Welcome to *Emu*

NEARLY everyone knows something about birds — most of us can tell a sparrow from a seagull.

Many people are serious about birds and go bird-watching, some keeping careful notes about what they observe.

In Australia, there are about 150 professional ornithologists, who study birds as part of their work. Their research is reported in a variety of publications, including the journal *Emu* (the journal of the Royal Australasian Ornithologists Union).

Emu, which is published by Birds Australia, was established in 1901, making it one of Australia's oldest scientific journals.

As *Emu* begins its second hundred years in 2001, Birds Australia is joining forces with CSIRO Publishing to produce the journal in print and electronic formats.

Ecos readers will be able to view the latest ornithological research on the internet by visiting www.publish.csiro.au/journals/emu/.

This site will provide free abstracts of each article, book reviews and other interesting information about the study of birds. Enthusiasts wanting to read the full articles can subscribe to *Emu* in print or electronic versions. Subscription information is available on the web, or call CSIRO Publishing on 1800 645 051.

Stone age crows

HANDYMEN know that the right tool will get the job done quickly and effectively. And so it seems, do crows. In a six week study of New Caledonian crows, Gavin Hunt from the University of Auckland saw the birds fashioning tools from leaf stems, in order to extract fat insect larvae from their burrows.

The crows selected leaf stems from the ground and removed any leaves by holding the stem with one foot and snipping the leaf off with their bills. The tools were then used to probe and anger the larvae nestling inside logs.

To do this, they held the tool in the tip of their bill and made quick up and down motions into the burrow, interspersed with quiet periods. This technique made the larvae aggressive so that they grasped the tool in their mandibles. When the birds withdrew their tools, the larvae were clamped on the other end.

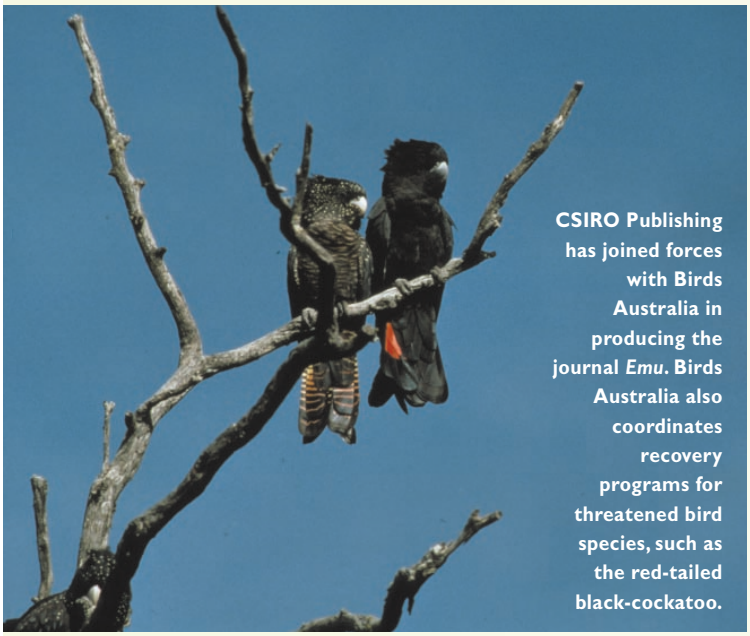
Hunt says the crows probed the burrows for over 10 minutes before removing the larvae, but occasionally the probing was too aggressive and killed the larvae.

Hunt noticed a juvenile crow amongst the adults, attempting, unsuccessfully, to probe burrows and fashion tools. This, he says, suggests that learning from adults is required to gain proficiency in tool skills.

He also found that crows in different localities have distinctly different tool traditions. For example, crows living at higher altitudes made hooked tools. These appear to be more efficient at extracting small invertebrates that do not clamp their mandibles onto tools. Hunt says more data is needed to establish whether these differences are cultural or variations due to habitat and/or prey type.

G Hunt (2000) Tool use by the New Caledonian Crow *Corvus moneduloides* to obtain Cerambycidae from dead wood. *Emu* 100:109—114.

Wendy Pyper 10.1071_ISSN0311-4546v106p34a



CSIRO Publishing has joined forces with Birds Australia in producing the journal *Emu*. Birds Australia also coordinates recovery programs for threatened bird species, such as the red-tailed black-cockatoo.

Dietary cunning

SINCE its introduction to Australia in the 1870s, the red fox has gained a reputation as a common predator of livestock and a serious threat to native wildlife. Dietary studies have shown it is an opportunistic predator and scavenger with diverse tastes.

Dr Robyn Molsher, Eddie Gifford, and Dr John McIlroy, of the Vertebrate Biocontrol Cooperative Research Centre, Canberra, investigated the diet of foxes in grazing land around Lake Burrendong, near Mudgee, NSW.

Analysis of the stomach contents of 255 foxes of various ages and sexes revealed that foxes had eaten 10 species of mammals, 11 species of birds, eight reptile species, two amphibian species, 25 invertebrate species and three kinds of plants over the two-year study period.

The diet was dominated by mammals, particularly carrion and rabbits. Carrion, mostly eastern grey kangaroo and sheep, was the main food group, most likely reflecting its availability. Invertebrates, rabbits and vegetation were the next most important by volume. Fabric, plastic, metal and stones were also consumed.

The scientists found large seasonal variation in diet. In summer, for example, the main food was invertebrates, whereas in winter, foxes ate more rabbits and vegetation, as the abundance of reptiles and grasshoppers declined. Cubs ate more reptiles than their elders, probably finding them an easy catch.

Interestingly, consumption of rabbits and small mammals was less on full-moon nights. The researchers say this is consistent with 'behavioural resource depression' in which prey species reduce their activity in risky areas and during moonlit nights, making them more difficult for predators to capture. These and other findings of the study should help improve the timing and effectiveness of baiting campaigns against the feral fox.

Molsher RL Gifford EJ and McIlroy 10.1071_ISSN0311-4546v106p34b

When revegetating yellow box woodland, seed should be collected from several trees existing in large populations.

Faulty indications?

IT IS difficult to judge whether forests are being managed in an ecologically sustainable way and impossible to measure and monitor the effects of forest management practices on all forest species.

Biological indicators or surrogates, are increasingly being used to assess and monitor biodiversity or ecological change. They include species or guilds of species, and structure-based indicators such as the structural complexity of forests, connectivity of fragments and heterogeneity.

But biological indicators have their limitations, according to a review by ecologists Drs David Lindenmayer, Chris Margules and Daniel Botkin.

Other scientists may disagree, but Lindenmayer and his colleagues argue that despite their intuitive appeal, the use of indicator species in conservation management can be misleading or fail altogether.

For example, the virtual elimination of the American chestnut as a dominant canopy tree in the mid-Atlantic forests of the United States, by the 1930s, due to fungal blight, has apparently led to no extinctions or grave threat to survival of other species, including the chestnut-eating gray squirrel.

The scientists suggest an urgent need to test relationships between the presence and abundance of potential indicator species and other species or ecological processes, before we rely on them. In the meantime, they believe that structure-based (spatial) indicators make better indicators of biodiversity in forests.

They also advocate an adaptive management approach in which ongoing forest management practices, such as logging, are treated as large-scale experiments from which managers can gain further knowledge and so improve the effectiveness and sustainability of management strategies.

Lindenmayer DB Margules CR and Botkin DB (2000) Indicators of biodiversity for ecologically sustainable forest management. *Conservation Biology,* 14:941—950.

Steve Davidson 10.1071_ISSN0311-4546v106p34c

Lone box warning

THE yellow box (*Eucalyptus melliodora*) is a handsome and widespread woodland and forest tree of eastern Australia. Yellow box woodlands and forests have virtually disappeared, but isolated trees still exist in agricultural landscapes. A botanist at Charles Sturt University, Dr Geoff Burrows, has found that these lone box trees produce less seed than those in woodland, and their seeds are also less viable.

Reproductive output was 45–48% lower in isolated trees than in woodland trees. Seed germination was 14% less, and the average number of viable seeds per 10 gram of capsule contents in isolated trees was only 38% that of woodland trees.

Burrows says these results suggest that the yellow box, like other eucalypts, has a mixed mating-breeding system with preferential outcrossing (pollen exchanged between different trees), but also is capable of self-pollination.

The trouble is, self-pollination (between flowers on a single tree) leads to lower seed yield and viability, and the resulting plants are generally thought to show inferior growth as saplings compared with cross-pollinated plants.

Burrows is concerned that landholders or other groups collecting seed for propagation and tree planting could favour isolated trees as these are often easily accessible, their capsule bearing branches tend to be close to the ground and their form may appear more pleasing than that of crowded woodland trees. They would be the only remaining trees in some areas.

He says while it would be possible to collect large numbers of seeds from isolated trees in paddocks, (they still produce about two seeds per capsule), the seeds would most likely be of poor genetic quality.

Seeds from isolated box trees, and probably from isolated trees of most other eucalypt species, should not be used for propagation and revegetation programs if at all avoidable. Far better to collect seed, from several trees, in populations having at least 500 individuals and where the trees are relatively dense, say 30—40 trees per hectare.

Burrows GE (2000) Seed production in woodland and isolated trees of *Eucalyptus melliodora* (yellow box, Myrtaceae) in the South Western Slopes of New South Wales. *Australian Journal of Botany*, 48:681—85.

Steve Davidson 10.1071_ISSN0311-4546v106p34d

Olives spreading

LIKE THE people of the Mediterranean, many birds and small mammals are fond of olives. In Australia, this fondness can be indulged on a grand scale, as olive groves for commercial or hobby purposes have been planted in almost every state. But the olive oil industry these groves were originally destined to supply did not succeed, and so today, many groves stand neglected, visited only by their furred and feathered friends.

As feral olives are considered noxious weeds in some states — they form dense crowns that prevent native trees regenerating — the foraging activities of birds and small mammals is a problem.

In a recent review of birds that consume olives, Dirk Spennemann and Richard Allen, from Charles Sturt University at Albury, showed that a number of native Australian birds contribute to the spread of olive trees.

They found that the pied currawong, emu, Australian magpie, satin bowerbird and black-faced cuckoo-shrike, were all long distance seed dispersal agents. The regurgitated pellets of pied currawongs for example, have been found to contain up to 23 olive seeds. Exotic birds, such as blackbirds and common starlings, are also guilty of seed dispersal.

But some Australian birds enjoy olives without contributing to their dispersal. These include the galah, sulphur-crested cockatoo and crimson rosella, which feed on fallen olives or remove droops from the tree and drop the pits beneath.

Although birds are the principal seed dispersal agents, rabbits, sheep, goats, foxes and mice also play a role. Spennemann and Allen warn that the variety of dispersal agents will increase as the size of olive droops decreases — a consequence of naturalisation and neglect — which may accelerate the dispersal of olives as weeds.

Galahs enjoy olives without contributing to their spread.