



Brolga Breeding Habitat

Managing Wetlands On Your Farm

Introducing Brolgas and their wetland habitat

Wetlands are hotspots for biodiversity. They can support an incredibly diverse concentration of life. A myriad of native birds, mammals, reptiles, frogs, fish, invertebrates and plants depend on them for at least part of their lifecycle, and ultimately for their survival. The much-loved Brolga is one of those species.

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 2.5 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 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, common on Riverina farms, is sometimes incorrectly called a Blue Crane.

Brolgas are often seen feeding in paddocks and crop stubble but for breeding they rely on shallow wetland areas that have low cover. Immature birds lack the red head of adults until they're about 18 months of age.



There are 15 species of crane in total and they are recognised as one of the most appealing 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 14 individuals in 1938 to around 300 by 1999.

Brolgas have declined dramatically in south-eastern Australia since European settlement, primarily from habitat loss, shooting, poisoning, predation of young by Foxes and inappropriate wetland management. Apart from the odd vagrant, Brolgas

Australia's Two Crane Species: Together in the Gulf Country near Karumba, QLD, the three birds on the left are a Sarus Crane family, the three on the right are a Brolga family. Both species depend on wetlands for breeding.





There are fewer than 1000 Brolgas remaining in south-eastern Australia. Their survival ultimately depends on how wetlands are managed on farms. Ensuring there is breeding habitat for pairs like this one (with a chick less than one week old in tow) is the most important thing we can do to help save the Brolga.

have now disappeared east of the Hume Highway from Sydney to Melbourne.

In south-eastern Australia, summer slowly dries their ephemeral breeding habitat and Brolgas move to flocking sites. Here, we can measure recruitment by counting the number of immature birds among the adults. Since 2000 in the Riverina this has ranged from 0-5%, which is frighteningly low compared to northern Australia where up to 15% is commonplace.

There are now two core areas in south-eastern Australia. The south-western Victorian group, which includes the far south-east of South Australia, supports around 650 birds. The Riverina group of northern Victoria and southern NSW supports fewer than 250 birds. Core breeding areas in the NSW Murray Catchment include the Urana, Jerilderie, Boree Creek, Lockhart, The Rock, Walbundrie, Oaklands, Saver-nake, Berrigan, Balldale, Corowa and Barooga regions. Most of these birds seem to use the Leeton and Colleambally flocking sites to the north each year. In

northern Victoria most pairs flock locally.

The Brolga is considered a threatened species in the southern states, listed as *Vulnerable* in Victoria, New South Wales and South Australia. They are still considered secure nationally with 100 000 or more birds but recent Birds Australia Atlas comparisons have shown strong evidence for a nation-wide decline in the last 20 years.

Well managed wetlands like this Brolga breeding site in the Yarra-wonga area support a wide range of other waterbirds and wetland species.



Managing your wetland for Brolgas

Flooding Regimes

Brolgas rely on shallow (~30 cm deep), ephemeral wetland areas for breeding. In the Riverina, breeding occurs between July and December in response to winter/spring rainfall. Breeding wetlands range from entirely ephemeral basin-type wetlands to the ephemeral edges of more permanent wetlands. Even farm dams for stock or irrigation storage that support extensive shallows with waterplants are used.

The wetland vegetation in Brolga breeding wetlands is rarely over 100 cm in height. This is primarily as a result of a short flooding regime 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 cm. This also favours low wetland plants like Spike-rushes and isn't deep enough to support reeds and tall

Breeding Brolgas like to maintain a panoramic view of their environment. Tall, dense vegetation is avoided.



rushes. Rice bays are only rarely used for breeding by Brolgas because the habitat is generally available too late in the season.

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.

The NSW Murray Wetlands Working Group, together with Murray Irrigation Limited and numerous landholders have been instrumental in helping to restore wetlands

Brolgas breed almost exclusively in ephemeral wetlands that are only flooded for about 2-6 months at a time, then allowed to completely dry out. They are usually large wetlands, between 10 and 200 hectares in area.



in the NSW Murray Catchment. The watering private property wetlands project has flooded wetlands 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 & Fire Regimes

The vast 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 and set seed.

Canegrass and Cumbungi can form tall (2+ metres), thick stands. They are sometimes burnt to promote grazing value by encouraging new, succulent shoots that are palatable to stock. Such management can be beneficial to Brolgas.

Foxes and Poor Breeding Success

It has become clear over the past 7 years in the Riverina that the vast majority (70-90%) of Brolga breeding attempts fail. Although direct evidence is usually lacking, Foxes are presumed to be responsible for most chicks disappearing within the first few weeks of hatching.

A long fledging period of around 95 days leaves young Brolgas grounded for much longer than most ground nesting birds. The lack of Foxes across northern Australia is probably at least partly responsible for the relatively healthy Brolga populations still present there.

The poor breeding success could also be attributable to poor habitat quality, resulting in starvation, malnutrition, a lack of cover against predators or the need to wander further to find food. Strategic baiting programs like those undertaken by the Rural Lands Protection Board that involve multiple farms, together with improved management of breeding wetlands should see Brolga breeding success improve.



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

Cumbungi (below, *Typha* species) prefers deeper, more permanent flooding, especially over summer.





These Canegrass (*Eragrostis australasica*) and Spike-rush (*Eleocharis* species) wetlands in the Urana, Boree Creek and Balldale regions 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 2 and 6 months. The vegetation is typically below 100 cm in height. The pair opposite are changing over incubation duties. The two eggs hatch in around 30 days. The chicks are not capable of flying for another 95 days, leaving them grounded and vulnerable to predation by foxes.







River Red Gum wetlands like the Walla Walla Swamp pictured here are suitable as Brolga breeding sites only if there are at least some open areas with well-spaced trees.

Powerlines and Fencelines

Because Brolgas often fly on twilight they are vulnerable to collisions with powerlines. Attaching colourful buoys can help avoid this. Fencelines can entangle and inhibit the movement of unfledged young so careful consideration about the placement of fencing should be taken. Avoiding barbed wire will also reduce the risk of entanglement.

Emergent waterplants like these Rushes (*Juncus* species) surrounding a Brolga nest grow best in the absence of trees.



Wetlands With Trees

Brolgas are generally only recorded utilising River Red Gum (*Eucalyptus camaldulensis*) or Black Box (*Eucalyptus largiflorens*) wetlands with a canopy cover of 10% or below, and usually lower than 5%. These sites have large, mature, well-spaced trees, together with shallow, open areas with emergent vegetation. 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 extensive red gum forests of the Riverina (e.g. Barmah-Millewa forest) Brolgas have essentially disappeared. Forestry practices have increased tree density and young trees have invaded open wetland areas because altered river levels have reduced the depth and duration of flooding in winter-spring, and increased summertime flooding, favouring mass-germination.

There are many Riverina waterbirds, such as egrets, spoonbills, herons and cormorants that breed in trees but many other waterbirds like Brolgas rely on more open areas. The key, as always, is one of balance.

Nardoo (*Marsilea drummondii*) and Spike-rush (*Eleocharis* species) habitat, at Lake Montague, near The Rock.



Constructed Wetlands

It is pleasing that the Brolga – one of southern Australia's most threatened waterbirds – is able to breed in relatively small (sometimes less than 5 ha), constructed wetlands in intensive irrigation landscapes.

These breeding sites are not typical of most on-farm storage dams, which usually lack sufficient habitat and support few waterbirds. During excessively dry periods, many landholders undertake earthworks to desilt and re-dig their farm dams to make them more efficient. During this time there is a great opportunity to dramatically increase the habitat value for Brolgas and biodiversity generally at the dam by creating ephemeral shallows. Excluding stock 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 (~30 cm) and waterplants for food, nest construction and cover.

Constructed ephemeral wetland used for irrigation storage near Jerilderie – a 30 ha, 200 ML Brolga breeding site that was ungrazed for 5 years, also supports Australian Painted Snipe, Australasian Bittern and 10 migratory shorebird species. Note the structural diversity of mudflat, Canegrass, Nardoo, *Eleocharis* Spike-rushes, Cumbungi and deep open water.



Other Wetland Species To Consider ...

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 very 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 level, and we need to take into account their habitat requirements as well. Australian Painted Snipe also breed in ephemeral wetlands, especially those with receding water levels that have a combination of very shallow water (<10 cm), exposed mud and dense, low waterplant cover. Australasian Bitterns favour taller vegetation like Cumbungi, *Phragmites* and tall Canegrass. Management that results in a mosaic of these different habitats is ideal.



The increasingly mythical **Australian Painted Snipe** (above left) is our country's most threatened resident waterbird, found at only about ten sites each year. The **Australasian Bittern** (above right), the world's most threatened bittern, breeds primarily in tall reed beds (Cumbungi and *Phragmites australis*) but makes wide use of Canegrass wetlands where Brolgas breed. The constructed wetland below near Jerilderie supported both of these threatened, cover dependent birds, together with breeding Brolgas, 10 migratory shorebird species and 40 other waterbird species.





The **Baillon's Crake** (above left) and Spotted Crake are regularly found at Brolga breeding sites—they too are dependent on the cover provided by waterplants like Spike-rushes and Canegrass. This adult **Whiskered Tern**, about to feed its chick a leech, was one of more than 200 pairs that nested at a Brolga breeding site in the Urana-Jerilderie area in 2000. The floating nest was made from Spike-rush stems.

Acknowledgements

I am indebted to the many hundreds of farmers that have supported my ongoing work on Brolgas since the late 1990s. Thanks to Alex Knight and the Murray CMA for the opportunity to prepare this booklet for the "Nest Egg" project and for reading over an earlier draft. Much of the information presented here has been drawn from my honours thesis at Charles Sturt University and a Threatened Species and Farming project with the Arthur Rylah Institute and Dept. of Sustainability & Environment. Nick Klomp, Ian Lunt, Richard Loyn, Annette Muir and Tam Lavis provided great support for those studies. There are many other people that have supported this Brolga work and I thank you greatly.

Useful Brolga website: www.ozcranes.net

Photo Credits

Front Cover: Peter Merritt, Pg. 2 top: M. Herring, bottom: P. Merritt, Pg. 3 top: David Webb, bottom: M. Herring, Pg. 4 top: D. Webb, bottom: M. Herring, Pg. 5 both: M. Herring, Pg. 6 both: M. Herring, Pg. 7: P. Merritt, Pg. 8 all: M. Herring, Pg. 9 top: P. Merritt, bottom: M. Herring. Pg. 10 Painted Snipe: D. Webb, Bittern: Ian Montgomery, bottom: M. Herring. Pg. 11 Tern: P. Merritt, Crake: Aiden Webb, Pea: D. Webb, frog spawn: M. Herring, Dotterel: P. Merritt. Back Cover: P. Merritt.

Publication Details

Published by the Murray Catchment Management Authority, June 2007. All text Copyright © Matthew Herring. All Photographs Copyright © as per photographer listed above.
ISBN: 978 0 7347 5924 5

The beautiful **Broughton Pea** (*Swainsona procumbens*) pictured below is often found at Brolga breeding wetlands. Frogs breed amongst the waterplants (see inset) and if mudflats are present a whole suite of both migratory (e.g. sandpipers) and resident shorebirds like the **Red-kneed Dotterel** benefit.



