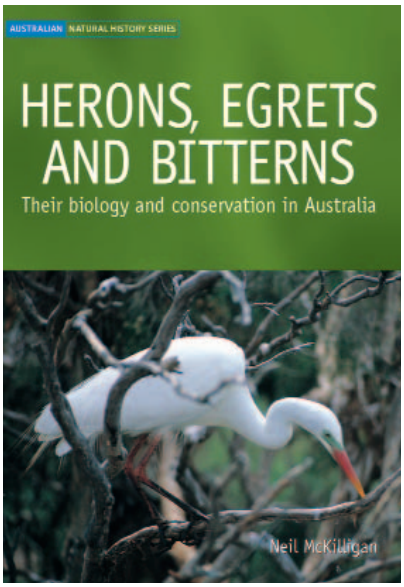

Herons, Egrets and Bitterns

Their biology and conservation in Australia

Neil McKilligan

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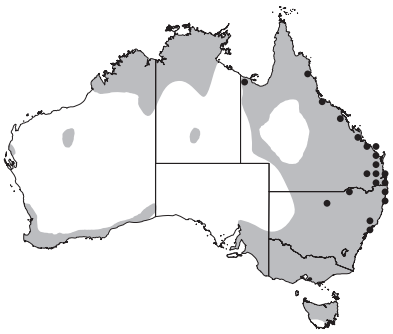
8
Species resident in Australia

This chapter presents a separate portrait of each of Australia's resident heron species, which includes descriptions about appearance, distribution, movements, feeding behaviour, diet, breeding and population status. Some of the detail on particular species overlaps with information in earlier chapters, but I've included this in order to give a more complete view of the bird and to highlight features that distinguish it from other herons. The first species described are the 10 day herons (subfamily Ardeinae), then the Nankeen Night Heron (subfamily Nyctocoracinae) and finally the three bitterns (subfamily Botaurinae). I begin with a fairly full account of the Cattle Egret because a good deal is known about this species and it is reasonable to assume that other heron species will resemble it in many respects. Less detailed accounts are presented for the other species, partly reflecting our limited knowledge of these, in their Australian context at least.

For each of these species, an image and a map showing its distribution (grey shading) and breeding records (dots) are given. These are adapted from *The New Atlas of Australian Birds*, hereafter referred to as the 'new atlas'. These distributions must be regarded as conservative. For the six colonial species that inhabit the Top End, an additional map is included showing the location and size of the heronries in this region. These heronries were mapped by Ray Chatto in the 1990s and are not adequately represented in the new atlas, although all or most of them must still be used annually by very large numbers of herons.

Cattle Egret, *Ardea ibis*



In its white, non-breeding plumage the Cattle Egret can be confused with other egrets, but it is distinguishable by its more compact build and relatively shorter legs, neck and bill. It also has a faint buff tinge on its forehead. Its bill, lores and irises are yellow and its legs grey-green. A minority of young Cattle Egrets retain a blackish bill colour for a short time after fledging, raising the possibility of confusion with the Little Egret, but the latter has a much more slender build.

Most breeding Cattle Egrets have bright orange or orange-buff plumes on the head, neck and back, but some one-year-olds are less brightly coloured, with less-developed plumes, or even retain the all-white non-breeding plumage. For a week or so at the start of nesting and pair-bonding, the bill is bright red except for a yellow tip, the lore is magenta and the iris is red. These then fade to yellow during egg laying with the bill becoming bright maize-yellow for a time. The tibia, and less often the tarsus, can acquire a reddish colour during breeding.

Males are larger than females (about 390 g and 340 g respectively), but not noticeably so at a distance. They are generally seen in grass paddocks in the company of a cow or similar grazing animal but also feed independently of a host.

Distribution

During the 19th century the Cattle Egret underwent a remarkable range expansion, most likely in response to human activities such as the introduction of irri-

Location and size of Cattle Egret heronries in the Top End in the 1990s.

gation systems, the creation of rice paddies and the worldwide expansion of the cattle industry and accompanying habitat modification. The nominate species, *A. i. ibis*, probably originated in central Africa, but has spread to South Africa, southern Europe, and crossed the Atlantic Ocean to colonise the Americas. It is absent from Iran and adjoining Middle Eastern countries. The subspecies, *A. i. coromanda*, is found across the Indian subcontinent and Asia as far north as Korea and Japan, and in South-East Asia, Papua New Guinea and Australia.

The early history of this species in Australia is uncertain. An introduction of 18 birds from India to Derby in WA in 1933 was probably unsuccessful. However, it is likely that Cattle Egrets have been visiting northern Australia from the islands to the north since pre-colonisation times. The relatively recent development of the pastoral industry in northern Australia would have changed the landscape to suit the Cattle Egret. We know they were present in large numbers in the NT in 1948, and by 1954 had spread south-east to nest for the first time in north-eastern NSW.

In the last 50 years they have extended their distribution even further to encompass, either permanently or seasonally, most of the higher rainfall pastoral lands of coastal and sub-coastal Australia. Their range takes in south-western WA, where they are still relatively rare; the Top End; the Barkly Tableland; much of eastern and south-eastern Australia, where it extends well inland; South Australia and Tasmania. They have been winter visitors to New Zealand since 1963 at least, but have not been recorded nesting there.

Cattle Egrets breed in large numbers in coastal heronries in the Top End; in a concentration of heronries along the coastal plain of Eastern Australia, from south-east Queensland to mid-coastal NSW; and in some widely scattered heronries in mid-coastal and north Queensland. They have nested well inland along parts of the Murray–Darling River System and there is probably further considerable scope for the establishment of heronries in this vast region.

Movements

The Cattle Egret is a partial migrant in that some individuals stay close to the natal heronry from one nesting season to the next but the majority leave the district in autumn and return the next spring. Recoveries of Cattle Egrets, mostly south of the natal heronry, suggest the birds spend the winter dispersed along the coastal plain as far as South Australia. A small number have been recovered west of the Great Dividing Range.

Some cross the seas to Tasmania or New Zealand, taking advantage of prevailing winds across the Tasman at certain times of the year. The longest recovery distance has been 2500 km, for an egret banded in south-east Queensland and recovered on Stewart Island, off the southern end of New Zealand's South Island, but some unmarked birds have apparently overshot New Zealand and landed in sub-Antarctic islands. It is virtually certain that many return from New Zealand to breed in Australia but proof of this is needed.

Cattle Egrets tend to return to their natal heronry to breed (a behaviour called 'philopatry') but a few have been re-sighted at a different heronry. Both juvenile and mature birds migrate but the juveniles travel further on average. Project Egret Watch revealed a good deal of fidelity by marked birds in returning to the same areas and even using the same foraging sites in successive years (M. Maddock pers. comm.).

Feeding and food

Cattle Egrets forage on pasture, marsh, grassy road verges, rain puddles and croplands, but not usually in the open water of streams or lakes, and they avoid marine environments. They exhibit a wide range of feeding behaviours but for the most part they have to 'Walk rapidly' (see Chapter 5), in order to keep up with their 'host', which may even be a tractor pulling a plough. They quite often feed without a host, for example on young lucerne crops where they position themselves under the irrigation sprays. They are generally seen in small flocks, the size of these being dictated in part by the number of available hosts. As might be guessed, larger-sized host species attract more egret followers than smaller ones. The alpha bird positions itself near the head of the host and enjoys a greater feeding success than those of lower status further back.

Cattle Egrets eat a very wide range of small animals. In the summer in south-east Queensland this includes substantial numbers of the noxious Cane Toad, but few centipedes and no millipedes, which they probably find distasteful. Plant material is found in boluses but this may have been ingested by accident as there are no records of deliberate herbivory. The most important summer prey in eastern Australia, judged both by the number of items and total biomass, are grasshoppers, locusts and field crickets (orthopteran insects). In some environments they eat a substantial number of Cattle Ticks, *Boophilus microplus*, pecking them directly off the cow and perhaps also off the ground. Tick-eating by this species has been disputed in the past but in the 1980s I found many mature Cattle Ticks in regurgates provided by chicks at a heronry in south-east Queensland. The persistence of the cement cone – a secretion by the tick that is used to attach itself to the host – around the mouthparts of some ticks confirmed these as having been taken directly off the cow (D. Kemp pers. comm.). As a tick-eater and a major predator of grass-eating insects, the Cattle Egret probably does good service to local agriculture. Unfortunately they also eat other predators of orthopterans, such as spiders, frogs and lizards.

The effect of the concentrated predation by thousands of nesting Cattle Egrets on local vertebrate biodiversity is unknown, but in inland south-east Queensland about half of the locally occurring species of frogs and reptiles are found among their prey, including rarities such as the Grey Snake, *Hemiaspis damelii*. Parent birds range as far as 29 km from the heronry in search of food.

There are no Australian data on the Cattle Egret's diet outside the breeding season. In South Africa and New Zealand their winter diet includes earthworms taken in large numbers from the rain-soaked soil. The migration of the Cattle Egret south, when other Australian migrants are flying north, may be best explained by their desire to exploit feeding opportunities made available by the winter rains of southern Australia.

Breeding and status

In eastern Australia the Cattle Egret's nesting season typically spans five months, from October to March. In the NT, large flocks start nesting in late November; small numbers start in January, synchronising with the other, more numerous, egret species in the heronry that start at this later date.

They nest colonially, often with other herons or with cormorant species. Cattle Egrets are not known to raise more than one brood of chicks in a season, but they can successfully re-nest after an early nest failure and are said to build a new nest for this purpose. Some breed in their first year and a proportion of these are still in their all-white juvenile plumage. All breeding birds of two years of age upwards have the orange breeding colour.

Heronries are always close to drinking water. This appears most important for the males, who, except for short excursions to drink, attend the nest continuously until the first egg is laid. They nest in trees, bushes, in reed beds and on the ground, preferring bushy trees to open, structured ones as the former allow for closely spaced nests (39–110 cm centre to centre) for mutual protection (N.G. McKilligan pers. obs.).

The male claims the nest site and builds a rudimentary nest before gaining a mate. He then collects the sticks and the female positions them. Dead sticks are preferred, but if these are not readily at hand considerable effort goes into breaking leafy, live twigs off the tree and the nest may end up being built mostly from these. Most nests are multi-layered platforms comprising several hundred sticks with a small amount of leafy material placed in its shallow cup. A few nests are built on top of old ones and make a very solid structure, but others are so loosely constructed that the eggs can be seen through the lattice of sticks. Stick stealing is rife and unattended nests (except those solidly glued together with faeces) quickly disappear. Stick collecting continues through incubation but it is then mostly restricted to the mid-morning and it may have more to do with reinforcing the pair-bond than reinforcing the nest. Advanced chicks occupy their time by making clumsy attempts at rearranging the nest.

A Cattle Egret egg is oval but more rounded at one end. Its surface is finely pitted and a pale greenish-white or a distinct green colour. Typical clutches are of two, three, four or five eggs. Eggs are laid one or two days apart as a rule, the clutch usually being completed within seven days. Incubation starts with the first egg and they hatch asynchronously 24 days after being laid. By three weeks post-hatching the chicks are well-feathered, their legs are well-developed and they explore for a short distance beyond the nest. They make short flights from about five weeks old, then progress to flying to the ground below the nests, and then a hundred metres or more to the nearby wetland, where they feed to some extent but mostly await the return of a parent, whereupon they return to the vicinity of their nest to be fed. They are independent by about eight weeks of age. In south-east Queensland most successful nests fledge two or three young. A brood of four is a rarity that only occurs in favourable years and in very dry years the mean number drops below two.

A proportion of eggs fail to hatch. In south-east Queensland this is due to accidents, infertility or predation by the Torresian Crow, *Corvus orru*. Crows usually fly from perch to perch through the heronry with the aim of scaring a sitting egret off its nest. During one particular observation of a this type of behaviour, the nesting egret being targeted gave the 'Full forward' threat display to the crow, which then seized the end of the egret's wing and a tug-of-war contest commenced. The egret was pulled off its nest but quickly returned

and this happened three times over several minutes. Finally the egret surrendered its nest and the crow proceeded to eat its three eggs with the egret standing nearby, but looking away without any visible sign of concern. When the crow departed the egret returned and ejected the empty shells. This and an observation of three fledgling Cattle Egrets threatening a Brown Goshawk, *Accipiter fasciatus*, disproves the conventional wisdom that herons will not defend their nests.

Chick deaths are most often due to starvation, with the smallest chick dying by the end of its second week, a time when competition among the siblings for food is most intense. During a period of severe drought many advanced chicks may not survive. Smaller numbers may succumb to heavy loads of parasites, such as bird ticks, *Argas robertsi*; predators, such as the White-bellied Sea Eagle, *Haliaeetus leucogaster*, and Wedge-tailed Eagle, *Aquila audax*; or attacks by other egrets. A new arbovirus, the Lake Clarendon Virus, has been found in bird ticks on Cattle Egret chicks in south-east Queensland and this may have caused their sickness or death. The oldest Cattle Egret lived to almost 14 years but mean life span after fledging is between two and three years.

While it seems that variation in rainfall underlies gross fluctuations in the sizes of Cattle Egret populations studied to date, other factors, such as changing agricultural practices and the bird's responses to these, are also important (see Box – Population dynamics of the Cattle Egret, page 64).

Cattle Egrets are numerous and widespread. Combining the estimated nesting numbers given in Chapter 7 for each state suggests a national breeding population of roughly 50 000 breeding pairs or a total of 150 000 birds, using Wetlands International's formula (total number = number of pairs x 3). By contrast Wetlands International estimates the total population to be 100 000, 30% fewer birds.

Taxonomy

There is considerable disagreement as to which genus the Cattle Egret should be assigned. It has been placed in the genera *Bubulcus*, *Ardea*, *Ardeola* and *Egretta*. In the Northern Hemisphere the monotypic genus *Bubulcus* is presently used. Monotypic means there is only one species in that genus. Christidis and Boles (1994) favour the genus *Ardea* based on the results of DNA studies, and *Ardea ibis coromanda* is used for the subspecies in Australia. Its common name is the Indian Cattle Egret.

For a very full description of the biology of the African Cattle Egret, *Bubulcus ibis ibis*, consult *The Cattle Egret: a Texas Focus and World View* by Ray Telfair, which is based mainly on studies of the migrant population in the United States.