BIRDS AND HUMANS IN HARMONY:
A SUSTAINABLE MANAGEMENT SCHEME IN LONG VALLEY
Dec 2005 – Nov 2007

BIRD MONITORING PROGRAMME

Programme 2006/07	Winter	December 2006 – February 2007

Summary Report – winter 2006-07 (December to February)

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1. Background

1.1. The Environmental and Conservation Fund (ECF) supports a Hong Kong Bird Watching Society's project: Birds and Human in Harmony – A sustainable Management Scheme in Long Valley, which aim to enhance conservation value especially for birds through a public-private partnership (PPP) scheme between the Hong Kong Bird Watching Society (HKBWS) and a local farming community since December 2005.

1.2. The aim of this project is to demonstrate that conventional farming operation could benefit wildlife in particular to wild birds with specific management practices and adoptions. Effectiveness of the management practices is reflected by utilization of birds in the area and the regular Bird Monitoring Programme records this data.

1.3. This report presents results of the bird monitoring programme conducted in winter 2006-07 (i.e. December to February).

2. Methodology

2.1. The Bird Monitoring Programme consists of regular bird surveys in the Long Valley area. The study area covers the whole Long Valley area confined by a drainage channel lying on west, north and east and Yin Kong Village on the south.

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2.2. The survey was conducted by following a standard transect to obtain comparables and complete coverage of all farmlands in the shortest time. Total surveying time maintains at about 3.5 hours in the morning.

2.3. One survey per week was scheduled in winter 2006-07. A total of 12 surveys were conducted and the schedule is as follows:

2006 December: 7, 14, 21, 28;
2007 January: 4, 11, 18, 25;
2007 February: 1, 8, 15, 23.

2.4. One surveyor who accredited by HKBWS recorded all wild birds in numbers and species with the specific number to each field in the whole study area.

3. Results

Overview

3.1. Numbers fluctuated considerably during the winter 2006-07. The peak count was 627 birds recorded on 23 February 2007, while there were two low numbers of 244 and 260 birds on 21 December 2006 and 1 February 2007. These low counts were probably weather related since strong wind was noted on both days. These figures indicated that birds moved in and out from the Long Valley area during the winter time. Details are shown in figure 1 and table 1.

Table 1. Numbers in each count, monthly average figures with SD of birds counted at Long Valley, winter 2006-07 and average figures (with SD) in winter 2005-06.

	December	January	February
Numbers of bird counted	571, 464, 244, 457	508, 408, 391, 557	260, 466, 550, 624
Winter 2006-07: Mean (SD)	434 (137)	466 (80)	475 (157)
Winter 2005-06: Mean (SD)	416 (193)	370 (100)	316 (86)

3.2. Table 1 also shows the figures from the previous year and it could shows that mean figures in all three months in winter 2006-07 are higher than the figures in winter 2005-06. However, the mean figures of two winter counts are not in

significantly difference (t-test, t = -1.706, P = 0.102, n.s.). Nevertheless, table 2 showed that the average figure of total numbers of bird in winter counts has increased 23% comparing to the previous winter.

Table 2. Mean (SD) of the total numbers of the birds in the Long Valley area, winter 2005-06 and winter 2006-07.

Winter 2005-06	Winter 2006-07
371 (136)	458 (118)

3.3. Number of bird species present in the study area is a direct indication of the diversity of the site. Analysis below is mainly done with the Shannon index H' ($H' = -\sum p_i \ln p_i$) which is commonly used to compare species richness and abundance. An index is transformed by the counts from each counting day and the analysis is made with the average figure of the index of the counts over the winter. Details are shown in appendix 1. The average figure of the Shannon index in winter 2006-07 which is 2.93 (SD = 0.23) is significantly higher than the same average figure of winter 2005-06 in 2.66 (SD = 0.35) (t-test, t = -2.301, df = 23, P = 0.03). Therefore, the Long Valley area had more bird species and higher abundance of birds in winter 2006-07 than in winter 2005-06.

3.4. When this project began in the study area in December 2005, very few habitat enhancements were in place. When the bird data this year were compared to that last year, the increase in abundance and diversity of birds strongly suggests that habitat enhancements in the last year were effective.

Managed area

3.5. The total area of managed fields under HKBWS was 152,700 sq.ft. till 15 January 2007 and then it was increased to 170,700 sq.ft. by changing field 227 and 229 into shallow water habitat. Together with 488,000 sq.ft. managed by CA, the total area of managed field in Long Valley area is 658,700 sq.ft. That leaves the unmanaged field area at 1,841,300 sq.ft.

3.6. Details of the total bird numbers, numbers per unit area, mean and SD are shown in appendix 2. The numbers of birds in all managed and unmanaged fields are not significantly different in this winter (t-test, t = 0.278, P = 0.784, n.s.). Table 3 shows that the difference of mean figures in winter counts is smaller than the counts in the autumn.

Table 3. Mean (SD) of the numbers of birds in all managed and unmanaged fields per unit area in autumn 2006 and winter 2006-07.

	Autumn 2006	Winter 2006-07
Managed fields	26.9 (12.1)	17.2 (8.1)
Unmanaged fields	14.7 (4.3)	18.0 (4.1)

3.7. These results show that the bird might have a stronger preference on managed fields during autumn (i.e. migration period) than in the winter time. The managed fields might be more attractive to the birds during the migration season than in the wintering period. The passage birds would stop in a place for very short period and they might choose the best habitats to feed and rest, while the winter visitors spend a long time in one site or area and so they would need a larger territory for finding food and avoiding predators and competition from other birds.

Dry agricultural land (DAL)

3.8. Field 101 and 110 are managed to this habitat. Two groups of Choi Sum were planted separately in this winter and the first group flowered in early January and the other in early February. The first group held seeds in late-January while the second one in late February.

3.9. The mean number per unit area in DAL fields is significantly higher than the mean number per unit area in the control, i.e. field 74 and 102 (Mann-Whitney Rank Sum Test, T = 194.500, P = 0.01). Superficially, the mean figure in the managed fields has increased by more than 100% over the same period last year. However, the difference is not significant (Mann-Whitney Rank Sum Test, T = 190.00, P = 0.07). Please keep in mind that habitat management had not started in these fields in the previous winter. So the success of habitat management in these fields has not been clearly demonstrated yet. Details can be referred to table 4.

Table 4. Mean (SD) of the counts of the birds in the dry agricultural land and its control per unit area.

	Winter 2006-07	Winter 2005-06
Managed fields	2.7 (3.5)	1.2 (2.7)
Control fields	0.3 (0.6)	0.1 (0.3)

Wet agricultural land (WAL)

3.10. A relatively fewer management tasks took place in the wet agricultural land because plants do not grow quickly in winter time. Stalk of paddy rice had been cut to open some area for birds. Chinese Arrow-head corms have been planted in both field 242 and 257. The ones in field 242 could not germinate at the first attempt. It took another round of planting to have successful germination. These fields were kept wet over the whole winter.

3.11. There were significantly higher numbers of birds per unit area in the WAL fields than the control fields (Mann-Whitney Rank Sum Test, T = 201.000, P = 0.004) and in the WAL the average number of birds in this winter is also significantly higher than in the previous winter (Mann-Whitney Rank Sum Test, T = 200.000, P = 0.018). Remind that wet agriculture habitat enhancement started in February 2006 on field 242 and May 2006 on field 257. Please refer to table 5 for details. The mean number of birds in the managed wet agricultural fields has increased by 27% over the same period last year.

Table 5. Mean (SD) of the counts of the birds in the wet agricultural land and its control per unit area.

	Winter 2006-07	Winter 2005-06
Managed fields	5.2 (4.9)	4.1 (12.9)
Control fields	0.5 (0.7)	0.4 (0.4)

Shallow water habitat (SWH)

3.12. Field 227 and 229 were converted into shallow water habitat from 15 January 2007 onward. Therefore the area of the SWH has increased in winter 2006-07. These two fields were used as control in our previous report to test the effectiveness of the habitat enhancement exercise for fields 224, 225 and 226.

3.13. In this report, we still use the count data of the field 227 and 229 as control for comparison. It is because no other suitable fields could be found in nearby location which could have similar habitat to the SWH. Other nearby water spinach fields were kept in dry condition over the winter. In addition, the habitat enhancement exercise took place on 15 January 2007 and the effect to the birds did not come immediately. Comparison is also made with the counts

in the previous winter in the same managed fields.

3.14. The average numbers of birds in the managed fields per unit area in this winter has no significant difference to the control and the counts in the previous years (Managed VS control, Mann-Whitney Rank Sum Test, T = 173.000, P = 0.194, n.s.; Winter 2005-06 VS Winter 2006-07, Mann-Whitney Rank Sum Test, T = 183.000, P = 0.149, n.s.). However, there was an increase by almost two times from last winters in the mean number of birds per unit area in managed fields (table 6).

Table 6. Mean (SD) of the counts of the birds in the shallow water habitat and its control per unit area, winter 2005-06 and winter 2006-07.

	Winter 2006-07	Winter 2005-06
Managed fields	3.5 (3.6)	1.2 (1.6)
Control fields	1.2 (1.2)	0.7 (0.7)

Farmland margin (FM)

3.15. As same as previous months, some farmland margins were planted with tomatoes and some has grown well and produced fruits. Analysis below includes fields that have tomatoes planted on the margin but with no other habitat enhancement. Therefore, out of the total 265,200 sq.ft. that have tomatoes planted on the margin, only 148,000 sq.ft. are used in this analysis. The total area of control fields is 137,000 sq.ft.

3.16. The average number of the birds recorded in the field with planted farmland margins and the control fields are not significantly different (Mann-Whitney Rank Sum Test, T = 171.000, P = 0.237, n.s.). However, there is some difference of the mean figures (table 7). Large variation of the counts indicates that the birds move in and out of these fields.

Table 7. Mean (SD) of the number of the birds in Farmland Margin and its control per unit area.

Managed, winter 2006-07	Control, winter 2006-07
12.28 (10.95)	6.9 (5.5)

Additional observations

3.17. Five species was newly found in the Long Valley area, namely Great Bittern *Botaurus stellaris* (on 4 December 2006), Pied Avocets *Recurvirostras avosetta* (firstly on 9 December 2006), Japanese Thrush *Turdus cardis* (30 January 2007), Brown-headed Thrush *Turdus chrysolaus* (on 1 February 2007) and Pale Thrush *Turdus pallidus* (on 13 January 2007). The first two species are wetland dependent species and their appearance in Long Valley might reflect the effectiveness of habitat enhancement or the increase of survey effort. The later three species belong to the same family *Turdus* and this winter is very good for seeing species in this family. Besides the regular weekly bird surveys, many bird watchers also submitted their observations and the Japanese and Pale Thrushes were reported by bird watchers outside the regular surveys. These species add up the total number of species recorded in the bird survey at 126.

3.18. Greater Painted-snipe *Rostratula benghalensis*, a key species for the conservation of Long Valley area, was recorded regularly in winter 2006-07. The maximum count was 11 birds on 18 January 2007 and this species was recorded in 11 survey days out of the total of 12 days. Also from nine survey days, the Greater Painted-snipes were recorded in field 96. This field is managed by CA. Habitat enhancements in the field included weed removing, water-level controlling and field margin planting.

3.19. In the past, the Greater Painted-snipes were less regularly found at Long Valley during the dry season. This result indicates that the habitat enhancement could have a positive effect on increasing the utilization of the Greater Painted-snipe in the Long Valley area.

Discussion

4.1. Comparing to last year, we see that there are significant increases in the mean number of birds in dry agricultural lands and wet agricultural lands and there are also apparently some increases of mean numbers of birds in the shallow water habitats. In addition, some seemingly positive results could not pass the statistical tests, and therefore cannot prove significant improvements in the numbers of birds. We comment that this is a natural consequence of the highly varied number of birds using Long Valley.

4.2. The variation of data within the groups indicates that birds often moved in and out of these fields or areas. One possible reason is human disturbances from

visitors and farmers. Farmers need to go into the fields to conduct habitat management exercises. Another reason would be the weather. In the future, surveyors will try to avoid the days with far from normal weather condition, e.g. strong wind and heavy rain.

4.3. At present, the managed agricultural fields are scattered widely in the Long Valley area. Visitors are not under strict control. One may expects that the number of birds in Long Valley will continue to fluctuate widely. There seem to be no easy solution in the near future.

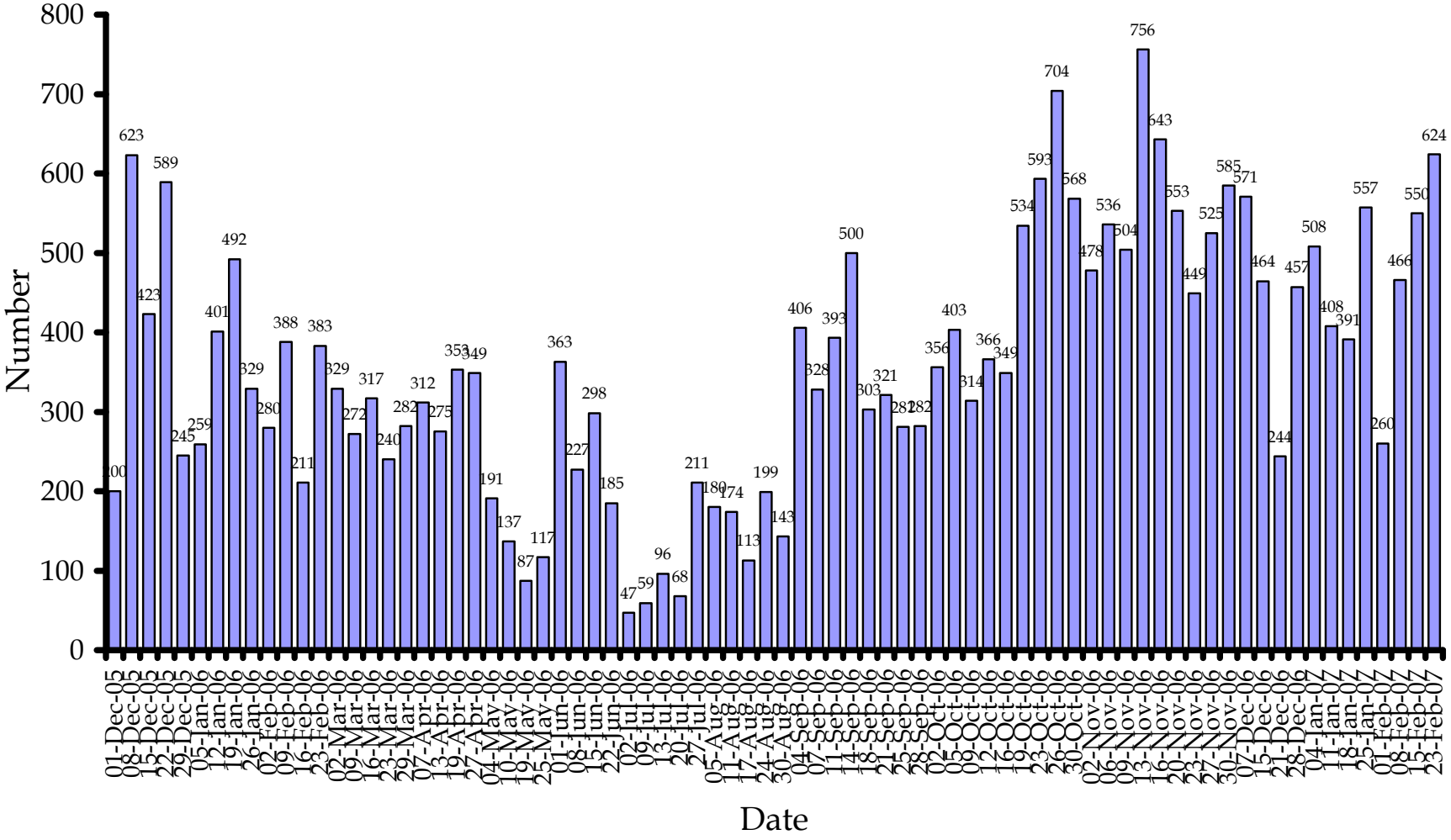

Figure 1. Total numbers of birds recorded in Long Valley, December 2005 to February 2007. Note: Survey was conducted once per week from December 2005 to August 2006, and December 2006 to February 2007 and twice per week in September to November 2006.

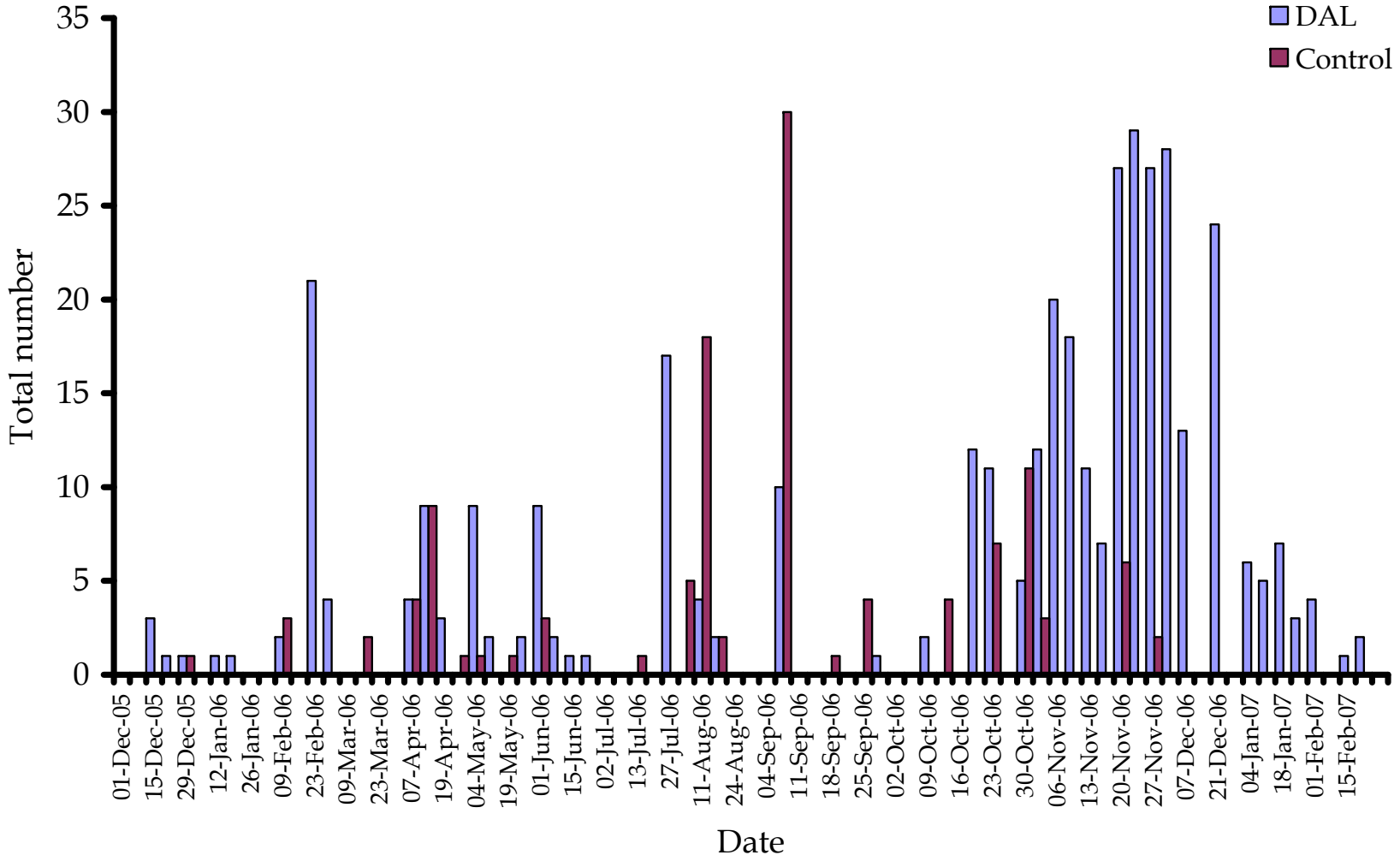

Figure 2. Total numbers of birds recorded in Dry Agricultural Lands (DAL) in Long Valley, December 2005 to February 2007. Note: Survey was conducted once per week from December 2005 to August 2006, and December 2006 to February 2007 and twice per week in September to November 2006.

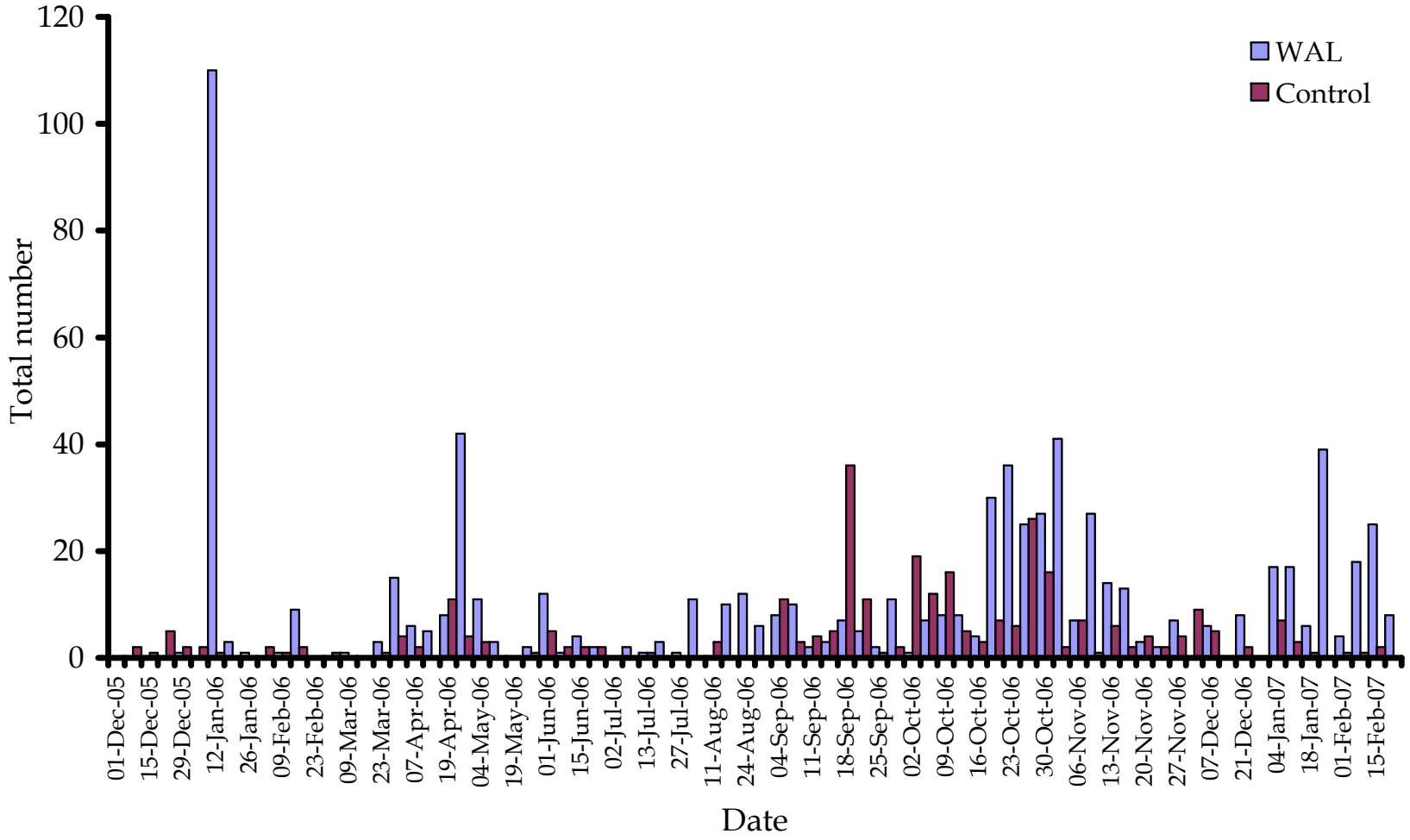

Figure 3. Total numbers of birds recorded in Wet Agricultural Lands (WAL) Long Valley, December 2005 to February 2007. Note: Survey was conducted once per week from December 2005 to August 2006, and December 2006 to February 2007 and twice per week in September to November 2006.

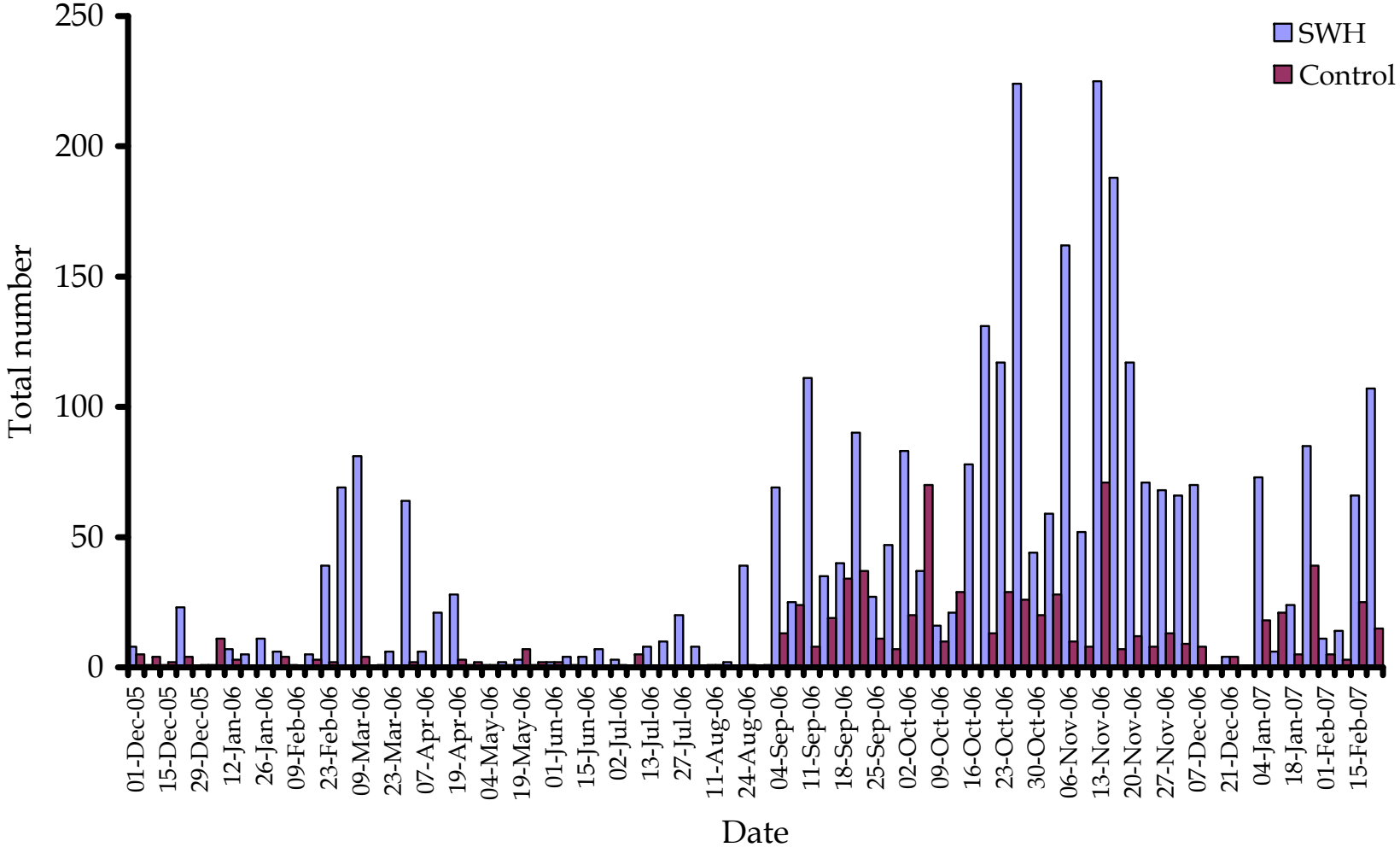

Figure 4. Total numbers of birds recorded in Shallow Water Habitat (SWH) Long Valley, December 2005 to November 2006. Note: Survey was conducted once per week from December 2005 to August 2006, and December 2006 to February 2007 and twice per week in September to November 2006.

Appendix 1. Total numbers, numbers of species and diversity indices (Shannon index) of birds counted in Long Valley, winter 2005-06 and winter 2006-07.

Winter 2005-06				Winter 2006-07			
Date	Total number	Number of species	Index	Date	Total number	Number of species	Index
1 Dec	200	25	2.32	7 Dec	571	37	2.58
8 Dec	623	46	3.15	14 Dec	464	48	3.30
15 Dec	423	30	2.15	21 Dec	244	42	3.14
22 Dec	589	41	3.07	28 Dec	457	43	3.08
29 Dec	245	36	2.89	-	-	-	-
5 Jan	259	34	2.23	4 Jan	508	36	2.82
12 Jan	401	32	2.51	11 Jan	408	45	3.08
19 Jan	494	35	2.71	18 Jan	391	42	3.02
26 Jan	329	33	2.68	25 Jan	557	44	2.80
2 Feb	280	24	2.17	1 Feb	260	31	2.53
9 Feb	388	37	2.80	8 Feb	466	40	3.07
16 Feb	211	30	2.96	15 Feb	550	44	2.91
23 Feb	383	36	2.91	23 Feb	624	45	2.86
Mean (SD)			2.66 (0.35)	Mean (SD)			2.93 (0.23)

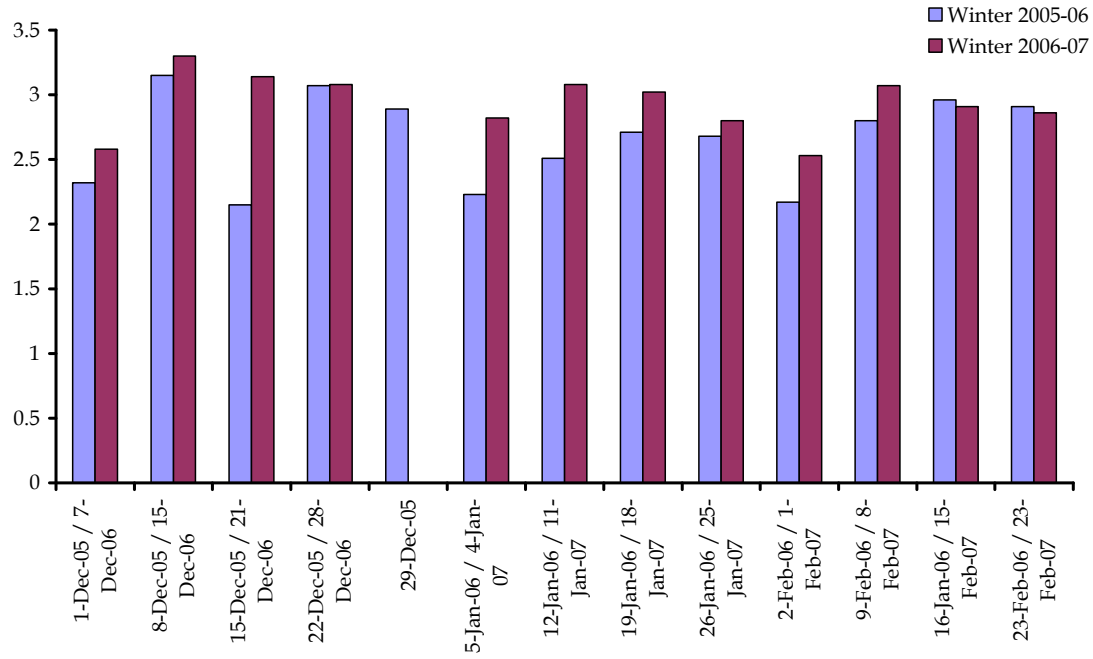

Figure 5. A weakly trend of Shannon Index of birds recorded in the Long Valley area in winters 2005-06 and 2006-07. This figure is derived from the data shown in Appendix 1.

Appendix 2. Total numbers of birds in fields adopted with pilot conservation management agreement projects by HKBWS and CA ('Managed' fields – 640,700 sq.ft. (before 15 Jan 2007) and 658,700 sq.ft. (after 15 Jan 2007)) and in the remaining fields ('Unmanaged' fields – 1,859,300 sq.ft. (before 15 Jan 2007) and 1,841,300 sq.ft. (after 15 Jan 2007)), winter 2006-07.

Date	Total bird numbers in Managed field	Total bird numbers in Managed field per unit area (x 10^{-5} sq.ft.)	Total bird numbers in Unmanaged field	Total bird numbers in Unmanaged field per unit area (x 10^{-5} sq.ft.)
7 Dec	149	23.3	422	22.7
14 Dec	102	15.9	338	18.2
21 Dec	76	11.9	166	8.9
28 Dec	92	14.4	343	18.4
4 Jan	156	24.3	352	18.9
11 Jan	83	13.0	325	17.5
18 Jan	71	10.8	307	16.7
25 Jan	230	34.9	323	17.5
1 Feb	40	6.1	218	11.8
8 Feb	60	9.1	404	21.9
15 Feb	138	21.0	403	21.9
23 Feb	147	22.3	388	21.1
	Mean (SD)	17.2 (8.1)	Mean (SD)	18.0 (4.1)