



Mai Po Inner Deep Bay Ramsar Site Waterbird Monitoring Programme

Winter 2003-04 Report

Y. T. Yu



The Hong Kong Bird
Watching Society Limited



Agriculture, Fisheries and
Conservation Department

Waterbird Monitoring at the Mai Po Inner Deep Bay Ramsar Site

Waterbird Count Coordinator

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Project Funding

Agriculture, Fisheries and Conservation Department

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Published by

The Hong Kong Bird Watching Society Limited

Available from

The Hong Kong Bird Watching Society Limited

Room 625, Beverley Commercial Building, 87-105 Chatham Road

Tsim Sha Tsui, Kowloon, Hong Kong

E-mail: hkbws@hkbws.org.hk Website: www.hkbws.org.hk

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This publication should be cited as

YU, Y.T. 2004. Winter 2003-04 Report on Waterbird Monitoring at the Mai Po Inner Deep Bay Ramsar Site. The Hong Kong Bird Watching Society Limited. Hong Kong.

Cover photo: Oriental Stork *Ciconia boyciana* at Mai Po (Photo by: Henry LUI)

Waterbird Monitoring at the Mai Po Inner Deep Bay Ramsar Site

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MAI PO INNER DEEP BAY RAMSAR SITE WATERBIRD MONITORING PROGRAMME

Programme 2003/04

Monthly Waterbird Counts

Oct 2003 - Mar 2004

Part 1: Winter 2003-2004 Report

Y.T. Yu¹

Introduction

Long-term monitoring of waterbirds in the Mai Po Inner Deep Bay Ramsar Site is an important aspect of the management strategy for the Site, and provides an indication of the health of the Deep Bay ecosystem. This programme, which commenced in March 1998, is administered and executed by the Hong Kong Bird Watching Society Limited (HKBWS) under subvention from the Agriculture, Fisheries and Conservation Department. Monthly counts of waterbirds form one part of this programme, the other main components being counts of migrant shorebirds utilising the area and surveys of ardeid nesting colonies. This report concerns the waterbird monitoring component for the winter period from October 2003 to March 2004.

Coordinated mid-monthly counts of wintering waterbirds in Hong Kong were carried out by members of the HKBWS on 12 October 2003, 9 November 2003, 7 December 2003, 25 January 2004, 22 February 2004 and 21 March 2004. The January count was carried out to coincide with the Asian Waterfowl Census organized by Wetlands International – Asia Pacific. Counts from November to March have been carried out each winter since 1992-1993; counts in January were first carried out in 1979.

In accordance with guidelines provided by Wetlands International, other counts, if higher, are included from the one-week period either side of the coordinated count date. It should be noted that for the majority of species this means the single count must be higher than the total provided by the coordinated count for it to be included. As in recent winters, the use of mobile phones at Tsim Bei Tsui and Mai Po Boardwalk ensured that double-counting and, as far as possible, under-counting was

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avoided for birds in the intertidal areas on the Hong Kong side of Deep Bay ('Inner Deep Bay').

Due to habitat degradation, the areas of Tin Shui Wai and Chau Tau were dropped from the list of sites counted from winter 2000-2001. Nam Sang Wai was only surveyed for roosting Great Cormorants *Phalacrocorax carbo* in the evening of the January count. This area is fenced by the land owner and is not accessible to waterbird counters.

Results

Coverage of the whole Deep Bay and the Ramsar Site was complete in November, January, February and March. Deep Bay C, D, and E, and Mai Po San Tsuen were not covered in the October count. Shenzhen River B and Tam Kon Chau were not surveyed in the December count.

The results of the six counts are summarized in Table 1; results in full are provided in Appendix 1.

Table 1. Deep Bay Area Waterbird Counts Winter 2003-2004 by groups and area.

Group	Site	Oct	Nov	Dec	Jan	Feb	Mar
Cormorants	Ramsar Site	2	2819	3446	7364	5846	544
	Deep Bay area	22	3041	4103	8964	4050	1353
	SI & SW	16	109	15	47	172	21
Ardeids	Ramsar Site	603	3210	2030	2220	2560	1670
	Deep Bay area	2571	5321	3963	3422	3663	2860
	SI & SW	479	521	520	537	530	555
Ducks and grebes	Ramsar Site	55	6768	13283	4022	5305	1075
	Deep Bay area	129	7242	16219	4536	11288	1991
	SI & SW	0	12	9	21	14	32
Rails, Coots etc.	Ramsar Site	17	110	61	268	81	78
	Deep Bay area	66	148	81	362	128	145
	SI & SW	6	5	5	9	7	1
Waders	Ramsar Site	2442	3840	4548	9742	1729	3429
	Deep Bay area	2593	4296	4743	9847	4273	6016
	SI & SW	24	94	91	63	74	36
Gulls and terns	Ramsar Site	0	1314	8385	296	167	35
	Deep Bay area	0	1345	8469	796	268	35
	SI & SW	0	0	0	0	0	0
Totals	Ramsar Site	3119	18061	31753	23915	13892	6831
	Deep Bay area	5381	21303	37578	27927	25466	12400
	SI & SW	525	872	642	677	797	645

SI & SW = Starling Inlet and Shuen Wan

Peak waterbird numbers occurred in December, which is different from previous years, when peak numbers were usually recorded in January. A total of 37,578 waterbirds of 52 species were recorded in the Deep Bay Area in the December count; the number of waterbirds present in the Ramsar Site was 31,753. This is the lowest number recorded since January 1990 (Figure 1). In January the number of waterbirds recorded dropped to a new low of only 27,927 individuals in the whole of Deep Bay and 23,915 in the Ramsar Site. The January count saw a considerable decrease of 48% and 41% respectively in comparison with the numbers in the previous year.

Two additional trial counts were conducted in January and February 2004, which provide supplementary data to the total numbers of waterbirds. Details are referred to Part 2 of this report and the numbers of waterbird in January and February are

adjusted to 36,478 and 29,234 respectively.

The decrease of waterbird numbers is mainly a result of a large decrease in numbers of the two main wintering waterbird groups: ducks and grebes, and gulls and terns. The number of ducks and grebes was 16,219 in December, while only 4,536 were counted in the January count. In winter 2002-03 the same group was recorded at 14,287 and 20,203, while in winter 2001-02 the December and January counts were 18,987 and 16,964 respectively. The number of gulls and terns showed the same pattern, and a maximum of only 8,469 birds were counted in this winter, while there was a significant drop in numbers from 13,191 birds in winter 2002-03 and 13,302 in winter 2001-02.

In order to gain a more accurate picture of the number of waterbirds that depend on Deep Bay for at least some part of the winter, and to counteract stochastic biases occurring as a result of using January count alone, the sum of peak species counts for the December to February period can be used. The total of these peak numbers was only 47,824 birds of 64 species, a notably decrease of 14,534, or 24% from the equivalent counts of previous winter. The January count comprised only 57% of the total winter count, which is the lowest percentage since the commencement of November to March waterbird counts in 1992-93. Similar to the monthly total number, this total of peak numbers can be adjusted using data from the two additional trial counts to 50,896 birds.

Counting conditions have become increasingly unfavourable over the years, due to sedimentation in the bay and poor visibility caused by atmospheric pollution (Yu 2003). In this winter two additional trial counts in the Deep Bay area, including areas of Deep Bay A (Futian), Deep Bay B (Mai Po boardwalk), Deep Bay C, D and E (from Tsim Bei Tsui jetty) were organized on days with high high-tide in the afternoon on 17 January and 15 February 2004. These counts aimed to find ways to refine the methodology so as to increase the accuracy and the effectiveness of the counts. We have noted that tidal height is an important factor affecting the result of waterbird counts. During winter months, the morning high-tide is usually much lower than that in the afternoon, which creates unfavourable conditions for the accuracy of counting. Some waterbird numbers were adjusted using data from these counts; for details of the additional counts, refer to Part 2 of this report.

The total number of waterbirds in winter 2003-04 was 50,896. This is a drop of 6-20% compared to a relatively stable range of 54,000 to 64,000 since winter 1997-98. From our field observation, the reason for the decrease in number might be cause by:

- Sedimentation increases the level of mudflat and causes encroachment of mangrove trees in the bay, thus reduce the area of available mudflat for foraging in the intertidal areas;
- The increase in mudflat level means that high tides are relatively lower in relation to the existing count locations. Thus, birds are located further away and are sufficiently close for accurate counting less frequently.
- Disturbance from illegal mudskipper collectors makes it more difficult to count birds. There may also be a direct impact on the numbers of birds actually occurring, as if both mudskipper collectors and birds wish to use an increasingly smaller area of available mudflat (the ‘prey’ items of both overlap), then some waterbirds may have to leave Deep Bay because disturbance prevents effective foraging.

The ten most numerous waterbird species recorded in the Deep Bay area during winter 2003-04 were: Great Cormorant *Phalacrocorax carbo* (8,964), Black-headed Gull *Larus ridibundus* (8,444), Pied Avocet *Recurvirostra avosetta* (3,500, see Part 2), Eurasian Wigeon *Anas penelope* (3,443, see Part 2), Northern Shoveler *Anas clypeata* (3,086), Dunlin *Calidris alpina* (2,430), Marsh Sandpiper *Tringa stagnatilis* (2,249), Common Teal (2,238), Kentish Plover *Charadrius alexandrinus* (2,210) and Little Egret *Egretta gazetta* (1,932).

Species of conservation significance

Some species that occur in the Deep Bay Area are of conservation significance due to their being listed as globally threatened by BirdLife International (2000), or because they are species for which Deep Bay supports, or may support, at least 1% of regional or flyway population, as used for implementing the Ramsar Convention criterion 3c. The ‘1% of regional or flyway population’ is based on information provided by Wetlands International (2002). A brief review of these important waterbird species is provided below.

Dalmatian Pelican *Pelcanus crispus* Conservation Dependent

Thirteen birds were present in Deep Bay this winter, one individual fewer than that in the previous winter. These birds constitute a minimum of 10% of the regional population which is estimated at fewer than 130 individuals in this region (Wetlands International 2002).

Great Cormorant *Phalacrocorax carbo*

A new Hong Kong high count of 8,964 birds was recorded in January. The 1% threshold value is set at 1,000 birds in the East Asia region (Wetland International

2002), meaning that Hong Kong supports 8.9% of the regional population.

Great Egret *Egretta alba*

A total of 1,064 individuals were recorded in the December 2003 count in the mid-winter period. In addition, a slightly higher number of 1,146 birds were recorded in the November count. The 1% threshold value is set at 1,000 individuals (Wetlands International 2002).

Oriental Stork *Ciconia boyciana* Endangered

An immature was recorded in the January count that remained in Deep Bay in February. This endangered species has only a small global population of fewer than 2,500 (BirdLife International 2000) to 3,000 individuals (Wetland International 2002).

Black-faced Spoonbill *Platalea minor* Endangered

A maximum of 266 birds were counted in December, including 259 individuals in Hong Kong and seven at Futian. This number is closed to a peak count of 262 at Mai Po on 14 December 2003 (P.J. Leader *pers. comm.*). The known global population was 1,206 individuals in January 2004 (Yu 2004), and hence approximately 22% of the world population, the same as the previous winter, was present in Deep Bay.

Pied Avocet *Recurvirostra avosetta*

This species was not recorded during the count in October. Numbers in counts from November to March were 1,012, 423, 1,267, 1,654 and 1,901 respectively. Inconsistency in these numbers indicated that tidal height affected the accuracy of the counts. The additional trial counts (see Part 2) obtained high numbers of 3,500 and 3,200 individuals; these constitute a maximum of 3.5% of the regional population because the 1% threshold value is set to 1,000 individuals (Wetlands International 2002).

Kentish Plover *Charadrius alexandrinus*

A count of 2,210 birds was made in January. The 1% regional population is set to 1,000 individuals and this number constitutes 2% of the regional population.

Eurasian Curlew *Numenius arquata*

The peak count in the monthly waterbird count was 739 in January, but a total of 850 birds were counted in the additional trial count of 15 February. The regional population is estimated at 35,000 individuals (Wetlands International 2002), and hence this represents 2.4% of the regional population.

Spotted Redshank *Tringa erythropus*

The peak winter count was 884 individuals in March but this is not in mid-winter period and so some passage individuals may also be included. A relatively low number of 339 birds were counted in the additional count on 17 January. However, a mixed flock of up to 2,445 *Tringa* sandpipers was recorded in the January count, and 1,849 and 1,050 birds were recorded in January and February additional counts. The 1% regional or flyway population is set at 1,000 (Wetlands International 2002) and this species has a minimum of 1% of the flyway population wintering in Deep Bay.

Marsh Sandpiper *Tringa stagnatilis*

The peak number of 2,249 birds was counted in December, which is the highest winter count of this species in Hong Kong, and constitutes a nearly 28% increase from the previous highest count recorded in winter 2002-03. The regional population is estimated at 90,000 individuals (Wetlands International 2002), and therefore this peak number represents to approximately 2.5% of the regional population.

Common Greenshank *Tringa nebularia*

The 1% regional or flyway population is set at 550 individuals (Wetlands International 2002). In winter 2003-04, the numbers were recorded as 883, 327, 489, 0, 326 and 281 from October to March. The high number in October suggested that some passage individuals were included. The numbers in mid-winter counts are closed to the 1% regional population and some unidentified *Tringa* (including Spotted Redshank) were recorded during the winter counts. Therefore, it is likely that at least 1% flyway population of this species winters in Deep Bay.

Nordmann's Greenshank *Tringa guttifer* Endangered

A single bird recorded in November is presumed to be a passage individual.

Saunders's Gull *Larus saundersi* Vulnerable

The peak count this winter was only 15 individuals, recorded in January, which is only about 9% of the peak number of 172 birds in winter 1993-94 and less than half the number of 35 individuals in the previous winter. The 1% threshold value is set at 85 from the whole population estimated at 7,100 to 9,600 (Wetlands International 2002).

Other notable counts

Falcated Duck *Anas falcata*

Two birds were recorded in January. Together with the records of previous winters, this species only appears in very low numbers presently.

Tufted Duck *Aythya fuligula*

A total of 1,095 individuals was recorded in December. This is the second highest count of this species, and very closed to the highest count of 1,140 birds in February 1999.

Eurasian Coot *Fulica atra*

The peak winter count of 260 was made in January, which is over four times the number present in the previous winter. However, the number is still low compared to the numbers in winters of the early 1990s. This species is also decreasing at some other wintering grounds (Simba Chan *in litt.*).

Other observations

Mudskipper collectors

Illegal mudskipper collectors continued to operate on the mudflats in the Deep Bay mudflat from February onward. They caused extensive disturbance to waterbirds and also their unsustainable collection of mudskippers and invertebrates can seriously affect this food source of wintering waterbirds.

Conclusion

The total number of waterbirds in winter 2003-04 was 50,896. This number constitutes a drop of 6-20% from the previous range of 54,000 to 64,000 waterbirds since winter 1997-98. Given the difficulties of accurately counting waterbird in the intertidal areas of Deep Bay, it is unclear how accurate this figure is, or whether it really indicates a significant decrease has occurred since last winter.

However, it is certainly the case that habitat deterioration caused by sedimentation of mudflat, encroachment of mangrove trees, and disturbance from mudskipper

collectors is on the increase. The open mudflat is the key area of this ecosystem, as it serves as an important feeding habitat for most of the wintering waterbirds in Deep Bay, and as a loafing site during low tide. In view of this, we have the following recommendations.

1. Efforts to site a new boardwalk hide further out in the mudflat should be encouraged. This would allow greater accuracy in determining waterbird numbers in Deep Bay, which is a key tool of Ramsar Site management.
2. The relevant government department should instigate appropriate research into the apparent decrease of available mudflat area, and if necessary action regarding conservation and management of the Ramsar Site.

Acknowledgements

I would like to thank the following counters for participating in the counts: J. Allcock, A. Au, I. Callender, G.J. Carey, M.L. Chalmers, A. Chan, H.F. Cheung, Dong Jiangtian, F. Fong, M. Hale, J & J. Holmes, W. Huen, W.M. Hung, S.F.Y. Lam, P.J. Leader, M.R. Leven, R.W. Lewthwaite, K.W. Ma, K. Ng, G. Talbot, Y.L. Tam, G. Tedbury, M. Turnbull, Wang Yongjun, L.C. Wong, W.Y. Yam, H.K. Ying.

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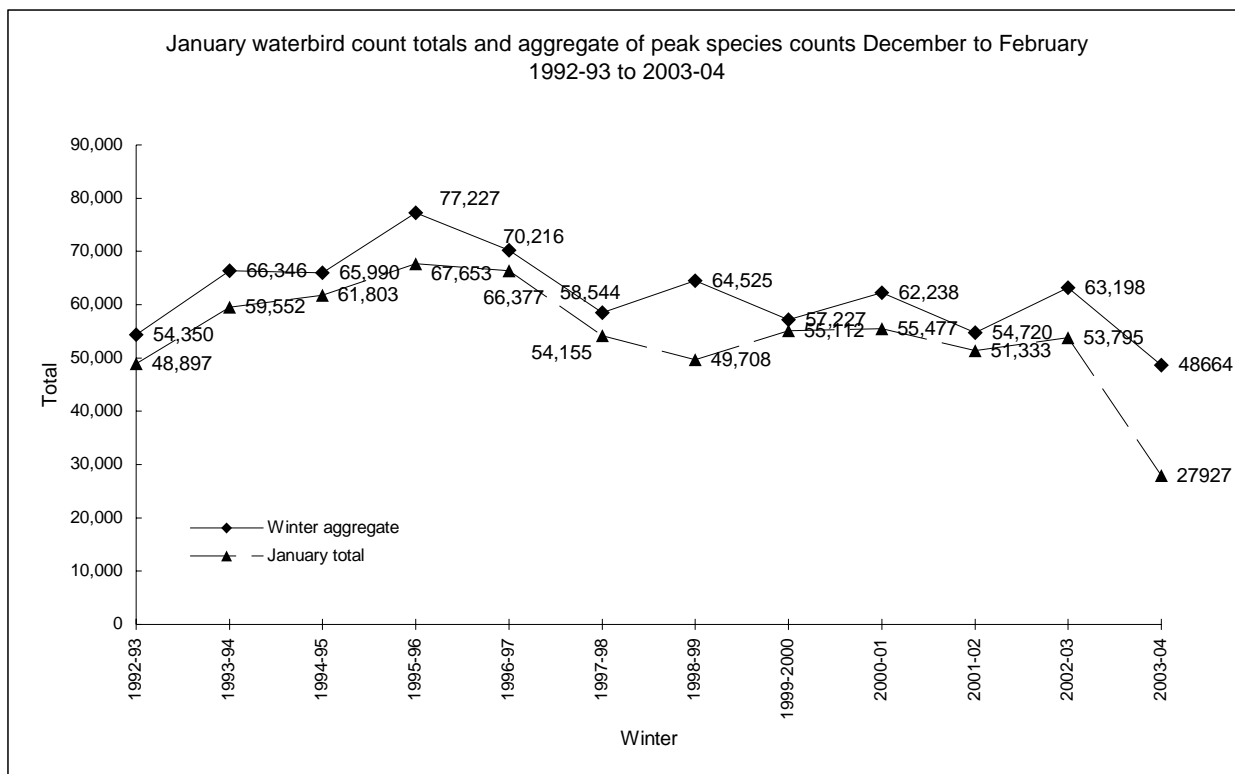
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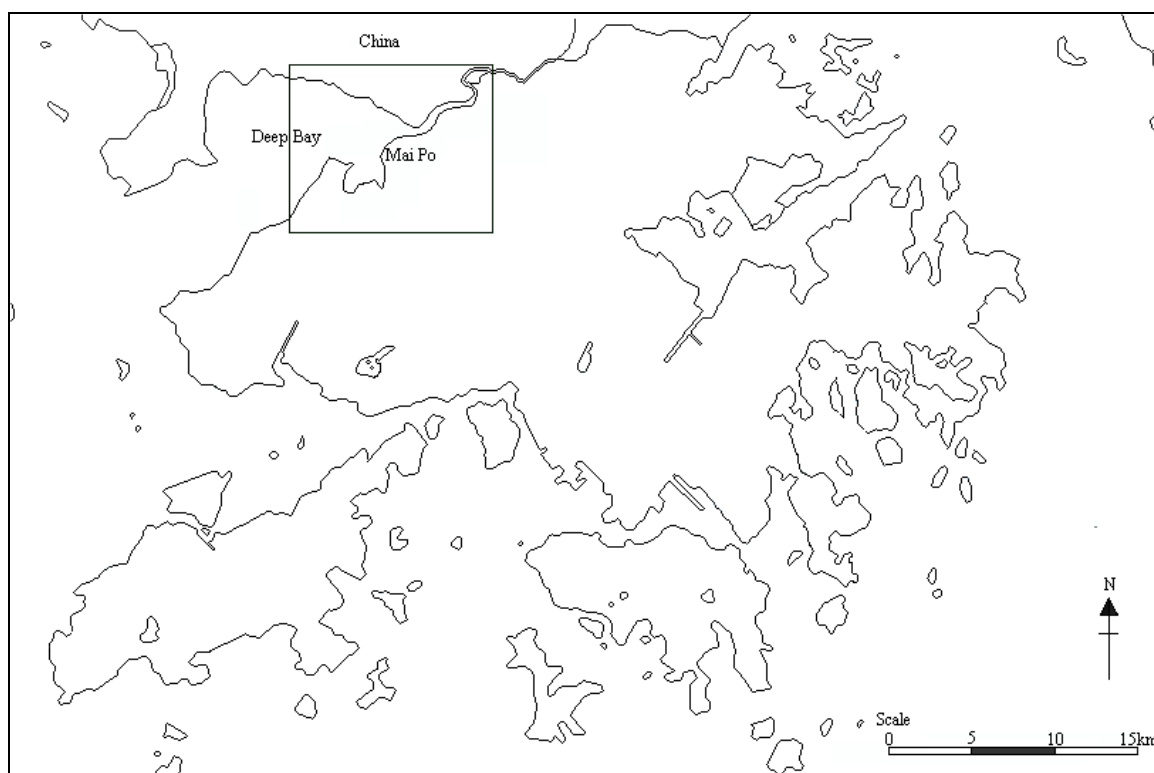
Yu, Y.T. 2004. The International Black-faced Spoonbill Census, 16-18 January 2004. Hong Kong Bird Watching Society Limited. Hong Kong.

Figure 1. January waterbird count totals and aggregate of peak species counts

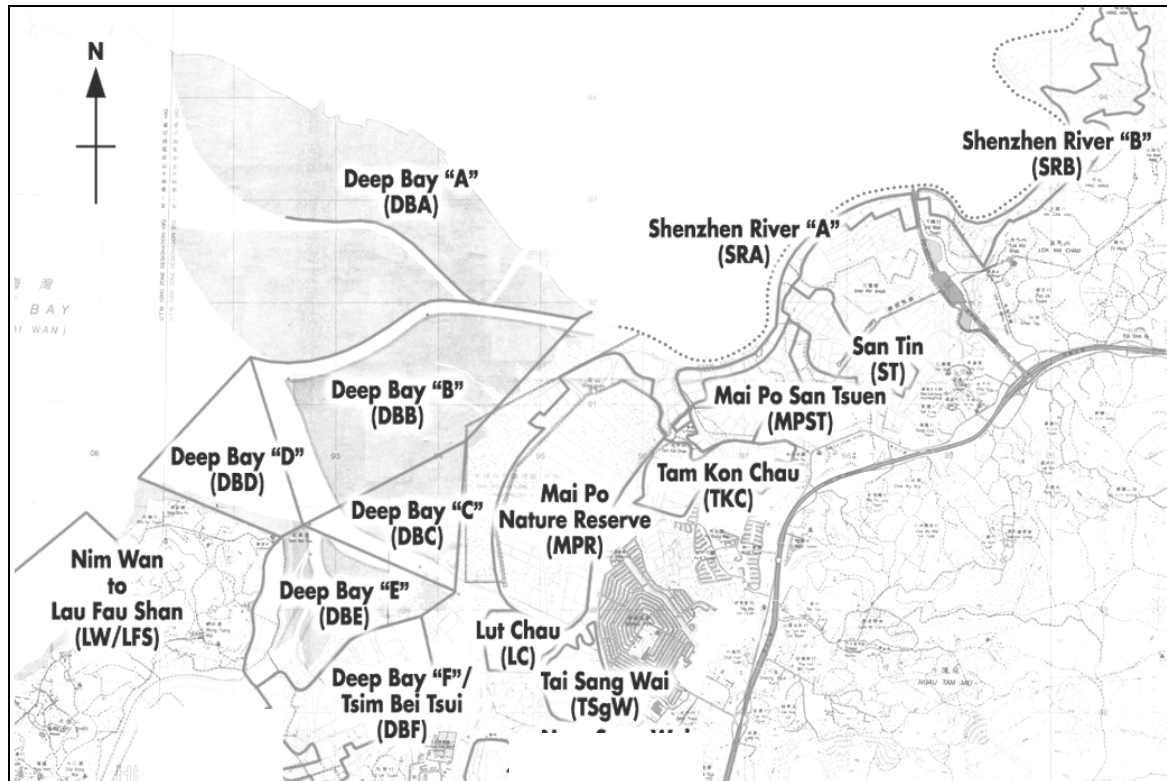
December to February 1992-93 to 2003-04



Map 1. Map of Hong Kong showing location of the Mai Po Inner Deep Bay Ramsar Site



Map 2. Locations of count sites of the Waterbird Monitoring Programme



Map 3. Aerial photo of the Mai Po Inner Deep Bay Ramsar Site

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**MAI PO INNER DEEP BAY RAMSAR SITE
WATERBIRD MONITORING PROGRAMME**

Programme 2003/04

Monthly Waterbird Counts

Oct 2003 - Mar 2004

**Part 2: Additional Counts of Waterbirds in Deep Bay Intertidal Area
in January and February 2004**

Y.T. Yu²

Background

In the past five winters waterbird numbers stabilised in a range of 50,000 to 55,000 individuals during the mid-winter count, in which around 25,000 birds were counted in the Deep Bay intertidal area. This area includes the mudflat in front of Mai Po boardwalk birdwatching hide, mudflat from Tsim Bei Tsui area and Futian Nature Reserve of Shenzhen. These areas are key habitats for the wintering waterbirds as they constitute the prime feeding and loafing sites during low tide.

Counts of waterbirds in mudflat areas rely on tidal movement. When the tide is rising, waterbirds are pushed toward to the Mai Po boardwalk bird watching hide. High tides in daytime during winter are usually low. In the past, high tide with a height of 1.8m or above could provide favourable conditions for counts of these waterbirds. However, counting activities have become more difficult in recent winters.

Sedimentation raises the height of the mudflat, and our observations indicate that high tides of at least 2.0m are required to push waterbird close the boardwalk hides. This has meant that in recent winters on the great majority of days from December to early February, the bulk of waterbirds is not close to the hides. In addition, counting conditions could also be affected by poor visibility caused by air pollution. This further affects the counting result obtained. For example, no representative counts of Eurasian Wigeon *Anas penelope*, Northern Pintail *Anas acuta*, small waders (i.e. Kentish Plover *Charadrius alexandrinus* and Dunlin *Calidris alpina*) were obtained during the counts in winter 2001-02.

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The aim of these additional trial counts was to provide up-to-date information on waterbird numbers in this area. In order to investigate the best time for conducting counts in intertidal areas, two additional counts took place on 17 January and 15 February 2004. High tides were predicted in the late afternoon on these days and their height was higher than that in the morning.

Synchronized counts were take place at the intertidal mudflat areas: Deep Bay A (Futian Nature Reserve, Shenzhen), Deep Bay B (i.e. from Mai Po boardwalk), Deep Bay C, D, and E (i.e. from Tsim Bei Tsui jetty). Surveyors in Mai Po boardwalk and Tsim Bei Tsui jetty communicated with mobile phones to ensure counting accuracy and no double-counting of birds in the area. The results were compared with that of regular monthly waterbird counts.

Results

A total of 20,483 and 21,767 waterbirds were counted in the additional counts in January and February respectively. These two figures show a high degree of similarity, although the number in different survey areas and different species groups varied in the counts (Table 1). The number of waterbirds from the monthly counts are shown in Table 1, which also have similar numbers in both January (14,201 birds) and February (14,307 birds). Clearly, the additional counts at afternoon high-tide could record higher total numbers of waterbirds by 43% and 52%.

A closer examination on species composition of these counts shows high similarity from both counts. The additional count and regular monthly count show similar percentages of composition of each bird groups, except 8,000 Black-headed Gulls present in the January additional count (Table 1). The counts in February also show similar percentages of most of the species group, except for ardeids.

All these similarities of waterbird numbers and species group percentages in the same month indicate that the counting activity is unbiased. The difference in the number of some species groups were clearly resulted from the height of high tide.

Table 1. Comparison of waterbird numbers in the Deep Bay intertidal areas from monthly waterbird counts and additional counts. Numbers in brackets are percentages to the total number.

Species group	Additional Count 17 Jan 2004	Monthly Count 25 Jan 2004	Additional Count 15 Feb 2004	Monthly Count 22 Feb 2004
Cormorants	19 (0.1, 0.2*)	0 (0.0)	162 (0.7)	50 (0.3)
Ardeids	885 (4.3, 7.1*)	1099 (7.7)	978 (4.5)	1604 (11.2)
Ducks, grebes, pelicans	3614 (17.6, 29.0*)	3036 (21.2)	13682 (62.9)	8396 (58.7)
Rails and coots	153 (0.7, 1.2*)	226 (1.6)	0 (0.0)	2 (0.0)
Waders	7447 (36.4, 59.7*)	9705 (67.9)	6932 (31.9)	4089 (28.6)
Gulls and terns	8365 (40.8, 2.9*)	225 (1.6)	7 (0.0)	166 (1.2)
Total	20483	14291	21761	14307

* Percentages excluding a count of 8,000 Black-headed Gulls

Discussion

These additional counts demonstrate that more waterbirds were counted at a higher high-tide, regardless of whether the counting took place in the morning or afternoon. The monthly waterbird counts were set for the morning as it was believed that counting conditions were better at this time, due to increased foraging activity and, in particular, less disturbance from fishermen activities. The present result shows that counting activities taking place at high high-tide condition is preferable as it produces a more accurate result that reflects the actual numbers present. In the mid-winter period, these high high-tides usually occur in the late afternoon.

The additional counts gave increased figures for some species, including Eurasian Wigeon *Anas penelope* (3,443), Pied Avocet *Recurvirostra avosetta* (3,500), Grey Plover *Pluvialis squatarola* (454), Black-tailed Godwit *Limosa limosa* (390), Eurasian Curlew *Numenius arquata* (850), Spotted Redshank *Tringa erythropus* (339), Common Redshank *Tringa totanus* (190), and Heuglin's Gull *Larus heuglini* (237).

However, these additional counts did not obtain increased counts of ducks and waders: a total of 5,350 unidentified ducks in February, and 1,849 and 1,050 unidentified waders (only identified as *Tringa spp.*). These numbers could only support the broad figures to their wintering populations in Deep Bay area. Small waders including Kentish Plover and Dunlin were not present in these high-tide days as they appear to move to roost when the tide is still relatively low.

By combining the above figures, the total number waterbirds in January and February 2004 could be adjusted to 36,478 and 29,234 respectively. Notwithstanding that, there was still a 32% and 29% decrease in the January count compared to that of the last two years (January and February 2003 were 53,795 and 38,491 respectively; and in 2002 were 51,333 and 29,632 respectively).



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APPENDICE



The Hong Kong Bird Watching Society Limited



Agriculture, Fisheries and Conservation Department