

# Jim Bravery's cranes: Brolgas and Sarus Cranes on the Atherton Tablelands, 1920-1975

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## Abstract

Jim Bravery (1896-1975) moved to the Atherton Tablelands in Queensland as a soldier-settler farmer in 1920. Already a birdwatcher, for the next 55 years he keenly observed and noted bird species, numbers and behaviour. In 1967 he recorded the first Sarus Cranes (*Antigone a. gillae*) on the Tablelands and in 1970 included Sarus Cranes and Brolgas (*A. rubicunda*) in his signature paper 'Birds of the Atherton Shire, Queensland' for the journal *Emu*. His unpublished writings, with other documents and historical observations, establish that Brolgas had colonised the recently-cleared farmlands of the Atherton Tablelands by at least 1920; that Brolga numbers were in the hundreds in the 1940s; and 1000 or more in the mid-1960s. They also suggest that in the early 1970s some 1500 cranes wintered on the central Atherton Tablelands at that time, mostly Brolgas, whereas today Sarus Cranes dominate the same area. Bravery's observations underline the historical importance to Brolgas of woodland swamps south of Atherton, now largely drained and cleared, which may in part explain this major change in species distribution. In 1960 Bravery noted poisoning of Brolgas – the first historical evidence of persecution on the Tablelands – due to crop damage, which as a farmer he considered negligible. He maintained a keen interest in both crane species and believed that Sarus Cranes had been present but unnoticed on the Tablelands before 1967. In his last diary entry in June 1975, only weeks before his death aged 79, Bravery was deeply interested in reports of Brolga-Sarus hybrids and looked forward to news of further research.

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## Introduction

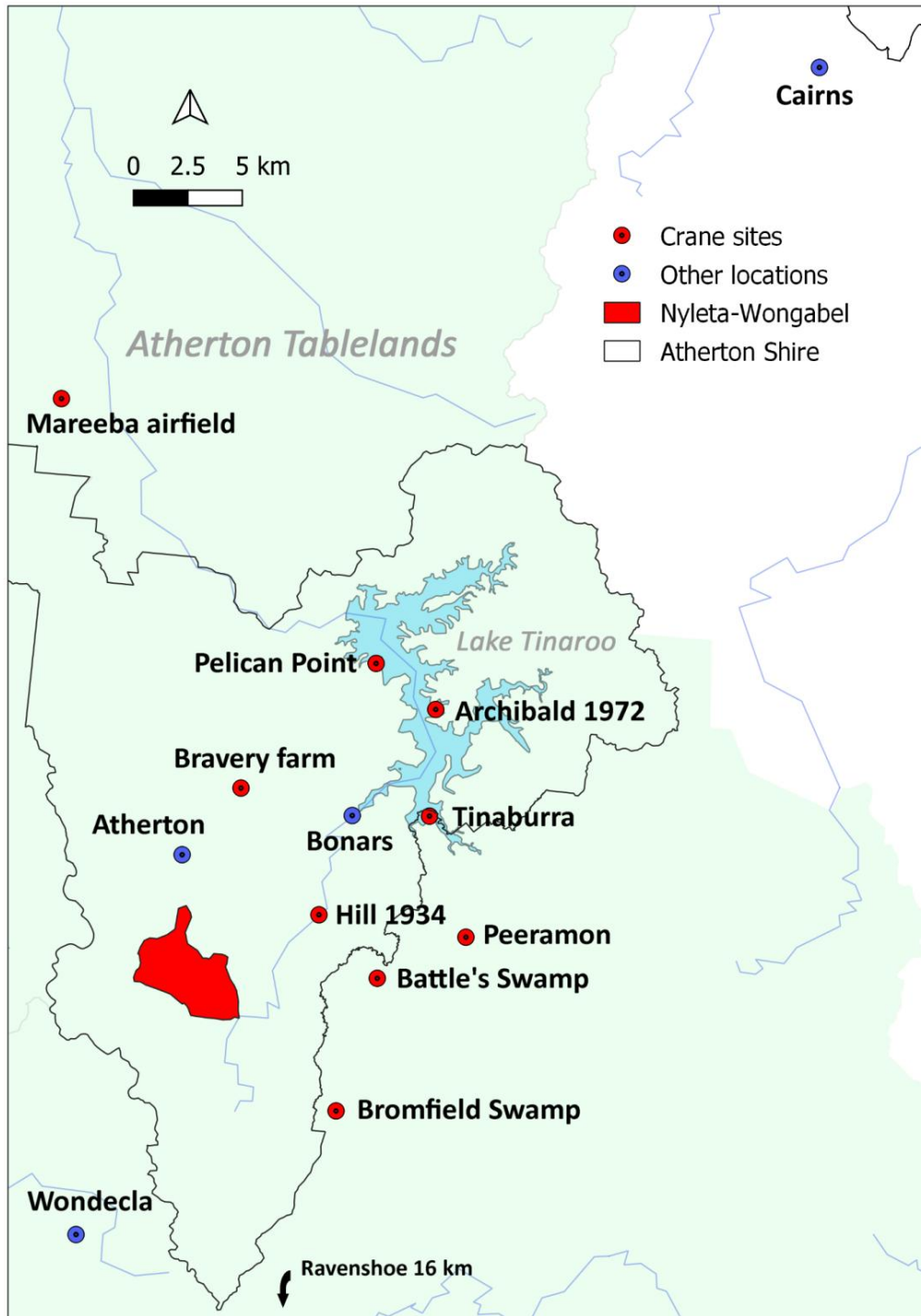
James Andrew Leslie ('Jim') Bravery (1896-1975: Fig. 1) worked as a coal miner at Tannymorel, near Warwick, south-east Queensland, before serving in France with the First AIF from 1917 to 1919 (National Archives Australia 2019). In August 1920 he was granted a Soldier Settlement lease (Portion 558, Parish of Barron: Anon. 1920) in Bean Tree Road, Tolga (17°14'S 145°29'E, 759 m asl), on the Atherton Tablelands, far north Queensland. He lived in Tolga for the rest of his life, marrying Mary Cecilia Healy (1891-1978) in 1923, and their son James Leslie was born in 1924 (Queensland Government 2020). Despite the challenges facing



**Figure 1. Jim Bravery (age 78) at Kaban, 8 August 1974, leading a field trip with delegates from the 16th International Ornithological Congress. Photographer unknown. Used with family permission.**

soldier-settler farmers on the Tablelands (Gilmore 2005) the Braverys expanded to dairy farming and cropping on two larger leased properties on Mazlin Creek, 1 km to the east of the original block (Bravery 1970; Scambler 2009; Fig. 2).

Eucalypt forest and rainforest along Mazlin Creek and around Atherton, were cleared from about 1890 (Anon 1891a), initially for timber cutting and thereafter producing maize, potatoes, lucerne and grazing for beef and dairy cattle (Anon 1891b;



**Figure 2. Atherton Tablelands 1920-1975.** Bravery's 1970 paper covered the former Atherton Shire (623 km<sup>2</sup>) and identified the Nyleta-Wongabel complex (c. 13 km<sup>2</sup>), which included Hasties Swamp, and others known locally as Marks', Maroney's, Newell's, Pavey's, and/or Willetts Swamps. (Location details of sites not clearly identified in the literature can be found in Appendix 1.)

Gilmore 2005). Clearing continued on the Tablelands from 1920 to 1975 (Frawley 1983; Diaries), which included vegetation around many natural wetlands, and some were drained (Anon 1891a; Dalziel 1948; Bravery 1970; Lynch *et al.* 2020). The Lake Tinaroo (3500 ha) irrigation impoundment was created in 1958 by damming the Barron River (Price 2009).

Bravery was already a birdwatcher before WW1 (Bravery 1968), but unlike his Tablelands contemporary W. Coleman who collected birds' eggs and skins (Howe 1932) Bravery was never interested in the 'philatelic' (Robin 2001) aspect of birdwatching (A. Leinster, M. Muoio personal communications). Rather, he integrated bird observation with every aspect of his daily life (Scambler 2009), with an interest in correct identification, bird behaviour, and conservation (e.g. Bravery 1967, 1968). His note describing the first observations of Australian Sarus Cranes (*Antigone a. gillae*) on the Tablelands in 1967 (Bravery 1969) was followed by the well-known 'Birds of the Atherton Shire, Queensland' in the journal *Emu* ('the 1970 paper'). In this paper, I draw on his unpublished diaries and writings and other records between 1920 and 1975 to review the history of Brolgas (*A. rubicunda*) and Sarus Cranes on the Atherton Tablelands. I also highlight Bravery's involvement with cranes and contributions to knowledge about them, particularly wetland habitats which were apparently historically important for Brolgas on the Tablelands. Further work is in preparation reviewing Bravery's life and his role in north Queensland birdwatching and ornithology.

## Methods

Bravery's notes and diaries were searched for references to Brolgas and Sarus Cranes and for details of key crane habitats. Recollections of family members and Tablelands residents were sought through personal contacts and a letter in '*The Tablelander*' newspaper (c. 2000). Historical records of Brolgas or 'Native Companions' and Sarus Cranes on the Atherton Tablelands up to 1975 were gathered from newspapers, journals, books and personal communications. The circumstances of historical observations were identified to help assess their relevance to the history of cranes on the Tablelands. Locations of historical sites (unless clearly identifiable) were

confirmed from maps, documents and local residents. Habitat maps and descriptions for the Nyleta-Wongabel area, pre-clearing and for 2017, were obtained from the Queensland Government (2019). The areas of swamp habitats now cleared and/or drained, compared with pre-clearing extents at Nyleta-Wongabel, were estimated in QGIS 3.4. An aerial photo mosaic of the area in 1978 was obtained from DERM (2012) and the boundary for the former Atherton Shire was provided by DNRME Open Data (2007). Statements based on Bravery's unpublished notes are cited as 'Diaries'. Quotations are verbatim, except where ellipses indicate omitted text, and square brackets indicate my additions.

## Results

### *Crane observations*

Bravery's notes (Table 1), and records from others (Table 2) establish that Brolgas were present in their hundreds on the Tablelands in the 1940s and numbered 1000 or more in the mid-1960s. In 1960 Bravery hand-wrote, in a large paginated exercise book, draft texts for the species to be covered in his planned paper 'Birds of the Atherton Shire'. The Brolga entry establishes a number of previously unpublished findings: Brolgas had been present for the whole of Bravery's time living on the Tablelands (40 years); in 1960 Brolgas were 'still plentiful', implying no decrease since 1920; persecution (poisoning) occurred around 1960; and Brolgas often returned to roosts after dark.

#### 51) *Megalornis rubicundus* Brolga

Still plentiful in suitable habitats birds usually sleeping in large swamp areas south of Atherton. Often large numbers two or three hundred can be seen resting on Pavey's Swamp a few miles south of Atherton. Although reports of damage to young cereal crops are exaggerated a few plants may be damaged. Personal observations of damage to farm crops over forty years of farming leaves me the knowledge that damage done is negligible. Cases of poisoning of this fine species have been reported recently. Breeds in inland swamps usually selecting small marshy areas. Often birds return to roosting grounds well after darkness has set in. [Addition, different pen]: Breeds inland and usually returning in April. [Later addition, in a 3rd pen]: 254 seen at Pavey's Swamp in late August and Sept. 1962.

**Table 1. Crane records by J. Bravery, Atherton Tablelands, far north Queensland, 1920-1975.**

Unless otherwise stated, records are from unpublished notebooks.

Date	Location	Cranes
1920-	Atherton Tablelands	Brolgas present
May-Dec, 1950-69	Willettts & Hasties Swamps	Each with 200-300 Brolgas, plus fewer at Tinaroo (Bravery 1970: note, only includes Atherton Shire sites)
1962-1974	Mostly Nyleta-Wongabel	75 dated records of Brolgas
24 Jul 1966	Willettts Swamp	1000 Brolgas: max. number recorded by Bravery
Jul 1967	Willettts Swamp	83 Brolgas and 23 Sarus Cranes: first Tablelands records of Sarus Crane (Bravery 1969)
Jul 1967- 1974	Mostly Nyleta-Wongabel	82 dated records of Sarus Cranes and 4 dated records of unidentified cranes
3 Sep 1967	Fosters (Pelican Point) Lake Tinaroo	2 Sarus Cranes: first Sarus record for Lake Tinaroo
1968	Atherton Tablelands	flocks of 500-1000 Brolgas (regular in dry season)
1940-68	Atherton Shire	Brolga included in list of Bravery observations 1940-1968
28 Dec 1968	Fosters (Pelican Point) Lake Tinaroo	3 Brolgas, 4 Sarus Cranes: max. number cranes Bravery recorded on Lake Tinaroo
Apr 1969	Bravery farm, Tolga	50 Brolgas in peanut field feeding on caterpillars
1970	Atherton Tablelands	est. 60 Sarus Crane pairs with flying young (Bravery in Gill 1971)
26 Sep 1970	swamp near Peeramon	'many' Sarus cranes, some immature (late afternoon)
Jun 1974	Willettts Swamp	40 Sarus Cranes: max. number recorded by Bravery

### Habitats

Although Bravery recorded pairs of Brolgas on small farm dams in the Wongabel area (Diaries), most cranes occupied more extensive wetlands, which Bravery described (including plant species) in the Diaries. Wetlands formerly comprised some 42% of the 1300 ha Nyleta-Wongabel area: 19.22% freshwater swamp; 13.87% Melaleuca swamps; and 8.82% Eucalypt swamps (Table 3, Fig. 3a), the last two forming the 'Swamp Woodland' of Bravery's (1970) habitat descriptions. Some drainage occurred in southern Nyleta-Wongabel before 1948 (Dalziel 1948) and in 1969 drainage began in the north (Bravery 1970), but the June 1978 imagery (DERM 2012) shows major northern swamps still holding water. Comparisons of the 2017 status of Regional Ecosystems at Nyleta-Wongabel with pre-clearing extent (Queensland

Government 2019: Fig. 3a), and with 1978 vegetation cover (DERM 2012), show that most swamp habitat was cleared after 1978 (Table 3, Fig. 3b).

### Discussion

#### *Crane numbers and distribution*

Although Bravery's note (above) shows that he believed there had been no decrease in wintering Brolgas from 1920 to 1960, his and other records are too fragmentary to infer an increase, for example after WW2. Estimates of total historical crane numbers on the Tablelands are speculative, as there were no simultaneous multi-site counts until 1997 (Scambler *et al.* in press). Nevertheless Bravery's records of up to 1000 Brolgas regularly at Nyleta-Wongabel in the 1960s; combined with Gill's (1971) count of 350 Sarus Cranes flying to roost there in 1970; and reports of at least 200

**Table 2. Crane records by other observers, Atherton Tablelands, far north Queensland, 1934-1975.**

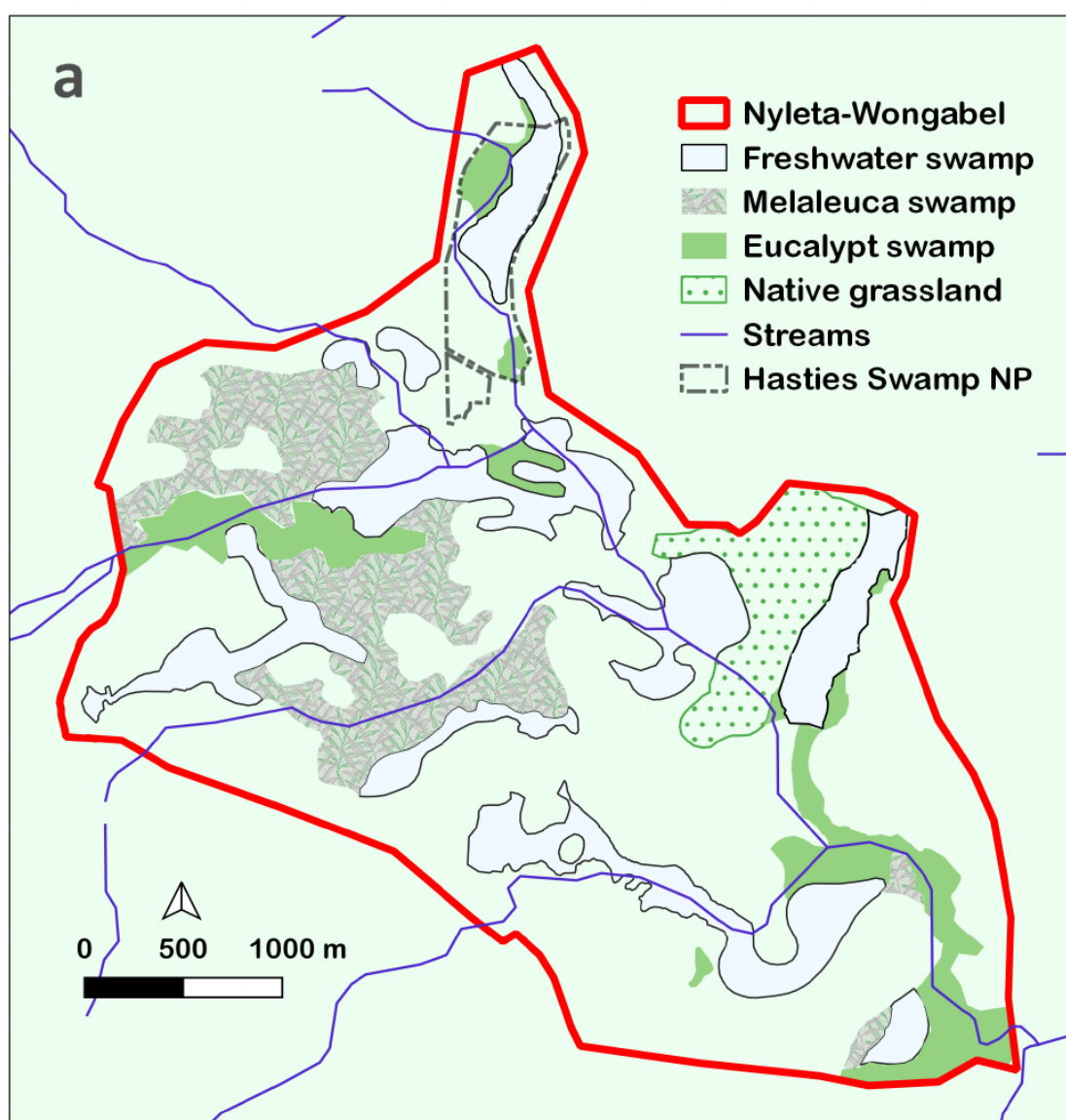
Date	Location	Cranes	Circumstances of observations
1934	farmland on Barron River	native companions 'destroyed ten acres of corn'	R. Hill (farmer, early Atherton settler and Shire Councillor: Anon 1935a)
1940s	near Atherton	100s of Brolgas on farmland	M. Marnane (resident) pers. comm. (Scambler 1997)
1943-45	'marshy land near Atherton'	up to five Brolgas	WW2 soldiers watching birds in between significant military duties (Bourke & Austin 1947)
1943-44	Mareeba airfield	est. 200 Brolgas; interfered with military air traffic	M. Marnane (resident) pers. comm. (Scambler 1997)
Sep 1948	Atherton Tablelands	'numbers...of Brolgas or Native Companions in the corn paddocks'	North Queensland Naturalists' Club report to <i>Cairns Post</i> (1948)
1952	'inaccessible' Wongabel swamps	large flocks of Brolgas exit in the morning to feed in fields, return in evening	visitor, birdwatcher (MacGregor 1952)
Sep 1953	Yungaburra	a flock of 50 Brolgas in paddocks	RAOU 1953 Campout group (Binns 1954)
Sep-Oct 1964	Atherton Tablelands	flocks of up to 200 Brolgas observed often. In paddocks between Yungaburra and Atherton, up to 100 birds following plough	Bird Observers Club group (Wheeler 1967)
Sep-Oct 1964	Bromfield Swamp	180 Brolgas landed	F. Smith, BOC group (Wheeler 1967)
Sep 1968	Tinaburra, Lake Tinaroo	50 Sarus Cranes	visitor, birdwatcher (Crowhurst 1968)
Dec 1968	Bromfield Swamp	21 Brolgas	visitor, crane naturalist (Walkinshaw 1973)
Sep 1969	Atherton Tablelands	38 Brolgas, 107 Sarus Cranes	crane scientist (Blackman 1971)
1970	Atherton Tablelands	est. 100 Sarus Cranes	visitor, birdwatcher, Gill (1971)
Aug 1971	Willetts Swamp	350 Sarus Cranes, c. 100 Brolgas	visitors, birdwatchers (Gill 1971; Smith 1971)
Nov 1972	Lake Tinaroo	300 Sarus Cranes, roosting; 15 Brolgas elsewhere	crane scientist (Archibald & Swengel 1987)
1972-	Bromfield & Battle's Swamps	Brolgas and Sarus Cranes roosting in dry season	T. Heidenreich (resident) pers. comm.
To 1974	Bromfield Swamp	Never >10 Sarus Cranes	H. Gill pers. comm. ('visited Tablelands sites mid-morning')
To 1974	Pelican Point, Tinaroo	Recorded Sarus Cranes	H. Gill pers. comm. (as above)

**Table 3. Swamp habitats of Nyleta-Wongabel (seasonally flooded).**

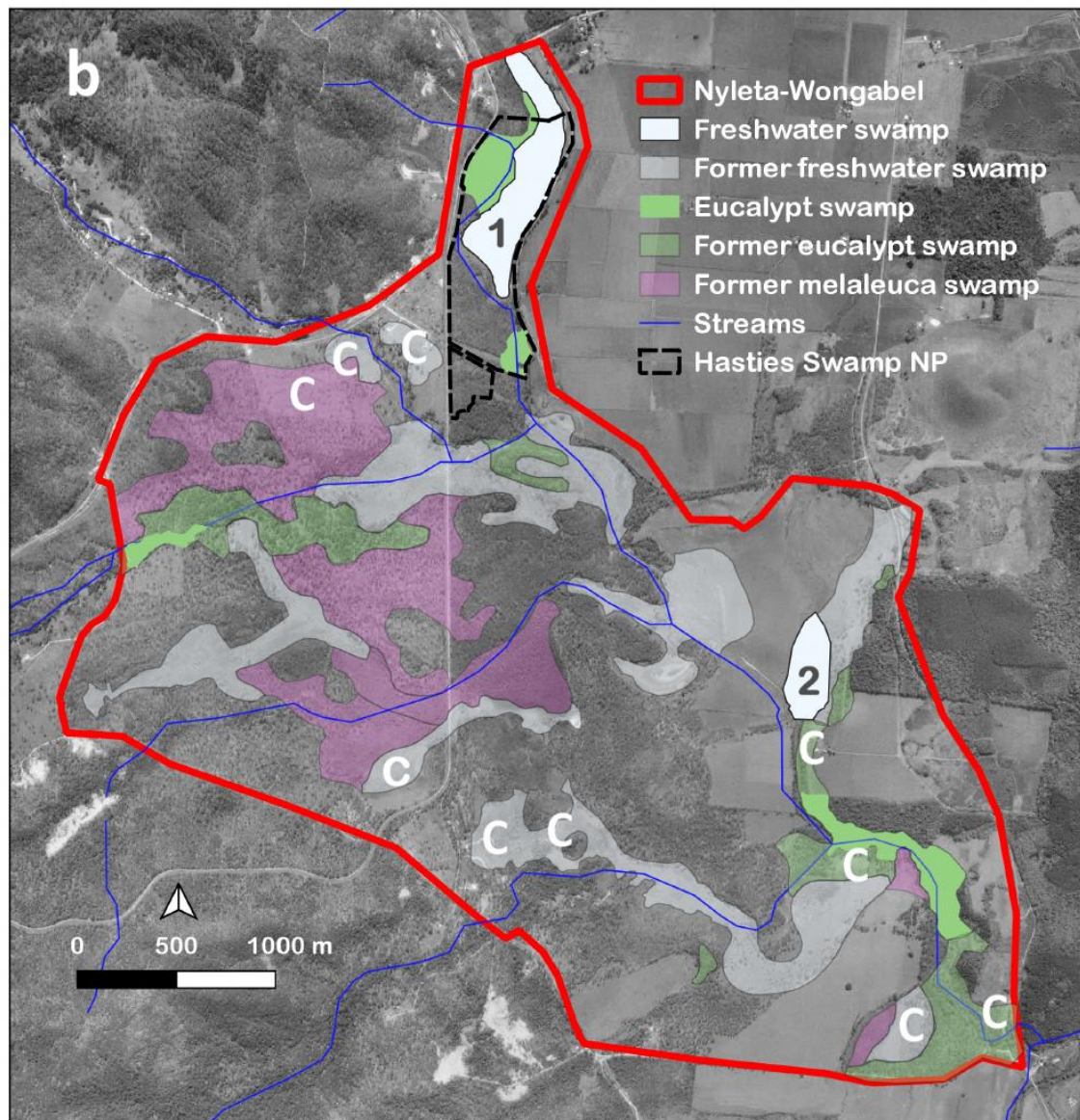
Details of Regional Ecosystems and their conservation status are in Appendix 2.

RE	Original (ha)	% of total habitat (1300 ha)	Type	Remnant (ha/%)
7.3.39c	248.36	19.22	Freshwater swamp	23.8/9.58 <sup>1</sup>
7.3.8a	28.3	2.19	Melaleuca floodplain	0
7.3.8b	115.71	8.95	Melaleuca swamp	0
7.3.34	35.25	2.73	Melaleuca swamp	0
7.3.39a	28.69	2.22	Eucalypt swamp	0
7.3.43a	85.28	6.60	Eucalypt with wetland	30.03/35.21 <sup>2</sup>
<b>Total</b>	<b>541.59</b>	<b>41.91</b>		

<sup>1</sup>83% in National Park. Not including Swamp '2' (Fig. 3b, see Discussion) <sup>2</sup>37% in National Park



**Figure 3a. Pre-clearing swamp habitats at Nyleta-Wongabel.** For details of Regional Ecosystems see Appendix 2. The unhatched eastern section of the Nyleta-Wongabel habitat complex, and areas further to the east and north, were ‘Mabi’ rainforest. Other unhatched habitats comprised several types of eucalypt forest and woodland.



**Figure 3b. Remnant and cleared swamp habitats at Nyleta-Wongabel, 2017.** Remnants and former swamp habitats in 2017 overlaid on June 1978 aerial photography (mosaic by DERM 2012). Locations ‘C’ are where imagery indicates clearing and drainage of swamp habitats before June 1978. For remnant swamp ‘2’, see Discussion.

cranes (mostly Brolgas) roosting at Bromfield and Battle’s Swamps during the same period (Wheeler 1967; T. Heidenreich personal communication), suggest the regular presence of some 1500 wintering cranes in the mid-1960s to 1970s, with an approximate species ratio in 1970 of 30% Sarus Cranes to 70% Brolgas. This estimate excludes Archibald’s November 1972 record of 300 Sarus Cranes roosting on Lake Tinaroo (Archibald & Swengel 1987), as it was late in the year and the birds may have shifted to Tinaroo from drying wetland sites.

Although this estimated number of wintering cranes in the early 1970s is similar to annual multi-site roost counts in the central Tablelands from 1997 to 2017 (average 1510: Scambler *et al.* in press), the species’ proportions are now very different: c. 90% Sarus Cranes and 10% Brolgas. Brolgas now mostly feed and roost further to the north-west near Mareeba, and to the south-west beyond Wondecla and Ravenshoe (Nevard *et al.* 2019; Scambler *et al.* in press). There is a slight indication that many Sarus Cranes may have left Wongabel for Bromfield Swamp by 1983, when local contacts advised Ray Swaby to visit Bromfield

to tape Sarus Crane calls, suggesting fewer were roosting at Wongabel than in 1970 (Swaby 1983; cf Gill 1971). Swaby (1983) counted 1050 cranes at Bromfield – 70% Brolgas and 30% Sarus Cranes – similar proportions to the estimated ratio for the early 1970s. Further exploration of the ‘tipping point’, when Sarus Cranes came to dominate wintering flocks in the central Tablelands, awaits the discovery of additional historical records from before 1997.

#### *Observer circumstances*

Visiting birdwatchers reported fewer Brolgas than Bravery, perhaps due to limited time. At Willetts Swamp cranes on the ground were often hidden amongst reeds and difficult to count (Diaries). Given the configuration of the swamp complex (Fig. 3a), and with swamp woodland surrounding the water, searching much of the potential habitat would take considerable effort. MacGregor (1952) described the area as ‘inaccessible’, and on one occasion Bravery took more than two hours to traverse only part of the Wongabel swamps (Diaries). When flying in to roost many cranes were too distant to count or identify even from a higher vantage point (Smith 1971). As well, prior to modern atlassing and similar schemes, visitors may have considered Brolgas too common to report, particularly after 1966 when the newly-discovered Sarus Crane (Gill 1969) became a species of considerable interest.

Bravery’s records should be interpreted in the context of his birdwatching hours, which beyond the home property were mainly in daytime, between morning and afternoon milking at the dairy, and subject to other farm work (Bravery 1961; Diaries; M. Muoio personal communication). His visits to the Wongabel wetlands were presumably in the middle of the day. This is supported by the few diary notes which include the time of visits, and his preference for visiting woodlands at Wongabel before the wetlands, as he considered ‘bush birds’ were too quiet in the heat of the day (Diaries). This schedule also explains his minor crane records from Lake Tinaroo, compared with Archibald’s early morning observation of 300 Sarus Cranes leaving a roost to feed in cropland (Archibald & Swengel 1987). Bravery’s visits to Tinaroo were later, and mostly to two properties (‘Bonars Crossing’ and ‘Fosters Farm’ or Pelican

Point) where just a few cranes foraged in pasture (Diaries).

Observer circumstances also explain the discrepancy between the number of Brolgas recorded during WW2 by M. Marnane compared with Bourke & Austin (1947). Marnane’s family farmed maize near Atherton and until mid-1944 also at Springmount, near Mareeba (Anon 1944), so he had opportunity to observe and hear reports of Brolgas at both locations. Bourke’s and Austin’s birdwatching was greatly constrained by military duties, but either could have observed a few Brolgas on ‘marshy land near Atherton’ while travelling through the Nyleta-Wongabel area to their respective bases at Ravenshoe and Wondecla (Bourke & Austin 1947).

#### *Differences in species’ habitat use*

The Nyleta-Wongabel swamps and surrounding ‘Swamp Woodland’ habitat were significant for Tablelands wintering cranes, particularly Brolgas, until at least 1975. Bravery’s notes of 500 to 1000 Brolgas at Nyleta-Wongabel in the middle of the day; together with MacGregor’s (1952) observation of large flocks leaving these swamps in early morning and returning late afternoon; and Wheeler’s party in 1964 (Wheeler 1967) seeing hundreds of Brolgas in fields; all combine to suggest a daily activity pattern where many Brolgas left the Nyleta-Wongabel roosts early to forage in fields but returned to rest, drink, bathe and feed further, before leaving again for afternoon foraging in fields. Similar patterns have been described for other populations (Marchant & Higgins 1993). Brolga daytime use of the Nyleta-Wongabel complex was apparently locally unique, as although at least 200 cranes (mostly Brolgas) roosted at Bromfield and Battle’s Swamps (both outside Atherton Shire) during the same period (Wheeler 1967; T. Heidenreich personal communication), very few if any were present there during the day (Diaries; T. Heidenreich, H. Gill personal communications).

The difference between Bravery’s maximum count of 40 Sarus Cranes, and reports by others of hundreds flying in to roost at night (Gill 1971; Smith 1971), implies that many Sarus Cranes did not return to roosting wetlands until evening. This is consistent with the finding of Nevard *et al.* (2019) that Sarus roost further from foraging sites than Brolgas, and with Archibald’s notes from Lake



Tinaroo in 1972 (Archibald & Swengel 1987): Sarus Cranes loafed, drank and bathed at ponds near feeding sites, then fed again in late afternoon before returning to the night roost.

After drainage began in 1969, Willetts Swamp no longer held water throughout the dry season (Diaries). Hasties Swamp retained water in most years, although at times with only waterholes (QDES 2013; Diaries). Remnant swamp '2' (Fig. 3b) partly refilled in 2017 and attracted hundreds of cranes to roost (Scambler *et al.* in press), but an attempt was subsequently made to retrain it (T. Nevard personal communication). The loss of most swamp habitat at Nyleta-Wongabel could have been a significant influence in the altered species distribution of wintering cranes on the Tablelands. Extensive potential roost habitat was created along the shores of Lake Tinaroo after 1958, but for reasons not yet understood Sarus Cranes, not Brolgas, colonised these sites (Archibald & Swengel 1987; Scambler 2020; Scambler *et al.* in press) and Brolgas apparently deserted the central Tablelands for preferred habitat elsewhere (Nevard *et al.* 2019; Scambler *et al.* in press).

*Period of Sarus Crane presence on the Tablelands*

After July 1967 Bravery wrote 'Sarus Crane' into the caption for Plate 1 of his (then) field guide (Fig. 4). In the 1970 paper he comments that Sarus were 'perhaps overlooked before 1967'. Privately he was more emphatic. In a 1968 note summarising crane records for the year, Bravery states: 'I am now inclined to believe Sarus Cranes could have been in Australia for many years and overlooked', and on 9 June 1968:

To Willetts Swamp and 44 cranes and including 6 Sarus species...Was accompanied by my wife and she believes like myself these Cranes have been in the Atherton shire areas for many years without being correctly identified.

George Archibald (International Crane Foundation: Archibald 1981) claimed that Bravery was involved in an earlier sighting:

The Sarus Crane...was first unofficially identified in Australia on 13 September 1964, by Dr and Mrs William Citterell [sic: =Cottrell] of Harvard University and Mr James Bravery of Atherton...at Hasties and Willetts Swamps on the Atherton Tableland. Unfortunately the photograph they took was not good enough to permit positive identification.

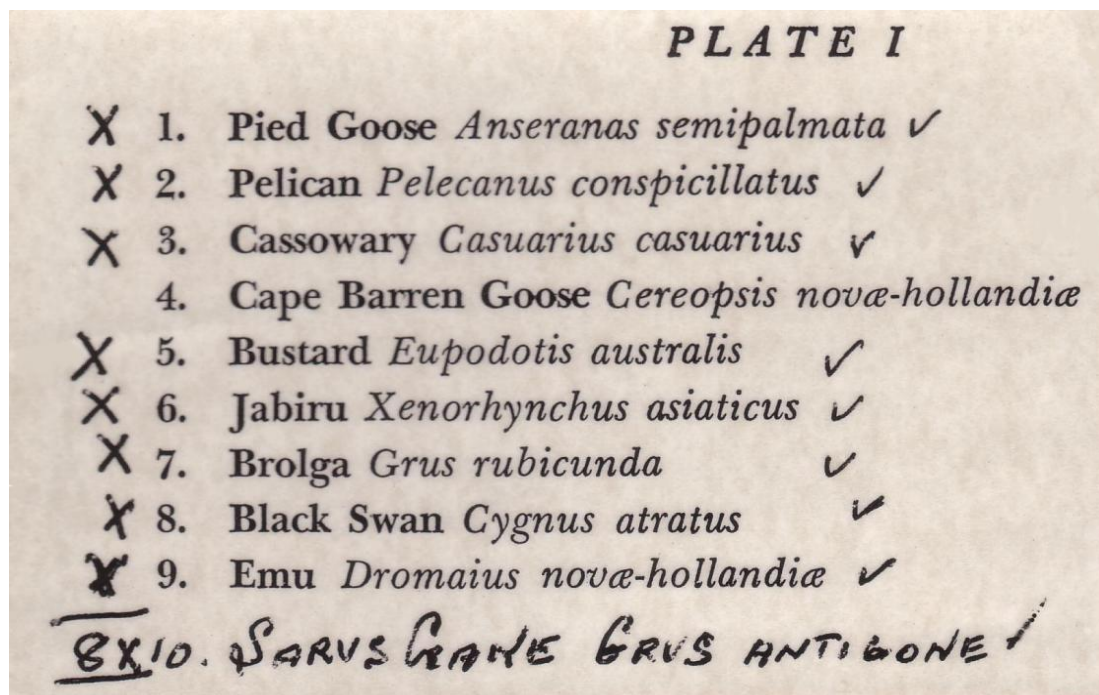


Figure 4. Bravery's post-July 1967 insertion of Sarus Crane into his field guide (Cayley 1958). On the facing page to the Plate 1 main text, Bravery has written: "A X denotes birds are resident or visit the Shire of Atherton ✓ denotes birds observed by J Bravery in Qld".

There is no Bravery diary for 1964 and the International Crane Foundation was unable to locate the image in their archive (B. Didrickson personal communication). Bravery corresponded with Dr Cottrell, but his diary note of 14 November 1967 makes no reference to photographs taken by the Cottrells in 1964:

Two letters from Bill Cottrell of Harvard regarding the Sarus Crane (*Grus antigone*). As Bill Cottrell studies the crane family he was particularly delighted to get Cook's colour study of the Normanton birds...Bill Cottrell is anxious to get more information on this new crane.

#### *Conflict, crane behaviour and identification*

The earliest report of conflict between Tablelands farmers and cranes is R. Hill's complaint of damage to a corn crop (Anon 1935a). Bravery's note of poisoning around 1960 is the first historical record of persecution, however persecution may have occurred earlier. In 1935 (Anon 1935b) the visiting Queensland Agriculture Minister alluded to a 'diminution in bird life'. He recommended that the Eacham Shire Council (adjoining Atherton Shire) improve protection for 'useful birds' on the Tablelands, including 'ibis and native companions'.

Bravery noted behaviour of both species, including that Brolgas and Sarus Cranes were usually segregated at the Willetts Swamp roost, e.g. on 29 June 1968:

To Willetts Swamp...24 Sarus Cranes 70 Brolga ...the Sarus Cranes keep to one area, most times being some distance from the Brolgas...after landing [pairs of] both species of Cranes face one another, bow and dance before resting.

Bravery's statement that Brolgas often arrive at roosts after dark is intriguing, as there is no evidence he ever visited a roost at night: presumably this information came from residents with roosts on their properties. Late arrival at roosts by Brolgas and the separation of the two species at roosts in the 1960s underline the behavioural changes noted by Scambler *et al.* (in press), who found that from 1997 to 2017, most Tablelands Brolgas arrived at roosts comparatively early and that Brolgas and Sarus Cranes mingled at most dual-species roost sites (*cf* Swaby 1983).

Bravery was a careful observer. Testing new 10 x 40 binoculars in July 1970, he was pleased to see the diagnostic red neck and pink legs of an adult Sarus pair from 1 km away, in dull light. His

diary notes (1967, 1968) also include the earliest known descriptions of a juvenile Australian Sarus Crane, and of a second-year immature that stayed on the Bravery farm for 18 months.

#### *'Crane Notes', June 1975*

Bravery died on 30 June 1975 and his last dated diary entry is of birds observed around the farm on 10 June. The last two pages he wrote are headed 'Crane Notes', with comments on hybrids:

Some interesting data from Dr Geo Archibald of International Crane Trust exchanged with Fauna Ranger Mark Weaver of Cairns. It does seem that the Sarus Crane could take over the Brolga species, as hybrids are now common...I also believe this may happen in the not to[o] distant future...A more complete check should be given and data could possibly prove the above data to be correct or otherwise...as the Cranes breed away from the Atherton Tableland mainly in Gulf areas and probably Cape York it would be difficult to keep a constant check...Recently a couple of weeks ago late May a few birds were seen in a flock coming from the north and with better weather the usual large influx of birds should occur.

Bravery was not to see the 1975 'influx of birds' but in succeeding years (Archibald 1981; Grant 2014; Nevard *et al.* 2020) scientists did pursue 'a more complete check' to confirm Brolga-Sarus hybridisation and resulting conservation implications. Jim Bravery would have carefully pondered over the new publications and greatly enjoyed discussions with 21st century crane researchers.

#### **Acknowledgements**

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**Appendix 1. Confirmation of historical locations.**

Site	Latitude	Longitude	Source
Archibald 1972	-17.204579	145.585182	Archibald & Swengel 1987; G. Archibald pers. comm.
Battle's Swamp	-17.320996	145.559872	T. Nevard pers. comm. (source, Battle family)
Fosters farm	-17.18464	145.559369	Diaries; J. Leighton pers. comm. ('Pelican Point')
Hill farm 1934	-17.293488	145.534608	Land disposed by Will of Robert Hill (Anon 1937)
Pavey's Swamp	-17.317527	145.490717	Diaries; J. Leighton pers. comm.
swamp near Peeramon	-17.308903	145.57538	Probably Quincan Swamp (Diaries)
Willetts Swamp	-17.310225	145.479358	Bravery 1970; Diaries (formerly Newell's Swamp, Marks' Swamp); P. Cannon pers. comm.

**Appendix 2. Pre-clearing Regional Ecosystem descriptions for the Nyleta-Wongabel complex.**

E=Endangered; OC=Of concern; LC=Least concern. See Queensland Government (2019) for details of status differences between Vegetation Management Act (VMA) and Biodiversity Status (Biodivstat)

RE	Status (VMA/Biodivstat)	Summary description of pre-clearing Regional Ecosystem
7.3.39c	OC/E	Ephemeral freshwater swamp. Drainage depressions in upland situations. Palustrine wetland (e.g. vegetated swamp)
7.3.8a	LC/E	<i>Melaleuca viridiflora</i> open forest to open woodland...impeded drainage on alluvial plains
7.3.8b	LC/E	<i>Melaleuca viridiflora</i> open forest to open woodland with eucalypt emergents ...Poorly drained alluvium...Floodplain
7.3.34	E/E	<i>Melaleuca viridiflora</i> open forest to closed forest. Broad swampy drainage lines of alluvial plains
7.3.39a	OC/E	<i>Eucalyptus tereticornis</i> open woodland... Seasonal swamp of broad drainage lines in uplands... Floodplain
7.3.43a	OC/E	<i>Eucalyptus tereticornis</i> open forest to woodland. Uplands on well-drained alluvium. Contains palustrine wetland (e.g. in swales)