

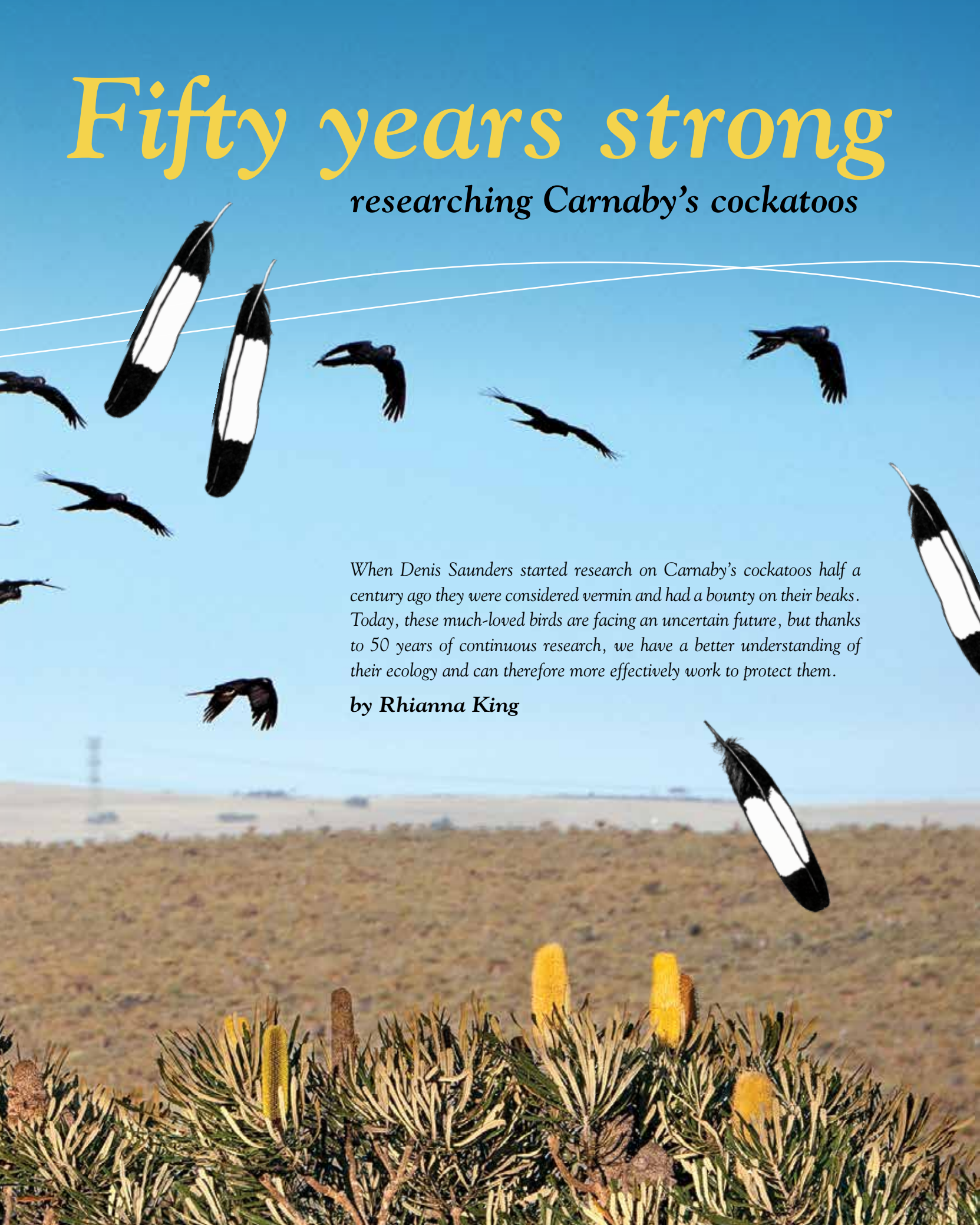


Fifty years strong

researching Carnaby's cockatoos

When Denis Saunders started research on Carnaby's cockatoos half a century ago they were considered vermin and had a bounty on their beaks. Today, these much-loved birds are facing an uncertain future, but thanks to 50 years of continuous research, we have a better understanding of their ecology and can therefore more effectively work to protect them.

by Rhianna King



If you ask Dr Denis Saunders AM how long a Carnaby's cockatoo lives, he'll tell you he doesn't know; he hasn't studied them long enough. This is a remarkable answer from someone who has spent the past 50 years gathering information about one of Western Australia's most iconic and long-lived birds. Denis started this project as a 21-year-old CSIRO research scientist to develop methods to minimise the damage Carnaby's cockatoos caused to commercial apple and pear orchards and pine plantations (see 'People in profile: Dr Denis A Saunders, AM', *LANDSCOPE*, Autumn 2015). Fifty years later, it has become somewhat of a labour of love, and he has no plans to stop studying them any time soon.

COUNTING CARNABY'S

It's hard to know exactly how many Carnaby's cockatoos are around today, compared with when Denis started his research half a century ago, but we do know that their range has been reduced by 50 per cent. In the early 1970s, Denis numbered them at between 12,000 and 60,000. He recalls that he would regularly see flocks of up to 3000 birds flying overhead in South Perth, feeding in pine plantations at Somerville (where Murdoch University is now located) and at Gnangara. By 1987 their numbers had significantly declined, leading to them being listed by the federal and state governments as an endangered species. Today, it is a rarity to see flocks larger than a couple of hundred.

HOW TIMES HAVE CHANGED

Denis marvels at how significantly research and collection techniques have changed in the past 50 years. He somewhat sheepishly describes the commonplace method of yesteryear that was used to collect specimens, known as 'last supper biology' or 'shot-gun ecology'. This method involved shooting and collecting birds of interest in order to make observations about their taxonomy, breeding biology and diet. However, he's quick to point out that most of



the specimens he collected in this way are now part of collections at the WA Museum and the Australian National Wildlife Collection in Canberra.

Nowadays, he says, once you've banded a bird, you don't have to handle them again to keep abreast of their movements. But it's been a bit of a journey to get to this point. Denis and his team first started fitting wing tags with a two-letter combination to Carnaby's cockatoos in 1970. In order to monitor these birds he used a telescope, and hoped for a cooperative bird that remained still long enough for him to read the letters. Where possible, birds were also fitted with a numbered leg band. Occasionally it was possible to read the numbers from afar, but more often than not it was necessary to re-capture the bird in order to record the numbers. Today, using a technique developed by former Parks and Wildlife senior wildlife officer Rick Dawson, the birds can be positively identified by using telescopic digital camera lenses to take multiple photographs of the birds' legs to record the band numbers. This can be done quickly, and means all banded females in nest hollows can be identified without any need to handle them after they have been banded as nestlings.

Satellite tracking by Murdoch University researchers is also providing Denis and others with a wealth of information about the movements



 Learn more about Carnaby's cockatoos

Scan this QR code or visit Parks and Wildlife Service's 'LANDSCOPE' playlist on YouTube.



Previous page

Main Carnaby's cockatoos fly over Coomallo Creek.

Inset A male Carnaby's cockatoo.

Photos – Sallyanne Cousins

Above left Denis Saunders (on vehicle) and John Ingram (on ladder) studying breeding populations of Carnaby's cockatoos at Manmanning in 1972.

Above View to the ground from the top of a ladder at the entrance of a cockatoo hollow.
Photos – Denis Saunders

and lifecycles of Carnaby's cockatoos. The data from the trackers can be downloaded to a mobile device in the field, providing instant, real-time information. Improvements to the trackers over the years also means they're lighter and smaller than they once were, so they are less likely to fall off or attract the attention of predators. And now, of course, DNA technology is able to differentiate individuals using a tiny tissue sample from the quill of a plucked feather.



“This has led to the fascinating observation that ... Carnaby’s cockatoos ‘perfect’ parenting after they’ve reached 15 years old.”

THE GOOD OL’ DAYS

According to Denis, developments in technology do not negate the relevance of the meticulous and long-standing research that has been done over the years to learn more about Carnaby’s cockatoos, particularly by members of the community. Denis describes farmers and other landholders as excellent naturalists, given their deeply felt and often long-term connection to the land, and has relied on data they have provided to inform his study. He also credits WA school students with helping to plot the distribution of Carnaby’s cockatoos at the start of his research. In 1968, he approached the Gould League through the Department of Education to seek permission to engage schools throughout the south-west as, at the time, almost all the small towns throughout the area had a school. More than 80 per cent of the schools (244 government schools) from Kalbarri to east of Esperance became involved and provided an abundance of data about the habits and distribution of Carnaby’s cockatoos. Unfortunately, an attempt to repeat this survey 20 years later could not be done on the same scale, as all of the small one- and two-teacher schools

had been closed, with students being bussed to schools in the larger towns. Still determined to collect the data, Denis approached landholders throughout the birds’ known range in 1987 and asked them to make and record observations about all species of birds they saw on their properties, including Carnaby’s cockatoos. A number of those landholders continue to make observations today and Alison Doley AM, who has recorded her observations for 30 years, was the first landholder to be invited to join the Carnaby’s cockatoo recovery team (see ‘People in profile: Alison Dooley’, *LANDSCOPE*, Autumn 2013). Other landholders have provided valuable information too; it was a conversation with a landholder that led Denis to the significant breeding site at what is now known as Coomaloo Creek study area.

A LONG-TERM RELATIONSHIP

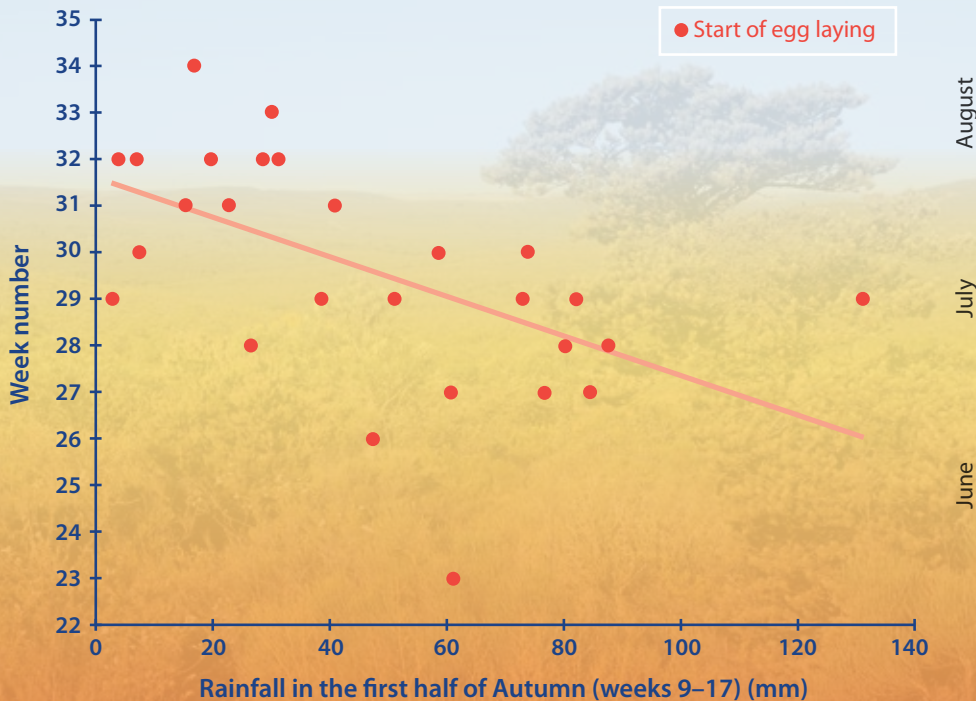
In 1969 and 1970, Denis studied breeding populations of Carnaby’s cockatoos at Coomaloo Creek, Manmanning, Tarwonga and Moornaming. During this time, he measured the length of the folded left wing of nestlings and recorded their

Above left Denis’s research has revealed fascinating insights into the breeding habits of Carnaby’s cockatoos.
Photo – Rick Dawson

Above Peter Mawson, Rick Dawson and Denis Saunders with one of the artificial hollows constructed and installed with help from the Rockingham Rotary Club.
Photo – Matt Swan/DBCA

Inset Carnaby’s cockatoos form pairs and mate for life.
Photo – David Bettini

body mass. From these data, Denis demonstrated that the left wing grows proportionately with age, and he was able to develop a formula to determine the age of the nestlings from the length of their folded left wing when their hatching dates were unknown. This has led to the fascinating observation that the size and body mass of a nestling is determined by the age of the parents. Denis has shown that six to 15-year-old parents produce ‘fat’ nestlings, while zero to six-year-old parents produce skinny ones. When a parent is older than 15 years, the size of their nestlings again reduces, but offspring



live to fledge nearly 100 per cent of the time (unless an extenuating circumstance befalls them), indicating that Carnaby's cockatoos 'perfect' parenting after they've reached 15 years old.

In 2009, shortly after Denis joined forces with then Department of Environment and Conservation senior wildlife officer Rick Dawson and zoologist Peter Mawson to continue research in the area, Coomaloo Creek again became a learning ground. During that same year, a bushfire that was ignited by a harvesting machine destroyed 16 trees with hollows in the study area, including three with nestlings. The following year, birds that were displaced by the fire descended on Coomaloo Creek, providing an opportunity to observe whether Carnaby's cockatoo breeding is limited by hollow availability. From 2011 to 2018, 68 artificial hollows were constructed, refined and installed to add to the 96 natural hollows available at the site. These factors have seen the number of breeding pairs increase at Coomaloo Creek from 41 breeding pairs in 2009 (down from 88 in 1975) to 127 by January 2017. And three-year-old females have been observed laying eggs, where before 1997 none younger than four had ever been known to attempt

to breed. Siblings born an unprecedented 51 days apart were also observed this year.

Another interesting long-term observation that has been made at Coomaloo Creek has been the relationship between rainfall and when Carnaby's cockatoos lay their eggs. Between 1969 and 2018, the date that egg-laying started varied from the second week in June to the third week in August, depending on how much rain the area received in the first half of autumn, which affected food availability. This and last year were some of the latest starts to breeding seasons that had been recorded, caused by very dry weather in the first half of autumn. However, 2016 was one of the earliest, after a wet autumn. This observation highlights the potential impact of climate change on the breeding habits of Carnaby's cockatoos.

So, while Denis's commitment to studying Carnaby's cockatoos seems unwavering, we are, at least for now, left wondering exactly how long these iconic birds live for in the wild. But Denis knows of one female who was at least 30 years old. The data collected through Denis's observations demonstrate the value of long-term research, and highlights the vulnerability of all animals, regardless of how abundant they may seem today.

Carnaby's cockatoos

(*Calyptorhynchus latirostris*) can often be heard before they are seen as they fly overhead issuing their undulating wailing cries, which sounds like "whee-la".

Their natural diet consists of seeds of banksia and other kwongan species, but in the past 60 years this has changed to incorporate seed from pine trees planted for timber production.

Their bill, which they use to bite and tear open seed, is short and rounded and is different to that of the Baudin's cockatoo, which has a longer slender bill. They have long tails with a broad white band.

Carnaby's cockatoos pair for life and nest in large hollows in wandoo and salmon gum woodlands in the Wheatbelt. They generally lay two eggs, but usually only one nestling survives. The nestling fledges at about 10 or 11 weeks, but is dependent on its parents until the start of the next breeding season.



Above left Relationship between rainfall and when Carnaby's cockatoos lay their eggs at Coomaloo Creek (1969–2016).

Background Carnaby's habitat at Coomaloo.

Above Carnaby's cockatoo.
Photos – Sallyanne Cousans

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