

A photograph of a Brolga bird standing in a grassy field. The bird is white with a red head and a long, dark beak. It is looking to the left. In the foreground, there is a nest made of dry grass and twigs. A smaller Brolga bird is sitting on the nest, and a small, fluffy chick is standing next to it. The background is a blurred green field.

BROLGA *breeding* HABITAT

**A GUIDE TO
MANAGING WETLANDS
ON YOUR FARM**



© Corowa District Landcare Inc. 2018.

You may copy, distribute, display, download and otherwise freely deal with this publication for any purpose, provided that you attribute Corowa District Landcare Inc. as the owner.

This booklet was written by Matt Herring, Murray Wildlife, in partnership with Corowa District Landcare Inc. and Murray Local Land Services.

COROWA DISTRICT LANDCARE

100 Edward Street
COROWA NSW 2646

Email: corowalandcare@bigpond.com



Local Land
Services

This publication should be cited as follows:
Herring, M. (2018), *Brolga Breeding Habitat: a guide to managing wetlands on your farm*. 2nd ed. Corowa District Landcare Inc., NSW.

Design by: PeeKdesigns
Printed by: Whirlwind Print
Printed on recycled paper
Published by: Corowa District Landcare Inc., NSW
First published: June 2007
Revised edition: May 2018
ISBN: 978-0-646-9900-6-4

Disclaimer: The information contained in this publication is based on knowledge and understanding at the time of writing (May 2018). However, because of advances in knowledge, users are reminded of the need to ensure that the information upon which they rely is up to date and to check the currency of the information with the relevant authorities.

Acknowledgements

"Hundreds of farmers across the Riverina of southern New South Wales and northern Victoria have contributed to this work on Brolgas since the late 1990s. The first edition was produced in 2007 as part of the Murray Catchment Management Authority's Nest Egg project, with Alex Knight. The information presented primarily draws on my honours thesis at Charles Sturt University and a Threatened Species and Farming project that I did with the Arthur Rylah Institute and Department of Sustainability and Environment. Nick Klomp, Ian Lunt, Richard Loyn, Annette Muir and Tam Lavis provided great support for those studies. Thanks to Judy Kirk at Corowa District Landcare and Murray Local Land Services for their help with this second edition. A special thanks to the landholders for their quotes, and to Inka Veltheim for the information on her GPS-tracking studies, as well as all of the photographers who allowed us to use their images."

MATT HERRING, MURRAY WILDLIFE
mherring@murraywildlife.com.au

Photos: All photos © Matt Herring except:
© Bob McPherson (front cover, inner cover left, page 7)
© Darren Slater (page 1 top, back cover)
© Adrian Martins (page 3)
© Bob Green (inner cover right, page 4)
© Jason Robins Photography (Native Dog Swamp, page 6)
© Chris Tzaros (painted snipe, page 9)
© David Webb (pea, page 9)

All landholders supplied their own images to accompany their quotes, except for Page 5: © Kim Woods.

WETLAND *hotspots*



Wetlands are hotspots for wildlife. They can support a wonderfully diverse concentration of native birds, mammals, reptiles, frogs, fish, invertebrates and plants. Many species are dependent on these habitats for at least part of their life cycle, and ultimately for their survival. The much-loved Brolga is one of them. They are often seen feeding out in paddocks or crop stubble but for breeding they rely on shallow wetland areas vegetated with low cover like Eleocharis Spike-rushes and Canegrass. These are usually ephemeral wetlands, which are short-lived wetlands that have a distinct wetting-drying cycle.

This guide can help landholders manage their wetlands for Brolgas.

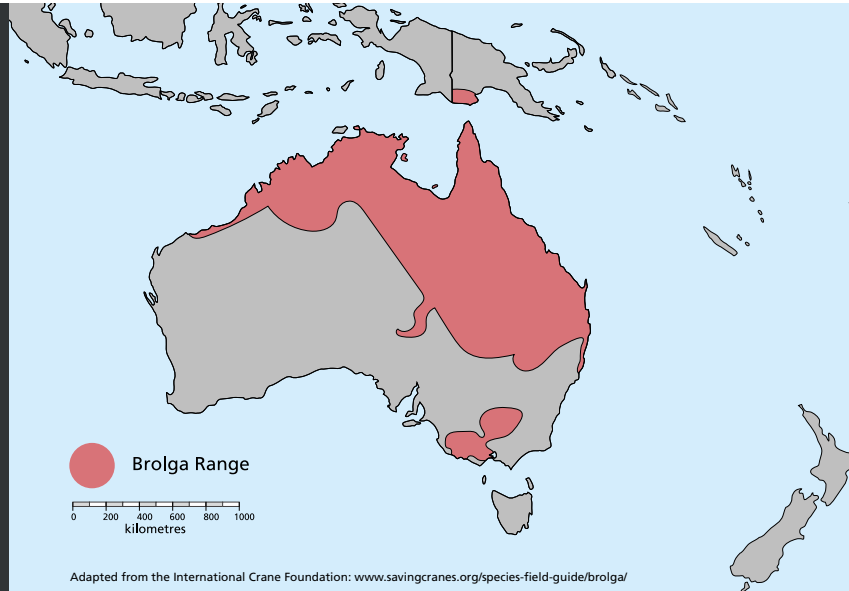


The two eggs hatch about 30 days after laying, then after around 95 days the chicks are able to fly.

CRANES

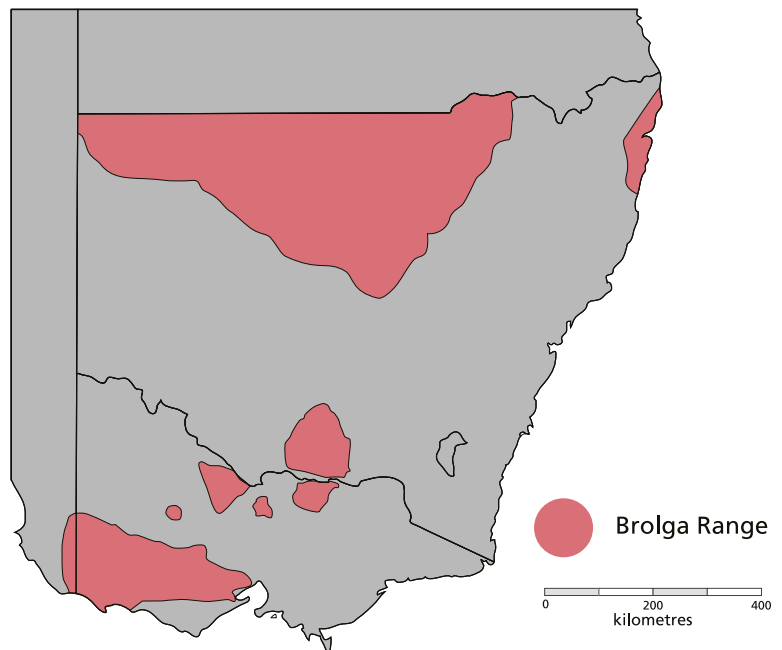


The Brolga is a large, charismatic wetland bird of northern and eastern Australia, as well as small parts of Papua New Guinea. Adults can stand up to 1.4 metres and have a wingspan of over two metres. Breeding pairs are thought to partner for life and it is likely that Brolgas can live for over 50 years in the wild. Brolgas, like other cranes, are renowned for their elaborate dancing displays and trumpeting calls during courtship and pair bonding. This captivating behaviour has been celebrated for many thousands of years through the dance and song of Indigenous Australians.



The only other crane species found in Australia is the slightly larger Sarus Crane, an Indian-Asian species, which has been recorded across northern Australia only since the mid-1960s, primarily in north Queensland. The White-faced Heron, commonly recorded on Riverina farms, is sometimes incorrectly called a Blue Crane.

There are fifteen species of crane in total and they are recognised as one of the most charming, yet most threatened, bird groups on the planet. The Whooping Crane suffered a severe population crash but has become an international symbol for successful conservation, with recovery efforts in North America turning imminent extinction around by boosting numbers from a low of fourteen individuals in 1938 to almost 500 in 2018.



Brolga distribution in south-eastern Australia

This map is based on research by Matt Herring, the Victorian Biodiversity Atlas and the Atlas of Living Australia. It only includes strongholds for breeding and flocking.

For more details on Brolga distribution visit the Atlas of Living Australia website: bie.ala.org.au

Breeding AND FLOCKING

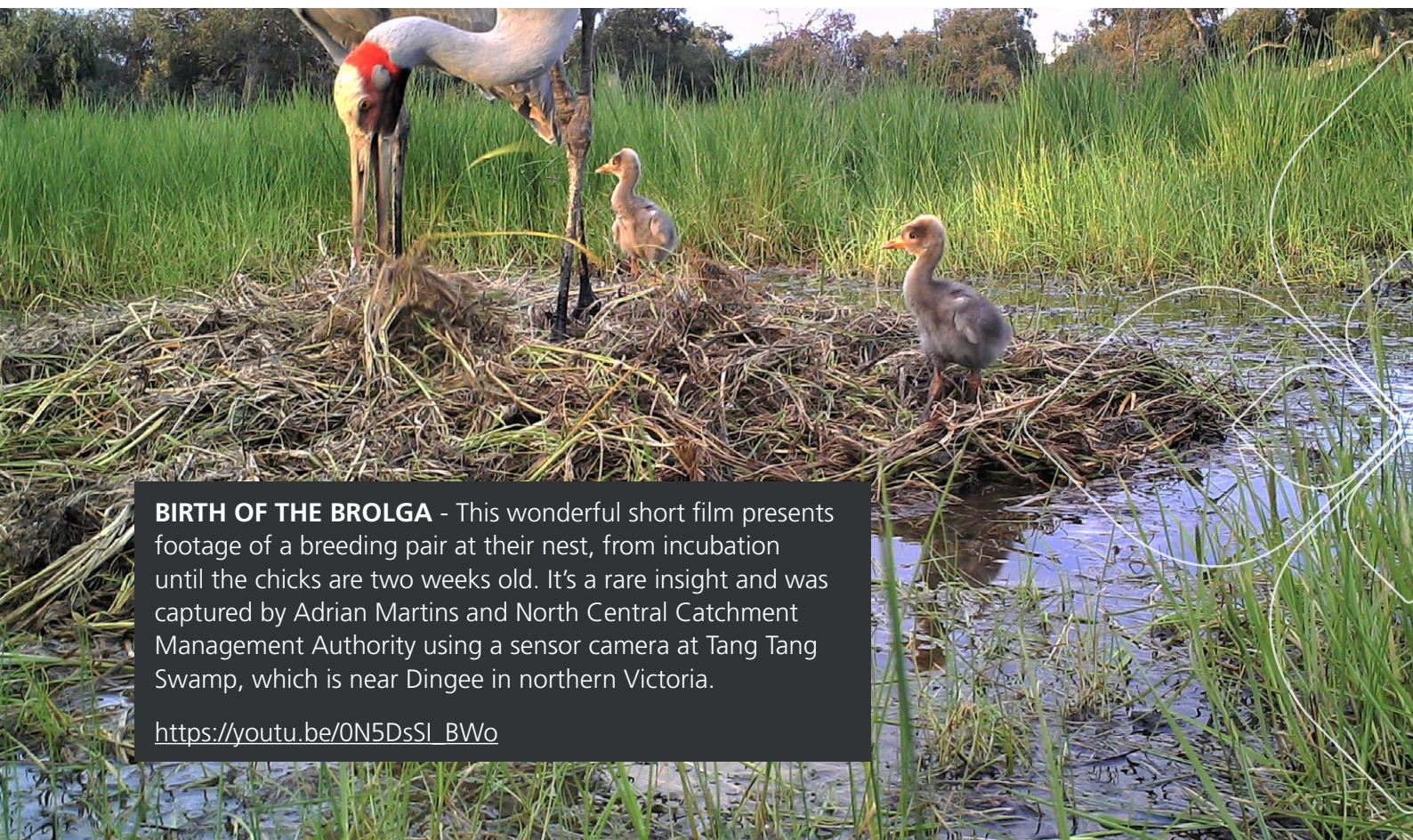


Brolgas have distinct breeding and flocking seasons. In south-eastern Australia, Brolgas usually breed in winter and spring, then as summer slowly dries their ephemeral breeding habitat they move to flocking sites. In south-western Victoria, recent GPS-tracking of Brolgas by Inka Veltheim, Federation University Australia, has shown movements between breeding and flocking sites of about 100 kilometres on average for some individuals and 20 kilometres on average for others. In northern Victoria, there are three key breeding areas – Yarrawong-Katamatite-Benalla-Rutherglen, Corop and Echuca-Dingee-Kerang – and they appear to flock locally. The key breeding area in southern New South Wales includes the Urana, Jerilderie, Boree Creek, Lockhart, The Rock, Walbundrie, Oaklands, Savernake, Berrigan, Balldale, Corowa and Barooga regions, though there is also some breeding further west around Moama and Deniliquin. The largest and most regular flocking area in southern New South Wales is at the Tuckerbil and Fivebough Swamps near Leeton. It appears to draw birds that breed further south.

"I have on one occasion seen a group of Brolga dance. I think late spring 1960, just north of Bull Plain on road reserve, just on dusk. They took no notice of me, I was in a utility travelling back home to Bull Plain. As a group of probably ten or a dozen they had formed into a rough circle bowed, danced forward then back, taking it in turn to preen and to be the central performer. I have never seen brolgas again at this site but it remains as a very special event to have witnessed."



BILL BOTT, COROWA DISTRICT LANDCARE MEMBER AND LOCAL LANDHOLDER.



BIRTH OF THE BROLGA - This wonderful short film presents footage of a breeding pair at their nest, from incubation until the chicks are two weeks old. It's a rare insight and was captured by Adrian Martins and North Central Catchment Management Authority using a sensor camera at Tang Tang Swamp, which is near Dingee in northern Victoria.

https://youtu.be/ON5DsSI_BWo

Threatened SPECIES



The Brolga is considered a threatened species in the southern states, listed as Vulnerable in New South Wales, Victoria and South Australia. Their decline in south-eastern Australia since European settlement has been severe. They were once a common bird, regularly recorded in their hundreds. The decline has primarily been from the loss of wetlands, as well as shooting, poisoning, inappropriate wetland management and possibly increased predation of young by foxes. Apart from the odd vagrant, they have now disappeared east of the Hume Highway from Sydney to Melbourne. They are still considered secure nationally with 100,000 or more birds but Birdlife Australia Atlas comparisons have shown strong evidence for a nation-wide decline.

There are now two core areas remaining for Brolgas in south-eastern Australia. The south-western Victorian group, which includes the far south-east of South Australia, has long been thought to support around 650 birds. However, a count of 907 birds by the Victorian Department of Environment, Land, Water and Planning across the flocking sites in 2013 suggests the population had increased or previously been underestimated. The Riverina group of northern Victoria and southern New South Wales supports a maximum of about 250 birds. The largest concentration in recent times was recorded at Tuckerbil Swamp near Leeton in 2003 and consisted of 123 birds. To determine how many young Brolgas survive beyond fledging, a count of the number of immature birds among the adults is carried out at flocking sites. In the Riverina, these counts have yielded only 0 to 5% immature birds. This is frighteningly low compared to northern Australia where around 15% is commonplace.



Immature Brolgas lack the red head of adults until they're about 18 months of age.



Only about 1,000 Brolgas remain in south-eastern Australia. Their survival depends on how wetlands on farms are managed. The most important thing we can do to help save the Brolga is provide suitable breeding habitat.


MANAGING *your* *wetland* FOR BROLGAS

it all begins with water



Brolgas rely on shallow, ephemeral wetland areas for breeding. Sometimes, they will nest out in the open but breeding sites are usually in wetland areas with vegetation like rushes and sedges. In the Riverina, nesting occurs between July and December, usually in response to winter and spring rainfall. Breeding wetlands range from entirely ephemeral basin-type wetlands to the ephemeral edges of more permanent wetlands. Farm dams for stock or irrigation storages are also used, so long as they support extensive shallows with waterplants.

The wetland vegetation in Brolga breeding wetlands is rarely over one metre in height. This is primarily as a result of a short flooding period, often just a few months, that never allows tall, dense vegetation like Cumbungi to establish and dominate. If tall vegetation or trees are present, they are widely spaced or very patchy, enabling Brolgas to maintain a panoramic view of their surrounds. Water depths at Brolga breeding wetlands average about 30 centimetres. This also favours low wetland plants like Eleocharis Spike-rushes and generally isn't deep enough to support reeds and tall rushes. Rice crops are only rarely used for breeding by Brolgas, probably because the habitat becomes available too late in the season and there's a lack of tuberous waterplants for Brolgas to eat.




"Brolgas are a gregarious species but when it comes to breeding they need their privacy. On our property, I leave the canegrass swamps as natural as I can and the Brolgas keep coming back. Many other waterbirds breed here too."



CHARLIE WEBB, SHEEP GRAZIER, LAKE CULLIVAL, URANA.

Canegrass (*Eragrostis australasica* and *Eragrostis infecunda*) and Spike-rush (*Eleocharis* species) wetlands are typical of Brolga breeding sites across the New South Wales and Victorian Riverina. They are treeless, ephemeral wetlands that explode with life when flooded. Water depths average about 30 cm and they are usually flooded for between two and six months. The vegetation is typically below 100 cm in height.



These Eleocharis Spike-rushes respond quickly to shallow flooding (5-50 cm). The underground tubers are a favoured food source of Brolgas.

Maintaining and restoring flows to the remaining shallow wetlands across the landscape is a priority for Brolga conservation. Restoration can sometimes be as simple as blocking a drain. Murray Local Land Services, Murray-Darling Wetlands Working Group and other organisations are working with numerous landholders to help conserve wetlands. The watering private property wetlands project has delivered environmental water on over 100 farms since the project began in 2001. The response of waterbirds, including Brolgas, and an array of other native wetland species, has been phenomenal.



Grazing and fire regimes

The majority of Brolga breeding sites in south-eastern Australia are on private land and are subject to grazing by sheep or cattle. Avoiding set stocking rates and allowing the area to be periodically rested from grazing are important general rules for wetland management. Excluding stock when the wetland is flooded will give waterplants the best chance to flourish.

Canegrass and Cumbungi can form tall (over two metres), thick stands. Sometimes wetland vegetation is burnt to maintain a certain structure or promote grazing value by encouraging new, succulent shoots that are palatable to stock. Such management can be beneficial to Brolgas because they like to maintain a panoramic view of their environment, avoiding tall, dense vegetation.



Native Dog Swamp – Bird-hide Showcases Brolgas

This 145-hectare wetland is a well-known Brolga breeding site along the Berrigan-Yarrawonga Road. It is mostly private land but has a Travelling Stock Reserve on the eastern side next to the road. This superb wetland now features a public bird-hide, which is well worth a visit. Murray Local Land Services and Murray-Darling Wetlands Working Group are working to improve the capacity of the area to store carbon and increase biodiversity. This includes the use of strategic grazing and fire regimes. Native Dog Swamp is also known to support the globally endangered Australasian Bittern and a wide range of other waterbirds.



Nulla Nulla Swamp – Corowa's Canegrass Gem

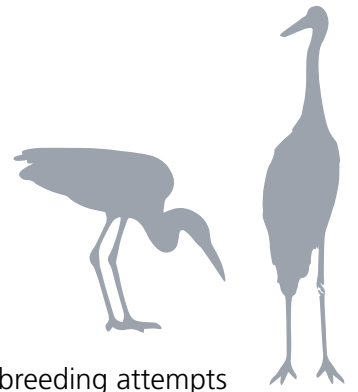
At around 230 hectares, Nulla Nulla Swamp is almost as large as the nearby township of Corowa. It is one of the Riverina's most significant canegrass wetlands and has supported breeding Brolgas for time immemorial. It is also known to support the globally endangered Australasian Bittern, together with many other waterbird species.



"Our grandchildren are now the fifth generation that enjoy spotting the Brolgas at Nulla Nulla Swamp. Last school holidays there was great excitement when we were close enough to see a pair with a mature chick."

JOY AND IAN MCLELLAN, COROWA LANDHOLDERS





Foxes and poor breeding success

In southern New South Wales and northern Victoria, only about 20% of Brolga breeding attempts are successful in producing fledged young. A fledging period of around 95 days leaves Brolga chicks grounded and unable to fly for a much longer period than most ground-nesting birds. The majority of Brolga chicks disappear within just a few weeks of hatching. Many of us blame foxes but direct evidence is usually lacking and there are plenty of other potential predators around wetlands.

The low breeding success may also be due to poor habitat quality. This could result in chick malnutrition or starvation, as well as the need for Brolga families to make arduous journeys, wandering further to find suitable food. There is also the potential issue of insufficient vegetation cover, with parents unable to successfully hide their chicks from predators.

If foxes are a key driver of poor breeding success then concerted efforts to reduce their numbers could make a big difference. Strategic baiting programs that involve multiple farms, together with improved management of breeding wetlands, should see Brolga breeding success improve. The lack of foxes across northern Australia, combined with higher quality wetlands, may explain the relatively healthy Brolga populations still present there.



"Majestic birds, their dances are spectacular, such a special treat to see them. So often swamps and wetlands are ploughed and cropped ... there goes more brolga habitat. Once these special places are destroyed, they're gone. The other big threat to brolgas is foxes and feral cats. My mum used to laugh at my raptures when I saw a pair at Savernake; her memories from her farm at Dunkeld near the Grampians were of flocks of 120. Having a personal connection to your acreage means you appreciate native habitats, and don't sacrifice the environmental balance for excessive financial gain."

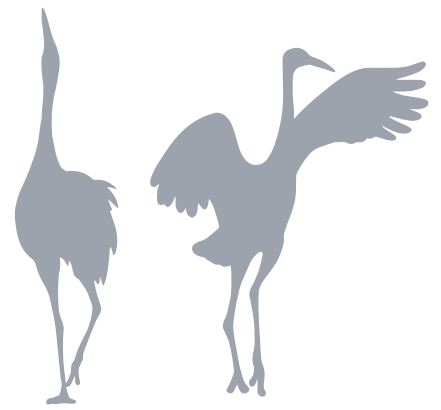


ANN SLOANE, SAVERNAKE FARMER.

Wetlands with trees

Brolgas are generally only recorded using River Red Gum (*Eucalyptus camaldulensis*) or Black Box (*Eucalyptus largiflorens*) wetland areas that have a canopy cover of less than 10%, and it's usually below 5%. These sites have large, well-spaced trees, together with shallow, open areas with emergent vegetation. Walla Walla Swamp is a good example of this. Unfortunately, several naturally open remnant wetlands in the Riverina have been planted with River Red Gums in recent years, making them unsuitable for Brolgas.

In the red gum forests of the Riverina, such as Barmah-Millewa, Brolgas have essentially disappeared. Forestry practices have often increased tree density, while young trees and tall rushes have invaded formerly more open wetland areas. River regulation has reduced flooding in winter-spring, and increased summertime flooding, favouring mass-germination and encroachment. There are numerous Riverina waterbirds, such as egrets, spoonbills, herons and cormorants that breed in trees but various other waterbirds like Brolgas rely on more open areas. The key, as always, is one of balance.



Powerlines and fencelines

Brolgas often fly on twilight, so they are particularly vulnerable to collisions with powerlines. Almost every year there are reports of Brolga deaths that are easily avoidable. For example, working with local government, road authorities and energy companies to attach colourful buoys can help avoid collisions. Fencelines can sometimes entangle unfledged young and inhibit their movement, so careful consideration about the placement of fencing should be taken. Avoiding barbed wire will also reduce the risk.

Farm dams

Brolgas typically breed in large wetlands, often over 50 hectares. However, it is pleasing that the Brolga – one of southern Australia's most threatened waterbirds – is capable of breeding in small constructed wetlands like farm dams. Sometimes, they're just a few hectares and can include storage dams in intensive irrigation landscapes.

These Brolga breeding sites are not typical of most farm dams, which usually lack shallows and waterplants, and support few waterbirds. During dry periods, many landholders undertake earthworks to desilt or re-dig their farm dams. At this time there is a great opportunity to dramatically increase the habitat value for Brolgas and biodiversity generally. Creating ephemeral shallows that can support healthy waterplant communities can be done within the dam or as part of an adjacent overflow. Excluding stock allows these areas to thrive and has the added benefit of reducing the risk of Liver Fluke, Johnes disease and other threats to stock associated with self-contaminated water.



Brolgas will breed in constructed wetlands, providing there are sufficient areas that have an ephemeral flooding regime of about 2-6 months with shallow water around 30 cm and waterplants for food, nest construction and cover.

Pictured is a constructed ephemeral wetland used for irrigation storage near Jerilderie – a 30 hectare, 200 megalitre Brolga breeding site that was ungrazed for five years, also supported Australian Painted Snipe, Australasian Bittern and 10 migratory shorebird species. Note the structural diversity of mudflat, Canegrass, Nardoo, Eleocharis Spike-rushes, Cumbungi and open water.

Small wetlands, including the constructed ones discussed here, are sometimes insufficient to facilitate a Brolga breeding event through to the chicks fledging, but clusters of smaller wetlands can do the job. Inka Veltheim's GPS-tracking work in south-western Victoria has shown breeding Brolgas using multiple wetlands before the chicks fledge. In the absence of large breeding sites, conserving and linking wetland clusters could be important.

Beyond BROLGAS



Targeting conservation efforts at individual species can backfire because management actions may disadvantage many other species, have few positive outcomes for biodiversity generally and waste precious time and money. Fortunately, one of the great things about Brolga breeding wetlands is that they typically support a high diversity of waterbirds and other wetland fauna. Some species found at Brolga wetlands, like the Australian Painted Snipe and Australasian Bittern, are also threatened species. These two birds are actually in more serious trouble than Brolgas, being threatened at the national and global level, so we should take into account their habitat requirements as well.



The **Australian Painted Snipe** is our country's most threatened resident waterbird, often found at only about ten sites each year. Like Brolgas, they breed in ephemeral wetlands, but the snipe have a particular preference for those with receding water levels that have a combination of very shallow water (less than ten centimetres), exposed mud and dense, low waterplant cover.

Australasian Bitterns often breed in short (less than one metre), dense wetland vegetation, including throughout the Riverina's rice crops. Unlike Brolgas, they also breed in tall stands of Cumbungi, Phragmites and Rushes (over two metres tall). Management resulting in a mosaic of different habitats is ideal.



The **Australian Spotted Crake** (pictured left) and Baillon's Crake are regularly found at Brolga breeding sites. They are dependent on the cover provided by waterplants like Eleocharis Spike-rushes and Canegrass.

The beautiful **Broughton Pea** (*Swainsona procumbens*) pictured right, is often found at Brolga breeding wetlands.

Frogs breed amongst the waterplants (frog spawn pictured below), and if shallow mudflats are present, migratory shorebirds from Russia can be found, like these **Sharp-tailed Sandpipers** (pictured below).



*The most important thing
we can do to help save the
Brolga is provide suitable
breeding habitat.*

The Australian Crane Network Website provides a hub
for the latest research and conservation of the
Brolga and Sarus Crane.

www.ozcranes.net

This project is supported by Murray Local Land
Services through funding from Catchment
Action NSW and the Australian Government's
National Landcare Program.



Local Land
Services



Australian Government

National
Landcare
Program



MURRAY
WILDLIFE

