Nature Conservation Management for Long Valley 2010-2012

BIRD MONITORING PROGRAMME

Programme 2010/12 March 2010 to February 2011

Summary Report – March 2010 to February 2011

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1. Background

1.1. The Environmental and Conservation Fund (ECF) supports a joint project: Nature Conservation Management for Long Valley 2010-2012, which aim to enhance the conservation value of this freshwater wetland especially for birds through a management agreement (MA) scheme between the Hong Kong Bird Watching Society (HKBWS), The Conservancy Association (CA) and the local farming community since March 2010.

1.2. The aim of this project is to conserve and enhance the agricultural freshwater wetland and habitat diversity for avifauna and other freshwater wetland-dependent species in Long Valley. The effectiveness of the management practices is reflected by the utilization in the area by birds and the regular Bird Monitoring Programme gathers such data.

1.3. This report presents the results of the bird monitoring programme conducted in the period from March 2010 to February 2011 which covers spring, summer, autumn and winter.

2. Methodology

Transect Counts

2.1. The bird monitoring programme in both the core and northern parts of Long Valley was conducted by regular transect counts following routes shown in Fig. 1, Fig. 2 and Fig. 3 in order to obtain comparable results and complete coverage of all farmlands in the shortest time. All birds encountered in the transects, including seen and heard, were recorded with the species (common) name and field (i.e. farming plot) number, following Fig. 1, 2 and 3, where the birds were located. Birds flying in the sky were also marked down but not allocated to any specific field. Bird calls heard which could not be exactly located to a field number was marked as 'Heard'. Transect count was also done in Ho Sheung Heung *feng-shui* wood area (Fig. 3). Surveys were separated into two parts: (1) The core part of Long Valley and (2) The northern part of Long Valley and Ho Sheung Heung *feng-shui* wood. Total surveying times for each of the two parts were maintained at about 3.0 hours and they were conducted simultaneously in the morning.

2.2. Surveys in the core part and northern part of Long Valley were done once a week in

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except that they were conducted once per two weeks in June and July. A total of 49 and 48 were conducted for the core area and northern part of Long Valley respectively as shown below:

2010 March: 2, 11, 16, 25, 31
2010 April: 7, 12, 21, 27
2010 May: 4, 12, 18, 26
2010 June: 1, 14, 29
2010 July: 14, 27
2010 August: 4, 10, 17, 26, 31
2010 September: 7*, 14, 22, 28
2010 October: 5, 12, 18, 25
2010 November: 1, 10, 15, 22, 30
2010 December: 6, 13, 21, 27
2011 January: 3, 10, 18, 24, 31
2011 February: 8, 16, 21, 28

*Notes: Survey in the first week of September was not conducted due to logistic reason.

2.3. Each survey was conducted by two surveyors accredited by HKBWS. One surveyor would cover the core part of Long Valley (Fig. 1) and the other would survey the northern part of Long Valley (Fig. 2) and the *feng-shui* wood at Ho Sheung Heung (Fig.3).

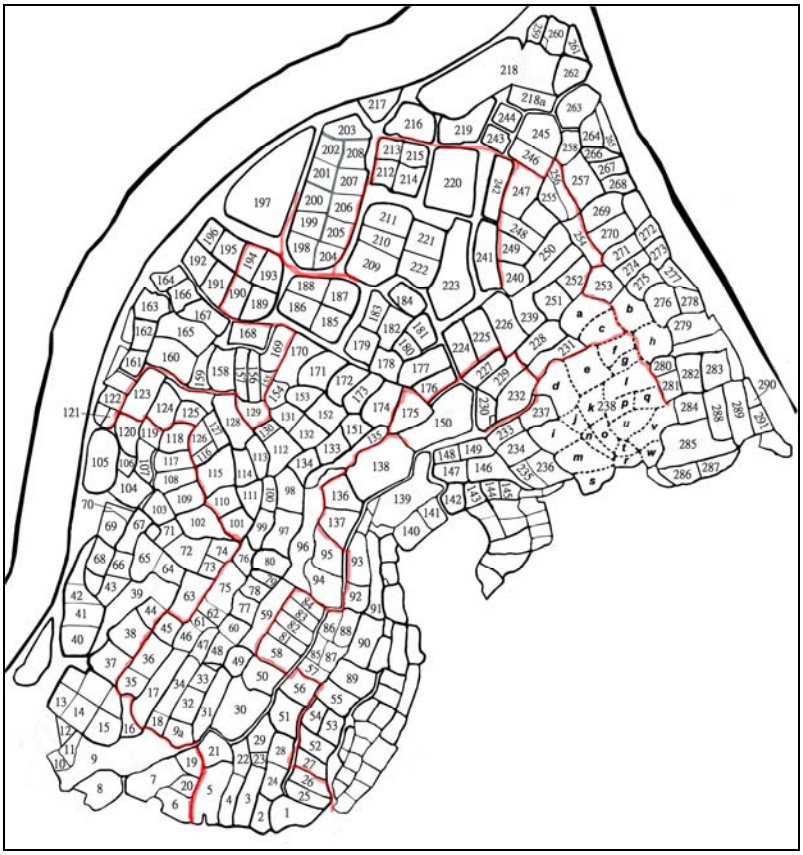

Figure 1. The transect (red line) and field numbers at the core part of Long Valley in this study.

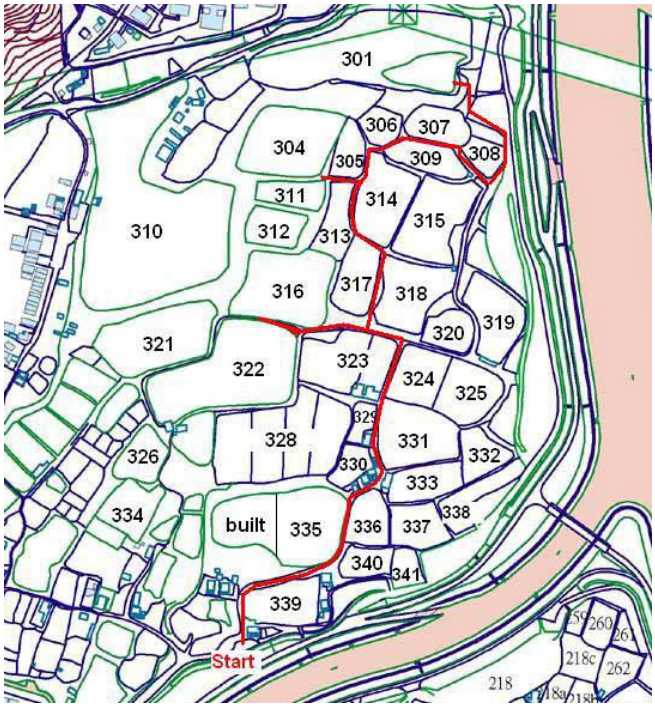

Figure 2. The transect (red line) and field numbers at the northern part of Long Valley in Ho Sheung Heung.

Figure 3. The transect (red line) at the Ho Sheung Heung *feng-shui* wood.

Statistical Analysis

2.4. Non-parametric multidimensional scaling (NMDS) and Analysis of similarities (ANOSIM) will be used to define and test the differences in bird assemblages and abundance in the following groups: (1) between managed fields and unmanaged fields and (2) managed wetland habitats and control fields.

2.5. Similarity percentage (SIMPER) will be applied to calculate the contribution of individual species toward the differences in the birds communities in the following comparisons: (1) between managed fields and unmanaged fields and (2) managed wetland habitats and control fields.

3. Results

Overview

3.1. For the core part of Long Valley, the peak counts in this period in different seasons were 510 on 2 March, 517 on 17 August, 1167 on 28 September and 1207 on 13 December in which 1207 birds recorded was the highest count in the core part of Long Valley since the MA project began in 2005. The lowest counts were 136 on 12 May, 222 on 14 July, 413 on 7 September and 530 on 8 February respectively. The numbers of birds recorded in April to June 2010, August 2010 to February 2011 were found higher than the previous years while the number dropped a bit in July 2010 (Table 1).

Table 1. Numbers in each count, monthly mean number of birds counted at the core part of Long Valley, spring, summer, autumn 2010 and winter 2010/2011, and the mean numbers (SD in parenthesis) in from spring 2006 to winter 2010/2011

	Spring 2010			Summer 2010		
	March	April	May	June	July	August
Numbers of bird counted in each survey	510, 415, 257, 350, 403	256, 474, 283, 377	177, 136, 237, 349	366, 327, 248	222, 223	364, 455, 517, 473, 383
2010: Mean (SD)	387(93)	348(99)	225(93)	314(60)	223(0.71)	438(64)
2009: Mean (SD)	345(25)	286(80)	181(18)	275(54)	392(111)	232(64)
2008: Mean (SD)	458(78)	330(130)	191(101)	73*	199(47)	328(112)
2007: Mean (SD)	459(71)	292(29)	200(91)	170(19)	270(43)	430(99)
2006: Mean (SD)	289(36)	322(37)	133(44)	268(79)	96(66)	161(34)
	Autumn 2010			Winter 2010/2011		
	September	October	November	December	January	February
Numbers of bird counted in each survey	413, 567, 1085, 1167	969, 847, 830, 678	1029, 848, 779, 749, 631	586, 1207, 868, 676	549, 779, 760, 921, 557	530, 666, 535, 625
2010: Mean (SD)	808(374)	831(119)	807(147)	834(275)	713(159)	589(67)
2009: Mean (SD)	477(200)	648(166)	488(97)	393(92)	445(86)	398(58)
2008: Mean (SD)	367(53)	541(95)	458(96)	656(193)	474(58)	538(133)
2007: Mean (SD)	343(65)	499(88)	634(205)	504(69)	373(110)	407(104)
2006: Mean (SD)	352(76)	468(138)	561(94)	436(136)	470(83)	476(158)

Table 2. Mean numbers of species and Shannon diversity indices (SD in parenthesis) of birds counted in core part of Long Valley, from spring 2007 to winter 2010/2011.

	Spring		Summer	
	No. of species	Index	No. of species	Index
2010: Mean (SD)	39 (6)	2.9 (0.2)	32 (3)	2.6 (0.2)
2009: Mean (SD)	40 (5)	3.1 (0.1)	27 (3)	2.7 (0.1)
2008: Mean	39 (8)	3.1 (0.2)	27 (3)	2.7 (0.1)

(SD)				
2007: Mean (SD)	32 (9)	2.7 (0.3)	28 (6)	2.6 (0.4)

	Autumn		Winter	
	No. of species	Index	No. of species	Index
2010: Mean (SD)	54 (6)	3.1 (0.1)	50 (4)	3.0 (0.3)
2009: Mean (SD)	43 (8)	2.9 (0.2)	45 (4)	3.2 (0.1)
2008: Mean (SD)	40 (6)	2.9 (0.2)	44 (3)	3.0 (0.2)
2007: Mean (SD)	42 (6)	3.0 (0.3)	43(4)	3.1 (0.1)

3.2. For the northern part of Long Valley, the peak count in spring was 221 on 11 March, in summer was 103 on 14 July, in autumn was 441 on 22 November and in winter was 337 on 6 December. The lowest count in spring was 82 on 4 May, in summer was 42 on 14 July, in autumn was 101 on 28 September and in winter was 229 on 3 January. The number of birds counted fluctuated less obviously compared to that in the core part of Long Valley. The trend dropped a bit at summer times and peaked in winter during the study period. (Table 3 and Fig. 6).

Table 3. Numbers in each count in northern part of Long Valley, in spring, summer and autumn 2010 and winter 2010/2011, and the mean numbers (SD in parenthesis) in spring and summer from 2008 to 2010.

	Spring 2010			Summer 2010		
	March	April	May	June	July	August
Numbers of bird counted	189, 221, 175, 198, 162	127, 195,114,214	82, 204, 175, 131	83, 42, 72	103, 84	77, 100, 71, 82, 54
2010: Mean (SD)	189(23)	163(49)	148(53)	66(21)	94(13)	77(17)
2009: Mean (SD)	148(39)	128(9)	105(9)	141(46)	149(27)	131(40)
2008: Mean (SD)	151(29)	141(44)	117(16)	298*	162(40)	136(16)

	Autumn 2010			Winter 2010/2011		
	September	October	November	December	January	February
Numbers of bird counted	127, 247, 101	162, 224, 291, 192	300, 369, 333, 441, 366	337, 336, 294, 248	229, 286, 286, 233, 230	323, 306, 270, 280
2010: Mean (SD)	158(78)	217(55)	362(52)	304(42)	253(30)	295(24)
2009: Mean (SD)	122 (41)	144 (32)	202 (60)	142 (74)	125 (28)	136 (55)
2008: Mean (SD)	155(52)	148(14)	152(43)	140(34)	201(70)	162(36)

Table 4. Mean numbers of species and Shannon diversity indices (SD in parenthesis) of birds counted in northern part of Long Valley from spring 2008 to winter 2010/2011.

	Spring		Summer	
	No. of species	Index	No. of species	Index
2010: Mean (SD)	32 (6)	2.9 (0.2)	32 (3)	2.6 (0.2)
2009: Mean	35 (5)	3.1 (0.2)	25 (1)	2.78 (0.1)

(SD)				
2008: Mean (SD)	32 (4)	3.1 (0.2)	29 (4)	2.8 (0.3)

	Autumn		Winter	
	No. of species	Index	No. of species	Index
2010: Mean (SD)	34 (8)	3.0 (0.2)	36 (3)	3.1 (0.1)
2009: Mean (SD)	31 (7)	2.9 (0.2)	32 (5)	3.0 (0.2)
2008: Mean (SD)	34 (6)	3.1 (0.3)	35 (6)	3.1 (0.2)

3.3. For the *feng-shui* wood, the peak count in spring was 106 on 2 March, in summer was 69 on 4 August, in autumn was 122 on 12 October and in winter was 137 on 28 February. The lowest count in spring was 35 on 16 March, in summer was 0 on 14 June, in autumn was 42 on 28 September and in winter was 40 on 20 December. Bird abundance fluctuated throughout the study period. It dropped in summer and rose to a stable level in late autumn and early winter (Fig. 8). The Shannon indexes of birds counted in the *feng-shui* wood were 2.32 (SD=0.31), 1.83 (SD=0.58), 2.09 (SD=0.38) and 2.33 (SD=0.20) in spring 2010, summer 2010, autumn 2010 and winter 2010/2011 respectively. (Table 5 and Table 6).

Table 5. Numbers in each count in the *feng-shui* wood, from spring 2010 to winter 2011 and the mean numbers (SD in parenthesis) from spring 2008 to winter2010/2011.

	Spring 2010			Summer 2010		
	March	April	May	June	July	August
Numbers of bird counted in each survey	106, 96, 35, 82, 68	60, 42, 39, 67	60, 68, 36, 38	5, 0, 4	15, 1	69, 64, 6, 7, 3
2010: Mean (SD)	77(28)	52(14)	51(16)	5(0.71)	8(10)	30(36)
2009: Mean (SD)	85(15)	89(21)	67(32)	40(17)	68(10)	53(17)
2008: Mean (SD)	80(19)	88(13)	65(12)	48*	40(17)	55(12)

	Autumn 2010			Winter 2010/2011		
	September	October	November	December	January	February
Numbers of bird counted in each survey	65, 45, 42	39, 122, 57, 66	58, 83, 83, 85, 65	107, 70, 40, 69	49, 78, 134, 62, 49	103, 91, 126, 137
2010: Mean (SD)	51(13)	71(36)	75(12)	72(27)	74(35)	114(21)
2009: Mean (SD)	54 (3)	60 (21)	81 (31)	56 (24)	58 (5)	72 (16)
2008: Mean (SD)	70(31)	60(16)	83(24)	77(22)	91(39)	116(47)

Table 6. Mean numbers of species and Shannon diversity indices (SD in parenthesis) of birds counted in Ho Sheung Heung *feng-shui* wood, from spring 2008 to winter 2010/2011.

	Spring		Summer	
	No. of species	Index	No. of species	Index
2010: Mean (SD)	10.3 (2.87)	2.32 (0.31)	5.7 (4.7)	1.83 (0.58)
2009: Mean (SD)	16.8 (2.94)	2.80 (0.23)	10.3(1.58)	2.01 (0.28)
2008: Mean	15.8 (2.76)	2.37 (0.21)	11.6 (1.06)	2.05(0.21)

(SD)				
	Autumn		Winter	
	No. of species	Index	No. of species	Index
2010: Mean (SD)	9.08 (2.57)	2.09 (0.38)	11.2(1.99)	2.33 (0.20)
2009: Mean (SD)	11.1 (2.8)	1.92 (0.29)	13.5 (2.7)	2.07 (0.31)
2008: Mean (SD)	13.1 (3.4)	2.04 (0.26)	15.5 (2.6)	2.19 (0.19)

Managed area

3.4. The surveyed area of the core part of Long Valley was 3,182,166 sq.ft. and that of the northern part of Long Valley was 1,020,889 sq.ft. Therefore, the total surveyed area is 4,203,056 sq.ft. The total area of agricultural fields in both parts of Long Valley managed by HKBWS and CA were different among months in the current study period (Table 7).

Table 7. Total surveyed area of managed and unmanaged fields in the core and northern part of Long Valley by the HKBWS and CA from March 2010 to February 2011.

Months	Area of managed fields (sq. ft.)	Area of unmanaged fields (sq. ft.)	Total	% of fields managed
March	998,780	3,204,276	4,203,056	23.8
April	1,057,980	3,154,076	4,203,056	25.2
May	1,083,580	3,119,476	4,203,056	25.8
June	1,083,580	3,119,476	4,203,056	25.8
July	1,083,580	3,119,476	4,203,056	25.8
August	1,083,580	3,119,476	4,203,056	25.8
September	1,083,580	3,119,476	4,203,056	25.8
October	1,083,580	3,119,476	4,203,056	25.8
November	1,083,580	3,119,476	4,203,056	25.8
December	1,083,580	3,119,476	4,203,056	25.8
January	1,083,580	3,119,476	4,203,056	25.8
February	1,083,580	3,119,476	4,203,056	25.8

3.5. During the study period, the mean bird density in managed fields was the highest in winter while it was the lowest in summer (Table 8). The ratio of mean bird density in managed fields to that in unmanaged fields of the same year reflected the utilization of managed fields by birds. The mean densities of birds and the ratios in the current study period lie within the range of previous years in spring, autumn and winter while it dropped in summer. The value in summer was the lowest in 2010 across years while others seasons in this study period lies with the range of variation in previous years.

Table 8. Mean (SD) bird density (per 100,000 sq. ft.) in all managed and unmanaged fields and ratio of mean bird density in managed fields to that in unmanaged fields in from spring 2007 to winter 2010/2011

	Spring 2007	Spring 2008	Spring 2009	Spring 2010
Managed fields	9.3 (6.4)	12.4 (10.9)	10.9 (5.6)	11.7 (7.4)
Unmanaged fields	14.4 (5.9)	5.4 (2.6)	5.9 (2.5)	7.0 (3.1)
Ratio	0.65	2.30	1.85	1.67
	Summer 2007	Summer 2008	Summer 2009	Summer 2010

Managed fields	6.7 (3.5)	21.4 (11.5)	12.3 (9.3)	10.7 (5.8)
Unmanaged fields	4.1 (2.2)	3.8 (1.8)	5.3 (2.3)	8.2 (2.1)
Ratio	1.63	5.63	2.32	1.30
	Autumn 2007	Autumn 2008	Autumn 2009	Autumn 2010
Managed fields	19.0 (9.5)	30.6 (9.7)	37.6 (10.8)	28.3 (15.7)
Unmanaged fields	20.3 (6.4)	8.1 (2.8)	10.5 (4.6)	16.6 (8.3)
Ratio	0.94	3.78	3.58	1.70
	Winter 2007/2008	Winter 2008/2009	Winter 2009/2010	Winter 2010/2011
Managed fields	22.9 (11.4)	36.6 (13.1)	22.5 (9.9)	33.1 (14.9)
Unmanaged fields	15.7 (3.0)	11.1 (3.1)	9.2 (4.0)	15.9 (6.4)
Ratio	1.46	3.30	2.43	2.08

3.6. From the NMDS plot, the bird communities recorded from the managed and unmanaged areas are clearly separated (Fig. 4). ANOSIM showed that the difference is significant (P<0.001). From SIMPER, the dissimilarity between bird assemblages in managed and unmanaged fields is 61.5%. SIMPER also showed that Wood Sandpiper (9.5%), Chinese Pond Heron (8.5%), Little Egret (7.4%) and Black-winged Stilt (6.8%) are typical species in managed area while Chinese Bulbul (6.1%), Crested Myna (5.0%), Spotted Dove (4.9%) and Red-whiskered Bulbul (4.5%) are typical species in unmanaged area.

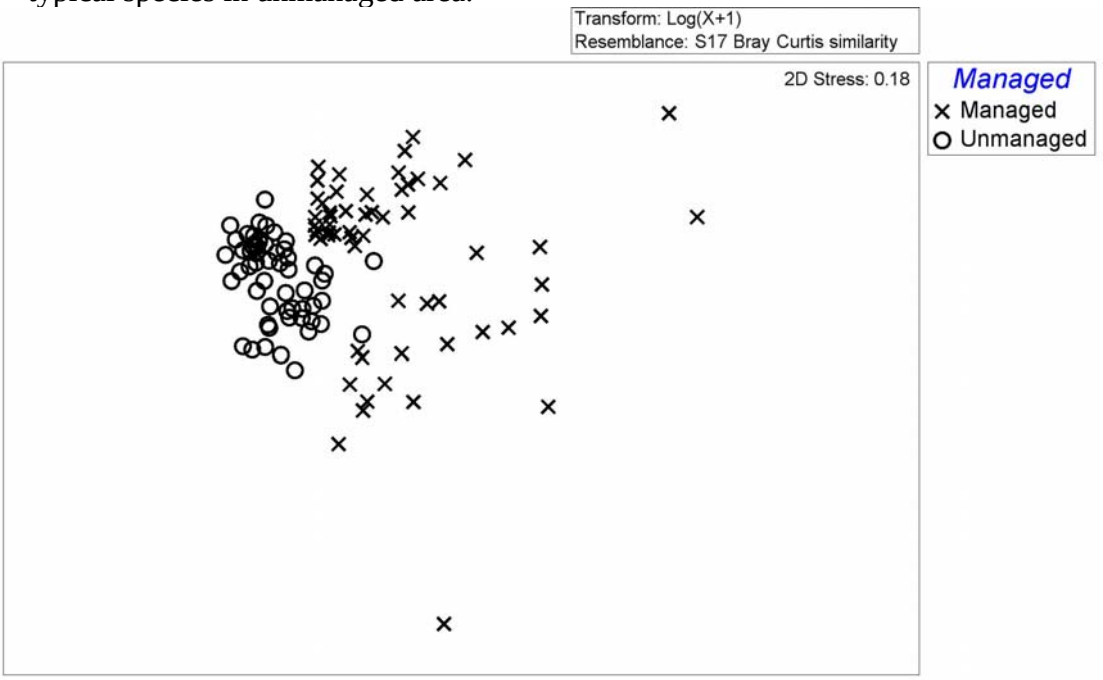

Figure 4. NMDS plot showing the bird assemblages recorded from managed and unmanaged fields.

Wet agricultural land (WAL)

3.7. In the current study period, the management practices of different WAL fields were started at different months. Therefore, the total areas of managed WAL were different among months (Table 9).

Table 9. Total area of managed WAL in the core and northern part of Long Valley from spring 2010 to winter 2010/2011.

Months	Total area of managed fields (sq. ft.)

March	218,380
April	218,380
May	218,380
June	218,380
July	218,380
August	218,380
September	233,380
October	233,380
November	233,380
December	233,380
January	233,380
February	233,380

3.8. The management practice of WAL from spring 2010 to winter 2010/2011 comprised of planting of Paddy Rice, Water Chestnut, Chinese Arrowhead, Water Caltrop, Lotus and Pygmy Water-lily.

3.9. The mean bird density in the managed WAL in spring 2010 dropped by 54%, 64%, 8% in spring, summer and autumn 2010 from the seasons in previous year respectively while in winter 2010/2011, it rose by 208% from the previous year (Table 10).

Table 10. Mean (SD) bird density (per 100,000 sq. ft.) in WAL and its control fields in from spring 2007 to winter 2010/2011.

	Spring 2007	Spring 2008	Spring 2009	Spring 2010
Managed fields	51.1 (35.5)	16.2 (14.3)	35.1 (22.7)	16.0 (25.7)
Control fields	39.3 (38.9)	13.4 (16.7)	7.8 (5.4)	16.3 (13.6)
	Summer 2007	Summer 2008	Summer 2009	Summer 2010
Managed fields	93.0 (113.3)	30.4 (20.3)	74.8 (72.0)	26.8 (25.7)
Control fields	10.2 (8.0)	9.5 (6.6)	4.0 (3.7)	9.4 (11.5)
	Autumn 2007	Autumn 2008	Autumn 2009	Autumn 2010
Managed fields	11.2 (5.8)	37.4 (16.2)	65.6 (27.5)	60.4 (42.2)
Control fields	1.3 (2.0)	5.7 (3.2)	17.0 (11.8)	26.6 (20.9)
	Winter 07/08	Winter 08/09	Winter 09/10	Winter 10/11
Managed fields	11.6 (12.8)	41.6 (12.8)	25.1 (11.6)	77.3 (44.6)
Control fields	2.3 (2.6)	8.1 (1.8)	11.6 (7.9)	21.5 (16.5)

Shallow water habitat (SWH)

3.10. The management practice of different fields of SWH started in different months in the current study period (Table 11).

Table 11. Total area of managed SWH in the core and northern part of Long Valley from spring 2010 to winter 2010/2011.

Months	Total area of managed fields (sq. ft.)
March	298,240
April	298,240
May	298,240
June	298,240
July	298,240
August	298,240
September	283,240

October	283,240
November	283,240
December	283,240
January	283,240
February	283,240

3.11. The management practice of SWH included water level maintenance, ploughing and weeding.

3.12. For spring and summer, the mean bird density of 2010 had 43.7% and 74.0% decrease compared with that of 2009 respectively. It increased by 36.3% and 57.8% compared with that of the previous year in autumn and winter respectively.

Table 12. Mean (SD) bird density (per 100,000 sq. ft.) in managed SWH from spring to winter in 2008-2011.

	2007 (07/08 for winter)	2008 (08/09 for winter)	2009 (09/10 for winter)	2010 (10/11 for winter)
Spring	22.6 (21.4)	12.3 (13.3)	28.4 (20.7)	16.0 (11.3)
Summer	11.0 (12.9)	16.9 (9.2)	22.0 (16.0)	5.73 (5.11)
Autumn	4.6 (4.9)	26.2 (14.2)	33.1 (12.2)	45.1 (13.5)
Winter	2.3 (1.7)	28.0 (16.9)	19.9 (13.4)	31.4 (20.8)

Fish pond (FP)

3.13. The managed area of FP remained at 148,550 sq. ft. in the current study period (Table 13). These practices included fish pond restoration, water lily planting and draining.

Table 13. Total area of managed fish pond in the core and northern part of Long Valley in from March 2010 to February 2011.

Months	Total area of managed fields (sq. ft.)
March	148,550
April	148,550
May	148,550
June	148,550
July	148,550
August	148,550
September	148,550
October	148,550
November	148,550
December	148,550
January	148,550
February	148,550

3.14. The mean bird densities in managed FP were decreased by 8.4 % and 60.9 % from 2009 to 2010 in spring and summer, while it increased in autumn and winter by 98.0 % and 49.5 % (Table 14).

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Table 14. Mean (SD) bird density (per 100,000 sq. ft.) in managed FP and its control fields from spring 2008 to winter 2010/2011.

	Spring 2008	Spring 2009	Spring 2010
Managed fields	1.1 (1.0)	14.3 (8.5)	11.9 (9.0)
Control fields	0.1 (0.1)	4.8 (4.2)	5.2 (5.0)

	Summer 2008	Summer 2009	Summer2010
Managed fields	1.6 (2.1)	15.7 (8.9)	6.3 (3.3)
Control fields	0.3 (0.2)	3.2 (2.9)	13.3 (14.5)
	Autumn 2008	Autumn 2009	Autumn 2010
Managed fields	11.2 (7.8)	10.1 (11.6)	20.0 (13.6)
Control fields	2.1 (3.0)	1.0 (1.8)	13.7 (16.7)
	Winter 08/09	Winter 09/10	Winter 10/11
Managed fields	24.9 (18.0)	19.6 (17.3)	29.3 (18.2)
Control fields	5.4 (3.3)	1.5 (1.5)	16.9 (14.6)

Water flea pond (WFP)

3.15. In the period from March 2010 to February 2011, five WFP of total area 64,000 sq. ft. were managed. Water level management, fertilizers and fish stocking were done in this period.

3.16. In the study period, the mean bird density in managed WFP rose from previous years by 204.3 %, 82.1 %, 24.6 % and 36.4 % (Table 15).

Table 15. Mean (SD) bird density (per 100,000 sq. ft.) in WFP from spring 2010 to winter 2010/2011.

	2007 (07/08 for winter)	2008 (08/09 for winter)	2009 (09/10 for winter)	2010 (10/11 for winter)
Spring	0.5 (0.4)	0.47 (0.45)	16.2 (10.5)	49.3 (27.7)
Summer	1.2 (1.3)	2.1 (2.8)	5.6 (4.8)	10.2 (7.40
Autumn	4.9 (2.5)	26.1 (19.1)	28.0 (19.3)	34.9 (23.2)
Winter	4.3 (2.1)	35.6 (17.8)	36.3 (21.1)	50.6 (28.8)

3.17. Bird assemblages were clustered by NMDS plot according to different managed habitats, including fish pond, shallow water habitat, wet agricultural land, water flea pond and unmanaged fields. It is shown that bird assemblages in different habitats are roughly separated (Fig. 5). By ANOSIM, the bird assemblages between different habitats are significant different ($P<0.001$). From the result of SIMPER, We found that Black-winged Stilt (57.6%), Wood Sandpiper (9.4%) and Chinese Pond Heron (9.0%) are typical species in water flea pond; Wood Sandpiper (19.0%), Common Snipe (11.5%) and Chinese Pond Heron (9.2%) are typical species in shallow water habitat; Wood Sandpiper (12.1%), Chinese Pond Heron (9.8%) and Scaly-breasted Munia (7.4%) are typical species in wet agricultural land; Little Egret (23.9%), Chinese Pond Heron (21.3%) and Chinese Bulbul (5.7%) are typical species in fish pond; Chinese Bulbul (6.0%), Crested Myna (5.0%) and Spotted Dove (4.9%) are typical in unmanaged Farmlands (Table 10) .

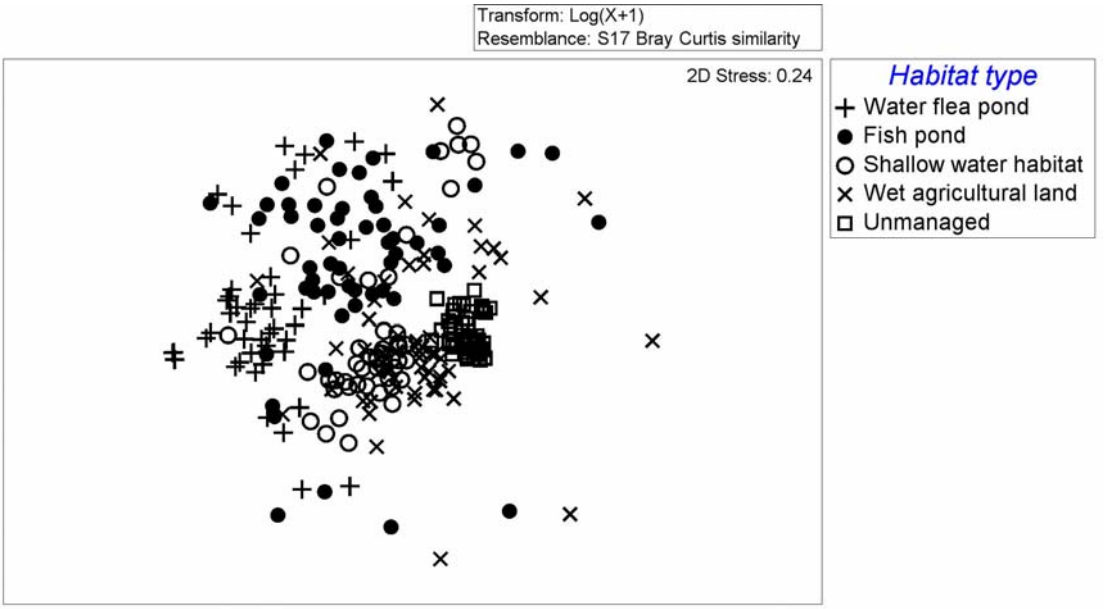

Figure 5. NMDS plot showing the bird assemblages recorded from the five habitat types: water flea pond, fish pond, shallow water habitat, wet agricultural land and unmanaged area.

4. Discussion

4.1. The trend in the abundance of birds in the core part of Long Valley from spring 2010 to winter 2010/2011 was similar to those in previous years, which it dropped from early spring to late spring due to the departure of wintering birds and reached the lowest in summer. The abundance of bird rose to the highest in autumn, and it fluctuated within winter owing to the influx of passage migrant mainly in October and November.

4.2. The management in the core part and the northern part of Long Valley was effective in attracting birds in autumn and winter. Firstly, the mean abundances of bird recorded in autumn and early winter were the highest within the year, as well as compared with the previous years, this indicated more birds were attracted to Long Valley in general. Of particular interest, a record high number of species and individuals in the core part of Long Valley in this study period. On 1 November 2010, a total of 62 species were recorded, which showed that high diversity of passage migrants were attracted to Long Valley including Black-faced Bunting, Buff-bellied Pipit, Chestnut-eared Bunting, Eurasian Skylark, Japanese Quail, Japanese Sparrowhawk and Yellow-breasted Bunting. On 13 December 2010, a total of 1207 individuals were recorded, relatively high number of winter visitors were counted including Black-winged Stilt, Common Snipe, Red-billed Starling, White-cheeked Starling, Wood Sandpiper and Yellow Wagtail.

4.3. We achieved high effectiveness of paddy rice planting to attract seed-eating birds in autumn 2009, this practices was conducted in this study period. High abundance and diversity of seed-eating birds were attracted to fields planted with rice paddy in October and November 2010, these species includes Black-faced Bunting, Chestnut-eared Bunting, Little Bunting, Yellow-breasted Bunting, Yellow-browed Bunting, Eurasian Skylark, White-rumped Munia and Scaly-breasted Munia. Besides,

Crested Bunting, Rustic Bunting and Chinese Penduline Tit were also recorded by birdwatchers. It is recommended to continue this management practice in the future.

4.4. In term of bird density in managed fields, the result in this study period was within the range of previous years, except that the ratio of mean bird density in managed to unmanaged fields was the lowest in summer in 2010 compared to previous years. We will pay close attention to this in the coming summer to try to evaluate the effectiveness of managed fields in summer. There were significant differences in the bird assemblages between managed and unmanaged area in which managed area were dominant by target waterbird species including Wood Sandpiper, Chinese Pond Heron, Little Egret and Black-winged Stilt while habitat generalists species including Chinese Bulbul, Crested Myna, Spotted Dove and Red-whiskered Bulbul outnumbered other species in unmanaged area.

4.5. For the management of WAL, there were noticeable changes in summer and winter in this study period from previous years. There was 64.2 % decrease in the mean density of birds in managed WAL in summer 2010 from summer 2009. One possible reason was that relatively low number of white-rumped Munia and Wood Sandpiper were recorded in summer 2010, in which these two species were recorded at high number in summer 2009. This is because farmers repelled birds from farmlands more actively during the rice grain forming stage in 2010 and more rice fields were harvested in 2010 than 2009. The mean bird density of managed WAL in winter 2010/2011 increased by 208% from winter 2009/2010. This implied that the management of WAL was effective in this winter, which attracted relatively high number of birds including Black-winged Stilt, Common Snipe, Scaly-breasted Munia, White-rumped Munia and Wood Sandpiper.

4.6. There were apparent changes in the mean bird density in managed SWH in different seasons. The number in summer 2010 was the lowest while the number in autumn 2010 and winter 2010/2011 were the highest among different seasons since 2007. The reason significant drop of the mean bird density in summer remains not clear and needs further investigation and observation in the coming summer. Among different habitats, SWH was very important in attracting target waterbirds particularly Wood Sandpiper and Common Snipe.

4.7. The increasing trend of the mean bird density in managed WAL and SWH in autumn and winter indicated that there may be still capacity to attract more birds to utilize the managed WAL and SWH in Long Valley. Yet, we need to further evaluate their effectiveness in spring and summer in the coming seasons.

4.8. The management of fishpond was very effective in autumn 2010 and winter 2010/2011 where high density of birds were recorded in managed fishponds. Species attracted to managed fishponds were mainly waterbirds including Black-winged Stilt, Chinese Pond Heron and Little Egret. However, it is observed that the density of bird in control fishponds (i.e. field 220 and 312) had noticeably increase compare with past years. This may due to the periodically strong cold fronts occurred in winter 2010/2011 which killed a lot of stocked fish in drained fish ponds, e.g. 223, while fish in control fishponds survived as they were not drained and contained larger volume of water which attracted birds to forage in control fishponds.

4.9. The management of water flea ponds were very effective in this study period, which the mean bird density were the highest in all four seasons compared to those in previous years. In particular, very high number of Black-winged Stilt and Barn Swallow were recorded in water flea ponds. In view of its bird species assemblage, water flea pond remains as a unique habitat in Long Valley.

4.10. The bird surveys in f*eng-shui* wood in northern part of Long Valley started in March 08, there were more bird species newly recorded from the surveys. In winter 09/10, three new species in Long Valley were recorded in f*eng-shui* Wood including Chestnut Bulbul, and Mountain Tailorbird. Their habitat preference associates to woodland to some extent, which implied the f*eng-shui* Wood is able to accommodate woodland associated birds. The surveys in f*eng-shui* Wood are recommended to continue, and more species are expected to be recorded in future surveys.

4.11. A trial of planting floating heart lotus and reed was conducted in field 238k and 238j during this study period and we found that higher diversity of birds were recorded in this study period. Planting of floating heart lotus and reed provided a suitable habitat secretive bird species and bird species that inhabit in reed bed, including Black-browed Reed Warbler, Common Moorhen, Dusky Warbler, Pheasant-tailed Jacana and Ruddy-breasted Crake which were not recorded in these two fields in previous study period. Moreover, there were apparently increase in the number of Greater Painted Snipe. We recommend to conduct further trial on planting various plant species to enhance the ecological value of Long Valley.

4.12. We found that there were significant differences between the bird assemblages recorded in different habitats. Different types of managed habitats were successful at attracting waterbirds while compared to unmanaged fields which were dominant by generalists, e.g. Chinese Bulbul, Crested Myna and Spotted Dove. This showed that maintaining the diversity of different types of managed fields in Long Valley is important to the bird diversity.

4.13. There are some notable sightings recorded from spring 2010 to winter 2010/2011 (Status follows Carey et. al. 2001 unless stated otherwise). They include:

Bean Goose *Anser fabalis*
Four individuals were photographed flying over Long Valley on 3 November. This species was sighted in Mai Po earlier and was the first record of this specie in Hong Kong. This is the first record in Long Valley.

Blue-tailed Bee-eater *Merops philippinus*
Scarce passage migrant. One individual was recorded on 28 October.

Blue-throated Bee-eater *Merops viridis*
Only two records in Hong Kong before 2001. One individual was seen and photographed in Long Valley on 29 May by birdwatcher. This is the first record of this species in Long Valley.

Black-faced Spoonbill *Platalea minor*
Common winter visitor to Deep Bay and listed as Endangered in IUCN red list. In the northern part of Long Valley, one was seen on 30 March and 13 April.

Brambling *Fringilla montifringilla*
Scarce passage migrant. One individual was photographed on 3 November by birdwatcher. This is the first record of this species in Long Valley.

Buff-bellied Pipit *Anthus rubescens*
Scarce winter visitor and passage migrant. One was recorded on 2 March, 1 November, 27 December, 3, 18 and 31 January, 16 and 21 February.

Chestnut Bulbul *Hypsipetes castanonotus*
Local resident and common winter visitor. One was recorded on 15 and 21 November.

Chestnut-cheeked Starling *Sturnus philippensis*
Scarce passage migrant. One individual was recorded on 28 September.

Chestnut-eared Bunting *Emberiza fucata*
Scarce migrant and rare in winter. One was recorded on 21 April, 25 October, 1, 15 and 30 November, 21 and 27 December and 8 February. Up to two individuals were recorded on 18 October and 22 November.

Cinnamon Bittern *Ixobrychus cinnamomeus*
Scarce passage migrant. One was seen on 28 May, 17 August, 7 September, and 5 October.

Citrine Wagtail *Motacilla citreola*
Scarce passage migrant and winter visitor. Two individuals were seen on 12 and 21 April, while one individual was on 7 April, 12 and 25 October, 6th and 27 December, 31 January, 8 and 28 February in the core part of Long Valley. In the northern part of Long Valley, one individual was recorded on 2, 11 and 26 March.

Crested Bunting *Melophus lathami*
Rare resident. An individual was photographed in Long Valley by several birdwatchers in mid-November

Dusky Thrush (Naumann's Thrush) *Turdus naumanni*
Scarce winter visitor. One individual was recorded on 11 March.

Eurasian Eagle Owl *Bubo bubo*
Scarce but widespread resident. An individual was photographed on 8 November in Long Valley. This is the first record of this species in Long Valley.

Eurasian Skylark *Alauda arvensis*
Rare passage migrant and winter visitor. One was seen on 1 November and 6 December in the core part of Long Valley. In the northern part of Long Valley, one was observed on 22 November.

Himalayan Swiftlet *Collocalia brevirostris*
Only 8 records in Hong Kong before 1998. Rare spring passage migrant (HKBWS 2009). One was recorded on 1 June.

Japanese Quail *Coturnix japonica*
Scarce passage migrant and winter visitor. Two were seen on 1 November and one was seen on 30 November.

Japanese Yellow Bunting
Scarce and irregular spring passage migrant and is listed as Vulnerable in IUCN Red List. One individual was photographed by birdwatcher on 27 April.

Lanceolated Warbler *Locustella lanceolata*
Scarce autumn migrant. Two were seen on 5 October and one was recorded on 12 October.

Pale Martin *Riparia diluta*
Uncommon spring and scarce autumn passage migrant (HKBWS 2009). One was recorded on 7 April.

Pheasant-tailed Jacana *Hydrophasianus chirurgus*
Scarce passage migrant, mainly in autumn. In the core part of Long Valley, one individual was recorded on 14 September. One individual was seen on 12 October and two were sighted on 18 October in the northern part of Long Valley.

Purple-backed Starling *Sturnus sturninus*
Scarce autumn passage migrant and very rare spring passage migrant. Two were recorded on 22 September and one was seen on 28 September.

Ruddy-breasted Crake
Scarce winter visitor and passage migrant. One individual was regularly recorded in our surveys while two individuals were recorded on 21 February.

Rustic Bunting *Emberiza rustica*
Only two record of wild birds before 2001. One individual was seen on 28 November by a birdwatcher.

Water Rail *Rallus aquaticus*
Scarce winter visitor and spring migrant. One was recorded on 3, 10, 18 and 24 January, 8 and 21 February.

Yellow-billed Grosbeak *Eophona migratoria*
Scarce and localised winter visitor. An individual was recorded on 10 January.

Yellow-breasted Bunting *Emberiza aureola*
Uncommon to common passage migrant. This species is currently listed as Vulnerable and a decreasing population trend is observed (IUCN 2009). Comparatively higher number of this species occurred in autumn 2009. It was recorded in 10 surveys during the period from 5 October to 1 January. The highest count was 7 on 18 October.

5. References

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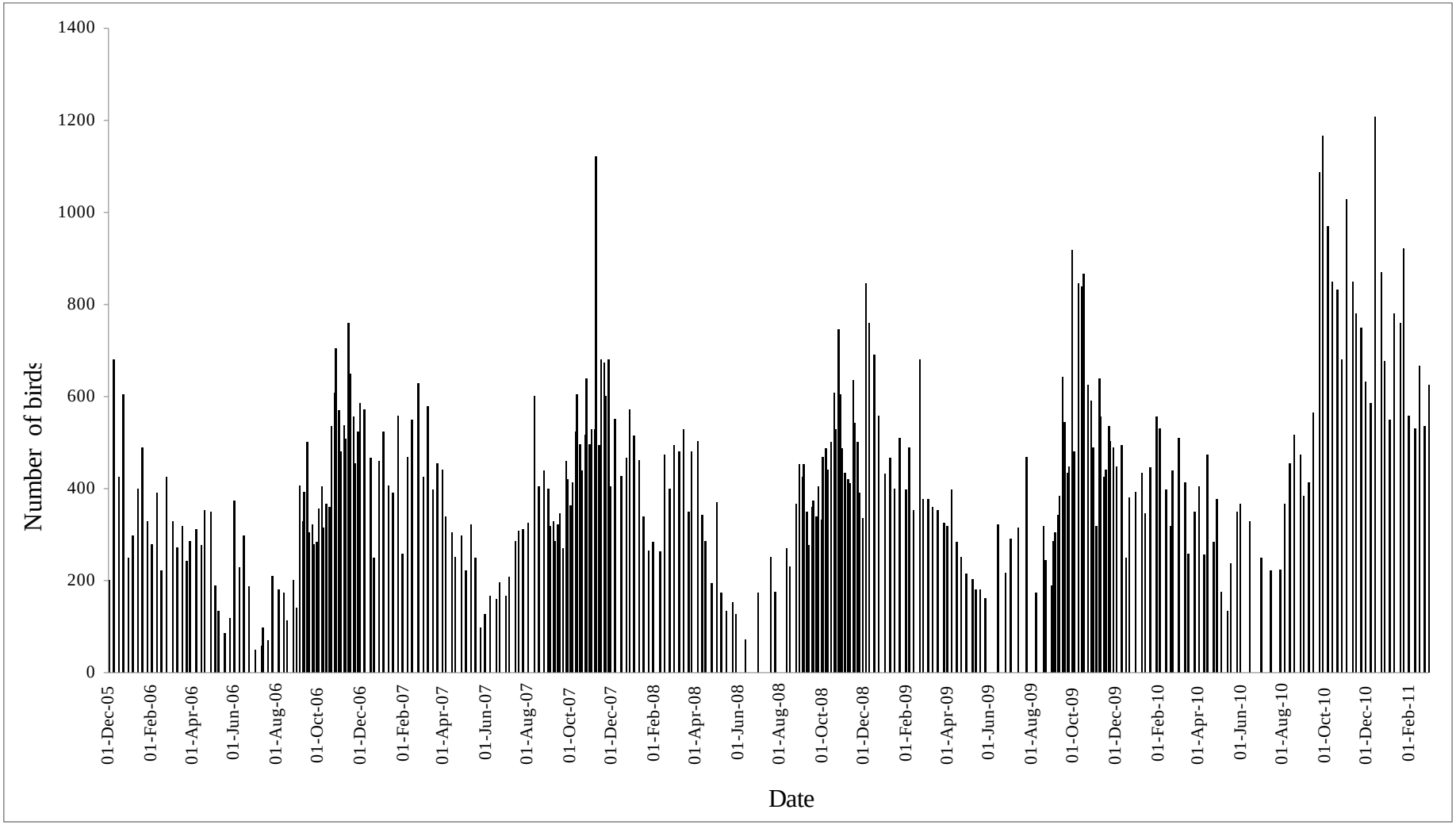

Figure 6. Total numbers of birds recorded in the core part of Long Valley from December 2005 to February 20101

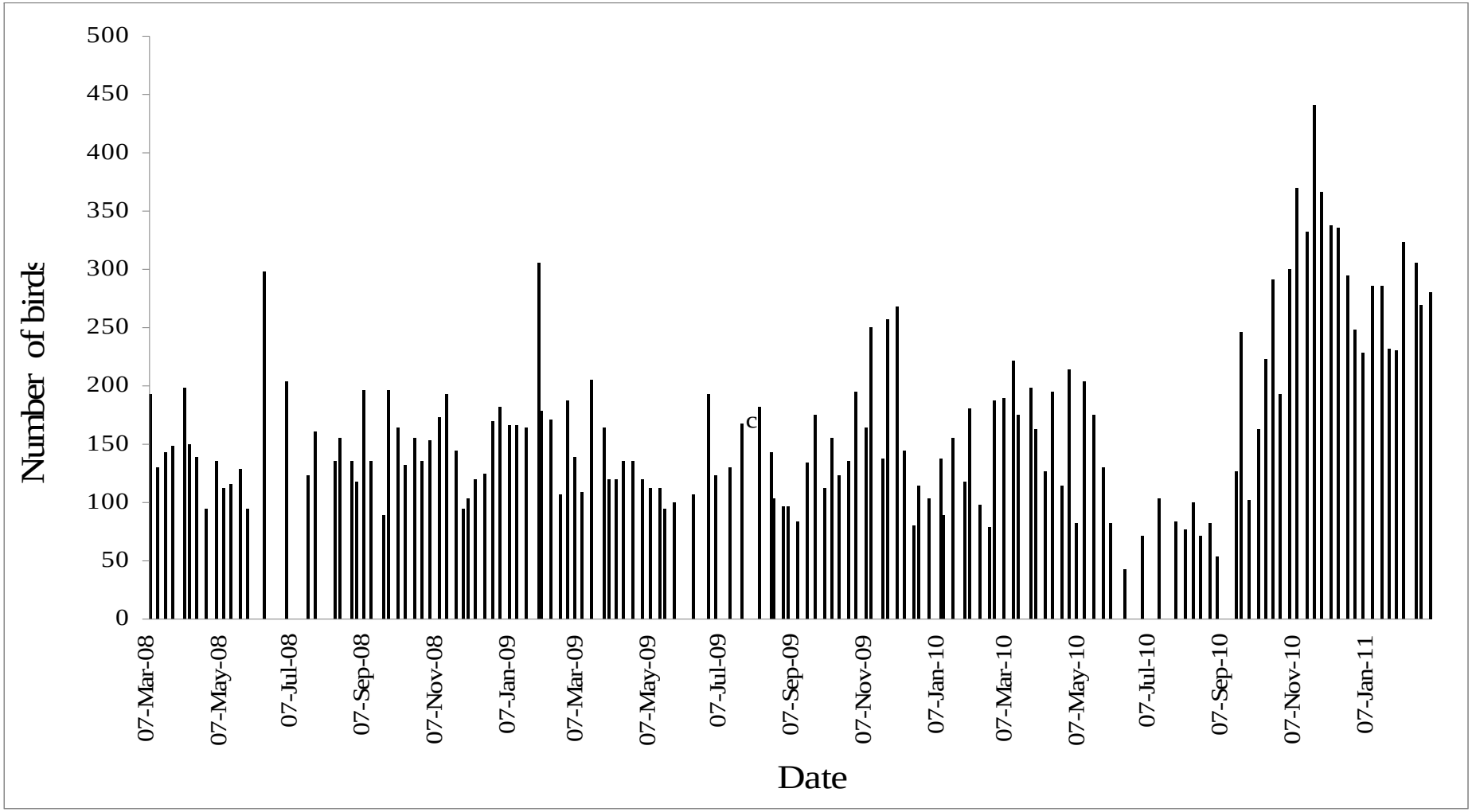

Figure 7. Total number of birds recorded in the northern part of Long Valley from March 2008 to February 2011

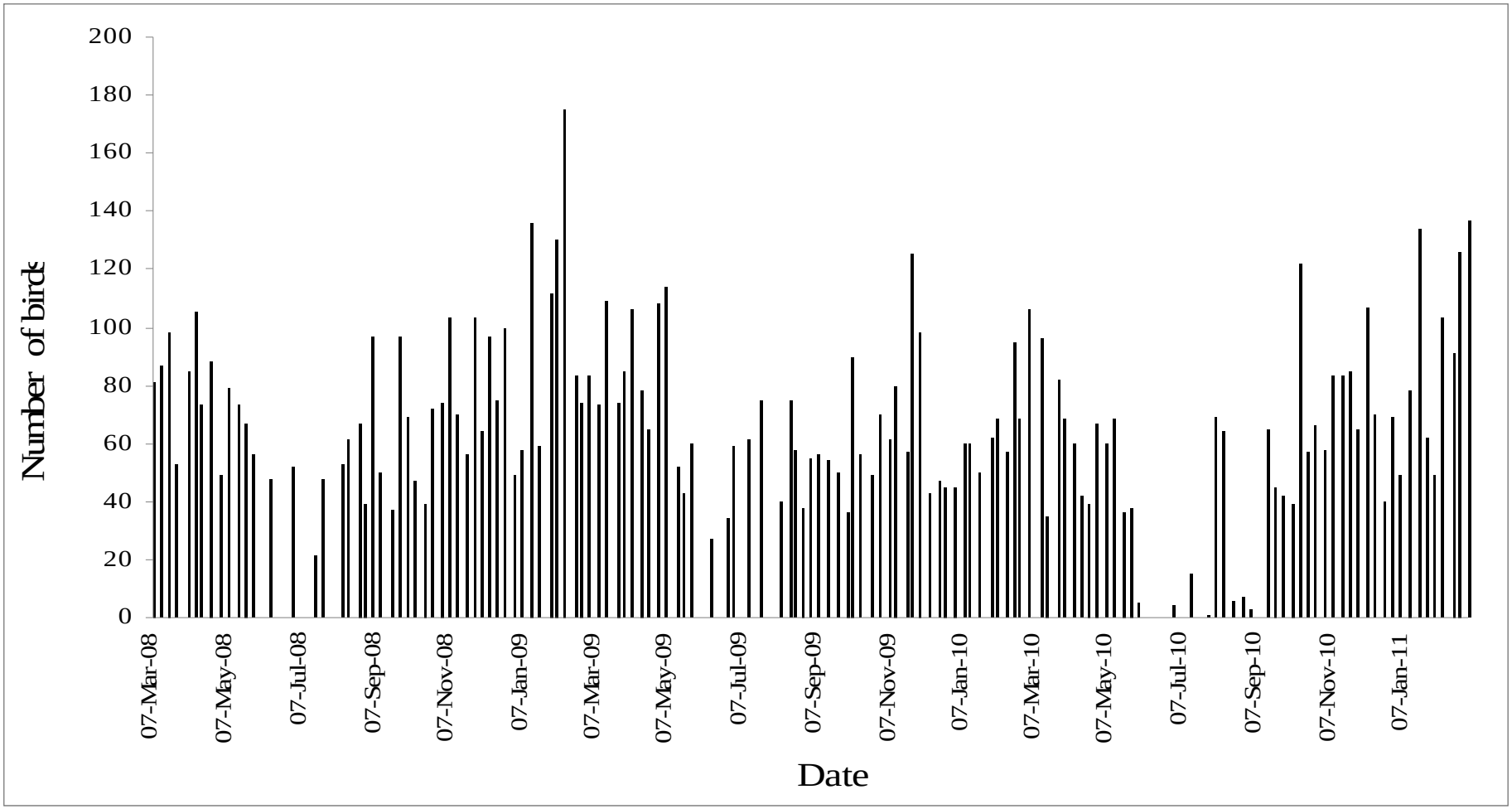

Figure 8. Total number of birds recorded in the *feng-shui* Wood of the northern part of Long Valley from March 2008 to February 2011

7. Appendix

Appendix 1. List of bird species and their average abundance recorded in regular bird survey in the core part of Long Valley during March 2010 to February 2011.

Number	English Name	Scientific Name	Status	Average Abundance
002	Japanese Quail	*Coturnix japonica*	NT	0.06
012	Gadwall	*Anas strepera*		0.04
019	Northern Shoveler	*Anas clypeata*		0.06
023	Eurasian Teal	*Anas crecca*		1.69
053	Yellow Bittern	*Ixobrychus sinensis*		0.10
055	Cinnamon Bittern	*Ixobrychus cinnamomeus*		0.08
059	Black-crowned Night Heron	*Nycticorax nycticorax*		0.02
061	Chinese Pond Heron	*Ardeola bacchus*		14.70
062	Eastern Cattle Egret	*Bubulcus coromandus*		6.84
063	Grey Heron	*Ardea cinerea*		0.41
065	Eastern Great Egret	*Ardea modesta*		1.14
066	Intermediate Egret	*Egretta intermedia*		0.35
067	Little Egret	*Egretta garzetta*		9.92
077	Great Cormorant	*Phalacrocorax carbo*		1.00
083	Black Kite	*Milvus migrans*		0.61
087	Crested Serpent Eagle	*Spilornis cheela*		0.24
090	Crested Goshawk	*Accipiter trivirgatus*		0.10
092	Japanese Sparrowhawk	*Accipiter gularis*		0.61
093	Besra	*Accipiter virgatus*		0.08
096	Eastern Buzzard	*Buteo japonicus*		0.31
102	Common Kestrel	*Falco tinnunculus*		0.16
104	Eurasian Hobby	*Falco subbuteo*		0.06
105	Peregrine Falcon	*Falco peregrinus*		0.04
109	Eastern Water Rail	*Rallus indicus*		0.14
111	White-breasted Waterhen	*Amaurornis phoenicurus*		3.35
113	Ruddy-breasted Crake	*Porzana fusca*		0.18
117	Common Moorhen	*Gallinula chloropus*		2.88
125	Black-winged Stilt	*Himantopus himantopus*		24.45
126	Pied Avocet	*Recurvirostra avosetta*		0.37
129	Pacific Golden Plover	*Pluvialis fulva*		0.29
133	Little Ringed Plover	*Charadrius dubius*		8.78
138	Greater Painted-Snipe	*Rostratula benghalensis*		2.57
139	Pheasant-tailed Jacana	*Hydrophasianus chirurgus*		0.02
141	Pintail Snipe	*Gallinago stenura*		2.29
142	Swinhoe's Snipe	*Gallinago megala*		0.27
143	Common Snipe	*Gallinago gallinago*		17.5
154	Marsh Sandpiper	*Tringa stagnatilis*		0.14
155	Common Greenshank	*Tringa nebularia*		0.24
158	Green Sandpiper	*Tringa ochropus*		1.41
159	Wood Sandpiper	*Tringa glareola*		48.02
162	Common Sandpiper	*Actitis hypoleucos*		0.84
167	Red-necked Stint	*Calidris ruficollis*		0.04
170	Long-toed Stint	*Calidris subminuta*		0.55
178	Red-necked Phalarope	*Phalaropus lobatus*		0.06
214	Domestic Pigeon	*Columba livia*		2.08

215	Oriental Turtle Dove	*Streptopelia orientalis*		0.22
217	Red Turtle Dove	*Streptopelia tranquebarica*		0.06
218	Spotted Dove	*Spilopelia chinensis*		9.02
226	Greater Coucal	*Centropus sinensis*		0.43
229	Asian Koel	*Eudynamys scolopaceus*		0.78
230	Plaintive Cuckoo	*Cacomantis merulinus*		0.37
232	Large Hawk Cuckoo	*Hierococcyx sparverioides*		0.24
236	Indian Cuckoo	*Cuculus micropterus*		0.16
250	Himalayan Swiftlet	*Aerodramus brevirostris*		0.02
255	House Swift	*Apus nipalensis*		9.33
258	White-throated Kingfisher	*Halcyon smyrnensis*		1.24
261	Common Kingfisher	*Alcedo atthis*		0.96
263	Pied Kingfisher	*Ceryle rudis*		0.10
264	Blue-tailed Bee-eater	*Merops philippinus*		0.33
268	Eurasian Wryneck	*Jynx torquilla*		0.20
276	Black-winged Cuckooshrike	*Coracina melaschistos*		0.04
283	Brown Shrike	*Lanius cristatus*		0.14
285	Long-tailed Shrike	*Lanius schach*		3.94
287	Black-naped Oriole	*Oriolus chinensis*		0.06
288	Black Drongo	*Dicrurus macrocercus*		3.78
290	Hair-crested Drongo	*Dicrurus hottentottus*		0.04
298	Eurasian Magpie	*Pica pica*		1.08
302	Collared Crow	*Corvus torquatus*	NT	0.35
303	Large-billed Crow	*Corvus macrorhynchos*		0.86
306	Great Tit	*Parus major*		0.20
310	Eurasian Skylark	*Alauda arvensis*		0.04
312	Red-whiskered Bulbul	*Pycnonotus jocosus*		6.63
313	Chinese Bulbul	*Pycnonotus sinensis*		19.45
314	Sooty-headed Bulbul	*Pycnonotus aurigaster*		3.29
315	Chestnut Bulbul	*Hemixos castanonotus*		1.27
319	Pale Martin	*Riparia diluta*		0.06
320	Barn Swallow	*Hirundo rustica*		9.14
323	Red-rumped Swallow	*Cecropis daurica*		0.04
326	Manchurian Bush Warbler	*Cettia canturians*		0.06
332	Dusky Warbler	*Phylloscopus fuscatus*		5.37
337	Yellow-browed Warbler	*Phylloscopus inornatus*		0.37
339	Arctic Warbler	*Phylloscopus borealis*		0.02
341	Pale-legged Leaf Warbler	*Phylloscopus tenellipes*		0.02
350	Oriental Reed Warbler	*Acrocephalus orientalis*		0.18
351	Black-browed Reed Warbler	*Acrocephalus bistrigiceps*		0.49
360	Russet Bush Warbler	*Bradypterus mandelli*		0.02
361	Lanceolated Warbler	*Locustella lanceolata*		0.06
362	Pallas's Grasshopper Warbler	*Locustella certhiola*		0.20
366	Zitting Cisticola	*Cisticola juncidis*		3.47
367	Golden-headed Cisticola	*Cisticola exilis*		0.47
368	Yellow-bellied Prinia	*Prinia flaviventris*		10.16
369	Plain Prinia	*Prinia inornata*		4.06
370	Common Tailorbird	*Orthotomus sutorius*		1.41
376	Masked Laughingthrush	*Garrulax perspicillatus*		7.57
388	Japanese White-eye	*Zosterops japonicus*		4.98
390	Crested Myna	*Acridotheres cristatellus*		41.47
391	Common Myna	*Acridotheres tristis*		0.67

392	Red-billed Starling	*Spodiopsar sericeus*		12.33
393	White-cheeked Starling	*Spodiopsar cineraceus*		6.10
394	Black-collared Starling	*Gracupica nigricollis*		17.86
395	Daurian Starling	*Agropsar sturninus*		0.16
396	Chestnut-cheeked Starling	*Agropsar philippensis*		0.02
400	Common Starling	*Sturnus vulgaris*		0.04
405	Grey-backed Thrush	*Turdus hortulorum*		0.10
407	Common Blackbird	*Turdus merula*		1.41
413	Dusky Thrush	*Turdus eunomus*		0.02
417	Bluethroat	*Luscinia svecica*		0.51
418	Siberian Rubythroat	*Luscinia calliope*		0.12
422	Oriental Magpie Robin	*Copsychus saularis*		7.67
425	Daurian Redstart	*Phoenicurus auroreus*		0.47
428	Siberian Stonechat	*Saxicola maurus*		7.06
431	Blue Rock Thrush	*Monticola solitarius*		0.02
447	Red-throated Flycatcher	*Ficedula albicilla*		0.04
458	Scarlet-backed Flowerpecker	*Dicaeum cruentatum*		0.02
462	Eurasian Tree Sparrow	*Passer montanus*		23.82
465	Scaly-breasted Munia	*Lonchura punctulata*		80.10
468	Eastern Yellow Wagtail	*Motacilla tschutschensis*		23.10
469	Citrine Wagtail	*Motacilla citreola*		0.24
470	Grey Wagtail	*Motacilla cinerea*		0.16
471	White Wagtail	*Motacilla alba*		16.90
472	Richard's Pipit	*Anthus richardi*		3.31
474	Olive-backed Pipit	*Anthus hodgsoni*		3.,41
477	Red-throated Pipit	*Anthus cervinus*		10.35
478	Buff-bellied Pipit	*Anthus rubescens*		0.22
485	Chinese Grosbeak	*Eophona migratoria*		0.06
490	Chestnut-eared Bunting	*Emberiza fucata*		0.24
491	Little Bunting	*Emberiza pusilla*		0.35
492	Yellow-browed Bunting	*Emberiza chrysophrys*		0.02
495	Yellow-breasted Bunting	*Emberiza aureola*	NT	1.37
499	Black-faced Bunting	*Emberiza spodocephala*		0.16

Note: Status listed is according to the IUCN Red List of Threatened Species 2010; NT = Near Threatened; VU= Vulnerable; EN = Endangered; CR = Critically Endangered.

Appendix 2. List of bird species recorded in regular bird survey in the northern part of Long Valley during March 2010 to February 2011.

Number	English Name	Scientific Name	Status	Average Abundance
023	Eurasian Teal	*Anas crecca*		0.29
041	Little Grebe	*Tachybaptus ruficollis*		0.02
051	Black-faced Spoonbill	*Platalea minor*	EN	0.04
053	Yellow Bittern	*Ixobrychus sinensis*		0.02
055	Cinnamon Bittern	*Ixobrychus cinnamomeus*		0.02
059	Black-crowned Night Heron	*Nycticorax nycticorax*		1.13
060	Striated Heron	*Butorides striata*		0.02
061	Chinese Pond Heron	*Ardeola bacchus*		5.21
062	Eastern Cattle Egret	*Bubulcus coromandus*		5.15
063	Grey Heron	*Ardea cinerea*		0.88
064	Purple Heron	*Ardea purpurea*		0.08
065	Eastern Great Egret	*Ardea modesta*		0.92
066	Intermediate Egret	*Egretta intermedia*		0.04
067	Little Egret	*Egretta garzetta*		5.29
077	Great Cormorant	*Phalacrocorax carbo*		0.04
083	Black Kite	*Milvus migrans*		0.44
092	Japanese Sparrowhawk	*Accipiter gularis*		0.02
102	Common Kestrel	*Falco tinnunculus*		0.10
104	Eurasian Hobby	*Falco subbuteo*		0.02
111	White-breasted Waterhen	*Amaurornis phoenicurus*		1.79
117	Common Moorhen	*Gallinula chloropus*		0.13
125	Black-winged Stilt	*Himantopus himantopus*		0.46
133	Little Ringed Plover	*Charadrius dubius*		3.42
138	Greater Painted-Snipe	*Rostratula benghalensis*		0.10
139	Pheasant-tailed Jacana	*Hydrophasianus chirurgus*		0.06
143	Common Snipe	*Gallinago gallinago*		0.75
155	Common Greenshank	*Tringa nebularia*		0.08
158	Green Sandpiper	*Tringa ochropus*		1.81
159	Wood Sandpiper	*Tringa glareola*		11.44
162	Common Sandpiper	*Actitis hypoleucos*		0.54
215	Oriental Turtle Dove	*Streptopelia orientalis*		0.5
217	Red Turtle Dove	*Streptopelia tranquebarica*		0.06
218	Spotted Dove	*Spilopelia chinensis*		5.67
226	Greater Coucal	*Centropus sinensis*		0.31
229	Asian Koel	*Eudynamys scolopaceus*		0.85
230	Plaintive Cuckoo	*Cacomantis merulinus*		0.06
232	Large Hawk Cuckoo	*Hierococcyx sparverioides*		0.02
236	Indian Cuckoo	*Cuculus micropterus*		0.08
254	Pacific Swift	*Apus pacificus*		0.02
255	House Swift	*Apus nipalensis*		1.42
258	White-throated Kingfisher	*Halcyon smyrnensis*		0.77
261	Common Kingfisher	*Alcedo atthis*		1.00
263	Pied Kingfisher	*Ceryle rudis*		0.31
283	Brown Shrike	*Lanius cristatus*		0.02
285	Long-tailed Shrike	*Lanius schach*		1.96
288	Black Drongo	*Dicrurus macrocercus*		1.52
290	Hair-crested Drongo	*Dicrurus hottentottus*		0.02

298	Eurasian Magpie	*Pica pica*		1.13
303	Large-billed Crow	*Corvus macrorhynchos*		0.38
306	Great Tit	*Parus major*		0.19
310	Eurasian Skylark	*Alauda arvensis*		0.02
312	Red-whiskered Bulbul	*Pycnonotus jocosus*		7.98
313	Chinese Bulbul	*Pycnonotus sinensis*		14.63
314	Sooty-headed Bulbul	*Pycnonotus aurigaster*		1.08
320	Barn Swallow	*Hirundo rustica*		7.42
326	Manchurian Bush Warbler	*Cettia canturians*		0.04
332	Dusky Warbler	*Phylloscopus fuscatus*		3.10
337	Yellow-browed Warbler	*Phylloscopus inornatus*		0.56
350	Oriental Reed Warbler	*Acrocephalus orientalis*		0.02
361	Lanceolated Warbler	*Locustella lanceolata*		0.06
366	Zitting Cisticola	*Cisticola juncidis*		0.19
368	Yellow-bellied Prinia	*Prinia flaviventris*		3.02
369	Plain Prinia	*Prinia inornata*		0.27
370	Common Tailorbird	*Orthotomus sutorius*		1.02
376	Masked Laughingthrush	*Garrulax perspicillatus*		10.98
388	Japanese White-eye	*Zosterops japonicus*		12.31
390	Crested Myna	*Acridotheres cristatellus*		8.08
391	Common Myna	*Acridotheres tristis*		0.58
392	Red-billed Starling	*Spodiopsar sericeus*		5.13
393	White-cheeked Starling	*Spodiopsar cineraceus*		1.21
394	Black-collared Starling	*Gracupica nigricollis*		5.83
404	White's Thrush	*Zoothera aurea*		0.02
405	Grey-backed Thrush	*Turdus hortulorum*		0.06
407	Common Blackbird	*Turdus merula*		1.25
409	Pale Thrush	*Turdus pallidus*		0.02
417	Bluethroat	*Luscinia svecica*		0.02
418	Siberian Rubythroat	*Luscinia calliope*		0.06
422	Oriental Magpie Robin	*Copsychus saularis*		4.38
425	Daurian Redstart	*Phoenicurus auroreus*		0.38
428	Siberian Stonechat	*Saxicola maurus*		1.25
437	Asian Brown Flycatcher	*Muscicapa dauurica*		0.02
447	Red-throated Flycatcher	*Ficedula albicilla*		0.02
460	Fork-tailed Sunbird	*Aethopyga christinae*		0.02
462	Eurasian Tree Sparrow	*Passer montanus*		14.04
465	Scaly-breasted Munia	*Lonchura punctulata*		1.71
469	Citrine Wagtail	*Motacilla citreola*		0.06
470	Grey Wagtail	*Motacilla cinerea*		0.02
471	White Wagtail	*Motacilla alba*		10.67
472	Richard's Pipit	*Anthus richardi*		2.21
474	Olive-backed Pipit	*Anthus hodgsoni*		8.10
477	Red-throated Pipit	*Anthus cervinus*		3.17
485	Chinese Grosbeak	*Eophona migratoria*		0.17
491	Little Bunting	*Emberiza pusilla*		1.33
499	Black-faced Bunting	*Emberiza spodocephala*		0.52

Note: Status listed is according to the IUCN Red List of Threatened Species 2010; NT = Near Threatened; VU= Vulnerable; EN = Endangered; CR = Critically Endangered

Appendix 3. List of bird species recorded in regular bird survey in *Feng-shui* Wood of the northern part of Long Valley during March 2010 to February 2011.

Number	**English Name**	**Scientific Name**	**Status**	Average Abundance
215	Oriental Turtle Dove	*Streptopelia orientalis*		0.70
218	Spotted Dove	*Spilopelia chinensis*		8.35
220	Common Emerald Dove	*Chalcophaps indica*		0.06
226	Greater Coucal	*Centropus sinensis*		0.38
229	Asian Koel	*Eudynamys scolopaceus*		1.04
230	Plaintive Cuckoo	*Cacomantis merulinus*		0.10
232	Large Hawk Cuckoo	*Hierococcyx sparverioides*		0.21
236	Indian Cuckoo	*Cuculus micropterus*		0.17
255	House Swift	*Apus nipalensis*		5.02
285	Long-tailed Shrike	*Lanius schach*		2.00
288	Black Drongo	*Dicrurus macrocercus*		1.85
290	Hair-crested Drongo	*Dicrurus hottentottus*		0.06
306	Great Tit	*Parus major*		0.92
312	Red-whiskered Bulbul	*Pycnonotus jocosus*		16.65
313	Chinese Bulbul	*Pycnonotus sinensis*		27.69
314	Sooty-headed Bulbul	*Pycnonotus aurigaster*		2.65
320	Barn Swallow	*Hirundo rustica*		1.85
332	Dusky Warbler	*Phylloscopus fuscatus*		3.50
336	Pallas's Leaf Warbler	*Phylloscopus proregulus*		0.25
337	Yellow-browed Warbler	*Phylloscopus inornatus*		1.94
339	Arctic Warbler	*Phylloscopus borealis*		0.04
341	Pale-legged Leaf Warbler	*Phylloscopus tenellipes*		0.02
368	Yellow-bellied Prinia	*Prinia flaviventris*		3.19
376	Masked Laughingthrush	*Garrulax perspicillatus*		11.48
390	Crested Myna	*Acridotheres cristatellus*		8.33
394	Black-collared Starling	*Gracupica nigricollis*		5.88
405	Grey-backed Thrush	*Turdus hortulorum*		0.63
406	Japanese Thrush	*Turdus cardis*		0.04
407	Common Blackbird	*Turdus merula*		2.52
409	Pale Thrush	*Turdus pallidus*		0.10
418	Siberian Rubythroat	*Luscinia calliope*		0.44
428	Siberian Stonechat	*Saxicola maurus*		1.27
437	Asian Brown Flycatcher	*Muscicapa dauurica*		0.08
458	Scarlet-backed Flowerpecker	*Dicaeum cruentatum*		0.73
460	Fork-tailed Sunbird	*Aethopyga christinae*		0.92
462	Eurasian Tree Sparrow	*Passer montanus*		15.50
465	Scaly-breasted Munia	*Lonchura punctulata*		1.75
474	Olive-backed Pipit	*Anthus hodgsoni*		9.75
491	Little Bunting	*Emberiza pusilla*		1.46

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