



Combined annual science review meeting



Participants in the LERNZ-IACRC annual science review meeting.

LERNZ (Lake Ecosystem Restoration New Zealand) and the Freshwater Products and Strategies Program of the Invasive Animals Cooperative Research Centre (IACRC), Australia, held their annual science review 2009 at the University of Waikato, Hamilton. This was an opportunity for researchers to share information on aquatic restoration and pest fish control. At the outset of the OBI research, research programmes, were aligned to be complementary to those of the IACRC. As a result, the considerable progress of the IACRC can be applied

to pest fish control in New Zealand. Thirty-five scientists from Australia attended the meeting, along with a similar number of researchers and students from New Zealand. At the conclusion of the meeting, Adam Daniel demonstrated surgical implantation of radio transmitters and Nick Ling conducted a field trip to the Lake Waikare fish pass in somewhat damp conditions. Abstracts of the presentation at the meeting (Daniel et al. 2009a) are available on request.



Adam Daniel with a koi carp.

Koi carp movement study completed

Adam Daniel has finished his Ph. D. on carp movements in the lower Waikato Basin (Daniel 2009). After three years of intensive study, Adam has optimized conditions for implanting transmitters (Daniel et al. 2009b). He has also established that koi carp use most of the Waikato River from the sea to Karapiro Dam, and travel up the Waipa River as far as Pirongia. Koi carp move freely between the lakes of lower Waikato and river, with movements concentrated in August and September. Adam's studies spanned two very different years; August to December was very dry and 2007, whereas the same period in 2008 was much wetter. During the dry 2007 year, koi carp moved widely, unable to get back to locations such as Lake Whangape because of barriers caused by the dry conditions. It is likely that the low-water conditions restricted access to feeding areas and increased competition. Conversely, during high water conditions fish had access to flooded margins and moved much less. Adam's study has provided crucial information that will allow us to target trapping operations to effective locations and times of the year.

Artificial ponds provide good habitat for inanga

Peter Ellery has a passion for whitebait, which led him to investigate the possibility of restoring inanga habitat in the Kaituna River. During studies for his Postgraduate Diploma in Applied Science at the University of Waikato, Peter studied borrow pits created during stop bank construction in the lower Kaituna River for their potential as inanga habitat. Having established their suitability by minnow trapping, he set about excavating more tidally flushed ponds. These ponds provided very suitable habitat for inanga; catch rates were 80% greater in the newly excavated ponds than in the old borrow pits. No inanga were caught at adjacent river sites, showing the importance of off-channel habitat (Ellery and Hicks 2009). Flood protection schemes have isolated inanga from their rearing habitats. Peter's study suggests that restoration of inanga habitat will be important in returning whitebait runs to their former size.



Peter Ellery setting a minnow net in an inanga pond.

Recent Publications

- Balvert, S., Duggan, I.C. and Hogg, I. 2009. Zooplankton seasonal dynamics in a recently filled mine pit lake: the effect of non-indigenous *Daphnia* establishment. *Aquatic Ecology* 43, (2): 403-413.
- Brookes J.D. and Hamilton D.P. (2009) Lakes and Reservoirs of Australia and New Zealand. In: Gene E. Likens, (Editor) *Encyclopedia of Inland Waters* volume 2, pp. 513-523 Oxford: Elsevier.
- Collier, K.J., Aldridge, B.M.T.A., Hicks, B.J., Kelly, J., Macdonald, A., Smith, B.J. and Tonkin, J. 2009. Ecological values of Hamilton urban streams (North Island, New Zealand): constraints and opportunities for restoration. *NZ Journal of Ecology* 33 (2)
- Daniel, A.J. 2009. Detecting exploitable stages in the life history of koi carp (*Cyprinus carpio*) in New Zealand. PhD thesis, University of Waikato, Hamilton, New Zealand. 147 pp.
- Daniel, A.J., Hicks, B.J., Hall, K.G. compilers. 2009a. Collected abstracts of the combined annual science review meetings of the Lake Ecosystem Restoration New Zealand and the Freshwater Products and Strategies Program of the Invasive Animals Cooperative Research Centre. Held 23-25 June 2009 at the University of Waikato, Hamilton, New Zealand.
- Daniel, A.J., B.J. Hicks, N. Ling, and B. David. 2009b. Acoustic and radio transmitter retention in common carp (*Cyprinus carpio* L.). *New Zealand Marine and Freshwater Research* 60: 328-333.
- Ellery, P.M. and B.J. Hicks. 2009. Restoration of floodplain habitats for inanga (*Galaxias maculatus*) in the Kaituna River. *New Zealand Natural Sciences* 34: 39-48.
- Trolle, D. 2009. The influence of sediment nutrient dynamics on the response of lake ecosystems to restoration and climate change. PhD thesis, University of Waikato, Hamilton, New Zealand.



Adult inanga caught in 20 minutes trapping in an artificially constructed inanga pond on the lower Kaituna River using cheese as bait.

Sediment modeling study completed



Dennis Trolle presenting his Ph.D. research in Taiwan
July 2009
New email: dtr@dmu.dk

Dennis Trolle came to us to start a Ph.D. study in 2006, after completing his M.Sc. at Aalborg University in Denmark. He has now finished his Ph.D. study, which focused on the influence of sediment nutrient dynamics and climate change on lake water quality. The work conducted for his thesis has so far resulted in two peer-reviewed publications while another two are underway. Dennis' thesis is now available through the University of Waikato Library. Soon after submitting his thesis in 2009, Dennis was headhunted by the National Environmental Research Institute, Denmark, who offered him a permanent job as a researcher at their institute in Silkeborg. There, he will continue his work with lakes, working with research topics such as effects of climate change on lake ecosystems, optimization of ecosystem models, and optimization of lake restoration measures.

Visiting students

Amir Reza Keshtkar is a PhD student from Teheran University, Iran, who is spending six months at Waikato University to work with David Hamilton on a Bayesian modeling approach to predicting algal blooms in Lake Rotorua. Further information: keshtkar.amirreza@gmail.com.

Jackie Chin is an undergraduate student at the University of California, San Diego. She has been funded through the undergraduate programme of PRAGMA (www.pragma-grid.net) to work with David Hamilton to improve chlorophyll profiles by developing a correction for 'non-photochemical quenching'. Further information: jpchin@ucsd.edu.

Sandor Szanyi is an undergraduate student from Budapest University of Technology and Economics in Hungary who was funded by GLEON (www.gleon.org) to work with the LERNZ group to develop a modeling capability for Lake Balaton, the largest lake in Central Europe. Further information: szanyis@gmail.com.