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LITTLE TERNS IN BOTANY BAY

Although Botany Bay, New South Wales, was once a stronghold for Little Tern *Sterna albifrons* breeding colonies along the margins of Botany Bay have been in decline for the past 50 years due to competing pressures from land development, human recreation, pollution, feral animals and artificially enhanced populations of native species, such as the Silver Gull *Larus novaehollandiae*. Records from the 1940s suggest that as many as 50 pairs regularly nested at the mouth of the Cooks River (33°57'S, 151°12'E) and that this was possibly one of the largest colonies in New South Wales (Campion 1963; Morris 1979; Smith 1990). Subsequent development of Sydney (Kingsford Smith) Airport, led to considerable alteration of the habitat on this site and a shift by the colony to Port Botany.

Between 1979 and 1983, half the 1940s total (i.e. approximately 25 pairs) nested at Port Botany (33°59'S, 151°13'E), with a high fledging success (young fledged per clutch) in the 1980/81 breeding season (Larkins 1984; Table 1), but lower success in later seasons up to 1983.

Although a nest with three eggs was discovered adjacent to the main runway at Sydney (Kingsford Smith) Airport in 1982 by D. Sawyer (E. Hoskin, Keith Hindwood Bird Recording Service), there are no further records known to the authors until 1988. In 1988, breeding adults were found raising young in a sand stockpile area next to the main runway at Sydney (Kingsford

Smith) Airport; an area subjected to frequent disturbance. Two nests containing three newly hatched young and one egg respectively, were also found at Port Botany (on a site previously referred to as 'Green Hill'; Larkins 1984) on 24 November 1988. Three pulli were first discovered beside the runway 10 January 1989 and banded (A. Leishman, pers. comm.). This site and Green Hill were subsequently monitored at least once per week during the 1988/89 breeding season. A further two nests were later located in this breeding season and three fledged young seen in the area. It is unlikely that all nests were found. Fledging success was not calculated because of the possibility of producing a spurious result. It was evident, however, that the size of the breeding population had dwindled to numbers lower than that recorded in the early 1980s. A measure of fledging success in the following season confirmed that excessive disturbances in the sand stockpile area were leading to depressed breeding success.

The breeding sites previously used by nesting little terns, adjacent to the runway and at Port Botany, were monitored at least weekly in 1989/90. From 9 December 1989 to 26 January 1990 these sites were visited 22 times. With the assistance of others (D. Larkins, K. Lisser and Greg Smith, pers. comm.) 15 nests were located. Five Little Tern nests and two Red-capped Dotterel *Charadrius ruficapillus* nests were lost because of sand removal. In all, 10 Little Tern pulli were banded, but only one fledged. The prognosis for the Botany Bay colony looked poor.

TABLE 1

Breeding data for Little Terns at Botany Bay, New South Wales. Other sources include Larkins (1984).

Colony	Season	Adult breeding pairs	Clutches	Eggs	Hatched	Fledged	Young per clutch
Port Botany	1980/81	29	29	74	30	12	0.41
Port Botany	1981/82	26	40	84	30	1	0.02
Port Botany	1982/83	25	25	57	28	1	0.04
Runway	1988/89	?	3 ⁺	7	4	3	—
Port Botany	1988/89	2	2	4	3	?	—
Runway	1989/90	14 [±]	15	?	12	1	0.07
Runway	1990/91	8 [±]	18	?	2	0	0
Port Botany	1990/91	1 [±]	1	2	2	2	2.0
Towra Point	1991/92	18 [±]	10 [±]	2	2	17	1.7*

+ Probably an under-estimate, ± Estimated from maximum number counted, * Probably an over-estimate.

In 1990/91 the situation worsened owing to sand removal, tidal inundation and continued pressure from human recreation on the sand stockpile area. Despite the erection of a protective barrier and warning signs, only two young were hatched, although none fledged. Fortunately, two young produced from one nest on the less disturbed Port Botany site fledged: both young were banded.

A reprieve came for the breeding Little Terns of Botany Bay in 1991/92. Nesting occurred on a small sand-spit (34°1'S, 151°9'E), severed from the mainland, near Towra Point at the southern end of Botany Bay. Nesting had been recorded from Towra Point in previous seasons but there was no information on how well the colony had done (Smith 1990).

We were late in detecting the colony in 1991/92. Breeding was well under way when R. Kingsford (pers. comm.) discovered approximately 15 adult pairs in breeding plumage and two downy young. On subsequent weekly visits to the colony we counted up to nine adults at a time in breeding plumage and estimated that from nine clutches 16 young fledged (eight of these were banded with metal bands; five received colour bands as well as their numbered ABBBS metal band). The number of young surviving per clutch probably over-estimates the true survival rate as no reliable figures were obtained on the total number of nests or eggs. Pairs are known to lay more than one clutch in a season, should there be an early failure (Smith 1990). Our estimate indicated that approximately 1.7 young per clutch had fledged. High survival rates have not been recorded in Botany Bay since 1980/81, when 0.41 young per clutch fledged (Larkins 1984).

There is hope that nesting by Little Terns at the southern end of Botany Bay will be permanent. Management of the habitat and colony by the New South Wales National Parks and Wildlife Service will certainly be made easier by the semi-remote nature of the location, compared with previous sites.

No banded young have yet been retrapped, however one nesting bird bearing colour bands was sighted in 1990/91. This bird was banded by the Victorian Wader Study Group on 4 March 1989 at Spermwhale Head, Victoria.

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K. EGAN

1 Bowman Street, Mortdale, NSW 2223.

GEOFFREY C. SMITH

Previous address: Environmental Survey and Research Branch, NSW National Parks and Wildlife Service, P.O. Box 1967, Hurstville, NSW 2220.

Present address: Fauna Conservation and Ecology Section, DPI Forest Service, P.O. Box 631, Indooroopilly, Old 4068.

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DIFFERENTIATING CRESTED AND LESSER CRESTED TERN CHICKS

Crested Terns *Sterna bergii* and Lesser Crested Terns *S. bengalensis* regularly breed together in mixed colonies where their breeding distributions overlap. I had often wondered what problems would be encountered in identifying the chicks of the two species for banding. Differences in published descriptions of the two species suggested that this should be possible, although direct comparisons between the species were not made.

Mathews and Iredale (p. 93) described downy Crested Tern nestlings as: 'dirty white above and below, the upper surface with a few brown speckles, but pattern not discernible. Iris pale brown; legs and feet brownish-white; bill white.' Harrison (1975) stated simply: 'down mottled and variable, silvery-grey to olive-green.' From my observations, downy Crested Tern nestlings are usually well speckled with black. The bill is dirty white or dull grey; it is also rather thick — a heavy type bill.

Campbell (p. 836), from an observation by J. Walker describing a Lesser Crested Tern runner just before flying, wrote: 'the young ones, in a