Waterbird Monitoring Programme at the Mai Po Inner Deep Bay Ramsar Site

Summer 2001 Report

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Introduction

Comprehensive counts of waterbirds in the Deep Bay area were first carried out as part of an annual midwinter waterbird census first undertaken by the Hong Kong Bird Watching Society (HKBWS) in 1979. These continued in January every winter (excluding 1980) until 1992-93 when they were expanded to cover the winter period from November to March. With the establishment of the Mai Po Inner Deep Bay Ramsar Site, a monthly waterbird monitoring programme was instituted. This project, which commenced in March 1998, is coordinated and carried out by the HKBWS and funded by the Agriculture, Fisheries and Conservation Department. Monthly counts of waterbirds in the site form one part of this programme, the others being counts of shorebirds during the migration season, and egretry surveys during the breeding season. This report concerns the monthly waterbird monitoring component.

Methodology

The methodology used and the areas covered are described in detail in the *Waterbird Count Handbook* (Carey undated, Carey 2002). In general terms, however, it involves surveying specified areas and, where possible, mapping birds to individual fish ponds or *gei wai*. Other variables, such as the vegetation surrounding each pond, the height of exposed edge to the pond and the percentage of pond bottom exposed as a result of drain-down are also measured. Tidal areas of Inner Deep Bay are surveyed simultaneously so as to ensure as little double-counting as possible occurs. During the summer months counts occur at high tide. During the winter months when there are substantial numbers of birds in the bay, and when there are no diurnal tides of a sufficient height to force inland all birds off the mudflat and onto roost sites inland, counts occur on a rising tide, preferably one that comes to about 2.0m., though in practice there are rather few of these. Higher counts of individual species one week either side of the count date are included if they are considered to be more accurate than those made on the day.

Summary reports are produced monthly, while seasonal reports are produced bi-annually, one for the summer period from April to September, and the other for the winter period from October to March. This report concerns the summer period of 2001.

Results

The results of each monthly count are provided in detail in Appendix 1.

April

The April 2001 waterbird count took place on the 15th. Coverage of the Ramsar Site was complete with the exception of Tam Kon Chau. For the Deep Bay area as a whole, all sites were surveyed apart from Shenzhen River B (Ma Tso Lung). A total of 12,858 waterbirds were recorded in the Deep Bay area (including Fu Tian, which is now being regularly surveyed), of which 11,683 were present in the Ramsar Site. Table 1 summarises this year's count, while Table 2 compares the total for Deep Bay Area and the Ramsar Site with equivalent counts since the monitoring programme started.

Table 1. Summary of waterbird count for April 2001.

Total by species group	**Deep Bay Area**	%	**Ramsar Site**	%	SW	SI
Cormorants	**1**	0.01	**0**	0.00	0	0
Herons,egrets, etc	**1519**	11.81	**884**	7.57	32	844
Ducks and grebes	**216**	1.68	**199**	1.70	0	0
Rails, Coot etc	**37**	0.29	**21**	0.18	1	7
Waders	**10,892**	84.71	**10,386**	88.90	9	10
Gulls and terns	**193**	1.50	**193**	1.65	0	0
TOTAL	**12,858**		**11,683**		42	861

SW : Shuen Wan, SI : Starling Inlet

Table 2. April waterbird counts 1998-2001.

	1999	**2000**	**2001**	**Average**	**Std. Dev.**
Deep Bay area	11,686	8,049	12,858	10,864	2047
Ramsar Site	11,148	7,826	11,683	10,219	1706

The April 2001 count is higher than equivalent counts in the previous two years, despite the fact that Tam Kon Chau was not surveyed. The largest numbers comprise waders and ardeids. A comparison of these two groups with the Ramsar Site figures for previous years is contained in Table 3.

Table 3. Comparison of selected waterbird count figures in the Ramsar Site for April 1998-2001.

	1999		2000		2001	
	count	%	count	%	count	%
Ardeids	506	4.5	387	4.9	884	7.6
Waders	10,474	94	7,350	93.9	10,386	88.9
Total	10,980	98.5	7,737	98.8	11,270	96.5
All waterbirds	11,148		7,826		11,683	

It can be seen that the number of ardeids and their proportion of the total count of waterbirds increased in 2001. The number of waders also increased to the second highest count made as part of this monitoring programme.

May

The May 2001 waterbird count took place on the 13th, and coverage of the Ramsar Site was complete apart from Tam Kon Chau and the few ponds in Shenzhen River A that lie within the Ramsar Site. With regard to the Deep Bay area as a whole, all other sites were surveyed apart from Shenzhen River A, Shenzhen River B (Ma Tso Lung) and San Tin.

A total of 3,201 waterbirds were recorded in the Deep Bay area, of which 2,238 were present in the Ramsar Site. Ardeids formed the largest group numerically, with 1620 present. The next largest group was waders, which numbered 1436. This reflects the summering population of ardeids and the latter part of migrant shorebird passage through Deep Bay. The results of the count are summarised in Table 4.

Table 4. Summary of waterbird count for May 2001.

Total by species group	**Deep Bay Area**	%	**Ramsar Site**	%	SW	SI
Cormorants	**0**	0.00	**0**	0.00	0	
Herons,egrets, etc	**1620**	50.61	**874**	39.05	56	
Ducks and grebes	**61**	1.91	**58**	2.59	0	
Rails, Coot etc	**29**	0.91	**19**	0.85	0	
Waders	**1436**	44.86	**1232**	55.05	14	
Gulls and terns	**55**	1.72	**55**	2.46	0	
TOTAL	**3201**		**2238**		70	n/c

SW : Shuen Wan, SI : Starling Inlet, n/c : not counted

A comparison with previous years' counts and the average for the month is provided in Table 5. It can be seen that this year's count was about average for the month.

Table 5. May waterbird counts 1998-2001.

	1998	1999	2000	2001	Average	Std. Dev.
Deep Bay area	n/c	3,973	2,206	3,201	3,127	723
Ramsar Site	n/c	3,438	1,862	2,238	2,513	672

The largest numbers comprise waders and ardeids. A comparison of these two groups with the Ramsar Site figures for previous years is contained in Table 6.

Table 6. Comparison of selected waterbird count figures in the Ramsar Site for May 1998-2001.

	1998		1999		2000		2001	
	count	%	count	%	count	%	count	%
Ardeids	1521	49.7	912	26.5	696	37.4	874	34.8
Waders	1482	48.4	2363	68.7	1000	53.8	1232	49.0
Total	3003	98.1	3275	95.2	1696	91.2	2106	83.8
All waterbirds	3063		3438		1862		2513	

It can be seen that the counts of ardeids and waders both remained within the range already established.

June

The June count took place on 17th, and coverage of the Ramsar Site was complete. With regard to the Deep Bay area as a whole, all other sites were surveyed apart from Shenzhen River B (Ma Tso Lung) and San Tin. A total of 3,324 waterbirds were recorded in the Deep Bay area (including Fu Tian), of which 1,500 were present in the Ramsar Site. As is usual at this time of year, ardeids comprised by far the largest group of birds, with 2,975 recorded. The increase on the number of ardeids recorded in May probably reflects the presence of locally-bred juveniles in the population. A small summering population of 246 waders was also present. The results of the count are summarised in Table 7.

Table 7. Summary of waterbird count for June 2001.

Total by species group	Deep Bay Area	%	Ramsar Site	%	SW	SI
Cormorants	**1**	0.03	**1**	0.07	0	
Herons,egrets, etc	**2975**	89.50	**1184**	78.93	68	
Ducks and grebes	**57**	1.71	**41**	2.73	0	
Rails, Coot etc	**45**	1.35	**31**	2.07	1	
Waders	**246**	7.40	**243**	16.20	0	
Gulls and terns	**0**	0.00	**0**	0.00	0	
TOTAL	**3324**		**1500**		69	n/c

SW : Shuen Wan, SI : Starling Inlet

A comparison with previous years' counts and the average for the month is provided in Table 8. It can be seen that this year's count was significantly above average, and was the highest since monthly waterbird counts began. However, there was no count in 2000, and the 1998 count was the first full waterbird count.

Table 8. June waterbird counts 1998-2001.

	1998	1999	2000	2001	Average	Std. Dev.
Deep Bay area	891	1,307	n/c	3,324	1,841	1045
Ramsar Site	1,194	999	n/c	1,500	1,231	251

As usual in midsummer, ardeids comprise the bulk of waterbirds recorded in the Ramsar Site. Table 9 details the counts of the most numerous ardeid species each June since 1998. It can be seen that numbers of the two larger species, Little and Great Egrets, have increased by a minimum of 50% compared with 1998 and 1999. The number of Cattle Egrets recorded, however, was lower.

Table 9. Comparison of counts selected ardeids in the Ramsar Site for June 1998-2000.

Species	1998	1999	2000*	2001
Cattle Egret	106	121	n/c	88
Chinese Pond Heron	113	120	n/c	133
Little Egret	292	283	n/c	561
Great Egret	213	220	n/c	324
Total (%) of all waterbirds	724 (81%)	744 (75%)		1106 (74%)
All waterbirds	891	999	-	1500

* count cancelled.

July

The July 2001 waterbird count was cancelled due to heavy rain.

August

The August 2001 waterbird count took place on the 19th, and coverage of the Ramsar Site was complete. With regard to the Deep Bay area as a whole, all other sites were surveyed apart from Shenzhen River B (Ma Tso Lung) and San Tin. A total of 4,124 waterbirds were recorded in the Deep Bay area (including Fu Tian), of which 2,858 were present in the Ramsar Site. Two groups comprised the bulk of birds: ardeids at 2118 and migrant waders at 1895. The results of the count are summarised in Table 10.

Table 10. Summary of waterbird count for August 2001.

Total by species group	**Deep Bay Area**	**%**	**Ramsar Site**	**%**	SW	SI
Cormorants	**0**	0.00	**0**	0.00	0	0
Herons,egrets, etc	**2118**	51.36	**950**	33.24	52	189
Ducks and grebes	**75**	1.82	**56**	1.96	0	0
Rails, Coot etc	**36**	0.87	**17**	0.59	1	1
Waders	**1895**	45.95	**1835**	64.21	2	7
Gulls and terns	**0**	0.00	**0**	0.00	1	0
TOTAL	**4124**		**2858**		56	197

SW : Shuen Wan, SI : Starling Inlet

A comparison with previous years' counts and the average for the month is provided in Table 11. It can be seen that this year's count was above average, and the highest August count since monthly waterbird counts began.

Table 11. August waterbird counts 1998-2001.

	1998	1999	2000	2001	Average	Std. Dev.
Deep Bay area	3,047	2,784	3,178	4,124	3,283	564
Ramsar Site	2,817	2,287	2,232	2,858	2,549	287

From Table 12, which compares counts of ardeids and waders during August counts since 1998, it can be seen that the count of migrant waders was the highest for the month, while that for ardeids was higher than that of the previous two years. It appears that the number of ardeids present in the Ramsar Site in 1998 (1588) was rather high, while the number present in the past three years has been in the range 826-950. However, it may be of significance that the August 1998 waterbird count occurred when the maximum diurnal tide height was 1.55m, rather than the 2.2m or higher that normally occurs during waterbird counts.

Table 12. Comparison of selected waterbird groups in the Ramsar Site for August 1998-2001.

	1998		**1999**		**2000**		**2001**	
	count	%	count	%	count	%	count	%
Ardeids	1588	56.4	861	37.7	826	37.0	950	33.2
Waders	1153	40.9	1363	59.6	1331	59.6	1835	64.2
Total	2741	97.3	2224	97.3	2157	96.6	2785	97.5
All waterbirds	2817		2287		2232		2858	

The same fact should be borne in mind when examining Table 13, which compares counts of the most numerous ardeids in the Ramsar Site in August of the last four years. These figures do suggest, however, that in August 2001 the number of Cattle Egrets, the count for which species is unlikely to be significantly affected by tidal heights, was notably low.

Table 13. Comparison of counts of selected ardeids in the Ramsar Site for August 1998-2000.

Species	August 1998	August 1999	August 2000	August 2001
Cattle Egret	187	111	222	31
Chinese Pond Heron	156	112	142	140
Little Egret	866	407	318	422
Great Egret	296	204	113	279
Total	1505	834	795	872

September

The September 2001 waterbird count took place on the 16th, and coverage of the Ramsar Site was complete, apart from the sites of Lut Chau/Tai Sang Wai, and Deep Bay B (Mai Po boardwalk). Given that this monthly count, like other summer counts, was carried out when there is no mud exposed in front of the boardwalk, there is unlikely to have been large numbers of waterbirds at Deep Bay B. Elsewhere in the Deep Bay area, San Tin was not counted.

A total of 4,566 waterbirds was recorded in the Deep Bay area (including Fu Tian), of which 3,087 were present in the Ramsar Site. The largest group comprised migrant waders at 2670, reflecting the peak of autumn passage, which occurs around this time. The second largest group comprised ardeids, which numbered 1621. A count of 242 ducks and grebes indicates the first arrival of wintering birds. The results of the count are summarised in Table 14.

Table 14. Summary of waterbird count for September 2001.

Total by species group	Deep Bay Area	%	Ramsar Site	%	SW	SI
Cormorants	**0**	0.00	**0**	0.00	0	0
Herons,egrets, etc	**1621**	35.50	**504**	16.33	112	273
Ducks and grebes	**242**	5.30	**193**	6.25	0	0
Rails, Coot etc	**33**	0.72	**11**	0.36	2	3
Waders	**2670**	58.48	**2379**	77.07	10	11
Gulls and terns	**0**	0.00	**0**	0.00	0	0
TOTAL	**4566**		**3087**		124	287

SW : Shuen Wan, SI : Starling Inlet

A comparison with previous years' counts and the average for the month is provided in Table 15. It can be seen that this year's count was closer to the average in the Deep Bay Area than in the Ramsar Site.

Table 15. September waterbird counts 1998-2001.

	1998	1999	2000	2001	Average	Std. Dev.
Deep Bay area	5,303	3,499	5,689	4,566	4,764	899
Ramsar Site	4,705	2,994	3,580	3,087	3,592	317

Table 16 provides a comparison of selected counts for September in the years 1998-2001. Although it appears that there has been a notable fall in the number of ardeids occurring, it can be seen from a comparison with Table 15 that this is confined to the Ramsar Site, reflecting a distributional difference, rather than a numerical one. Indeed, the count of 911 Little Egrets in the Deep Bay area is the second highest September count yet.

Table 16. Comparison of selected count figures in the Ramsar Site for September 1998-2001.

	1998		**1999**		**2000**		**2001**	
	count	%	count	%	count	%	count	%
Ardeids	1132	24.1	993	33.2	1054	29.4	504	16.3
Waders	3366	71.5	1889	63.1	2121	59.2	2379	77.1
Total	4498	95.6	2882	96.3	3175	88.6	2883	93.4
All waterbirds	4705		2994		3580		3087	

The other species count of interest is that of Grey Heron, of which 122 were recorded in the Deep Bay area. This is the highest count of this species in Hong Kong in September. With regard to the ardeid species that regularly breed in Hong Kong, Table 17 compares totals for each with those of the previous three years.

Table 17. Comparison of counts of selected ardeids in the Ramsar Site September 1998-2001.

Species	September 1998	September 1999	September 2000	September 2001
Cattle Egret	138	136	95	34
Chinese Pond Heron	97	122	162	89
Little Egret	428	506	433	223
Great Egret	288	137	250	74
Total	951	901	940	420

The three previous counts for September were very similar in terms of the total number of ardeids, all lying between 900 and 952. As described above, the number of each species in the Ramsar Site itself was relatively low, while, with the exception of Cattle Egret, the numbers in the Deep Bay area were normal. Only 42 Cattle Egrets were recorded in the Deep Bay area, a rather low figure, perhaps reflecting weak autumn passage.

Table 18 summarises total counts of the main ardeid species in the Ramsar Site during each of the monthly counts and the total number of breeding pairs of each species as recorded by the Ramsar Site Waterbird Monitoring Programme and reported by Wong and Kwok (2001). The pattern for

Cattle Egret suggests highest numbers occurred during spring migration, and that autumn passage was rather weaker. The pattern for both Chinese Pond Heron and Little Egret indicates a gradual increase to at least June, presumably related to an increasing number of locally-bred birds present in the population.

The peak count of Chinese Pond Herons is somewhat lower than the known number of breeding pairs, as might be expected for a species that is unobtrusive when foraging. In contrast, the peak count of Little Egrets is higher than the known number of breeding birds, reflecting its high visibility when foraging and the presence of non-breeding or juvenile birds. With regard to Great Egret, this species remains a relatively rare breeding species in Deep Bay, and thus the peak in June suggests an influx of non-breeding summering birds from elsewhere.

Table 18. Total counts of main ardeid species in the Ramsar Site, April to September 2001, and number of breeding pairs in Deep Bay (from Wong and Kwok 2001).

Species	April	May	June	July	August	September	breeding population
Cattle Egret	143	138	88	-	31	34	22 pairs
Chinese Pond Heron	81	97	133	-	140	89	90 pairs
Little Egret	309	448	561	-	422	223	145 pairs
Great Egret	135	148	324	-	279	74	12 pairs
Total	668	831	1106	n/c	872	420	269 pairs

n/c : no count

Discussion

No clear pattern emerges with regard to the numbers of most locally-breeding ardeid species in the Ramsar Site or Deep Bay area. During the first part of the summer numbers were generally mixed or slightly lower with regard to previous years, while in the latter part of the summer they were slightly above average. The only species for which a clear-cut difference is apparent is Cattle Egret, the numbers of which were relatively low in the autumn. However, the Deep Bay breeding population of this species is not large, and its numbers are largely influenced by the strength of spring and autumn migration.

References

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