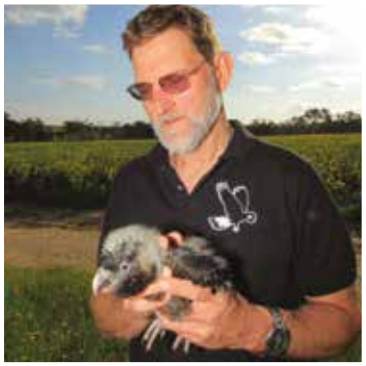


Dr Denis A Saunders, AM

by Tania Durlik

The endangered Carnaby's cockatoo is lucky to have a friend in Dr Denis Saunders who has spent almost 50 years fighting for its survival. While his efforts to prevent further decline are making a difference, the battle for long-term survival endures.

Denis Saunders is a rare sort – almost as rare as the bird species he has devoted nearly half a century trying to save. As a university graduate with a degree in zoology, he never envisaged he would spend the next 47 years investigating ways to help slow the decline of Carnaby's cockatoo (*Calyptorhynchus latirostris*), once thought to be the same as Baudin's cockatoos and previously known as the short-billed white-tailed black cockatoo.

His interest in the species was first ignited in 1968 (the same year he married his university sweetheart) when he joined the wildlife research division of CSIRO to study the ecology of Carnaby's cockatoo, a charismatic bird that also forms life-long bonds with their partners. Little did he know at the time, this work would be vital in his battle to save the species in coming years.

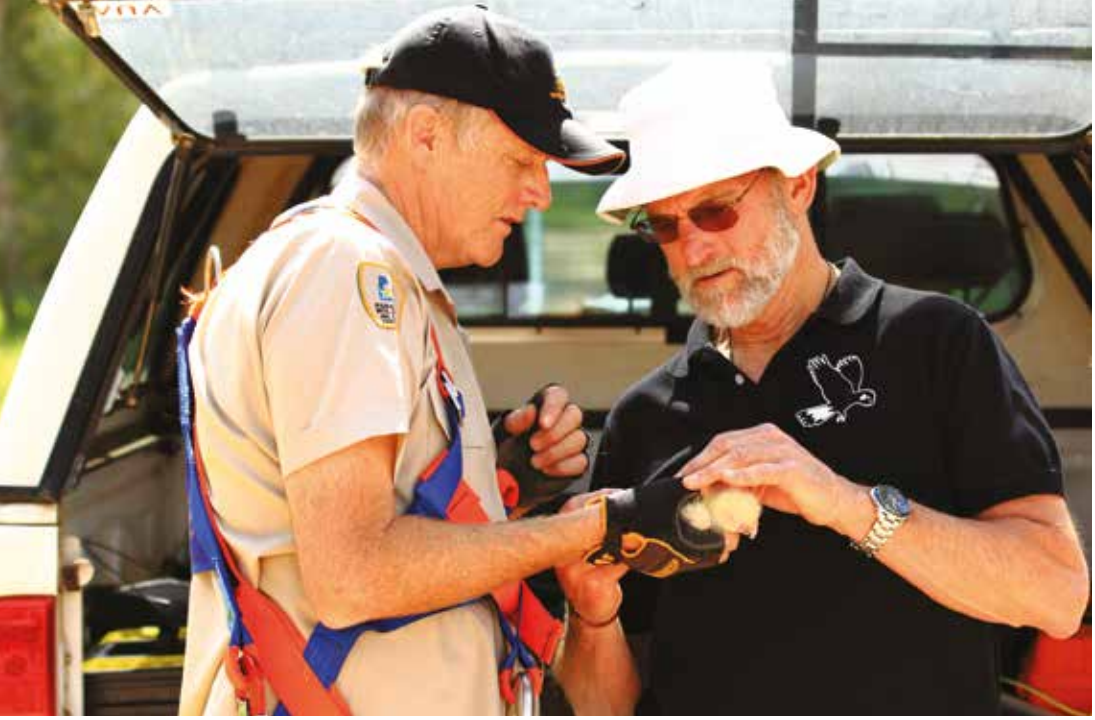
At the time the bird was classified as vermin and had a bounty on its bill due to its fondness for apple and pear seeds and almond crops. It was also a pest in pine plantations, not only because of its fondness for pine seeds, but because the weight of the birds often caused bent trunks, not suitable for sawn timber.

Early on in his research, Denis unravelled many mysteries surrounding Carnaby's cockatoo and was among the first to explore a significant breeding haven for the species that was quickly recognised as crucial habitat. With these findings came renewed hope.

This was the start of his close association with the wonderful cockatoo, a relationship that his wife describes as his "other marriage". While few men can say they spend the majority of their time with another "bird" and remain married, it's a love affair that continues to grow.

By the late 1980s, the species had disappeared from more than 30 per cent of its breeding range as a result of culling and broadscale clearing of native vegetation for agriculture, and was consequently placed on the State and Federal government endangered species lists. What had started as a fortuitous research opportunity years earlier, rapidly turned into a battle as the species faced extinction.

Left A 30-year-old-female cockatoo first banded by Denis Saunders in 1988.
Photo – Rick Dawson/Parks and Wildlife
Inset Denis Saunders examines a nestling.
Photo – Matt Swan/Parks and Wildlife



Above left Parks and Wildlife officer Rick Dawson and Denis Saunders inspect a Carnaby's nestling.

Above Rick Dawson inspects an artificial hollow installed at Coomallo Creek.
Photos – Matt Swan/Parks and Wildlife

Opposite page
Five-day-old nestling.
Photo – Rick Dawson/Parks and Wildlife

Keen to share his knowledge with others to help guide future management of Carnaby's cockatoo, Denis has published 41 papers on the species in peer-reviewed scientific journals and 12 in other publications, including Parks and Wildlife's *Western Wildlife* newsletter.

He still continues to document and publish the results of his research and his work has been recognised on a global scale with countless awards received, including the 1998 International Society for Conservation Biology's Individual in Government Award.

While his dedicated work to help protect crucial Carnaby's cockatoo habitat continues, his concern for their long-term survival endures. He remains hopeful that with strategic planning and increased protection, their distinct and raucous cries will still be heard in our skies centuries from now.

REALISING A PASSION

The first breakthrough for Denis came when, during his research, he confirmed suggestions documented by Ivan Carnaby in 1948 that there were two species of black cockatoos with white tail-bands in south-western Australia: Baudin's cockatoo responsible for orchard damage and Carnaby's cockatoo responsible for damage to pine trees.

With the taxonomy of Carnaby's cockatoo verified, Denis then shifted his focus to the ecology of the species. As he set off in search of breeding habitat he met Frank Grigson, a farmer and avid egg collector at Cockleshell Gully, who directed him to Coomallo Creek, north of Badgingarra. During his first visit to the area Denis immediately realised it was a significant breeding ground. Subsequently, the area became a home away from home for Denis. While conditions were often harsh, flies relentless and the days long, together with his technical officer John Ingram, he soon became acquainted with the birds that were nesting in the small oasis of wandoo trees surrounded by Kwongan and agricultural land.

Since then, Denis has spent thousands of hours at Coomallo Creek conducting surveys, banding Carnaby's cockatoos, observing their breeding and feeding behaviour, and monitoring their movements throughout the year.

MOVING FOWARD

Unquestionably, Denis' work at Coomallo Creek has been pivotal in helping to develop a solid knowledge base to assist with improved management of the species. The breeding population of Carnaby's cockatoo at Coomallo Creek has been studied in detail since 1969, with at least two site visits made annually in 28 breeding seasons from 1969. After relocating to Canberra in 1997 Denis no longer had the opportunity to monitor the population, but retained his interest in the subject as an inaugural member of the species' recovery team.

In 2009, Denis resumed his visits to Coomallo Creek after teaming up with wildlife officer Rick Dawson and zoologist Peter Mawson from the former Department of Environment and Conservation. Both had agreed to assist with Denis' fieldwork and this collaboration has been momentous in sustaining the Carnaby's cockatoo population at Coomallo Creek.

CRAFTING NESTING HOLLOWS

In early September 2009, Denis and Rick visited Coomallo Creek to look for new nesting hollows and banded birds. Their survey work was made considerably easier by the expertise of department staff who used a map of the study area, originally developed by the Australian Survey Office in the 1970s, to produce an updated and detailed map that pinpointed the exact locations of nesting trees.

"... installing artificial hollows in strategic locations is assisting with the species' recovery. The team has successfully mounted 60 artificial hollows at Coomallo Creek, and during the 2014 breeding season 53 per cent of breeding attempts (eggs laid) were made in artificial hollows."

The map was then overlaid on satellite imagery enabling Rick and Denis to locate the majority of more than 200 hollow trees used by Carnaby's cockatoos between 1969 and 1996.

When he first started studying the species, Denis had established that breeding females used the same hollow each year, provided they were successful and the hollow was unoccupied when they returned to breed.

On revisiting the site with Rick and Peter, Denis discovered that many of the hollow trees he had monitored before 1996 no longer existed, or were no longer useable, and many hollows were in need of repair for a variety of reasons including fallen floors and splitting sides.

This inspired a new focus for the team – not only to restore the natural hollows, but also to install artificial ones as part of an experiment to provide greater breeding opportunities for the cockatoos.

To achieve the latter successfully, the structure and dimensions of the artificial hollows needed to be large enough to allow plenty of room for the females to access them, and deep enough to reduce predation and provide protection from the elements. As the hollows were made from large PVC pipes, they also required a ladder so the birds could climb in and out. Another consideration was the inclusion of a sacrificial wooden post, which the females could chew to add wood chips to the sterilised base on which to lay their eggs.

Artificial hollows for Carnaby's cockatoos had previously been built and placed in forest and woodland areas since the 1980s. However, there was insufficient information about the use of the hollows to guide the team's design and placement to maximise the chances of the species using them successfully.

After spending time sourcing the best design, the team set about installing 20 artificial hollows in late September 2011.

More recently the team has refined the design further by creating larger artificial hollows that more closely resemble natural ones, which average one metre deep, have a floor diameter of 40cm and open vertically.

Denis believes that installing artificial hollows in strategic locations is assisting with the species' recovery. The team has successfully mounted 60 artificial hollows at Coomallo Creek, and during the 2014 breeding season 53 per cent of breeding attempts (eggs laid) were made in them.

While this in itself is a great feat, Denis is quick to point out that ongoing maintenance is essential to ensure both natural and artificial hollows are repaired as soon as they become derelict. While the artificial hollows have become an important tool in cockatoo conservation Denis says if they are not maintained, they will become unusable.

STORMY TIMES

The trial of artificial hollows could not have come at a better time. Leading up to the installation of the first of the artificial hollows in 2011, Carnaby's cockatoos received a major blow with a heatwave in the Great Southern killing at least 208 birds at Hopetoun and Munglinup, and many more may have died but were not recorded. Two months later a hailstorm in Perth killed 57 birds and 24 others were taken into care for rehabilitation.

These events occurred just weeks after a fire at Coomallo Creek, destroyed

16 active nesting hollows and killed three nestlings. The fire also burnt out the southern end of the study area and wiped out part of the breeding habitat.

These were testing times for Denis but the fight to save this highly intelligent and fascinating species never faltered and his research continued.

BREEDING SUCCESS

As a result of the artificial hollows experiment (which continues today), the number of breeding attempts at Coomallo Creek has risen dramatically over the years, from 41 in 2009 to 101 in 2014. This rapid increase was due to the installation of extra hollows and the repair of derelict ones enabling breeding birds, whose habitat was destroyed in the 2009 fire, to move into the study area. While the statistics are encouraging, the amazing journeys and stories of individual Carnaby's cockatoos are even more uplifting.

Denis recalls that when a female Carnaby's cockatoo with a seven-week-old nestling was killed by a wedge-tailed eagle, her male partner continued to feed the nestling by himself until it fledged. The male was seen a few months later along the Hill River, near Jurien, with both his new partner and his fledgling. The following year the pair and their newest fledgling were seen together with his fledgling from his previous union, evidence of a resilient family bond.

Another inspirational story close to the heart of both Denis and Rick is that of a female nestling (named 'Cilla' by ABC radio listeners) who was banded in 2010. Her birth and battle to survive was portrayed in the award-winning documentary *On a Wing and a Prayer* and book of the same title. Beating the odds and overcoming many threats, the nestling fledged successfully. She was re-sighted twice in 2014, nesting in a hollow just 600m from where she fledged. Unfortunately, however, like many young and inexperienced birds, she was unsuccessful in her first breeding attempt.

Although many species cast off their offspring as soon as they leave the nest, young Carnaby's cockatoos form very strong parental bonds and stay with their parents until the following breeding season. This provides the parents with an opportunity to show their offspring how food and water are distributed in a very patchy landscape. The bonds between breeding birds are so strong that Denis recalls only ever seeing one case where the partners have separated and bred with other individuals.

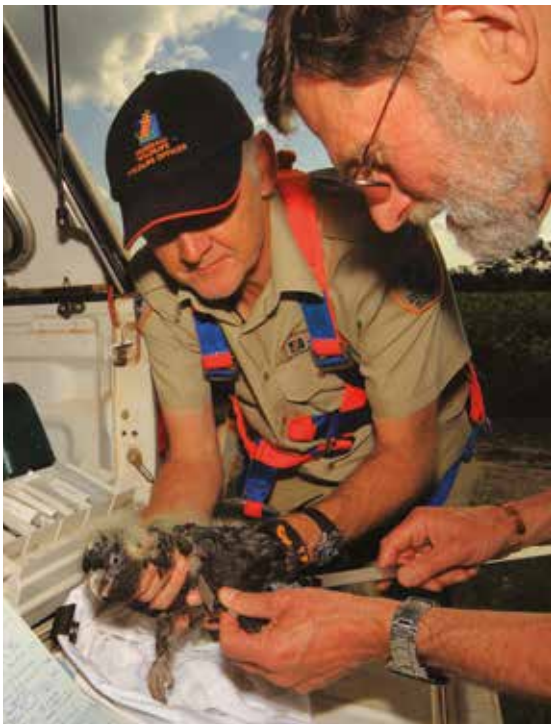
The formula

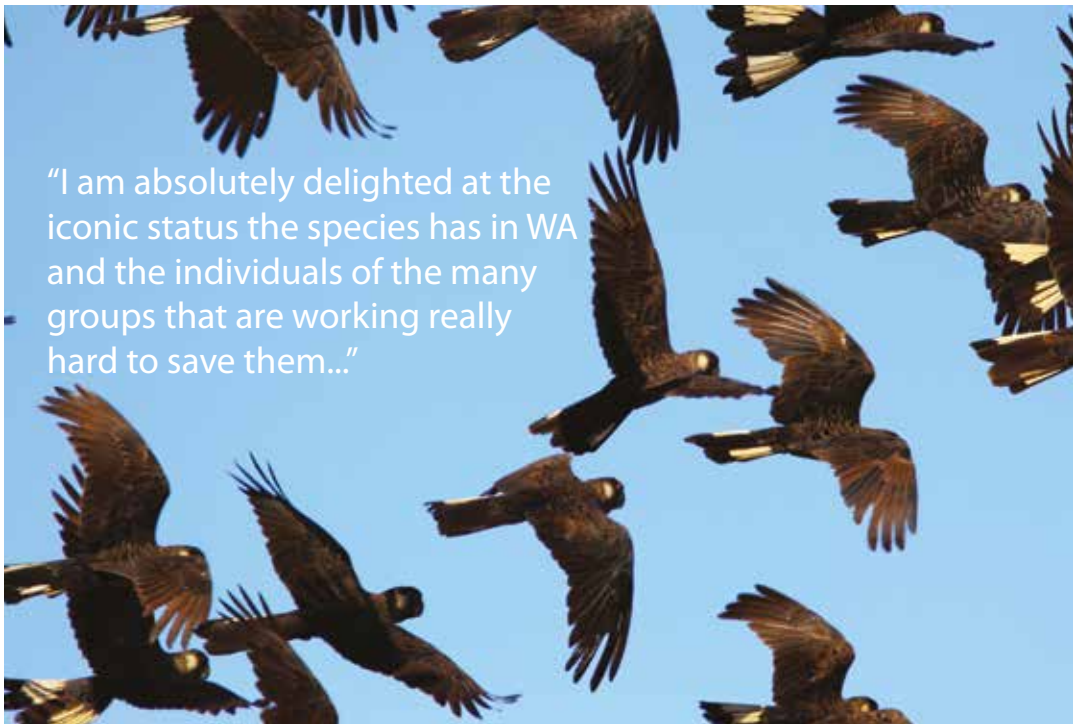
Denis has developed a formula that enables him to work out the age and health of a Carnaby's cockatoo nestling. The age is calculated using the length of the cockatoo's folded left wing, and the nestling's health is based on the relationship between its age and weight.

Above The three-year-old banded hen on the left is the youngest-ever confirmed breeding female.
Photo – Rick Dawson/Parks and Wildlife

Above right A Carnaby's cockatoo nestling inside one of the artificial hollows.

Left The age and health of a cockatoo can be measured in the folded wing of the nestling.
Photos – Matt Swan/Parks and Wildlife





Above left Rick Dawson and Denis Saunders measure a nestling in the field.
Photo – Matt Swan/Parks and Wildlife

Above The screech of Carnaby's cockatoo is a quintessential Western Australian sound.

Left Riley Raffan is the third generation of the Raffan family that have nurtured Carnaby's cockatoos on their property.
Photos – Rick Dawson/Parks and Wildlife

SUPPORTING THE CAUSE

The assistance Denis and Rick have received from private landowners and volunteers has been instrumental in the battle to save Carnaby's cockatoos. Much of the study area at Coomallo Creek, where the majority of the artificial hollows have been placed, is on a property owned by the Raffan family who has always been very supportive of the research. They even offered Denis the use of their caravan for accommodation when his study shed collapsed because termites had eaten all the supports.

These days when Denis and Rick visit the area to conduct their annual monitoring in September and November, they stay in the Raffan's old farmhouse. In return, they share their knowledge with younger family members who have shown a keen interest in the conservation of Carnaby's cockatoo.

In addition to the Raffan family, the Paish and McAlpine families have also supported research on their properties. Volunteers from the Palm Beach Rotary Club and BirdLife Australia have also helped with installing, repairing and checking hollows and nesting sites.

Denis says there have been many other individuals over the years who have dedicated their time and effort to assisting with the research and conservation of these beautiful birds, and Denis admits that without them and the involvement of future generations he would be fighting a losing battle.

LIVING WITH HOPE

As an energetic 67-year-old, Denis is showing no signs of slowing down just yet. However, behind his optimism there's a hint of sadness at the reality that if the threats to Carnaby's cockatoo persist, his grandchildren and their grandchildren and beyond may never experience the joy of seeing the majestic beauty of a flock of Carnaby's cockatoos flying across the skies.

Denis sums up his ongoing battle best this way: "I am absolutely delighted at the iconic status the species has in WA and the individuals of the many groups that are working really hard to save them, because effectively under their wings sit a whole swag of other species, and if you get it right for Carnaby's cockatoos you'll get it right for a whole range of other species".

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