MOUND-BUILDING MEGAPODES

The story of the intriguing malleefowl

The enigmatic malleefowl is one of only three species of bird in Australia that build enormous egg-incubating mounds. Since European settlement, their numbers have reduced in the wild, but DBCA is working with the community to help improve the outlook for these fascinating birds.

photos and story by Sallyanne Cousans

Previous page
Main A malleefowl rakes the leaf litter to forage for invertebrates.
Inset The back and wings of a malleefowl have intricate patterning.

Above left The malleefowl that Sallyanne tracked through her lens on a property south of Ongerup.

Above Adult malleefowl.

Earlier this year I was sitting quietly in my camouflage hide on a property south of Ongerup, with my camera poised, when a large, mottled bird emerged from the scrub and walked elegantly about 20 metres in front of me. Recognising it as a malleefowl (*Leipoa ocellata*), I excitedly tracked its movements through my lens and watched as it stopped beneath a tree where the ground was thick with leaf litter. With a powerful foot, it raked methodically at the fallen leaves then stooped and pecked quickly at the disturbed ground. It fed for a minute or two, presumably on a smorgasbord of wriggling insects, before continuing on its way. Then it disappeared from my line of sight, as it passed behind a dense shrub. I waited in anticipation for it to reappear. But it didn't. I was perplexed. Where did it go?

DISAPPEARING ACT

Malleefowl once occurred over much of the southern half of Australia, but their current range is believed to be half of what it was before 1992. They are now listed as 'vulnerable' under both the national *Environment Protection and Biodiversity Conservation Act 1999* and the Western Australian *Biodiversity Conservation Act 2016*. However, surveying them is problematic; sightings are uncommon and are often by chance. The birds are often solitary, so you are only likely to see one individual, and they are so well-camouflaged that you could walk right past one without even realising. They can even seem to just disappear from sight, like I witnessed that day in the bush.

The bird I saw most likely passed behind the shrub and, using it as cover, had immediately changed its course and walked purposefully away from me. Or it stayed behind the shrub to rest, camouflaged by its cryptic plumage.

WHAT'S ALL THE FUSS ABOUT?

Malleefowl are large terrestrial birds that stand about 60 centimetres tall. The males and females are similar in appearance and have large feet and powerful legs. The back and wings are coloured with an intricate mosaic of grey, white, black and russet. The head and neck are grey and the dark-grey crown feathers can be held flat to the head or raised in a spiky crest. The chin and upper throat are chestnut and there is a long, black stripe, which is streaked with white, that extends from the fore-neck to the lower breast.

Their diet is varied and omnivorous, and includes insects, plants, berries and seeds. They have even been known to eat bees and wasps.

MOUND-BUILDING MEGAPODES

The main claim-to-fame of these intriguing birds is their extraordinary nesting habits. As megapodes, malleefowl do not sit on their eggs like other birds, but bury them in a large mound, which can be up to four metres in diameter and about a metre high. Malleefowl build these nests out of leaf litter and sand, and the heat that is generated from the decomposing plant matter incubates the eggs. By building a sophisticated incubation chamber, the female is able to deposit her eggs and leave them to safely develop; a characteristic that led renowned ornithologist John Gould to refer to the malleefowl as 'the spotted egg-leaver'.

But it takes a while to get to this point. Before the first egg is laid, malleefowl spend months planning and preparing the mound for nesting. Usually, a pair will renovate an existing mound and begin excavating a large hole in the ground, which they fill with leaf litter that they have collected over the previous weeks. After a good downpour of rain, and the litter is sufficiently wet, the composting

"... malleefowl do not sit on their eggs like other birds, but bury them in a large mound... "

process is activated and the birds cover the litter with a thick layer of sand.

Before and during egg-laying and throughout the incubation period, they constantly monitor and adjust the mound to make sure its internal temperature is just right. It is believed that sensory membranes within the bill, or the tongue itself, act like a sort of in-built thermometer and enable the birds to check the temperature and act accordingly.

During the composting process, the malleefowl adjust the temperature by removing or adding sand – raking it off to vent the heat and returning it when the temperature has stabilised. Later in the cycle, as the composting winds down, solar becomes their prime source of heat; sand from the mound is spread out in the sun to warm up and is then raked back in.

When the internal nest temperature is a steady 33 degrees Celsius, the female lays the first of her many large eggs. The male digs the mound out, a process that can take up to two hours, and the female enters the hole and scrapes a small niche in which she deposits her egg. The male gently covers it with soil and starts the two-to-three-hour job of filling the mound back in. The nest is dug out and a new egg is laid every three to eight days over the next few weeks, amounting to an average of 15 to 25 eggs. During this time, the male takes most of the responsibility of mound maintenance while his mate dedicates her time to foraging for food to sustain her for the continuing egg-laying.

This remarkable process can see the birds shifting a tonne of sand each day and can occupy them for nine to 11 months of the year.

SUPERPRECOCIAL CHICKS

Sixty days after the egg is laid, the chick uses its big feet to break through the shell and into the surrounding earth. Its next journey – the upward climb to the surface through a metre or more of sand – can take hours. It is tiring work and the malleefowl chick must stop for frequent rests. When it finally pops its head through the earth's surface, it opens

Above A camera trap image of malleefowl filling in their nest mound with leaf litter. *Photo – Eddy Wajon/Sallyanne Cousans Photography*

Above right (from left) Emu, malleefowl and chicken eggs.

Right Malleefowl chicks are completely independent from birth.

its eyes and finds itself totally alone. Without any parental guidance on what to do next, the small, quail-like chick stands upon wobbly legs, and struggles for a moment with unsteady balance. It then scurries across the top of the mound, slipping and tripping on the uneven surface, and topples over the edge and runs down the slope. It quickly collects itself and scuttles directly into the cover of the bush, blending with its surroundings and disappearing from sight.

Like all megapodes, malleefowl are superprecocial, which means that when chicks hatch from the egg they are completely independent. Chicks are fully feathered and already have the ability to run, forage and look after themselves.

They are even able to fly on their first day of life.

Despite their amazing self-sufficiency and camouflage, mortality is high; only one to two per cent of wild malleefowl chicks make it to maturity. They can quickly succumb to hunger and predation. Natural predators, such as raptors, goannas, currawongs and crows, and introduced animals, such as foxes and feral cats, are quick to make a meal of them.

TOUGH ODDS

The main cause of the decline of malleefowl is loss of habitat. Historically the birds occurred across the southern half of mainland Australia except for Queensland. But, due to extensive land clearing for agriculture, much of the prime malleefowl environment is now gone. The remaining habitat is severely fragmented and malleefowl now exist in isolated pockets of remnant bushland; the vast, cleared landscapes are just too great for them to cross. This is not good news for their genetic diversity. Roads also divide habitat and present a constant hazard; it is not uncommon to see a dead malleefowl lying on the roadside.

Bushfires also present a threat to malleefowl, as their preferred habitat is bush that has been unburnt for 20 to 30 years. A bushfire in this type of environment could be catastrophic and, even if breeding pairs were to survive a blaze, it would be unlikely that they would ever breed again.

Malleefowl are forced to compete for food with herbivores such as feral goats, sheep and rabbits. These animals can significantly reduce the amount of food available, especially in the smaller remnants and during lean times such as drought.

Red foxes are a threat to malleefowl at each stage of their lifecycle. They are known to dig eggs from the mound and are not deterred by an adult malleefowl frantically flapping its wings and running around.

CONSERVATION MEASURES

Over the past few decades, work has been underway to understand the

Above left A track winds through mallee country, typical malleefowl habitat.

Above right Grey currawong (*Strepera versicolor*) eat malleefowl chicks.

Left The introduced European red fox preys on malleefowl at each stage of their life cycle.

Above left A malleefowl mound in a revegetated site on private land in the Gondwana Link.

Above Setting a camera trap for mound monitoring.

needs of the malleefowl, identify threats to their survival and help protect them. A *National Recovery Plan for Malleefowl* was prepared, which addresses several key threats, including habitat loss and fragmentation, fire and predation, and identifies ways to promote malleefowl-friendly farming practices.

In WA, government and non-government organisations, community groups, friends' groups, private landowners and volunteers are protecting remnant reserves, restoring degraded farmlands, and tackling weeds and introduced animals.

The Malleefowl Preservation Group was formed in 1992 and was instrumental in conserving these elusive birds and protecting critical habitat. The group operated for 21 years, grew to 650 members and initiated several projects, which are being continued today by different organisations, including a program to encourage the public to report sightings, introduced animal control, identification and monitoring of mounds and the development of *The Malleefowl Magic School Education Package* – a school education program. Members also established 65 kilometres of wildlife corridors by linking remnant malleefowl habitat.

Since then, addressing the problem of fragmented habitat has also been achieved by Gondwana Link – an ambitious project to reconnect isolated pockets of remnant bushland (see also 'Guest column' on page 7). Through land purchased by organisations and private individuals, degraded farmlands are being rehabilitated and secured for the future by covenant. Ultimately, a continuous wildlife corridor will extend some 1000 kilometres from the south-west corner of the State to near the edge of the Nullarbor Plain.

North of the Wheatbelt – another stronghold for the malleefowl – several pastoral leases have been purchased by DCBA, Bush Heritage and the Australian Wildlife Conservancy. These former farms are being returned to nature by removing introduced animals such as sheep, goats and rabbits.

Creating and protecting habitat has been complemented by re-introduction of malleefowl to areas they once inhabited. Through its *Western Shield* program, DBCA and its predecessors have successfully reintroduced malleefowl to Francois Peron National Park in Shark Bay. The Yongergnow Australian Malleefowl Centre, in association with DBCA has boosted malleefowl numbers in the wild with the release of its captive-raised birds.

MONITORING MALLEEFOWL

In order to ensure their survival, it is necessary to monitor the malleefowl populations and gauge how they are responding to recovery plans. But, monitoring an elusive and seldom-seen subject relies on gathering information from their nesting mounds, rather than counting the birds themselves or using other common survey methods. Each year since the 1980s an army of volunteers has committed time to collecting and recording data to contribute to the National Malleefowl Monitoring Database, which is administered by the National Malleefowl Recovery Team as part of the national recovery plan. The volunteers are guided by the *National Malleefowl Monitoring Manual* – a comprehensive, online document, which ensures that data are collected in a standardised way.

Nearly all the mounds currently being monitored were located by systematic foot patrols, whereby a line of people walk as one, often through impenetrable, prickly scrub in inhospitable conditions. Hundreds of mounds across the country have been located in this way. It is time-consuming, labour intensive and for large areas, impractical.

Airborne trials using Light Detection and Ranging (LiDAR), also known as 3D laser scanning, are proving most effective, especially for searching large and remote areas. LiDAR technology is not new but has only recently been employed for mound detection. Once the mounds have been located using this method, they

Top Inside the Yongergnow Australian Malleefowl Centre.

Above A malleefowl pair on their mound at Yongergnow.

Above right Visitors can view malleefowl in large, bush aviaries at the Yongergnow centre.

Below right Signage warns motorists to slow down for malleefowl.

can be visited to conduct an on-ground physical survey.

Camera traps, which are specialised cameras with in-built motion-detectors, are another useful tool. They can be erected at active mounds and left for weeks at a time to record activity in detailed clarity.

YONGERGNOW

Another key tool in the plight to protect the malleefowl is to increase community awareness through education. The Yongergnow Australian Malleefowl Centre is an educational facility focused on the protection of the malleefowl and its habitat. The centre is known simply as 'Yongergnow', which comes from the Noongar words 'yonger', which means 'male kangaroo' and refers to the location of the centre in Ongerup – the place of the male kangaroo, and 'gnow', which means 'malleefowl'.

Located in the town of Ongerup, about 400 kilometres south-east of Perth, Yongergnow is a state-of-the-art facility, which showcases the amazing natural history of this remarkable bird. It houses a sleek, modern exhibition centre, cafe, gallery and – the star attractions – free-ranging malleefowl.

Inside the centre, malleefowl footprints painted on the floor lead visitors into a large, bright space filled with a wonderful and varied display of themed panels, photographs and museum specimens and an area to view audio visual presentations.

The building is situated in five hectares of pristine mallee bush, which is protected by vermin-proof fencing. Within this reserve are two large open-air bush aviaries, which house a thriving population of malleefowl.

To the amazement and delight of the Yongergnow staff, malleefowl have paired and built impressive mounds three times in the past five years. A succession of healthy chicks have grown and thrived from eggs that were laid up until the 2018–19 breeding season, and from eggs that were incubated at Yongergnow. At eight months old, when they are big enough, the juvenile birds are fitted with a colour-coded leg band. These bands will help to identify them when they are re-sighted in the future after they have been relocated to approved DBCA reserves at various locations across the State.

WHY SHOULD WE CARE?

These measures are being taken to ensure this unique and extraordinary bird does not disappear forever and cause the domino effect that is commonly seen when one species is omitted from a landscape. And we can all do our bit. If you are lucky enough to spot a malleefowl while you're out in the bush, you can fill out a malleefowl report form and contribute much-needed data about these magnificent and elusive creatures.

Sallyanne Cousans is a Western Australian-based freelance photographer who specialises in nature and wildlife. She can be contacted on 0428 888 301, or by email (s.cousans@bigpond.com).

Malleefowl Report Forms are available for download from DBCA's Parks and Wildlife Service website.