

Bitterns in Rice
PROJECT

The Bitterns in Rice Project

A curious rice grower photographed some strange birds in his crop, triggering the Ricegrowers' Association of Australia, Birdlife Australia, Riverina Local Land Services and other organisations to come together to learn more about bitterns and see what could be done to aid in their conservation.

Since 2012 the Bitterns in Rice Project has been uncovering the well-guarded secrets of Australia's Bunyip Bird – the globally endangered Australasian Bittern – and raising awareness of its plight. Bitterns arrive in rice crops about two months after sowing and begin nesting once there is sufficient cover. We also now know that rice growers in the New South Wales Riverina are custodians of the largest known breeding population in the world.



Our vision is to see bitterns and other significant wildlife prosper alongside rice farming; building on existing habitat values, and demonstrating that agriculture and wildlife conservation can work together.

Farming & Nature Conservation

As global demand for food continues to grow, the need to better incorporate biodiversity into agriculture also grows. Dedicated conservation areas, such as fenced-off wetlands or national parks, are central yet inadequate in conserving biodiversity.

In Australia's recent history, land and water have tended to be managed for either agriculture or nature conservation, rather than both. The Bitterns in Rice Project is about co-management, bringing together two traditionally separate schools of thought.

"If we can help bitterns by providing them with a habitat to live in and breed in then it's a win-win situation for everyone."

Coleambally Rice Farmer,
Ian Payne



"One of the great benefits of being a rice grower is witnessing how many different species of wildlife can benefit from the rice crop."

Mayrung Rice Farmer,
Shelley Scoullar



Australasian Bittern Facts

Scientific name: *Botaurus poiciloptilus*

Size: with neck stretched up, can stand about a metre tall. Males are larger than females (875-2085 gms versus 571-1135 gms). Wingspan: 1050-1180 cms.

Habitat: shallow wetlands with vegetation like reeds, rushes, sedges, canegrass, rice.

Diet: fish, frogs, yabbies, small mammals, insects, lizards.

Breeding: poorly known. Usually four or five eggs in well-hidden platform nest about 10-30 cm above water level. Incubation approx. 23 days; chicks leave nest after about two weeks, then take a further five weeks until fledging. Appears that only female incubates & raises young.

Movements: poorly known. Responds to flooding of ephemeral inland wetlands, probably sometimes from coastal refuges.

Relatives: Three other species in *Botaurus* group not found in Australasia: the American Bittern, Pinnated Bittern and Eurasian/Great Bittern. Two other bitterns found in Australia (*Ixobrychus* group): Black Bittern & Australian Little Bittern.



Juvenile Nankeen Night-Heron



Mice are among the prey bitterns pursue. Photo by Peter O'Connell.



Bittern eggs are similar in size to small chicken and bantam eggs.

Identification: Commonly confused with the smaller, tree-roosting Nankeen Night-Heron that often occurs in flocks and is seen feeding around rice fields at night. Australasian Bitterns are not known to roost in trees and only rarely occur in loose flocks of five or more.

Juvenile and immature Nankeen Night-Herons lack the orange-brown plumage of adults and can have a similar mottled brown plumage to bitterns. Otherwise, bitterns are the only large, brownish heron-like waterbirds found in the rice fields of the NSW Riverina.

The Bunyip Bird & Booming Males

The deep, booming calls given by males during the breeding season helped give rise to legends of Australia's mythical Bunyip. Various Indigenous groups, and later, European colonists, told tales of a fearsome, elusive creature living in the swamps.

The call can be heard for about two kilometres. The best time to listen for it is at dawn or dusk, but they can boom throughout the day and night. Because bitterns are so sneaky and hide in wetland vegetation, the booming of males is a useful way of learning they're present.

Masters of sneakiness and stealth: this Australasian Bittern eyes off potential prey on the edge of a rice crop near Jerilderie. Photo by Peter Merritt.

Globally Endangered Species

It is estimated that only 1500-4000 Australasian Bitterns remain in the world, with the International Union for Conservation of Nature (IUCN) classifying them as *Endangered*. The Australian Government also considers the species *Endangered*. The largest remaining populations occur in south-eastern Australia and New Zealand, with smaller populations persisting in Tasmania, south-west WA and possibly still New Caledonia.



How many bitterns use rice crops in the Riverina?

Since 2012 a key aspect of our work has been determining the size of the bittern population using rice crops. Our primary method is standardised 1-hour surveys around dawn and dusk on randomly selected rice farms with aerially-sown rice.

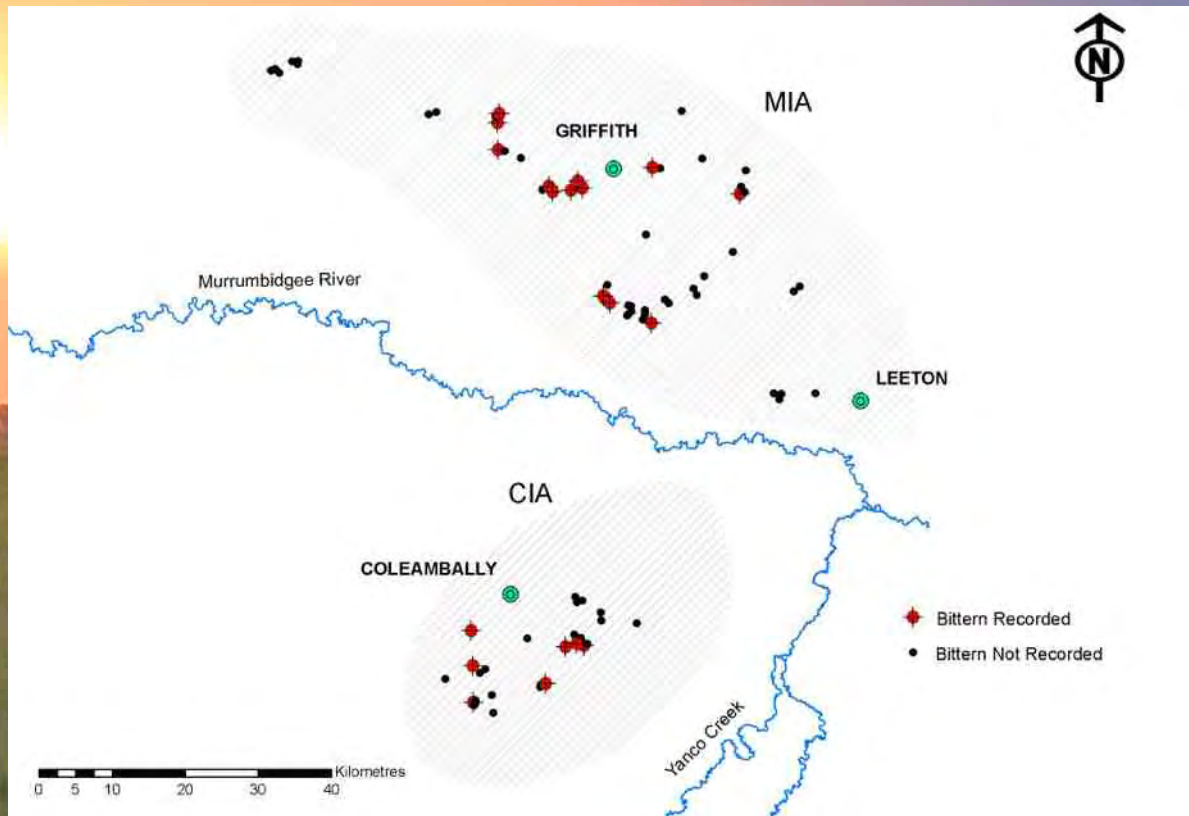
The random approach means our results are representative, giving us confidence in extrapolating them. A key survey window exists in summer when males are booming, but before the rice is too tall, making observation difficult.

We have more data analysis to do and are yet to apply the random approach to surveys in the Murray Valley. Bittern numbers also vary between years, largely as a result of the amount of rice grown.

Nonetheless, it is already clear that in most years the rice attracts approximately 750 bitterns (500-1000). This is remarkable as it equates to between 19% and 50% of the total global population. Riverina rice crops support the largest known Australasian Bittern breeding population in the world.

Four bitterns in one bay, early in the breeding season, a rare sight.





The 2014-2015 Rice Season

Last season, as a result of funding from Riverina Local Land Services, we expanded our random sampling approach from the Coleambally Irrigation Area (CIA) to include the Murrumbidgee Irrigation Area (MIA), producing our best insights yet. We had 80 sites, 23-30 hectares each, on 41 randomly selected farms with aerially-sown rice (see map above). After just two surveys at each site, bitterns were recorded on 37% of farms and 26% of sites. When bitterns were recorded, it

usually involved one or two individuals, but additional surveys often revealed the presence of more. For example, one farm was found to support eight bitterns and at least three nests.

Once harvest began, bitterns concentrated in the remaining unharvested crops and we found two farms, one near Leeton and one near Coleambally, that together supported at least 26 bitterns. That's about 1% of the global population.



"I'm pleased that by growing rice we can support such large numbers of the endangered bittern."

Griffith Rice Farmer, Gary Andrezza





Above Left: A sensor camera image of a female turning her eggs near Griffith.

Above Right: A two-day-old chick near Coleambally, covered in ginger down.

Left: One of three nests, each with an adult female, in a male's breeding territory in one rice field, indicating polygamy. These chicks: 3-5 days old.

Bottom Left: An approx. 13-day-old chick.

Bottom right: An approx. 18-day-old chick about 50 metres from its nest, hiding in Barnyard Grass on bank between bays.

Below: Regurgitated 16 cm Carp from approx. 9-day-old chick.





Widespread & Successful Breeding

It's now clear there is widespread breeding of bitterns in rice crops and that they can breed successfully, producing fully fledged young before harvest. The random sampling approach, together with surveys near the end of the season, have been central in revealing this.

It's remarkable that these constructed, agricultural wetlands can yield ten or so tonnes of rice per hectare, as well as future generations of one of the world's rarest, most threatened waterbird species; the Australasian Bittern.

Above: Approx. seven-day-old chick.

Right: One of eight 'random' nests found during the 2014-2015 season. Within two weeks the chicks start leaving the nest and move around the rice field.



"I've trialled bittern friendly rice cropping and I reckon there are many benefits for the rice industry. Even if it means sacrificing a small area of crop to ensure the long term viability and environmental sustainability of our area, then I'm still all for it."



Coleambally Rice Farmer, Bernie Star

Factors Affecting Breeding Success

There are several things that rice growers could do to improve the chances of chicks surviving. We have seen chicks hiding in Barnyard Grass on banks between bays and suspect cover like this would reduce the risk of predation by foxes, cats and other predators. We know chicks are fed frogs, tadpoles and carp, and management that leads to abundant prey might also improve breeding success. Bittern prey are likely to be affected by water and pesticide regimes, adjacent habitat and other factors.

Below: This chick didn't make it. A fox scat was found on top of the pile of feathers.



Bittern Friendly Rice Growing

In May, 2014 we launched the first edition of our Bittern Friendly Rice Growing Tips. This work in progress is a crucial part of the Bitterns in Rice Project, enabling rice growers to take the lead on bittern conservation. They are for rice growers in the NSW Riverina that are keen and able to help conserve this special bird.

Aerially Sown Rice

Bitterns show a strong preference for aerially sown crops, rather than direct-drill, sod or combine sown. We suspect the earlier inundation and lack of dry phases build up key prey and are then more attractive to bitterns. In the 2015-2016 season, with Riverina LLS funding, we're planning to test these ideas, looking in detail at sowing methods, water management and bittern prey.

Early Start & Cumbungi

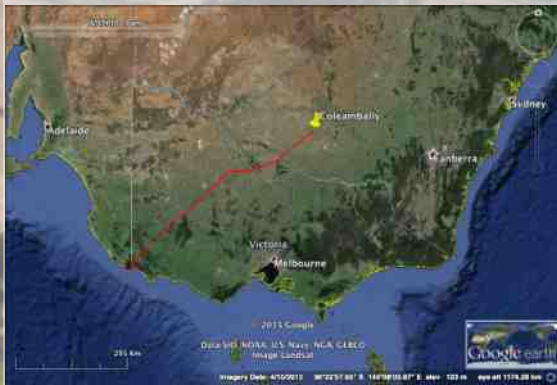
The rice season means bittern breeding tends to be delayed and early crops are the first occupied by bitterns. Sites with Cumbungi around the edge have almost twice the chance of supporting bitterns.

Adjacent Habitat

The management and creation of bittern habitat next to or part of a rice field is one of the best things that growers can do to benefit these birds and other wildlife. From natural wetlands to drainage channels and farm dams, there are numerous opportunities. We're keen to trial dedicated, independently managed habitat bays as part of rice fields, maintaining them between rice seasons.

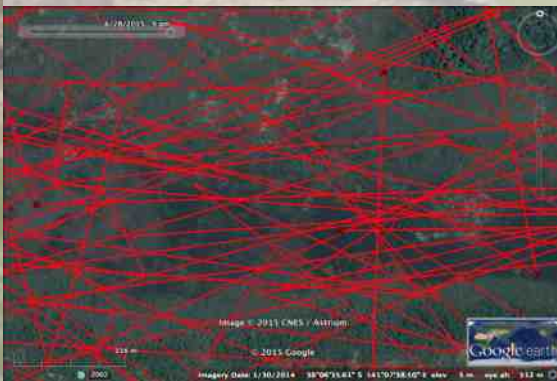


Above: This storage dam has shallows and waterplant patches: excellent habitat.



Above: The 557 km dispersal of Robbie to restored coastal wetlands in SA & Vic.

Below: Some of Robbie's movements at Long Swamp, May-July, 2015.



Introducing Robbie ...

On April 21st, 2015, the first ever Australasian Bittern to be satellite tracked was away. Robbie, a 3-4 month old rice-bred male from Coleambally, was named by the district's irrigation cooperative after Mark Robb, for his bitterns in rice work.

Initially he stayed local, moving up to a kilometre, but then on the afternoon of April 30th he began heading south-west, first appearing near Deniliquin. We thought he was chasing unharvested rice but he just kept going, eventually arriving at the recently restored Pick Swamp, with the unfamiliar sounds of nearby waves on the South Australian coast.

He then headed along the coast back into Victoria, settling at Long Swamp, which is also undergoing restoration. He's been there for over two months and has even been sighted. Will he stay and breed, or return for the next rice season? His journey is connecting seemingly disparate wetlands and people.



Where do bitterns go after harvest?

The network of wetlands that bitterns rely on from about May to November, when there is no rice, is slowly being revealed. Thanks to a successful crowdfunding effort, with the generous support of more than 300 people and 20 community groups, we'll eventually be able to satellite track ten bitterns between rice seasons, following them wherever they go.

A Diverse Network

Targeted surveys of suspected non-breeding wetlands in the Riverina, together with observations from rice farmers and the tracking results to date, highlight the value of a wide range of wetlands, including large Riverina swamps, creeklines, channels, dams, irrigated wheat crops and large coastal wetlands in Victoria and South Australia.



This four-hectare dam near Leeton supported at least eight bitterns during the 2014 non-breeding season.



The Australian Painted Snipe

Like our bittern, this bird is considered nationally and globally endangered. Remarkably, we've learnt they can also use rice fields in their hundreds, favouring the edges where there is mud and low cover. Photo by Peter Merritt.

An Australasian Bittern seizes a Southern Bell (Growling Grass) Frog, itself a threatened species.

Photo by Peter Menkhorst.

The rice crops and irrigation infrastructure in Coleambally and the western Murray Valley are important for these frogs. They are the only large frogs commonly found in rice and are probably important prey for bitterns when available.



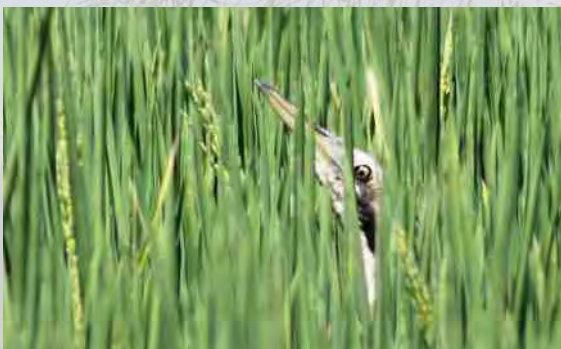
Beyond Bitterns

Since our project began in 2012 we have learnt much about the many other waterbirds and wildlife using rice, and we're keen on seeing them prosper alongside bitterns. We have recorded 53 waterbird and seven frog species in rice, with at least 18 breeding. We've found 11 species listed as threatened in NSW, like the Brolga and Eastern Grass Owl.

The populations of several waterbirds, such as Baillon's Crake, Whiskered Tern and Glossy Ibis, are significant, probably numbering into the tens of thousands in some years. Migratory shorebirds that breed in Russia can be found. Populations of some frogs, like the Spotted Marsh Frog, may exceed a billion in some years.

**For the latest news on the
Bitterns in Rice Project
including tracking updates:**

www.bitternsinrice.com.au



The BIRP working group comprises Neil Bull, Matt Herring, Andrew Silcocks, Mark Robb, Anna Wilson, Keith Hutton, Max O'Sullivan, Inka Veltheim, Daryl Gibbs, Wayne Robinson, Kimberley Beattie, Elisa Tack, Rick Webster & David Parker.



Ricegrowers'
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of Australia INC



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We gratefully acknowledge rice farmers, and previous funding and support from Coleambally Irrigation, Rural Industries Research & Development Corporation, Norman Wettenhall Foundation, Murray LLS, NSW OEH, Murrumbidgee Field Naturalists, Murrumbidgee Landcare, Murray Irrigation and Murrumbidgee Irrigation. This booklet: written and compiled by Matt Herring, July, 2015.



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