka Catchment. No water quality trends are evident in the main stem of the Mohaka River, however nutrient increases are evident in the Taharua and Waipunga tributaries.

- Functional measures of stream ecosystem health

- Review of monitoring programmes –recommended changes to the freshwater quality monitoring network that include the introduction of a lakes programme, increasing sampling frequency to monthly for the Tukituki Catchment and the introduction of urban stream monitoring to the SOE programme.

Pakuratahi Landuse Study

Recently the council competed a study of the effects of forestry on water physicochemistry of the Pakuratahi Stream. It was basically a follow up on work that had been done before by NIWA. The study showed that within 7 years of harvesting, all water quality variables showed no statistically significant difference to pre harvest concentrations.

Biodiversity Strategy

We are currently researching what is known about aquatic and terrestrial biodiversity in our region and gaining an appreciation of what other agencies are doing with respect to biodiversity management. The long term goal is to have a strategy that outlines desired outcomes for biodiversity of the Hawke's Bay Region and what methods can be used to

achieve these outcomes. Once this document has been finalised a monitoring strategy will be written.

AEE Guidelines

We are currently drafting up some guidelines for the assessment of effects on freshwater ecosystems. This guideline will assist consultants in providing adequate information to enable processing of applications that may affect the instream ecosystems of Hawke's Bay.

In stream flow assessments

HBRC have a programme of habitat survey and modelling of their major rivers. Surveys are carried out and modelled in-house but this year we worked with **John Hayes** and the team from the Cawthron Institute, and with Fish and Game staff from Hawke's Bay and Wellington regions, to develop habitat suitability curves for rainbow trout. This is the first time that these curves, a critical part of the flow-habitat modelling process, have been defined on east coast rivers. The process was an excellent opportunity for the locals to learn from the experts at Cawthron, and hopefully for them to learn some of the hydrological limitations posed by east coast rivers. The process is for divers to observe trout behaviour and to mark the position of the fish. Hydrologists then follow up to record depth and velocity where the fish were observed, and to sample available habitat. Results provide the depth-velocity-substrate-flow relationships used in habitat modelling.

As part of this work we were able to utilise Cawthron's Ditson sonar camera. This is less intrusive to the trout than the normal diving observations. Where divers need to get within about 5m of a fish, the Ditson can "see" 3 or 4 times that distance. Sonar film suggests that trout movement is altered by the presence of divers. The centroids of the fish beat remains approximately the same, though the size of the beat appears restricted. Results are still being finalised by Cawthron and will be used in modelling the results of surveys this summer. They will also be used to re-interpret earlier habitat surveys.

Compiled by Brett, Geoff and Graham

Taranaki Regional Council (TRC)

Members of the scientific staff involved in Freshwater monitoring are **James Kitto**, **Maureen O'Rourke**, **Lorraine Smith**, **Kimberley Hope** (currently on maternity leave), **Bart Jansma**, **Richard Fitzpatrick** and **Chris Fowles** (Scientific Officers), and **Peter Ashe** (Environmental Monitoring Manager), who continue to manage and/or participate in compliance monitoring of waterways that receive discharges from oil wells, municipal oxidation ponds, landfills, quarries and a wide range of industrial sites, or from which water is abstracted for irrigation, municipal water supplies and hydroelectric schemes. The increase in oil/gas exploration in the past two years has resulted in more extensive biomonitoring of these activities, particularly those associated with individual wellsites.

The biomonitoring component of consent monitoring programmes concentrates on macroinvertebrate communities, using taxa richness, MCI, semi-quantitative MCI ($SQMCI_S$)

and community composition to calculate stream health. Field sampling, processing and quality control procedures closely follow the NZMWG Protocols (2001). Since the early 1980s, Council biologists have processed over 6800 macroinvertebrate samples from about 1000 sites. The Council also performs a microscopic check for undesirable heterotrophic growths in conjunction with macroinvertebrate sampling for consent compliance monitoring purposes where the consented activity has potential to promote such growths.

Instream habitat data are stored together with macroinvertebrate, periphyton and fish data in the Council's relational database. This database has also been used to enable comprehensive analyses to be made of taxa richness, MCI and $SQMCI_S$ distributions in the region, particularly in relation to altitude and the sub-regions of the area. **Chris Fowles** is currently working with Cawthron Institute staff to further evaluate the extensive macroinvertebrate database on a regional basis, review the state of the environment monitoring programme, and utilise the data to assess the influence of several variables on biotic indices such as the MCI. The initial output has been the development of methods for temporal trending of state of the environment (SoE) biological data. This has complemented Council's internal trending of the SoE physicochemical programme's data for the 1995-2005 period, both of which will contribute toward the next TRC SoE report.

Major water abstractions are subject to biological monitoring programmes. Several electric fishing and spotlighting surveys are undertaken each year to assess the impacts of diversions, dams, weirs and fish-passes on fish distribution. Copies of all fish survey data are entered into the national database.

The Council recently updated its register of dams, weirs and other potential barriers to fish passage in Taranaki. The primary purpose of the register is to have all dams and weirs consented while ensuring that passage for fish is provided. **Kimberley Hope** and **Bart Jansma** continue working towards this goal.

The Taranaki Regional Council continues to monitor sewage treatment pond system performance in the region with the monitoring programmes including analyses of pond phytoplankton composition.

The Council has also continued long-term monitoring of Lake Rotorangi, at 46 km in length the longest riverine lake in New Zealand. Trends in lake data have been the subject of two reviews as the data record now extends over 20 years since establishment of the lake. A further trending report is in preparation as a component of the consent holder's AEE for the upcoming renewal of (30 year old) consents due for expiry in mid 2008. The Council has also been involved with Trust Power Ltd in facilitating the passage of elvers over the Patea dam, an operation that involves a trapping and transfer system, which on average moves 500,000 elvers per year into Lake Rotorangi. Similar trapping systems have been implemented at other hydroelectric power schemes in the region (see NIWA reports).

In response to submissions to the Proposed Freshwater Plan for Taranaki (which has been operative since 2001), a series of investigations has been conducted over recent years. A report collating the results of water quality investigations into the impacts of dairy pond system discharges, particularly toward the upper reaches of catchments, is in draft form.

Doc# 214962

These results were evaluated in relation to rules in the TRC Regional Freshwater Plan and the report should be available soon.

State of the environment monitoring (SEM) using physicochemical methods (11 sites) and macroinvertebrates (52 sites) formally began eleven years ago in Taranaki. The SEM programme provides an integrated assessment of Taranaki streams, particularly those that have received less attention in consent monitoring programmes. It also includes some monitoring of the effects of riparian planting including the incorporation of a field assessment for periphyton cover on streambeds. Periphyton monitoring has been expanded to include the monitoring of nuisance growths at certain rivers around the region. The SEM programme also includes the assessment of bacteriological levels in relation to recently updated guideline standards for ten freshwater contact recreational sites and data has been forwarded to MfE in response to nationwide reporting requests. The Council's second State of the Environment Report covering the first five years of data collection was published in 2003. Data from both the macroinvertebrate faunal and physicochemical water quality programmes have been evaluated for trend detection purposes (see earlier).

Riparian management initiatives are a focus of Council policies with specific catchments such as those of the Waiwhakaiho River, Kaupokonui, Kapoaiaia, Katikara and Tawhiti streams targeted for extensive planting and state of the environment monitoring. Several smaller catchments have recently been targeted, with the new dairy industry Accord targeting all catchments in due course.

Council staff (mainly **Ray Harris**) have been trained and participated in several de-limiting 'rocksnot' (*Didymo*) monitoring surveys (with NIWA, Biosecurity NZ and Taranaki Fish and Game staff) in the region. Up to 12 sites have been included to date and surveillance monitoring will continue and be incorporated into the SoE periphyton regional programme where appropriate. Greater public awareness of the *Didymo* invasive threat is being promoted in the Taranaki region and this is being extended to schools' environmental educational activities promoted by the Council's Education Officer.

Compiled by Chris Fowles

Tasman District Council

TDC has been working on a range of projects over the last year, which are summarised below.

Fish passage – over the last two summers we have had a student assisting us with assessments of fish passage issues at culverts, flapgates, dams and other structures. We now have a total of 134 potential fish barriers identified. About 65% of these are likely to be a barrier at most flows. About 60% of all barriers were over-hanging culverts. Four barriers have been removed in the past year. We are working with our engineering assets staff to try to involve them in the monitoring of culverts – a slow but steady process. In a collaborative project with Cawthron and DoC we are researching the extent of fish passage at tidal flap gates using a DIDSON video camera.

Regional Fish Survey – a first for TDC. This cooperative project with DoC and Fish and Game (as well as Cawthron and Landcare Research through the Motueka ICM programme) will kick off in late Oct 2006.

***Lagarosiphon* control** on a spring-fed creek near Takaka using black-out shading with weed mat. The reason this has been a priority job is that we found very low dissolved oxygen concentrations in parts of the waterway infested with the weed. Concentrations at 100mm below the surface were 30-40% and below 2% at 300mm below the surface. Following on from the success of trials using weed mat in Marlborough, we have deployed the mat from the spring source for almost 100m downstream. The intent is to re-use the material in successive reaches downstream.

Motupipi River Catchment Management Programme - Setting up a 'mini' integrated catchment management group for the Motupipi Catchment in Golden Bay involving farmers as the first stage. This is our Tier 2 Monitor Catchment under the Dairying and Clean Streams Accord. We are also setting up an automated WQ monitoring station in this catchment. Water quality in this catchment is among the worst in the region with almost every water quality and stream habitat issue is represented – nutrients, faecal pathogens, fine sediment, and weed. There is a high likelihood of success of environmental initiatives for this spring-fed waterway because of buy-in from landowners and knowledge of many of the sources of contamination.

Aorere River catchment (Golden Bay) – in response to Tasman District Council monitoring and resolution of some specific on-farm pollution issues in part of the catchment (mostly faecal pathogen discharges), a farmer-led application to SFF has been successful. Landcare Trust is coordinating the project with farmers to help them with farm environmental plans. We also hope to model faecal contaminant flows in the catchment. In addition to recreational water quality issues there is a strong drive from shellfish farmers for improved water quality (particularly during and after rain).

Reservoir Creek rehabilitation project – building on the removal of a number of fish passage barriers last year, a number of initiatives are under way for this urban catchment in Richmond including stream habitat enhancement and education to residents about discharging pollutants that drain to the creek. The project already achieved some goals just by better integration of activities of the different Council departments (engineering, parks and reserves and environmental information).

QA manual for the river water quality monitoring programme – this is now complete and available if anyone is interested.

Stream Habitat Assessment Protocols project – this national Envirolink-Funded project is now up and running. A national set of protocols for stream habitat assessments will be developed over the next two years with the aim of providing 'state of the art' protocols for those organisations involved in management of streams and aquatic biodiversity. These protocols should not only be relevant, cost and time-effective and appropriate at operating over a range of situations commonly faced but they must also be scientifically robust. The project will determine what are the key elements of habitat that must be assessed in order to interpret biodiversity condition and trend. The project team also includes: with **Trevor**

James (as the Regional Council Project Champion) and **Jon Harding** (as project coordinator and lead author), **John Quinn**, **Ian Boothroyd**, **John Hayes**, **Mike Joy**, **Adrian Meredith** and **Rachel Ozanne**

Provided input into the TDC **Engineering Standards Manual** – a very useful and positive cooperation between resource science and engineering to ensure structures and works in waterways is more environmentally friendly.

Environmental Monitoring and Reporting Strategy. This strategy has now been completed and we hope to put this to the interested community in Oct-Nov. A lot of work has gone into developing a solid rationale for prioritizing each area of monitoring at Council and the core indicator set (workings for these are included in appendices of approx 200 pages). A plan for the ways and means of reporting has also been developed.

Motueka ICM – good work on fine sediment sources is well under way along with many other very useful applied research.

Compliance monitoring of dairy farms – the level of compliance amongst dairy farms is improving due to a consistent effort in this area. The level of enforcement has also stepped up after a long period of education and warning.

Recreational water quality monitoring programme – we have suspended this monitoring programme this summer (apart from 4 core sites) in order to do sanitary surveys (to find the source) at two sites that have had breaches of guidelines over the last few years. We hope to resume the programme again next summer.

Waimaori – we continue to have a successful involvement with this waterway education programme.

Compiled by Trevor James

Universities

Massey University

Russell Death – After much of 2005 chasing the conference circuit around North America and Europe Russell has been spending this year at home teaching, supervising and trying to get some research written up. He has completed manuscripts on more of his Urewera research, nutrient limitation in the Rangitikei River and is currently working on a manuscript comparing global disturbance diversity relationships. He has also hosted **Riku Paavola** and **Anna Astorga** from the Finnish Environmental Institute who have surveyed streams throughout New Zealand within a metacommunity framework to compare with similar surveys in Finland.

Rob Buxton joined the Massey freshwater ecology team from the Centre of Environmental Intelligence Systems at Staffordshire University where he completed a PhD with **Bill Walley**. Rob is starting to work on a project funded by Massey University, Hawke's Bay Regional

Council and Horizons Regional Council to develop a Bayesian Belief Model to assess ecosystem integrity.

Mike Joy is working on fish and habitat models for Environment Waikato and Horizons Regional Councils, as well as the Envirolink Habitat Assessment and Restoration Indicators projects. His students are working on a diverse range of topics including wastewater treatment, faecal coliform changes over flood peaks, farmers' attitudes to conservation, barriers to fish migration and stream restoration. He has recently joined in on the Sustainable Water Programme of Action and been involved in lobbying Horizons over the state of the Manawatu River. A new research area is in the biosecurity area working on Intelligent Systems for Prediction and Detection of Pest Invasions with Sue Worner at the National Centre for Advanced Bio-Protection Technology, Lincoln University.

Ian Henderson is continuing taxonomic work on Trichoptera. A paper with **John Ward** (Canterbury Museum) describing three new species of *Alloecentrella* (including larvae) is nearly completed. He has also been working on a web-based version of the New Zealand Trichoptera Database that John and he developed and maintain. This database contains location, collection and curation details for caddisfly specimens identified to species. There are over 40,000 records from 5,600 locations including data from 47 museums or private collections and the efforts of over 350 collectors. The online version is still under development but can be found at http://nzcaddis.massey.ac.nz. You can search for locations by grid reference or name, and get a list of species for a location or area. You can also search by species and generate a simple distribution map. Ian would welcome any comments on this project.

In May 2003, **Alex James** began a PhD investigating the impacts of reduced stream flow on habitat condition and macroinvertebrate behaviour. This is centred on experimental flow manipulations in three, small Wairarapa streams. Diversions were constructed to severely reduce the flow for an approximately 100 m reach in each stream. The biotic and abiotic characteristics of this reduced flow reach were compared to those of a non-reduced, natural flow reach upstream of the diversion. Alex supplemented this work with a short-term, streamside channel, flow reduction experiment at the University of British Columbia in 2004. More recently, Alex has been collaborating with **Alastair Suren** from NIWA on an in-stream channel experiment looking at the impacts of flow reduction on the drift, hyporheic usage and community structure of macroinvertebrates in the Kaiapoi River, Canterbury. Alex is aiming to have his PhD completed in May 2007, after which he will look for something else to do.

Zoë Dewson is currently writing up her PhD research on the ecological effects of water abstractions, aiming to be finished by February 2007. She has investigated the effects of reduced flow on invertebrate communities and ecosystem functioning in small streams by surveying existing water abstractions and using diversions to reduce flows experimentally. These studies suggest that several factors might influence responses to water abstraction, including water quality in the stream, the quantity of water removed, and the timing and duration of water abstraction

Jonathan Tonkin (**Jono**) completed an Honours thesis looking at the effects of flow regulation on macroinvertebrate drift in the Tongariro River. He completed this in May 2006

achieving first class Honours. Jono is now in the early phases of a PhD looking at the effects of flow variability on stream food webs.

Nicola Atkinson (**Nicky**) is a masters student at Massey University and under the supervision of Dr **Mike Joy**, my research is focused on evaluating migration barriers to native fish populations in the Wellington region. As our native fish fauna is largely diadromous, free access up and downstream is critical for aquatic biodiversity in New Zealand. Thus, the emphasis of my research is to assess how manmade barriers, such as culverts weirs and dams, impede, restrict or completely stop passage for different species. As a part of this, she will also be focusing on one species, the banded kokopu, where she will be analysing strontium levels within their otoliths in order to determine whether or not they have migrated to sea or are recruiting within freshwater. She hopes to be able to collect samples from a number of sites with restricted access to the sea and limited alternative migratory habitats, such as lakes and wetlands. In addition, some barriers in the Wellington region have had fish passes installed. However, whether or not they allow passage for all, or any, species is unknown. Hence, she will also be focusing on assessing and characterising these passes in terms of their effectiveness.

Manas Chakraborty is a Masters student testing the ability of FWENZ (Freshwater environments classification of New Zealand rivers) in defining an environmental classification that maximises discrimination of spatial variation in pristine biodiversity patterns of New Zealand's rivers and streams. The FWENZ is based on a suite of candidate variables that characterise the environment of each section of the river networks throughout the country. Statistical analyses using the biological data (macroinvertebrate assemblages) sampled from over 100 sites throughout the country will be used to select a suite of variables that optimally discriminate spatial variation in community composition. Multivariate clustering of these sites based on macroinvertebrate community composition would be compared to their FWENZ classification at different hierarchical levels of classification to determine the optimal levels of FWENZ classes for the purpose of conservation assessment of rivers and streams.

Amy Macdonald completed an Honours thesis looking at structural and functional assessments of small stream ecosystems in the Wairarapa. She completed this in March 2006 achieving first class Honours. Amy was recently appointed as the new freshwater Technical Support Officer for DOC Northland.

Compiled by Russel Death

University of Canterbury

Freshwater Ecology Research Group (FERG)

Jon Harding has been on sabbatical much of this year and has had an opportunity to undertake some research on mosquitoes on Tonga, visit **John Maxted** in the Everglades and work on riparian spiders in acid mine drainage systems with **Matt McTammany** (Bucknell University) in Pennsylvania. **Angus McIntosh** has been busy working on the effect of changing ecosystem size on streams communities as well as continuing his research in Colorado with

Bobbi Peckarsky. **Mike Winterbourn** is collaborating with Jon Harding and **David Hawke** (CPIT) in a further study of nutrient addition/limitation on ecosystem processes in streams draining petrel colonies near Punakaiki. He is also interacting with **Sandy Milner's** team at University of Birmingham (UK) in a study of *Deleatidium* production in a glacier-fed stream. Much of his recent time has been spent assisting with the editing of the forthcoming Natural History of Canterbury volume that is to be published by Canterbury University Press.

Tanya Blakely is probably completing her last PhD field season working on canopy insect communities associated with tree holes. **Jonathan Bray** has been busy with field work for his MSc on algal communities in acid mine drainage systems on the West Coast, while **Rebecca Eivers** has completed her MSc thesis on riparian buffers in pine plantation forests and is currently enjoying life somewhere in France. **Iain Fraser** has also submitted his MSc thesis on forest fragmentation effects on benthic stream communities on Banks Peninsula. Iain is about to head off to Africa. Fresh back from the North American Benthological Society Conference **Duncan Gray** has begun work on his Ph.D tentatively entitled "Determining ecological connectivity within braided river landscapes". To date the focus of the thesis is on a national survey of lateral and longitudinal invertebrate diversity patterns in braided rivers, which will run concurrently with an investigation of invertebrate food-webs around spring ecotones. He has just published his first book; "Trouts Larder: a guide to trout food in New Zealand streams" (not a cooking book) which will reached the bookshop shelves in late September. **Michelle Greenwood** has been continuing her PhD on the role of flooding disturbances on populations and cannibalism rates of the riparian fishing spider, *Dolomedes aquaticus.* Michelle has started writing up, with just a few last bits of fieldwork to tidy up this summer. In June, she had great fun at the NABs conference in Anchorage and managed to win the best student talk for basic research. In addition, a team from Burnside High School made it to the finals of the RSNZ Big Science video competition with a 5 minute film they made on her research. **Hamish Greig** is continuing his PhD research on biotic interactions in ponds of varying permanence while juggling jaunts to Colorado and Alaska.

Simon Howard is making good progress on his MSc on galaxiid populations in the Cass basin. **Amy Whitehead** recently started a PhD looking at identifying the most productive habitats for whio (blue duck) to help managers prioritise conservation effort. This will involve both habitat modelling using GIS and population modelling to build a picture of important habitat characteristics for whio right across the New Zealand landscape. Amy is currently working on modelling the effectiveness of stoat control for the management of a population of whio in several Fiordland rivers and part of this work was recently presented at the NZ Ecological Society conference. **Darragh Woodford** is just beginning his PhD on the population ecology of non-migratory galaxiid fish in the Canterbury high country. Darragh will be looking at the role of habitat gradients and trout distributions within river networks in controlling population fragmentation and dispersal in Canterbury galaxias and Alpine galaxias.

Compiled by Jon Harding

University of Otago

Freshwater Fish Ecology and Evolution

Dr **Gerry Closs** is supervising a number of aquatic ecology-related projects at the University of Otago in New Zealand, with several thesis completions and new starts in the past year. Dr.

Eric Hansen was awarded a Ph.D. for his thesis on 'Distribution, movement, growth and individual behaviours of a drift feeding stream fish in relation to food supply'. Eric has returned to the USA and is currently enjoying a well-earned break. **Tobias Bickel** submitted his Ph.D. thesis on the ecology of Lagarosiphon in Lake Dunstan. Tobias recently completed his oral exam and has only revisions to complete before the thesis can be accepted. **Esben Kristensen** has also submitted his PhD thesis on the population dynamics and migration of brown trout in the Taieri River catchment. **Ryan Ellery** received First Class honours for his honours research on the 'Decay of perch odour and anti-predator responses by common bully'.

New arrivals to the lab include two Ph.D. students. **Andy Hicks** is beginning a PhD investigating facultative amphidromy in whitebait (*Galaxias sp.*) and bully (*Gobiomorphus sp.*) species of New Zealand. **Adrian Lill** has commenced a PhD thesis examining factors determining fish and invertebrate communities in small Otago estuaries. **Nicholas Dunn** is continuing his PhD research on the ecology of local adaptations in non-diadromous galaxiids. Recent notable successes have included spawning of wetland *Galaxias golumoides* in aquaria. Several students are in the final stages of either lab work or writing up theses. **Shannan Crow** is finishing his PhD research examining niche partitioning and potential character displacement in recently identified species of the *Galaxias vulgaris* complex. **Ricky Olley** is finishing his masters research using otolith microchemistry to identify migration patterns of brown trout (*S. trutta*) within the Motueka catchment. **Quinn Cannon** and **David Harris** are completing M.Sc. theses on the role of food in determining the distribution of banded kokopu and trout respectively. **Mark Hrynkiw** is writing up his MSc research on the ecology of the kahru longjaw galaxiid. **Gerry Closs** is continuing his own research on population dynamics and connectivity of various fish species, and is planning to focus on smelt (*Retropinna retropinna*) this summer. Summer bursary students, **Rasmus Gabrielsson** and **Tim Rolston** will also join the team over summer examining the transfer of didymo between river systems, and uptake of trace elements into otoliths respectively. Dr. **Cecil Jennings** from the University of Georgia, Athens, USA will also visit over summer, examining the potential of portable ultrasonography to determine the population structure and reproductive status of large galaxiids.

Compiled by Gerry Closs

University of Waikato

Centre for Biodiversity and Ecology Research

David Hamilton continues work on the Rotorua Lakes with a major emphasis on water quality modelling to project impacts of future land-use change. He is also heavily involved in organizing the NZFSS conference in Rotorua later this year.

Amanda Baldwin is currently preparing for publication work on the formation of Lake Tarawera's DCM.

David Burger ...has moved to the Netherlands!

Joseph Butterworth has begun his MSc in ernest. For part of Joseph's thesis, water quality of Lake Rotokakahi (a private lake currently closed to public) will be monitored over one year period to determine the current health status of this lake. Population surveys of the freshwater mussel (*Hyridella menziesi*) or kakahi will be conducted specifically to determine what key environmental factors control distribution and abundance of this species. An historical account of Lake Rotokakahi will be developed incorparating relevant matauranga (traditional knowledge) and will focus on past issues impacting on present water quality conditions.

Chris Mcbride continues to conduct monthly Bio-fish surveys and water quality monitoring of Lakes Rotorua, Rotoiti, Rotoehu, Okareka and Rotoma, and has completed five Bio-fish surveys of northern and southern Lake Taupo between January and June 2006. Chris was also involved in installing a remote weather station near Lake Tarawera in September, and will deploy the first remote lake monitoring site on Lake Rotorua, to be added to the Global Lakes Ecological Observatory network in December.

As a part of his PhD study, **Deniz Özkundakci** has investigated a method for extracting phosphorus from sediments to obtain a ^{31}P nuclear magnetic resonance (NMR) spectrum. Preliminary results show, that ^{31}P NMR can provide a powerful tool to quantify the inorganic and organic phosphorus pool in the sediment. Deniz will use this technique to investigate the effect of treatment for nutrient stabilisation on the phosphorus transformation in a lake.

Vivienne Cassie-Cooper is continuing to work on her collection of diatom photomicrographs which form part of the Landcare Research Herbarium at Lincoln.

Wendy Paul completed her MSc thesis and has recently graduated with first class honours. She will be presenting some of her research at the NZFSS conference in November. Wendy is now working for the University of Waikato as a Biology technician for 0.75 of the year and will continue to be involved with lakes research for the remainder of the year.

Matthew Prentice's research project will use high resolution sampling of phytoplankton and water quality parameters to understand key variables influencing cyanobacterial dynamics within the Lower Karori Reservoir. Data will be incorporated into the models DYRESM-CAEDYM and ELCOM-CAEDYM to simulate temporal and spatial phytoplankton dynamics within the reservoir and test hypotheses relating to the dynamics of cyanoabacteria. The effects of a European Perch (*Perca fluviatilis*) removal in initiating a trophic cascade will also be investigated.

Eloise Ryan continues to expand her role as Environmental Water Specialist with Genesis Energy. She is managing water quality monitoring programmes associated with Huntly Powerstation, the new e3p Powerstation in Huntly and will shortly start work on the Rodney Power Station Project. She is working closely with and being supported by many consultancy firms including Tonkin & Taylor, URS Ltd and NIWA on water-related projects.

Dennis Trolle is at the end of his field study, where he has been collecting and analyzing cores from 12 different lakes in the Rotorua district. The field study is expected to be finished by December 2006, after which the results are to be published in a scientific journal.

Nina von Westernhagen has been working on the data preparation for a three dimensional model (ELCOM-CAEDYM). Data incorporated in the model results from previous 18 months data collection on Lake Rotoiti. Model results will be expected early next year. Furthermore she has been working on spatial and temporal variability analyses on Lake Rotoiti for a publication. Some variability results will be presented on the NZFSS conference in November 2006.

Compiled by Louise

University of Auckland

School of Geography and Environmental Science

Ian Boothroyd is a part-time Senior Lecturer responsible for teaching and research in freshwater ecology and resource management. His research interests at the University include chironomid taxonomy, macroinvertebrate grazing of biofilms, ecology of geothermal ecosystems and frameworks for sustainable development. See news on Kingett Mitchell Ltd. for further information.

Several students have completed their research theses over the past year or so. **Graham Surrey** has completed his MSc research on the pressure-state-response model for environmental monitoring based on restoration initiatives in Waitakere City. **Jessica Pacalioga** has completed her MSc research on the rate and influence of decay of mangrove leaves in established and newly formed mangrove forests. **Liza Inglis** explored the effectiveness of the River Environment Classification for use in Auckland streams, and looked at reach scale habitat differences. The uniqueness within and between geothermal ecosystems has been the focus of research by **Sylvia Hay**. Her work involved invertebrate community analyses as well as molecular analyses of *Chironomus* species from different geothermal ecosystems. **Erica Colley** looked at the relationship between bacterial, algal and macroinvertebrates colonisation of rock surfaces in streams. Her work also involved experiments on the feeding preferences of *Potamoprygus antipodarum*. **Daniel Gulliver** has completed his research on the effects of rapidly changing landuse on streams of North Auckland, and **Parvati Prema** has researched the effectiveness of multi-purpose expectations from wetland restoration initiatives using triple-bottom line reporting. **David Aalbers** was involved in a summer project looking at fragmentation of aquatic habitat in urban and peri-urban streams.

Students currently involved in their research include **Joanne Yee**, who is looking at integrated catchment management frameworks and a focus on geomorphological factors; and **Richard Mairs** will be conducting his research on the fragmentation of riparian vegetation and associated geomorphic and instream habitat factors in urban and peri-urban streams. **Kelly Booth** is a summer student who will be assisting Ian with his work on geothermal ecosystems by surveying the terrestrial invertebrate fauna associated with different geothermal ecosystems.

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NZFFSS 40th Anniversary

Call for photographs and memorabilia

The 40th anniversary of the founding of the New Zealand Limnological Society is approaching. We expect to celebrate this occasion with a series of events. Amongst the happenings will be a short history of the Society and the freshwater sciences in general as they have impacted on New Zealand.

As part of this history of the Society we would like to include as many photographs and other memorabilia that relates to past events of the NZFFSS as possible. Photographs might include conference attendees, conference field trips and also any key limnological events (for example the 1987 SIL Congress held in Hamilton, other key conferences or workshops, or even supervisors and their students at work!). Informative and entertaining photographs or other memorabilia are welcomed!

All photographs will be scanned at high resolution and the originals returned to the sender as soon as possible. Digital photographs can be e-mailed. Please ensure that the date and name of the event, and names of personnel are included with your photograph or other memorabilia. All photographs and material will be duly acknowledged except where otherwise requested.

Please send all material to:

Dr Ian Boothroyd

Kingett Mitchell Ltd.

P.O. Box 33-849

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AUCKLAND

Ph: 09 486 8068

Fax: 09 486 8072

Mobile: 021 275 4109

E-mail: iboothroyd@kma.co.nz

So search through your photograph albums or boxes of memorabilia and share your memories with other members of the Society and New Zealand at large!

Contributed Items

A call for action on Manawatu River degradation

We the undersigned group of concerned scientists and regional residents call on Horizons Regional Council (Horizons) to take action on unacceptable water quality and continued deterioration of the Manawatu River. (See attached fact sheet for more details)

Background

The recent decision by Horizons to grant a Resource Consent for Fonterra to continue discharging wastewater into the Manawatu River highlights the extremely poor state of the river, Fonterra's indifference to being an environmental leader, and Horizons' failure to protect the environment. The public must be made aware of the underlying problems that the decision presents: the Consent was granted because the River's water quality is extremely poor; Fonterra's discharge will add significantly to the poor quality, and Horizons have compounded the problem by failing to enforce compliance with Consent conditions. It is important to note that while individual staff at Horizons work hard and are trying to protect the environment, Horizons' permissive policies have failed and must be changed.

1. **The problem — deterioration of the Manawatu River.**

   Irrespective of the measurement used, the state of the Manawatu River has been deteriorating since Horizons Regional Council has been in existence, e.g.,

   1. Sediment loadings in the River have significantly increased during recent decades[2].
   2. A recent Horizons water quality trend analysis[3] shows most measured parameters of river health have declined significantly since at least 1989.
   3. Invertebrate samples over many years from the lower Manawatu River classify the River as severely polluted[4].
   4. A suite of sensitive migratory native fish is now missing from two-thirds of the Manawatu River Catchment[5].

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[2] Horizons Regional Council. 2005. State of the Environment Report of the Manawatu-Wanganui Region. Palmerston North.

[3] Gibbard, R., J. Roygard, O. Ausseil, and L. Fung. 2006. Water Quality Trends in the Manawatu Wanganui Region 1989 - 2004. 2006/EXT/702, Horizons Regional Council.

[4] Death, F., and R. G. Death. 2005. River Health of the Manawatu-Wanganui Region. Report to Horizons Regional Council, Massey University Palmerston North.

[5] Joy, M. K., and R. G. Death. 2002. Predictive modelling of freshwater fish as a biomonitoring tool in New Zealand. Freshwater Biology **47**:2261-2275.

Death, R. G., and M. K. Joy. 2000. Freshwater Fish in tributaries of the South Eastern Upper Manawatu River. A report to horizons.mw Institute of Natural Resources-Ecology Massey University, Palmerston North.

Joy, M. K. 1999. Freshwater fish in the upper Manawatu River: a contribution to a life supporting capacity study. A Report to the Manawatu-Wanganui Regional Council Massey University, Palmerston North.

Joy, M. K. 1999. Native Fish Diversity and Distribution in Selected Tributaries of the Oroua River: a contribution to a Study of the Life Supporting Capacity of the Oroua River. A Report to the Manawatu-Wanganui Regional Council Massey University, Palmerston North.

Lack of compliance with Consent conditions

Horizons' record of enforcing Consent conditions is poor. Analysis of compliance data on the current Consents to discharge into the Manawatu River shows that most of the large discharges failed at least one of their Consent conditions for most sampling dates over the last several years (see attached fact sheet).

The Fonterra Consent

The recent Consent for Fonterra's plant at Longburn to continue discharging wastewater into the Lower Manawatu River has highlighted problems with the Resource Management Act (RMA). The discharge was considered a minor impact but this was because of the poor quality of the receiving water[6], i.e. the water quality is already so bad, Fonterra's discharge could not make a measurable difference. At the hearing Fonterra presented the costs of other options; the cheapest would cost $10 million and the most expensive was $17 million. It chose the cheapest option and Horizons acquiesced. It is a matter of major concern that Fonterra – one of NZ's wealthiest companies, and one that has promoted its 'environmental concern' by requiring dairy farmers to protect water quality under its 2003 Dairying and Clean Streams Accord, is unwilling to adopt 'best practice' or to play its part in improving the Manawatu River's degraded state.

Manawatu residents are being forced to accept this further degradation of the river because it is too expensive for Fonterra to avoid. Thus, we are thus subsidising the company to the tune of $10 million.

2. Actions we expect from Horizons Regional Council:

1. The implementation of Integrated Catchment Management (ICM) plans for all catchments, including rule based nutrient budgets to control run-off from intensively farmed properties.
2. A moratorium on the renewal of existing Consents or the granting of new Consents to discharge into the Manawatu River catchment, until the ICM in point 1 is implemented.
3. Immediate and effective action against all breaches of Resource Consents discharging into the Manawatu River catchment.
4. Consent monitoring results to be made publicly available (as required by Section 35 of the RMA). All major discharges should have their Consent monitoring results put on the Horizons web pages as soon as they are received so the public can access them and see at a glance which discharger is not complying.
5. Consents that involve self monitoring by applicants should have external review and/or independent monitoring.

[6] Fonterra dump makes minor difference, interview with Regional Councillor Annette Main (Manawatu Evening Standard 10 August 2006)

6. Immediate progress on retiring erosion prone hill country and tree planting assistance packages[7].
7. The introduction of a policy of significant fines for non-complying territorial authorities and other large-scale dischargers, along with a recommendation that any such fines be refunded for upgrading the offending plant to halt the problem.

Conclusion

The Manawatu River is unhealthy and has been deteriorating for a long time. This is an indictment on Horizons Regional Council and shows it has failed in its duty under the RMA to avoid, remedy, or mitigate adverse effects on the River's degraded water quality. We call on Horizons to halt this decline immediately by changing its environmental management regime. Horizons must undertake rule-based, integrated catchment management controls on all inputs into the river from both point and non-point sources. Horizons must effectively enforce compliance with Consent conditions and make monitoring results public so that public pressure can assist the Council in its enforcement responsibilities.

We note that this region is not alone in its lax monitoring and enforcement and that most other regions have similar problems. We call on other groups to initiate similar action plans for their regions.

Contact - Mike Joy m.k.joy@massey.ac.nz

71 Signatories:

Manawatu Degradation Fact Sheet

Water quality – Nutrients

- Eight of the ten State of the Environment (SOE) sites in the Manawatu catchment showed significant increases in Nitrogen (NO_3) and dissolved reactive phosphorous (DRP) for the last 10 years[8].

Water quality – Sediment

- The only measure of sediment used by Horizons is turbidity, which gives a rough measure of the amount of soil being washed off the land. Four of the ten SOE sites in the Manawatu catchment showed significant increases in turbidity for the last 10 years[1].

River biology – Fish

- The migratory native fish species shortjaw kokopu, banded kokopu, koaro and redfin bully are sensitive to pollution; they are no longer found in approximately two thirds of

[7] Parts of these actions may already be included in plans or intended for the "One Plan"; however, so far we have seen much talk and very little action.

[8] Gibbard, R., J. Roygard, O. Ausseil, and L. Fung. 2006. Water Quality Trends in the Manawatu Wanganui Region 1989 - 2004. 2006/EXT/702, Horizons Regional Council.

the Manawatu catchment and are now only in the Tararua Ranges on both east and west sides. This is despite suitable habitat in the Ruahine Ranges. This distribution appears to be associated with poor water quality in the rest of the catchment on migratory routes. At each point where upstream migrating fish have a choice they take the branch with the better water quality[9].

River biology – Invertebrates

- Two invertebrate indices are used by most New Zealand Regional Councils; these are the macroinvertebrate community index (MCI) and the QMCI (the quantitative version of the MCI). Using the MCI, 9 of the 13 Manawatu catchment SOE sites sampled for invertebrates in 2005 were classed as severely polluted, 2 were classed as possibly impacted, and two were classed as clean water[10]. Using the QMCI, 5 of the 13 SOE sites were classed as severely impacted, and the other 8 as possibly impacted. The sites classed as severely polluted using both indices were the three lower Manawatu river sites, Opiki, Karere Road and Maxwells Line and the Oroua River at Awahuri.

Point source inputs –

- The major discharges by volume into the Manawatu River have all regularly failed to comply with at least one of their consent conditions for more than the last 5 years. Apart from 1 abatement notice in 1998 there have been no prosecutions resulting from these non-compliances since 1998.
- Data for 138 current discharge consents and 246 sampling events for the last 6 years were supplied by Horizons. Of these 246 sampling events, 90 (36%) failed to meet at least 1 consent condition; on 70 occasions the conditions were 'mostly met', and for the rest (36%) all conditions were met.
- As an example, some of the largest discharges by volume are listed below, as well as the number of monitoring events and number of non-compliances:

Consent holder	Number of monitoring events	Number of times at least 1 condition NOT met	Years covered
PNCC Palmerston North sewage	8	8	2004-2005
Dannevirke sewage	1	1	2005
Ashhurst sewage	3	3	2004-2005
Tui breweries	6	6	2000-2005

[9] Joy, M. K., and R. G. Death. 2002. Predictive modelling of freshwater fish as a biomonitoring tool in New Zealand. Freshwater Biology **47**:2261-2275.

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Joy, M. K. 1999. Freshwater fish in the upper Manawatu River: a contribution to a life supporting capacity study. A Report to the Manawatu-Wanganui Regional Council. Massey University, Palmerston North.

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[10] Death, F., and R. G. Death. 2005. River Health of the Manawatu-Wanganui Region. Massey University.

New Zealand pharmaceuticals (cooling water)	22	20	2000-2006
New Zealand pharmaceuticals (industrial waste)	22	19	2000-2006
Richmond Fellmongers	15	13	2000-2006
MDC Feilding sewage	3	3	2005-2006
Rongotea sewage	2	2	2006

The Resource Management Act – Under this act the following sections relate to Horizons duties in regard to compliance of resource consents:

Section 35(2) Every local authority shall monitor-

- (d) The exercise of the resource consents that have effect in its region...

Section 35(3) "Every local authority shall keep reasonably available at its principal office, information which is relevant to the administration of policy statements and plans, the monitoring of resource consents, and current issues relating to the environment of the area, to enable the public -

- To be better informed of their duties and of functions, powers, and duties of the local authority; and
- To participate effectively under this Act

Section 35(5) The information to be kept by a local authority under subsection (3) shall include -

- (gb) records of all resource consents granted within the local authority's region...
- A summary of all written complaints received by it during the preceding 5 years concerning alleged breaches of the Act or a plan, and information on how it dealt with each such complaint

Food for thought

From: peanz [mailto:peanz@xtra.co.nz]
Sent: Friday, 9 June 2006 4:25 p.m.
To: ndeans@nmfgc.co.nz; b.sorrell@niwa.co.nz
Subject: Arthur Haughey letter

Re the above in today's Autumn NZFSS newsletter, I couldn't agree more – even as scientists, you can't complain about slanted media coverage, lack of public understanding of issues etc if you run scared of "lobbying" and promotion.

We "lobby" industry organisations do it all the time and it works – you all know about the Great South Basin, right, and Business NZ's stance on possible increased business models for SOEs – that's because we are actively involved with the media and in public information/education. Goodness, climate change and response options get heaps of mileage, and much of the science there is still debatable! But people & Governments have made calculated, risk-management decisions and have run with them – well good, so why can't the Society do the same.

So get on with it – we should indeed have a budget line item for this, payed for by subs and possibly other sources – if this association is anything to go by, that line item should have about $8-10K alongside it

Mike P

Dr Mike Patrick

Executive Officer

PEPANZ

ph (04) 472-1993

Editors Note: Arthur Haughey's letter is re-published below for readers reference

Attn. Brian Sorrell

Sec. NZLS

c/- Box 8602

CHRISTCHURCH

Onemana PDC

Whangamata

WAIKATO 2982

3 April 2006

Ref: Presidents comment in Newsletter Nov. 2005

Neil Deans' concerns about developing views and issuing statements highlight similar situations in other professional and academic groups. In particular scientific groups seem to find publicity and media statements difficult and uncomfortable. This is understandable because good science relies on evaluating often contradictory data and reaching a rational conclusion consistent with well established and widely held theories. In the past few decades life has become more complicated and competitive. Thus groups like NZLS have an obligation to take a calculated stand on relevant topics, both to inform the wider community and lobby decision makers, in the hope of better outcomes for us all.

I strongly support a formal process to achieve this. Suggested elements which should be incorporated include:

1. Nature and basis for statement - ie, reason for preparation and type of concern. eg, "universal" or "particular" topic/urgent response or long-term strategy.

2. Authority to prepare and release statement eg, Presidential view, Secretary et al, Committee/ Special Panel, etc

3. Ratification of statement +/or Adoption as "Society Policy" eg, at subsequent AGM/by special vote 4. Identification of "Target" {Part of 1. for "particular" Part of 6. for "universal"}?

5. Recovery of Costs Incurred eg, special P.G.S.F/M.fEnvir support/Donations

6. Assessment of Achievements/Outcomes of each statement.

7. Review of "Policies" on a regular basis.

On the basis that (collectively at least) Limnologists know much about the importance and ramifications of freshwater and its management, then, if we make our views clear, and make it easy for consultation to take place, the public and affected parties should think automatically of asking our views.

I hope these ideas are helpful and encouraging.

Arthur Haughey

Contacts: ph/txt: 027 682 8600

Mail: 21b Fairview Road, Mt Eden, AKL 1003

S.I.L. 1987 Trust Fund Awards

The Society administers grants for overseas travel by young scientists and visits by overseas scientists through the SIL 1987 Trust Fund. The two grants are:

S.I.L. 1987 Trust Fund Travel Award

S.I.L. 1987 Trust Fund Guest Lecturer Award

S.I.L. 1987 Trust Fund Travel Award

Objective: To enable outstanding young scientists to attend overseas conferences, seminars or workshops, or to visit institutions to learn techniques, develop expertise, use equipment, collections or library facilities not available in New Zealand.

Eligibility: Applicants shall be New Zealand based members of the New Zealand Freshwater Sciences Society. Preference will be given to candidates less than 35 years of age, or who graduated in the previous 10 year period.

Previous awards: No person shall be ineligible for an award because of a previous award.

Applications: Applications shall be made on the electronic form available either on the website (http://freshwater.rsnz.org) or from the Secretary of the New Zealand Freshwater Sciences Society (b.sorrell@niwa.co.nz) by the date shown below.

Applicants will need to state their aims and objectives, submit a draft itinerary, supporting letters from relevant institutions, overseas contacts, a curriculum vitae, a list of publications, a draft budget showing other sources of financial support obtained or being sought, and name two referees.

Criteria: Applicants will be judged on the benefits that are likely to accrue to the candidate and limnological research in New Zealand as a result of the trip.

Reporting: The successful candidate will submit a trip report for publication in the Society's newsletter. Where appropriate, the successful candidate will also describe the work done during the trip at the next annual meeting of the Society.

Award: The award will cover the costs of travel (up to 100% for the grantee only) together with a contribution towards accommodation and living expenses up to $2000.00 or such higher sum that may be determined by the Trustees.

Tenure: Such period/periods as the Committee thinks fit.

Frequency: The award may be made annually provided there are suitable candidates. The Committee may decide not to make an award in any particular year.

Closing date: Applications must be submitted to the Secretary/Treasurer by 1 November in any year for the following year.

S.I.L. 1987 Trust Fund Guest Lecturer Award

Objective: To provide financial support for visits to and/or within New Zealand by eminent overseas limnologists, whose visits will benefit New Zealand's limnological research community as a whole.

Eligibility: Candidates should be eminent in some field of limnological research and have the ability to make a contribution to limnological research in New Zealand.

Previous awards: No person shall be ineligible for an award because of a previous award.

Applications: Applications shall be made on the electronic form available either on the website (http://freshwater.rsnz.org) or from the Secretary of the New Zealand Freshwater Sciences Society (b.sorrell@niwa.co.nz) by the date shown below.

Nominations: Candidates must be nominated by a financial member of the NZFSS who will submit on their behalf a letter outlining the aims and objectives of the trip, a curriculum vitae, a list of publications, a draft itinerary, a draft budget showing other sources of finance if any, and the names of two referees.

Criteria: The candidates shall be judged on their eminence in the field of limnological research and their ability to make a contribution to New Zealand's limnological research community. Visitors will be expected to address the annual meeting of the NZFSS and to visit several New Zealand research institutions including universities.

Reporting: The successful candidate will submit a trip report for publication in the Society's newsletter.

Award: The award will cover the costs of travel (up to 100% for the grantee only) together with a contribution towards accommodation and living expenses up to $2000.00 or such higher sum that may be determined by the Trustees. In determining the value of the award the Committee shall take into account the fact that overseas scientists are often better able to receive financial assistance than New Zealanders.

Tenure: Such period/periods as the Committee thinks fit.

Frequency: The award may be made annually provided there are suitable candidates. The Committee may decide not to make an award in any particular year.

Closing date: Applications must normally be submitted to the Secretary/Treasurer by 1 November in any year for the following financial year starting 1 July, although applications outside these times may be considered in special circumstances.

SIL 1987 Trust Travel Award

Duncan Gray, University

I was extremely grateful to receive funding from the S.I.L. 1987 trust to attend my first international conference. The 54th North American Benthological Society (NABS) annual meeting was held over five days during June 2006 in Anchorage, Alaska. The conference was well attended by 752 delegates whom presented on a wide range of topics from fish and insect ecology to bio-assessment to global climate change. My own area of interest is the ecology of upland floodplain rivers which was also well catered for.

The NABS annual meeting was advertised to me as being a bigger (because it is in America) version of our own NZFSS annual gathering. It is true that the NABS conference is a relaxed and sociable affair, but I wasn't prepared for the truly international flavour and diversity of presenters. Delegates were predominantly North American, but there was also a good turnout from the antipodes, Europe and Asia. Watching the struggles of some delegates with English put my own eloquency qualms to shame, as all speakers were given every encouragement.

On a more erudite note the NABS 2006 meeting gave me the chance to meet some of the global big guns in my area of study. For the past two years I have been studying the braided rivers of the South Island. Initially I became interested in the many, seemingly stable, springs that I discovered whilst hunting for trout on the expansive gravel floodplains of these rivers. In amongst the wholesale carnage wreaked by the last flood, I found peaceful silvery streams emitting from clear pools decorated with dancing sands and abundant life. When I started reading around the subject, there was very little literature on floodplain springs *per se*, but a burgeoning topic of floodplain study, connectivity, ecotones, hyporheic and phreatic, shifting mosaic dynamic stabilities. A "new" holistic view of floodplain rivers, which incorporated my oases of stability, was being formed in Europe and North America. In Europe the single remaining pristine braided catchment, the Tagliamento, N.W Italy, was being intensively studied by the likes of Arscott, Ward and Tockner. They made some important observations about habitat dynamics and turnover, and the knock-on effects to taxa in the various habitats. Over the (Atlantic) ditch Stanford, Ward (again) and Poole were finding previously underestimated eco-systems within the greater alluvial aquifer of the Flathead River and modelling the hydrological connectivity that appears to drive the complex relationships between both surface and underground habitats. Given the abundance of floodplain rivers in New Zealand we have contributed very little to the global growth of this topic. Not only did I get to meet several of the authors of these important papers, but they also proved to be nice guys and more than happy to discuss my ideas and the New Zealand situation. Dave Arscott has just arrived in New Zealand to take up a position at NIWA Christchurch and I look forward to working with him on some of our iconic rivers.

All this bodes well for my ensuing PhD. My intensions are to look more specifically at the braided river system. The key to understanding these rivers seems to be connectivity. Not only of habitats, via hydrological flow paths, but also of populations via dispersal and colonisation dynamics. Many of the people I met at NABS have set the scene for this study and I hope I can justify their interest and enthusiasm.

Overall the conference was very enjoyable and defiantly a fun, yet serious learning experience. I presented my research on the second day and I felt my talk was a success. I didn't receive any fatal questions and the response was generally favourable, as was the case for the entire New Zealand contingent. On the whole, a judicious choice from the five concurrent options usually resulted in an interesting experience and some new ideas. The plenary and opening sessions provided an insight into the ecotone between science and politics/policy. Frances Ulmer, the mayor of Juneau, spoke particularly well on her involvement with the anadromous fisheries debate in North America. The situation is very familiar with the opposing forces of profit Vs. sustainability Vs. extreme green, all butting heads, with indigenous claims and competition from overseas involved too. It was also good to see some of the famous names in North American freshwater ecology in the flesh, rather than just as names at the head of a paper.

Of course we had a bit of look around Alaska too. The three day ferry journey from Seattle, bypassing Canada, up to Juneau was unforgettable. Tents were gaffer taped to the deck and we slept, read and chatted our way along the Inside Passage amidst whales, dolphins, invisible moose and rain squalls. After the conference a hire car was driven into the interior, not that there are really any other roads to go on, and we toured Denali National park and enjoyed some fishing. The legendary monster salmonids were highly elusive, however, it was nice to catch a few of the northern hemisphere's arctic grayling, which are even nicer cooked on a fire under the midnight sun. An excellent trip all up, the Canterbury group returned home with a variable range of insect bites, inspirations, new contacts and photographic prizes.

I am extremely grateful to the S.I.L. 1987 Trust for providing me with the opportunity to attend my first international conference. Not only has this affirmed my belief in science as a worthy path, but also allowed me to forge some valuable links with the international scientific community and provided a renewed perspective on how fortunate New Zealand is to have a small population and some relatively un-impacted ecosystems. I look forward to my next international conference.

SIL 1987 Trust Fund Reports

2004-2005

Kit Rutherford, Treasurer, 17/1/06

Highlights

	17/10/2003	31/3/2004	30/9/2005
Assets	$64,000	$62,200	$63,300
Income	-$2,600 *	$2,500	$5,700

* there was a drop ($4,600) in the value of shares in the Int. Equity Tust Fund

Awards by Trust	$3,250	$3,740	$4,700
	Mike Joy	Susie Woods	David Burger
	Andrew Boulton		
	student prizes		

Awards by Lim Soc	$5,000
	Marc Schallenberg
	student prizes

NB Sums rounded to nearest $100

Notes

The BNZ NZ Blue Chip Equity Trust was compulsorily closed during 2004 and funds switched to the BNZ Strategic Bond Trust

$7,000 was transferred on 13th May 2004 from cash reserves to the BNZ Int. Equity Trust

The BNZ Int. Equity Trust earned a healthy $3,600 interest (~12%)

INVESTMENTS	**17/10/03**	**31/03/2004**	**30/09/2005**
BNZ NZ Blue Chip Equity Trust	$10,375	$11,229	$0
BNZ Int. Equity Trust	$23,366	$24,515	$35,161

	$18,747	$19,238	$27,829
cash reserves.	$10,989	$7,249	$283

Sum available for awards in 2006 (based on the Trust's Deed)

Interest	$5,700
5% of assets	$3,200
Total	**$8,900**

Treasurer's recommendation (based on previous awards) 5,000

2005-2006

Kit Rutherford, Treasurer, 29/9/06

Highlights

	31/3/2004	30/9/2005	15/9/2006
Assets	$62,200	$63,300	$63,400
Income	$2,500	$5,700	$5,820

Awards by Trust	$3,740	$4,700	$4,120
	Susie Woods	David Burger	Duncan Gray
Student prizes			$1,600*

* refunded to FWSS

NB Sums rounded to nearest $100

INVESTMENTS	**17/10/03**	**31/03/2004**	**30/09/2005**	**31/03/2006**
BNZ NZ Blue Chip Equity Trust	$10,375	$11,229	$0	$0
BNZ Int. Equity Trust	$23,366	$24,515	$35,161	$40,554
NZ Strategic Bond Trust	$18,747	$19,238	$27,829	$22,700
cash reserves.	$10,989	$7,249	$283	$283

Sum available for awards in 2007 (based on the Trust's Deed)

Interest	$5,820
5% of assets	$3,170
Total	**$8,990**

Treasurer's recommendation (based on previous awards)$5,000

Minutes of the 38th Annual General Meeting of the New Zealand Limnological Society Inc. (2005)

The AGM was held at the Rutherford Hotel, Nelson. The meeting opened at 16.30 hrs, 30th August 2005.

Present: Neil Deans, President
Brian Sorrell, Secretary-Treasurer
and 45 members

Apologies:

Barry Biggs, Vivienne Cassie-Cooper, Clive Howard-Williams, Dave Rowe, Mike Winterbourn.

Motion: That apologies be accepted. *(Neil Deans/Vida Stout carried).*

Minutes of the 37th AGM:

Matters arising from minutes:

- *Name Change:* The treasurer reported that the adoption of the new trading name "New Zealand Freshwater Sciences Society" as ratified at the 2004 AGM had been completed. The original formal name continues to be used for taxation purposes and for formal communication e.g. with the Companies Office and Registrar for Incorporated Societies (hence its use on AGM minutes!).
- *Fortieth Anniversary:* Ian Boothroyd reported on several initiatives proposed for the Society's 40th Anniversary. Ian and Ann Chapman are planning a book to document the history of limnology and the Society in New Zealand, and would welcome any material from members. They intend to make applications to the Lotteries Board and Heritage Fund (such Awards can be up to $20000) to support the book. Another initiative is a series of oral history interviews with long-serving and founding members to capture their recollections for posterity. It is proposed to have the National Library provide training in carrying out these interviews for some members. It was suggested that National Radio may be approached to broadcast some of the information. Another idea is for a special issue of NZJMFR with guest editors from the Society, although some members raised the issue of the high cost of special issues. Finally, a special social event for members is planned. Ian made a call for volunteers to contact him to form a sub-committee for the anniversary.
- *Fish and Invertebrate Posters:* The President reported that copies of the Fish and Invertebrate posters are still in stock at Environment Waikato, and are available from

Dave Speirs. Dave has started working on a macrophyte poster with assistance from macrophyte ecologists such as Paul Champion.

- *Newsletter:* The President thanked Ngaire Phillips for taking on the role of Newsletter Editor, and expressed the Society's appreciation for Mike Winterbourn's excellent editorship in the preceding years. The meeting was supportive of the current two newsletters per year system, with one relatively informal edition mid-year and an issue following the standard format in November. The Editor reminded the meeting that the success of the Newsletter rested upon members providing requested material on time and that she had already found some difficulty in getting contributions from members. The advantages and disadvantages of hard copy and pdf format were discussed at some length, and it was agreed that the Editor would ask for email feedback on preferred format. It was also agreed that pdf versions of all future newsletters would be placed on the website, but with any membership lists removed for privacy reasons.
- *Members' achievement awards:* The President thanked Jon Harding for his efforts in preparing the discussion document that was circulated to all members in advance of the AGM. There was considerable discussion about the purpose and scope of the Awards. The Awards are proposed to be distinct from traditional Honorary membership, which is usually conferred on the basis of lifetime achievement on retirement or at the end of a career, instead recognising any significant achievement during the course of a career. It was emphasised that the Awards would not be annual, but made only when an outstanding contribution could be recognised. The cost of issuing medals was raised and would be investigated by the Executive and reported back to the membership.

Motion: That the New Zealand Freshwater Sciences Society Medal be enacted according to the following rules, using the criteria as proposed in the discussion document:

1. There is a New Zealand Freshwater Sciences Society Medal for an outstanding contribution to our understanding and management of freshwaters by a member of the Society, with criteria for consideration of nominations as set out in the document "Honouring members of the NZ Freshwater Sciences Society".
2. That any nominations for Medals are considered by the Awards Committee (currently comprising the President, Secretary-Treasurer, a SIL Trustee and two members elected at an AGM).
3. That it is noted that honorary membership of the Society can be voted at a General Meeting of the Society, for those members who have performed significant service to the Society usually over a long period, on the recommendation of the Executive Committee as set out in the Society rules.

(Ann Chapman/Ian Boothroyd carried)

Motion: That minutes be accepted as a true and correct record of the 37th A.G.M. *(B. Sorrell/Carolyn Burns carried)*

President's report:

It is my pleasure to provide my third report to the Annual Conference of the New Zealand Freshwater Sciences Society in Nelson on the 30th of August 2005. As our joint conference with the Ecological Society this year is occurring earlier than usual, this report is presented less than a full year after the previous one.

Finances and Membership

The Society is in a sound state. The report by our hardworking Secretary Treasurer, Brian Sorrell, shows our finances to be healthy and to be largely similar to the previous year. Elsewhere in this report the various projects we have been undertaking on your behalf are set out. The question arises as to what any additional projects the membership would like us to undertake on behalf of the Society. I would welcome any discussion on this point, as we exist to promote freshwater sciences and facilitate and support research and researchers in this field. Our membership of 372 is relatively stable, being a slight increase on last year. We have noted that there is some turnover of members, but most are relatively long term in their commitment to the Society. Regrettably about a third of current members are behind in their renewal of subscriptions. It would greatly assist Brian to have memberships enthusiastically renewed without the necessity of reminders.

Preparations for the 40th Anniversary

Ian Boothroyd is leading preparations for our 40th anniversary in two years time, with assistance from Ann Chapman. Ian has proposed a book covering the people and some of the events over the last 40 years and also looking forward to the Society's future. He is keen to interview some of the members who have been involved in the Society from its foundation and has a variety of ideas including a potential special edition of the New Zealand Journal of Freshwater and Marine Research to celebrate the milestone. If you have any suggestions or are prepared to assist please contact Ian at Kingett Mitchell in Auckland.

Publications

Sales of the New Zealand Freshwater Sciences and Hydrological Societies' new book "Freshwaters of New Zealand" have been strong during the year. The initial difficulties with some misbound copies have now been rectified, which has effectively reduced our costs as we have fewer books in stock and Caxton Press have accepted responsibility for their error which has slightly reduced printing costs.

The Entomological Society has approached Mike Winterbourn to update the jointly produced standard macroinvertebrate identification text (Winterbourn, Gregson and Dolphin), which is proceeding swiftly and should soon be available. This should bring all the information up to date and will be a 'must have' for anyone working with stream invertebrates in New Zealand.

Sales of the New Zealand Stream Invertebrate text, (Collier and Winterbourn) have increased on reducing its price.

Posters

Dave Spiers has advised that the two posters of invertebrates and fish have been widely distributed but after reprinting there are plenty still available. Contact Dave at Environment Waikato if you would like copies. Production of the next poster in the series, on aquatic plants, has been unavoidably delayed, but with luck should be under way again soon. Any offers to assist in the production of other possible posters, such as of birds, would be

appreciated. Dave Spiers has offered to coordinate the production, but would welcome photos and assistance with the text, which is not an onerous task.

Society Awards

Jon Harding has developed a paper reviewing our Society's Awards, which recommends, amongst other things, that the Society develops a medal to recognise 'an outstanding contribution to freshwater science'. This idea has been discussed among the Executive which supports the proposal for consideration at the AGM.

Conferences

The 2005 Conference is held jointly for the first time with the New Zealand Ecological Society in Nelson. A committee of locals from both societies chaired by Trevor James has been working away at an ambitious programme including a two day field trip option for those wishing to visit Golden Bay. Scheduling this conference required it to be held in late August/early September, which is not ideal, but was the only time when a suitable venue was available. Some members have been unable to attend a conference at this time which is regrettable, but the opportunity to share ideas with our colleagues from the Ecological Society could only occur at this time. At the time of writing, many members appear to be taking up the opportunity to attend and present papers; certainly more from our Society than from our colleagues.

The 2006 conference is proposed for Rotorua. David Hamilton is chairing the conference committee and promises to have plenty of interest in respect of lake management, especially given the extensive plans to improve water quality of Lakes Rotorua and Rotoiti.

No specific location has been confirmed for the 2007 conference which would be jointly held in New Zealand with the Australian Society of Limnology. This would normally be held in the South Island on rotation. Queenstown has been suggested as a suitable location, being attractive to attendance by Australians who could fly there directly, although it suffers from no Society members being located there to assist with organisation. Otago and Southland members may be able to assist. Alternatives would be Dunedin or Christchurch.

Newsletter

Ngaire Phillips has taken on the responsibility for the Newsletter, with assistance from Mike Winterbourn. Ngaire has introduced an updated electronic format with two editions of the Newsletter each year, to keep the information more topical and provide a greater opportunity to provide information of interest to Society members. As always, any material provided which meets with editorial requirements will be gratefully received.

Website

Steph Parkyn has continued to operate the website, hosted by the Royal Society, found at http://freshwater.rsnz.org/. This provides not only information about the Society but also upcoming conferences, Society Awards, publications including the newsletter, and useful links to other societies. We are now seeking another person to assist with this role, which is not unduly onerous but does need someone who is web-savvy. Thanks for the good work over the last few years, Steph.

National Issues

Rob Davies-Colley and I prepared a submission on behalf of the Society to the Government's Freshwater component of its 'Sustainable Development Programme of Action'. In addition, Jon Harding and I attended some meetings of the 'stakeholder reference group', which was to give advice on freshwater matters from a variety of interested parties, including industry, environmental, recreational and scientific perspectives. This process has stalled until after the election, but, depending on the makeup of the next government, is likely to further develop a framework for future freshwater management. Freshwater scientists will seek to ensure a role for adequate science and research to inform the management of freshwaters in the future.

Public Good Funding for Freshwater Research

Concern amongst the science community is growing about the funding process for environmental research in general and for freshwater science in particular. There has been no increase in funding for environmental research since 1998, which means an effective reduction in funds of at least 10% in 2005 value. The Government has recognised that freshwater issues are both a priority and urgent through its 'Sustainable Development Programme of Action' and freshwaters are now recognised by the public as the most significant environmental issue in New Zealand today[11]. Despite this high profile for freshwaters, and ongoing interest by graduates in the freshwater field, the funding and allocation process appears arbitrary and takes a large proportion of researchers' time to place bids. The recently announced funding round from the Foundation for Research, Science and Technology was oversubscribed by up to 8 times. Such a funding environment leads to frustration and is readily criticised as being opaque, time consuming and wasteful of valuable resources. There is grave risk that in some areas there may be a loss of capacity and intellectual capital which New Zealand can ill afford to lose, particularly as it is not readily replaced. It is unsurprising that there are concerns from young people about the desirability of a research career in science. At least the wider society is aware of the importance of our field. The challenge will be to ensure that adequate resources are provided to support the research, scientists and the institutions necessary to deliver the required high standard. I would appreciate any views on this topic and any suggestions as to the means by which we make our concerns known where they might cause some improvement.

Concluding Remarks

I would like to express my thanks to all the members of the Executive committee and other members who voluntarily assist to keep the Society functioning and provide services to its members. In these days of 'user pays' it is very helpful that so many people are prepared to assist without expectation of financial reward. As the net is cast widely, I consider that none of the duties are too onerous. Any support offered and provided, however, is appreciated.

I move from the Chair that this report be accepted. *(Neil Deans/Carried).*

[11] Hughey, KFD; GN Kerr; R Cullen (2004) Public Perceptions of New Zealand's Environment: 2004 EOS Ecology, Christchurch. 102 pp ISBN 0-476-01265-1

Secretary/Treasurer's report:

Membership

Total membership at 24 August 2005 was 372.

Membership figures for the last four years are shown in Table 1 & 2. Total membership is similar to last year. Due to the timing of this year's conference, the increase in number of paid members reflects those unpaid/in arrears in 2004 that have caught up since December. The 2005/06 mailout will occur shortly after the conference – please pay promptly!

There have been 18 new members joining since December 2004 (9 student/unwaged, 1 corporate and 8 ordinary).

Table 1. Financial status of membership

	2005**	**2004**	**2003**	**2002**	**2001**
Members current:					
Paid	237	154	162	216	219
Unpaid	42	100	109	59	127
Members in arrears:					
1 yr	38	47	34	55	-
2 yr	20	24	12	-	-
3 yr	8	8	15	-	-
Other:					
Honorary	11	11	11	11	11
Life	1	1	-	-	-
Legal req.*	1	1	1	1	1
Societies	5	5	5	5	2
Libraries	9	9	9	9	9
Total	**372**	**360**	**358**	**356**	**369**

* Not a member

**Not comparable with other years due to different timing of conference.

Table 2. Type of membership

	2005	**2004**	**2003**	**2002**	**2001**
Ordinary	260	252	249	251	247

Corporate	24	23	22	23	27
Honorary	11	11	11	11	11
Life	1	1	-	-	-
Unwaged/student	71	68	71	66	82
Other (Societies)	5	5	5	5	2

Table 3. Regional distribution of membership and membership categorised by institution.

Regional		Institutions	
Northland	7	Universities	55
Auckland	34	CRIs	76
Waikato	89	Other Res/Env Inst.	33
Bay of Plenty	20	DoC	28
Gisborne/Hawkes Bay	7	Fish & Game	10
Taranaki	3	Loc./Region. Govt	29
Manawatu-Wanganui	21	Central Govt	5
Wellington	27	Companies	3
Tasman-Nelson-Marlborough	15	Private addresses	118
Canterbury	76	Libraries & Societies	15
West Coast	5		
Otago	30		
Southland	4		
Overseas	17		
Unknown	17		

Finances:

- The accounts were audited by Erin Humphrey of Brown Web Richardson, Hastings.
- The Society continued its expenditure programme approved at earlier AGMs. Support for re-printing of the invertebrate and fish posters ($6050) exceeded the cost of the second printing ($4784). The balance is going towards printing of the new macrophyte poster.
- As of 22 August 2005, there are ca. 300 out of 1000 *FoNZ* copies in stock and we have just passed the break-even point. The discounting in value of the invertebrate book stock offset against its sales leaves a net loss in book value of $1100 for the financial year.

- Major income items include interest on our investments ($2223), and higher total subscription payments ($8713) than last year, with more arrears having been recovered this year.
- The 2004 Waiheke conference made a total profit of $771 ($504 of this banked after 30.6.05).
- We have one term deposit, the combined Jolly Fund, with $38,345.90 at 26 August 2005. The Current Account at 26 August 2005 was at $12,054.19.

Motion: That the Society Accounts for 2003/04 be accepted. *(Brian Sorrell/Maureen Lewis– carried).*

Motion: That the Auditor for the next financial year be Brown Webb Richardson Ltd., Hastings. *(Brian Sorrell/Greg Burrell– carried).*

SIL Trust report

The Treasurer was unable to attend and provide a report. A report will be provided for the next newsletter and AGM minutes. David Burger thanked the Trust and the Society for his 2004 Award and made a brief report on the conferences he attended.

Future Conferences

The President thanked the Nelson committee lead by Trevor James for organising a highly successful 2005 conference.

David Hamilton presented an account of progress for the 2006 conference in Rotorua, and confirmed that the dates would be 26 – 30 November 2006. The Park Heritage Hotel, which successfully hosted recent Lake Water Quality meetings, would be the likely venue. Planning of field trips was also well underway, with trips likely to focus on geothermal waters, and restoration of lakes.

Possible venues for the 40th anniversary 2007 Conference, due to be another joint conference with ASL and in the South Island, were canvassed. Only a few centres were likely to be able to accommodate the size of the conference, and Queenstown was raised as the most suitable given its direct air-links with Australia and its interesting freshwater environments. Key Southland and Otago members will be contacted to form an organising committee.

General Business

- The President announced that Steph Parkyn was stepping down as website manager, and thanked her on the Society's behalf for her years of service. Volunteers were called for, and David Burger was duly co-opted as the new webmaster.

- The meeting discussed the many difficulties and limitations in science funding facing the Society, particularly the opaqueness and arbitrary nature of the FRST OBI process, the lack of any real increase in freshwater science funding since 1998, and the bias of the Marsden Fund against non-molecular biology, despite the public identification of healthy freshwater systems as the country's number one environmental problem. Other problems raised were the Government's presentation of

non-science initiatives as 'science', and the low commitment of agencies such as MfE and DoC to freshwater relative to other business.

Motion: That the Executive draft a press release outlining our concern on the lack of resourcing of freshwater science. *(Richard Allibone/Chris Arbuckle - carried).*

Meeting closed 17.45 hrs.

Awards Presented at the Joint NZES & NZFSS Conference : 28th August – 1ST September, Nelson, 2005.

NZES Awards

Te Tohu Taiao – Award for Ecological Excellence

Assoc. Prof. David Given – Botanical Services Curator @ Christchurch City Council.

Best Paper by a New Researcher - $500

Mike Joy – Massey University

Joy M.K. & Death R.G. (2004) Predictive modelling and spatial mapping of freshwater fish and decapod assemblages using GIS and neural networks. *Freshwater Biology*. Vol 49, 1036-1052.

Life Membership

Peter Williams – Landcare Research

Ecology in Action Award -$1000

Karen Denyer – Environment Waikato

Student Prizes

Best Student Paper Presented at the Conference - $500

Michelle Greenwood – University of Canterbury

Living on ecosystem boundaries: the impacts of floods on populations of a NZ fishing spider *Dolomedes aquaticus.*

Highly Commended Paper Presented at the Conference - $300

David Burger – University of Waikato

Nutrient Cycling in a eutrophic polymictic lake: quantifying sedimentation and benthic fluxes to assess internal nutrient loads.

Best Student Poster Presented at the Conference - $300

Rebecca Eivers – University of Canterbury

The response of stream invertebrates to riparian vegetation age and condition in exotic plantation forests.

Highly Commended Poster Presented at the Conference - $150

Arun Siva – Victoria University of Wellington

Long-term vegetation changes in Otari-Wiltons bush following possum control.

Best Honours or Masters Student - $150

Brendan Doody – What is coming up in the roses? Potential role of domestic gardens and the future of Riccarton Bush.

Sponsored Prizes

Best Paper on a Conservation Topic presented at the Conference

(Department of Conservation)

Jessica Costall – Massey University

Katipo spiders in Manawatu: population dynamics, monitoring techniques and habitat preferences.

Best paper on an Applied Research Topic.

(Kingett Mitchell Ltd)

Jointly awarded to:

Kate McAlpine – Department of Conservation.

Factors contributing to invasion success in the environmental weed *Berberis darwinii:* seed dispersal, germination and seedling establishment.

Liza Inglis – University of Auckland

The river environment classification and its application in the Auckland region.

New Zealand Freshwater Sciences Society Medal and Honorary Membership

Rules:

1. *The New Zealand Freshwater Sciences Society Medal is for an outstanding contribution to our understanding and management of freshwaters by a member of the Society, with criteria for consideration of nominations as set out below.*
2. *Nominations for Medals are considered by the Awards Committee (currently comprising the President, Secretary-Treasurer, a SIL Trustee and two members elected at an AGM).*
3. *Honorary membership of the Society can be voted at a General Meeting of the Society, for those members who have performed significant service to the Society usually over a long period, on the recommendation of the Executive Committee as set out in the Society rules.*

Criteria for the Medal:

Matters for consideration by the Awards Committee (not all need apply in any particular case and not in priority order):

- National or international recognition of research or management output
- Leadership in particular fresh or brackish water science field
- Quantum and quality of research or management output
- Contribution to education or public knowledge of freshwater science
- Contribution towards sustainable management of freshwater environments
- Contribution towards the conservation of one or more species, habitats or freshwater ecosystems

There would be an expectation that any members nominated and considered worthy of this elevated status would be recognised in an appropriate fashion, such as in an award ceremony at the annual conference, to which the person awarded would be invited at the Society's cost and expected to provide a presentation. Nominations would include relevant biographic information, a statement of the nominated person's specific outstanding contributions to freshwater science in New Zealand and letters of support from at least two members of the Society. Closing dates for nominations would be by 30 June of each year. There would be no expectation that any Award need be presented in any given year.

Criteria for Honorary Membership of the Society:

As is set out in the Constitution, persons considered eligible for honorary membership are recommended to a General Meeting of the Society by the Executive Committee. Criteria for the award would usually involve significant service to freshwater science and/or to the Society, usually over a lengthy period. It is recommended that any nominations for honorary membership could be received by the Executive committee from members at least two months prior to any General Meeting of the Society, to provide time for the Committee to consider these and make a recommendation to the General Meeting with adequate notice as required in the Society Rules.

New Zealand Freshwater Sciences Society
Established 1968

Freshwater Sciences Society Conference 2006

Keeping it Fresh

Werohia te wero (Take up the Challenge)

27-30 November, Park Heritage Hotel, Rotorua

REMINDER TO REGISTER

Just over a month until this year's NZ Freshwater Sciences Society Conference kicks off and we know there are still lots of registrations to come in. It really helps if we receive advance registrations in order to arrange room allocations, catering, field trip numbers etc. A PDF of the full Conference Brochure and the link to the online Registration Form can be found at the FSS website: http://freshwater.rsnz.org

We look forward to seeing you at the conference
For any further enquires please contact:
Nelson Tourism Services
Email: freshwater@nzdirect.co.nz
Ph: 03 546 6338
or
Professor David Hamilton, University of Waikato
email davidh@waikato.ac.nz
Ph. 07 858 5046

New Zealand Limnological Society Financial Statements to June 2005

NEW ZEALAND LIMNOLOGICAL SOCIETY

INDEX TO FINANCIAL STATEMENTS
FOR THE YEAR ENDED 30 JUNE 2005

NEW ZEALAND LIMNOLOGICAL SOCIETY

STATEMENT OF FINANCIAL POSITION
AS AT 30 JUNE 2005

		This Year	Last Year
LIABILITIES			
Current Liabilities			
Subscriptions in Advance	570		1031
		570	1031
MEMBERS FUNDS			
Opening Balance	61725		73312
Surplus of Income Over Expenditure for Year	5816		(11588)
Closing Balance		67541	61724
		$ 68111	$ 62755

	Statement No 1	
	This Year	Last Year
ASSETS		
Current Assets		
Bank of New Zealand Ltd		
Current Account	10926	16304
Term Deposit	38346	35910
Sundry Debtors	1415	-
Interest Accrued	26	285
Goods and Services Tax	1327	217
Stock on Hand	16071	10039
	68111	62755
	$ 68111	$ 62755

These financial statements and notes must be read subject to the accompanying Accountants Statement

NEW ZEALAND LIMNOLOGICAL SOCIETY

STATEMENT OF FINANCIAL PERFORMANCE
FOR THE YEAR ENDED 30 JUNE 2005

		Statement No 2	
		This Year	Last Year
Gross Profit/(Loss) transferred from Trading Account		(1100)	-
Income			
Subscriptions		8713	7010
Conference Income		267	-
Donations Received		35	76
Book Sales		-	466
Poster Sales		6050	-
Entomological Society Bulletin		-	518
Interest Received		2223	2245
		16188	10315
Expenditure			
V H Jolly Memorial Fund	1200		-
Student Awards	300		-
Bank Charges	208		180
Conference Registration	289		-
General Expenses	-		4
Postage	128		44
Poster Printing	4784		4322
Printing Costs			
Newsletter	1951		1687
Royal Society Fund	644		572
SIL Trust Prizes	800		650
SIL Trust Donation	-		10000
Travelling Expenses	68		4444
	10372		21903
Total Expenditure		10372	21903
Surplus of Income Over Expenditure transferred to Members Funds		$ 5816	$ (11588)

These financial statements and notes must be read subject to the accompanying Accountants Statement

NEW ZEALAND LIMNOLOGICAL SOCIETY

TRADING ACCOUNT
FOR THE YEAR ENDED 30 JUNE 2005

	Statement No 3
	This Year
Book Sales	18842
Cost of Sales	
Opening Stock	10039
Book Publishing Costs	25974
	36013
Closing Stock	16071
	19942
Gross Profit/(Loss) transferred to Statement of Financial Performance	$ (1100)

These financial statements and notes must be read subject to the accompanying Accountants Statement

NEW ZEALAND LIMNOLOGICAL SOCIETY

NOTES TO AND FORMING PART OF THE FINANCIAL STATEMENTS FOR THE YEAR ENDED 30 JUNE 2005

Statement No 4

1 These Statements include actual Subscription Income received.

2 Book Stock on Hand is valued at cost or net realisable value whichever is lower.

3 The Term Deposit is due on 22 January 2006 @ 6.20%

4 The Statements have been prepared on a GST exclusive basis as the Society is registered for GST.

5 These statements cover a 12 month period.

6 During the year the Society changed its trading name to New Zealand Freshwater Sciences Society.

These financial statements and notes must be read subject to the accompanying Accountants Statement

BWR
Brown Webb Richardson

Brown Webb Richardson Ltd
111 Avenue Road East
PO Box 146
Hastings
New Zealand
Telephone 06 873 8037
Facsimile 06 876 5211
Email info@bwr.co.nz
Web www.bwr.co.nz

AUDIT REPORT TO THE MEMBERS OF THE NEW ZEALAND FRESHWATER SCIENCES SOCIETY INC

We have audited the attached Financial Report. The Financial Report provides information about the past financial performance of the Society and its financial position as at 30 June 2005.

Committee Responsibilities
The Committee is responsible for the preparation of a Financial Report which fairly reflects the financial position of the Society as at 30 June 2005 and of the results of operations for the year ended 30 June 2005.

Auditors Responsibilities
It is our responsibility to express an independent opinion on the Financial Report presented by the Committee and report our opinion to you.

Basis of Opinion
An audit includes examining, on a test basis, evidence relevant to the amounts and disclosures in the Financial Report. It also includes assessing:

- the significant estimates and judgements made by the Committee in the preparation of the Financial Report, and
- whether the accounting policies are appropriate to the Society's circumstances, consistently applied and adequately disclosed.

We conducted our audit in accordance with generally accepted auditing standards in New Zealand except that our work was limited as explained below. We planned and performed our audit so as to obtain all the information and explanations which we considered necessary in order to provide us with sufficient evidence to give reasonable assurance that the Financial Report is free from material mis-statements, whether caused by fraud or error. In forming our opinion we also evaluated the overall adequacy of the presentation of information in the Financial Report.

Other than in our capacity as auditors we have no relationship with or interests in the New Zealand Freshwater Sciences Society Inc.

Qualified Opinion
Control over revenue prior to being recorded is limited and there are no practical audit procedures to determine the effect of this limited control. In this regard we have not obtained all the information and explanations that we have required.

In our opinion, except for adjustments that might have been found to be necessary had we been able to obtain sufficient evidence concerning the above-mentioned income, the attached Financial Report fairly reflects the results of operations for the year ended 30 June 2005 and the financial position of the Society as at 30 June 2005.

Our Audit Report was completed on 6 December 2005 and our qualified opinion is expressed as at that date.

Brown Webb Richardson Ltd

BROWN WEBB RICHARDSON LIMITED
Hastings

Mrs Sue Adkins

School of Biological Sciences

University of Canterbury

Private Bag 4800

CHRISTCHURCH

Aquatic invertebrate ecology; vertical distribution patterns; shellfish bed regeneration

Adkinsj@xtra.co.nz

Dr Richard Allibone

Department of Conservation

Science and Technical Centre

P.O. Box 10-420

WELLINGTON

Freshwater fishes; conservation; ecology

Mrs Margaret Allison

Institute of Food, Nutrition and Human Health

Massey University

Private Box 756

WELLINGTON

Water microbiology and its effect on human health

m.j.allison@massey.ac.nz

Miss Anita Anderson

URS New Zealand Ltd

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AUCKLAND

freshwater ecology, water quality, resource management and conservation

anita_anderson@urscorp.com

Mr Chris Arbuckle

Manager Resource Science - Otago Regional Council

70 Stafford St

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DUNEDIN

Native freshwater fishes; GIS and remote sensing; environmental monitoring

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Dr Dave Arscott

NIWA

P O Box 8602

Riccarton

CHRISTCHURCH

River ecology and management; invertebrate and periphyton ecology; fluvial geomorphology; riparian ecology; fish ecology

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Miss Emily Atkinson

Department of Conservation

Southland Conservancy

PO Box 743

INVERCARGILL 9840

NZ native freshwater fish

eatkinson@doc.govt.nz

Ms Brenda Baillie

Ensis

Private Bag 3020

ROTORUA

Stream and riparian ecology and management; woody debris dynamics; channel morphology

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Ms Amanda Baldwin

Dept of Biological Sciences

University of Waikato

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HAMILTON

Eutrophic lake management; aquatic plants and algae

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Miss Sheree Balvert

12a Ford St

HAMILTON

sfb9@waikato.ac.nz

Dr Jim Bannon

Woodlawn

RD 3

CAMBRIDGE

Effects of temperature, dissolved oxygen and haeatological adaptation on sustained swimming in fish

jbannon@xtra.co.nz

Miss Annabel Barnden

School of Biological Sciences

University of Canterbury

Private Bag 4800

CHRISTCHURCH

Acid mine drainage

arb61@student.canterbury.ac.nz

Mr Grant Barnes

Auckland Regional Council

P.B. 92-012

AUCKLAND

Wetland ecology; native fish; water quality

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Ms Treffery Barnett

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Okura

RD2, Albany

AUCKLAND

Freshwater invertebrate taxonomy

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Mr José Barquin Ortiz

Universidad de Cantabria

Dpto. Ciencias y Técnicas del Agua

y del Medio Ambiente

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SPAIN

Limnological research; invertebrate diversity; freshwater springs

jose.barquin@unican.es

Ms Keren Bennett

Bioresearches

P.O. Box 2828

AUCKLAND

Native freshwater fish; aquatic invertebrates

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Ruth Berry

Investment Manager, Environment and Society

Foundation for Research, Science and Technology

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WELLINGTON

Resource management; classification systems

ruth.berry@frst.govt.nz

Mr Tobias Bickel

Department of Zoology

University of Otago

P O Box 56

DUNEDIN

Invasive macrophytes; lake ecology; foodwebs in lakes; macrophyte management; fish ecology

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Dr Barry Biggs

NIWA

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Riccarton

CHRISTCHURCH

Stream ecology; stream algae/periphyton; stream invertebrates; nutrients

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Mr Robin Black

6 Mahana Pl

ROTORUA

Geology; native fish

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Dr Paula Blackett

41 Diomede Glade

HAMILTON

Water quality; impacts of discharges; environmental behaviour; environmental education; society-environment relationships

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Ms Tanya Blakely

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St Martins

CHRISTCHURCH

Aquatic invertebrates living in terrestrial systems; restoration; dispersal; deforestation

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Mr Marty Bonnett

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Riccarton

CHRISTCHURCH

Freshwater fish and ecology; galaxiids; electric fishing

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Kingett Mitchell Ltd

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Takapuna

AUCKLAND 1332

Stream ecology; chironomid taxonomy and ecology; biodiversity; biomonitoring; resource management

iboothroyd@kma.co.nz

Dr Jacques Boubée

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RD 3

HAMILTON

Impact assessment of thermal power stations and hydro reservoirs; fish passes; fish migration; temperature effects on fish; fish feeding; chironomids

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Dr Andrew Boulton

Ecosystem Management

University of New England

Armidale NSW 2350

AUSTRALIA

Macroinvertebrate ecology; rivers; hyporheic zone; leaf litter breakdown; river management; groundwater/surface water interactions; education

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Mr Scott Bowie

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CHRISTCHURCH

Native fish habitat protection; high country; Waitaki Basin; non-migratory galaxiids

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Mr Eddie Bowman

NIWA

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ROTORUA

Water quality; hydrology; fisheries; instream biota

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Ms Alice Bradley

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OTAGO

Acid mine drainage

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Dr Paul Broady

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CHRISTCHURCH

Algae, cyanobacteria: terrestrial, non-marine aquatic, taxonomy, ecology, Antarctic algae

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Dr Niall Broekhuizen

NIWA

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HAMILTON

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Mr Logan Brown

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General freshwater research

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Mr Fin Bruce

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Glenview

HAMILTON 2001

Life history and distribution of crayfish (Paranephrops zealandicus) ; growth and behaviour of freshwater jelly fish (Craspedacusta sowerbii)

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Mr Francis Burdon

118 Iles Rd

ROTORUA

Aquatic-terrestrial linkages; stream communities and ecosystem processes; land-use impacts; effects of invasive species; urbanisation; agriculture

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David Burger

Dept of Biological Sciences

University of Waikato

Private Bag 3105

HAMILTON

Zooplankton dynamics; nutrient cycling in lakes

dburger@waikato.ac.nz

Mr Max Burnet

10 Leda Place

North New Brighton

CHRISTCHURCH 8009

Effects of eutrophication

Dr Noel Burns

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Devonport

AUCKLAND

Physio-chemical factors associated with lakes; lakes monitoring; lakewatch software

lakescon@xtra.co.nz

Prof. Carolyn Burns

Department of Zoology

University of Otago

P O Box 56

DUNEDIN

Plankton; lakes; microbial food webs

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Dr Gregory Burrell

Kingett Mitchell Ltd

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CHRISTCHURCH

Applied and urban ecology; hyporheic zones; GIS; invertebrates and microbes

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Mr David Cameron

Montgomery Watson Harza

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WELLINGTON

Water quality; freshwater biology

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Dr Vivienne Cassie Cooper

Landcare Research

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HAMILTON

Taxonomy and ecology of marine and freshwater microalgae; fossil and recent diatoms, ultrastructure; check lists; toxic phytoplankton; red tides

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Mr Lindsay Chadderton

Department of Conservation

P.O. Box 13049

CHRISTCHURCH

Stream ecology; impacts of adventive species and catchment modifications on native fish and invertebrates; freshwater conservation and restoration

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Manas Chakraborty

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PALMERSTON NORTH

Aquatic ecological modelling using macroinvertebrate diversity and GIS database; freshwater monitoring

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Mr Paul Champion

NIWA

P O Box 11-115

HAMILTON

Aquatic and wetland plant ecology and management; biosecurity

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Dr Ann Chapman

Dept of Biological Sciences

University of Waikato

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HAMILTON

Ecology of zooplankton, zoobenthos and weed fauna; crustacean systematics (esp. Copepoda, Amphipoda, Ostracoda).

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Miss Sjaan Charteris

Department of Conservation

Canterbury Conservancy

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CHRISTCHURCH

Native fish; whitebait migration; freshwater ecology; spawning; wetlands; indigenous species

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DUNEDIN

Environmental impact assessment; freshwater ecology

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HAMILTON

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DUNEDIN

Lotic ecology; fish ecology; predator-prey interactions; food web ecology; habitat use; freshwater ecology

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Mr Bruce Colgan

Address Unknown

Fish passage; water quality; macroinvertebrate biomonitoring

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Dr Kevin Collier

Environment Waikato

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HAMILTON

Stream ecosystems; benthic invertebrate ecology; food and feeding of riverine birds; conservation and restoration of freshwater ecosystems

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Dr Jim Cooke

NIWA

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HAMILTON

Sediment-water interactions; nutrient transformations; land-use effects on water quality; water quality monitoring; technology transfer

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Mr Simon Coubrough

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Khandallah

WELLINGTON

Native freshwater fish; sport fishery management; aquatic invertebrate ecology; aquaculture

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NORTHLAND 0250

Freshwater mussel breeding

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Mr Bill Crawford

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TAUPO 3351

Ephemeroptera; Aquatic Insects

Ms Glenys Croker

NIWA

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HAMILTON

Freshwater invertebrates

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Dr Trevor Crosby

Landcare Research

Private Bag 92170

AUCKLAND

Diptera, especially Simuliidae taxonomy and biology; use of computers for information retrieval

crosbyT@landcareresearch.co.nz

Ms Anna Crowe

Cawthron Institute

Private Bag 2

NELSON

Freshwater ecology; freshwater macroinvertebrates; periphyton ecology; biomonitoring; blue-green algae

anna.crowe@cawthron.org.nz

Mr Adam Daniel

27A Aurora Tce

Hillcrest

HAMILTON

Radio telemetry; fish behaviour; invasive fish; common carp

carpresearch@gmail.com

Dr Bruno David

Department of Conservation

Research, Development & Improvement Division

P.O. Box 112

HAMILTON

Freshwater fish ecology; flows and hydrology; radiotelemetry; tagging

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Dr Rob Davies-Colley

NIWA

P O Box 11-115

HAMILTON

Optical properties of water; public perception of water quality; river morphology and sediment transport; riparian management; bacterial indicators in water

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Ms Mary de Winton

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HAMILTON

Aquatic plants; charophytes; lake restoration; seed banks

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Dr Ken Deacon

Biology Dept. Lakehead University

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CANADA P7B5E1

Environmental issues; Odonata; biomonitoring

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Ms Tracie Dean

Department of Conservation

Northern Regional Office

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HAMILTON

Freshwater fish; freshwater conservation; resource management

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Mr Neil Deans

Fish and Game New Zealand

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NELSON

Freshwater conservation management

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Dr Russell Death

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Massey University

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PALMERSTON NORTH

Community ecology; aquatic macroinvertebrates

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Dr Michel Dedual

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Te Rangiita

TURANGI

Ichtyology; limnology

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Miss Zoe Dewson

Institute of Natural Resources - Ecology

Massey University

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PALMERSTON NORTH

Aquatic invertebrates; low flows

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Melanie Dixon

Greater Wellington - The Regional Council

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WELLINGTON

Wetlands

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Mr Robert Donald

Norske Skog Tasman Ltd

Private Bag

KAWERAU

Trophic level interactions; smelt feeding ecology

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Dr Wayne Donovan

Bioresearches

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AUCKLAND 1

Water quality; fisheries

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Miss Elizabeth Dowling

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Bryndwr

CHRISTCHURCH

edowling@doc.govt.nz

Miss Theresa Downs

Department of Zoology

University of Otago

P O Box 56

DUNEDIN

Lakes; wetlands; phytoplankton; ecology; restoration

dowth867@student.otago.ac.nz

Dr Ian Duggan

Dept of Biological Sciences

University of Waikato

Private Bag 3105

HAMILTON

Species invasions; rotifers; zoogeography; macrophyte-invertebrate interactions

duggan@waikato.ac.nz

Mr Maurice Duncan

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Riccarton

CHRISTCHURCH

Effects of disturbance on lotic biota; habitat assessment by 2D modelling

m.duncan@niwa.co.nz

Mr Nicholas Dunn

Department of Zoology

University of Otago

P O Box 56

DUNEDIN

Ecology of Galaxiidae

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Ms Lois Easton

37 Dignan St

Pt Chevalier

AUCKLAND

Freshwater ecology; urban stormwater management; riparian management

nz_kereru@yahoo.co.nz

Ms Kate Edenborough

Auckland Regional Council

P O Box 92-012

AUCKLAND

Streams; stormwater; community education

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Miss Tracey Edwards

NIWA

P O Box 11-115

HAMILTON

Aquatic plant management

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Mr Eric Edwards

Department of Conservation

P O Box 743

INVERCARGILL

Freshwater fish conservation

eedwards@doc.govt.nz

Mr Hans Eikaas

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Avonside

CHRISTCHURCH

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Miss Rebecca Eivers

School of Biological Sciences

University of Canterbury

Private Bag 4800

CHRISTCHURCH

Effectiveness of riparian buffers in exotic plantation forests

rse18@student.canterbury.ac.nz

Mr Perry Empson

Environment Waikato

P O Box 4010

HAMILTON

Freshwater fisheries distributions; macroinvertebrates as environmental monitoring tools; sampling methodologies; compliance monitoring; mining impacts

perry.empson@ew.govt.nz

Dr Kay Etheredge

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R.D. 5

HAMILTON 3285

Phytoplankton; taxonomy & ecology; dystrophic lakes

etheredge@xtra.co.nz

Mr Brent Evans

Auckland Regional Council

P O Box 92-012

AUCKLAND

Stream monitoring; fish passage; integrating science and management; performance monitoring and assessment

brent.evans@arc.govt.nz

Ms Rebekah Eyles

Department of Zoology

University of Otago

P O Box 56

DUNEDIN

Ecology & Health; waterbourne diseases & aquatic ecosystems

reyles@new.co.nz

Dr Geoff Fish

27B Holland Street

ROTORUA

Chemistry of static waters and sediments; phytoplanton; limnomedusae

Mr Malcolm Flain

65 Cotswold Ave

Bishopdale

CHRISTCHURCH 5

Fish, especially salmonid biology; ecology of rivers and lakes

Dr Elizabeth Flint

33 Poynder Avenue

CHRISTCHURCH

Phytoplankton taxonomy

Mr Rob Forlong

Address Unknown

Fisheries; habitat modelling; IFIM; water management

rob.forlong@gw.govt.nz

Dr Don Forsyth

37 Link Road

RD 1

TAUPO

Chironomid ecology and systematics; aquatic invertebrate ecology

donfor@reap.org.nz

Miss Elizabeth Fowler

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HAMILTON

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CHRISTCHURCH

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Impact of water allocation and power development on trout and eel fisheries; GIS modelling of fish distribution and abundance

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Systematics of hydrobiid gastropods; biogeography

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HAMILTON EAST

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WHAKATANE

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DUNEDIN

ecological responses of lakes to anthropogenic impacts; climate change and lakes; palaeolimnology

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Dr Donald Scott

55 Riccarton Rd

MOSGIEL

River ecology; freshwater fisheries; effect of pollution and water abstraction on fisheries.

salmo@xtra.co.nz

Mr Graham Sevicke-Jones

Hawkes Bay Regional Council

Private Bag 6006

NAPIER

ecology of riverine systems

jonesy@hbrc.govt.nz

Dr Angela Sharples

263 Old Taupo Rd

ROTORUA

lake water quality

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Ms Karen Shearer

Cawthron Institute

Private Bag 2

NELSON

Macroinvertebrate ecology; invertebrate drift

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Mr Eddie Sides

82 Wyndham St

P O Box 91250

AUCKLAND

Human impacts on aquatic ecosystems; interactions between environment and biota

eddie.sides@boffamiskell.co.nz

Mr Marcus Simons

Department of Conservation

P.O. Box 5244

DUNEDIN

Conservation of native fish; ecology of aquatic habitats;

management of exotic species

msimons@doc.govt.nz

Mrs Fiona Smith

4 Barker St

LINCOLN

sb.fksmith@xtra.co.nz

Ms Kirsty Smith

Address unknown

lakes; plankton; water quality

smithkirs@student.vuw.ac.nz

Mr Robert Smith

Tasman District Council

Private Bag 4

RICHMOND 7031

SOE monitoring; water quality; land use impacts; wetlands; algal ecology; resource management

rob.smith@tdc.govt.nz

Mr Brian Smith

NIWA

P O Box 11-115

HAMILTON

NZ caddis larval-adult associations especially Hydrobiosidae; identification of adult EPTs

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Mr Joshua Smith

NIWA

P O Box 11-115

HAMILTON

Freshwater fish

j.smith@niwa.co.nz

Mr Ton Snelder

NIWA

P O Box 8602

Riccarton

CHRISTCHURCH

Water resources management

t.snelder@niwa.co.nz

Mr Theerasak Somdee

Institute of Food, Nutrition and Human Health

Massey University

Private Box 756

WELLINGTON

t.somdee@massey.ac.nz

Dr Brian Sorrell

NIWA

P O Box 8602

Riccarton

CHRISTCHURCH

Lake and wetland ecology, management and restoration; macrophyte ecophysiology; nutrient cycling; carbon cycling

b.sorrell@niwa.co.nz

Mr David Speirs

Environment Waikato

P O Box 4010

HAMILTON

Water abstraction; waterway enhancement; environmental monitoring; freshwater fish

david.speirs@ew.govt.nz

Dr Bob Spigel

NIWA

P O Box 8602

Riccarton

CHRISTCHURCH

Physical limnology

b.spigel@niwa.co.nz

Mr Brett Stansfield

277 Whirinaki Rd

Whirinaki

RD2

NAPIER

Water quality monitoring

brett@hbrc.govt.nz

Dr John Stark

Cawthron Institute

Private Bag 2

NELSON

Macrophyte-invertebrate associations; aquatic entomology and taxonomy (Hydroptilidae and Chironomidae); hot spring ecology; biological monitoring; biotic indices

john.stark@cawthron.org.nz

Mr Richard Storey

NIWA

P O Box 11-115

HAMILTON

Stream Ecology, Hyphoreic zone, Riparian management;

ephemeral streams; wetland ecology

r.storey@niwa.co.nz

Dr Rebecca Stott

NIWA

P O Box 11-115

HAMILTON

Wastewater microbiology

r.stott@niwa.co.nz

Dr Vida Stout

School of Biological Sciences

University of Canterbury

Private Bag 4800

CHRISTCHURCH

South Island lakes and ponds, especially as dynamic ecosystems; zooplankton; macrophyte fauna; freshwater mites

vida.stout@canterbury.ac.nz

Mr Rowan Strickland

Cawthron Institute

Private Bag 2

NELSON

Freshwater fish

rowan.strickland@cawthron.org.nz

Dr Alastair Suren

NIWA

P O Box 8602

Riccarton

CHRISTCHURCH

Aquatic bryophytes and invertebrates; alpine and urban stream ecology; flow-invertebrate interactions

a.suren@niwa.co.nz

Ms Lavanya Susarla

URS New Zealand Ltd

Level 6, URS centre, 13-15, College Hill

PO Box 821

AUCKLAND

Water quality; zooplankton and phytoplankton; macroinvertebrates; conservation and restoration of freshwater ecosystems; MCI; resource management; management plans

lavanya_susarla@urscorp.com

Mr Darin Sutherland

37A Carrington Avenue

HAMILTON

Population and evolutionary genetics; taxonomy and ecology of freshwater amphipods and mysids

dls7@waikato.ac.nz

Miss Donna Sutherland

NIWA

P O Box 8602

Riccarton

CHRISTCHURCH

Aquatic plant and algal taxonomy, physiology and control; Antarctic algal taxonomy; Antarctic cyanobacterial physiology

d.sutherland@niwa.co.nz

Dr Chris Tanner

NIWA

P O Box 11-115

HAMILTON

Wetland ecology and ecotechnology; aquatic plants

c.tanner@niwa.co.nz

Mr Aleki Taumoepeau

NIWA

P O Box 11-115

HAMILTON

Aquatic botany; weed control

a.taumoepeau@niwa.co.nz

Mr Mark Taylor

79 Regency Cr

Redwood

CHRISTCHURCH

Freshwater ecology; fish ecology; aquatic macroinvertebrate ecology

mark@ael.org.nz

Mr Russell Taylor

School of Biological Sciences

University of Canterbury

Private Bag 4800

CHRISTCHURCH

Chironomids; glacial streams

russell.taylor@clear.net.nz

Mr Ross Thompson

Centre for Biodiversity Research

University of British Columbia

6270 University Boulevard, Vancouver

BC V6T 124 CANADA

food web ecology of aquatic invertebrates; effects of lantation logging on aquatic communities

ross.thompson@stonebow.otago.ac.nz

Ms Fleur Tiernan

Auckland Regional Council

P.B. 92-012

AUCKLAND

limnology; stream macroinvertebrate assemblages; ephemeral streams; nutrient impacts; disturbance effects

fleur.tiernan@arc.govt.nz

Dr Mike Timperley

NIWA

P O Box 109 695

Newmarket

AUCKLAND

Environmental chemistry and toxicology

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Ms Ria Tiney

Bioresearches

P O Box 2828

AUCKLAND 1140

Freshwater fish and aquatic invertebrates; stream ecology

ria@bioresearches.co.nz

Prof. Colin Townsend

Department of Zoology

University of Otago

P O Box 56

DUNEDIN

Stream ecology; fish; invertebrates

colin.townsend@stonebow.otago.ac.nz

Mr Sven Sebastian Uhlmann

Department of Zoology

University of Otago

P O Box 56

DUNEDIN

Influence of land use on river ecosystems; impact of multiple stressors

sebastian.uhlmann@stonebow.ac.nz

Miss Rossana Untaru

Chemistry Department

University of Waikato

Private Bag 3105

HAMILTON

Lake eutrophication; trace elements and nutrients in freshwater and sediments

rossana@xtra.co.nz

Dr Mike Vanden Heuvel

Forest Research Institute

Private Bag 3020

ROTORUA

Aquatic ecotoxicology; aquatic ecology

mike.vandenheuvel@forestresearch.co.nz

Mr Bill Vant

Environment Waikato

P O Box 4010

HAMILTON

Water quality; data analysis and interpretation; public communication

bill.vant@ew.govt.nz

Dr Christina Vieglais

Biosecurity New Zealand

P.O. Box 2526

WELLINGTON

Invasion biology; incursion response; new organisms; didymosphenia

christina.vieglais@maf.govt.nz

Dr Jonet Ward

949 Shands Rd

RD6

CHRISTCHURCH 7676

Aquatic ecology; Water quality, wetlands, management of aquatic resources

tjward@ihug.co.nz

Miss Summer Warr

Address unknown

Freshwater ecology; riparian restoration; water quality; resource management

Miss Kiryn Weaver

Institute of Natural Resources - Ecology

Massey University

Private Bag 11-222

PALMERSTON NORTH

trout-macroinvertebrate interactions; seasonal variations of macroinvertebrates

kirynw@hotmail.com

Ms Kerry Webster

NIWA

P O Box 109 695

Newmarket

AUCKLAND

Trace metal transport and fate in aquatic systems

k.webster@niwa.co.nz

Dr Jenny Webster-Brown

Chemistry Department

University of Auckland

Private Bag 92019

AUCKLAND

Trace metal chemistry in aquatic environments

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Mr Rohan Wells

NIWA

P O Box 11-115

HAMILTON

Macrophytes; lake management

r.wells@niwa.co.nz

Mr David West

47 Regent St

HAMILTON

Native freshwater fish, esp. large galaxiids; fish passage; whitebait; galaxiid diet; age and life history; fish health

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Dr Eddy White

3-26 Robinson Terrace

TAUPO

Eutrophication.

Miss Michelle White

64 Ellesmere St

Ravensbourne

DUNEDIN

mwhite@dcc.govt.nz

Miss Amy Whitehead

School of Biological Sciences

University of Canterbury

Private Bag 4800

CHRISTCHURCH

Freshwater ecology and conservation biology; habitat associations; population modelling

alw76@student.canterbury.ac.nz

Ms Belinda Whyte

Address unknown

Environmental impact appraisal; native freshwater fish; aquatic invertebrates

Miss Michele Widdowson

15 Millthorpe Crescent

HAMILTON

Stream ecology; land use impacts

michelewiddowson@yahoo.com

Dr Bob Wilcock

NIWA

P O Box 11-115

HAMILTON

Lowland streams, water chemistry, land use change; gas transfer

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Mr Thomas Wilding

NIWA

P O Box 11-115

HAMILTON

Stream ecology; lake monitoring; urban waterways; fish habitat modelling

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Mr Ben Wilson

Fish and Game New Zealand

Auckland/Waikato Region

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HAMILTON

Freshwater fish

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Prof. Emeritus Mike Winterbourn

School of Biological Sciences

University of Canterbury

Private Bag 4800

CHRISTCHURCH

Stream ecology; aquatic entomology; land-water interactions;colonisation processes

mike.winterbourn@canterbury.ac.nz

Mr Keith Wise

20A Debron Avenue

Remuera

AUCKLAND

Aquatic insects and Neuroptera

kwise@akmuseum.org.nz

Ms Susie Wood

Cawthron Institute

Private Bag 2

NELSON

Toxic cyanobacteria in New Zealand; taxonomy of species and identification of cyanotoxins

susie.wood@cawthron.org.nz

Mr Darragh Woodford

School of Biological Sciences

University of Canterbury

Private Bag 4800

CHRISTCHURCH

Freshwater fish ecology; conservation biology

dwo270@student.canterbury.ac.nz

Mr Aslan Wright-Stow

NIWA

P O Box 11-115

HAMILTON

Water quality; stream ecology; effects of siltation; landuse effects on stream health; freshwater invertebrate taxonomy

a.wright-stow@niwa.co.nz

Dr Roger Young

Cawthron Institute

Private Bag 2

NELSON

Water quality; land use; organic matter dynamics; fisheries ecology

roger.young@cawthron.org.nz

Dr Jens Zollhöfer

36 Hawford Rd

Opawa

CHRISTCHURCH 8002

Hydrobiology; invertebrates; management; impact assessment; SOE; resource consent

jens@eosecology.co.nz

New Zealand Freshwater Sciences Society

How do I join?

Print out the following details, fill in the boxes and mail to Secretary/Treasurer, Brian Sorrell, c/- NIWA, PO Box 8602, Riccarton, Christchurch, New Zealand. b.sorrell@niwa.co.nz

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Title:.....**Surname**:.....

Initials:.....**First Name:**.....

Address:

Telephone: (main).....

(other).....

Fax:..... **Email**:.....

Membership type (corporate, waged, student, unwaged):

.....

Please fill out the following permissions:

I agree to the NZ Freshwater Sciences Society publishing my membership details.

Choose one: Yes No Please sign: _____

I give permission for my email address to be added to the NZFSS email mailing group

Choose one: Yes No Please sign: _____

My preferred format for receiving the NZFSS newsletters is as a:

Choose one: Electronic pdf Hard copy

Brief List of Your Professional Interests:

Payment:

Waged/Corporate $40

Student $10

Unwaged $10

Royal Society of New Zealand Travel Grants* (optional) $4

TOTAL AMOUNT....$.....

Make cheques payable to "NZ Freshwater Sciences Society"

Payment by Credit Card:

Visa Mastercard (circle one)

Name on card: .....

Card no:.....

Expiry date:.....

Signature:.....

Send to:

Secretary/Treasurer Brian Sorrell, c/- NIWA, PO Box 8602, Riccarton, Christchurch, New Zealand. b.sorrell@niwa.co.nz

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*used for overseas travel awards for beginning NZ scientists and administered by The Royal Society of New Zealand

Constitution

CONSTITUTION

1 The name of the Society shall be the New Zealand Limnological Society Incorporated.

2 Objectives: To establish effective liaison between all persons interested in any aspect of fresh and brackish water research in New Zealand, and to encourage and promote these interests.

3 Means of Attaining Objectives:

(a) The establishment and maintenance of a register of all persons working in the appropriate fields in New Zealand, giving details of their current interests.
(b) The holding of meetings and conferences to deliver scientific papers, and to discuss scientific topics.
(c) Co-operation and affiliation with other scientific bodies when appropriate.
(d) The production of a newsletter including information about the current interests of freshwater workers, and listing relevant new publications and other items of interest.
(e) The distribution of the Newsletter to appropriate organisations in New Zealand and overseas.

4 Membership:

(a) The members of the Society shall be:
    1 Ordinary members who shall be persons admitted to membership by the committee, and whose annual subscription as fixed from time to time shall be accepted by the Committee.
    2 Unwaged Members who shall be any full-time student of a secondary or tertiary educational institution, and who shall pay such annual subscription as shall be fixed from time to time.
    3 Honorary Members who may be elected at a general meeting on the recommendation of the Committee.
    4 Life Members who shall be persons admitted to membership by the committee, and whose lifetime subscription shall be paid in advance as a single fee as fixed from time to time.
(b) Newly elected members shall be notified by the Secretary of their election and sent a copy of the constitution.
(c) Any member may resign by giving notice in writing to the Secretary, and paying all subscriptions due.
(d) Any member shall notify the Secretary in writing of a change of address.
(e) The Committee shall have the power to cancel membership in the case of conduct considered prejudicial to the Society.
(f) All members are entitled to receive the Society's Newsletter free of charge.

5 Executive and Meetings:

(a) There shall be an Executive Committee consisting of the President, the immediate Past President (ex officio), the Secretary-Treasurer, the Editor, and two (2) other members,

(b) The Committee shall implement the Society's general business, and a simple majority shall decide all questions at Committee Meetings. If voting is equal, a motion is lost. A quorum at a Committee Meeting shall be three (3).

(c) The officers shall be elected every two years, either at a General Meeting or by postal ballot as the existing Committee determine. The postal ballot shall be held before the end of the financial year, and if a General Meeting is not held, the committee shall have the power to scrutinize and count the votes, and declare the results.

(d) The newly elected officers shall take office 1 month after their election.

(e) Candidates for positions as officers shall be nominated at the General Meeting, or in writing signed by two other members, received by the Secretary before the time of such meetings, or by the 31st of August if a meeting is not held. Every candidate shall signify personally, or in writing his or her acceptance of nomination. The Committee shall have the power to co-opt members of the Society to fill any casual vacancies on the Committee.

(f) The Executive Committee may summon a General Meeting or a General Meeting shall be summoned on receipt of a request signed by no fewer than ten (10) members entitled to vote. General Meetings shall be summoned by notice in writing, specifying the business to be considered, and notices shall be posted not less than fourteen (14) days prior to the proposed date.

(g) At all General Meetings, ten (10) members entitled to vote shall constitute a quorum, and a simple majority shall carry a motion. Voting shall be on the voices, or by show of hands or by ballot at the discretion of the chairman, provided that, if any member so demand, voting shall be by ballot. The Chairman shall have a deliberative and a casting vote.

(h) Votes of members. Each Member shall have one vote at a General Meeting, and each Affiliated Body shall have the right to appoint a delegate who shall have one vote at a General Meeting.

6 Finance:

(a) Annual Subscription: shall be due on the 1st of July in each year and the amount shall be fixed at a General Meeting. Members whose subscriptions are not paid by the succeeding 30th of June shall be unfinancial and shall be liable to forfeit all benefits of membership. The financial year shall conclude on the 30th of June.

(b) The funds of the Society shall be controlled by the Executive Committee and shall be banked in the name of the Society. Cheques and bills shall be signed by any one of the President or Secretary-Treasurer, and must be approved in writing by other members of the Executive Committee. The Society shall not have the power to borrow money.

(c) Any income, benefit or advantage shall be applied to the charitable purposes of the Society as described in Sections 2 and 3 above.

(d) No member of the Society, or any person associated with a member, shall participate in or materially influence any decision made by the Society in respect of the payment to or

on behalf of that member or associated person of any income, benefit or advantage whatsoever.

(e) Any such income paid shall be reasonable and relative to that which would be paid in an arm's length transaction (being the open market value).

(f) The provisions and effect of clauses 6(c), 6(d) and 6(e) shall not be removed from this document and shall be included and implied into any document replacing this document.

(g) Payment of accounts must first be approved by the Executive Committee. This may be done at a meeting or by mail, and items may be approved in advance for one financial year.

(h) An Annual Report and Financial Statement shall be prepared and posted to members. The Financial Statement shall be audited by a person appointed at the previous General Meeting.

7 Organisation:

(a) The Secretary-Treasurer shall keep (i) a Minute Book containing full minutes of all meetings, and (ii) a Register with the names, addresses, professional interests and date of joining of all members.

(b) Affiliated Bodies. Incorporated or unincorporated bodies, and other organisations approved by the Committee, may become affiliated with the Society on acceptance by the Committee, and on payment of such annual subscription as may be fixed from time to time.

(c) Changes in the Constitution may be made only on a two-thirds majority of the votes polled, and this vote shall be conducted by letter.

(d) No addition to or alteration or recession of the rules shall be approved if it affects the charitable objects, the personal benefit clauses, or the winding up clause, except as specified under clause 7(g) below.

(e) The Common Seal of the Society shall be in the custody of the Secretary, who shall in pursuance of a resolution of the Committee to that effect, affix the same to all instruments requiring the same.

(f) The Society shall not be wound up except on a two-thirds majority of a postal vote, but shall be dissolved in the event of the membership being fewer than five (5) persons. In the event of dissolution of the Society, its assets shall become the property of the Royal Society of New Zealand which shall dispose of the assets in accordance with the aims of the Society.

(g) The provisions and effects of this clause 7(f) shall not be removed from this document and shall be included and implied into any document replacing this document, except that another organisation, which must be an Inland Revenue Department approved charitable organisation, may be named in place of the Royal Society of New Zealand.