

## Meeting & Trip Reports

**An overview of the animal life of pre-human Central Otago, and how it interacted with the vegetation.** 16 Nov 2005

Reviewed by *Geoff Rogers*

PhD student, Jamie Wood is studying the more recent paleontological history of Central Otago by searching for fossils in the dry soils beneath rock overhangs, the dry soils within caves, and excavating peat bogs. He came to this study, undertaken within the Geology Department of Otago University, following a recent wave of paleoecological investigations into Otago's pre-human vegetation. That preceding work points to extensive scrub and forest dominating below treeline in today's grassy landscapes.

Jamie first described the three phases of palaeontological discovery in Central:

- 1) The first documented European discoveries during the gold-rush phase commencing from 1860. This phase of curiosity-driven fossicking started with the first discovery of gold and extended through the 1900-1970 period of land clearance and development. Horse-drawn dray-loads of bones from swamps often resulted in indiscriminate collecting.
- 2) Hydroelectric development of the Clutha River in the 1980s spurred discovery of fossils, bones and ancient birds' nests in rock shelters.
- 3) Lastly, recent scientific enquiry including Jamie's thesis study and Trevor Worthy's reconstructions of Otago's pre-settlement avifauna.

Amongst the discoveries, three complete moa eggs have emerged, including one by an Earnsclough dredge worker, which subsequently sold to a Rothschild family member for 280 pounds. There was real money to be made from fossils when the gold deposits failed!

Jamie's data sources are wide and varied: moa coprolites (faeces), bird feathers, bones, woody twigs, leaves, dried fruits of trees, fossil pollen from peat bogs, gizzard stones, gizzard contents, and insects. One excavation of 2m x 2m x 0.8m deep in a swamp of the upper Styx basin returned approximately 1000 bones. From all this, he is expanding the list of birds no longer found in Central Otago over previously published lists; for instance, he has confirmed adzebill remains from a Dunback Cave and strong evidence that a nest deposited in the Alexandra museum was not that of an "eagle", rather that of a kakapo. He has acquired finely tuned detective skills in tracking down and thoroughly elucidating previously vague accounts of palaeontological and archaeological material. By reworking some of Otago's iconic fossil sites such as Earnsclough Cave, he is providing a landscape picture of plant and animal habitats and relationships. One "eye-opener" was the size of individual gizzard-stones and the total gizzard weight reputed to have been carried by *Pachyornis elephantopus*, a large, squat, rhino-like moa from dryland South Island...stones > 50 mm diameter and the total weighing 2.5 kg, clearly a woody-twig-processing grinding mill.

The overall impression is that Jamie is dealing with a massive amount of both minute and massive data elements. Yet, we should expect a novel picture to emerge from his thesis of the pre-human vegetation habitats of birds, albeit compromised by the birds' selective use and the differential preservation of those plants. He tantalised us with emerging evidence for a raft of regionally- and nationally-extinct birds of forest, treeland, and scrub vegetation.

**Flora of Macraes and potential skink/plant interactions in a changing environment.** 22 Feb 2006

*Allison Knight*

Mike Thorsen, DOC, has helped identify a surprising 328 native and 72 exotic plant species in Macraes Reserve, which sits on the edge of the Central Otago dry country. Twenty eight nationally threatened or at risk species hang on in this mosaic of pasture, tussock grassland, shrubby gullies and ephemeral wetlands. Lichen-covered schist tors are one of the last hide-outs of two impressive and nearly extinct skinks, the huge giant skink and the large black and yellow Otago skink. These have hung on despite Maori burnings, the extinction of large browsing birds, pakeha farming, and introduction of many predators.

These days a predator-proof fence keeps out all ground predators and all browsers except rabbits. But is the resultant increase in tall tussock, kanuka and broadleaf helping the nearly extinct skinks and the rare and endangered plants? This could change the pattern of plants, availability of berries and insects, shade the tors and reduce the amount of sun available for thermoregulation and change the ease of travel between tors for the skinks.

Shading of rare and endangered plants could also be a problem, as the ephemeral wetlands in the fenced area are already being invaded by weeds such as the tall sedge, *Carex ovalis*. The tiny mouseling, *Myosurus minimus*, a rare spring annual, is already doing better in areas which are still grazed, such as the Crater. Under shady overhangs grow the rare native grass, *Simplicia laxa*, the threatened forget-me-not, *Myosotis tenericaulis* and the prickly shield fern, *Polystichum vestitum*. There was a suggestion that some of these plants had found refuge in these dry shady places as their habitat on the dry shady forest floor disappeared. Graeme Loh suggested that a decrease in frost with recent climate change, not just the removal of browsers, could have contributed to the emergence of frost-tender trees such as broadleaf.

One wonders whether excluding the browsers along with the predators is the optimum strategy for protecting the skinks or the threatened plants. Would it be possible to erect a simple stock fence across some of the predator proof area, to allow some controlled browsing, particularly of the ephemeral wetlands. This might protect some of these threatened species from being shaded out and give them another chance.