

# EGRETRY COUNTS IN HONG KONG, WITH PARTICULAR REFERENCE TO THE MAI PO INNER DEEP BAY RAMSAR SITE

## SUMMER 2000 REPORT

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### Summary

In the 2000 breeding season, a total of 746 nests of Great Egrets (*Egretta alba*, 52 nests), Little Egrets (*Egretta garzetta*, 248 nests), Cattle Egrets (*Bubulcus ibis*, 67 nests), Black-crowned Night Herons (*Nycticorax nycticorax*, 254 nests) and Chinese Pond Herons (*Ardeola bacchus*, 125 nests) in 17 egrettries were recorded in Hong Kong. A Chau egrettry in Starling Inlet was the largest egrettry (251 nests), while Tai O egrettry on Lantau and Ma On Kong egrettry at Kam Tin were the smallest (each six nests). Black-crowned Night Heron and Little Egret were the two most abundant breeding species in Hong Kong. The total number of nests in Hong Kong declined by 10% between 1999 and 2000. The total number of nests in the Deep Bay area comprised 26.1% of the total number of nests in Hong Kong. Little Egret was the most abundant nesting species in the Deep Bay area. The number of ardeid nests in the Deep Bay area shows an overall trend of decline since 1994. Local egrettries are threatened by loss of nesting and feeding habitats. Identification, preservation and management of feeding habitats are recommended to ensure the sustainability of the Hong Kong breeding population of ardeids.

### 1 INTRODUCTION

Breeding activity is an important aspect of population dynamics. Nesting populations of colonial waterbirds are counted as part of long-term monitoring studies in Europe, Australia and the United States (Maddock and Baxter 1991, Gawlik *et al.* 1998, Kushlan and Hafner 2000). Long-term records of breeding populations of colonial nesting ardeids are only present in Hong Kong and Vietnam in East and Southeast Asia (Lansdown *et al.* 2000). Recording of number of ardeid nesting populations in Hong Kong by volunteers of the Hong Kong Bird Watching Society started as early as 1958, but was suspended between 1975 and 1989 (Young and Cha 1995). Records were far from complete and on many occasions only breeding species were recorded with no count of nesting pairs made. In addition, not all colonies were counted each year. A total of 34 egrettries, active or abandoned, have been reported in Hong Kong up to the year 2000. At least 16 of these 34 colonies were discovered after 1990 (*ibid.*) and therefore only have a dataset of less

than 10 years. As a result of these factors, it is difficult to study long-term trends of the ardeid breeding population in Hong Kong.

The recording of breeding populations of egretries in the Deep Bay area as part of the long-term monitoring of waterfowl abundance in the Mai Po and Inner Deep Bay Ramsar Site started in 1998. Systematic surveys in the Deep Bay area have been carried out, including annual recording of both breeding species and the number of nesting pairs. Since the 1999 breeding season, we have attempted to survey all known breeding colonies in Hong Kong. In addition to recording breeding species and breeding population, an estimate of breeding success was incorporated into the surveys. This information will be useful for the long-term monitoring of the ardeid population in Hong Kong and Inner Deep Bay area.

## 2 METHODS

Seventeen egretries were surveyed between April and June 2000 (Table 1), and these are mapped in Figure 1. Nests with incubating adults or chicks were counted from vantage points at all egretries except the Stonecutters egretty, where the number of nests was counted by estimating the number of birds around the egretty because most nests were built in dense vegetation. In addition, the nesting substratum was noted. For egretries surveyed more than once, nesting population was taken to be the sum of the highest count of each species. The number of chicks in each nest was counted and the mean number of chicks was estimated for Little Egrets (*Egretta garzetta*) at the Mai Po Village egretty.

Table 1. Dates of egretty surveys in the 2000 breeding season (Locations in Figure 1)

Egretty	Date
1. Mai Po Village	15 Apr, 21 Apr, 11 May, 1 Jun
2. Tam Kon Chau	24 Apr, 26 May, 1 Jun
3. Pak Nai	29 Apr, 12 May
4. Ngau Hom Shek	6 May
5. Ho Sheung Heung	11 May, 1 Jun
6. Tai Po Market	1 May, 6 May, 1 Jun
7. Centre Island	9 Jun
8. Penfold Park	21 Apr
9. A Chau	12 Mar, 22 Apr, 20 May
10. Stonecutters	29 Apr
11. Ho Chau Lang (Au Tau)	29 Apr
12. Lam Tsuen	19 Jun
13. Tai O	7 May
14. Shui Mei *	23 Jun
15. Ho Pui *	25 Apr, 24 May, 20 Jun, 28 July
16. Ma On Kong *	25 Apr, 24 May, 20 Jun, 28 July
17. Shek Wu Wai *	20 Jun, 28 July

\* data provided by Ecosystems Ltd.

### 3 RESULTS and DISCUSSIONS

#### 3.1 Nesting population

##### 3.1.1 All egrettries

A total of 746 nests were recorded at 17 egrettries in Hong Kong in the 2000 breeding season (Figure 1, Appendix 1 - 17), and this was a 10% decline from 830 nests in 1999 (Wong *et al.* 2000). Records of the Shui Mei, Ho Pui, Ma On Kong and Shek Wu Wai egrettries (Fig. 1) were provided by Ecosystems Ltd. (App. 15 – 17) (Ecosystems Ltd. unpubl. data). The Tam Kon Chau, Ho Chau Leng (Au Tau), Shui Mei and Lam Tsuen egrettries were newly reported in 2000. The Shek Wu Wai egrettry was first reported in 1996 and was only surveyed in 1996 and 1997 (L. Young, pers. comm.). The Pak Nai, Tai Po Market and Stonecutters egrettries moved to new locations near the former ones. The movement of the Tai Po Market egrettry could be due to the smothering of nesting sites by climbers. Clearance of climbers at the old egrettry site was done by AFCD during the time of writing of this report. Abandonment of the former Pak Nai egrettry could be due to collection of eggs and chicks by villagers (Wong *et al.* 2000).

The highest number of nests was recorded at A Chau egrettry (33.6% of total nests in 2000) while the lowest was at the Ma On Kong and Tai O egrettries (each 0.8% of total nests in 2000) (Table 2). Nests in the A Chau egrettry accounted for 71% of the total number of nests of Great Egrets (*Egretta alba*), 61% of Black-crowned Night Herons (*Nycticorax nycticorax*) and 63% of Cattle Egrets (*Bubulcus ibis*) of all colonies in the 2000 breeding season.

Black-crowned Night Heron was numerically the dominant breeding species in Hong Kong in 2000, while Great Egrets were the least (Table 2). Although the Black-crowned Night Heron was the dominant breeding species, it only nested in five colonies, while Little Egrets occurred in 15 and Chinese Pond Herons (*Ardeola bacchus*) in 14 colonies.

Table 2. The number of nests at each egretty in the Hong Kong in the 2000 breeding season.

	Great Egrets	Little Egrets	Black-crowned Night Herons	Chinese Pond Herons	Cattle Egrets	Total nests (% of total nests)
1. Mai Po Village	8	44	40	6	10	108 (14.5)
2. Tam Kon Chau		1		12		13 (1.7)
3. Pak Nai		40		2	2	44 (5.9)
4. Ngau Hom Shek		11		4		15 (2.0)
5. Ho Sheung Heung		19		40	1	60 (8.0)
6. Tai Po Market	1	10	6			17 (2.3)
7. Centre Island	5	38	23		3	69 (9.3)
8. Penfold Park		20		2		22 (3.0)
9. A Chau	37	15	155	2	42	251 (33.7)
10. Stonecutters	1	20	30			51 (6.8)
11. Ho Chau Leng (Au Tau)		21		7		28 (3.8)
12. Shui Mei *		1		15		16 (2.1)
13. Lam Tsuen				12		12 (1.6)
14. Tai O		5		1		6 (0.8)
15. Ho Pui *		2		2	9	13 (1.7)
16. Ma On Kong *				6		6 (0.8)
17. Shek Wu Wai *		1		14		15 (2.0)
Total	52	248	254	125	67	746 (100.0)

\* data provided by Ecosystems Ltd.

### 3.1.2 Egrettries in Deep Bay

There were five active egrettries (Mai Po Village, Tam Kon Chau, Pak Nai, Ngau Hom Shek and Shek Wu Wai egrettries) in the Deep Bay area in 2000. The total number of nests in the Deep Bay area comprised 26.1% of the total number of nests in Hong Kong in 2000. Tam Kon Chau egretty was the only active colony within the Inner Deep Bay Ramsar Site and there were 13 nests in this egretty. The former Tsim Bei Tsui egretty, which was the only colony within the Inner Deep Bay Ramsar Site in 1998 (Carey 1998), was inactive in 1999 and 2000. However, the mangal nesting sites were still intact. Five nesting colonies have been established and abandoned in Tsim Bei Tsui since 1989 (L. Young, pers. comm.).

The Little Egret was numerically the dominant breeding species in the Deep Bay area, while Great Egrets were the least in 2000 (Table 3). Egrettries in the Deep Bay area contained 44.4% of total nests of Cattle Egrets and 39.1% of total nests of Little Egrets in Hong Kong.

The temporal trend of number of ardeid nests in the Deep Bay area between 1989 and 2000 is shown in Fig. 2. There was no record in 1992 and the counts of Great Egrets and Cattle Egret in 1996 were incomplete (Table 4). In addition, not all colonies in the Deep Bay area were surveyed every year. The peak number of nests was recorded in 1994. Since then, the nesting ardeid

population in the Deep Bay area has apparently showed an overall trend of decline ( $r_s = -0.964$ ,  $p < 0.01$ ). The number of nests in the Deep Bay area in 2000 was the second lowest since 1989.

Figure 2. Number of nesting pairs in the Deep Bay area between 1989 and 2000

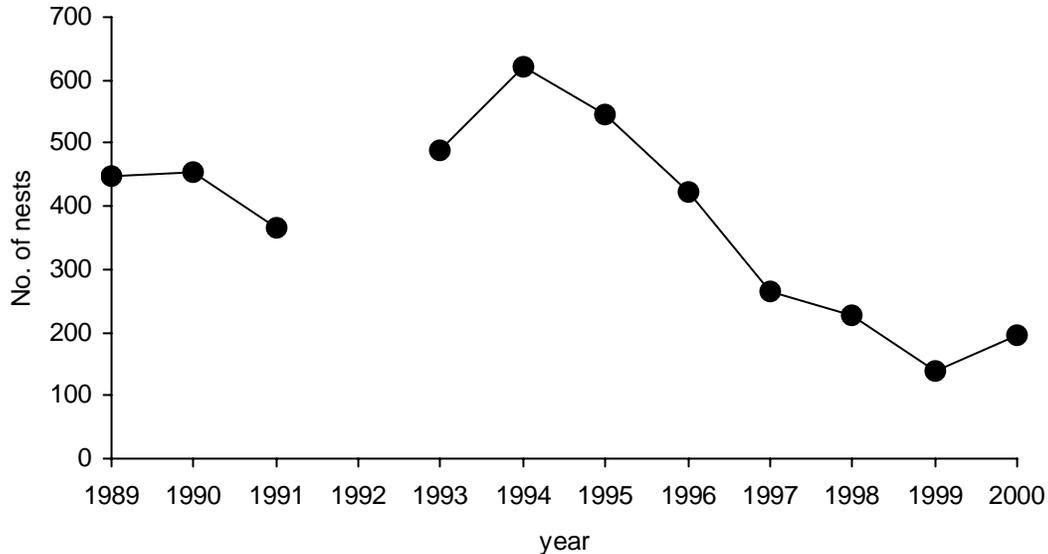


Table 3. Percentage of nests of each ardeid species in the Deep Bay area as total in Hong Kong in 2000

Species	No. of nests in Deep Bay	Total no. of nests in Hong Kong	Deep Bay nests as % of all nests in Hong Kong
Great Egret	8	52	15.4
Little Egret	97	248	39.1
Black-crowned Night Heron	40	254	15.7
Chinese Pond Heron	38	165	23.0
Cattle Egret	12	27	44.4

Table 4. Numbers of nesting pairs of each ardeid species in the Deep Bay area between 1989 and 2000. "+" = minimum number.

	Grey Heron	Great Egret	Little Egret	Black-crowned Night Heron	Chinese Pond Heron	Cattle Egret	Total
1989	0	0	94	90	181	84	449
1990	1	4	106	97	167	80	455
1991	0	6	100	199	153	107	366
1992	-	-	-	-	-	-	-
1993	5	29	272	265	95	88	489
1994	1	46	319	485	171	85	622
1995	0	23	334	396	136	53	546
1996	0	40+	263	155	103	16+	422
1997	0	12	263	7	130	10	266
1998	0	33	114	80	86	28	227
1999	0	6	68	26	16	24	140
2000	0	8	97	40	38	12	195

### 3.2 Potential breeding success

The number of chicks was recorded in five of the 17 surveyed egrettries (App. 18-22). The mean size of the fledged brood of Little Egrets at Mai Po Village egrettry was  $2.1 \pm 0.15$  (S.E.) ( $n = 38$ ) in the 2000 breeding season. Since the mean size of the fledged brood of Little Egrets at Mai Po Village egrettry was not estimated in the 1999 breeding season, no comparison could be made.

The date of nesting at Mai Po and A Chau egrettries has been getting later over the years, and this is most likely related to food availability (L. Young, pers. comm.). However, this change in food availability may be induced by 'man', such as fishpond operators changing their method of management so affecting the timing of prey availability. In addition, it may also be caused (wholly or partially) by a change in rainfall pattern. For example, it has been shown that the timing of nesting of Cattle Egrets is related to when the spring rains begin (Maddock and Baxter 1991, McKilligan 1997), as the rain will lead to an increase in the amount of invertebrates on which Cattle Egrets feed.

### 3.3 Nesting habitats

Nesting habitat was recorded at Mai Po Village, Tam Kon Chau and Ho Sheung Heung egrettries. All nests at the Tam Kon Chau egrettry were built on a single Banyan tree (*Ficus microcarpa*). All nests at the Ho Sheung Heung egrettry were built on bamboo. Nests at Mai Po Village egrettry were built on bamboo and trees (*Melaleuca leucadendron*, *Ficus microcarpa* and *Cassia* sp.).

### 3.4 Management

Long-term sustainability of ardeid nesting colonies will depend on the protection of nesting habitats (Kushlan and Hafner. 2000) and preservation of enough feeding habitats in the vicinity of the colonies (Hoffmann *et al.* 1996, Mckilligan 1997). Some egrettries (e.g., Stonecutters and Centre Island egrettries) suffered from being overgrown by climbers. Climber removal outside the breeding season is recommended. Both colony size and diversity of nesting species can be affected by qualitative and quantitative degradation of feeding habitats around egrettries (e.g., Farinha and Leitão 1996, Hoffmann *et al.* 1996, Hafner and Kushlan 2000). Local colonies are apparently getting smaller and more dispersed over time, and this is potentially influenced by food availability (L. Young, pers. comm.). The most important threat to local ardeid nesting colonies is loss of feeding habitats due to regulated and unregulated development. The combined impacts are probably ecologically unsustainable. Therefore, the sustainability of local ardeid colonies will also depend on identification, preservation and long-term management of key feeding habitats.

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#### 5 REFERENCES

- Carey, G.J. 1998. *Egret counts in Hong Kong, with particular reference to the Mai Po and Inner Deep Bay Ramsar Site – Summer 1998 Report*. The Conservancy Association.
- Farinha, J. P. and D. Leitão. 1996. The size of heron colonies in Portugal in relation to foraging habitat. *Colonial Waterbirds* 19 (Special Publication 1): 108-114.
- Gawlik, D.E., R.D. Slack, J. A. Thomas and D. N. Harpole. 1998. Long-term trends in population and community measures of colonial-nesting waterbirds in Galveston Bay Estuary. *Colonial Waterbirds* 21: 143-151.
- Hoffmann, L., H. Hafner and T. Salathé. 1996. The contribution of colonial waterbird research to wetland conservation in the Mediterranean region. *Colonial Waterbirds* 19 (special publication 1): 12-30.
- Kushlan, J. A. and H. Hafner. 2000. *Heron Conservation*. Academic Press, Great Britain.
- Landsdown, R. V., T. Mundkur and L. Young. 2000. Herons in East and South-east Asia. pp 73-98, in (J. A. Kushlan and H. Hafner). *Heron Conservation*. Academic Press, Great Britain.
- Maddock, M. and G.S. Baxter. 1991. Breeding success of egrets related to rainfall: a six-year Australian study. *Colonial Waterbirds* 20(3): 133-139.
- McKilligan, N.G. 1997. A long term study of factors influencing the breeding success of the Cattle Egret in Australia. *Colonial Waterbirds* 20(3): 419-428.
- Wong, L. C., Kwok, H. K. and Carey, G.J. 2000. *Egret counts in Hong Kong, with particular reference to the Mai Po and Inner Deep Bay Ramsar Site – Summer 1999 Report*. The Conservancy Association.
- Young, L. and M.W. Cha. 1995. The history and status of egretries in Hong Kong with notes on those in the Pearl River delta, Guangdong, China. *Hong Kong Bird Report* 1994: 196-215.