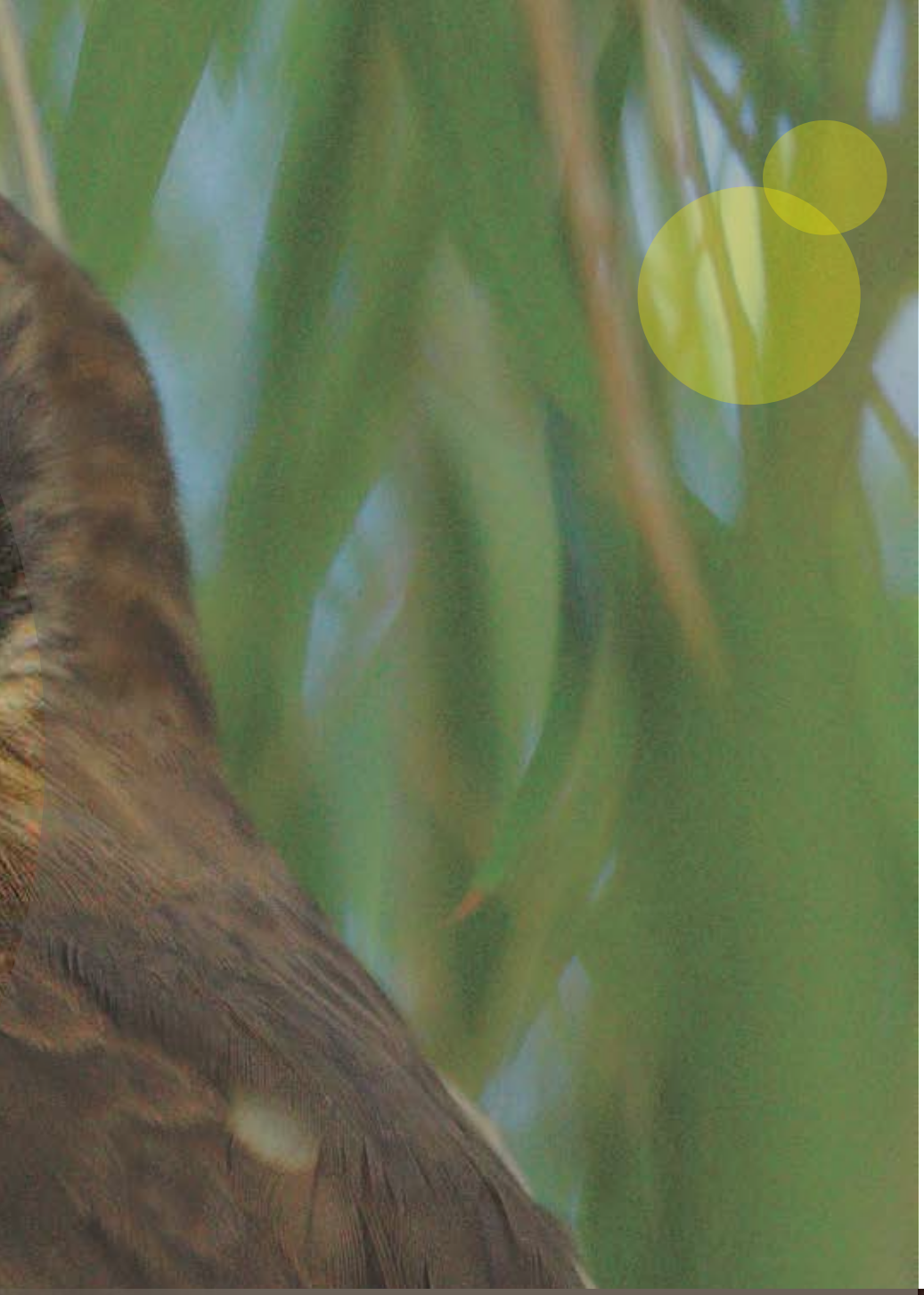
Shining a light

on our curious night creatures



While most of us are tucked up in our beds at night, PhD student Mike Lohr can often be found in pockets of dense scrub, listening silently for the call of the southern boobook owl. Mike is investigating the possible causes for the decline of Australia's smallest owl, and the threats the species face, to help develop recovery plans to conserve this intriguing animal's remaining populations.

BY JENNIFER MARS

Striding through the bush, dodging prickly moses (*Acacia pulchella*) and pulling up invasive plant species as he goes, Edith Cowan University PhD student Mike Lohr scours the Wheatbelt woodlands, Perth Hills forest and remnant bushland areas in urban sites looking for southern boobook owls (*Ninox boobook*) to take blood samples. He wears a head torch and carries a backpack, which he keeps packed with all of his equipment so he's ready to head out each evening and can dash out at a moment's notice if he gets a report about an easily catchable boobook, or one that's been killed on the road, which he needs to pick up. Mike also travels with a very long selfie-stick that he uses to peer into the nesting boxes or tree hollows to see if there are any breeding owls. And he carries a taped recording of the southern boobook call that he plays intermittently for five minutes to see if any boobooks respond.

"Boobooks are quite territorial and this usually gets a quick response. If I'm close to the centre of a territory they often fly in and start searching for the intruder they think is present," he says.

Distant small dogs can sound surprisingly similar to a boobook, and people walking at night are sometimes surprised to encounter someone in camouflage clothing wearing a headlamp in the bush.

"When I explain what I'm doing they often actually end up sticking around to assist with the survey," said Mike.

OUT IN THE BUSH

Most of the legwork in getting ready for fieldwork is coordinating the volunteers. Thankfully, "everybody seems to love owls" and Mike seldom has a shortage of folks who are excited to help. And even the ice-cold conditions of winter in the Perth Hills and Wheatbelt areas doesn't deter them, all Mike asks of them is to wear a coat for night trips, pack a snack and a thermos of coffee.

Mike doesn't feel the cold as he grew up in upstate New York with snow-drizzled winters and short summers, but he always throws in an extra jacket, just in case the shivering West Aussies need it.

CAUSES OF DECLINE

As part of his PhD, which is being supervised by Parks and Wildlife ornithologist and principal research scientist Dr Allan Burbidge, Mike is looking at a range of factors that may have caused the decline in the numbers of boobook owls. These include habitat fragmentation, loss in genetic diversity due to inbreeding, possible infection of a cat-borne parasite that causes toxoplasmosis, loss of nest hollows and the effects and types of rodent poison that they may be exposed to.

Considerable evidence has been collected from research in North America, Europe and New Zealand to show that rat and mice poisons are killing a variety of owls, eagles, hawks and other wild animals such as mountain lions, bobcats and foxes. Poisons such as brodifacoum and bromadiolone, which were developed in the 1970s and 1980s, are ultra-potent anticoagulant rodenticides and cause internal bleeding on ingestion. While they are banned in most countries, they can still be bought in Australia, and their widespread use is having profound effects on native animals. This motivates Mike to learn more about their impact.

It is unlikely that owls would eat cereal-based baits, but they are at risk of secondary poisoning from eating animals that have consumed poisonous baits. In studies in other parts of the world, researchers examined the livers of dead birds to measure the amount of pesticides. While Mike is also testing the livers from dead owls for evidence of pesticide, he is undertaking analysis of blood samples – using only a 0.5 millilitre blood sample – to examine for evidence of toxoplasmosis, as well as building a genetic profile for the boobook owl.

Previous page
Main The captivating boobook owl.
Photo – Matt Swan/Parks and Wildlife
Inset Juvenile boobook owls in a tree nest hollow.
Photo – Simon Cherriman

Above Boobook juveniles in a tree nest with the remains of a rainbow lorikeet, which they are known to prey upon.
Photo – Rick Dawson/Parks and Wildlife

Opposite page
Top left Edith Cowan University PhD student Mike Lohr with a boobook owl.
Left Boobook owls are measured and weighed as part of the study.
Photos – Simon Cherriman

This is not without its challenges – owls are crepuscular; that is, they are active during dawn and dusk, so this is when Mike needs to be in the field. But finding owls at night can be difficult, because while they have yellowy-green coloured eyes, they flash red at night in torchlight. Boobooks are generally much easier to capture during the day, but they are also much harder to find, which is

Habitat and behaviour

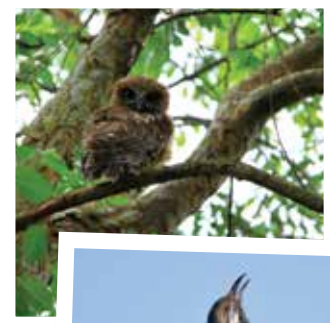
Photo – Simon Cherriman

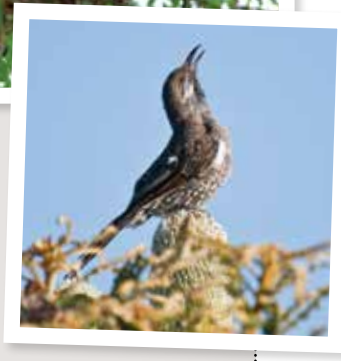
There are at least four Nyoongar names for the boobook owl, of which 'Kookomit' and 'Yartj' are two. Until recently boobook owls were classified as *Ninox novaeseelandiae*. However, due to the huge variation in calls, size, colour and other features, scientists have now split *Ninox* into two species – *N. novaeseelandiae* for those owls that live in Tasmania and New Zealand, and *N. boobook* for all mainland southern boobooks. Scientists also separated out a few populations on islands in Indonesia that had previously been listed as boobook subspecies and are now classified as separate species.

Australia has nine species of owl: eight on the mainland and one that is a resident of Christmas Island. Australian owls belong to two families: Tytonidae (barn owls) and Strigidae (hawk owls). *Ninox* is a genus of hawk owls, and boobook owls are Australia's smallest, most common and most widespread owl species. The colour of their plumage varies dramatically by region with very dark brown individuals in WA's south-west to paler sandy-coloured birds in the drier regions of WA.

The habitats they use vary widely and cover most of Australia. They are found just about everywhere except for treeless desert areas. Even so, in areas with sparse trees some owls can be found around creek lines where there are trees large enough to have nesting hollows, and occasionally they have been found nesting in small caves.

Boobooks are sometimes spotted bathing after dusk or at dawn. Many of the areas in which they live lack surface water and they are known to use backyard birdbaths and small pools on granite rocks to drink at night.





Boobooks eat a wide variety of birds, mammals, reptiles and invertebrates and use a variety of strategies to capture prey. Mike has seen them catch large moths and beetles on the wing and land on the ground to capture a large centipede. They have also adapted to urban environments by catching insects flying around streetlights. Boobooks have been known to crash into dense foliage to scare out insects and have been spotted picking off the occasional frog around an ornamental pond in a backyard in urban Joondalup.

Boobooks will sometimes take large prey as well. The remains of an adult red wattlebird and an immature Australian magpie have been found beneath a regularly used boobook roost, and the remains of a rainbow lorikeet were found inside a nest box used as part of Mike's study along with three boobook chicks. "On quite a few occasions, when capturing boobooks at night the blood on their beak from their last bird or mammal meal was not even dry!"

Strange calls in the night, secretive hide-outs and silent flight adds to the mystery of these nocturnal predators. Their call is a soft hoot through a closed beak. The 'boo' is pitched higher than the 'book,' and has a vibrato quality about it. BOObook! Owls can rotate their heads 270 degrees and use head-bobbing and swaying side-to-side as a means of focusing on what has caught their attention. It is easy to understand why they have intrigued and delighted people from ancient times until this very day.

Centre right A camouflaged boobook.
Photo – Simon Cherriman

Above right Western wattlebirds are known prey of boobook owls.
Photo – Lochman Transparencies

Above left Mike collects blood samples and observational data from boobook owls.

Top Man-made nesting boxes.

Above Tagging boobooks allows Mike and his team to collect ongoing data.
Photos – Simon Cherriman

"Mike hopes his research will tease out some of those impacts and look at how they operate at a landscape level. He is optimistic that his research will generate some solid recommendations for improving conservation outcomes for predatory birds, and owls in particular."

why Mike is grateful to the many people who call and email him about roosting boobooks. Once a boobook is found, actually catching it can be dangerous, since they attack with their feet first, usually aiming for your head or face.

CURRENT RESEARCH

At this early stage of Mike's research, the preliminary data on the rodenticide analysis indicate that exposure rates are higher than have been suspected. Many of the boobooks tested have been exposed to pesticides, and some had levels that are probably higher than a lethal dose. This confirms Mike's observations when he dissected livers of dead boobooks that showed physical signs of rodenticide poisoning (haemorrhaging without physical damage, blood in the body cavity and bleeding from the mouth).

Mike is interested in what trends he will uncover when he looks at how exposure relates to the type of habitat the boobooks were in and what area of the State they came from. It has also motivated him to investigate other species he suspects may be at even greater risk than boobooks due to dietary differences and high sensitivity to rodenticide poisoning.

It is well known that human activity, especially the extreme alteration of habitats for uses such as land development or agriculture, has impacted all species. Mike hopes his research will tease out some of those impacts and look at how they operate at a landscape level. He is optimistic that his research will generate some solid recommendations for improving conservation outcomes for predatory birds, and owls in particular.

It's difficult to predict exactly what a loss of owl species would mean for Australia, but we do know that the loss of native predators can have a profound impact on both the species they prey on and larger predators up the food chain. This, in turn, can have unforeseeable

Top Boobook owls are known to occur in areas such as John Forrest National Park.
Photo – Gooitzen van der Meer/Parks and Wildlife

Above Mike uses a 'selfie stick' to check in nests.

Above right Boobook owl chicks in a nest box.
Photos – Simon Cherriman

impacts on the entire ecosystem. Mike also believes that continued loss of native biodiversity irreversibly changes our relationship with the natural world and erodes important cultural values.

Most farmers Mike speaks to 'don't see many boobooks around anymore'. They generally remember when they used to be around, before extensive clearing, and everyone seems to be familiar with barn owls, which are common in the Wheatbelt. Fewer boobooks, and fewer people to report dead ones, mean less data are collected so it's harder to make a comparison between their occurrence in urban and agricultural areas. However, Mike suspects that because rodenticides aren't widely used in crops in WA, and are only used for asset protection around buildings (such as in grain storage, machine and other sheds), the amount of poison put out per unit area might be higher in the city due to use in dense residential and commercial areas.

Mike is working on some ideas to test this hypothesis using different species where samples might be more readily available for both areas. He is hoping that his findings regarding rodenticide exposure in boobooks may generate the interest and resources to do so in the near future and to test a wider variety of species for exposure.

In the meantime, Mike will continue to spend his early mornings and evenings stalking the inconspicuous and curious boobook owls of the WA bush in order to shine a light on their welfare and what factors may be undermining it.

Jennifer Mars is undertaking creative writing studies. She first heard about Mike's research through Eagles Heritage in Margaret River when she contacted them about taking some photos and to ask questions about boobooks for her upcoming children's picture book. Jennifer can be contacted by email at jennifermars@yahoo.com.

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