

**AGE STRUCTURE ASSESSMENT OF
WINTERING BLACK-FACED SPOONBILL
IN HONG KONG 2002-03**



Photo by Henry Lui

**A REPORT TO
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THE HONG KONG BIRD WATCHING SOCIETY LIMITED



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IN HONG KONG 2002-03**



**Survey organized by
The Hong Kong Bird Watching Society Ltd.**

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Background

The Agriculture, Fisheries and Conservation Department commissioned the Hong Kong Bird Watching Society to conduct a study: Age Structure Assessment of Wintering Black-faced Spoonbill at Mai Po Inner Deep Bay Ramsar Site, Hong Kong in 2002-03 winter. Similar studies had been carried out since 1998 (Anon 1999, 2001a, 2001b, 2002).

Objectives

Being as part of the long-term monitoring programme, the present study aims at assessing the age structure of the Black-faced Spoonbills *Platalea minor* in winter 2002-03, i.e. the ratio between adult and non-adult, and comparing the result with the previous studies.

This long-term monitoring of the age structure of the wintering population in Deep Bay, Hong Kong is crucial and critical for estimating population trend and breeding success of the globally endangered Black-faced Spoonbill.

Methodology

Age determination

The most obvious distinction between adult and non-adult Black-faced Spoonbills in distance view is the colour of their wing tips. The wing tips of non-adult are in black colour and will be gradually replaced by adult white plumage. However, it is very difficult to see their wing tips clearly unless they are extending their wings or flying. Therefore, the best and suitable way to differentiate the adult and non-adult of Black-faced Spoonbills is checking the colour of their wing tips when they are flying. By taking photographs or video* of Black-faced Spoonbills, the number of adult and non-adult can be recorded and their percentages can be determined. This method has been adopted for ageing the wintering Black-faced Spoonbills in Mai Po in last few years. (* digital photographs are captured from the video for records.)

Study area and period

The field surveys were carried out from late October 2002 to mid April 2003 at interval of 10 ± 2 days, totally in 20 surveys (Table 1). A total of minimum 30 Black-faced Spoonbills were recorded during each group of three consecutive surveys (i.e. a month) (Table 1).

All field surveys (taking photographs and videos) were carried out in the Mai Po Nature Reserve. Surveys were taken in several locations in Mai Po, including Pond 2, 6, 8 (near sluice gate when drained down and from tower hide), 16/17, 20 and 23 because Black-faced Spoonbills changed their loafing location in Mai Po during the course of the survey period in 2002-03. On 1 December 2002 and 15 March 2003, survey activities had been extended to Tsim Bei Tsui area. This is aimed to cover all the spoonbills in the whole Deep Bay area. The exact locations of the field surveys were shown in Figure 1.

Results

The first wintering Black-faced Spoonbill was recorded on 16 October 2002. Despite the first field survey was conducted on 26 October, no spoonbill was photographed on that day. The first survey with spoonbill recorded was on 5 November. The total cumulative number of Black-faced Spoonbills recorded was 1068 in winter 2002-03. The numbers of adult and non-adult of each survey are grouped from the same month and the result is summarized in table 2. The monthly total number of Black-faced Spoonbill photographed is ranged from 139 (April 2003) to 251 (December 2002). The high number in December is resulted by four surveys in this month and there were three surveys in other months. Mean number of Black-faced Spoonbills photographed in each survey was 56 ± 19 (SD).

The percentage of non-adult decreased generally from November (46%) to February (29%) and then increased afterwards till April (70%). The overall mean percentage of non-adult Black-faced Spoonbills in winter 2002-03 was $39 \pm 16\%$. Similar to previous years, adult spoonbills left Mai Po in late March and early April and result in April is biased to non-adult birds. By excluding the April data, the mean percentage of non-adult Black-faced Spoonbills was $37 \pm 13\%$. Hence, the mean percentage of adult Black-faced Spoonbills was $63 \pm 13\%$.

Discussion

A total cumulative number 1068 of Black-faced Spoonbills recorded in this survey made a 14% increase from the total number (915) of previous winter. Getting familiarized to the method and knowledgeable to the daytime loafing behaviour of the Black-faced Spoonbills, and increasing numbers of photographers contributed to this increase of number. It was also the first time that we collected some data in Tsim Bei Tsui area. Increase of the sampling size and coverage has brought a more accurate and representative age ratio of the wintering Black-faced Spoonbills in Hong Kong.

The overall percentages of $63 \pm 13\%$ adult Black-faced Spoonbills of winter 2002-03 is slightly less than that in winter 2001-2002 (i.e. $69 \pm 13\%$ of adult) (Figure 2), but the difference is not very significant. The overall percentage of adult in winter 2001-02 is also the highest among all years since the commencement of this study (Table 3).

Though the peak number of Black-faced Spoonbills recorded in winter 2002-03 was 258 (P.J. Leader *pers. comm.*), an increase of 34% from the peak number in winter 2001-02 (i.e. 192), percentage of adult Black-faced Spoonbills showed a small scale of decrease but difference is insignificant (Table 4).

Population dynamics

A prediction of the world population of 1185 was made in the report of winter 2001-02 (Anon 2002). In January 2003, the International Black-faced Spoonbills Census yielded a total of 1068 Black-faced Spoonbills in many known wintering sites of East Asia. An outbreak of avian botulism in Taiwan caused a death of total 73 birds, otherwise the

number could be even higher as 1142 individuals. The estimated figure is very similar to the actual number regardless to this outbreak (i.e. 90-96%) but it has to be stressed that this prediction is also based on some unproved assumptions, such as equal age ratio among wintering sites, equal sex ratio and an unexamined mortality rate.

The percentage of adult Black-faced Spoonbills in winter 2002-03 is 63%, which again fell into a range of 53% to 69% of previous studies. It shows that the proportion of adult and non-adult has remained stable in past five years. The known population of the Black-faced Spoonbills has increased more than three fold from the lowest 294 individuals in early 1990s to 1068 individuals in January 2003. This constant percentage of adult (or non-adult) Black-faced Spoonbills indicates that the breeding of this species should be successful in past few years.

Recommendation for future studies

Long-term monitoring of age distribution of Black-faced Spoonbills wintering in Hong Kong

This photographic method of determining the age structure of the wintering Black-faced Spoonbills in Mai Po has been used for five years. Results, in comparison with the annual International Black-faced Spoonbill Census, show a high degree of similarity. It is proved that this study is essential and worthwhile for providing information on the population trend of this globally endangered species.

Similar studies in other wintering Black-faced Spoonbill population for comparison

In order to find out detail age structure and population demography, various assumptions have to be verified and justified. For example, this survey should also be conducted in other large wintering grounds of this species, i.e. Tsengwen Estuary in Taiwan, Red River Delta in Vietnam and sites in Japan. Moreover, these data should be comparable among different sites and can be combined. The same methodology should be applicable in other wintering grounds.

Summary

An age structure survey of the globally endangered Black-faced Spoonbills in Hong Kong was conducted during the winter 2002-03. The survey aims at finding the percentages of adult and non-adult of this wintering population. A cumulative total of 1068 individuals were recorded from November 2002 to April 2003, in which 63% were adult individuals. The overall percentage of adults did not differ significantly from that of previous year. The percentage remained similar in past few years, all within the range of 53 to 69%.

References

Anon. 1999. Conservation Management of the critically endangered Black-faced Spoonbills *Platalea minor* in the Mai Po and Inner Deep Bay Ramsar Site. Unpublished report by WWF Hong Kong to the Agriculture, Fisheries and Conservation Department, Hong Kong Special Administrative Region Government.

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Table 1. Date and place of age determination surveys of Black-faced Spoonbills, 2002-03 winter.

Session	Date	Place
1	26 October 2002	Mai Po
2	5 November	Pond 6
3	14 November	Pond 6
4	23 November	The scrape
5	1 December	Pond 6, 8, 23 and Tsim Bei Tsui
6	12 December	Pond 6
7	22 December	Pond 6
8	29 December	Pond 2
9	9 January 2003	Pond 6
10	18 January	Pond 6
11	26 January	The scrape
12	7 February	Pond 6
13	15 February	Pond 6
14	25 February	Pond 6
15	6 March	Pond 6, 8 and 20
16	15 March	Pond 6, 8, 20 and Tsim Bei Tsui
17	23 March	The scrape
18	3 April	The scrape
19	12 April	Pond 20
20	20 April	The scrape

Table 2. Number of adult and non-adult Black-faced Spoonbills recorded, 2002-03 winter.

Date	Adult	Non-adult	Total	% of adult	% of non-adult
26 October 2002*	0	0	0	0	0
5 November	25	34	59	42	58
14 November	39	28	67	58	42
23 November	31	20	51	61	39
			177	54 ± 10	46 ± 10
1 December	65	33	98	66	34
12 December	27	21	48	56	44
22 December	45	13	58	78	22
29 December	27	20	47	57	43
			251	64 ± 10	36 ± 10
9 January 2003	26	39	65	40	60
18 January	32	24	56	57	43
26 January	43	4	47	91	9
			168	63 ± 26	37 ± 26
7 February	46	20	66	70	30
15 February	37	9	46	80	20
25 February	26	15	41	63	37
			153	71 ± 9	29 ± 9

6 March	19	7	26	73	27
15 March	60	45	105	57	43
23 March	28	21	49	57	43
			180	62 ± 9	38 ± 9
3 April	12	41	53	23	77
12 April	30	22	52	58	42
20 April	3	31	34	9	91
			139	30 ± 25	70 ± 25
<hr/>					
Total					
(Nov to Apr)	621	447	1068	58 ± 19	42 ± 19
<hr/>					
Total					
(Nov to Mar)	576	353	929	63 ± 13	37 ± 13

* The first Black-faced Spoonbill was noted on 16 October but no spoonbill was found on the survey on 26 October.

Table 3. Overall mean percentages (\pm SD) of adult Black-faced Spoonbills in Mai Po from winter 1998-99 to winter 2002-03 (data from Anon 1999, Anon 2001a, Anon 2001b, Anon 2002).

Winter	Percentage
1998-1999	56 ± 12*
1999-2000	53 ± 22*
2000-2001	60 ± 12
2001-2002	69 ± 13
2002-2003	63 ± 13

* Data are re-analyzed for this comparison.

Table 4. T-test of the significance of the difference in the proportion of adult Black-faced Spoonbills in Deep Bay between winters 2001-02 and 2002-03

Month	t	d.f.	P	Significant?
November	-1.300	4	0.264	No
December	0.102	6	0.922	No
January	0.363	4	0.735	No
February	-0.856	4	0.440	No
March	1.027	5	0.351	No
April*	T = 18.00	-	0.057	No

*Data of April failed to normality test. Mann-Whitney Rank Sum Test was used to the comparison.

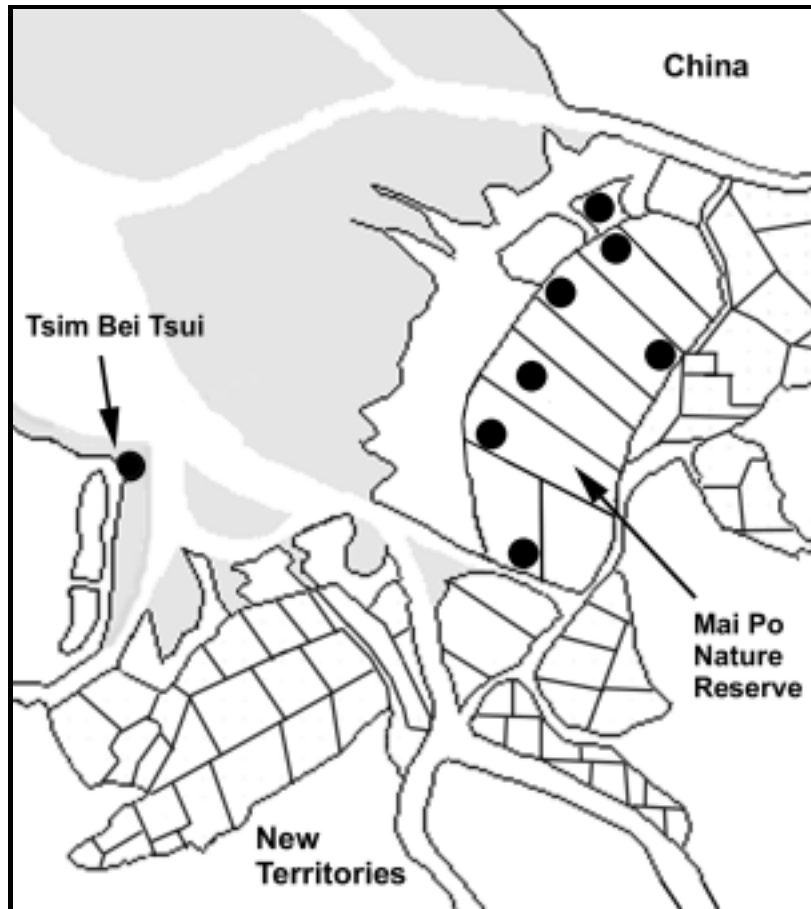


Figure 1. Mai Po Nature Reserve and Tsim Bei Tsui, and locations () of surveys

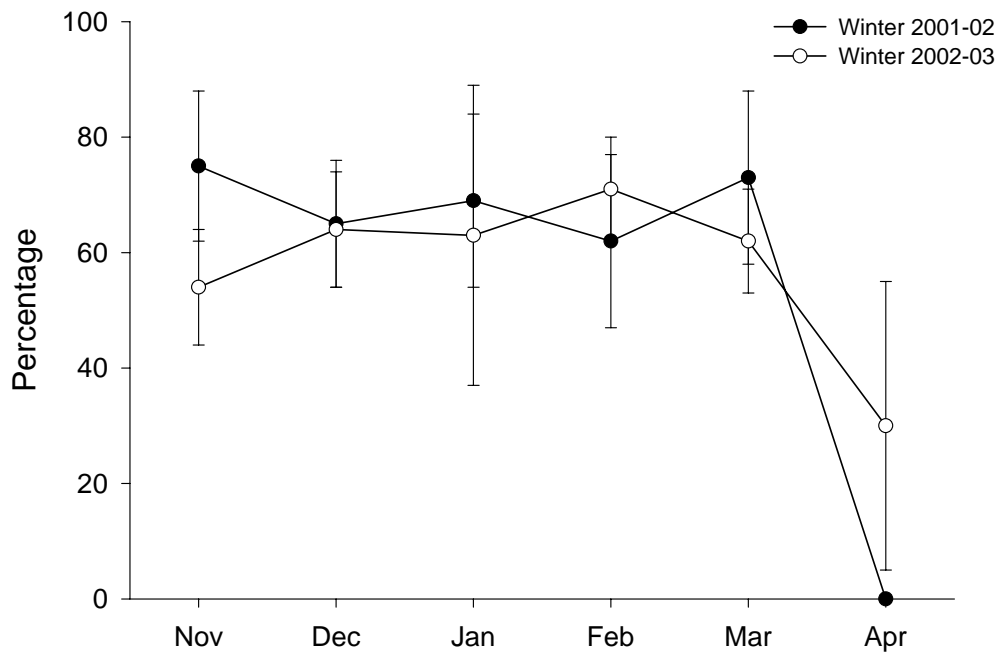


Figure 2. Monthly mean percentage (\pm SD) of adult Black-faced Spoonbills in Mai Po, winter 2001-02 and 2002-03.