BUILD IT AND THEY WILL COME:

Supporting nesting little penguins

BY CHENÉE MARRAPODI

Less than 700 metres off the coast of Rockingham, Penguin Island is home to Western Australia's largest colony of little penguins. This haven is also Australia's most north-western little penguin habitat, meaning this precious population lives at the edge of the species' preferred climate range. This makes the little penguins of Penguin Island especially vulnerable to climate change. But work is being done to help protect them and encourage their breeding, so the species can survive into the future.

June to September is a special time on Penguin Island. This is typically when the first lot of little penguin chicks emerge from their nests, about eight weeks after their eggs were laid. In the weeks leading up to laying the eggs, adult penguins search for the perfect nesting site and then the parents share the responsibility of sitting on the eggs for about five weeks until the chicks hatch.

ISLAND HOME

Little penguins nest in crevices and burrows, but on Penguin Island the soft sand means the burrows often collapse. As a result, the penguins seek out dense vegetation beneath which to burrow. This vegetation also helps to keep the burrows cool. Unfortunately, warmer temperatures and reduced rainfall in recent years, caused by a changing climate, mean there is less of this type of habitat available today. This is especially concerning for the little penguins of Penguin Island as, even though adult penguins can lay two sets of eggs a year, up to 70 per cent of chicks do not live past 12 months, making successful breeding crucial to the species' survival.

The status of Penguin Island's most famous residents has been the subject of ongoing research. For the past decade, researchers from DBCA, its predecessors, and several universities, have been closely monitoring the colony. Sadly, this has shown a 75 per cent decline in population numbers, with the most recent count revealing there are just over 500 little penguins visiting the island. The cause of this decline has been attributed to a number of factors; a reduction in food availability and limited nest sites are considered to be the main culprits, but the colony's close proximity to a major coastal city and other human impacts are adding to the pressure.

As part of her PhD thesis, Erin Clitheroe has been analysing the impacts of nesting habitats on the little penguin species and trialling the use of artificial nesting boxes to help support their breeding. Retired DBCA wildlife officer Rick Dawson heard about her work and was keen to help. Rick has extensive experience building artificial hollows for black cockatoos (see 'Fifty years strong: researching Carnaby's cockatoos', *LANDSCOPE*, Summer 2018–19) and enlisted the support of his fellow Rotarians from Rockingham Rotary Club. Guided by Erin's designs, the team built new homes for the penguins.

Previous page
Main Penguin Island is located in Shoalwater Islands Marine Park, just off Rockingham.
Photo – Dennis Sarson/Lochman Transparencies
Insets Penguin Island is home to a colony of little penguins.
Photos – Jiri Lochman (Photos 1 and 4); Erin Clitheroe (Photos 2 and 3)

Above Researchers from DBCA and members of the Rockingham Rotary Club worked to build and trial the use of artificial nesting boxes.

Opposite page
Above left PhD student Erin Clitheroe with one of the island's little penguins.
Above right As well as being an important area for penguins and other sea birds, the island caters to visitors.
Photos – Rick Dawson
Right At just 40 centimetres, little penguins are the smallest of the 17 penguin species that occur on the Australian coast.
Photo – DBCA

OUT WITH THE OLD, IN WITH THE NEW

Designing bespoke nesting boxes that would appeal to the penguins and suit their needs, was no simple feat. While the penguins can be feisty and tenacious, they don't always have the best judgement. And Erin found that once they saw something they liked the look of, like a new nesting spot, they just went for it, even if the conditions weren't ideal.

Initially, the artificial boxes were made from a thin plywood, which proved to be inappropriate for the summer heat. Monitoring of the boxes revealed that some of them reached internal temperatures that exceeded 40 degrees Celsius; a major issue as the ideal temperature range for eggs is between 14 and 23 degrees Celsius.

Little penguins are incredibly vulnerable to heat and can go into shock when exposed to temperatures above 35 degrees. They typically begin nesting in April, and lay their eggs from late May all the way through until October. But penguin breeding depends on food availability, as well as other environmental variables like water temperature. As the effects of climate change become

Hear more about little penguins

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"Designing bespoke nesting boxes that would appeal to the penguins and suit their needs, was no simple feat."

better understood, we are starting to see changes in the previously observed breeding patterns. Data have revealed that some penguins have started to breed later in the year, which means chicks are in the nest during summer, when temperatures are at their hottest.

Extreme high temperatures also affect the weight of fledglings, as they expend energy trying to cool down, instead of storing fat for their growth. The weight of a penguin fledgling can be a strong predictor of survival and chicks are less likely to survive their first year if they weigh less than a kilogram.

With this in mind, the boxes were designed to resemble a natural burrow as much as possible. To keep the internal temperature down, Erin and the team surrounded the boxes with vegetation and incorporated a ventilation system into the lid. They also experimented with covering some of the nest boxes with shade cloth. The addition of shade cloth alone reduced internal temperatures by up to three degrees, while a combination of shade cloth and real vegetation decreased temperatures by five degrees. An impressive difference for the little penguins nestled inside!

MOULTING SEASON

While little penguins are unable to get airborne, their wings do make extraordinary flippers, and enable them to 'fly' through the water. They can swim up to eight kilometres per hour, and dive as deep as 60 metres to catch small fish.

Their feathers are waterproof, which helps to regulate their body temperature while they're at sea. At the end of the breeding season, usually right in the peak of summer, little penguins begin to moult. They replace their old, weathered feathers with new ones, a process that can take two to three weeks. During this time, the penguins are at their most vulnerable. They need to remain on land while they are moulting as they aren't waterproof until a full new set of feathers is formed. Without being able to swim or fish, the penguins are unable to cool down, which can cause them immense stress.

LOOKING FORWARD

So far, Erin and her team have installed 20 new artificial nest boxes around Penguin Island. The project is in its final stages and estimated to be completed by the end of 2019. Although it's still too early to determine the success rate of the nest boxes, early data indicate that creating boxes that maintain a lower internal temperature will give the island's little penguins the best possible chance at breeding, and support them as they face the challenges associated with a changing climate.

Get to know the little penguin

The little penguin (*Eudyptula minor*) is the smallest of the 17 penguin species, and the only one to live permanently along Australia's coast. They sometimes go by the name fairy penguin or blue penguin. On land, they waddle around awkwardly on their hind legs, standing approximately 40 centimetres tall. In the water, their small wings propel them, while their tail acts as a rudder.

The little penguin lives along the southern coast of Australia, from Rockingham to northern New South Wales. They are carnivores and eat fish, mostly anchovies, pilchards, whitebait and squid.

Little penguins are protected under the Biodiversity Conservation Act.

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For more information about Penguin Island visit parks.dpaw.wa.gov.au/park/penguin-island