

Giant koaro in Lake Pukaki

AS VISITORS gaze at the inspiring view of Mount Cook framed by the waters of Lake Pukaki, few would guess that this lake is home to a population of rare white koaro.

Koaro (*Galaxias brevipinnis*) is a scaleless, native fish. It is one of the whitebait species and occurs in many New Zealand rivers. It is much less common in lakes, and large specimens such as that recently caught in Lake Pukaki (see photo) are rare. They provide a glimpse of what used to be.

Before the introduction of trout to New Zealand about 100 years ago, the koaro was the main fish species in many New Zealand lakes. Populations of this native "trout" flourished, and Maori fished for koaro until the introduction of predatory trout decimated koaro populations. The decline of koaro in Lake Taupo and the Rotorua lakes is well known, but the fate of this



Koaro (270 mm, 226 g) caught in gillnet set at a depth of 20 m in Lake Pukaki on 29 January 1999. (Photo: David Rowe)

fish in large South Island lakes has remained a mystery.

Recent PGSF-funded studies by NIWA of the fish populations in large South Island lakes, which are affected to varying degrees by turbidity and fluctuating water levels, have shown that koaro populations are still present in some lakes. In particular, reasonably high densities of koaro still occur in Lake Pukaki despite the lake's relatively inhospitable environment. We suspect that their abundance may be linked to the very small

flour population.

The large koaro pictured is one of several found in the lake, and large numbers of fish of this size would probably once have flourished in this and other lakes. The fish's coloration – pure white tinged with pink – is unusual and is probably a camouflage adaptation to the whitish colour that glacial "flour" gives the water of this lake.

David Rowe
NIWA, Hamilton

CLIVAR under way!

OVER THE NEXT DECADE and beyond, NIWA climate specialists will be contributing to a major international research programme that focuses on the combined role of the ocean and the atmosphere in the global climate. The research will concentrate on variability over time scales from months to centuries.

The Climate Variability and Predictability programme (CLIVAR) has become the primary research component of the World Climate Research Programme (WCRP) which aims to improve climate forecasting and understanding of anthropogenic effects. CLIVAR follows on from the successful Tropical Ocean Global Atmosphere (TOGA) and World Ocean Circulation Experiment (WOCE) programmes and takes up the further scientific challenges they have identified. The overall aim of CLIVAR is the development of new global and regional forecast models.

New Zealand is significantly affected by El Niño–Southern Oscillation (ENSO) events and recent press releases from NIWA and other Crown Research Institutes highlight the role of the recently discovered Pacific Decadal Oscillation in changing New Zealand's climate over the past 20 years (see *Water &*

Atmosphere 6(3):4). Planned CLIVAR sub-programmes will give emphasis to these phenomena, which originate in the tropical Pacific. However, little attention, so far, has been given to the extratropical variability in the Southern Hemisphere, which also significantly affects New Zealand.

In late 1998 Dr John Kidson of NIWA represented New Zealand at an international conference on CLIVAR at UNESCO Headquarters, Paris, France. Run by the WCRP sponsors (World Meteorological Association, International Council of Scientific Unions and the Intergovernmental Oceanographic Commission), the conference was organised to advance the planning and begin the implementation of CLIVAR. Approximately 250 delegates from 60 countries attended.

It was hoped that Dr Kidson – who was nominated by the Royal Society of New Zealand Climate Committee to attend the conference and to present New Zealand's national report – would be able to promote more effort on understanding and predicting variability in the extratropical Southern Hemisphere.

In his address Dr Kidson outlined New Zealand's plans to contribute to the CLIVAR

programme in a number of areas, most of which will involve NIWA. These include further climate modelling and palaeo-climate studies, and monitoring of the major ocean currents that pass near New Zealand.

Ocean monitoring requires long time-series of observations obtained through research voyages, moorings and the manufacture and deployment of floats and drifters. The latter can travel at depths of as much as 2000 m to measure low-level currents and to provide vertical profiles of temperature and salinity as they rise to the surface every 14 days. Ocean monitoring overall will contribute to better understanding and prediction of decadal-scale fluctuations in the climate, such as the "climate shift", described by NIWA and other CRIs and referred to earlier.

CLIVAR is an important programme which promises to bring significant benefits to New Zealand over its 15-year lifetime. It relies on voluntary contributions from individual countries for its success and we should support it to the best of our ability.

For further information, contact:
Dr John Kidson, NIWA, PO Box 14-901, Kilbirnie, Wellington
ph: 04 386 0300; fax: 04 386 2153;
email: j.kidson@niwa.cri.nz

Taiapure site visit and hui

COLLABORATIVE WORK is now underway with NIWA and Ngati Koata to restore traditional karengo (*Porphyra* sp.) beds on D'Urville Island. The project is an objective in the larger PGSF-funded programme "Enhancement and Restoration of Taiapure and Mahinga Mataitai". The programme aims to model the recovery of kai moana under various customary management strategies, to collate information on traditional methods of coastal management, and to put selected management strategies into practice within a rohe and evaluate their effectiveness.

Karengo is a leafy, lettuce-like seaweed, traditionally important as a dried and fresh vegetable. Closely related species are very important plants in many countries. The species used in Japan, for example, is known as nori.

In early February 1999, NIWA staff involved in the project hosted a hui at the NIWA Nelson office following a visit to traditional karengo sites on D'Urville Island. Ngati Koata representatives and Dr Wendy Nelson from Te Papa attended. The project objectives were outlined and discussed, followed by the sharing of iwi traditional harvesting techniques, and historical use and abundance of local karengo. Wendy then described the life history of karengo and overseas culture methods. This resulted in considerable discussion about using stages of the culture process to enhance natural karengo abundance. Wendy also illustrated the two types of karengo found on the shores of D'Urville – one looks like a bunched-up floret, while the other has long slender blades.

Field work began in March 1999 with monthly sampling to compare different harvesting techniques. This four-year project will expand to include the enhancement of pupu (catseye), pua, blue cod and crayfish populations next year.

The successful hui bodes well for a cooperative working environment and ongoing, informative communication process.

For further information, contact:
Ken Grange or Laura Richards,
NIWA, PO Box 893, Nelson
ph.: 03 548 1715; fax: 03 548 1716;
email k.grange@niwa.cri.nz