Australian Platypus Conservancy

A monotreme about town

Given how difficult it is to spot platypus, one would think they spend most of their time lounging in and around their burrow. But a recent study by the Australian Platypus Conservancy has shown that platypus like to cruise around.

Study leader, Dr Melody Serena, says a single animal can encompass up to three waterways in the single home range. 'We had one animal that moved more than 10 kilometres in one night,' she says. 'This confirms the need for platypus conservation to be planned on a whole catchment basis.'

The aim of the study was to provide information on the habitat requirements of platypus in urban waterways. It concentrated on a site about 20 km east-north-east of Melbourne, where the Diamond and Mullum Mullum creeks meet the Yarra River. There, several platypus were fitted with radio tags to track their movements.

Areas of ideal habitat were identified during the study. It seems that platypus are extremely picky when it comes to real estate, building their burrows in sections of rivers with overhanging vegetation and undercut banks made stable by vegetation.

'The combination of these characteristics meant that the animals were selecting sites where their burrows would be hidden from predators such as dogs, cats and birds of prey,' Serena says. 'They also select parts of the bank that are less subject to erosion.'

Serena and her colleagues hope that information from the study will help to protect platypus habitat.

'In urban waterways, banks are often remodelled for stabilisation works,' she says. 'If you are changing banks with heavy machinery, it's usually a good idea to put in features that will benefit the wildlife, or at least to put them back the way they were.'

Contact: Dr Melody Serena (03) 9716 1626, email: platypus@vicnet.net.au. The research was described last year in the Australian Journal of Zoology *46 (3):267-282.*

Denis Faye

Trees face the acid test

FOR the first time, scientists have shown that certain species of trees can counteract soil acidification. Using field and laboratory studies, CSIRO's Andrew Noble and Peter Randall are developing an agroforestry armoury against this damaging phenomenon.

Soil acidification – the progressive lowering of soil pH – is a major problem in Australia, affecting more than seven million hectares and causing production losses of some $300 million a year. It's a natural process that occurs slowly during the weathering of soils, but in vast areas of Australia it has been accelerated by agricultural practice.

Acid soils have several undesirable characteristics. Soil minerals such as aluminium and manganese are mobilised in the soil solution at levels that can be toxic to plants. In addition, fertility declines as soils acidify: essential nutrients such as phosphate and molybdenum become less available, while leaching may deplete cations such as calcium, magnesium and potassium. Part of the danger is that the phenomenon doesn't show itself until it's too late.

'Acidification is an insidious process,' Noble says. 'The first sign of a problem is invariably a reduction in production capacity.'

The potential of trees to remediate acid soils stems from a peculiar characteristic of many affected Australian soils: they are duplex, which means that a light-textured acidic A horizon is underlain by a heavy clay B horizon that is usually alkaline. Noble and Randall hypothesised that trees might act as a sort of biological pump, bringing this alkalinity to the surface and, in this way, reducing the acidity of the surface layer.

With funding provided by the Joint Venture Agroforestry Program, the two scientists conducted several experiments to test their hypothesis. They collected litter samples from a range of plantation-grown species – including eucalypts, acacias and exotic species – and determined their alkalinity when burnt to ash. They added litter samples to acidic soils and monitored changes in pH. They assessed the pH and cation status of soils under plantations of selected species, and conducted a greenhouse study to determine seasonal and other factors that might affect ash alkalinity.

The experiments showed that the ability of trees to reduce soil acidification varied between species. In general, the native species tested – mainly eucalypts and acacias – had lower nutrient contents and ash alkalinities than the exotic species and would therefore be expected to have less impact on acidification. But the species with the highest ash alkalinity measured was white cedar (*Melia azederach)*, a species native to Australia's east coast.

Noble says the potential role of trees in dealing with acidification needs further investigation, but the results are encouraging enough to consider different ways of deploying suitable trees, such as in tree/pasture rotations or agroforestry.

There are a couple of provisos. Since it is the litter that has most effect on reducing acidity, whole-tree harvesting – in which all biomass is removed from the site – would be counterproductive. Soils would also need a long period of convalescence. 'Agroforestry to remediate acidification would be a long-term investment,' Noble says. 'But it may well be a viable proposition under certain economic regimes and in locations where there are duplex soils.'

Copies of the project's full report, and a summary, are available from the RIRDC/LWRRDC/FWPRDC Joint Venture Agroforestry Program, (02) 6272 4819.

Alastair Sarre