

A recently formed Crested Tern (*Thalasseus bergii*) colony on a sandbank in Fog Bay (Northern Territory), and associated predation

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Abstract

A Crested Tern colony founded on a sandbank in northern Fog Bay (Northern Territory) failed in 1996 presumably due to inexperienced nesters. Attempts to breed in the years following were equally unsuccessful until 2012 when the colony was established. In 2014, the rookery comprised at least 1500 adults plus numerous chicks. With the success and growth of the colony, the predators, White-bellied Sea Eagles and Silver Gulls, were quick to capitalise on the new prey. Changes in the species diversity and numbers of the avifauna highlight the dynamic and fragile nature of life on the sandbanks of Fog Bay.

Crested Terns (*Thalasseus bergii*) are the predominant colonial-nesting sea birds in the Northern Territory, with at least five islands supporting colonies of more than 30 000 nesting birds each year (Chatto 2001). These colonies have appeared stable over time with smaller satellite colonies located in the vicinity of the major rookeries. Silver Gulls (*Chroicocephalus novaehollandiae*) and White-bellied Sea Eagles (*Haliaeetus leucogaster*) prey heavily on the adults and chicks (Chatto 2001).

In December 1989, Guinea & Ryan (1990) documented the avifauna and turtle nesting activity on Bare Sand Island (12°32'S, 130°25'E), a 20 ha sand dune island with low shrubs and a few trees. The island lies in the northern Fog Bay within a string of eight islands extending from the mainland (Figure 1). Guinea & Ryan (1990) reported an abundance of birds, including nesting Black-naped Terns (*Sterna sumatrana*) and Pacific Reef Herons (*Egretta sacra*), and non-nesting Crested Terns, White-bellied Sea Eagles, Silver Gulls and Lesser Frigatebirds (*Fregata ariel*). Seven years later, Whiting *et al.* (1997) documented the abundance and diversity of the avifauna with comments on the unsuccessful establishment of a Crested Tern rookery on a sandbank 1 km to the south of Bare Sand Island. This sandbank is located 150 km from the nearest large breeding colony on Melville Island



Figure 1. Map showing location of the sandbank with the Crested Tern colony, relative to Bare Sand and Djadjalbit islands. The insert shows the location of the site relative to Darwin 50 km to the west. (Inset courtesy of Google Earth)

(Chatto 2001). The failure of the small colony of 200 nests from tidal inundation was attributed to the birds being young inexperienced breeders (Whiting *et al.* 1997). Predation by a White-bellied Sea Eagle was also recorded at that time. The colony languished for some years with sporadic eggs being recorded by researchers visiting the sandbank during checks for nesting sea turtles (Michael Guinea pers. obs.) and being undetectable in the numerous sea birds surveys by Chatto (2001). In June and July 2012, the Crested Tern colony was again present but in larger numbers. In the same year, Silver Gulls nested on Bare Sand Island apparently for the first time since the annual dry season visits began in 1995.

Counts of adult Crested Terns were made opportunistically on 7 and 11 July 2014 to estimate the number of adults present within the colony. Counts of active nests were unachievable from the angle of our observation coupled with the density of the colony. Counts were made at a distance of an estimated 25 m of resting birds in non-overlapping sections of the colony (see Clarke *et al.* 2011 for method of observation). The black crest and beak were the distinguishable features used in counting adults on the ground. During the second visit, the colony was circumnavigated as we recorded GPS locations and took photographs.

The two counts yielded similar densities with approximately 1200 breeding adult terns (Figure 2) in the main colony, two satellite colonies of 70 and 150 adults, and one aggregation of approximately 200 adults accompanying a large crèche of chicks all of similar age. The main colony, positioned on the highest point of the sandbar, contained mostly adults incubating eggs and also chicks of two age classes (i.e. palm-size, and those of adult height with some able to fly short distances).

Two predation events on Crested Tern chicks were observed during the visit on 7 July. An adult White-bellied Sea Eagle was perched on driftwood at the edge of the main colony eating a Crested Tern chick. The head and some downy skin of the chick remained on examination of the site after the eagle's departure. The eagle was assumed to be one of the breeding pair on nearby Djadjalbit Islet (Figure 1), with a young chick in the nest at the time of the observation.

At least eight Silver Gulls – adults and juveniles from the Bare Sand Island rookery – were observed on both counts patrolling the perimeter of the colony for unprotected chicks and eggs. During the first count, the gulls were observed to intercept an adult tern moving its chick between the main colony and the crèche colony and killed the chick. The Bare Sand Island Silver Gull rookery contained chicks and eggs and at the time overlooked the sandbank from dunes on the nearest point on Bare Sand Island (Figure 1).



Figure 2. The main Crested Tern colony on the sandbank in Fog Bay containing approx. 1200 adult birds, 11 July 2014. (Christine Giuliano)

No footprints of herons (*Ardeidae*) were observed on the sandbank during our survey. This comes as a surprise as Nankeen Night Herons (*Nycticorax caledonicus*) forage nightly in groups of up to 30 on Bare Sand Island for newly emerged Flatback Sea Turtles (*Natator depressus*) (Giuliano *et al.* in press). These herons could also be expected to visit the tern colony where other predators of the turtle hatchlings have clearly identified a reliable food source in the form of tern chicks.

Observations over at least two decades of the avifauna of Bare Sand Island and its surrounding sandbanks and islands accentuate the dynamics of the ecosystem. Having been absent during multiple previous surveys (Chatto 2001), the Crested Tern rookery on the sandbank to the south of Bare Sand Island appears to have reached maturity with more than one thousand birds breeding for the past three dry seasons. With its increase in size from its faltering trials in 1996 (Whiting *et al.* 1997) to the present, the predators have also increased in numbers and determination. Little Terns (*Sterna albifrons*), once an obvious dry season nester on the northern beach of Bare Sand Island (Meredith & Lochman 2002), have decreased in number in the past three years, possibly in response to the establishment of the Silver Gull rookery. Continuing observations will lead to a better understanding of how the avifauna responds to changing climate and variations in sea level.

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