

# The Location and Status of Egret Colonies in Coastal New South Wales

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**Summary:** Thirteen active egret colonies were located along 800 km of the NSW coastline from Sydney north to the New South Wales–Queensland border. These colonies contained up to four egret species: Great *Ardea alba*, Intermediate *A. intermedia*, Little *Egretta garzetta*, and Cattle Egrets *A. ibis*. Each colony site is described and its location

given. All colonies were located in or near wetlands, and the factors that may be important in determining which wetland is selected for occupation are discussed. The long term future of breeding colonies is examined and a recommendation made about the reservation of potential colony sites.

Colonial breeding occurs in 61 families or subfamilies of birds (Lack 1968), and is common among ardeids (Krebs 1978). Four species of egrets breed in coastal NSW: Great *Ardea alba*, Intermediate *A. intermedia*, Little *Egretta garzetta* and Cattle Egrets *A. ibis*. Each of these species is known to nest in colonies, with only the Great Egret recorded breeding as a solitary pair (Krebs 1978).

Breeding colonies are discrete entities covering relatively small areas of land. A single colony may, however, contain a large proportion of the regional breeding population of one or a number of species, or even the entire population of some species (e.g. Anderson & Keith 1980). Individuals breeding in colonies are vulnerable to disturbance and/or destruction of the colony site. The potential for disruption to the breeding population is greater where the nesting birds show a preference for a particular type of habitat that may itself be under some threat.

This paper documents the present location of egret colonies along the coastal plain of New South Wales from Sydney north to the New South Wales–Queensland border and examines some of the physical characteristics of these sites that may make them suitable for occupation by egret colonies. The factors controlling the size and distribution of these colonies, have been addressed elsewhere (Baxter 1992).

## Study area and methods

Along the coast of New South Wales colonies were located by road (six excursions from January 1988 to February 1991) and from the air (during the summer of 1990–91). The characteristics of each colony site were

noted to enable factors that may be important in determining the suitability of a site for occupation by an egret colony to be examined. Predominant tree species within the colony were identified and the trees at each site were either counted or estimated if the number was large. The presence or absence of standing water under nest trees was noted on each field trip.

Standing water may be an important factor in determining initial colony site selection (e.g. protection from potential terrestrial predators, Burger 1981). The period of one of the first visits (in January 1988) was the driest of the entire study period; I consider that that visit gave a good indication of which wetlands would be the first to dry out in adverse conditions. Thus, the sampling program was well timed to detect differences in the hydrology of wetlands. At one of the colonies (Junction Hill) most nests were in dryland trees but this colony first began in trees in standing water (D. Geering pers. comm.).

## Results

Between January 1988 and February 1991, 13 colonies were located (Fig. 1) and they contained more than 10 000 nests of the four egret species. The number of nests of each egret species and the species of the predominant nest tree are given in Table 1. These 13 colonies are described below; the abbreviations in parentheses after colony names are those used in Figure 2.

### Chittaway Point (CP)

This colony contained only Great and Little Egrets and was found on dry land at the end of a peninsula (Chittaway Point, 33°20'S, 151°27'E) in Tuggerah Lake formed by sediment deposited by

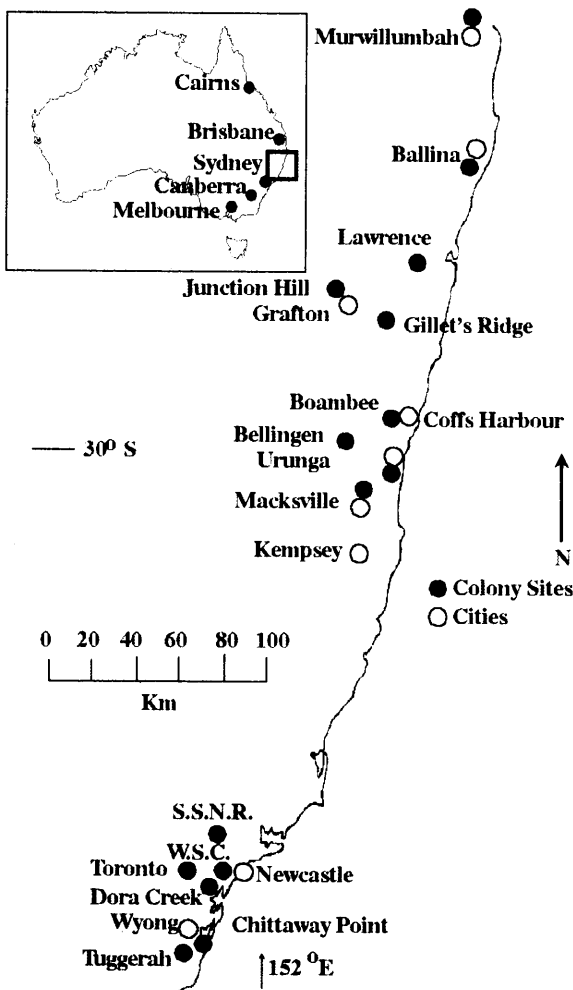


Figure 1 Location of the egret colonies along the north coast of New South Wales.

Ourimbah Creek as it discharged into the lake. The vegetation was dominated by Swamp Oak *Casuarina glauca*, where all nests were located, with only a few scattered Bitou Bush *Chrysanthemoides moniliferum* and *Lantana* sp. on the higher parts of the peninsula. Parts of the colony site were subject to inundation by saltwater from Tuggerah Lake and there were areas where shallow pools of water could lie for a relatively long time. The colony had been in existence since at least the 1983–84 breeding season and had only ever contained Great and Little Egrets, but in the 1987–88 breeding season three pairs of Striated Herons *Butorides striatus* also nested in the same area but in different trees from the egrets (A. Morris pers. comm.). There was a more or less continuous cover of trees over the colony site but Great and Little Egrets nested in different groups of trees approximately 20 m apart.

#### Tuggerah (Tuga)

The Tuggerah colony was the only single-species colony found in this study and contained only Cattle Egrets. The colony was established in 1989 in a wetland ( $33^{\circ}19'S$ ;  $151^{\circ}25'E$ ) which the year before had been deepened, surrounded with an earth wall and converted into a polishing pond for a new sewage treatment works. The colony site was visited in March 1990 and many of the wetland trees, mainly Swamp Paperbark *Melaleuca ericifolia*, were dead or appeared to be dying. This may have been due to the artificially raised water level in the wetland. This site was used for breeding only in the 1989–90 season.

#### Dora Creek (DC)

The Dora Creek colony was located in a stand of Broad-leaved Paperbarks *M. quinquenervia* that were surrounded by a large, open water wetland ( $33^{\circ}07'S$ ;  $151^{\circ}30'E$ ). The colony contained Little Pied *Phalacrocorax melanoleucos* and Little Black Cormorants *P. sulcirostris*, Sacred Ibis *Threskiornis moluccus* and Royal Spoonbills *Platalea regia*, in addition to the nests of four species of egret. Even though the colony site was only about one kilometre from the town of Dora Creek, it was completely screened from habitation by dense marginal vegetation that also made access difficult. Many Broad-leaved Paperbarks had blown down around the edge and in the colony area of the wetland.

#### Toronto (Tnto)

This colony was in large Swamp Oaks between a small remnant wetland and a railway line ( $33^{\circ}00'S$ ;  $151^{\circ}35'E$ ). Until early 1990, suburban trains ran regularly along the line, less than 15 m from the nesting egrets. The trees used by the egrets were not in standing water, although Broad-leaved Paperbarks in standing water were used for nesting by Little Pied and Little Black Cormorants. The wetland receives runoff from nearby urban areas and has a sewage overflow valve opening into it.

Local residents who are members of the Toronto Wetlands Group have prepared a management plan for the wetland including a walking trail, seats and interpretive signs. This group has warned that the NSW Roads and Traffic Authority plans to widen the main Newcastle/Toronto road by extending it into the colony wetland (N. McFadyen pers. comm.). In July 1991, another group of local residents who live along the current Newcastle–Toronto road began lobbying the local city council to have the new road built through the colony wetland as soon as possible.

#### Wetlands Centre, Shortland (WCS)

The first nesting records in the Lower Hunter Valley are for Great and Intermediate Egrets that nested in mangroves on Koorang Island, in the Hunter River estuary in the early 1970s (M.N. Maddock pers. comm.). The site of this colony was destroyed by bridge construction and egrets have not nested on the island since.

The present colony site at the Wetlands Centre, Shortland (formerly known as the Shortland Wetlands Centre) is situated on approximately 65 ha of flood-prone land in the Newcastle suburb of Shortland ( $32^{\circ}52'S$ ,  $151^{\circ}41'E$ ). In the past there has been some clearing of native vegetation, filling of natural wetlands and horse grazing, but this site and the adjoining Newcastle Wetlands Reserve support six naturally occurring vegetation types, described by McDonald & Winning (1986). Since then several thousand native, though not necessarily site-indigenous, trees and shrubs have been planted.

**Table 1** Composition of egret colonies on the New South Wales north coast. All colonies other than Tuggerah and Macksville were censused in January 1988. The Tuggerah colony was censused in December 1989 and Macksville in January 1991.

Colony	Number of egret nests				Total	Nest tree species
	G	I	L	C		
Chittaway Pt.	3	0	4	0	7	<i>Casuarina glauca</i>
Tuggerah	0	0	0	100	100	<i>Melaleuca ericifolia</i> , <i>M. linariifolia</i>
Dora Creek	31	2	3	96	132	<i>M. quinquenervia</i>
Toronto	16	0	0	36	52	<i>C. glauca</i>
WCS	198	453	57	1393	2101	<i>M. quinquenervia</i> , <i>C. glauca</i>
SSNR	3	0	0	507	510	<i>M. quinquenervia</i> , <i>Eucalyptus tereticornis</i>
Macksville	5	4	0	424	433	<i>M. linariifolia</i> , <i>C. glauca</i>
Urunga	28	9	0	753	790	<i>M. quinquenervia</i>
Boambee	2	2	0	1185	1189	<i>M. quinquenervia</i> , <i>E. pilularis</i>
Junction Hill	17	51	1	931	1000	<i>M. quinquenervia</i> , <i>Cinnamomum camphorum</i>
Lawrence	85	260	6	1264	1615	<i>M. quinquenervia</i>
Ballina	14	12	0	968	994	<i>Avicennia marina</i> , <i>Aegiceras corniculatum</i>
Murwillumbah	18	7	0	1693	1718	<i>Pinus radiata</i> , <i>C. camphorum</i>
Total	420	800	71	9350	10641	

Egret breeding first started in Newcastle Wetlands Reserve in 1978–79 in *Melaleuca* swamp forest, then in 1980–81 the birds moved approximately 400 m to the north west and took up their present location (M.N. Maddock pers. comm.) in similar vegetation that covers about 2.4 ha of the WCS site. It was the only vegetation type at WCS dominated by trees. MacDonald & Winning (1986) identified three species of paperbarks; Broad-leaved Paperbark, Swamp Paperbark and Snow-in-summer *M. linariifolia*. During this study, when trees were individually measured and mapped, I also found two Prickly-leaved Paperbarks *M. styphelioides*.

There is a sewage overflow pipe leading from the suburb of Shortland into the *Melaleuca* swamp forest. This pipe is a safety valve that carries excess discharge which cannot be handled by the sewerage system during times of high stormwater flow. Thus, it is an avenue for input of large amounts of nutrients and water into the swamp at periodic intervals. After consultations with the wetlands centre management, the Hunter Water Board blocked the pipe in the winter of 1989. Excess sewage was still able to escape into the swamp by lifting a concrete access hatch but any such overflows were visible and the magnitude of the problem could be assessed.

In 1985, MacDonald & Winning (1986) observed that there was a complete lack of paperbark seedlings in the egret colony area. This observation was confirmed in the winter of 1987 when the colony was surveyed as part of this study, although some new shoots had been produced from the stumps of windthrown or snapped adult trees. To establish, Broad-leaved Paperbark seedlings require shallow, almost stationary water or damp soil (Sainty & Jacobs 1981). MacDonald & Winning (1986) postulated that the lack of seedlings in the egret colony area was due to artificially high and prolonged water levels caused by construction of causeways to the east of the colony site.

In most seasons the ground beneath the paperbarks was covered by water to a maximum depth of about 1 m. The water-level vegetation was dominated by Water Ribbons *Triglochin procera*. Most of the water surface was covered by floating duckweeds *Spirodela pusilla* and *Woolfia australiana*. Both species are indicative of eutrophic conditions (MacDonald & Winning 1986). The wet margins of the paperbark swamp forest were covered by amphibious herbs including *Bacopa monnieri*, Water Buttons *Cotula coronopifolia*, Water Primrose *Ludwigia peploides* and River Buttercup *Ranunculus inundatus*, (MacDonald & Winning 1986).

#### Seaham Swamp Nature Reserve (SSNR)

SSNR is located in the small village of Seaham approximately 23 km north of WCS (32°40'S, 151°43'E). The swamp covers a total area of 7.5 ha of the Williams River floodplain. About 4 ha of the northern section is set aside as a nature reserve managed by the NSW National Parks and Wildlife Service (NPWS).

The physical and chemical characteristics of the swamp have been described by Gilligan (1974, 1979). The aquatic vegetation was dominated by Water Ribbons but duckweed covered large portions of the water surface as at WCS. The introduced Water Hyacinth *Eichhornia crassipes* was also present, but was controlled by periodic removal and spraying by NPWS.

Only two adult Broad-leaved Paperbarks grew in open water but there were some seedlings established on a floating raft of Water Couch *Paspalum distichum* growing in the open water area of the swamp. Broad-leaved Paperbark was the dominant tree growing around the margins. All nests have been in these trees, with the exception of several nests in a small Forest Red Gum *Eucalyptus tereticornis* growing near the water edge. The nest trees were approximately 40 m from the nearest house. The group of trees

which now form the bulk of the egret nesting sites germinated on a raft of floating water couch in the centre of the swamp and took root in their current, marginal position after the raft was blown to the swamp edge, before 1979 (B.J. Gilligan pers. comm.). Since then no new paperbarks have germinated. The small dryland area of the reserve was dominated by Forest Red Gum, Narrow-leaved Ironbark *E. crebra* and Spotted Gum *E. maculata*. No egret nests have been found in these trees (M.N. Maddock pers. comm.).

#### Macksville (Mvle)

The Macksville colony (30°42'S; 153°00'E) was not discovered until February 1991. Local residents reported that the colony had used the same site for several years but there had been only a few nests in previous years. An earlier colony had been reported at approximately this site by bird observers but had been abandoned early in the 1980s. There was no colony active in this wetland in January 1988 when I surveyed the area by road and drove past. It is possible that the colony had abandoned the site some years previously and returned some time after the 1987–88 breeding season.

The wetland was located approximately 50 m from the Bellinger River and was surrounded by dense growth of Cumbungi, *Typha* sp. The main tree species in the wetland were Snow-in-summer, Swamp Oak and some Weeping Willows *Salix babylonica*.

At the time of discovery there were roadworks in progress immediately adjacent to the colony site. These works entailed construction of a large embankment (approximately 3 m high) to carry traffic through the gully which contained the colony wetland. The effects of this embankment on the hydrology of the wetland are not known but it is possible that drainage may be impeded and water levels may rise.

#### Urunga (Unga)

This colony was located on a wetland on the southern edge of the village of Urunga (30°31'S; 153°01'E), with the nesting trees approximately 200 m from the nearest house. On field trips the water depth did not exceed 70 cm allowing profuse growth of Water Ribbons. Water Lilies *Nymphaea* sp. covered approximately 30% of the water surface and Tall Spikerush *Eleocharis sphacelata* was found in clumps throughout the wetland and more densely around the margins. The predominant tree was Broad-leaved Paperbark which formed a pure stand in the nesting area of the wetland. In other places around the margins Swamp Oak was present. Little Pied Cormorants and Sacred Ibis also nested in this colony.

#### Boambee (Bbee)

The Boambee colony was unlike any other colony along the New South Wales north coast in that it was located in the back yard of a residence in the village of Boambee (30°20'S; 153°05'E), 10 km south of Coffs Harbour (Fig. 1). The nearest nesting tree was less than 12 m from the resident's back door. While many people find the noise and smell of bird colonies offensive, the owners of this property selected the house because of the presence of the egrets.

The colony was located in a clearly defined pond on Boambee Creek and the earliest nests were confined to the Broad-leaved Paperbarks which are emergent from the water (L.E. Truscott pers. comm.), which in places was several metres deep. The colony has been present for at least ten years and during that time the nesting birds have grown in number to occupy most trees in the creek and some of the marginal vegetation which included Weeping Willow, Blackbutt *E. pilularis*, Bamboo *Bambusa* sp. and Willow Bottlebrush *Callistemon salignus*. The water surface was covered by Water Lilies.

#### Junction Hill (JH)

The Junction Hill colony was located in grazing land just north of a relatively new housing subdivision outside the city of Grafton (29°39'S; 152°56'E). The colony was first established in a wetland, known locally as Lake Edgcombe. The only emergent plant was Broad-leaved Paperbark and the water surface was completely covered by Water Hyacinth. With increasing colony size the egrets spread to nest in dryland trees in a sheltered gully adjoining the wetland. The largest and most numerous trees in this area were Camphor Laurel *Cinnamomum camphora* but others such as Blackwood *Acacia melanoxylon*, Rusty Fig *Ficus rubiginosa*, Whalebone Tree *Streblus brunonianus*, Native Peach *Trema aspera*, Native Holly *Alchornea ilicifolia*, Large-fruited Orange Thorn *Citriobatus spinescens*, Native Rosella *Hibiscus heterophyllus*, Devil's Apple *Solanum capsicoides*, Foambark Tree *Jagera pseudorhus* and Lantana were also present. Cattle and horses had open access to this section of the colony and there was evidence of them using this vegetation as shelter. The ground cover was almost completely composed of grasses but there were also large areas of bare earth.

#### Lawrence (Lawr)

This colony was located in a shallow freshwater wetland in grazing land on the floodplain of the Clarence River (29°30'S; 153°06'E). The site was surrounded by the small, dispersed village of Lawrence. The colony site was abandoned before the 1990–91 breeding season but was used again in the 1991–92 and 1992–93 breeding seasons (M.N. Maddock pers. comm.). The wetland vegetation was dominated by Broad-leaved Paperbarks that supported almost all the egret nests. The water surface was completely covered by water hyacinth that, in places, formed floating rafts sufficient to support Broad-leaved Paperbark seedlings. The vegetation in the surrounding areas was sparse and dominated by exotic pasture grasses. An abandoned citrus orchard near the southern margin of the wetland also supported some Cattle Egret nests. Nesting pairs of Little Pied and Little Black Cormorants and Sacred Ibis were present together with a pair of Royal Spoonbills.

#### Ballina (Ball)

The Ballina colony was located approximately 2 km from West Ballina (28°51'S; 153°30'E) in mangroves on a backwater of a small creek that formed part of the Richmond River estuary. The colony was close to the West Ballina sewage treatment works, separated from the polishing ponds only by an earth wall approximately 10 m thick at the base. Both River Mangrove *Aegiceras corniculatum* and Grey Mangrove *Avicennia marina* were present. The ground beneath the trees was bare mud and did not support any vegetation. On the landward margins of the mangrove forest, some Sampire *Sarcocornia quinqueflora* was present along with several individuals of the introduced Groundsel Bush *Baccharis hamillifolia*. Swamp Oak and pasture grasses became more common with increasing distance from saltwater and the colony. The mangroves in which the colony was established were bounded on two sides by grazing land. Sacred Ibis and Little Black Cormorants were also present in this colony.

#### Murwillumbah (Mbah)

This was the most northerly colony visited during this study (28°21'S; 153°25'E) and was located in the remnants of a wetland surrounded by a small industrial estate off Lundberg Drive, about 2 km from the centre of Murwillumbah. The original vegetation of the wetland was dominated by Broad-leaved Paperbarks. However, at

the time of this survey all these trees which were rooted in water were either dead or in a very poor condition. This was shown by a reduced crown, numerous dead branches or denuded stems and few new green shoots. They provided few opportunities for nesting birds, which included Little Pied Cormorants and Sacred Ibis as well as three species of egrets.

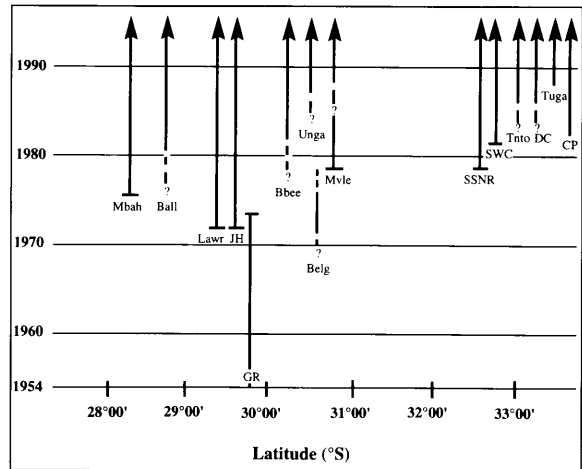
A hill rising to the east from the wetland had been planted with Monterey Pine *Pinus radiata* by the local council; thus there were no native species of plants in this area, except for a few Broad-leaved Paperbarks on the swamp edge. Many weeds, including Camphor Laurel, Lantana and climbing vines of the family Solanaceae, had invaded the pine plantation. Most of the breeding birds had moved from the wetland vegetation into the pines, Camphor Laurels, Lantana, vines and some paperbarks *M. leucodendron* that the shire council planted along the edge of Lundberg Drive. Many of the pines used for nesting had died or had many dead and bare branches, or branches which had only dead needles. The margins of the wetland supported dense mats of Slender Knotweed *Periscaria decipiens* and Senegal Tea *Gymnocoronis spilanthoides*. Parrot's Feather *Myriophyllum aquaticum* was a common emergent plant growing with these species. Floating plants included *Salvinia Salvinia molesta*. An unidentified cyanobacterium was also present. These last two organisms are indicative of high nutrient conditions (Bayly & Williams 1976; Sainty & Jacobs 1988).

## Discussion

### Past pattern of colonies

The few differences in the physical characteristics of colonies and nearby wetlands without colonies found by Baxter (1992) suggests that there are a number of potentially suitable sites available for occupation by egrets. Factors other than the physical characteristics of the site may be important in determining which sites are chosen from a number that appear physically suitable.

Hilden (1965) proposed that selection of a breeding site is governed by heredity, but the innate pattern of habitat preference is reinforced at a later stage by learning. Hilden gave the example of Curlews *Numenius arquata* that naturally nested only in bogs. Some of these bogs were reclaimed for agriculture and returning Curlews found that their old nesting site was modified but due to their site tenacity the birds still nested in the same site. The young raised at this site became imprinted on the new habitat type and from that time Curlews rapidly spread to nest in agricultural land where they had not previously nested. It has also been noted that some members of the Ardeidae show an attachment for previously used colony sites even though the vegetation of the site may change over time (Kerns & Howe 1967), provided the vegetation still has sufficient nesting opportunities.



**Figure 2** Chronology of the north coast colonies. '?' indicates the precise date is unknown. Data are largely from Morris (1979) but also from personal communications with observers and bird banders.

In experiments on nesting vegetation, Bongiorno (1970) showed that, although Laughing Gulls *Larus atricilla* nested in the same discrete areas of marsh, none nested where the vegetation substrate had been artificially altered. That author suggested that habitat selection in these birds was due to adults orienting to proximate cues (*sensu* Lack 1954, p. 272), in this case tall grasses *Phragmites* sp.

A pattern of nesting consistent with site selection by Hilden's mechanism is evident in northern New South Wales where eight of the 13 colonies were first established in Broad-leaved Paperbark swamps. With time, some colonies spread out to occupy a variety of dryland vegetation bordering the colony site.

The first Cattle Egret breeding colony in New South Wales was established at Gillett's Ridge, east of Grafton in 1954 (Fig. 1). It gradually grew in size until 1973 when the nesting trees died and nesting birds deserted that colony and moved to the Junction Hill site which had first been used as a colony site the year before (Morris 1979). During the 1970s there was a large expansion in range and numbers of Cattle Egrets, and each of the colonies which established at this time used a similar type of Broad-leaved Paperbark swamp, with the exception of Ballina, Toronto, Macksville, Tuggerah and Chittaway Point. The Ballina colony was established after nearby colonies at Murwillumbah, Lawrence and Junction Hill had been active for up to eight

years (Fig. 2). As both the Junction Hill and Murwillumbah colonies grew, birds began to nest in a variety of vegetation types around the wetland edge (Baxter 1992). The Toronto and Chittaway Point colonies were established after the WCS colony had been in existence for some time (Fig. 2). At WCS some of the nest trees are Swamp Oak (Baxter 1992), the same species as that used for nesting at Toronto and Chittaway Point. It may be that the Ballina, Toronto and Chittaway Point colonies were first established by birds from one of the older colonies, which had their habitat preference modified from the more usual Broad-leaved Paperbark swamp in the manner described by Hilden (1965).

The number of birds nesting at the Macksville colony rose sharply between the 1988–89 and 1990–91 breeding seasons. It may be that some of these birds came from the newly abandoned colony at Lawrence, where some of the nesting trees are of the same species as at Macksville. Nesting birds displaced from Lawrence may also have been attracted to breed at Macksville by the few pairs which were already present there.

This hypothesis of innate habitat preference and site tenacity is supported by evidence from tagging studies conducted at three colonies on the New South Wales coast. Of the almost 400 birds tagged as young at WCS and SSNR over five breeding seasons, 136 individuals returned to breed there in one or more seasons while only six have been observed to breed elsewhere (five from WCS bred at SSNR and one from SSNR bred at Lawrence). Tagging has taken place at Lawrence over two breeding seasons and there have been no observations of a Lawrence bird breeding at any other colony in northern New South Wales or southern Queensland, all of which (except Macksville) are monitored by observers (M.N. Maddock pers. comm.). Further, of these 136 tagged birds, over 70% returned to their natal colony the following year to breed again, and 50% returned to breed a third time (M.N. Maddock pers. comm.). Mortality over the year would account for some of the non-returns, so the data suggest that very few birds, if any, choose to nest at a different colony from the one in which they were born.

Only the location of the Tuggerah and Kooragang Island colonies cannot be explained by the mechanism described by Hilden (1965). The Tuggerah colony was established in *M. linariifolia* and *M. ericifolia*, trees that were not used for nesting at any nearby colony. It would, therefore, not be possible for birds at a nearby colony to habituate to these tree species and move to Tuggerah to use the same species of trees. It may be

**Table 2** Estimated occupation time of colony sites. The life of a colony site is estimated to be around 18 years.

Colony	Years of occupation	Visible damage to vegetation
Murwillumbah	15	Dead and defoliated trees, cyanobacteria bloom in water
Ballina	12	None obvious
Junction Hill	18	Dead and defoliated trees
Boambee	12	Dead and defoliated trees
Urunga	7	Some defoliation
Macksville	14*	Dead and defoliated trees
SSNR	13	Many dead and defoliated trees
WCS	10	Dead and defoliated trees
Toronto	≈7	None obvious
Dora Creek	≈7	Excreta covering leaves, some defoliation
Tuggerah	2	Many dead and dying trees
Chittaway Point	11	None obvious

\* Assuming continuous occupation since 1979.

significant in this regard that Tuggerah contained only Cattle Egrets. It may be that the Tuggerah colony (and perhaps WCS) was established close to another colony because of the social stimulus of a number of synchronously nesting birds (Tuggerah close to Chittaway Point; WCS close to SSNR). Such a mechanism has been suggested by several overseas authors (Anderson & Keith 1980; Belzer & Lombardi 1989).

It appears that there is a strong preference for one particular type of habitat, Broad-leaved Paperbark swamp forest, for breeding colonies of egrets in northern New South Wales but before a definitive statement can be made the relative availability of this type of vegetation must be measured. Nonetheless, the fate of this type of forest is important to the maintenance of viable breeding colonies of these birds. In a comprehensive inventory of coastal wetlands in this state, Goodrick (1970) showed that 60% of wetlands of high value to waterfowl had been destroyed or reduced in value since European occupation, although the particular type of *Melaleuca* forest in which ardeids commonly nest may have been reduced by only about 20%. Pressey (1981a, 1983, 1984a; cited in Pressey & Harris 1988) estimated that 91% of the total area of wetlands had been lost on the Hunter, Clarence and Macleay River floodplains, all of which are part of my study area. The rate of destruction is likely to have been less

since 1985 when state government controls (State Environmental Planning Policy #14) were introduced but a net loss of wetlands probably continues.

Of the 13 colonies visited in this study only WCS, SSNR and Chittaway Point are reserved in any way and the continued use of the other sites is dependent on sympathetic landowners. It is known from studies overseas (Kerns & Howe 1967; Wiese 1978; Custer *et al.* 1980; Dusi 1983; Belzer & Lombardi 1989) and New South Wales (Baxter 1992) that large concentrations of colonially nesting birds can kill the vegetation at their nest site. Therefore, the present colony sites cannot be considered permanent and future movement of the colonies should be expected. Limited experience in New South Wales (Fig. 2) suggests that colonies will remain at one site for about 18 years. If that is the case only four of the sites described in this report can be expected to persist for more than ten years (Table 2). Steps to ensure the protection of suitable colony site habitat should be taken so there will be sites from which colonies can choose when their present site becomes unsuitable.

Few differences in the physical characteristics of the colony sites were found. The size of colonies was not correlated to any measure of the area of terrestrial feeding habitat but the number of nests of Great, Intermediate and Little Egrets was correlated with the area of estuarine wetlands, especially saltmarshes and mangroves (Baxter 1992). The choice may reflect a random selection among suitable colony sites, or the influence of factors other than those examined in this study such as the avoidance of human disturbance or damage rather than an active search for optimal foraging conditions. It is apparent, however, that ardeids tend to establish colonies close to existing and reused colonies (Custer *et al.* 1980). Such sites, especially those with large areas of saltmarsh and mangrove feeding ground close by, are those where efforts to secure future colony sites should be concentrated.

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### Application published in the *Bulletin of Zoological Nomenclature*

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Case 2856. *Psittacus banksii* Latham, 1790 and *P. lathamii* Temminck, 1807 (currently *Calyptorhynchus banksii* and *C. lathamii*; Aves, Psittaciformes): proposed conservation of the specific names.

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**Abstract.** The purpose of this application is the conservation of the specific names of both the Australian Glossy Black Cockatoo, which has the universally accepted name *Calyptorhynchus lathamii* (Temminck, 1807), and the Australian Red-tailed Black Cockatoo *Calyptorhynchus banksii* (Latham, 1790). In recent years *C. banksii* has commonly been called *C. magnificus* (Shaw in Shaw & Nodder, 1790). Shaw's name actually applies to the Glossy Black Cockatoo, *C. lathamii* (Temminck, 1807). *C. lathamii* is threatened not only by *Psittacus magnificus* Shaw in Shaw & Nodder, 1790 but also by *P. banksii flavicollo* Kerr, 1792, an unused senior synonym. It is proposed that confusion will be avoided by the suppression of the specific names *magnificus* and *flavicollo*, so that the Red-tailed and Glossy Black Cockatoos are validly named *C. banksii* and *C. lathamii* respectively.