

ROBBIE'S GONE A ROAMING

Rice crops in the New South Wales Riverina support the largest known breeding population of the endangered Australasian Bittern. But where do they go after the rice is harvested? **Matt Herring**, **Inka Veltheim** and **Andrew Silcocks** shed some light on this mystery, thanks to crowd-funded satellite transmitters and a trailblazing bird.

A legend is born

We were feeling the pressure. The rice season was fast drawing to a close and we still hadn't caught a single bird. The significance of the population of bitterns breeding in rice crops was now clear, yet we could only speculate on what they did for six months every year between rice seasons. Hundreds of people and dozens of organisations had contributed to crowd funding satellite trackers and were eagerly waiting to see where these bitterns would go.

The previous week we'd seen at least 18 bitterns in this Coleambally rice crop. It was a rare event, as they concentrated at the last remaining unharvested crops that still retained some puddles with tadpoles and other prey. But most of the bitterns had already moved on. We were also about to leave when we spotted an Australasian Bittern flying a short distance away out over a channel bank.

We sprang into action. The first net sailed past the bird's head. If there had been a bittern about 1.5 metres directly behind we'd have caught it. Unlike our previous failed attempts though, this bittern didn't fly off afterwards. But we were out of loaded nets, and a golden opportunity had gone begging. We took off and hastily reloaded the net gun.

Returning with freshly loaded nets in hand, the bittern was still there. This time we didn't miss and within seconds one of Australia's most elusive and threatened birds was in our arms. The careful process of attaching the harness and backpack with satellite transmitter began. It was a male, only about three or four months old, still with pin feathers on his head and the characteristic speckled buff-orange flight feathers of young bitterns. Presumably, he was born in a rice bay not too far away. When we took the hood off just prior to his release, he was feisty and raring to go. Little did we know that a legend had been born.

Connecting the wetlands

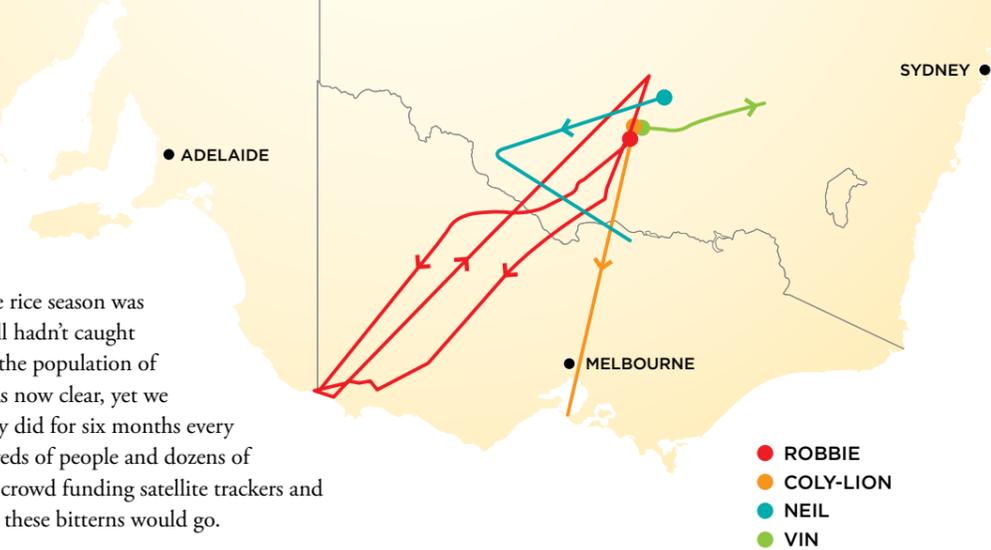
The Coleambally Irrigation Cooperative was one of a number of generous donor organisations that had bought naming rights for the bitterns through the Bitterns in Rice crowdfunding process. They named him after one of their own, Mark Robb, affectionately known as Robbie. He was a Bitterns in Rice Project stalwart so it was a fitting tribute.

Robbie was the very first Australasian Bittern to be tracked by satellites. Crucially, he would offer us a precious first glimpse into the seasonal movement patterns of this globally endangered species, whose total population is estimated at just 1,000-2,500 mature individuals. Acquiring new ecological knowledge about bitterns is no easy task. They're thin on the ground and despite their size, they are among the sneakiest of Australia's birds, usually concealing themselves in wetland vegetation. Satellite transmitters were an expensive but attractive option to begin informing conservation efforts beyond the rice fields, such as where best to target environmental water and manage habitat. If Robbie's movements uncovered previously unknown bittern sites or emphasised the importance of known sites, it would prove that tracking technology can be money well spent.

Quickly, however, the jokes emerged. Like his namesake, Robbie the bittern didn't go anywhere—he just hung around the local district.

Then on 30 April 2015, nine days after we met him, the excitement began. Robbie first appeared near Deniliquin, about 90 kilometres away, and we thought he was chasing unharvested rice. But he kept moving. We were able to follow him almost live as we received fixes while he was flying. Social media was abuzz, receiving updates every hour. As he approached the Victorian border it became clear we were witnessing his first dispersal from the rice growing region. The last fix we received before his transmitter went into its 48-hour off-cycle put him near Wycheproof in the Victorian Mallee.

Migrants and dispersing nomads endure great risk when they're moving, especially young, inexperienced individuals. A growing number of Robbie's followers became concerned about



Opposite: An Australasian Bittern bursts from a rice crop in the NSW Riverina. Photo by Andrew Silcocks

Above: This map traces the travels of the satellite-tagged Australasian Bitterns.

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Above: Recently restored by the Nature Glenelg Trust, the picturesque Long Swamp, in Victoria's far-west, was Robbie's home for four months last winter.

Opposite, from top: Vin the Bittern has his transmitter attached.

Andrew Silcocks and Inka Veltheim loom over the cage trap used to capture bitterns, which is fitted with a mirror and a sound system playing the bird's booming call.

A Bittern chick captured in a Coleambally rice field.

All photos by Matt Herring

his welfare. We all wondered where he'd appear. It was nothing short of thrilling when his transmitter came back online for its 8-hour on-cycle. There he was, 557 kilometres from his Coleambally rice crop, having arrived safely at the recently restored Pick Swamp on the South Australian coast near Mount Gambier. How did he know to go there? Did he 'wing-it' and get lucky or was he led by an experienced elder? Perhaps it was innate. Whatever the reason, it likely reflected thousands of years of inland-coastal movement patterns and it formally connected the two most important regions for bitterns in south-eastern Australia.

Robbie's journey of connecting seemingly disparate wetlands had begun, and the first insights into where these rice-breeding bitterns might go had been revealed. New jokes emerged. People said that rice growers and South Australians don't normally see eye to eye but Robbie wasn't privy to water politics and didn't recognise state borders.

Just when we thought Robbie might settle at Pick Swamp for the coming winter, he moved. Heading east along the coast back into Victoria, Robbie stopped for a day or two around the mouth of the Glenelg River at Nelson, and eventually arrived at Long Swamp. He'd chosen another recently restored wetland; this one about 21 kilometres from Pick Swamp. The folks at Nature Glenelg Trust (NGT) were delighted. They were actively working on the swamp at the time and understandably took it as an endorsement of their restoration efforts. Just before winter, Robbie was seen for the first time. Lachie Farrington, an ecologist at NGT, said the little hump on his back was clear and

pointed out how weird it was seeing a rare bird in the middle of nowhere and already being on a first name basis. Robbie liked what he found at Long Swamp and stayed for four months.

At times we feared the worst. One day, a series of low-medium accuracy fixes put him about 1.5 kilometres out to sea for three hours in bad weather. These unfiltered coordinates suggested he was flying into 40-50 km/h winds, moving backwards at about 1 km/h. It's normal for many birds to die in their first year and we thought things looked grim. But not our Robbie. He was fine. He'd survived his near-600 kilometre dispersal and what appeared to be a traumatic ordeal at sea.

Robbie made it but many did not

Not all bitterns made it to their non-breeding wetlands though. While we were searching for other bitterns to catch, we found a pile of juvenile bittern feathers crowned with a fox scat, a none-too-subtle indication of the likely cause of death. We've also confirmed, from nest monitoring, that many chicks do not survive. Increasing breeding success in rice fields—ramping up the bittern yield—is a key focus for the Bitterns in Rice Project. We know they can breed successfully, producing fully-fledged young prior to harvest, but there are several key factors likely to affect how many make it.

Naturally, the ever-present foxes and cats around rice crops have a particularly strong impact. But bittern prey is also worth considering. We've found an important relationship between the rice growers'

sowing method, water management and the abundance of critters that bitterns like to eat. Bitterns show a strong preference for the more traditional rice crops—those that are aerially sown and inundated early in the season, around October. Our prey sampling study during the 2015-2016 season verified that these crops tend to support much more prey (tadpoles, small fish) leading into the peak breeding period for bitterns. Driven by water savings, many rice growers are shifting away from these methods to direct-drill and sod-sown crops. These 'delayed permanent water' crops are not inundated until around December. Mid-season drainage and shorter season varieties are also emerging trends. The rice season is being compressed, which is likely to affect breeding success.

Return to the Riverina

But back to Robbie—our Very Important Bittern. The love for this V.I.B. blossomed, with a following that had grown to thousands of fans across Australia, and places as far away as Nepal and England. Spring arrived and speculation mounted about whether he'd return to the Riverina or make it a permanent sea change. Perhaps he'd woo a local female (or two, or three), embrace the coastal life and even breed in his first year.

By mid-September, the burning question burned no longer. Robbie flew 615 kilometres from Long Swamp all the way back to the Riverina, landing at Lake Wyangan, a large Cumbungi-lined reservoir near Griffith. Within two days he was in the Coleambally region, 70 kilometres to the south, not far from where we'd first met him five months earlier. His loop was complete. But he didn't stay long. He flew another 85 kilometres south to near Finley, though not before being photographed in an irrigated wheat crop at Coleambally by his namesake, Mark Robb.

Robbie had jumped the gun on the rice season and never settled. He used farm dams, channels and wheat crops around Finley and Tocumwal but never found anything he really liked. In early October he flew back into south-western Victoria and spent a couple of weeks at Lake Condah and Condah Swamp. Robbie then shifted to the Crawford River around Lyons and Hotspur for a month, before returning to Pick Swamp in South Australia at the end of spring. On the way, he stopped at a dam embedded in a pine plantation. His journey was full of insights like this. And then just as he had done seven months earlier, Robbie retraced his own journey back into Victoria, once again stopping around the Glenelg River mouth at Nelson on his way back to Long Swamp.

The signal is lost

We welcomed 2016 by managing to catch two new bitterns. January is peak bittern breeding activity in Riverina rice crops. The soothing sound of booming males fill the air, and eggs begin hatching. We were able to test a new capture method. It was a design used for American Bitterns and consisted of a large cage trap with a mirror inside and small sound system playing the bittern's boom.



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The method had been adapted by some very helpful folks from New Zealand who had successfully caught booming male Australasian Bitterns to attach radio transmitters and monitor local movements. After a week we were just about to throw the towel in, having failed to lure any territorial adult males inside our cages, but we decided to try something new: we moved the traps up on to the banks between rice bays.

Boom. In two days, we had two new bitterns. Vin was named by the Murray-Darling Wetlands Working Group as a tribute to a long-standing member, Vin Byrnes, who had recently passed away, while Coly-Lion came courtesy of the Coleambally Lions Club. As suspected, they both stayed tight within their respective booming territories over the next three months.

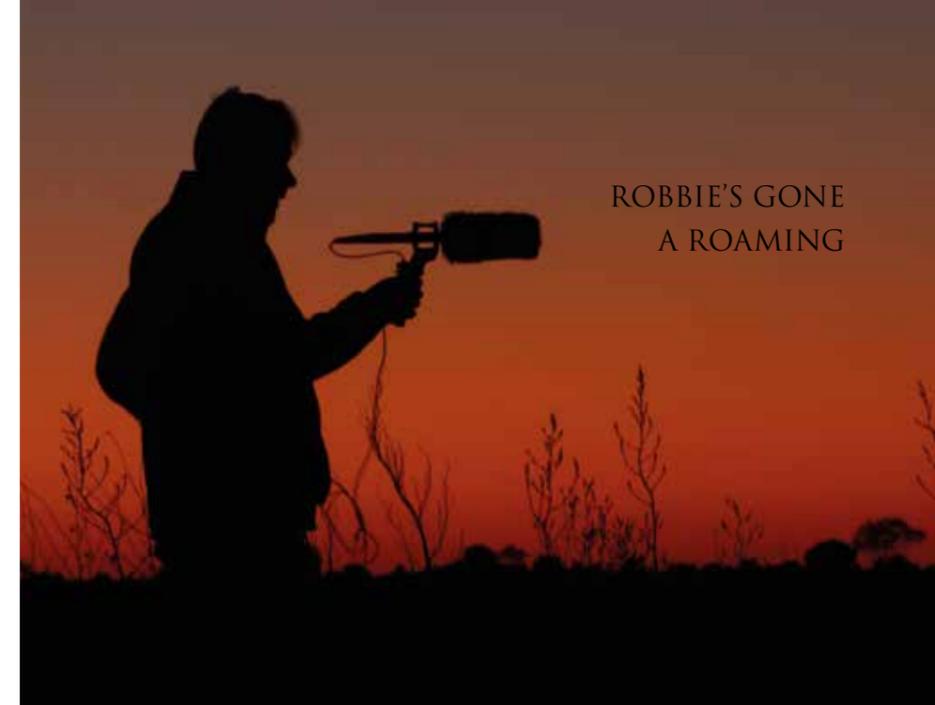
Meanwhile, Robbie had flown back to Pick Swamp, where he was again photographed by keen birders, before returning once again to his new home: Long Swamp. Like clockwork, he stopped at Nelson on the way. It was his ninth state border crossing. The case for *Bitterns Without Borders* was stronger than ever.

As Robbie added new wetlands to his network we were able to inform the locals, usually farmers, about their V.I.B guest. We assured them he was low maintenance, preferring to keep to himself and sort out his own meals. But his travels, or at least the tracking, were always going to end. In April 2016 we lost contact; the last fixes placing him at Long Swamp. We knew he'd developed quite a following during his 323-day journey but we did not anticipate the ensuing despair and outpouring of sadness. The media interest was intense, culminating in a live television interview for BBC World News. He was officially the most famous bittern ever.

What had happened? Did the transmitter just fail or fall off? Was he still he alive? We reassured people that his legacy was enduring and his journey provided unprecedented insights into the movements of these endangered birds.

Robbie passes the baton

Fortunately, just as word had spread about Robbie going off the radar, and as another rice season was drawing to a close,



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we added two new bitterns to the crew. Enter Neil and COG, young males from Murrumbidgee near Leeton. Neil was named by the Ricegrowers' Association of Australia after Neil Bull, a driving force behind the Bitterns in Rice Project since day one, while COG represented the Canberra Ornithologists Group.

Neil's dispersal in May 2016 was impressive. He took a 450 kilometre u-turn of sorts via the Wakool River floodplain near Swan Hill all the way to Moodie Swamp, a superb Canegrass wetland north of Benalla. COG, on the other hand, stayed put, using channels around Murrumbidgee's harvested rice fields. Vin headed 191 kilometres towards Sydney before we lost contact. Coly-Lion's transmitter failed just prior to harvest but then a bittern with a little lump on its back was spotted by eagle-eyed observers, Cameron Brown and Jessica Durrant, at Tootgarook Swamp on the Mornington Peninsula, south of Melbourne.

Could this be Robbie? It turned out the answer was no, though it was a great find nonetheless. It was Coly-Lion, identified by his light blue leg band, 395 kilometres from his booming territory in a Coleambally rice crop. It meant that four of our first five bitterns had all made big movements after harvest, leaving the Riverina rice-growing region. Three of them had headed south into Victoria.

Our growing knowledge of the network of wetlands that these bitterns depend on all started with Robbie. He began stitching

together parts of the landscape for us, emphasising the value of both restored swamps and agricultural wetlands, and reminding us how connected we all are. He's become an icon for the species and there's every chance he'll be sighted again. The legend lives on.

The Bitterns in Rice Project began in 2012 and is a collaboration between BirdLife Australia and the Ricegrowers Association of Australia. It is supported by Riverina Local Land Services through funding from the Australian Government's National Landcare Programme. You can follow the movements of the bitterns and see updates on the entire project at www.bitternsinrice.com.au

Special thanks to all who contributed to the crowd-funding. The Cumberland Bird Observers Club, North Central Catchment Management Authority, Murrumbidgee Field Naturalists Club, Murrumbidgee Shire Community Demonstration Farm, Murray Irrigation Limited and Birding NSW, together with the five organisations mentioned in the article, all made significant contributions.

Andrew Silcocks braves the mozzies to record booming male Australasian Bitterns at sunset. Photo by Inka Veltheim