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Research & Monitoring Work

Five-year Report

Mai Po Nature Reserve

September 2005 – August 2010



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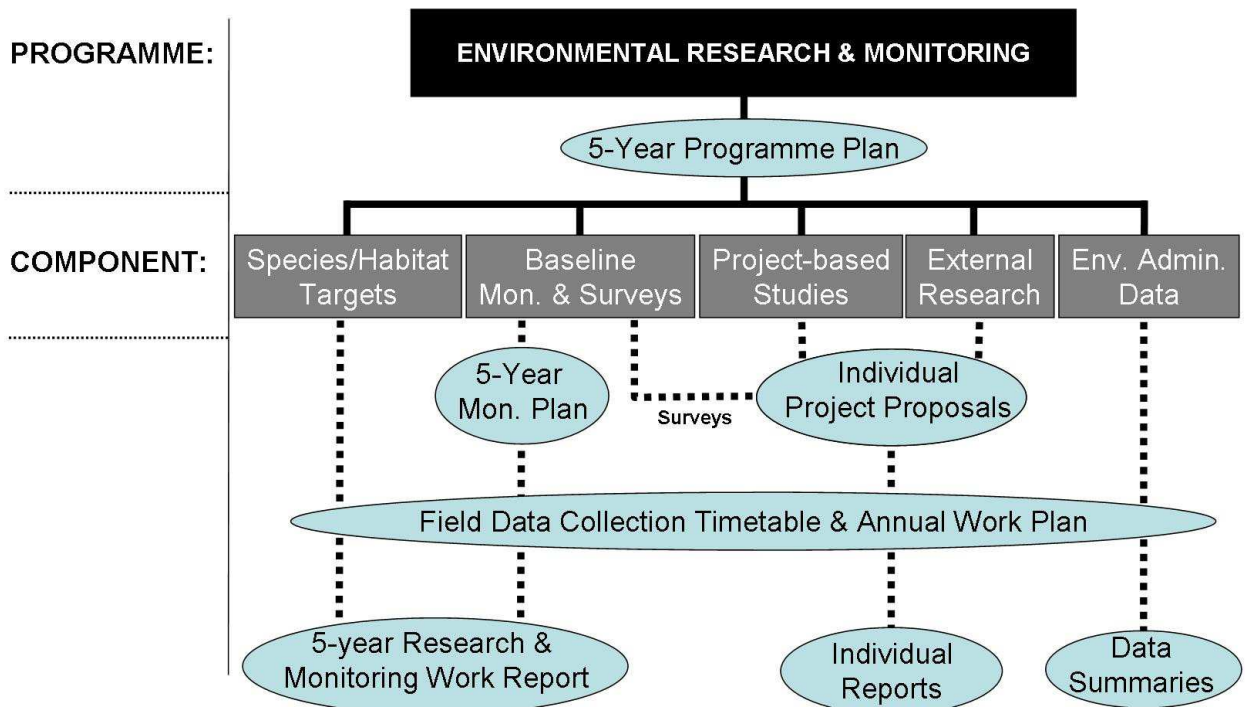
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1. INTRODUCTION

- 1.1.1 WWF's Research and Monitoring Programme at the Mai Po Nature Reserve (MPNR) is carried out as a requirement of the Mai Po Management Plan (WWF-HK, 2006) to generate specific information upon a variety of wildlife species/groups, habitats, management operations and targets to directly inform the habitat management decision making process with the intent to improve conditions for priority wetland biodiversity.
- 1.1.2 The programme consists of five components (see illustration below), 3 of which are the subject of this report; (1) "Baseline ecological monitoring" to understand long-term environmental parameters and/or ecological attribute trends, (2) "Project-based studies" to directly investigate habitat or species management techniques, and (3) "Species targets" to assess if the requirements of important species/groups are being met.
- 1.1.3 This report covers the period from September 2005 to August 2010. Ecological data and information collected under the three components are illustrated to facilitate simple comparisons between years.
- 1.1.4 Reference should be made to the "Baseline Ecological Monitoring Plan 2007-2010" (WWF-HK, 2010a) or individual "Project-based Study" reports for specific details relating to survey methodologies.
- 1.1.5 Meteorological data from the nearby Lau Fau Shan weather station within the report period was obtained from the Hong Kong Observatory and is summarised in Appendix I for reference.



BASELINE MONITORING

2 BASELINE MONITORING

2.1 Avifauna

2.1.1 Morning Bird Count

2.1.1.1 A total of 120 counts (24 counts per year) were successfully completed within the reporting period as per the date selection criteria and specified interval. Individual summary sheets for each count can be downloaded from the WWF-HK website (WWF-HK, 2011). Yearly count summaries are presented in Appendix II and species summaries in Appendix III. The analysis in this section refers only to Category A birds (WWF-HK, 2010a).

2.1.1.2 To increase geographic coverage of the count and supplement both species and abundance data without significant additional effort, the count methodology was revised on 12 June 2006 to include:

- (1) Ponds #1, #2 and #5 (non-WWF managed ponds) – increase geographic coverage
- (2) A new bird category “B” (all birds either outside the MPNR boundary or not stationary within the Reserve) – supplementary data

2005-06

2.1.1.3 Between mid-November to early February count totals reached over 4,000 birds (Table 1a and Figure 1a) with a peak count of 5,415 individuals (19 December). Low counts (< 2,000 birds) occurred between April and August; the lowest count being 563 (14 May).

2.1.1.4 The number of bird species counted ranged between 42 (14 May) and 68 (02 December); mean = 54, cumulative total = 131; including 8 wetland species of global conservation concern (Appendix IIIa). Notable counts included:

- 12 Purple Heron (17 October, a high count in recent years);
- 1 Greater White-fronted Goose (20 March and 10 April)

2006-07

2.1.1.5 Count totals reached over 4,000 birds between October to March and in September (Table 1b and Figure 1b) with a peak count of 12,132 individuals (01 December). Low counts (< 2,000 birds) occurred from April to June; lowest count 592 (23 May).

2.1.1.6 The number of bird species counted ranged between 37 (12 June) and 75 (06 October); mean = 57, cumulative total = 141; including 13 wetland species of global conservation concern (Appendix IIIb). Notable counts included:

- 7,620 roosting duck on *Gei wai* #16/17 (01 December);
- 42 Eurasian Coot (15 January, a high count in recent years);
- 4 Pheasant-tailed Jacana (17 October);
- 8 Pied Kingfisher (15 August).

2007-08

2.1.1.7 High counts (> 4,000 birds) were recorded in late September, early October and from late November to early February (with the exception of the 21 January count) (Table 1c and Figure 1c). The peak count was 8,063 individuals (21 November). Low counts (< 2,000 birds) occurred from late March to mid July; lowest count being 559 (24 May).

2.1.1.8 The number of bird species counted ranged between 42 (30 June) and 67 (25 September); mean = 57, cumulative total = 131; including 8 wetland species of global conservation concern (Appendix IIIc). Notable counts included:

- 4,153 Northern Pintail (21 November);
- 2 Black-winged Kite (14 August).

2008-09

- 2.1.1.9 Counts of over 4,000 birds were recorded from late November to early February and in early September (Table 1d and Figure 1d). The peak count was 5,088 individuals (16 December). Total counts were low (< 2,000 birds) from late March to late July; the lowest count being 801 individuals (24 April).
- 2.1.1.10 The number of bird species counted ranged between 48 (12 January and 06 July) and 72 (14 November); mean = 59, cumulative total = 137; including 9 wetland species of global conservation concern (Appendix III d). Notable counts included:
- 5 Greater Painted Snipe (04 June, including 3 juveniles).

2009-10

- 2.1.1.11 Between early December and late February, high count totals (> 4,000 birds) were recorded with another high count in mid-October (Table 1e and Figure 1e). The peak count was 6,212 individuals (22 February). Low count totals (< 2,000 birds) were recorded from April to July; the lowest count being 598 individuals (24 June).
- 2.1.1.12 The number of bird species counted ranged between 47 (24 June) and 74 (02 October); mean = 60, cumulative total = 151; including 9 wetland species of global conservation concern (Appendix III e). Notable counts included:
- 677 roosting Black-headed Gull (22 February, an uncommon species inside the MPNR).

Table 1. Morning Bird Count Monthly Summary.

Table 1a. Monthly Summary 2005-06.

Month	Mean Count	Peak Count	Peak No. of Species	
			Cat. A	Cat. A & B
Sep-05	2774.5	2880	58	-
Oct-05	3208.0	3558	62	-
Nov-05	4184.5	5360	60	-
Dec-05	5233.0	5415	68	-
Jan-06	4325.5	4634	58	-
Feb-06	3782.0	4075	60	-
Mar-06	3056.0	3602	53	-
Apr-06	876.0	1032	61	-
May-06	838.5	1114	47	-
Jun-06	1072.5	1200	45	49
Jul-06	1312.5	1467	53	57
Aug-06	1691.5	2366	57	58

Table 1b. Monthly Summary 2006-07.

Month	Mean Count	Peak Count	Peak No. of Species	
			Cat. A	Cat. A & B
Sep-06	2127.5	3458	63	66
Oct-06	3460.0	4152	75	78
Nov-06	4349.0	4983	71	79
Dec-06	9463.5	12132	63	71
Jan-07	6208.5	7003	67	72
Feb-07	4010.0	5056	59	62
Mar-07	3341.0	4771	68	75
Apr-07	1012.5	1217	59	66
May-07	631.0	670	47	50
Jun-07	710.0	769	45	49
Jul-07	2309.0	2534	50	53
Aug-07	1446.0	2210	58	60

Table 1c. Monthly Summary 2007-08.

Month	Mean Count	Peak Count	Peak No. of Species	
			Cat. A	Cat. A & B
Sep-07	3524.5	4527	67	72
Oct-07	4188.0	4837	65	75
Nov-07	5667.0	8063	64	73
Dec-07	4509.5	4835	58	66
Jan-08	4293.0	4598	63	66
Feb-08	4506.5	5416	59	65
Mar-08	1929.5	2438	61	62
Apr-08	755.0	791	58	66
May-08	766.0	973	54	60
Jun-08	1018.0	1096	49	53
Jul-08	1953.5	3198	49	54
Aug-08	2858.0	2874	61	65

Table 1d. Monthly Summary 2008-09.

Month	Mean Count	Peak Count	Peak No. of Species	
			Cat. A	Cat. A & B
Sep-08	3228.5	4002	63	67
Oct-08	2276.5	2493	59	64
Nov-08	4278.0	4993	72	77
Dec-08	4817.5	5088	64	71
Jan-09	4212.0	4269	64	69
Feb-09	3789.5	4264	61	66
Mar-09	2803.5	3769	62	68
Apr-09	826.0	851	52	60
May-09	1434.5	1784	69	75
Jun-09	1285.5	1311	59	64
Jul-09	1490.5	1732	51	54
Aug-09	3144.0	3199	63	65

Table 1e. Monthly Summary 2009-10.

Month	Mean Count	Peak Count	Peak No. of Species	
			Cat. A	Cat. A & B
Sep-09	2972.5	3579	72	76
Oct-09	3794.5	4248	74	77
Nov-09	3402.5	3936	61	68
Dec-09	5283.0	5308	69	70
Jan-10	4826.0	5569	69	75
Feb-10	5407.0	6212	66	72
Mar-10	3662.0	3931	61	64
Apr-10	1308.5	1583	70	78
May-10	742.0	762	61	67
Jun-10	742.0	886	50	54
Jul-10	1394.0	1534	54	57
Aug-10	2529.5	2658	59	62

Figure 1a. Morning Bird Count Bird Group Summary Graphs: 2005-06.

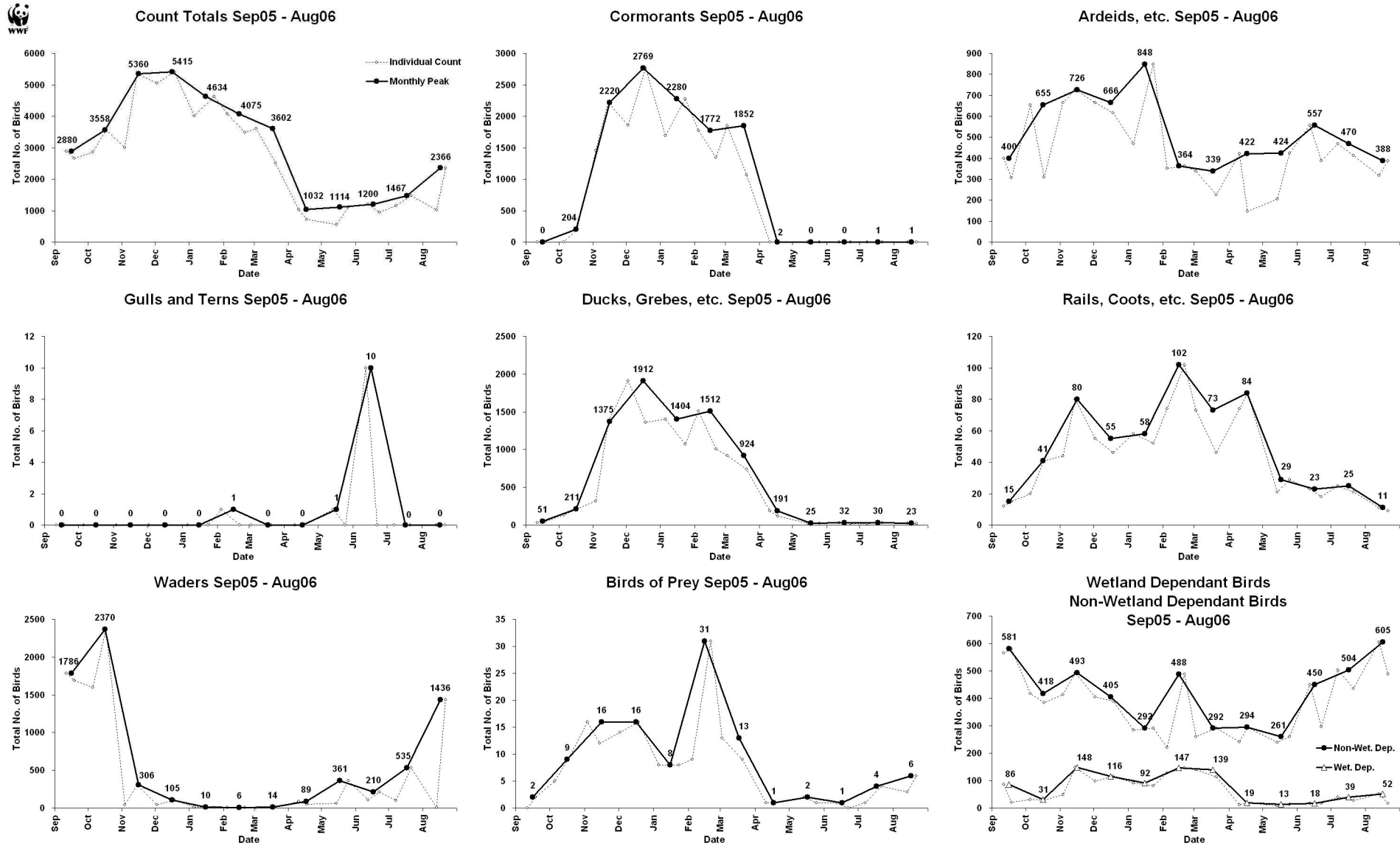


Figure 1b. Morning Bird Count : Bird Group Summary Graphs: 2006-07.

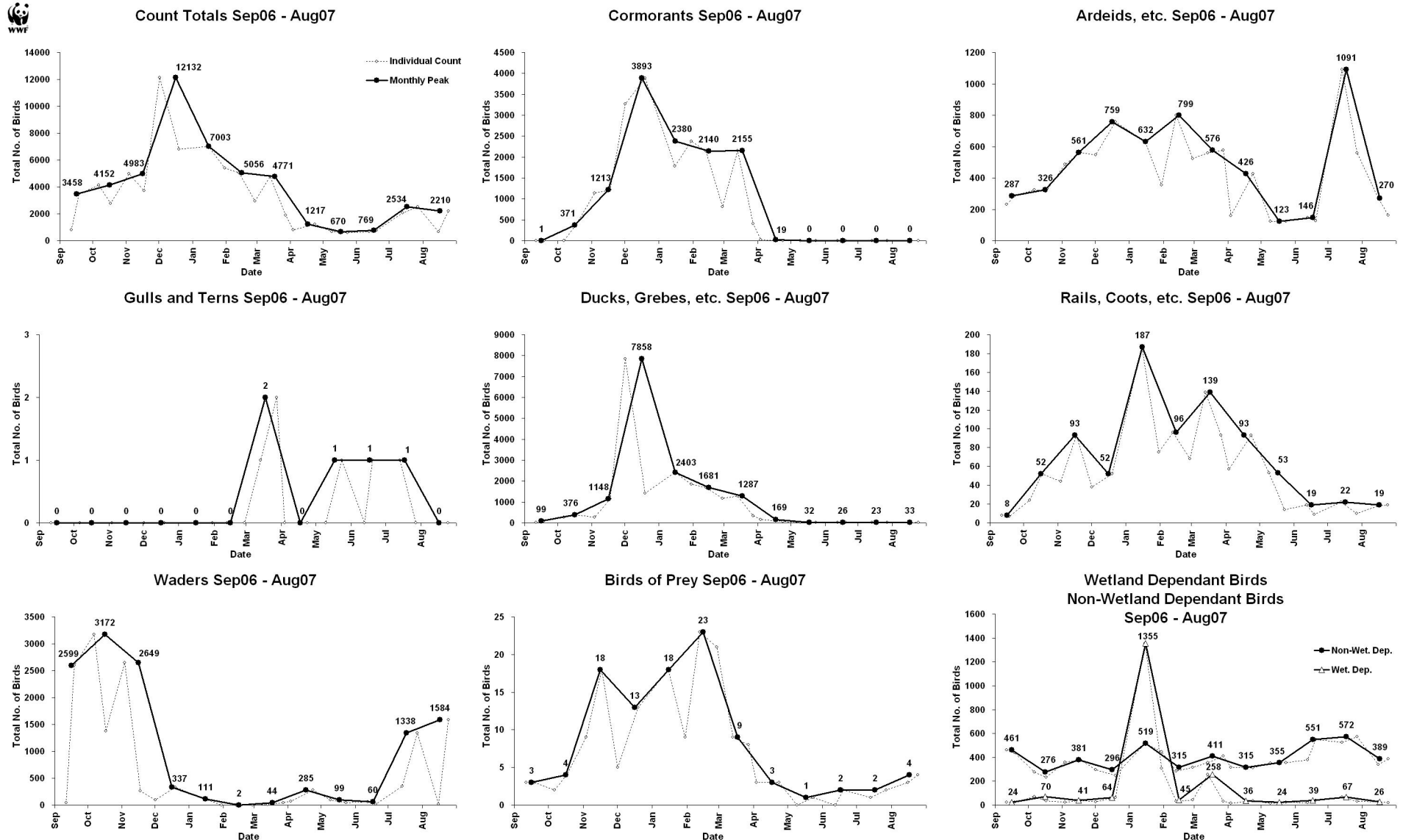


Figure 1c. Morning Bird Count : Bird Group Summary Graphs: 2007-08.

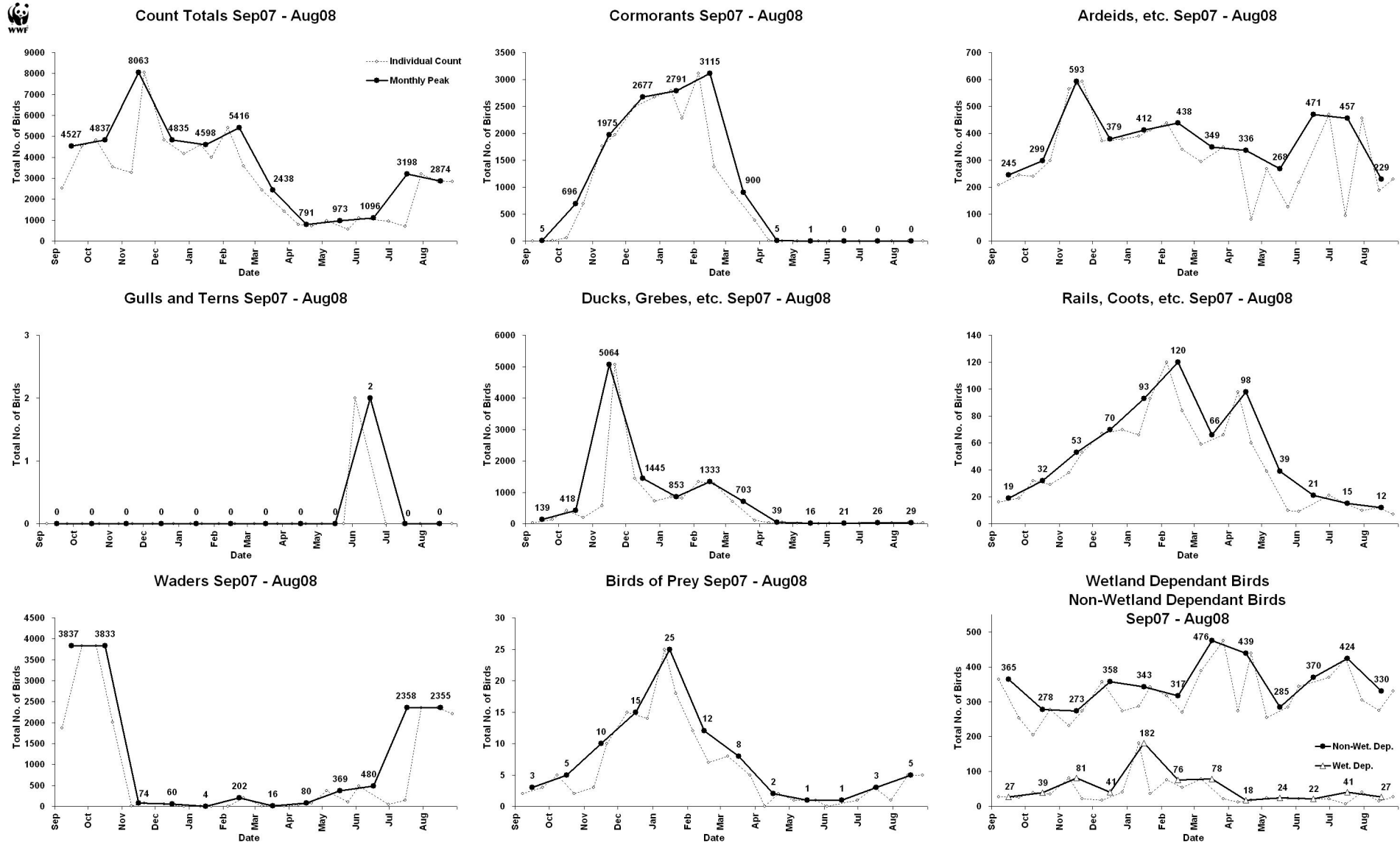


Figure 1d. Morning Bird Count : Bird Group Summary Graphs: 2008-09.

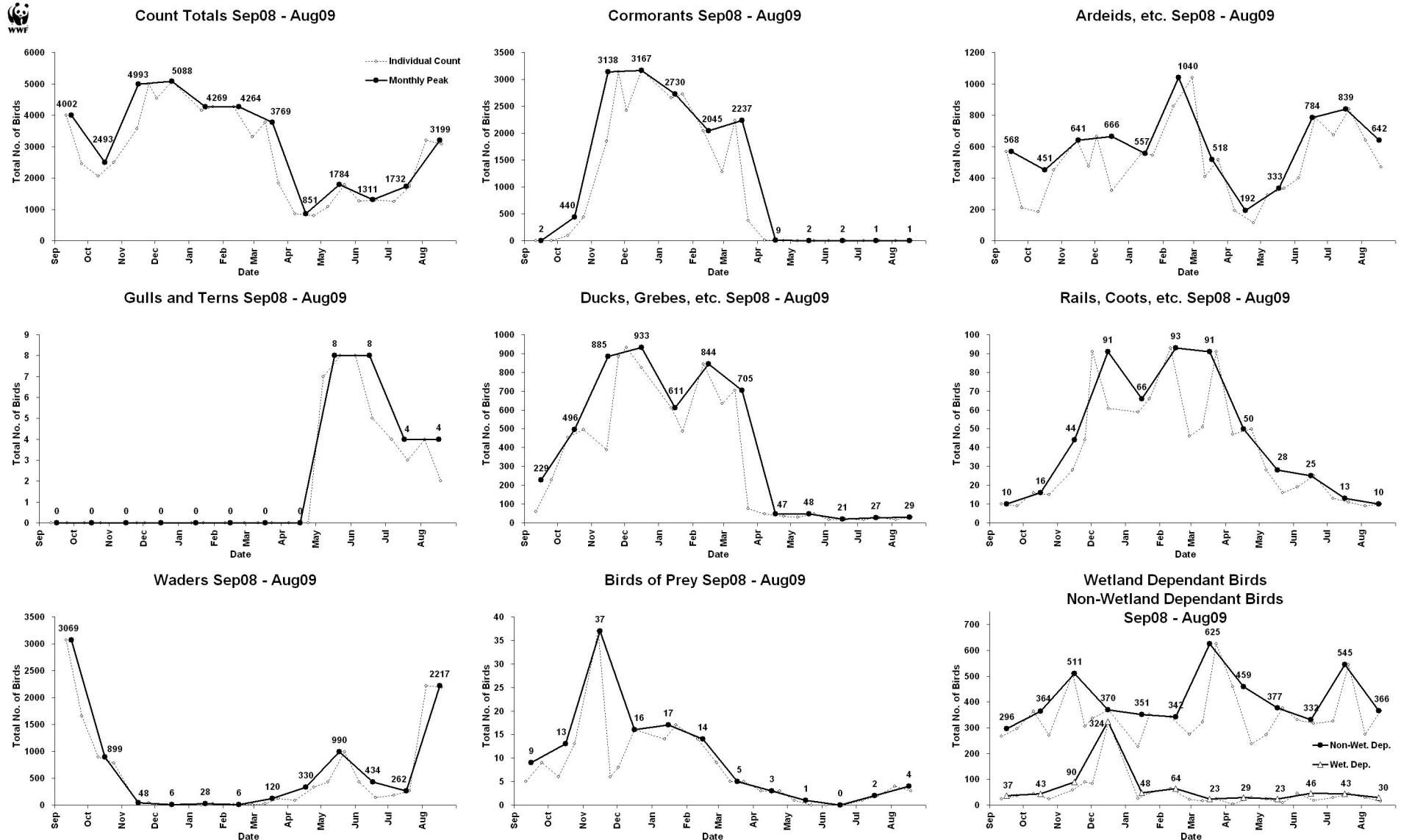
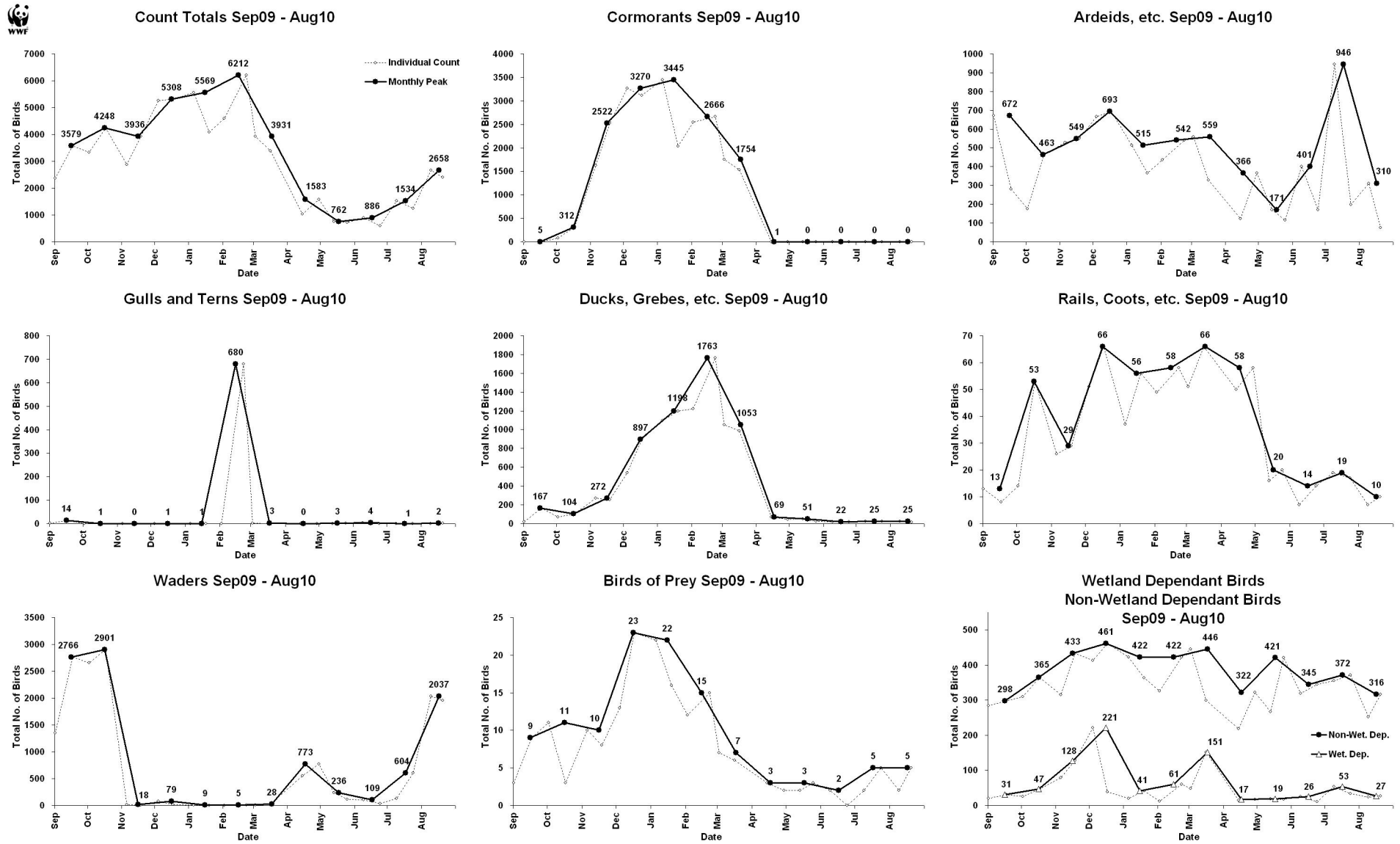


Figure 1e. Morning Bird Count : Bird Group Summary Graphs: 2009-10.



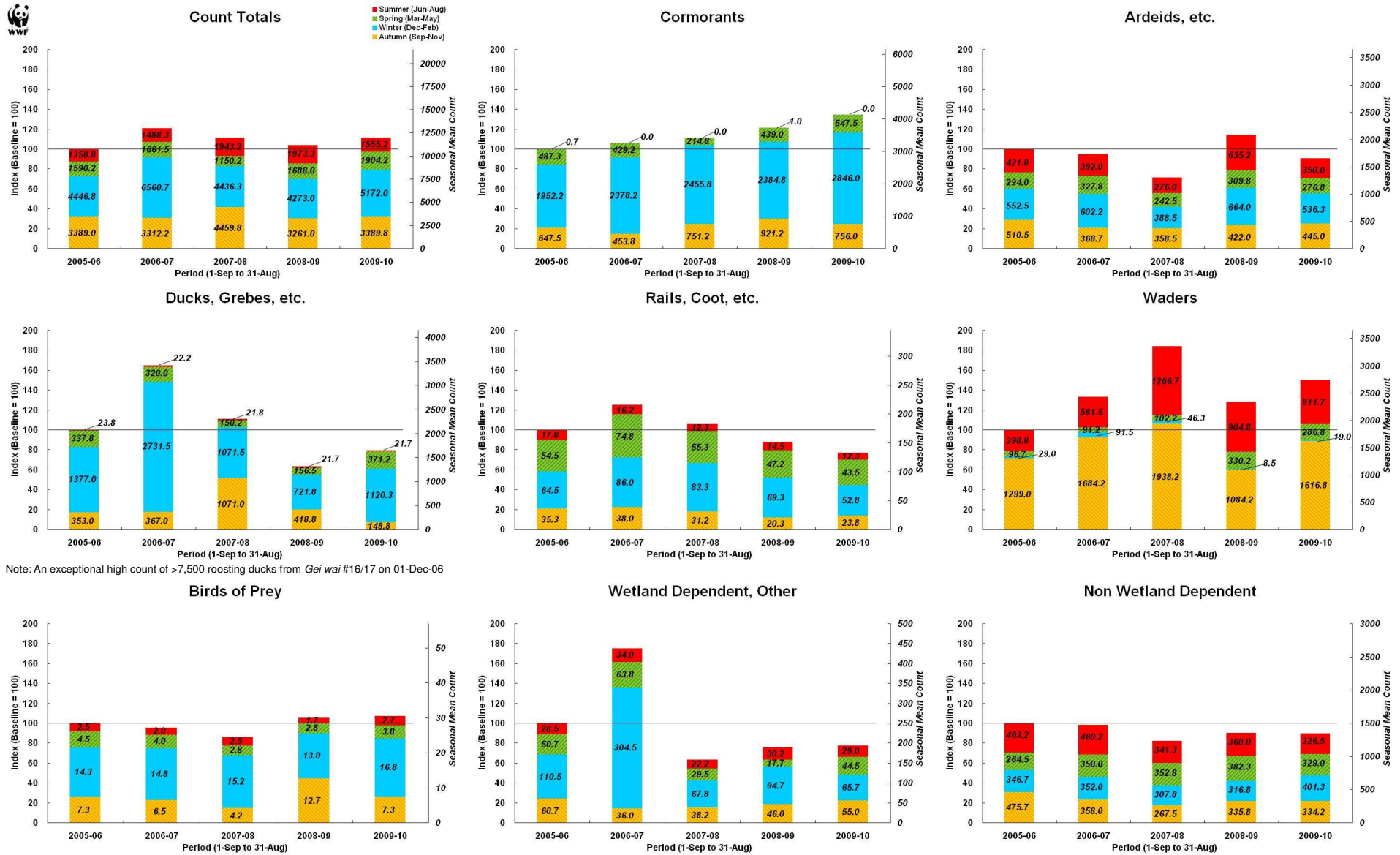
Comparison

- 2.1.1.8 A comparison was made upon changes in the number of individuals within each bird group throughout the reporting period. The cumulative total of each year period is used to derive an index and the survey year 2005-06 as the baseline year (=100) (Figure 2). Each index bar is divided proportionally into 4 seasons according to the cumulative total count for each 3-month period (WWF-HK, 2010b).
- 2.1.1.9
- **Count total** in 2005-06 was the lowest (index = 100), and 2006-07 (index = 120) the highest mainly due to significantly higher winter counts (mean = 6,560.7). Count total dropped in the following 2-year period, rising again in 2009-10. Autumn count was highest in 2007-08 (mean = 4,459.8) and remained stable in other years (mean count around 3,300). The 2009-10 spring count was highest (mean = 1,904.2). Two consecutive good summers were recorded in 2007-08 and 2008-09 (mean count around 1,900) (Figure 2).
- 2.1.1.10
- **Great Cormorant.** The index increased year-on-year from the baseline to 130. There was a significant increase in the winter mean count from 1,952.2 to 2,846.0 (Figure 2).
 - **Ardeids, etc..** In most years, indexes were below the baseline. The exception being 2008-09 when high mean counts of over 600 were recorded in both winter and summer (Figure 2).
 - **Gulls and Terns.** This group is not typically associated with the Mai Po *gei wai* and also tide dependent (particularly terns), hence an index graph is not derived for this group. A high count of 680 individuals was recorded on 22 February 2010 (Appendix IIb).
 - **Ducks, Grebes, etc..** The highest index was recorded in 2006-07 (index = 160), mainly as a result of a high winter mean count. The index continued to drop in 2007-08 reaching the lowest point in 2008-09 (index = 60), which was notably the poorest for this group in MPNR. There was a slight rise in 2009-10 but the index was still below the baseline (Figure 2).
 - **Rails, Coots, etc..** The index rose in 2006-07 to above 120 and then decreased continuously to below 80 in 2009-10. Mean counts in winter and spring dropped while the other 2 seasons remain fairly constant (Figure 2).
 - **Waders.** The presence of waders during the count was greatly affected by the availability of early morning high tides, which were more often encountered during autumn than spring. Hence the index for the group fluctuated. Higher autumn mean count (1,938.2) was recorded in 2007-08 indicating it was a better autumn for waders in MPNR during morning high tide compared to other years (Figure 2).
 - **Birds of Prey.** The index gradually dropped from the baseline to 90 in 2007-08 mainly due to lower counts in autumn and spring. The index then rose above baseline to over 105 in the following 2 years, owing to good autumn counts in 2008-09 (mean count = 12.7) and a high winter count in 2009-10 (mean count = 16.8) (Figure 2).
 - **Wetland Dependant Other.** 2006-07 was the peak period with an index over 170 and a very high winter mean count (304.5), mainly contributed to by a single high count of Red-billed Starling on 15 January 2007. Indexes in the subsequent years dropped below the baseline with a poor year in 2007-08 (index = 60), but slowly increased thereafter to around 80 in 2009-10 (Figure 2).
 - **'Non Wetland Dependant'**. The index in 2006-07 dropped slightly but was similar to the baseline year. In 2007-08, the index continued to drop to 80, the lowest within the 5-year period. An increase was observed in the following 2 years with the index reaching 90 (Figure 2).

Conclusions and Recommendations

- 2.1.1.11
- The Morning Bird Count fulfilled its main function over the past 5 years to systematically collect detailed bird data to inform habitat management decisions.
 - The survey transect sufficiently covered most of the *gei wai*/ponds within the MPNR, with a few exceptions: 1) Pond #20e, #20f, #24b and #24d are not fully observable; 2) the two newly created freshwater ponds, Pond #16a and #17a are not covered by the transect. Therefore the transect should be modified accordingly if monitoring data from these ponds is required.
 - The survey transect was modified in 2006 to include ponds which are not managed by WWF, i.e. Ponds #1, #2, #3b and #5. Data from these ponds should be separated from the main analysis.
 - The criteria for setting count dates is considered appropriate, although the absence of early morning spring high tides is clearly affecting counts of waders and wader species.
 - During high tide conditions when waders use the high-tide roosts, the recorder can at his/her discretion use a number of mandatory scan points, including Hide #3 or #5 at *Gei wai* #16/17 and Hide #8 at *Gei wai* #11. For consistency sake, use of these scan points should be included in the methodology and birds encountered en route to those hides regarded as Category B.
 - The mapping of target species/groups locations has generated useful information to inform habitat management decision. Data could also be used for further study of habitat preference and seasonal movement of species/groups in the MPNR. Mapping criteria should be updated and revised according to management and research needs.

Figure 2. Morning Bird Count Bird Group Comparison Graphs.



Note: An exceptional high count of >7,500 roosting ducks from Gei wai #16/17 on 01-Dec-06

Note: A high count of >1,300 Red-billed Starling on 15-Jan-07.

2.1.2 Roosting Birds

2.1.2.1 Anatidae

2.1.2.1.1 A total of 80 counts (16 counts per year) were successfully completed within the reporting period. Counts were carried out bi-weekly from October to April in each year period with 2 extra counts in January and December/February to coincide with the expected peak influx of Anatidae. Raw count data is presented in Appendix IV. Appendix V and Appendix VI show the count and species summaries respectively.

2.1.2.1.2 To supplement species and abundance data and increase geographic coverage of the count without significant additional effort, the count methodology was revised.

Prior to winter 2007-08, counts were only conducted on Category A ponds (#15a-b, #20a-f and #24g-f) and a few selected *gei wai*. Thereafter all freshwater ponds and *gei wai* within MPNR were included. Therefore *gei wai* count data from 2005-06 and 2006-07 is excluded in this section but presented in Appendix IV for reference.

2005-06

2.1.2.1.3 Two peak counts for Category A ponds occurred on 29 December (5,285) and 07 February (3,590) (Table 2a and Figure 3a). Total counts remained high (> 1,000) from late November to March (Appendix Va).

2.1.2.1.4 Cumulative species total was 15, including 1 species of global conservation concern and 3 species (single birds) from captive origin. Northern Pintail was the most abundant species with a mean count of 768.6. Eurasian Wigeon and Eurasian Teal were the next 2 most abundant species both with a mean count over 200 individuals and recorded in more than 10 counts (Appendix VIa).

2.1.2.1.5 Notable counts included:

- 31 Gadwall (15 January) and 257 Garganey (22 March); the highest for those species in Hong Kong in recent years (Anon, 2006a and Anon, 2006b).
- 3 Ferruginous Duck (15 January and 09 March); a species of “near threatened” conservation status.
- A single Greater White Fronted Goose (22 March); a recent addition to Hong Kong in November 2005.

2006-07

2.1.2.1.6 A single peak count for Category A ponds was recorded on 12 January with 6,027 individuals (Table 2b and Figure 3b). High counts (> 1,000) were recorded from mid-December to late January (Appendix Vb).

2.1.2.1.7 The cumulative species total was 14, including 3 species of global conservation concern. The most abundant species was Tufted Duck with a mean count of 537.0 and peak count of 4,174 individuals (a significant count for the species in MPNR in recent year). Northern Pintail, Northern Shoveler and Eurasian Wigeon were the next 3 most abundant species all with a mean count over 100 and recorded in more than 10 counts (Appendix VIb).

2.1.2.1.8 Notable counts included:

- 1 Common Pochard; an uncommon record for Hong Kong;
- 3 separate counts of 1 Falcated Duck and 1 Ferruginous Duck; both globally “near threatened” species.

2007-08

- 2.1.2.1.9 Peak count for Category A Ponds was 1,996 individuals (07 December), whilst that for whole MPNR was 3,847 (07 December) (Table 2c, Figure 3ci and 3cii). High counts (> 1,000 birds) were recorded in 3 Category A counts during December to January. For the whole MPNR, high counts occurred from late November to mid-February, with the exception of a count in mid-January during low tide (Appendix Vc).
- 2.1.2.1.10 The cumulative species total in Category A Ponds was 8; an additional 2 species (Common Pochard and Mallard) were recorded in other ponds/*gei wai* in the MPNR. Northern Pintail was the most abundant species in both Category A Ponds (mean count = 226.9) and the whole MPNR (mean count = 500.2). The next abundant species in Category A Ponds was Tufted Duck with a mean count of more than 100 individuals. For the whole MPNR, Northern Shoveler and Tufted Duck were the other abundant species both with a mean count greater than 200 and recorded in more than 10 counts (Appendix VIc).
- 2.1.2.1.11 Notable counts included:
- 1 Common Pochard (11 January); an uncommon record for Hong Kong;
 - 25 Chinese Spot-billed Duck (18 February); a relatively good count in recent years.

2008-09

- 2.1.2.1.12 Count total in Category A Ponds remained low throughout the recording period, with a high count of only 406 individuals recorded in late January. For the whole MPNR, 2 peak counts occurred, one in early December (2,016 individuals) and the other one in early March (937 individuals) (Table 2d, Figure 3di and 3dii). Only 2 high counts (> 1,000 birds) were recorded in the whole MPNR; 09 December and 23 December (Appendix Vd).
- 2.1.2.1.13 Cumulative species total in both Category A Ponds and whole MPNR was 9, consisting of the same species. Eurasian Wigeon was the most abundant species in Category A Ponds (mean count = 106.0) being recorded in 12 counts. Northern Pintail and Tufted Duck were the next 2 abundant species in Category A Ponds with peak count over 100, recorded in more than 10 counts. The top 3 abundant species (mean count total above 100) in the whole MPNR were Northern Pintail, Eurasian Wigeon and Northern Shoveler, while Northern Pintail was significantly more abundant with peak count of 1,326 individuals (Appendix VI d).
- 2.1.2.1.14 Notable counts included:
- Two separate counts of 25 Chinese Spot-billed Duck (23 December and 09 January).

2009-10

- 2.1.2.1.15 For Category A Ponds, counts remained low throughout the recording period, with a high of only 451 individuals recorded in late December. One peak count was recorded for the whole MPNR in late January (total = 1,601 individuals) (Table 2e, Figure 3ei and 3eii). Count totals were constantly over 1,000 individuals from mid-December to mid-March for the whole MPNR (Appendix Ve).
- 2.1.2.1.16 Cumulative species total in Category A Ponds was 9; two additional species (Gadwall and Philippine Duck) were recorded in the whole MPNR. Tufted Duck was the most abundant species in Category A Ponds with mean count of 88.4 and peak count of 277. Northern Pintail and Eurasian Wigeon were the next 2 abundant species with peak counts over 100 individuals. Eurasian Wigeon was recorded in 11 counts while Northern Pintail was only recorded in 50% of the counts (8 counts). For the whole MPNR, Northern Pintail was the most abundant (mean = 260.4). Tufted Duck, Northern Shoveler and Eurasian Wigeon were also abundant (mean count > 100) and recorded in over 10 counts (Appendix VI e).

2.1.2.1.17 Notable counts included:

- Three separate counts of a single Philippine Duck; the first occurrence of this globally “vulnerable” species in Hong Kong.

Table 2. Roosting Anatidae Count Monthly Summary.

Table 2a. Winter 2005-06.

Month	Category A Ponds		
	Mean Count	Peak Count	Peak No. of Species
Oct-05	111.5	221	6
Nov-05	1309.5	2153	7
Dec-05	3232.5	5285	8
Jan-06 ¹	2238.3	2822	9
Feb-06 ¹	2624.0	3590	8
Mar-06	1441.0	1670	10
Apr-06	84.0	114	8

¹ - one extra count

Table 2b. Winter 2006-07.

Month	Category A Ponds		
	Mean Count	Peak Count	Peak No. of Species
Oct-06	33.5	64	1
Nov-06	240.0	261	7
Dec-06 ¹	1953.0	2846	7
Jan-07 ¹	3434.3	6027	9
Feb-07	393.5	623	9
Mar-07	274.0	428	6
Apr-07	17.5	33	6

¹ - one extra count

Table 2c. Winter 2007-08.

Month	Category A Ponds			MPNR TOTAL		
	Mean Count	Peak Count	Peak No. of Species	Mean Count	Peak Count	Peak No. of Species
Oct-07	2.0	4	1	7.5	15	4
Nov-07	132.5	245	5	836.5	1452	6
Dec-07 ¹	1340.3	1996	6	2612.3	3847	8
Jan-08 ¹	651.7	1374	5	1678.0	3232	8
Feb-08	624.5	645	6	1438.5	1712	9
Mar-08	55.5	110	5	611.5	662	7
Apr-08	1.0	2	1	14.5	23	3

¹ - one extra count.

Table 2d. Winter 2008-09.

Month	Category A Ponds			MPNR TOTAL		
	Mean Count	Peak Count	Peak No. of Species	Mean Count	Peak Count	Peak No. of Species
Oct-08	0.0	0	0	9.0	18	2
Nov-08	161.5	217	2	458.5	635	6
Dec-08 ¹	260.3	334	7	1349.7	2016	7
Jan-09 ¹	333.7	406	8	512.3	603	8
Feb-09	201.5	237	6	611.0	624	7
Mar-09	105.5	191	3	528.0	937	6
Apr-09	6.5	9	2	8.0	9	3

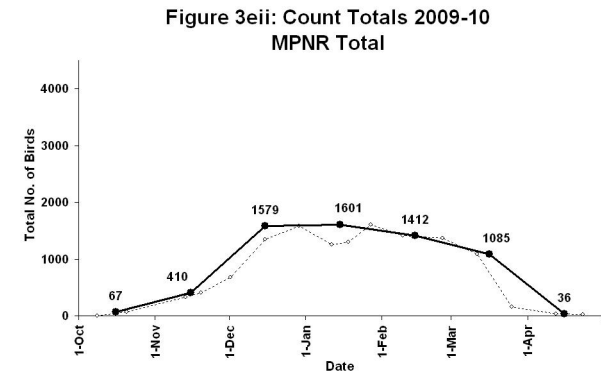
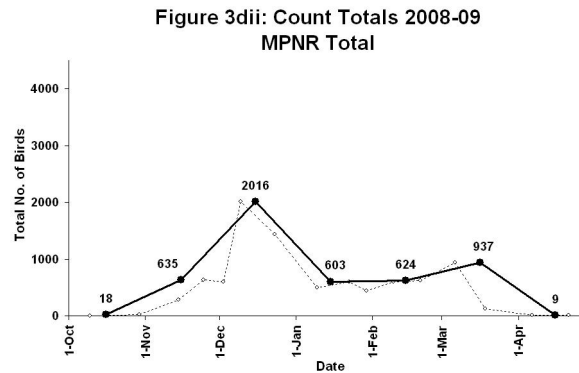
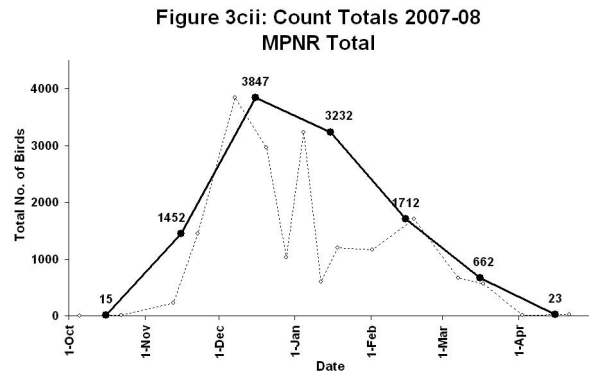
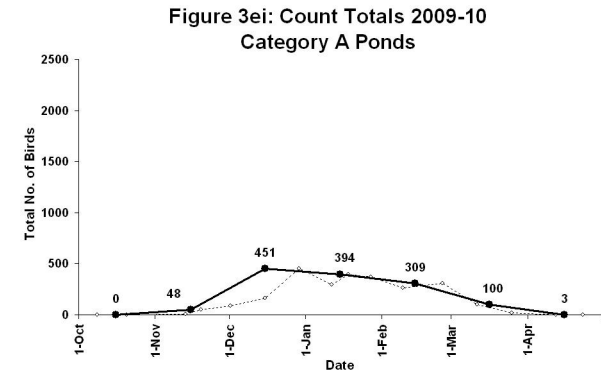
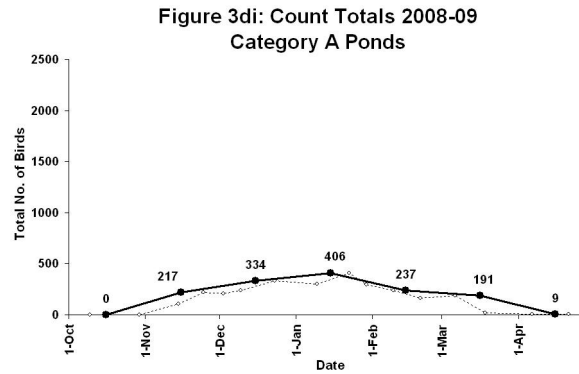
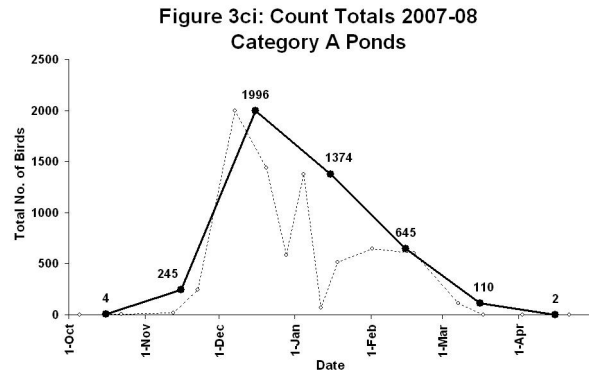
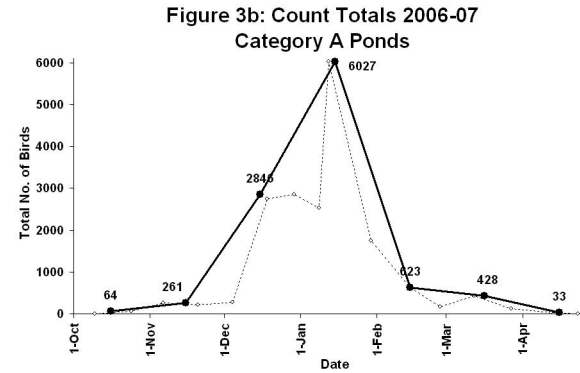
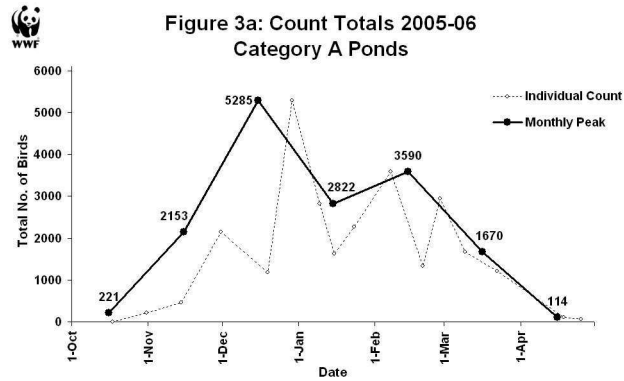
¹ - one extra count.

Table 2e. Winter 2009-10.

Month	Category A Ponds			MPNR TOTAL		
	Mean Count	Peak Count	Peak No. of Species	Mean Count	Peak Count	Peak No. of Species
Oct-09	0.0	0	0	33.5	67	5
Nov-09	26.5	48	6	368.5	410	8
Dec-09 ¹	232.3	451	8	1204.0	1579	9
Jan-10 ¹	353.0	394	7	1382.3	1601	10
Feb-10	287.0	309	4	1387.5	1412	6
Mar-10	60.0	100	4	621.5	1085	9
Apr-10	2.5	3	1	26.5	36	4

¹ - one extra count.

Figure 3. Roosting Anatidae Count Summary Graphs.



Comparison

Category A Ponds (2005-10)

- 2.1.2.1.18 Winter mean counts in Category A Ponds dropped continuously over the 5-year period. The peak in 2005-06 (mean = 1,684.0) was followed by a 30% decrease in 2006-07 (mean = 1129.9). Numbers continued to decline in the following 2 winters; 58% in 2007-08 (mean = 475.4) and 64 % in 2008-09 (mean = 170.8). A milder decrease (8%) was recorded in 2009-10 (mean = 156.8) (Table 3a and Figure 4a).
- 2.1.2.1.19 Figure 4a shows the winter mean counts for the 5 most abundant species in Category A Ponds in the 5-year period:
- **Eurasian Teal** was the third most abundant species in 2005-06 (mean = 236.9). Numbers dropped by around 80% in 2006-07 (mean = 51.9) followed by a near absence from Category A Ponds in the last 3 years of the reporting period.
 - **Eurasian Wigeon**. A decreasing trend was observed. Highest mean count was in 2005-06 (mean = 271.6). The mean count then dropped to around 35% in 2006-07 (mean = 173.0) followed by a 50% reduction in 2007-08 (mean = 87.4). A 21% increase was recorded in 2008-09 (mean = 106.0), but fell again in 2009-10 (mean = 44.9).
 - **Northern Pintail** contributed to around 45% of the anatidae recorded in 2005-06 in Category A Ponds (mean = 768.6). Winter mean count reduced by 70% in 2006-07 (mean = 213.6) and 2007-08 (mean = 226.9) and continued to drop to low counts in 2008-09 (mean = 31.4) and 2009-10 (mean = 18.7).
 - **Northern Shoveler**. The trend was similar to Eurasian Teal with mean counts in the first 2 years (2005-06 and 2006-07) relatively high with over 100 individuals. A severe reduction was recorded in the remaining 3 years with winter means lower than 15.
 - **Tufted Duck** contributed to less than 9% of the total winter mean count in 2005-06 (mean = 149.8). The number more than doubled in 2006-07 (mean = 537.0) to become the dominant species. Winter mean count dropped back in 2007-08 (mean = 139.8) in the following year and continued to reduce in 2008-09 (mean = 23.5). In 2009-10, the mean count rose again (mean = 88.4) and Tufted Duck contributed to over 50% of the total.
 - **Others**. Other anatidae species contributed between 1-3% of the data set and had a similar trend to the total winter mean counts over the 5-year period.

MPNR Totals (2007-10)

- 2.1.2.1.20 Winter mean count of the MPNR was highest in 2007-08 (mean = 1,168.0) but the number reduced by 47% in 2008-09 (mean = 550.9). A 43% increase was recorded in 2009-10 (mean = 789.6) (Table 3b and Figure 4b).
- 2.1.2.1.21 Winter mean counts for the 5 most abundant species in MPNR are shown in Figure 4b:
- **Eurasian Teal** was the 5th abundant species in the whole MPNR occurring in small numbers within the 3-year period.
 - **Eurasian Wigeon** winter mean count was fairly constant throughout the 3-year period with the peak winter mean count recorded in 2008-09 (mean = 181.5).
 - **Northern Pintail** was the dominant species in the whole MPNR in 2007-08, contributing to over 40% of the total mean count. A significant 60% drop was observed in 2008-09 (mean = 195.7) followed by a 30% increase in 2009-10 (mean = 260.4).
 - **Northern Shoveler** abundance fluctuated with means varying between 109.5 and 231.8 in the 3-year period. This species was more abundant in other freshwater ponds/*gei wai* than Category A Ponds.
 - **Tufted Duck** was the second most abundant species in the MPNR in 2007-08 contributing to around 20% of the total. The winter mean count dropped significantly in 2008-09 (mean = 39.1), with ducks mainly utilising Category A Ponds. Consistent with the overall trend, an increase was recorded in 2009-10 (mean = 178.2).
 - **Others**. Other anatidae species generally contributed between 1-3% of the data set.

Table 3. Roosting Anatidae Species Comparison.

Table 3a. Category A Ponds.

Winter	Winter Mean Count						TOTAL
	Eurasian Teal	Eurasian Wigeon	Northern Pintail	Northern Shoveler	Tufted Duck	Others	
2005-06	236.9	271.6	768.6	193.9	149.8	63.2	1684.0
2006-07	51.9	173.0	213.6	120.3	537.0	34.2	1129.9
2007-08	0.8	87.4	226.9	14.4	139.8	6.1	475.4
2008-09	0.5	106.0	31.4	4.4	23.5	5.0	170.8
2009-10	0.3	44.9	18.7	1.9	88.4	2.6	156.8

Table 3b. MPNR Total.

Winter	Winter Mean Count						TOTAL
	Eurasian Teal	Eurasian Wigeon	Northern Pintail	Northern Shoveler	Tufted Duck	Others	
2005-06	Not counted						
2006-07	Not counted						
2007-08	42.4	147.5	500.2	231.8	227.8	18.3	1168.0
2008-09	11.8	181.5	195.7	109.5	39.1	13.4	550.9
2009-10	28.1	138.7	260.4	175.9	178.2	8.4	789.6

Figure 4. Roosting Anatidae Comparison Graphs.

Figure 4a. Winter Mean Count : Category A Ponds.

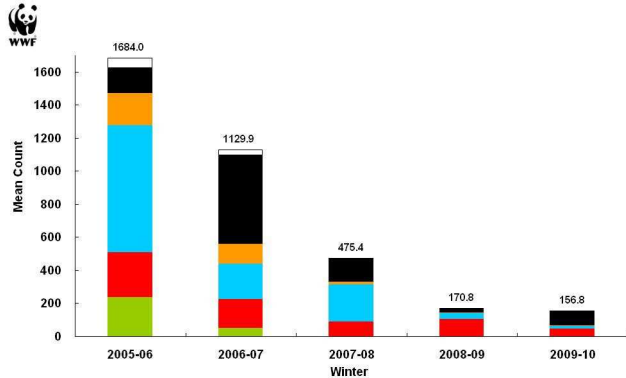
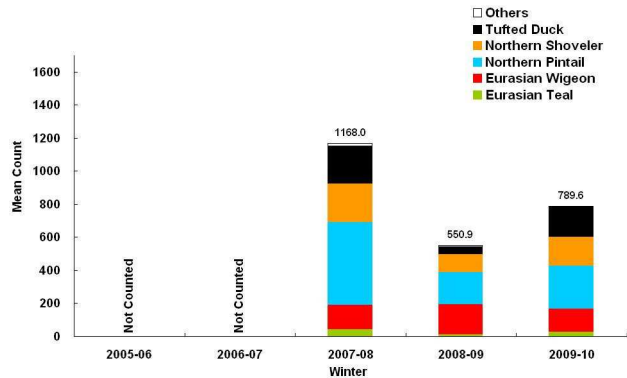


Figure 4b. Winter Mean Count : MPNR Total.



Conclusions and Recommendations

- 2.1.2.1.22
- The Roosting Anatidae Count served its function to inform habitat management decisions and enable better understanding of annual fluctuations in species composition and numbers in MPNR.
 - An increase in the geographic coverage of the count from 2007-08 winter onwards (to include all *gei wai* and ponds in the MPNR) enabled a more comprehensive understanding of the distribution of Anatidae in the MPNR and should be continued.
 - If resources allow, recorders should be stationed at *gei wai*/ponds where Anatidae were most abundant: *Gei wai* #3, #4, #6, #16/17, #21 and Pond #20(a-f).
 - Given the low abundance of Anatidae in early October and late April, it is recommended to shorten the survey period e.g. commence in mid-October and end in mid-April.
 - In December, January and February there were limited late afternoons with good tide height to conduct an extra count. Hence the extra count was often carried out during unfavourable tidal conditions which are undesirable. Therefore it is suggested to cancel the extra count. This would also reduce human resources.
 - Anatidae were observed flying from the Bay to roost in the MPNR after the counting time when it was dark. Shifting the survey time to late evening or early morning might be considered to better understand the overall night roosting population.

2.1.2.2 *Ardeidae*

2.1.2.2.1 A total of 40 counts (8 counts per year) were successfully completed within the reporting period. Winter counts were carried out between January and February and summer counts between mid-June to mid-August. Raw count data is presented in Appendix VII.

2.1.2.2.2 Data from an additional 26 counts carried out in other months in 2006 and 2007 are excluded in this section but presented in Appendix VII as reference.

2006

2.1.2.2.3 Egretty usage was significantly higher in summer months than winter with a peak count of 753 individuals compared to 36 individuals only in winter. Only Chinese Pond Heron was recorded in winter while in summer months 4 species were observed. Little Egret was the dominated species in summer months, contributing to around 45% of the total mean count (Table 4a and 4b).

2007

2.1.2.2.4 A relatively high winter usage was recorded with 1,828 individuals of 3 species roosting on 08 February. The number of Little Egret (929 individuals) recorded equated to about 45%, of the Deep Bay population recorded in the same month. Similarly, a count of 887 Great Egret was more than the Deep Bay population recorded in the same month (Anon 2007a). Winter usage by both species was 60% higher than in summer. However, summer usage by Chinese Pond Heron was considerably higher with a peak count of 251 individuals, compared to winter (Table 4a and 4b).

2008

2.1.2.2.5 The winter count was again higher than the summer. Both Great Egret and Little Egret mean counts exceeded 500 individuals on 04 February, resulting in a peak count of 1,117 individuals. Summer usage for both species was relatively low with peak counts less than 30 individuals. The number of Chinese Pond Heron was low in both winter (mean count = 23.3) and summer (mean count = 13.0) (Table 4a and 4b).

2009

2.1.2.2.6 Higher usage was recorded in winter with a peak count of 783 individuals, however usage was only recorded on 04 February among the 4 counts. Great Egret and Little Egret contributed to 53% and 46% of the total count respectively. Only 2 Chinese Pond Heron individuals were recorded in winter. Summer counts were low with a peak count of only 24 individuals on 25 June, comprising 17 Great Egret (Table 4a and 4b).

2010

2.1.2.2.7 No *Ardeidae* was observed roosting on the egretty in winter nor summer periods (Table 4a and 4b).

Comparison

2.1.2.2.8 A comparison was made upon winter and summer mean counts within the 5-year period (Figure 5a and 5b):

- **Winter** usage was low in 2006 given that no Great Egret or Little Egret was roosting. High mean counts (> 1,000 individuals) were recorded in 2007 and 2008. Usage dropped considerably by nearly 80% in 2009 (mean = 195.8) then fell to zero in 2010.
- **Summer** usage by over 600 individuals was recorded in the first 2 years. Numbers dropped severely in 2008 to less than 30 individuals and continued to fall eventually to zero in 2010.

2.1.2.2.9 Figures 5a and 5b show the changes in mean count for each species within the 5-year period:

- **Chinese Pond Heron** was the dominant species using the egretty in summer for breeding, winter usage though was minimal. Summer mean counts in 2006 and 2007 were above 150 individuals but dropped greatly in the following 2 years with no birds observed roosting in 2010.
- **Great Egret** was observed roosting for 3 consecutive winters. Winter mean counts dropped progressively from 2007 (mean = 532.3) to 2008 (mean = 420.0). A further 75% reduction was recorded in 2009 (104 individuals) and zero individuals recorded in 2010. In the summer period, roosting was mainly recorded in 2006 (mean = 190.3) and 2007 (mean = 259.5). Low mean counts of (< 10 individuals) were recorded in 2008 and 2009.
- **Little Egret**. Both winter and summer trends are similar to Great Egret with high usage in 2007 (mean = 585.5) and 2008 (mean = 494.0). An 80% drop was recorded in the winter mean count of 2009 with less than 100 individuals recorded. Summer mean counts in 2006 and 2007 were around 250 individuals but reduced in 2008 (mean = 10.8). Numbers continued to drop in 2009 and reached zero in 2010.
- **Cattle Egret** were only recorded roosting in small numbers in 2006 summer and 2007 (winter and summer), contributing to less than 1% of the data set.

Conclusions and Recommendations

- 2.1.2.2.10
- Though the Tam Kon Chau egretty is located outside the MPNR, the Roosting Count provided important information about Ardeidae in Deep Bay.
 - The count location provided the recorder with a good view of birds entering the egretty from most directions. However, those entering from a northerly direction might be overlooked, especially Chinese Pond Heron as they do not circulate above the egretty prior to roosting. The problem could be overcome by carrying out a co-ordinated count with extra recorders observing the northeast side of the egretty.
 - Usage of the egretty has declined notably in recent years. As such it should be considered to abandon the survey in coming years until reconlonisation is observed.
 - Further study should be carried out to understand the possible causes of the decline in the Tam Kon Chau egretty usage and its potential impact to the Deep Bay Ardeidae population, especially for Chinese Pond Heron.

Table 4. Roosting Ardeidae Count Summary.

Table 4a. Winter Counts.

Winter (Jan-Feb)	Chinese Pond Heron		Great Egret		Little Egret		Cattle Egret		TOTAL	
	Mean	Peak	Mean	Peak	Mean	Peak	Mean	Peak	Mean	Peak
2006	12.0	36	0.0	0	0.0	0	0.0	0	12.0	36
2007	3.5	12	532.3	887	585.5	929	4.5	12	1125.8	1828
2008	23.3	38	420.0	536	494.0	563	0.0	0	937.3	1117
2009	0.5	2	104.0	416	91.3	365	0.0	0	195.8	783
2010	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0

Table 4b. Summer Counts.

Summer (Jun-Aug)	Chinese Pond Heron		Great Egret		Little Egret		Cattle Egret		TOTAL	
	Mean	Peak	Mean	Peak	Mean	Peak	Mean	Peak	Mean	Peak
2006	158.3	220	190.3	260	277.0	367	0.8	2	626.3	753
2007	185.0	251	259.5	334	254.5	298	10.0	21	709.0	819
2008	13.0	26	3.5	8	10.8	26	0.0	0	27.3	60
2009	2.5	5	9.0	17	1.3	3	0.0	0	12.8	24
2010	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0

Figure 5. Roosting Ardeidae Comparison Graphs.

Figure 5a. Winter Mean Count.

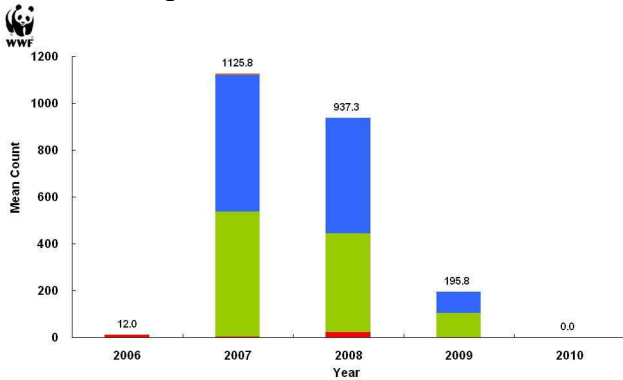
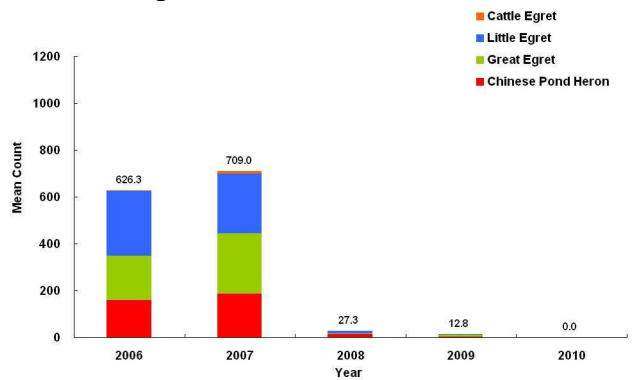


Figure 5b. Summer Mean Count.



2.1.2.3 Collared Crow

2.1.2.3.1 A total of 40 counts (8 counts per year period) were successfully completed within the reporting period. Winter counts were carried out between mid-December to mid-February and summer counts in July and August. Raw count data is presented in Appendix VIII.

2.1.2.3.2 Data from an additional 24 counts and 14 casual observations carried out in 2005-06 and 2006-07 are excluded in this section but presented in Appendix VIII as reference.

2005-06

2.1.2.3.3 The summer roosting population was double that of the winter. Winter counts were steadier, ranging from 38 to 44 individuals; while those for summer fluctuated between 81 and 103 individuals. Two main roosting locations were used: trees along the FCA road at the seaward end of *Gei wai* #16/17 and intertidal mangrove trees inside the FCA. The peak count of 103 individuals (10 August) was a new Hong Kong high count (Table 5).

2006-07

2.1.2.3.4 Summer counts were again higher compared to winter. The peak winter count was 61 individuals (04 January) whilst that for summer was 96 individuals (12 July). A count of 35 individuals on 31 July 2007 was exceptionally low compared to other counts in the summer period. The roosting flock generally preferred to roost inside the intertidal mangrove areas, although trees along the FCA road by the seaward end of *Gei wai* #16/17 were used occasionally (Table 5).

2007-08

2.1.2.3.5 Winter counts were higher in early winter with 70 individuals recorded (17 December) compared to around 50 individuals in late January and early February. Summer counts were comparatively less stable and varied between 32 to 100 individuals. Birds utilised 2 roosting locations: trees on FCA road at seaward end of *Gei wai* #16/17 and intertidal mangrove trees in the FCA (Table 5).

2008-09

2.1.2.3.6 The roosting population over the winter gradually dropped from a peak of 68 individuals (22 December) to 42 individuals (10 February). A reverse trend was observed in summer with a steady increase from early July to late August. All counts in summer were over 100 individuals, with a new high count for Hong Kong of 112 (21 August) individuals. Intertidal mangrove trees located inside the FCA was the sole roosting location (Table 5). It is worth noting that Collared Crow's global conservation status was upgraded to "near threatened" in this year period.

2009-10

2.1.2.3.7 A high winter count of 74 individuals was recorded at the beginning of the winter period (30 December). The roosting population reduced to 54 individuals in late January and early February. Summer roosting population rose progressively from 70 individuals on 06 July to the peak of 126 individuals on 30 August, which became the highest count for Hong Kong. The roosting flock was observed only using intertidal mangrove trees located inside the FCA for roosting (Table 5).

Comparison

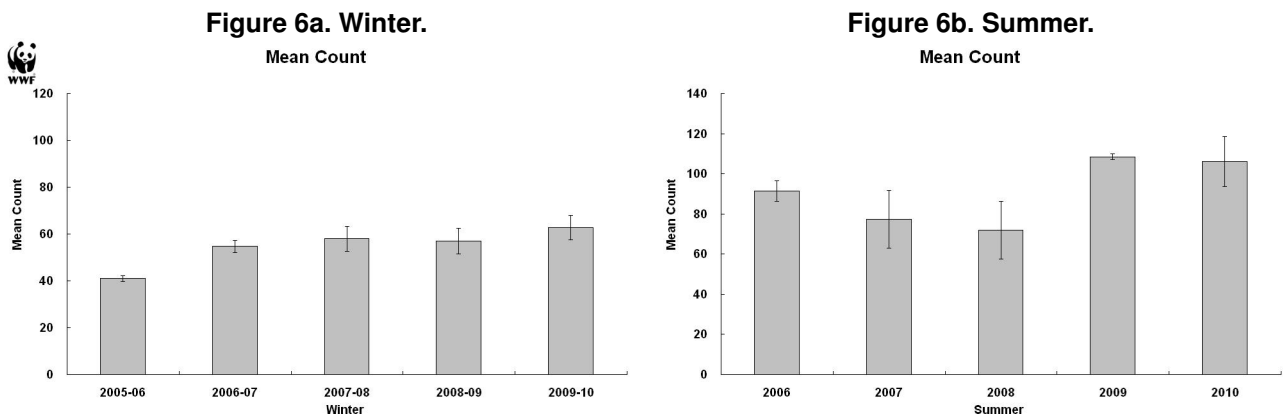
2.1.2.3.8 A comparison was made upon the winter and summer mean counts within the 5-year period (Figure 6):

- **Winter** mean count increased gradually from 41.0 in 2005-06 to 58.0 in 2007-08. The mean dropped slightly in 2008-09 to 57.0 and then rose again in 2009-10 to the peak of 62.8.
- **Summer** mean count dropped by 15% from the high of 91.5 in 2005-06 to 77.3 in 2006-07. The mean count continued to reduce to a low of 72.0 in 2007-08. The summer means in the last 2 years of the reporting period were substantially higher compared to the first 3 years; both mean counts were above 100.

Table 5. Roosting Collared Crow Count Summary.

Year	Winter Counts		Summer Counts	
	Mean	Peak	Mean	Peak
2005-06	41.0	44	91.5	103
2006-07	54.8	61	77.3	96
2007-08	58.0	70	72.0	100
2008-09	57.0	68	108.5	112
2009-10	62.8	74	106.0	126

Figure 6. Roosting Collared Crow Comparison Graph.



Conclusions and Recommendations

- 2.1.2.3.9
- The Roosting Collared Crow Count provided valuable information on the population trend of the species in Deep Bay. The data is also of regional importance for this “Near Threatened” species.
 - Birds were often observed heading to roost around or slightly after sunset time, however, roosting behaviour varied. Thus the recorder should be in the counting position at least 30 minutes before sunset time.
 - A co-ordinated count involving an extra recorder stationed at northern MPNR could be considered to observe birds coming from the north to roost which might be overlooked by the main recorder stationed at southern MPNR.
 - Pre-roosting locations used within the MPNR could be marked on a recording map. Such information would potentially be informative for habitat management decision.
 - A full one-year survey could be carried out once every 5-years to better understand the seasonal trend. This might lead to the revision of the main winter and summer count surveying periods.

2.1.3 Breeding Waterbirds

2.1.3.1 Black-winged Stilt

- 2.1.3.1.1 Monitoring of the breeding Black-winged Stilt population was carried out annually from 2007. Each year 2 surveys were completed in the month of May. Eight counts were successfully completed within the reporting period. Full data sets are presented in Appendix IX.
- 2.1.3.1.2 The number of nests and juveniles recorded varied between years. The peak nest count was 28 (12 May 2009) and the lowest was 2 (27 May 2010). However, 2010 was a relatively good year in terms of the number of juveniles. The highest count of juveniles was 25 individuals (20 May 2008) (Table 6).
- 2.1.3.1.3 Nests were observed on 6 different *gei wai*/ponds throughout the reporting period. *Gei wai* #16/17 was used as a nesting site every year while other *gei wai*/ponds were used occasionally, for example, Ponds #15a and #15b were only used in the early years and *Gei wai* #23 was the main nesting site in 2007. Newly restored open water habitats, such as Pond #17b and *Gei wai* #21, were used in the first summer after being restored (Appendix IX).
- 2.1.3.1.4 In 2007 and 2008, juveniles were recorded only at the nesting locations. In the later 2 years, juveniles were recorded away from the known nesting locations, for example in 2010, in Pond #8a and *Gei wai* #18 where nests were not recorded (Appendix IX).

Table 6. Peak Yearly Breeding Black-winged Stilt Count.

Year	No. of Nest	No. of Juvenile
2007	23	7
2008	14	25
2009	28	19
2010	9	21

Conclusions and Recommendations

- 2.1.3.1.5
- The Breeding Black-winged Stilt Survey is proving a useful way to monitor the annual breeding population and provide habitat management information for the species.
 - Some birds were observed nesting before the start of the designated survey period, also a few juveniles in some years (e.g. 2010). Therefore the survey period should start earlier e.g. in mid-April. The survey might also be extended into mid-June to cover the full breeding season if necessary.

2.2 Invertebrates

2.2.1 Odonata

2.2.1.1 Adult transect

2.2.1.1.1 A total of 28 counts (14 counts per survey year) were successfully completed within the 5-year reporting period, with surveys carried out in 2006 and 2009 as per the chosen methodology. In each survey year, counts were undertaken between mid-March and mid-October every 2 weeks on an afternoon-morning rotation basis with transect directions being reversed each time. As per the specified methodology, no data was collected from Pond #20 before 08 April to avoid disturbance to any remaining winter Anatidae. Data sets are presented in Appendix X.

2.2.1.1.2 A few counts were rescheduled due to long periods of unsuitable weather:

- Second count in May 2006 postponed to early June;
- First count in June 2009 shifted from morning to afternoon;
- First count in September 2009 postponed to second half of the same month.

2.2.1.1.3 The two species *Anax guttatus* and *Anax parthenope* were recorded as one species because they are indistinguishable in the field.

2006

2.2.1.1.4 Total counts ranged from 478 (29 September) to 1,550 individuals (26 April) with a mean count of 891.3 (Table 7a and Figure 7a). Counts over 1,000 individuals occurred between March and May. The number of species encountered ranged from 12 (28 March) to 21 (13 October) with a cumulative total of 25 species (Appendix XIa and XIIa).

2.2.1.1.5 The number of damselfly ranged between 51 (29 June) and 1,114 (26 April). The number was high (>500) in March, April and October and lower (<300) in the main summer months (May to September). Counts ranged between 150 (28 March) to 874 (09 May) being higher (>600) from May to mid July and lowest (<300) in March, late September and October (Table 7a and Figure 7a).

2.2.1.1.6 *Ischnura senegalensis* and *Rhyothemis variegata* were the most abundant adult odonata with mean counts of 317.5 and 209.7 respectively (Appendix XIIa). The records of *Mortonagrion hirosei* singletons on 26 April and 09 May are important because the species is classified as globally vulnerable.

2009

2.2.1.1.7 Count totals ranged from 212 (17 March) and 1,529 (13 May). The mean count was 577 individuals (Table 7b and Figure 7b) with high counts recorded in mid-May, late September and early October (> 900 individuals). The lowest number of species was 8 (17 March) and the peak 17 (19 August). The cumulative total number of species encountered was 21 (Appendix XIIb and XIIIb).

2.2.1.1.8 The peak number of damselfly was 1,188 individuals (13 May) and the lowest 9 (24 June). High counts (> 500) were recorded during 3 counts (late April, mid May and mid-July). Low counts occurred from June to early July (<100). The number of dragonfly recorded varied between 45 (17 March) and 677 (25 September). Numbers were lower at the beginning of the survey period (mid-March to April) with less than 120 individuals observed (Table 7b and Figure 7b).

2.2.1.1.9 *Ischnura senegalensis* and *Brachythemis contaminata* were the most abundant species with mean counts of 247.1 and 121.0 individuals respectively (Appendix XIIb). The globally vulnerable *Mortonagrion hirosei* was recorded during 4 counts all at the beginning of the survey year. The maximum number observed was 3.

Table 7. Odonata Adult Transect Count Summary.

Table 7a. 2006.

Date	No. of Damselfly	No. of Dragonfly	TOTAL	No. of species
28-Mar-06	1105	150	1255	12
19-Apr-06	819	356	1175	16
26-Apr-06	1114	436	1550	19
09-May-06	379	874	1253	18
05-Jun-06	138	625	763	15
16-Jun-06	174	604	778	17
29-Jun-06	51	716	767	15
14-Jul-06	116	684	800	15
31-Jul-06	175	430	605	17
15-Aug-06	245	493	738	18
30-Aug-06	182	447	629	18
19-Sep-06	179	530	709	18
29-Sep-06	232	246	478	18
13-Oct-06	681	297	978	21
Mean	399.3	492	891.3	17

Table 7b. 2009.

Date	No. of Damselfly	No. of Dragonfly	TOTAL	No. of species
17-Mar-09	167	45	212	8
01-Apr-09	197	118	315	15
28-Apr-09	560	85	645	14
13-May-09	1188	341	1529	14
26-May-09	201	296	497	16
12-Jun-09	45	360	405	14
24-Jun-09	9	387	396	12
03-Jul-09	74	206	280	14
15-Jul-09	545	242	787	16
07-Aug-09	127	333	460	15
19-Aug-09	33	344	377	17
17-Sep-09	58	279	337	15
25-Sep-09	238	677	915	15
09-Oct-09	490	433	923	13
Mean	280.9	296.1	577.0	14

Figure 7. Odonata Adult Transect Count Graphs.

Figure 7a. 2006.

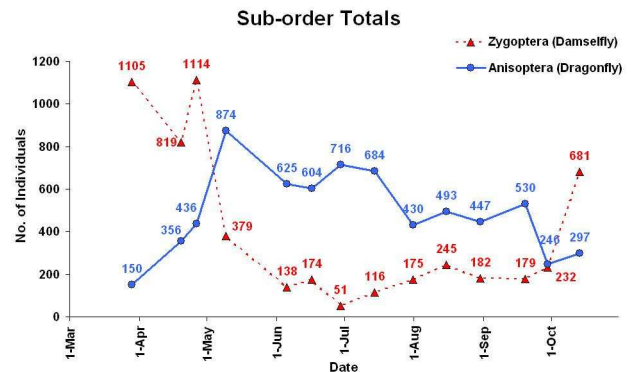
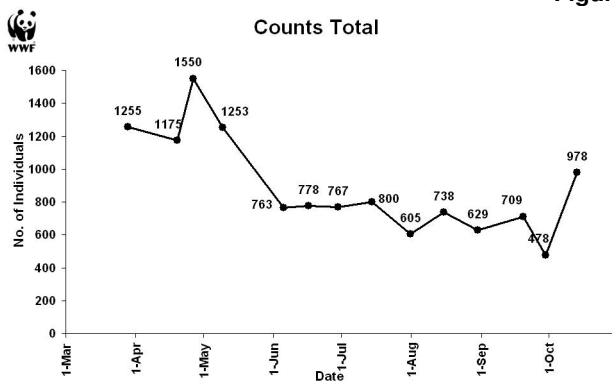
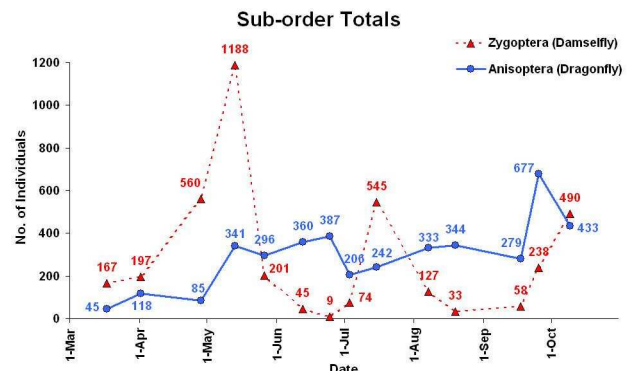
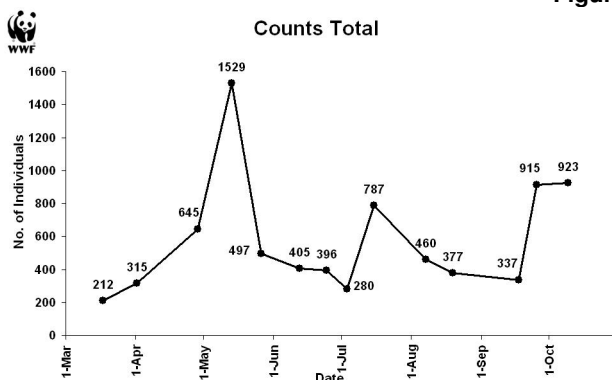


Figure 7b. 2009.

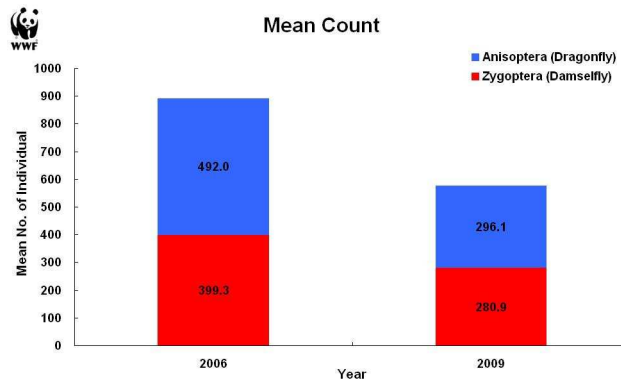


Comparison

2.2.1.1.10 A comparison was made upon the mean count of the 2 survey years (Figure 8):

- **Zygoptera** mean count was 30% lower in 2009 (mean count = 280.9) compared to 2006 (mean count = 399.3).
- **Anisoptera** mean count was 40% lower in 2009 (mean count = 296.1) compared to 2006 (mean count = 492.0).
- **Overall** odonata total mean count was 35% higher in 2006 than in 2009.

Figure 8. Odonata Adult Transect Count Comparison Graph.



Conclusions and Recommendations

- 2.2.1.1.11
- The Odonata Adult Transect Count provided information on seasonal abundance and species diversity in the MPNR.
 - The frequency of survey - twice every five years - was adequate for assessing the general trend of the group in the MPNR. However to better understand the impact of habitat management or restoration on the group, surveys might be carried out annually at selected freshwater ponds.
 - The height and density of pond edge vegetation greatly affected the survey result. Tall and dense vegetation was not favoured by most odonata and it also blocked the view of the recorder. More frequent grass cutting (at least once every month) is probably necessary along the transect route.
 - The transect route might need to be revised to traverse several newly converted freshwater ponds in the MPNR.
 - The existing transect route is long and includes “non-surveying” link sections between ponds. Thus, surveying time is protracted and affected the result, e.g. morning count often extended to mid-day when odonata abundance dropped. Consideration should be given to separating the transect into individual parts with co-ordinated counts carried out with additional recorders.

2.2.1.2 *Exuviae*

2.2.1.2.1 *Exuviae* was collected on an approximate 1-2 week basis from March to September in 2006 and 2009. To avoid disturbing any remaining winter Anatidae, traps at Ponds #20d and #20f were set up in April. Data sets are presented in Appendix XIII.

2006

2.2.1.2.2 The monthly totals of collected *exuviae* varied between 5 (September) and 175 (April), with 330 collected in total. The majority of *exuviae* were collected in April and May (Table 8a and Figure 9a).

2.2.1.2.3 The number of species identified from the collected *exuviae* ranged between 4 (July and September) and 11 (May), with a cumulative total of 14 species. The highest number of odonata species *exuviae* collected was from *Ischnura senegalensis* (52 individuals) and *Brachydiplax chalybea* (50 individuals) (Appendix XIVA). Supplementary *exuviae* collected from pond edge vegetation indicated that two other species, *Anax guttatus* and *Epophthalmia elegans*, also bred at MPNR.

2009

2.2.1.2.4 No *exuviae* was collected in March due to the late set up of traps at the survey ponds. In other months, monthly totals varied between 4 (September) and 138 (July) with 417 collected in total. The vast majority of *exuviae* was collected between May to July (Table 8b and Figure 9b).

2.2.1.2.5 The number of species identified from the collected *exuviae* ranged between 2 (September) and 8 (June), with a cumulative total of 11 species. *Orthetrum sabina* (155 individuals) and *Ischnura senegalensis* (124 individuals) comprised almost half of the total *exuviae* collected (Appendix XIVb). Supplementary *exuviae* collected from pond edge vegetation indicated that two other species, *Diplacodes trivialis* and *Sinictinogomphus clavatus*, also bred at MPNR.

Table 8. Odonata Exuviae Count Summary.

Table 8a. 2006.

Month	No. of Damselfly	No. of Dragonfly	TOTAL	No. of species
Mar-06	2	13	15	8
Apr-06	63	112	175	10
May-06	9	74	83	11
Jun-06	1	20	21	6
Jul-06	0	9	9	4
Aug-06	3	19	22	5
Sep-06	3	2	5	4
Cumulative Total	81	249	330	14

Table 8b. 2009.

Month	No. of Damselfly	No. of Dragonfly	TOTAL	No. of species
Mar-09	0	0	0	0
Apr-09	2	6	8	4
May-09	22	98	120	6
Jun-09	34	76	110	8
Jul-09	51	87	138	6
Aug-09	14	23	37	7
Sep-09	1	3	4	2
Cumulative Total	124	293	417	11

Figure 9. Odonata Exuviae Count Summary Graphs.

Figure 9a. 2006.

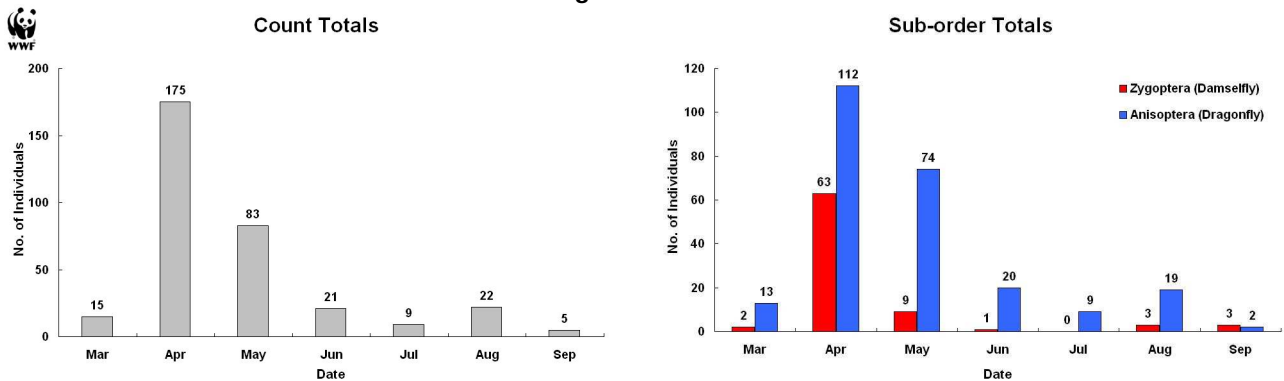
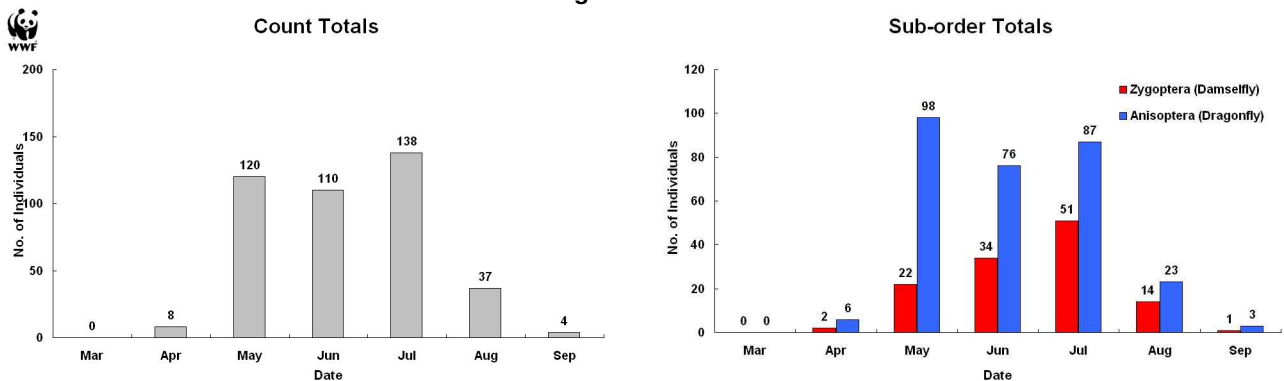


Figure 9b. 2009.

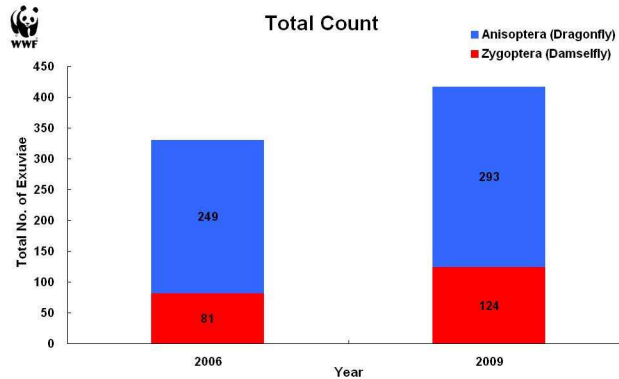


Comparison

2.2.1.2.6 A comparison was made upon the total number of exuviae collected in the 2 survey years (Figure 10):

- **Zygoptera** exuviae collected in 2009 (total = 124) was 53% greater compared to 2006 (total = 81).
- **Anisoptera** exuviae collected in 2009 (total = 293) was 18% greater compared to 2006 (total = 249).
- **Overall** exuviae collected in 2009 was 26% higher than 2006.

Figure 10. Odonata Exuviae Count Comparison Graph.



Conclusions and Recommendations

- 2.2.1.2.7
- The Odonata Exuviae Count enabled the better understanding of the diversity of odonata species breeding at the MPNR and their relative breeding abundance.
 - The survey frequency - twice every five years - was adequate for monitoring general changes in the abundance and diversity of breeding in the MPNR.
 - A catalogue of different species of exuviae collected during field work was kept in the Education Center Laboratory as a reference for identification.
 - Rainfall influenced the data. Exuviae had to be collected before heavy rain and traps had to be often reset particularly after heavy rain when water-levels increased rapidly.
 - Pond edge vegetation should be removed at trap locations to increase the usage of the traps and to prevent them being damaged by excessive vegetation growth.
 - It should be noted that data from Pond #20d and #f in 2009 were disrupted due to summer draining of those ponds. Relatively high numbers of exuviae were collected from the traps as most odonata larvae were trapped in small pools of shallow water and had no access to pond edge vegetation.
 - The collection of exuviae and maintenance of traps was labour intensive. In both survey years, volunteers were utilised.

2.3 Habitat

2.3.1 Fixed Point Photography

- 2.3.1.1
- In December 2005, 2007 and 2009, sets of panoramic photographs were taken of the Mai Po *gei wai*/ponds from fixed point locations inside the Reserve.
 - A panoramic photograph of the intertidal mudflat from the WWF floating birdwatching hides was taken annually in July (i.e. 5 sets were taken in this reporting period).

Conclusions and Recommendations

- 2.3.1.2
- Fixed Point Photography is a useful tool to visually record changes in habitat condition over years and should be continued.
 - Fixed point locations might be revised to increase the number of *gei wai*/ponds covered. However, where possible, the fixed points should be located at/adjacent to permanent infrastructure, e.g. bird-watching hide, sluice gate.

2.4 Water Quality

2.4.1 Pond #15

2.4.1.1 Water quality data were collected monthly from Ponds #15a and #15b between November and March. Raw data are presented in Appendix XV.

2.4.1.2 Due to equipment problems, data could not be collected in November and December 2005. Salinity measurement only commenced in 2007-08. Therefore a summary of the mid-winter data only is shown in Table 9.

Conclusions and Recommendations

- 2.4.1.3
- The collection of basic water quality data from Pond #15a and #b was sufficient to inform the decision of when to water exchange in mid-winter.
 - The survey could be extended to other *gei wai*/ponds if requested by the habitat management team.

Table 9. Water Quality Data Summary.

Year	Pond #15a			Pond #15b		
	DO (mg/L)	pH	Salinity (ppt)	DO (mg/L)	pH	Salinity (ppt)
Jan-06	6.3	7.0	-	3.1	5.6	-
Jan-07	6.2	7.3	-	1.8	7.2	-
Jan-08	10.5	9.3	10.0	12.3	9.1	6.0
Jan-09	11.6	9.0	9.2	13.5	8.8	6.8
Jan-10	2.3	8.7	8.5	3.9	8.7	4.7

2.5 Wildlife Sightings/Other Records

2.5.1 Avifauna

2.5.1.1 Starting from September 2005, bird sightings from a wide range of sources (visitors to MPNR, the WWF bird record board and birders note book at the Mai Po car park, Birdline telephone service and HKBWS internet forum) were entered into a centralised bird record database. The database also includes breeding records of waterbirds and wetland dependent birds and can now be accessed via the WWF website. The records presented in this section are from areas in and around the MPNR, including neighbouring fishponds and the main inter-tidal mudflat zone.

2005-06

2.5.1.2 Yearly peak counts of some of the species of conservation concern are shown in Table 10a.

Table 10a. Sightings of Bird Species of Conservation Concern: 2005-06.

Bird Species	Peak count	Month
Dalmatian Pelican	2	January
Swinhoe's Egret	3	May
Oriental Stork	1	January
Black-faced Spoonbill	340	December
Falcated Duck	2	December
Baer's Pochard	1	January
Ferruginous Duck	3	March
Greater Spotted Eagle	3	November
Imperial Eagle	4	December
Eurasian Curlew	1022	January
Nordmann's Greenshank	20	April
Spoon-billed Sandpiper	1	October, April, May
Relict Gull	2	January
Manchurian Reed Warbler	1	September, October, November

2.5.1.3 Other noteworthy sightings:

- First Hong Kong record of Greater White-fronted Goose seen at the Reserve from November to April.
- Second Hong Kong record of Short-eared Owl seen on the Mai Po access road on 31 December; Collared Kingfisher seen at Gei wai #8 (02 October) and Water Pipit seen on the Mai Po access road (27 January).
- 1 Black Stork (29 December).
- 1 over-summering Black-faced Spoonbill in September.
- 5 Common Pochard (08 December).
- 1 Crested Honey Buzzard (01 October).
- 6 Amur Falcon (12 October).
- 1 Little Curlew in September.
- 1 Blunt-winged Warbler (17 October).
- 1 Spotted Bush Warbler in October and November.
- 1 Indian Spot-billed Duck *Anas poecilorhyncha* with 4 juveniles seen in May at Gei wai #8.
- At least 3 juvenile Zitting Cisticola observed in June at Pond #20.

2.5.1.4 High counts:

- 27 Gadwall (20 January).
- 83 Greater Scaup in Deep Bay (19 February, Hong Kong record highest count).
- 227 Greater Sand Plover (27 August, Hong Kong record highest count).
- 165 Oriental Pratincole at Mai Po access road (29 March).
- 710 Red-necked Phalarope at the mudflat (03 May).
- 28 Buff-bellied Pipit on the Mai Po access road (27 January, Hong Kong record highest count).
- 1,500 Yellow Wagtail (12 November).

2006-07

2.5.1.5 Yearly peak counts of some of the species of conservation concern are shown in Table 10b.

Table 10b. Sightings of Bird Species of Conservation Concern: 2006-07.

Bird Species	Peak count	Month
Swinhoe's Egret	2	April
Black-faced Spoonbill	366	December
Lesser White-fronted Goose	2	November
Falcated Duck	12	March
Ferruginous Duck	2	December
Greater Spotted Eagle	3	October
Imperial Eagle	4	December
Nordmann's Greenshank	46	April
Asian Dowitcher	120	May
Spoon-billed Sandpiper	6	April
Manchurian Reed Warbler	1	September

2.5.1.6 Other noteworthy sightings:

- First Hong Kong record of 2 Lesser White-fronted Goose from mid-November to late March and a Western Water Rail in December at Gei wai #21
- Second Hong Kong record of a Smew at Pond #20 (24 December) and a Lesser Whitethroat at Gei wai #8b (15 October).
- 12 over-summering Black-faced Spoonbill.
- 2 Cotton Pygmy-goose (29 October).
- 4 Common Pochard in December.
- 3 Crested Honey Buzzard (11 October).
- 2 Yellow-legged Button-quail (21 October).
- 5 Pheasant-tailed Jacana (30 October).
- 1 Oriental Plover (07 April).
- 5 Dusky Thrush (03 February).
- 1 Common Reed Bunting (03 February).

2.5.1.7 High count:

- 26 Gadwall (29 January).
- 9 Eastern Buzzard (08 November).
- 20 Amur Falcon (11 October, Hong Kong record highest count).
- 8,600 Pied Avocet at the mudflat (11 February, Hong Kong record highest count).
- 2,200 Red-necked Stint (09 May).
- 10,980 Curlew Sandpiper at Gei wai #16/17 (17 April, Hong Kong record highest count).
- 63 Blue-tailed Bee-eater (09 October).
- 11,260 Red-billed Starling flying pass Pond #20 (25 December, Hong Kong record highest count).

2007-08

2.5.1.8 Yearly peak counts of some of the species of conservation concern are shown in Table10c.

Table 10c. Sightings of Bird Species of Conservation Concern: 2007-08.

Bird Species	Peak count	Month
Dalmatian Pelican	1	February
Swinhoe's Egret	5	April
Black-faced Spoonbill	327	November
Falcated Duck	16	April
Ferruginous Duck	1	November
Greater Spotted Eagle	4	January
Imperial Eagle	3	January
Asian Dowitcher	650	April
Spoon-billed Sandpiper	2	April
Relict Gull	2	January
Manchurian Reed Warbler	1	September
Japanese Swamp Warbler	1	November

2.5.1.9 Other noteworthy sightings:

- First Hong Kong record of an American Scoter recorded at Pond #20 (09 December); a Steppe Eagle at Gei wai #1617 (22 December); a Pacific Swift sub-species kanoi on the Mai Po access road (24 January) and a Japanese Swamp Warbler at Gei wai #8b (10 November).
- 2 over-summering Black-faced Spoonbill
- 1 Lesser Frigatebird (01 December).
- 1 Black Stork (03 November).
- 2 Black-winged Kite (14 August).
- 7 Amur Falcon (12 October).
- 1 Oriental Plover (09 April).
- 1 Slender-billed Gull in March.
- 1 Northern Boobook (28 April).

2.5.1.10 High count:

- 6 Eastern Marsh Harrier (30 January).
- 15,900 Pied Avocet at Deep Bay mudflat (13 January, Hong Kong record highest count).
- 121 Blue-tailed Bee-eater roosting at FCA mangrove (05 October, Hong Kong record highest count).
- 24 Brown Shrike (29 April).

2008-09

2.5.1.11 Yearly peak counts of some of the species of conservation concern are shown in Table10d.

Table 10d. Sightings of Bird Species of Conservation Concern: 2008-09.

Bird Species	Peak count	Month
Swinhoe's Egret	5	May
Black-faced Spoonbill	324	December
Falcated Duck	6	December
Greater Spotted Eagle	2	January
Imperial Eagle	3	December
Nordmann's Greenshank	26	April
Great Knot	42	February
Spoon-billed Sandpiper	1	October, April
Manchurian Reed Warbler	1	September, October

2.5.1.12 Other noteworthy sightings:

- First Hong Kong record of a Tundra Bean Goose at Deep Bay mudflat (01 January) and a Great Stone-curlew at Gei wai #16/17 (24 June).

- Second Hong Kong record of 2 Eurasian Oystercatcher at Deep Bay mudflat (09 April).
- 1 Black Bittern (01 October).
- 1 Black Stork (10 November).
- 6 Common Pochard (22 February).
- 2 Black-winged Kite (17 September).
- 4 Amur Falcon (15 October).
- 1 Oriental Plover (14 March).
- 2 records of 1 Little Curlew in September and April.
- 1 winter record of Little Stint (13 December).
- 1 Chiffchaff (02 December).
- 1 Steppe Eagle in March.

2.5.1.13 High count:

- 160 Eurasian Coot at Deep Bay mudflat (22 February).
- 4 Long Billed Dowitcher (08 April).
- 1,300 Red-necked Stint (25 March).
- 71 Blue-tailed Bee-eater (14 April).

2009-10

2.5.1.14 Yearly peak counts of some of the species of conservation concern are shown in Table 10e.

Table 10e. Sightings of Bird Species of Conservation Concern: 2009-10.

Bird Species	Peak count	Month
Dalmatian Pelican	1	December
Swinhoe's Egret	1	April
Black-faced Spoonbill	344	November
Falcated Duck	1	February
Philippine Duck	1	March
Greater Spotted Eagle	3	December
Imperial Eagle	4	December
Spoon-billed Sandpiper	1	February, March, April
Relict Gull	1	January
Japanese Swamp Warbler	1	December
Styan's Grasshopper Warbler	1	October
Manchurian Reed Warbler	1	September, January, May

2.5.1.15 Other noteworthy sightings:

- First Hong Kong record of a Philippine Duck at Gei wai #23 (09 March).
- Second Hong Kong record of a Japanese Swamp Warbler at Gei wai #8b (11 December) and a Steppe Eagle at Gei wai #3 (15 November).
- 1 Lesser Frigatebird (19 January).
- 2 Common Pochard (26 December).
- 1 Baillon's Crake (13 April).
- 1 Eurasian Oystercatcher (19 January).
- 1 Common Ringed Plover (18 February).
- 2 Oriental Plover (04 April).
- 2 Little Curlew (04 May).
- 1 Slender-billed Gull (07 February).
- 1 Collared Kingfisher (5 September).
- 1 Fairy Pitta (06 May).
- 1 Baikal Bush Warbler (22 October).

2.5.1.16 High count:

- 31 Eurasian Bittern at Gei wai #8b (19 March, Hong Kong record highest count).
- Migrating flock of 445 Chinese Sparrowhawk (16 April).
- 3,370 Red-necked Stint (11 April, Hong Kong record highest count).
- 8,800 Curlew Sandpiper (11 April, Hong Kong record highest count).
- 35 Pallas's Grasshopper Warbler (21 September).

2.5.2 **Mammals**

2.5.2.1 Record keeping of any unusual/uncommon mammals sightings by WWF staff or visitors to MPNR commenced in September 2005.

2005-06

2.5.2.2 Noteworthy sightings include:

- Chinese Leopard Cat sighted in November, January (3 times), February, May and June (3 times).
- 2 sightings of Small Indian Civet including a dead individual.
- 32 sightings of Small Asian Mongoose reported in most months with the exception of December and July, including 2 sightings of 1 juvenile in May and September.
- 1 Lesser Bent-winged Bat *Miniopterus pusillus*, a new addition to the Mai Po mammal list, was captured during AFCD's mist net survey on 24 August.

2006-07

2.5.2.3 Noteworthy sightings include:

- 1 Chinese Leopard Cat sighted on 12 September and on another occasion on 02 August, a juvenile seen moving along FCA road together with a Small Indian Civet.
- 3 other sightings of Small Indian Civet in May and August.
- 1 Eurasian Otter sighted on AFCD path (28 August).
- 22 sightings of Small Asian Mongoose reported in most months with the exception of February and March, including 7 sightings of family group with 1 to 3 juveniles.

2007-08

2.5.2.4 Noteworthy sightings include:

- 8 sightings of Chinese Leopard Cat including 2 dead individuals and an adult with 2 cubs seen (30 July).
- 1 Eurasian Otter (08 December and 08 January).
- Small Indian Civet seen on 6 occasions including 1 dead individual killed by feral dog.
- 1 Wild Boar seen at FCA mangrove (18 April).
- 20 sightings of Small Asian Mongoose including 1 juvenile seen in October.

2008-09

2.5.2.5 Noteworthy sightings include:

- Chinese Leopard Cat seen in December, January (2 times) and February (2 times).
- 1 Eurasian Otter (21 November and 24 April).
- 4 sightings of Small Indian Civet including 2 dead individuals.
- 21 sightings of Small Asian Mongoose reported in most months with the exception of March and May, including 5 sightings of family group with 2 to 3 juveniles.

2.5.2.6 2009-10

Noteworthy sightings include:

- Chinese Leopard Cat seen in 4 occasions including 1 individual killed by feral dog.
- 1 Small Indian Civet (01 June).
- 4 sightings of Small Asian Mongoose in September (3 times) and February.

2.5.2.7 Records of all feral dogs and cats captured at MPNR (and subsequently passed to AFCD's Dog Unit) continued to be kept. Such captures result from operation of dog traps or those removed by hand. Data is available from WWF upon special request.

2.5.3 Herpetofauna

2.5.3.1 Record keeping of any unusual/uncommon reptile or amphibian sightings by WWF staff or visitors to MPNR commenced in January 2006.

2005-06 (January – August 2006)

2.5.3.2 Noteworthy sightings include:

- 1 Burmese Python (12 January) and 1 Chinese Cobra (09 March).
- An exotic Malaysian Box-tortoise seen on 18 May being a new addition to the Mai Po Herpetofauna list.

2006-07

2.5.3.3 Noteworthy sightings include:

- 2 sightings of Burmese Python (14 November and 20 December) and 1 King Cobra (26 September).

2007-08

2.5.3.4 Noteworthy sightings include:

- 2 sightings of Burmese Python (03 September and 17 March) and 1 King Cobra (08 May).

2008-09

2.5.3.5 Noteworthy sightings include:

- 3 sightings of Burmese Python (14 October, 18 October and 27 February), 1 Chinese Cobra (24 June) and 1 King Cobra (26 May).

2009-10

2.5.3.6 Noteworthy sightings include:

- 5 sightings of Burmese Python (05 January, 21 February, 22 February, 12 May and 26 July), 1 Common Blind Snake (02 March), 1 Mangrove Water Snake (15 July) and 1 Reeves's Terrapin (10 February).

2.5.4 Odonata

2.5.4.1 Record keeping of any important sightings by WWF staff or visitors to MPNR commenced in January 2006.

2005-06 (January – August 2006)

2.5.4.2 Noteworthy sightings include:

- Over 20 individuals of *Mortonagrion hirosei* were counted on 2 occasions in July at the floating boardwalk. The finding was the record highest day count of the species at Mai Po and was the first known observation of the species away from reedbed habitat.
- 3 species of odonata, *Neurothemis fulvia*, *Pseudothemis zonata* and *Zyxomma petiolatum*, not encountered during baseline survey were recorded occasionally in the Reserve.
- 1 *Copera marginipes* and 1 *Gynacantha* sp. were recorded close to the Reserve boundary. Both species were not recorded during baseline survey.

2006-07

2.5.4.3 Noteworthy sightings include:

- Records of *Mortonagrion hirosei* at *Gei wai* #13 boardwalk and the floating boardwalk.
- 1 *Nannophya pygmaea* recorded close to the Reserve boundary on 24 November was a new addition to the Mai Po species list.
- *Neurothemis fulvia* recorded in the Reserve and *Orthetrum pruinosum* recorded at the floating boardwalk.

2007-08

2.5.4.4 Noteworthy sightings include:

- More than 10 *Mortonagrion hirosei* individuals seen at *Gei wai* #13 boardwalk (01 September) and over 30 individuals, including teneral, recorded at the floating boardwalk (15 August).
- *Pseudagrion rubriceps* recorded in the Reserve and *Orthetrum pruinosum* recorded at the floating boardwalk.

2008-09

2.5.4.5 Noteworthy sightings include:

- Records of more than 10 *Mortonagrion hirosei* individuals, including teneral, on 3 occasions in April, June and July at the floating boardwalk.
- *Pseudothemis zonata*, which was not encountered during baseline survey, were recorded occasionally in the Reserve.

2009-10

2.5.4.6 Noteworthy sightings include:

- Over 10 *Mortonagrion hirosei* individuals seen at the floating boardwalk (27 May).
- 1 male *Trithemis aurora* seen at *Gei wai* #8b (16 October) being the only record of the species in the Reserve since 2003.

2.5.5 Conclusions and Recommendations

- #### 2.5.5.1
- The Wildlife Sighting database records valuable information on wildlife groups in the MPNR which were not covered by the routine baseline monitoring work, e.g. Mammal and Herpetofauna.
 - For wildlife groups surveyed regularly under routine monitoring work such as Avifauna and Odonata, the database provided supplementary information on species diversity and abundance.

PROJECT-BASED STUDIES

3 PROJECT-BASED STUDIES

3.1 Within the 5-year reporting period, 7 project-based studies were completed including:

- Trials to Improve the Roosting Habitat for Wintering Waterfowl in Ponds #20 and #24 at Mai Po Nature Reserve 2005-06 (Anon. 2006a and Anon 2006b).
- Trial on Improvements to the High Tide Roosting Habitat for Migratory Waterbirds at *Gei wai* #16/17 Mai Po Nature Reserve 2005-06 (Anon. 2006c and Anon 2006d).
- Study upon the Wildlife Impact and Potential Economic Habitat Management Benefits of Introducing Asian Water Buffalo *Bubalus bubalis* into the Freshwater Ponds at Mai Po Nature Reserve (WWF-HK, 2008a).
- A Short Study on the Butterfly Hotspots in Mai Po Nature Reserve – Summer 2007 (WWF-HK, 2008b).
- Brief Report on the Survival of Shrub Species Planted between 1996-2007 at Mai Po Nature Reserve (WWF-HK, 2008c).
- Study into the Avian Value of Different Aged Stands of *Phragmites australis* at Mai Po Nature Reserve (WWF- HK & HKBRG, 2008).
- Baseline survey on the usage of MPNR by roosting Barn Swallow *Hirundo rustica* and Yellow Wagtail *Motacilla flava* (WWF-HK, 2010c).

3.2 Final reports of these studies can be downloaded from the WWF website.

SPECIES TARGETS

4 SPECIES TARGETS

4.1 Management Plan Targets

4.1.1 *Black-faced Spoonbill*

- 4.1.1.1 The 2006-2010 Mai Po Management Plan (WWF-HK, 2006) identified Black-faced Spoonbill as a key species and set targets to provide (1) roosting habitat in BMZ4 for an average of 50% or more of the Black-faced Spoonbill wintering in Deep Bay, and (2) feeding habitat for 20% of the same population in the *gei wai* during winter drain down.
- 4.1.1.2 Data collection commenced in November 2006. Roosting Black-faced Spoonbill data were collected from November to March and feeding data were collected from December to February.
- 4.1.1.3 The mean percentage of Black-faced Spoonbill roosting in BMZ4 dropped gradually from 2006-07 (mean = 80.6%) to 2009-10 (mean = 46.8%). The management target was not achieved in 2009-10 (Table 11 and Figure 11).
- 4.1.1.4 The mean percentage of Black-faced Spoonbill feeding in draining *gei wai* fluctuated over the years although remained at about 40%. The target was achieved in all 4 winter periods (Table 12 and Figure 12).

Conclusions and Recommendations

- 4.1.1.5
- The roost counts were scheduled during mid-day when Spoonbill are believed to be roosting rather than feeding. However, on occasion higher roosting populations were recorded in morning or evening. Therefore, the survey time should be evaluated, and anecdotal data collected outside of the survey time could be considered useful for assessment purposes.
 - It should be taken into account that Black-faced Spoonbill also roost in other *gei wai*/pond in MPNR.
 - It should be noted that the Deep Bay population data was mostly collected during high tide and contained data collected from the Shenzhen area.
 - Feeding counts were carried out on either the 3rd or 4th day of draining usually in early morning or evening. Several counts could be carried out at different times to obtain the highest number.
 - Coordinated counts involving several recorders at different location could be considered to increase accuracy for the feeding counts.

Table 11. Roosting Black-faced Spoonbill Management Target Data Summary.

Month	% of Deep Bay population ¹			
	06-07	07-08	08-09	09-10
November	98.0%	58.7%	44.0%	92.8%
December	100.0%	97.4%	69.8%	35.6%
January	78.2%	73.7%	51.5%	27.4%
February	62.2%	62.1%	47.4%	44.1%
March	64.3%	50.3%	50.6%	34.0%
MEAN %	80.6%	68.5%	52.7%	46.8%

¹ – Deep Bay population data source: AFCD and HKBWS

Figure 11. Roosting Black-faced Spoonbill Management Target Summary Graph.

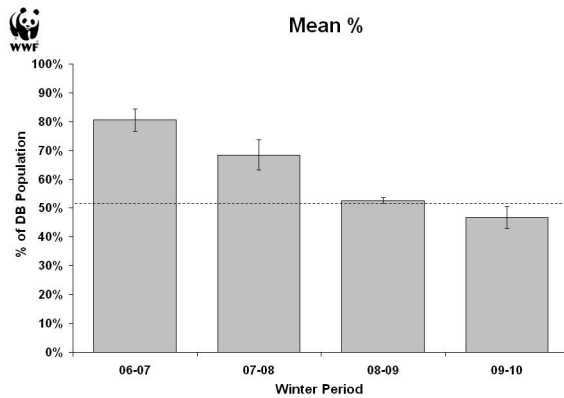
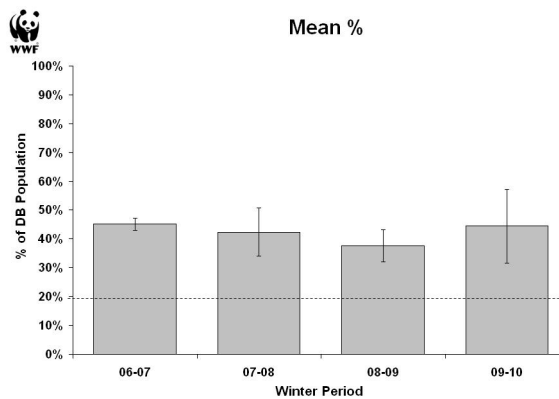


Table 12. Feeding Black-faced Spoonbill Management Target Data Summary.

Month	% of Deep Bay population ¹			
	06-07	07-08	08-09	09-10
December	43.2%	56.9%	48.8%	68.8%
January	49.5%	42.1%	32.3%	39.7%
February	42.7%	28.1%	32.1%	24.8%
MEAN %	45.1%	42.4%	37.7%	44.4%

¹ – Deep Bay population data source: AFCD and HKBWS

Figure 12. Feeding Black-faced Spoonbill Management Target Summary Graph.



4.1.2 Anatidae

- 4.1.2.1 Anatidae are identified as a key waterbird group with a target set in the 2006 Management Plan (WWF-HK, 2006) to provide roosting habitat in *Gei wai* #16/17, Ponds #15, #20 and #24 for an average of 20% of the Anatidae wintering in Deep Bay.
- 4.1.2.2 Data were collected through the Anatidae monitoring work under the WWF baseline monitoring programme (section 2.1.2.1) from 2006 onwards between December and February.
- 4.1.2.3 The management target was only achieved in winter 2006-07 with a mean of 23.0%. Thereafter the percentage dropped significantly in 2007-08 to 8.2% and continued to decrease to 2.2% and 1.7% in the following 2 winter periods (Table 13 and Figure 13).

Conclusions and Recommendations

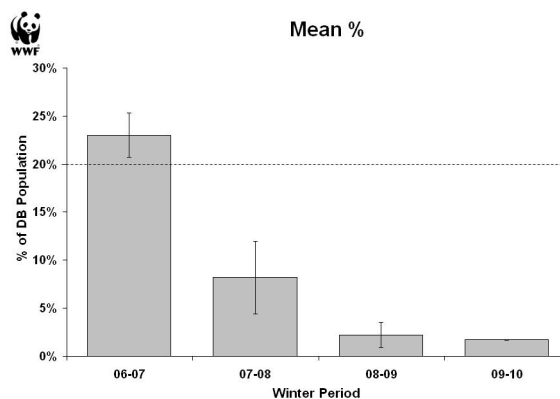
- 4.1.2.4
 - The use of baseline monitoring data to assess the Anatidae management target was appropriate and required no extra human resources to collect data.
 - It should be noted that the Deep Bay population also included data collected from the Shenzhen area.
 - It should be taking into account that Anatidae also utilize other *gei wai*/pond in MPNR to roost.

Table 13. Roosting Anatidae Management Target Data Summary.

Month	% of Deep Bay population ¹			
	06-07	07-08	08-09	09-10
December	24.6%	15.5%	4.8%	1.8%
January	26.0%	6.3%	1.2%	1.6%
February	18.4%	2.8%	0.6%	1.7%
MEAN %	23.0%	8.2%	2.2%	1.7%

¹ – Deep Bay population data source: AFCD and HKBWS

Figure 13. Roosting Anatidae Management Target Summary Graph.



4.1.3 Shorebirds

- 4.1.3.1 Shorebirds are an important waterbird group at MPNR with a target to provide roosting habitat in BMZ9 and *Gei wai* #6, #8 and #11 for an average of 60% of the shorebirds in Deep Bay during spring and autumn passage (WWF-HK, 2006).
- 4.1.3.2 Data was obtained from AFCD and HKBWS in autumn (8-week period between 02 September and 28 October) and spring (8-week period between 24 March and 19 May) starting from Autumn 2006.
- 4.1.3.3 In the spring period, targets were achieved in 3 years except 2008. Mean percentage ranged from 49.3% to 94.6%. Autumn targets were all achieved in 4 years, mean percentage ranged from 70.1% to 92.0% (Table 14 and Figure 14)

Conclusions and Recommendations

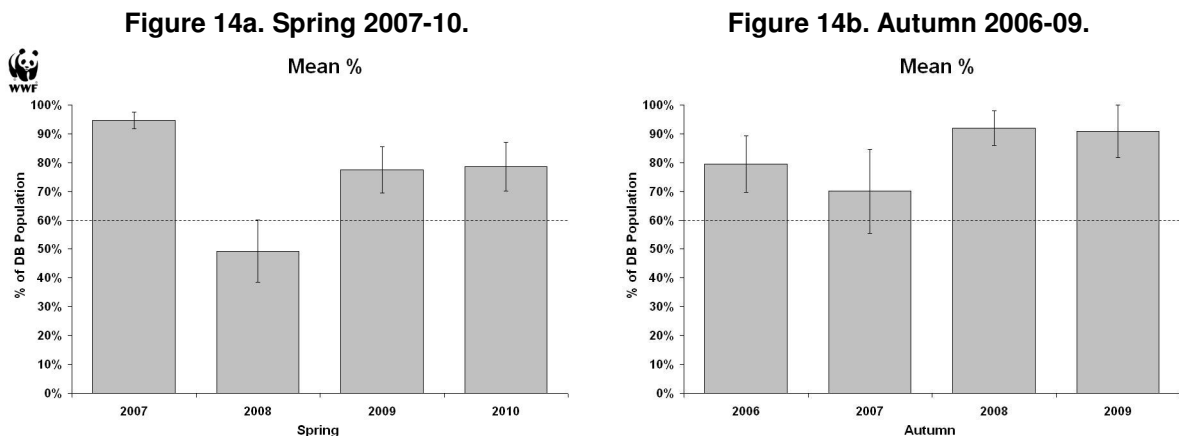
- 4.1.3.4
 - The use of external party data to assess shorebird management targets was effective and reduced the human resources required from WWF.
 - It should be noted that shorebirds generally depart from the Bay and head to the MPNR high-tide roosts when tide heights exceed 2.1m. Thus, only counts carried out during such tidal condition are suitable for assessing the target. Special attention should be paid to this in future assessments.

Table 14. Roosting Shorebird Management Target Data Summary.

Year	Mean % of Deep Bay population ¹	
	Spring	Autumn
2006	-	79.5%
2007	94.6%	70.1%
2008	49.3%	92.0%
2009	77.5%	90.9%
2010	78.6%	-

¹ - Data source: AFCD and HKBWS

Figure 14. Roosting Shorebird Management Target Summary Graph.



5. REFERENCES (*) & BIBLIOGRAPHY

- * Anon. 2006a. **Trials to Improve the Roosting Habitat for Wintering Waterfowl in Ponds #20 and #24 at Mai Po Nature Reserve 2005-06 : Final Report**. Report by World Wide Fund for Nature Hong Kong to the Agriculture, Fisheries and Conservation Department, Hong Kong Special Administrative Region Government.
 - * Anon. 2006b. **Trials to Improve the Roosting Habitat for Wintering Waterfowl in Ponds 20 and 24 at Mai Po Nature Reserve 2005-06 : Waterfowl Report**. AFCD/SQ/20/05. Report by World Wide Fund for Nature Hong Kong to the Agriculture, Fisheries and Conservation Department, Hong Kong Special Administrative Region Government.
 - * Anon, 2006c. **Trial on Improvements to the High-tide Roosting Habitat for Migratory Waterbirds at Gei wai #16/17 Mai Po Nature Reserve 2005-06 : Final Report**. Report by World Wide Fund For Nature Hong Kong to the Agriculture, Fisheries and Conservation Department, Hong Kong Special Administrative Region Government.
 - * Anon. 2006d. **Trial on Improvements to the High Tide Roosting Habitat for Migratory Waterbirds at Gei wai #16/17 Mai Po Nature Reserve 2005-06. Waterbird Report**. Report by the World Wide Fund for Nature Hong Kong (WWFHK) to the Agriculture, Fisheries and Conservation Department, Hong Kong Special Administrative Region Government.
 - * Anon. 2007a. **Winter 2006-07 Report on Waterbird Monitoring at the Mai Po Inner Deep Bay Ramsar Site**. Report by Hong Kong Bird Watching Society to the Agriculture, Fisheries and Conservation Department, Hong Kong Special Administrative Region Government.
- Carey, G.J. 2002. **Waterbird Count Handbook. A Guide for Participants in Waterbird Counts in Hong Kong**. Hong Kong Bird Watching Society, Hong Kong.
- Carey, G.J., Chalmers, M.L., Diskin, D.A., Kennerley, P.R., Leader, P.J., Leven, M.R., Lewthwaite, R.W., Melville, D.S., Turnbull, M. and Young, L. 2001. **The Avifauna of Hong Kong**. Hong Kong Birdwatching Society, Hong Kong.
- Fellowes, J.R., Lau, M.W.N., Dudgeon, D., Reels, G., Ades, G.W.J., Carey, G.J., Chan, B.P.L., Kendrick, R.C., Lee, K.S., Leven, M.R., Wilson, K.D.P. & Yu, Y.T. (2002). **Wild Animals to Watch: Terrestrial and Freshwater Fauna of Conservation Concern in Hong Kong**. *Memoirs of the Hong Kong Natural History Society* 25: 123-159.
- Fowler, J., Cohen, L. and Jarvis, P. 1998. **Practical Statistics for Field Biology**. 2nd Ed. Wiley, Chichester.
- Hayman, P., Marchant, J. and Prater, T. 1986. **Shorebirds – An Identification Guide to the Waders of the World**. Helm London.
- Madge, S. & Burn, H. 1989. **Wildfowl : An Identification Guide to the Ducks, Geese and Swans of the World**. Helm London.
- * WWF-HK. 2006. **Management Plan for Mai Po Marshes Wildlife Education Centre and Nature Reserve 2006-2010**. The World Wide Fund for Nature Hong Kong. Hong Kong.
- WWF-HK, 2007. **Research and Monitoring Programme Plan for the Mai Po Nature Reserve : 2007 - 2011**. The World Wide Fund For Nature Hong Kong, Hong Kong.
- * WWF-HK, 2008a. **Study upon the Wildlife Impact and Potential Economic Habitat Management Benefits of Introducing Asian Water Buffalo *Bubalus bubalis* into the Freshwater Ponds at Mai Po Nature Reserve – Final Project Report 2008**. Report to the Environmental Conservation Fund by World Wide Fund For Nature Hong Kong, Hong Kong.
 - * WWF-HK, 2008b. **A Short Study on the Butterfly Hotspots in Mai Po Nature Reserve – Summer 2007**. World Wide Fund For Nature Hong Kong. Internal Report.
 - * WWF-HK, 2008c. **Brief Report on the Survival of Shrub Species Planted between 1996-2007 at Mai Po Nature Reserve**. World Wide Fund For Nature Hong Kong. Internal Report.
 - * WWF-HK, 2010a. **Baseline Ecological Monitoring Plan : Mai Po Nature Reserve : 2007 – 2010**. World Wide Fund For Nature Hong Kong, Hong Kong. *Unpublished*.
 - * WWF-HK, 2010b. **Mai Po Nature Reserve Morning Bird Count Five-year Summary Graphs: September 2005 to August 2010**. World Wide Fund For Nature Hong Kong, Hong Kong.
 - * WWF-HK, 2010c. **Baseline survey on the usage of MPNR by roosting Barn Swallow *Hirundo rustica* and Yellow Wagtail *Motacilla flava***. World Wide Fund For Nature Hong Kong.

- * WWF-HK. 2011. WWF Hong Kong Website: <http://www.wwf.org.hk>
- * WWF-HK & HKBRG, 2008. **Study into the Avian Value of Different Aged Stands of *Phragmites Australis* at Mai Po Nature Reserve**. Joint report by the World Wide Fund For Nature Hong Kong and the Hong Kong Bird Ringing Group.

APPENDICES

APPENDIX I – Monthly Rainfall and Temperature Summaries.

APPENDIX Ia – 2005-06

Month	Rainfall (mm)		Temperature (°C)	
	Mean	Max	Mean	Range
Sep-05	6.02	54.5	27.60	22.5 - 33.6
Oct-05	0.03	0.5	25.50	18.4 - 32.7
Nov-05	1.07	18.5	22.30	13.4 - 30.8
Dec-05	0.06	1.0	16.10	8.0 - 25.2
Jan-06	0.82	13.5	16.00	6.4 - 25.8
Feb-06	2.11	29.0	17.60	8.8 - 25.0
Mar-06	2.08	35.5	18.50	7.3 - 27.1
Apr-06	2.12	43.5	23.80	13.2 - 32.0
May-06	9.24	83.0	25.40	18.9 - 32.9
Jun-06	13.77	145.5	27.30	21.5 - 33.2
Jul-06	7.10	39.0	28.60	23.3 - 34.6
Aug-06	10.00	55.0	28.00	23.8 - 33.7

APPENDIX Ib – 2006-07

Month	Rainfall (mm)		Temperature (°C)	
	Mean	Max	Mean	Range
Sep-06	6.93	110.5	26.20	19.5 - 33.1
Oct-06	0.03	1.0	25.90	21.5 - 31.3
Nov-06	2.55	57.0	22.70	16.9 - 30.8
Dec-06	0.81	18.0	17.30	8.9 - 29.6
Jan-07	0.84	24.5	15.40	8.3 - 23.9
Feb-07	0.64	8.0	19.40	9.4 - 27.3
Mar-07	0.48	6.5	20.20	9.2 - 29.3
Apr-07	4.20	76.0	21.50	11.0 - 30.4
May-07	7.92	54.5	26.30	20.0 - 33.5
Jun-07	13.98	125.0	28.50	21.3 - 34.0
Jul-07	1.10	11.5	29.90	24.4 - 34.5
Aug-07	12.60	64.5	28.20	22.8 - 34.9

APPENDIX Ic – 2007-08

Month	Rainfall (mm)		Temperature (°C)	
	Mean	Max	Mean	Range
Sep-07	1.87	41.5	27.90	23.1 - 33.3
Oct-07	1.00	17.5	26.00	19.4 - 32.4
Nov-07	0.67	10.5	20.80	10.7 - 29.7
Dec-07	0.45	12.5	19.30	10.3 - 28.2
Jan-08	1.60	31.0	14.90	6.2 - 29.0
Feb-08	0.84	13.5	12.70	5.8 - 20.8
Mar-08	0.95	14.5	20.50	9.6 - 30.1
Apr-08	4.65	100.0	24.10	16.4 - 32.2
May-08	4.60	39.0	25.70	19.3 - 32.6
Jun-08	42.53	266.5	26.80	22.0 - 33.9
Jul-08	7.71	77.5	28.55	23.2 - 35.0
Aug-08	5.53	51.0	28.53	22.6 - 34.1

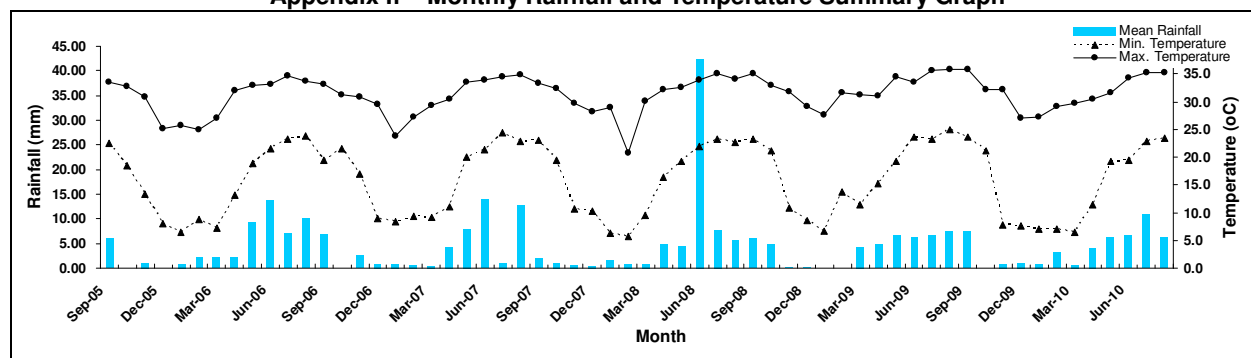
APPENDIX Id – 2008-09

Month	Rainfall (mm)		Temperature (°C)	
	Mean	Max	Mean	Range
Sep-08	5.97	87.0	28.90	23.2 - 35.0
Oct-08	4.76	139.5	26.97	21.2 - 32.9
Nov-08	0.15	4.5	22.16	10.9 - 31.9
Dec-08	0.16	3.0	18.33	8.5 - 29.2
Jan-09	0.02	0.5	15.23	6.7 - 27.6
Feb-09	0.04	0.5	22.19	13.8 - 31.7
Mar-09	4.35	44.5	20.14	11.5 - 31.3
Apr-09	4.63	56.5	22.99	15.3 - 31.0
May-09	6.55	101.0	26.22	19.2 - 34.5
Jun-09	6.25	39.0	28.28	23.7 - 33.6
Jul-09	6.65	67.0	29.32	23.3 - 35.7
Aug-09	7.45	47.0	29.22	24.9 - 35.8

APPENDIX Ie – 2009-10

Month	Rainfall (mm)		Temperature (°C)	
	Mean	Max	Mean	Range
Sep-09	7.41	68.5	29.38	23.6 - 35.9
Oct-09	0.10	2.5	26.53	21.2 - 32.1
Nov-09	0.88	13.5	19.76	7.8 - 32.2
Dec-09	1.06	7.5	16.76	7.7 - 27.0
Jan-10	0.87	15.0	16.84	7.1 - 27.2
Feb-10	3.15	74.0	18.24	7.0 - 29.2
Mar-10	0.54	6.5	21.84	6.5 - 29.8
Apr-10	4.10	44.0	26.49	11.4 - 30.5
May-10	6.30	81.0	23.06	19.3 - 31.6
Jun-10	6.55	64.0	27.39	19.5 - 34.2
Jul-10	10.87	125.0	29.25	22.8 - 35.2
Aug-10	6.19	44.5	28.82	23.4 - 35.3

Appendix If – Monthly Rainfall and Temperature Summary Graph



APPENDIX IIa – Morning Bird Count Data Summary : Sep 2005 – Aug 2006

DATE	BIRD GROUPS									TOTAL	No. of Species	
	Cormorants	Ardeids, etc.	Gulls and Terns	Ducks, Grebes, etc.	Rails, Coots, etc.	Waders	Birds of Prey	Wetland Dep. Other	Non Wetland Dep.		Cat. A	Cat. A + B
11-Sep-05	0	400	0	31	12	1786	0	86	565	2880	51	-
18-Sep-05	0	307	0	51	15	1692	2	21	581	2669	58	-
05-Oct-05	3	655	0	130	20	1596	5	31	418	2858	62	-
17-Oct-05	204	309	0	211	41	2370	9	30	384	3558	62	-
03-Nov-05	1458	666	0	320	44	44	16	48	413	3009	59	-
14-Nov-05	2220	726	0	1375	80	306	12	148	493	5360	60	-
02-Dec-05	1855	666	0	1912	55	45	14	99	405	5051	68	-
18-Dec-05	2769	615	0	1358	46	105	16	116	390	5415	56	-
05-Jan-06	1691	470	0	1404	58	10	8	92	284	4017	58	-
23-Jan-06	2280	848	0	1069	52	4	8	81	292	4634	53	-
04-Feb-06	1772	352	1	1512	74	6	9	128	221	4075	60	-
20-Feb-06	1346	364	0	1007	102	4	31	147	488	3489	57	-
02-Mar-06	1852	339	0	924	73	2	13	139	260	3602	50	-
20-Mar-06	1068	226	0	742	46	14	9	113	292	2510	53	-
10-Apr-06	2	422	0	191	74	89	1	12	241	1032	52	-
17-Apr-06	2	147	0	120	84	53	1	19	294	720	61	-
14-May-06	0	206	1	25	21	61	2	8	239	563	42	-
25-May-06	0	424	0	25	29	361	1	13	261	1114	47	-
12-Jun-06	0	557	10	32	23	109	1	18	450	1200	43	47
22-Jun-06	0	387	0	17	18	210	0	17	296	945	45	49
07-Jul-06	1	470	0	20	25	98	1	39	504	1158	46	50
21-Jul-06	1	412	0	30	21	535	4	28	436	1467	53	57
13-Aug-06	1	317	0	23	11	5	3	52	605	1017	43	46
21-Aug-06	1	388	0	21	9	1436	6	17	488	2366	57	58

(Boxed and shaded numbers = peak count)

APPENDIX IIb – Morning Bird Count Data Summary : Sep 2006 – Aug 2007

DATE	BIRD GROUPS									TOTAL	No. of Species	
	Cormorants	Ardeids, etc.	Gulls and Terns	Ducks, Grebes, etc.	Rails, Coots, etc.	Waders	Birds of Prey	Wetland Dep. Other	Non Wetland Dep.		Cat. A	Cat. A + B
11-Sep-06	1	233	0	23	8	45	3	23	461	797	43	49
18-Sep-06	1	287	0	99	7	2599	3	24	438	3458	63	66
06-Oct-06	2	326	0	280	24	3172	2	70	276	4152	75	78
17-Oct-06	371	317	0	376	52	1380	4	36	232	2768	67	75
03-Nov-06	1135	488	0	276	44	2649	9	22	360	4983	67	68
17-Nov-06	1213	561	0	1148	93	260	18	41	381	3715	71	79
01-Dec-06	3268	546	0	7858	38	95	5	26	296	12132	62	71
19-Dec-06	3893	759	0	1427	52	337	13	64	250	6795	63	69
15-Jan-07	1778	632	0	2403	187	111	18	1355	519	7003	67	72
30-Jan-07	2380	355	0	1839	75	3	9	307	446	5414	64	67
12-Feb-07	2140	799	0	1681	96	1	23	30	286	5056	59	61
27-Feb-07	810	522	0	1181	68	2	21	45	315	2964	58	62
13-Mar-07	2155	560	1	1287	139	7	9	258	355	4771	68	75
27-Mar-07	401	576	2	343	93	44	8	33	411	1911	63	66
03-Apr-07	19	160	0	169	57	69	3	16	315	808	49	58
23-Apr-07	0	426	0	60	93	285	3	36	314	1217	59	66
09-May-07	0	123	0	29	53	99	0	16	350	670	44	50
23-May-07	0	122	1	32	14	43	1	24	355	592	47	48
12-Jun-07	0	146	0	26	19	60	0	19	381	651	37	39
19-Jun-07	0	126	1	20	9	21	2	39	551	769	45	49
13-Jul-07	0	1091	1	23	22	352	1	67	527	2084	47	50
27-Jul-07	0	558	0	21	10	1338	2	33	572	2534	50	53
15-Aug-07	0	270	0	10	18	14	3	26	341	682	43	46
24-Aug-07	0	161	0	33	19	1584	4	20	389	2210	58	60

(Boxed and shaded numbers = peak count)

APPENDIX IIc – Morning Bird Count Data Summary : Sep 2007 – Aug 2008

DATE	BIRD GROUPS									TOTAL	No. of Species	
	Cormorants	Ardeids, etc.	Gulls and Terns	Ducks, Grebes, etc.	Rails, Coots, etc.	Waders	Birds of Prey	Wetland Dep. Other	Non Wetland Dep.		Cat. A	Cat. A + B
07-Sep-07	0	208	0	37	16	1867	2	27	365	2522	60	63
25-Sep-07	5	245	0	139	19	3837	3	26	253	4527	67	72
08-Oct-07	65	241	0	418	32	3833	5	39	204	4837	65	75
23-Oct-07	696	299	0	195	29	2005	2	35	278	3539	62	68
09-Nov-07	1766	565	0	573	38	13	3	81	232	3271	63	71
21-Nov-07	1975	593	0	5064	53	74	10	21	273	8063	64	73
09-Dec-07	2501	372	0	1445	67	60	15	17	358	4835	56	66
27-Dec-07	2677	379	0	726	70	4	14	41	273	4184	58	66
11-Jan-08	2791	390	0	853	66	4	25	182	287	4598	58	64
21-Jan-08	2277	412	0	805	93	3	18	37	343	3988	63	66
05-Feb-08	3115	438	0	1333	120	5	12	76	317	5416	59	65
19-Feb-08	1374	340	0	1267	84	202	7	54	269	3597	55	60
07-Mar-08	900	294	0	703	59	7	8	78	389	2438	61	62
27-Mar-08	383	349	0	104	66	16	5	22	476	1421	57	59
09-Apr-08	5	336	0	32	98	35	0	12	273	791	49	54
21-Apr-08	0	81	0	39	60	80	2	18	439	719	58	66
05-May-08	1	268	0	16	39	369	1	24	255	973	54	60
24-May-08	0	127	0	7	10	106	1	23	285	559	46	52
03-Jun-08	0	218	2	21	9	480	0	22	344	1096	49	53
30-Jun-08	0	471	0	12	21	44	1	21	370	940	42	47
15-Jul-08	0	94	0	18	15	148	3	7	424	709	43	48
30-Jul-08	0	457	0	26	10	2358	1	41	305	3198	49	54
14-Aug-08	0	187	0	25	12	2355	5	15	275	2874	58	63
27-Aug-08	0	229	0	29	7	2215	5	27	330	2842	61	65

(Boxed and shaded numbers = peak count)

APPENDIX IId – Morning Bird Count Data Summary : Sep 2008 – Aug 2009

DATE	BIRD GROUPS									TOTAL	No. of Species	
	Cormorants	Ardeids, etc.	Gulls and Terns	Ducks, Grebes, etc.	Rails, Coots, etc.	Waders	Birds of Prey	Wetland Dep. Other	Non Wetland Dep.		Cat. A	Cat. A + B
11-Sep-08	0	568	0	60	10	3069	5	23	267	4002	63	67
25-Sep-08	2	212	0	229	9	1661	9	37	296	2455	60	63
10-Oct-08	94	184	0	454	16	899	6	43	364	2060	59	64
24-Oct-08	440	451	0	496	15	783	13	24	271	2493	59	64
14-Nov-08	1853	641	0	389	28	45	37	59	511	3563	72	77
25-Nov-08	3138	476	0	885	44	48	6	90	306	4993	59	71
02-Dec-08	2422	666	0	933	91	6	8	84	337	4547	64	71
16-Dec-08	3167	320	0	825	61	5	16	324	370	5088	64	71
12-Jan-09	2661	557	0	611	59	1	14	26	226	4155	48	51
22-Jan-09	2730	544	0	485	66	28	17	48	351	4269	64	69
10-Feb-09	2045	857	0	844	93	5	14	64	342	4264	61	66
27-Feb-09	1284	1040	0	633	46	6	9	22	275	3315	53	57
11-Mar-09	2237	410	0	705	51	22	5	17	322	3769	57	62
23-Mar-09	381	518	0	75	91	120	5	23	625	1838	62	68
07-Apr-09	9	192	0	47	47	90	3	4	459	851	52	59
24-Apr-09	3	113	0	35	50	330	3	29	238	801	52	60
7-May-09	2	293	7	29	28	429	1	23	273	1085	61	67
22-May-09	2	333	8	48	16	990	0	10	377	1784	69	75
04-Jun-09	2	401	8	18	19	434	0	46	332	1260	59	64
19-Jun-09	1	784	5	21	25	141	0	18	316	1311	51	53
06-Jul-09	1	675	4	18	13	181	1	30	326	1249	48	53
20-Jul-09	0	839	3	27	11	262	2	43	545	1732	51	54
04-Aug-09	1	642	4	17	9	2217	4	30	275	3199	53	60
18-Aug-09	1	470	2	29	10	2194	3	14	366	3089	63	65

(Boxed and shaded numbers = peak count)

APPENDIX IIe – Morning Bird Count Data Summary : Sep 2009 – Aug 2010

DATE	BIRD GROUPS									TOTAL	No. of Species	
	Cormorants	Ardeids, etc.	Gulls and Terns	Ducks, Grebes, etc.	Rails, Coots, etc.	Waders	Birds of Prey	Wetland Dep. Other	Non Wetland Dep.		Cat. A	Cat. A + B
01-Sep-09	0	672	2	21	13	1351	3	20	284	2366	63	65
17-Sep-09	5	281	14	167	8	2766	9	31	298	3579	72	76
02-Oct-09	77	176	1	71	14	2656	11	25	310	3341	74	77
17-Oct-09	312	463	0	104	53	2901	3	47	365	4248	64	72
05-Nov-09	1620	529	0	272	26	18	10	79	315	2869	59	62
18-Nov-09	2522	549	0	258	29	9	8	128	433	3936	61	68
04-Dec-09	3270	667	1	543	51	79	13	221	413	5258	69	70
17-Dec-09	3113	693	0	897	66	16	23	39	461	5308	60	66
05-Jan-10	3445	515	1	1098	37	9	22	20	422	5569	58	65
19-Jan-10	2040	366	0	1198	56	2	16	41	364	4083	69	75
02-Feb-10	2542	435	0	1223	49	3	12	12	326	4602	55	61
22-Feb-10	2666	542	680	1763	58	5	15	61	422	6212	66	72
02-Mar-10	1754	559	3	1053	51	10	7	48	446	3931	61	64
16-Mar-10	1530	328	0	985	66	28	6	151	299	3393	53	61
14-Apr-10	0	122	0	69	50	556	3	15	219	1034	58	60
29-Apr-10	1	366	0	44	58	773	2	17	322	1583	70	78
13-May-10	0	171	0	51	16	236	2	19	267	762	61	67
25-May-10	0	115	3	25	20	118	3	17	421	722	52	54
09-Jun-10	0	401	4	18	7	109	2	26	319	886	52	55
24-Jun-10	0	171	0	22	14	35	0	11	345	598	47	47
09-Jul-10	0	946	1	25	19	133	2	53	355	1534	50	54
24-Jul-10	0	198	0	25	17	604	5	33	372	1254	54	57
09-Aug-10	0	310	1	25	7	2037	2	24	252	2658	59	62
20-Aug-10	0	74	2	15	10	1952	5	27	316	2401	57	61

(Boxed and shaded numbers = peak count)

APPENDIX IIIa – Morning Bird Count Species Summary : Sep 2005 – Aug 2006

Bird Species	Yearly Mean	Yearly Peak	No. of counts present	Bird Species	Yearly Mean	Yearly Peak	No. of counts present	Bird Species	Yearly Mean	Yearly Peak	No. of counts present
Great Cormorant	771.9	2769	18	Green Sandpiper	0.1	2	1	Sooty-headed Bulbul	0.1	3	1
Black-faced Spoonbill	25.8	91	19	Grey-tailed Tattler	0.5	9	2	Brown Shrike	<0.1	1	1
Eurasian Spoonbill	<0.1	1	1	Marsh Sandpiper	74.9	802	9	Long-tailed Shrike	6.3	17	23
Black-crowned Night Heron	15.9	42	24	Spotted Redshank	1.7	15	5	Siberian Stonechat	1.4	5	14
Chinese Pond Heron	25.0	68	24	Wood Sandpiper	1.7	10	12	Daurian Redstart	0.3	4	3
Grey Heron	133.6	398	24	Common Sandpiper	2.6	15	18	Oriental Magpie Robin	10.2	23	24
Purple Heron	3.1	12	20	Terek Sandpiper	10.4	125	4	Siberian Rubythroat	0.1	1	2
Striated Heron	3.2	13	12	Great Knot	0.2	4	1	Common Blackbird	0.1	1	2
Eastern Cattle Egret	7.8	54	18	Red Knot	0.2	5	1	Grey-backed Thrush	0.1	1	2
Eastern Great Egret	122.4	279	24	Curlew Sandpiper	1.7	18	5	Masked Laughingthrush	12.0	25	24
Intermediate Egret	3.3	15	17	Dunlin	0.1	2	1	Arctic Warbler	0.2	2	3
Little Egret	103.3	275	24	Ruff	<0.1	1	1	Common Tailorbird	0.5	2	8
Eurasian Bittern	0.1	1	2	Sharp-tailed Sandpiper	0.3	4	4	Dusky Warbler	1.6	10	11
Yellow Bittern	1.4	5	12	Red-necked Stint	4.0	95	1	Pale-legged Leaf Warbler	<0.1	1	1
Black-headed Gull	0.1	1	2	Common Snipe	0.2	3	3	Yellow-browed Warbler	0.6	3	8
Gull-billed Tern	0.4	10	1	Pheasant-tailed Jacana	<0.1	1	1	Plain Prinia	8.7	33	16
Eurasian Teal	54.9	318	12	Black-capped Kingfisher	0.4	2	7	Yellow-bellied Prinia	14.7	48	16
Eurasian Wigeon	122.6	446	12	Common Kingfisher	4.2	12	24	Asian Brown Flycatcher	0.3	1	7
Ferruginous Duck	0.1	3	1	Pied Kingfisher	0.4	3	5	Grey-streaked Flycatcher	<0.1	1	1
Gadwall	0.8	12	2	White-throated Kingfisher	4.6	15	19	Great Tit	2.0	7	15
Garganey	30.0	165	15	Grey Wagtail	2.9	68	2	Japanese White-eye	45.2	153	24
Hybrid Duck	0.1	1	2	Zitting Cisticola	0.1	2	1	Black-faced Bunting	0.5	3	6
Mallard	0.2	5	1	Oriental Reed Warbler	1.5	10	6	Scaly-breasted Munia	27.2	112	17
Northern Pintail	128.0	822	12	Collared Crow	7.6	34	22	Eurasian Tree Sparrow	5.3	13	22
Northern Shoveler	109.8	417	14	Red-billed Starling	41.0	136	10	Chinese Grosbeak	0.2	4	1
Spot-billed Duck	6.2	22	18	Eastern Marsh Harrier	0.2	3	3	Black-collared Starling	23.6	90	24
Tufted Duck	36.5	236	10	Pied Harrier	<0.1	1	1	White-cheeked Starling	10.4	79	9
Greater White-fronted Goose	0.1	1	2	Eastern Imperial Eagle	0.8	3	8	White-shouldered Starling	2.6	24	5
Little Grebe	26.0	40	24	Western Osprey	0.7	3	13	Crested Myna	5.3	22	18
Common Moorhen	26.2	73	18	Besra	0.2	1	4	Black-naped Oriole	0.1	2	1
Eurasian Coot	5.3	30	10	Chinese Sparrowhawk	<0.1	1	1	Black Drongo	4.2	26	13
White-breasted Waterhen	11.5	25	23	Black Kite	3.8	23	17	Azure-winged Magpie	7.3	42	18
Black-winged Stilt	46.4	201	17	Bonelli's Eagle	<0.1	1	1	Eurasian Magpie	9.5	25	24
Pied Avocet	15.1	210	8	Eastern Buzzard	1.0	8	9	House Crow	0.1	1	3
Grey-headed Lapwing	0.2	2	3	Peregrine Falcon	0.3	2	5	Large-billed Crow	1.9	6	17
Northern Lapwing	0.5	5	4	Oriental Turtle Dove	4.3	17	13				
Little Ringed Plover	0.6	6	6	Domestic Pigeon	0.5	7	2	Unidentified			
Greater Sand Plover	5.5	80	6	Spotted Dove	37.8	67	24	Duck spp. (Unidentified)	7.5	90	4
Pacific Golden Plover	0.5	7	2	Asian Koel	5.3	16	21	Tringa spp. (Unidentified)	17.8	426	1
Grey Plover	0.5	6	3	Indian Cuckoo	0.2	3	2	Calidris spp. (Unidentified)	0.8	20	1
Oriental Pratincole	0.1	3	1	Greater Coucal	5.6	12	21	Wader spp. (Unidentified)	2.9	70	1
Asian Dowitcher	0.1	2	2	Barn Swallow	0.1	2	2	Accipiter sp. (Unidentified)	<0.1	1	1
Bar-tailed Godwit	0.7	14	3	Eurasian Wryneck	<0.1	1	1	Unidentified bird of prey	<0.1	1	1
Black-tailed Godwit	31.5	237	8	White Wagtail	4.0	20	16	Starling spp. (Unidentified)	0.3	7	1
Eurasian Curlew	6.8	104	7	Olive-backed Pipit	2.5	15	10	Prinia (Yellow-bellied/Plain)	5.8	27	8
Whimbrel	8.8	174	6	Richard's Pipit	<0.1	1	1	Flowerpecker sp. (Unidentified)	<0.1	1	1
Common Greenshank	162.6	1041	14	Chinese Bulbul	108.5	232	24				
Common Redshank	55.9	600	11	Red-whiskered Bulbul	10.1	50	22				

(shaded = wetland species with global conservation concern)

APPENDIX IIIb – Morning Bird Count Species Summary : Sep 2006 – Aug 2007

Bird Species	Yearly Mean	Yearly Peak	No. of counts present	Bird Species	Yearly Mean	Yearly Peak	No. of counts present	Bird Species	Yearly Mean	Yearly Peak	No. of counts present
Great Cormorant	815.3	3893	15	Marsh Sandpiper	108.7	967	7	House Swift	0.1	2	1
Black-faced Spoonbill	39.5	215	22	Spotted Redshank	0.2	3	2	Eurasian Wryneck	0.1	1	2
Eurasian Spoonbill	0.5	3	9	Wood Sandpiper	36.9	238	12	Oriental Skylark	0.2	3	2
Black-crowned Night Heron	15.8	65	24	Common Sandpiper	2.5	16	18	White Wagtail	2.8	8	18
Chinese Pond Heron	15.1	47	23	Terek Sandpiper	0.6	9	4	Olive-backed Pipit	2.5	13	10
Grey Heron	134.3	364	24	Great Knot	0.1	3	1	Chinese Bulbul	83.0	145	24
Purple Heron	1.7	6	20	Broad-billed Sandpiper	<0.1	1	1	Red-whiskered Bulbul	7.0	29	22
Striated Heron	3.2	17	11	Curlew Sandpiper	10.2	239	2	Long-tailed Shrike	5.5	17	24
Eastern Cattle Egret	4.5	30	14	Dunlin	<0.1	1	1	Siberian Stonechat	1.5	5	13
Eastern Great Egret	109.4	540	24	Ruff	0.1	2	1	Daurian Redstart	0.2	3	2
Intermediate Egret	2.4	9	14	Sharp-tailed Sandpiper	0.3	3	3	Oriental Magpie Robin	12.7	33	24
Little Egret	94.7	415	24	Red-necked Stint	0.3	5	2	Siberian Rubythroat	0.5	5	5
Eurasian Bittern	<0.1	1	1	Long-toed Stint	0.1	2	1	Common Blackbird	0.3	3	3
Yellow Bittern	1.5	7	13	Common Snipe	0.3	6	2	Grey-backed Thrush	0.3	5	2
Black-headed Gull	0.2	2	4	Pintail / Swinhoe's Snipe	0.1	2	1	Masked Laughingthrush	14.1	38	21
Saunders's Gull	0.0	1	1	Pheasant-tailed Jacana	0.3	4	3	Arctic Warbler	0.1	1	2
Eurasian Teal	60.7	857	18	Black-capped Kingfisher	0.7	3	10	Common Tailorbird	0.8	3	13
Eurasian Wigeon	132.4	1410	14	Common Kingfisher	4.0	9	21	Dusky Warbler	7.9	49	14
Falcated Duck	0.1	2	1	Pied Kingfisher	2.3	8	19	Manchurian Bush Warbler	<0.1	1	1
Ferruginous Duck	<0.1	1	1	White-throated Kingfisher	4.3	10	18	Yellow-browed Warbler	2.6	9	10
Gadwall	1.4	11	9	Grey Wagtail	0.2	4	1	Plain Prinia	10.4	24	23
Garganey	41.2	292	16	Eastern Yellow Wagtail	1.0	7	9	Yellow-bellied Prinia	22.7	51	24
Lesser Whistling Duck	0.3	1	6	Zitting Cisticola	0.1	1	2	Asian Brown Flycatcher	0.3	5	3
Northern Pintail	272.5	3630	13	Black-browed Reed Warbler	0.3	3	3	Great Tit	3.3	11	23
Northern Shoveler	207.9	2024	19	Oriental Reed Warbler	3.9	53	9	Japanese White-eye	40.3	103	24
Spot-billed Duck	0.7	8	4	Collared Crow	11.8	51	24	Black-faced Bunting	0.5	7	5
Indian Spot-billed Duck	0.1	2	1	Red-billed Starling	81.0	1309	11	Yellow-breasted Bunting	0.7	16	1
Chinese Spot-billed Duck	5.3	31	8	Red-throated Pipit	0.1	2	1	Scaly-breasted Munia	28.4	212	16
Tufted Duck	116.4	756	12	Eastern Marsh Harrier	0.8	3	9	Eurasian Tree Sparrow	6.4	21	21
Lesser White-fronted Goose	0.3	2	3	Pied Harrier	<0.1	1	1	Yellow-fronted Canary	<0.1	1	1
Little Grebe	21.1	41	24	Greater Spotted Eagle	0.5	3	7	Black-collared Starling	28.0	167	24
Common Moorhen	36.3	138	18	Eastern Imperial Eagle	0.5	3	7	White-cheeked Starling	8.2	123	5
Eurasian Coot	6.9	42	11	Western Osprey	0.6	2	11	White-shouldered Starling	0.9	14	4
White-breasted Waterhen	10.6	24	22	Besra	0.3	2	5	Crested Myna	3.8	19	19
Black-winged Stilt	47.7	245	18	Black Kite	2.9	14	16	Black Drongo	4.0	14	16
Pied Avocet	29.7	298	7	Bonelli's Eagle	<0.1	1	1	Azure-winged Magpie	4.8	30	12
Grey-headed Lapwing	<0.1	1	1	Eastern Buzzard	1.0	4	10	Eurasian Magpie	10.7	31	24
Little Ringed Plover	0.5	5	6	Japanese Sparrowhawk	<0.1	1	1	Carrion Crow	<0.1	1	1
Greater Sand Plover	1.8	28	4	Common Kestrel	<0.1	1	1	Daurian Jackdaw	0.1	1	3
Pacific Golden Plover	2.2	41	4	Peregrine Falcon	0.1	1	2	Large-billed Crow	0.5	4	7
Grey Plover	2.2	23	3	Oriental Turtle Dove	10.4	52	14				
Oriental Pratincole	<0.1	1	1	Red Turtle Dove	0.0	1	1	Unidentified			
Asian Dowitcher	0.3	6	2	Domestic Pigeon	0.2	4	1	Accipiter sp. (Unidentified)	0.1	1	2
Bar-tailed Godwit	0.1	2	1	Spotted Dove	31.8	75	24				
Black-tailed Godwit	26.9	304	7	Asian Koel	6.3	17	22				
Eurasian Curlew	14.5	82	7	Indian Cuckoo	0.2	2	3				
Eastern Curlew	0.1	2	2	Large Hawk Cuckoo	<0.1	1	1				
Whimbrel	7.7	67	7	Plaintive Cuckoo	<0.1	1	1				
Common Greenshank	212.3	1886	16	Greater Coucal	4.3	14	21				
Common Redshank	100.3	637	13	Savanna Nightjar	<0.1	1	1				
Green Sandpiper	<0.1	1	1	Barn Swallow	10.5	208	8				

(shaded = wetland species with global conservation concern)

APPENDIX IIIc – Morning Bird Count Species Summary : Sep 2007 – Aug 2008

Bird Species	Yearly Mean	Yearly Peak	No. of counts present	Bird Species	Yearly Mean	Yearly Peak	No. of counts present	Bird Species	Yearly Mean	Yearly Peak	No. of counts present
Great Cormorant	855.5	3115	15	Spotted Redshank	2.0	42	4	White Wagtail	4.7	12	23
Black-faced Spoonbill	30.1	129	24	Wood Sandpiper	42.0	315	12	Olive-backed Pipit	1.1	8	8
Eurasian Spoonbill	0.1	1	2	Common Sandpiper	1.9	8	18	Chinese Bulbul	66.6	188	24
Black-crowned Night Heron	15.7	57	23	Terek Sandpiper	8.7	116	8	Red-whiskered Bulbul	7.4	28	22
Chinese Pond Heron	8.7	20	24	Great Knot	<0.1	1	1	Long-tailed Shrike	5.0	14	24
Grey Heron	112.7	284	23	Red Knot	0.3	5	2	Siberian Stonechat	1.1	3	14
Purple Heron	2.0	8	17	Curlew Sandpiper	4.7	69	6	Daurian Redstart	0.3	2	5
Striated Heron	2.6	10	13	Ruff	0.1	1	2	Oriental Magpie Robin	10.8	26	24
Eastern Cattle Egret	1.7	6	14	Sharp-tailed Sandpiper	0.1	1	2	Siberian Rubythroat	0.1	1	2
Eastern Great Egret	69.5	220	24	Red-necked Stint	4.5	84	5	Common Blackbird	0.3	4	3
Intermediate Egret	1.7	11	14	Long-toed Stint	0.2	3	2	Masked Laughingthrush	18.9	40	24
Little Egret	70.6	207	24	Common Snipe	0.1	2	2	Arctic Warbler	0.1	1	2
Yellow Bittern	1.0	8	8	Pheasant-tailed Jacana	<0.1	1	1	Common Tailorbird	0.9	2	16
Black-headed Gull	0.1	2	1	Black-capped Kingfisher	0.1	1	2	Dusky Warbler	8.9	42	15
Eurasian Teal	34.3	216	14	Common Kingfisher	3.6	10	22	Manchurian Bush Warbler	0.1	1	3
Eurasian Wigeon	76.5	277	15	Pied Kingfisher	1.5	5	15	Pallas's Leaf Warbler	0.0	1	1
Gadwall	0.1	2	1	White-throated Kingfisher	3.1	8	18	Yellow-browed Warbler	2.5	9	9
Garganey	16.3	280	9	Grey Wagtail	0.1	1	2	Plain Prinia	7.6	34	23
Mallard	0.1	2	1	Eastern Yellow Wagtail	2.0	13	11	Yellow-bellied Prinia	23.7	70	24
Northern Pintail	236.9	4153	12	Zitting Cisticola	0.2	2	3	Asian Brown Flycatcher	0.4	3	7
Northern Shoveler	102.8	437	18	Black-browed Reed Warbler	0.2	3	2	Red-throated Flycatcher	<0.1	1	1
Spot-billed Duck	0.2	5	1	Chinese Penduline-Tit	1.7	16	5	Great Tit	3.9	13	21
Indian Spot-billed Duck	0.1	1	2	Oriental Reed Warbler	1.8	14	8	Japanese White-eye	28.3	73	24
Chinese Spot-billed Duck	4.1	23	9	Collared Crow	8.3	25	23	Black-faced Bunting	0.6	3	6
Tufted Duck	87.1	783	10	Red-billed Starling	16.8	161	10	Little Bunting	<0.1	1	1
Little Grebe	20.1	42	24	Red-throated Pipit	0.1	1	2	Scaly-breasted Munia	11.6	83	15
Common Moorhen	32.7	98	17	Black-winged Kite	0.1	2	1	Eurasian Tree Sparrow	4.7	10	22
Eurasian Coot	3.3	17	8	Eastern Marsh Harrier	0.4	3	7	Chinese Grosbeak	<0.1	1	1
Watercock	<0.1	1	1	Greater Spotted Eagle	0.5	2	8	Black-collared Starling	23.2	129	24
White-breasted Waterhen	9.5	23	23	Eastern Imperial Eagle	0.3	2	6	White-cheeked Starling	0.8	7	6
Black-winged Stilt	34.7	251	16	Western Osprey	0.6	3	10	White-shouldered Starling	0.8	10	5
Pied Avocet	25.1	235	8	Besra	0.7	3	13	Crested Myna	9.1	33	23
Little Ringed Plover	0.6	4	6	Chinese Sparrowhawk	<0.1	1	1	Black Drongo	4.6	19	16
Greater Sand Plover	26.3	291	5	Black Kite	2.2	16	14	Azure-winged Magpie	6.1	31	17
Pacific Golden Plover	1.0	10	7	Bonelli's Eagle	0.1	1	3	Eurasian Magpie	8.6	18	24
Grey Plover	1.7	12	8	Eastern Buzzard	0.8	4	9	Large-billed Crow	0.5	4	5
Oriental Pratincole	<0.1	1	1	Common Kestrel	<0.1	1	1				
Ruddy Turnstone	<0.1	1	1	Eurasian Hobby	<0.1	1	1	Unidentified			
Asian Dowitcher	0.4	4	3	Peregrine Falcon	0.3	1	7	Accipiter sp. (Unidentified)	<0.1	1	1
Bar-tailed Godwit	0.1	3	1	Asian Barred Owl	0.0	1	1	Flycatcher sp. (Unidentified)	<0.1	1	1
Black-tailed Godwit	57.2	378	11	Oriental Turtle Dove	2.9	19	11				
Eurasian Curlew	24.9	213	9	Domestic Pigeon	0.2	3	2				
Whimbrel	9.4	60	6	Spotted Dove	36.8	132	24				
Common Greenshank	278.3	1476	19	Asian Koel	4.4	11	21				
Common Redshank	124.9	1150	14	Indian Cuckoo	0.1	2	2				
Green Sandpiper	0.1	1	3	Oriental Cuckoo	<0.1	1	1				
Grey-tailed Tattler	0.2	2	3	Greater Coucal	5.3	18	17				
Marsh Sandpiper	188.9	1595	7	Barn Swallow	4.3	70	5				

(shaded = wetland species with global conservation concern)

APPENDIX III d – Morning Bird Count Species Summary : Sep 2008 – Aug 2009

Bird Species	Yearly Mean	Yearly Peak	No. of counts present	Bird Species	Yearly Mean	Yearly Peak	No. of counts present	Bird Species	Yearly Mean	Yearly Peak	No. of counts present
Great Cormorant	936.5	3167	22	Common Redshank	120.3	648	14	Greater Coucal	4.3	15	20
Black-faced Spoonbill	39.4	219	22	Green Sandpiper	0.1	3	1	Blue-tailed Bee-eater	0.3	8	1
Eurasian Spoonbill	0.4	3	5	Grey-tailed Tattler	0.5	7	2	Barn Swallow	2.3	28	8
Black-crowned Night Heron	18.1	70	23	Marsh Sandpiper	83.3	761	10	White Wagtail	3.5	13	21
Chinese Pond Heron	15.0	27	24	Spotted Redshank	10.7	207	5	Olive-backed Pipit	1.3	6	10
Grey Heron	136.1	377	24	Wood Sandpiper	34.9	433	7	Richard's Pipit	0.1	1	3
Purple Heron	1.4	4	15	Common Sandpiper	2.0	6	18	Chinese Bulbul	96.5	275	24
Striated Heron	2.1	12	11	Terek Sandpiper	16.4	168	6	Red-whiskered Bulbul	5.4	16	21
Eastern Cattle Egret	0.8	5	7	Great Knot	2.7	34	2	Brown Shrike	<0.1	1	1
Eastern Great Egret	153.2	436	24	Red Knot	0.2	4	2	Long-tailed Shrike	5.5	14	24
Intermediate Egret	1.9	9	18	Broad-billed Sandpiper	0.1	3	1	Siberian Stonechat	0.9	3	11
Little Egret	138.9	375	24	Curlew Sandpiper	7.4	85	6	Daurian Redstart	0.5	2	7
Eurasian Bittern	<0.1	1	1	Ruff	<0.1	1	1	Oriental Magpie Robin	11.2	24	24
Yellow Bittern	0.4	3	5	Sharp-tailed Sandpiper	<0.1	1	1	Siberian Rubythroat	0.2	1	4
Black-headed Gull	1.0	6	8	Red-necked Stint	0.4	9	2	Common Blackbird	0.2	2	3
Caspian Tern	0.2	3	2	Long-toed Stint	0.2	4	2	Masked Laughingthrush	18.5	41	24
Gull-billed Tern	0.5	6	2	Common Snipe	1.1	20	3	Common Tailorbird	1.6	4	18
Eurasian Teal	54.9	366	15	Greater Painted-snipe	0.2	5	1	Dusky Warbler	9.3	53	15
Eurasian Wigeon	86.0	362	11	Black-capped Kingfisher	0.1	2	2	Pale-legged Leaf Warbler	<0.1	1	1
Gadwall	0.2	3	2	Common Kingfisher	3.4	8	22	Pallas's Leaf Warbler	<0.1	1	1
Garganey	11.2	106	8	Pied Kingfisher	2.4	7	19	Russet Bush Warbler	<0.1	1	1
Mallard	0.2	2	2	White-throated Kingfisher	2.6	6	18	Yellow-browed Warbler	3.4	14	13
Northern Pintail	78.8	576	11	Eastern Yellow Wagtail	1.4	10	7	Plain Prinia	5.1	15	22
Northern Shoveler	56.0	241	13	Zitting Cisticola	0.3	2	5	Yellow-bellied Prinia	23.5	63	24
Chinese Spot-billed Duck	3.8	20	13	Black-browed Reed Warbler	1.0	11	9	Asian Brown Flycatcher	0.3	4	5
Tufted Duck	11.9	85	17	Chinese Penduline-Tit	1.6	11	8	Red-throated Flycatcher	0.1	1	3
Great Crested Grebe	0.1	1	2	Oriental Reed Warbler	1.5	10	8	Great Tit	5.5	12	20
Little Grebe	26.8	49	24	Collared Crow	9.3	37	24	Japanese White-eye	33.0	109	23
Common Moorhen	26.8	83	20	Red-billed Starling	23.5	293	10	Black-faced Bunting	0.3	3	4
Eurasian Coot	1.7	10	8	Red-throated Pipit	<0.1	1	1	Scaly-breasted Munia	17.7	89	16
White-breasted Waterhen	9.4	23	24	Eastern Marsh Harrier	0.5	3	8	White-rumped Munia	0.2	3	2
Black-winged Stilt	35.4	191	16	Pied Harrier	<0.1	1	1	Eurasian Tree Sparrow	4.6	14	22
Pied Avocet	22.3	440	8	Greater Spotted Eagle	0.4	2	8	Black-collared Starling	20.5	81	24
Grey-headed Lapwing	<0.1	1	1	Eastern Imperial Eagle	0.5	3	7	White-cheeked Starling	0.5	5	4
Northern Lapwing	<0.1	1	1	Western Osprey	0.5	2	11	White-shouldered Starling	0.8	15	4
Little Ringed Plover	3.0	22	13	Besra	0.5	4	6	Crested Myna	9.4	64	21
Greater Sand Plover	8.5	77	6	Black Kite	4.0	27	17	Black-naped Oriole	<0.1	1	1
Lesser Sand Plover	0.2	3	2	Bonelli's Eagle	<0.1	1	1	Black Drongo	3.1	9	13
Pacific Golden Plover	0.3	3	6	Eastern Buzzard	0.6	4	8	Azure-winged Magpie	5.9	21	20
Grey Plover	2.1	19	6	Peregrine Falcon	0.3	1	8	Eurasian Magpie	8.7	29	22
Oriental Pratincole	0.4	5	3	Asian Barred Owlet	0.1	1	2	Large-billed Crow	1.0	4	12
Asian Dowitcher	0.2	3	3	Oriental Turtle Dove	5.1	23	13				
Bar-tailed Godwit	1.3	25	3	Red Turtle Dove	0.5	9	2	Unidentified			
Black-tailed Godwit	29.3	275	11	Domestic Pigeon	0.3	3	4	Bunting spp. (Unidentified)	0.1	3	1
Eurasian Curlew	15.0	83	9	Spotted Dove	32.3	60	24				
Eastern Curlew	<0.1	1	1	Asian Koel	5.1	12	22				
Whimbrel	8.5	80	10	Indian Cuckoo	0.1	2	2				
Common Greenshank	174.7	1085	19	Plaintive Cuckoo	<0.1	1	1				

(shaded = wetland species with global conservation concern)

APPENDIX IIIe – Morning Bird Count Species Summary : Sep 2009 – Aug 2010

Bird Species	Yearly Mean	Yearly Peak	No. of counts present	Bird Species	Yearly Mean	Yearly Peak	No. of counts present	Bird Species	Yearly Mean	Yearly Peak	No. of counts present
Great Cormorant	1037.4	3445	14	Eurasian Curlew	20.3	110	8	Greater Coucal	5.5	16	21
Black-faced Spoonbill	38.8	158	23	Whimbrel	13.9	151	11	Barn Swallow	7.5	154	6
Eurasian Spoonbill	0.2	2	4	Common Greenshank	211.5	1045	20	Eurasian Wryneck	0.0	1	1
Black-crowned Night Heron	11.2	51	24	Common Redshank	119.8	827	15	White Wagtail	5.4	17	22
Chinese Pond Heron	13.2	30	24	Green Sandpiper	0.1	1	3	Olive-backed Pipit	2.5	10	10
Grey Heron	127.7	333	24	Grey-tailed Tattler	0.1	2	2	Richard's Pipit	0.1	1	3
Purple Heron	1.3	5	18	Marsh Sandpiper	153.0	1441	12	Chinese Bulbul	79.4	206	24
Striated Heron	1.5	7	11	Spotted Redshank	0.7	4	8	Red-whiskered Bulbul	6.7	26	23
Eastern Cattle Egret	1.9	15	10	Wood Sandpiper	7.5	71	8	Brown Shrike	0.1	1	2
Eastern Great Egret	107.1	534	24	Common Sandpiper	2.2	11	18	Long-tailed Shrike	5.3	13	24
Intermediate Egret	4.9	13	22	Terek Sandpiper	0.5	7	2	Siberian Stonechat	0.8	3	13
Little Egret	93.7	308	24	Great Knot	4.7	98	4	Daurian Redstart	0.6	4	8
Eurasian Bittern	0.2	2	3	Red Knot	0.9	13	2	Oriental Magpie Robin	9.8	22	24
Yellow Bittern	0.4	2	8	Broad-billed Sandpiper	<0.1	1	1	Siberian Rubythroat	0.1	2	2
Black-headed Gull	28.6	677	6	Curlew Sandpiper	17.2	323	6	Common Blackbird	0.5	9	3
Heuglin's Gull	0.1	1	3	Dunlin	<0.1	1	1	Dusky Thrush	<0.1	1	1
Caspian Tern	0.1	3	1	Ruff	0.1	1	2	Grey-backed Thrush	0.1	1	2
Gull-billed Tern	0.4	3	6	Sharp-tailed Sandpiper	<0.1	1	1	Pale Thrush	0.1	1	2
Whiskered Tern	0.4	10	1	Red-necked Stint	5.3	120	4	Masked Laughingthrush	13.9	33	24
Slaty-backed Gull	<0.1	1	1	Long-toed Stint	0.2	4	1	Arctic Warbler	0.1	1	2
Caspian Gull	<0.1	1	1	Common Snipe	<0.1	1	1	Common Tailorbird	1.6	5	17
Eurasian Teal	4.3	42	9	Greater Painted-snipe	0.3	4	2	Dusky Warbler	6.1	27	13
Eurasian Wigeon	63.4	272	17	Pheasant-tailed Jacana	<0.1	1	1	Manchurian Bush Warbler	<0.1	1	1
Gadwall	0.3	4	2	Black-capped Kingfisher	0.1	1	3	Pallas's Leaf Warbler	0.2	2	3
Garganey	8.6	130	7	Common Kingfisher	4.2	9	24	Yellow-browed Warbler	2.3	14	11
Greater Scaup	0.1	1	2	Pied Kingfisher	1.6	4	16	Plain Prinia	4.7	16	21
Mallard	0.2	2	3	White-throated Kingfisher	2.4	6	17	Yellow-bellied Prinia	19.6	49	24
Northern Pintail	85.3	315	12	Eastern Yellow Wagtail	0.4	2	8	Asian Brown Flycatcher	0.3	2	4
Northern Shoveler	103.1	506	13	Zitting Cisticola	0.2	2	3	Grey-streaked Flycatcher	0.1	3	1
Chinese Spot-billed Duck	4.2	18	17	Black-browed Reed Warbler	0.2	1	4	Red-throated Flycatcher	<0.1	1	1
Tufted Duck	114.2	624	14	Chinese Penduline-Tit	0.4	4	3	Great Tit	4.5	12	22
Philippine Duck	0.1	1	3	Oriental Reed Warbler	2.1	28	8	Japanese White-eye	20.2	63	24
Great Crested Grebe	0.2	1	5	Collared Crow	9.8	43	24	Black-faced Bunting	0.5	5	4
Little Grebe	31.4	56	24	Red-billed Starling	27.2	203	11	Chestnut Munia	<0.1	1	1
Common Moorhen	23.8	66	19	Black-winged Kite	<0.1	1	1	Scaly-breasted Munia	30.3	107	19
Eurasian Coot	0.6	5	5	Eastern Marsh Harrier	0.5	2	9	White-headed Munia	0.3	7	1
Slaty-breasted Rail	<0.1	1	1	Pied Harrier	<0.1	1	1	Eurasian Tree Sparrow	6.4	25	22
White-breasted Waterhen	8.7	25	21	Greater Spotted Eagle	0.1	1	3	Red-and-Green Macaw	0.3	1	6
Black-winged Stilt	25.3	105	19	Eastern Imperial Eagle	0.6	4	7	Black-collared Starling	27.6	88	24
Pied Avocet	4.3	49	9	Western Osprey	0.9	3	17	White-cheeked Starling	4.2	45	8
Grey-headed Lapwing	<0.1	1	1	Besra	0.3	2	6	White-shouldered Starling	0.4	3	7
Little Ringed Plover	0.5	5	4	Black Kite	4.2	16	21	Common Myna	0.1	2	1
Greater Sand Plover	23.4	277	5	Bonelli's Eagle	0.1	2	1	Crested Myna	16.5	41	24
Lesser Sand Plover	1.2	22	2	Eastern Buzzard	0.7	4	9	Black-naped Oriole	<0.1	1	1
Pacific Golden Plover	2.6	57	4	Peregrine Falcon	0.2	1	4	Black Drongo	2.8	11	15
Grey Plover	1.0	8	6	Eurasian Collared Dove	<0.1	1	1	Hair-crested Drongo	<0.1	1	1
Oriental Pratincole	<0.1	1	1	Oriental Turtle Dove	5.6	33	15	Azure-winged Magpie	4.7	29	17
Ruddy Turnstone	0.1	2	1	Domestic Pigeon	0.9	8	5	Eurasian Magpie	5.5	15	23
Asian Dowitcher	0.4	2	5	Spotted Dove	37.5	83	24	Large-billed Crow	0.8	4	11
Bar-tailed Godwit	1.1	10	4	Asian Koel	5.1	17	23				
Black-tailed Godwit	65.5	450	11	Indian Cuckoo	<0.1	1	1				

(shaded = wetland species with global conservation concern)

APPENDIX IVa - Roosting Anatidae Count Data : Winter 2005/06

Date	Species	Category A Ponds										GW 16/17	Weather/ Comments		
		15a	15b	20a	20b	20c	20d	20e	20f	24f	24g				
17-Oct-05	Eurasian Wigeon	2	-	-	-	-	-	-	-	-	-	-	-	-	Hazy with light rain. <i>Gei wai</i> #16/17 is fully drained for earthmoving work.
	TOTAL	2	0	0	0	0	0	0	0	0	0	0	0	0	
31-Oct-05	Eurasian Teal	2	-	-	-	1	-	-	-	-	-	-	11	Hazy.	
	Eurasian Wigeon	105	19	3	11	24	20	-	2	-	-	42			
	Gadwall	-	-	-	-	4	-	-	-	-	-	-	-		
	Garganey	9	-	-	-	6	-	-	-	-	-	-	310		
	Northern Pintail	2	-	-	-	9	-	-	-	-	-	-	43		
	Northern Shoveler	-	-	-	-	4	-	-	-	-	-	-	-		
TOTAL	118	19	3	11	48	20	0	2	0	0	0	406			
14-Nov-05	Common Pochard	-	-	-	-	-	-	2	-	-	-	-	-	Overcast.	
	Eurasian Teal	-	-	-	-	-	-	-	-	-	-	-	61		
	Eurasian Wigeon	160	-	4	-	23	14	5	14	1	2	-	69		
	Garganey	-	-	-	-	-	13	-	-	5	-	-	-		
	Northern Pintail	69	-	-	-	39	21	4	8	6	5	-	123		
	Northern Shoveler	-	-	10	-	16	28	8	9	-	-	-	149		
	Tufted Duck	-	-	-	-	-	-	-	-	-	-	-	10		
TOTAL	229	0	14	0	78	76	19	31	12	7	7	412			
30-Nov-05	Common Pochard	-	-	-	-	-	-	3	-	-	-	-	-	Hazy. Survey on Pond #24f and #24g conducted on 29-Nov-05.	
	Eurasian Teal	-	-	13	-	-	-	-	-	1	-	-	376		
	Eurasian Wigeon	141	59	12	5	7	31	7	-	3	-	-	82		
	Garganey	4	-	1	-	-	5	-	-	7	-	-	8		
	Northern Pintail	180	94	82	6	876	63	24	102	50	6	-	160		
	Northern Shoveler	-	-	15	-	111	24	5	28	4	-	-	51		
	Tufted Duck	-	-	7	-	61	-	95	21	-	-	-	-		
TOTAL	325	153	130	11	1055	123	134	151	65	6	6	677			
19-Dec-05	Eurasian Teal	-	-	2	-	1	7	-	6	-	-	-	140	Dry and cold.	
	Eurasian Wigeon	158	78	23	2	5	2	23	12	32	5	-	55		
	Ferruginous Duck	-	-	-	-	2	-	-	-	-	-	-	-		
	Gadwall	-	-	-	-	3	-	2	5	-	-	-	-		
	Garganey	-	8	-	-	-	2	-	6	-	1	-	-		
	Northern Pintail	154	199	3	1	231	9	1	1	62	40	-	80		
	Northern Shoveler	3	4	1	-	49	11	1	6	5	3	-	30		
	Tufted Duck	-	-	3	-	8	-	-	-	-	-	-	-		
	TOTAL	315	289	32	3	299	31	27	36	99	49	49	305		
29-Dec-05	Eurasian Teal	-	-	192	168	50	7	-	5	-	-	-	594	Windy.	
	Eurasian Wigeon	165	87	64	42	60	10	12	14	24	2	-	21		
	Gadwall	-	-	-	2	-	-	-	14	-	-	-	-		
	Garganey	-	-	32	-	-	-	-	-	-	-	-	5		
	Northern Pintail	67	166	128	168	1540	57	-	40	7	116	-	175		
	Northern Shoveler	7	-	110	127	1150	31	8	20	7	18	-	210		
	Tufted Duck	-	-	7	-	520	-	4	31	6	-	-	-		
TOTAL	239	253	533	507	3320	105	24	124	44	136	136	1005			
09-Jan-06	Eurasian Teal	-	-	83	3	3	33	1	1	-	-	-	223	Hazy and cold.	
	Eurasian Wigeon	106	54	43	4	15	13	29	16	8	-	-	62		
	Gadwall	-	-	-	-	-	-	-	25	-	-	-	-		
	Garganey	-	-	7	-	2	7	-	9	2	-	-	-		
	Northern Pintail	87	64	32	9	1100	74	8	1	2	58	-	61		
	Northern Shoveler	-	-	26	49	180	13	5	2	-	15	-	5		
	Tufted Duck	-	-	30	38	540	9	6	1	-	9	-	-		
TOTAL	193	118	221	103	1840	149	49	55	12	82	82	351			
15-Jan-06	Chinese Spot-billed Duck	-	-	-	-	-	-	-	3	-	-	-	-	Hazy.	
	Eurasian Teal	-	-	168	189	72	140	-	-	17	-	-	-		
	Eurasian Wigeon	104	64	6	11	32	30	17	26	-	15	-	8		
	Ferruginous Duck	-	-	1	2	-	-	-	-	-	-	-	-		
	Gadwall	-	-	-	-	-	3	-	28	-	-	-	-		
	Garganey	-	5	15	8	5	2	-	-	3	-	-	-		
	Northern Pintail	85	84	2	14	267	4	-	-	5	41	-	14		
	Northern Shoveler	3	-	2	4	18	1	1	5	1	34	-	8		
	Tufted Duck	-	-	34	17	41	2	-	-	-	1	-	-		
TOTAL	192	153	228	245	435	182	18	59	29	91	91	30			

APPENDIX IVa - Roosting Anatidae Count Data : Winter 2005/06 (cont')

Date	Species	Category A Ponds										GW 16/17	Weather/ Comments	
		15a	15b	20a	20b	20c	20d	20e	20f	24f	24g			
23-Jan-06	Eurasian Teal	-	-	150	100	92	50	-	-	-	-	-	-	Cold and windy.
	Eurasian Wigeon	173	125	-	6	30	2	6	6	12	22	-		
	Gadwall	-	-	-	1	2	-	-	16	-	-	-		
	Garganey	-	20	-	-	2	-	-	-	-	-	-		
	Northern Pintail	115	111	8	-	530	-	-	3	-	15	-		
	Northern Shoveler	-	-	-	10	14	-	-	-	-	6	-		
	Tufted Duck	-	-	30	10	594	-	-	-	-	-	-		
	TOTAL	288	256	188	127	1264	52	6	25	12	43	0		
07-Feb-06	Eurasian Teal	-	-	23	107	205	45	-	2	97	-	312	Dry and hazy.	
	Eurasian Wigeon	250	85	3	11	40	11	37	6	-	15	8		
	Ferruginous Duck	-	-	3	-	-	-	-	-	-	-	-		
	Gadwall	-	-	-	-	8	-	10	-	-	-	-		
	Garganey	-	19	17	8	-	-	-	5	-	-	-		
	Northern Pintail	138	49	164	260	1600	37	-	2	-	5	980		
	Northern Shoveler	9	-	16	35	23	52	-	4	3	89	9		
	Tufted Duck	-	-	59	7	31	-	-	-	-	-	-		
TOTAL	397	153	285	428	1907	145	47	19	100	109	1309			
20-Feb-06	Eurasian Teal	-	-	200	80	48	20	-	-	4	1	-	Overcast.	
	Eurasian Wigeon	210	148	-	10	30	30	7	2	3	9	3		
	Gadwall	-	-	-	-	4	-	-	6	-	-	-		
	Garganey	1	26	-	10	-	20	9	-	-	-	-		
	Northern Pintail	123	38	-	30	36	-	-	-	-	3	-		
	Northern Shoveler	4	18	150	10	9	-	-	-	-	3	-		
	Tufted Duck	-	-	30	-	-	-	-	1	-	-	-		
	TOTAL	338	230	380	140	127	70	16	9	7	16	3		
27-Feb-06	Eurasian Teal	-	-	122	17	3	5	-	-	2	-	-	Cold and rainy. Unusual tidal surge (2.1m at 18:10).	
	Eurasian Wigeon	145	180	-	3	-	59	12	-	-	10	-		
	Ferruginous Duck	-	-	2	-	-	-	-	-	-	-	-		
	Gadwall	-	-	-	2	-	-	-	-	-	-	-		
	Garganey	-	-	24	-	-	-	3	5	-	-	-		
	Northern Pintail	10	24	327	49	1450	119	-	-	11	-	61		
	Northern Shoveler	2	-	196	27	52	15	1	-	2	1	28		
	Tufted Duck	-	-	66	2	-	-	1	-	-	-	-		
TOTAL	157	204	737	100	1505	198	17	5	15	11	89			
09-Mar-06	Chinese Spot-billed Duck	-	-	-	-	-	-	-	2	-	-	-	Very hazy.	
	Eurasian Teal	-	2	420	78	14	34	-	-	82	-	30		
	Eurasian Wigeon	33	230	8	9	49	64	-	14	5	-	7		
	Ferruginous Duck	-	-	3	-	-	-	-	-	-	-	-		
	Gadwall	-	-	-	-	1	1	-	2	-	-	-		
	Garganey	5	-	62	9	2	-	1	6	-	-	5		
	Northern Pintail	-	13	26	34	317	35	-	-	-	-	-		
	Northern Shoveler	10	8	40	3	2	-	-	-	5	1	3		
Tufted Duck	-	-	32	2	-	-	3	3	-	-	-			
TOTAL	48	253	591	135	385	134	4	27	92	1	45			
22-Mar-06	Chinese Spot-billed Duck	-	-	-	-	-	-	-	2	-	-	-	Humid and overcast.	
	Eurasian Teal	1	-	496	108	1	-	-	-	6	-	-		
	Eurasian Wigeon	7	13	6	15	103	22	8	-	-	-	4		
	Gadwall	-	-	-	2	6	-	-	-	-	-	-		
	Garganey	-	4	126	89	8	19	8	3	-	-	-		
	Greater White-fronted Goose	1	-	-	-	-	-	-	-	-	-	-		
	Mallard	-	1	-	-	-	-	-	-	-	-	-		
	Northern Pintail	2	-	-	9	26	-	-	-	-	-	-		
Northern Shoveler	-	1	70	8	8	-	-	-	-	-	-			
Tufted Duck	-	-	25	4	-	-	2	2	-	-	-			
TOTAL	11	19	723	235	152	41	18	7	6	0	4			

APPENDIX IVa - Roosting Anatidae Count Data : Winter 2005/06 (cont')

Date	Species	Category A Ponds										GW 16/17	Weather/ Comments
		15a	15b	20a	20b	20c	20d	20e	20f	24f	24g		
18-Apr-06	Chinese Spot-billed Duck	-	-	-	-	-	-	-	2	-	-	-	Humid and overcast.
	Eurasian Teal	1	-	-	-	7	-	-	-	-	-	-	
	Eurasian Wigeon	-	-	-	-	5	-	-	-	-	-	-	
	Falcated Duck*	-	-	-	-	-	-	-	-	-	-	1	
	Garganey	-	-	-	-	79	-	-	-	-	-	-	
	Hybrid Duck*	-	-	-	-	1	-	-	-	-	-	-	
	Northern Pintail	-	-	-	-	6	-	-	-	-	-	-	
	Northern Shoveler	-	-	-	-	11	-	-	-	-	-	1	
	Tufted Duck	-	-	-	-	1	-	-	1	-	-	-	
TOTAL	1	0	0	0	110	0	0	3	0	0	2		
25-Apr-06	Chinese Spot-billed Duck	-	-	-	-	1	-	-	-	-	-	-	Overcast.
	Eurasian Teal	-	-	-	-	2	-	-	-	-	-	-	
	Eurasian Wigeon	-	-	-	-	29	-	-	1	-	-	-	
	Falcated Duck*	-	-	-	-	1	-	-	-	-	-	-	
	Garganey	-	-	-	-	15	2	-	-	-	-	-	
	Greater Scaup*	-	-	-	-	1	-	-	-	-	-	-	
	Northern Shoveler	-	-	-	-	2	-	-	-	-	-	-	
TOTAL	0	0	0	0	51	2	0	1	0	0	0		

* - birds from captive origin.

APPENDIX IVb - Roosting Anatidae Count Data : Winter 2006/07

Date	Species	Category A Ponds										Other <i>gei wai</i>						Weather/ Comments
		15a	15b	20a	20b	20c	20d	20e	20f	24f	24g	6	8	11	16/17	21	23	
09-Oct-06	Chinese Spot-billed Duck	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	Hazy with light rain.
	Garganey	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	TOTAL	3	0	0	0	0	0	0	0	0	0	0	0	2	0	0		
24-Oct-06	Eurasian Wigeon	34	30														Overcast.	
	TOTAL	34	30	0	0	0	0	0	0	0	0	0	0	0	0	0		
06-Nov-06	Chinese Spot-billed Duck	-	-	-	-	-	-	-	-	-	3	-	-	-	-	5	Clear.	
	Eurasian Teal	-	-	-	-	-	-	-	-	-	5	-	-	-	-	-		
	Eurasian Wigeon	57	186	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Gadwall	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Garganey	-	2	-	-	-	-	-	-	-	-	-	-	2	-	-		
	Lesser Whistling Duck	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Northern Pintail	1	-	-	-	-	-	-	-	-	39	-	-	1	-	-		
	Northern Shoveler	-	8	-	-	-	-	-	-	-	23	-	-	1	-	-		
TOTAL	58	203	0	0	0	0	0	0	0	70	0	0	4	0	5			
20-Nov-06	Chinese Spot-billed Duck	-	-	-	-	-	12	-	-	-	2	-	-	-	-	16	Hazy.	
	Eurasian Teal	-	-	-	-	-	1	-	-	-	2	-	-	-	-	1		
	Eurasian Wigeon	92	72	4	-	8	4	-	-	-	-	-	-	5	-	-		
	Garganey	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Lesser Whistling Duck	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Northern Pintail	2	3	-	-	-	2	-	-	-	76	-	-	46	-	-		
	Northern Shoveler	-	14	-	-	-	-	-	-	-	35	-	-	32	-	-		
TOTAL	94	94	4	0	8	19	0	0	0	115	0	0	83	0	17			
04-Dec-06	Chinese Spot-billed Duck	-	-	-	-	-	-	-	-	-	-	5	-	-	-	4	Hazy.	
	Eurasian Teal	-	-	-	-	-	-	-	-	-	27	-	-	16	-	-		
	Eurasian Wigeon	109	54	1	-	-	10	-	-	-	1	17	-	460	-	-		
	Gadwall	-	2	-	-	-	-	-	-	-	-	1	-	-	-	-		
	Garganey	4	-	-	-	-	6	-	-	-	-	-	-	-	-	-		
	Lesser White-fronted Goose	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-		
	Mallard	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Northern Pintail	17	15	-	-	9	3	-	-	-	49	-	-	1460	-	6		
	Northern Shoveler	2	3	2	-	2	26	-	-	-	70	9	-	-	-	-		
Tufted Duck	-	-	-	-	10	-	-	-	-	-	-	-	-	-	-			
TOTAL	132	75	3	0	21	45	0	0	0	147	34	0	1936	0	10			

APPENDIX IVb - Roosting Anatidae Count Data : Winter 2006/07 (cont')

Date	Species	Category A Ponds										Other <i>gei wai</i>						Weather/ Comments
		15a	15b	20a	20b	20c	20d	20e	20f	24f	24g	6	8	11	16/17	21	23	
18-Dec-06	Eurasian Teal	-	-	81	-	-	71	-	-	-	-	32	-	-	5	-	95	Clear.
	Eurasian Wigeon	187	29	-	-	24	2	7	3	-	-	6	327	-	1260	-	37	
	Gadwall	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	
	Garganey	-	12	29	-	-	3	2	-	-	-	-	-	-	-	-	-	
	Lesser Whistling Duck	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Lesser White-fronted Goose	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	
	Northern Pintail	37	49	-	-	610	217	72	-	-	-	-	17	-	715	5	152	
	Northern Shoveler	-	5	8	-	490	492	109	-	-	-	52	74	-	730	-	-	
	Tufted Duck	-	-	79	-	45	3	14	56	-	-	-	-	-	-	-	15	
TOTAL	224	96	197	0	1169	788	204	59	0	0	90	420	0	2712	5	299		
29-Dec-06	Chinese Spot-billed Duck	-	-	-	-	-	-	-	-	-	-	8	-	-	-	4	Hazy.	
	Common Pochard	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-		
	Common Shelduck	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-		
	Eurasian Teal	-	-	9	-	-	-	-	-	-	-	37	-	-	24	-		
	Eurasian Wigeon	423	46	-	2	92	139	18	-	-	-	5	436	-	284	1		14
	Garganey	-	9	60	11	18	13	6	2	-	-	-	-	-	1	-		-
	Northern Pintail	46	-	13	7	240	278	62	62	-	-	78	50	-	85	9		7
	Northern Shoveler	-	-	23	2	64	46	20	22	-	-	78	50	20	40	-		-
	Tufted Duck	-	-	49	17	580	6	278	180	-	-	29	21	-	-	-		-
TOTAL	469	55	154	39	997	482	384	266	0	0	227	565	20	435	10	25		
08-Jan-07	Chinese Spot-billed Duck	-	-	-	-	-	-	-	-	-	-	4	-	-	-	-	Clear.	
	Eurasian Teal	-	-	-	-	60	-	-	-	-	10	-	-	42	-	-		
	Eurasian Wigeon	113	28	-	-	4	2	2	-	-	-	-	-	1	-	3		
	Ferruginous Duck	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-		
	Gadwall	-	-	-	-	12	-	-	-	-	-	-	-	4	-	-		
	Garganey	-	6	29	-	56	6	3	-	-	-	-	-	-	-	-		
	Northern Pintail	84	14	1	-	34	4	-	-	-	121	37	-	19	23	12		
	Northern Shoveler	4	21	10	7	6	4	2	-	-	83	71	25	46	4	-		
	Tufted Duck	-	-	128	10	1800	9	8	-	63	35	17	-	2	-	-		
TOTAL	201	69	168	17	1973	25	15	0	0	63	249	129	25	114	27	15		
12-Jan-07	Baikal Teal	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	Overcast.	
	Eurasian Teal	-	-	111	57	-	3	-	-	-	7	35	-	99	-	3		
	Eurasian Wigeon	220	64	20	17	35	1	10	-	2	-	40	6	27	-	43		
	Falcated Duck	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-		
	Garganey	-	24	-	8	-	4	5	-	-	-	-	-	10	-	-		
	Lesser Whistling Duck	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Lesser White-fronted Goose	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-		
	Northern Pintail	121	41	83	41	570	256	-	-	-	27	83	1	946	14	-		
	Northern Shoveler	11	6	47	-	23	-	2	-	69	31	136	24	60	12	3		
Tufted Duck	-	-	291	42	3450	12	282	1	96	-	37	-	-	-	-			
TOTAL	352	136	552	165	4079	276	299	1	0	167	65	335	31	1142	26	49		

APPENDIX IVb - Roosting Anatidae Count Data : Winter 2006/07 (cont')

Date	Species	Category A Ponds										Other <i>gei wai</i>						Weather/ Comments
		15a	15b	20a	20b	20c	20d	20e	20f	24f	24g	6	8	11	16/17	21	23	
29-Jan-07	Baikal Teal	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	Clear. Ducks at Pond #20c flushed by Eastern Marsh Harrier before count started.
	Chinese Spot-billed Duck	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	
	Eurasian Teal	-	-	28	85	29	79	-	-	-	-	36	-	-	57	12	7	
	Eurasian Wigeon	144	12	16	16	6	-	-	-	-	-	-	7	-	193	-	14	
	Falcated Duck	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	
	Gadwall	-	-	-	-	16	9	-	-	-	-	-	1	-	-	-	-	
	Garganey	-	18	9	17	-	1	-	-	-	-	-	-	-	1	-	-	
	Lesser White-fronted Goose	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	
	Northern Pintail	39	4	95	125	37	-	-	-	-	-	49	8	-	2432	4	-	
	Northern Shoveler	1	3	6	-	13	1	-	-	-	145	6	46	25	164	-	-	
	Tufted Duck	-	-	18	87	535	-	-	-	2	147	-	89	-	-	-	-	
TOTAL	184	37	172	331	636	91	0	0	2	292	91	155	25	2847	16	21		
14-Feb-07	Baikal Teal	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	Overcast.	
	Chinese Spot-billed Duck	-	-	-	-	-	-	-	-	-	-	6	-	-	-	-		
	Eurasian Teal	-	-	3	-	3	210	-	-	-	-	7	-	-	1000	-		2
	Eurasian Wigeon	141	49	-	-	3	3	-	-	-	-	-	-	-	10	-		-
	Falcated Duck	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-		-
	Ferruginous Duck	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-		-
	Gadwall	-	-	-	-	-	8	-	-	-	-	-	-	-	-	-		-
	Garganey	-	15	-	-	-	5	2	2	-	-	-	-	-	30	-		-
	Northern Pintail	65	42	-	-	1	5	-	-	-	-	6	-	-	4470	-		-
	Northern Shoveler	24	-	-	-	1	2	1	-	-	8	-	2	-	-	-		-
	Tufted Duck	-	-	-	-	6	14	-	-	-	8	-	-	-	2	-		-
TOTAL	230	107	3	0	14	248	3	2	0	16	13	8	0	5513	0	2		
26-Feb-07	Chinese Spot-billed Duck	-	-	-	-	-	-	-	-	-	-	-	-	2	-	17	Overcast and windy. Border Police activity in and around Ponds #15a and #15b caused a significant disturbance to duck.	
	Eurasian Teal	-	-	-	-	-	-	-	-	-	-	-	-	-	90	-		
	Eurasian Wigeon	8	17	-	-	13	-	-	1	-	4	-	13	-	46	-		5
	Ferruginous Duck	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-		-
	Gadwall	-	-	-	-	11	-	-	-	-	-	-	-	-	6	-		-
	Garganey	-	25	-	-	-	-	-	-	-	-	-	-	-	6	-		-
	Lesser Whistling Duck	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-		-
	Northern Pintail	-	-	-	-	1	-	-	-	-	-	5	-	-	1410	-		-
	Northern Shoveler	2	15	-	-	1	-	-	-	-	51	-	-	13	210	-		-
	Tufted Duck	-	-	-	-	4	2	-	3	-	4	-	-	-	-	-		-
TOTAL	10	58	0	0	30	2	0	4	0	60	5	13	15	1768	0	22		

APPENDIX IVb - Roosting Anatidae Count Data : Winter 2006/07 (cont')

Date	Species	Category A Ponds										Other <i>gei wai</i>						Weather/ Comments
		15a	15b	20a	20b	20c	20d	20e	20f	24f	24g	6	8	11	16/17	21	23	
12-Mar-07	Chinese Spot-billed Duck	-	-	-	-	-	-	-	-	-	-	-	-	13	-	-	-	Overcast and windy.
	Eurasian Teal	-	-	-	-	-	-	-	-	-	54	-	-	90	-	-		
	Eurasian Wigeon	39	78	5	-	6	-	-	-	5	-	10	-	5	-	-		
	Gadwall	-	-	-	-	4	-	-	-	-	-	-	-	-	-	-		
	Garganey	11	-	-	-	4	-	-	-	-	-	-	-	-	-	-		
	Northern Pintail	2	1	-	-	-	-	-	-	-	-	1	-	150	-	-		
	Northern Shoveler	8	1	-	-	3	-	-	-	81	75	2	2	75	-	-		
	Tufted Duck	-	-	5	-	139	-	-	-	36	-	8	-	-	-	-		
TOTAL	60	80	10	0	156	0	0	0	0	122	129	21	15	320	0	0		
27-Mar-07	Eurasian Teal	-	-	-	-	-	-	-	-	-	-	-	-	150	-	-	Overcast with light rain.	
	Eurasian Wigeon	6	10	-	-	15	-	-	-	3	-	-	1	30	-	-		
	Garganey	6	-	-	-	4	-	-	-	-	-	-	-	20	-	-		
	Northern Pintail	2	2	-	-	-	-	-	-	-	-	-	-	6	-	-		
	Northern Shoveler	4	2	-	-	-	-	-	-	-	-	-	-	50	-	-		
	Tufted Duck	-	-	-	-	66	-	-	-	-	-	-	-	-	-	1		
TOTAL	18	14	0	0	85	0	0	0	0	3	0	0	1	256	0	1		
12-Apr-07	Eurasian Wigeon	2	-	-	-	15	-	-	-	-	-	-	-	-	-	-	Overcast.	
	Garganey	-	-	-	-	5	-	-	-	-	-	-	-	-	-	-		
	Lesser Whistling Duck	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Northern Pintail	1	-	-	-	1	-	-	-	-	-	-	-	-	-	-		
	Northern Shoveler	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-		
	Tufted Duck	-	-	-	-	-	-	-	6	-	-	-	-	-	-	-		
TOTAL	3	1	0	0	23	0	0	6	0	0	0	0	0	0	0	0		
23-Apr-07	Eurasian Wigeon	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	Overcast.	
	Falcated Duck	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Garganey	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9		
	Tufted Duck	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-		
TOTAL	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	11		

APPENDIX IVc - Roosting Anatidae Count Data : Winter 2007/08 (cont')

Date	Species	Category A Ponds										Other Ponds						Other Gei wai											Weather/ Comments								
		15a	15b	20a	20b	20c	20d	20e	20f	24f	24g	15c	16b	17b	24a	24b	24c	24d	24e	3	4	6	7	8	9	10	11	12		13	14	16/17	18	19	21	22	23
18-Feb-08	Chinese Spot-billed Duck	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25	Cloudy and hazy.
	Eurasian Teal	-	-	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	4	4	-	19	-	-	-	-	-	-	-	-	-	-	-	-	2	16	
	Eurasian Wigeon	78	38	-	-	3	3	2	-	-	-	-	-	-	-	-	-	-	-	13	-	-	-	-	-	59	2	-	-	1	-	-	-	-	12	59	
	Gadwall	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	-	-	-	-	-	-	-	8		
	Garganey	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Mallard	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	
	Northern Pintail	316	43	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	26	37	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	124	
	Northern Shoveler	-	-	-	-	5	-	-	-	-	24	-	-	18	-	-	-	-	121	32	46	46	28	-	-	4	9	1	-	-	-	70	4	48	53		
	Tufted Duck	-	-	-	-	9	-	-	-	-	73	-	-	-	-	-	-	-	22	10	-	3	39	-	-	122	7	3	-	-	-	-	-	-	2	-	
TOTAL	394	87	0	0	21	3	2	0	0	97	0	0	18	0	0	0	0	173	96	46	68	67	0	0	185	23	4	0	3	0	70	4	64	287			
07-Mar-08	Eurasian Teal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Clear.	
	Eurasian Wigeon	18	13	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	2	-	-	-	-	-	-	1	12	8		
	Gadwall	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11		
	Garganey	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Northern Pintail	2	5	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	42	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5		
	Northern Shoveler	-	-	-	-	-	-	-	-	-	22	-	-	30	-	-	-	-	153	66	4	27	14	-	-	44	9	15	-	-	-	11	5	-	70		
	Tufted Duck	-	-	-	-	-	-	-	-	-	43	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	-	-	-	-	-	-	-	-	2		
TOTAL	20	21	3	0	1	0	0	0	0	65	0	0	30	0	0	0	0	153	115	4	27	14	0	0	54	15	15	0	0	0	11	6	12	96			
17-Mar-08	Chinese Spot-billed Duck	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	9	-	-	-	-	-	-	-	-	-	-	-	-	-	Clear.		
	Eurasian Teal	-	-	-	-	-	1	-	-	-	-	6	-	-	-	-	-	23	20	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-		-	
	Eurasian Wigeon	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	1	-	-	-	-	-	2	-	-	15	-	-	-	-	12		30	
	Northern Pintail	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-			
	Northern Shoveler	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	103	214	-	-	19	-	-	28	25	8	-	1	-	2	-	-		31	
TOTAL	0	0	0	0	0	1	0	0	0	0	0	6	0	0	0	0	0	126	241	3	1	28	0	0	28	27	8	0	17	0	2	0	12	61			
02-Apr-08	Chinese Spot-billed Duck	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Light showers.		
	Eurasian Wigeon	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-			
	Northern Shoveler	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-		-	
TOTAL	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0			
21-Apr-08	Eurasian Wigeon	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	6	-	-	-	-	-	-	Clear		
	Garganey	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11	-	-	-	-	-	-			
	Northern Shoveler	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-			
	TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			

APPENDIX IVd - Roosting Anatidae Count Data : Winter 2008/09 (cont')

Date	Species	Category A Ponds										Other Ponds						Other Gei wai													Weather/ Comments									
		15a	15b	20a	20b	20c	20d	20e	20f	24f	24g	15c	16b	17b	24a	24b	24c	24d	24e	3	4	6	7	8	9	10	11	12	13	14		16/17	18	19	21	22	23			
09-Jan-09	Chinese Spot-billed Duck	-	-	-	-	-	17	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8	-	-			
	Eurasian Teal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	-	-	1	-	-	-	-	-	-	-	-	-	-	-				
	Eurasian Wigeon	3	129	11	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	33	12	10	-	-	36	-	-	-	-	-	-	-	-	-				
	Gadwall	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7	-	-	-	-	-	-	-	-	-	-				
	Garganey	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
	Northern Pintail	16	28	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7	-	-			
	Northern Shoveler	2	-	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	-	-	-	-	-	-	2	-	3	-	-			
	Tufted Duck	-	-	40	-	-	-	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	30	-	-	-	-	-	-	-	-	3	-	-			
TOTAL	21	159	79	0	4	17	20	0	0	0	0	0	0	0	0	0	0	0	0	19	0	52	16	10	0	0	78	0	0	0	0	0	2	0	21	0	0			
22-Jan-09	Chinese Spot-billed Duck	-	-	-	-	-	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
	Eurasian Teal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Eurasian Wigeon	3	195	-	-	-	-	-	-	6	-	-	-	-	-	-	-	-	-	-	-	63	2	-	-	-	9	-	-	-	-	-	-	-	-	-	-	-		
	Gadwall	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Garganey	-	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Northern Pintail	3	11	1	-	-	-	-	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Northern Shoveler	-	-	4	-	-	-	-	-	15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	-	-	
	Tufted Duck	-	-	49	45	1	1	42	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	-	-	-	-	-	-	-	-	-	-	-	-		
TOTAL	6	208	58	45	1	13	0	75	0	0	0	0	0	0	0	0	0	0	0	81	11	64	2	0	0	0	19	0	0	0	0	0	16	0	2	2	0	0		
29-Jan-09	Chinese Spot-billed Duck	-	-	-	-	-	19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Eurasian Teal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Eurasian Wigeon	2	162	8	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	88	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Garganey	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Mallard	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Northern Pintail	1	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Northern Shoveler	-	1	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	-	-		
	Tufted Duck	-	-	45	1	-	-	26	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
TOTAL	3	173	59	1	0	22	26	11	0	0	0	0	0	0	0	0	0	0	0	14	33	90	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0		
09-Feb-09	Chinese Spot-billed Duck	-	-	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	-	-	
	Eurasian Teal	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Eurasian Wigeon	-	186	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Gadwall	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Northern Pintail	9	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Northern Shoveler	-	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	
	Tufted Duck	-	-	-	7	-	-	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	TOTAL	9	196	10	13	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0	210	66	58	15	0	0	0	0	0	0	0	0	0	0	2	0	10	0	0	
20-Feb-09	Chinese Spot-billed Duck	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8	-	-	
	Eurasian Teal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Eurasian Wigeon	-	143	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	17	8	-	-	5	-	-	-	-	-	-	-	-	-	-	-	
	Northern Pintail	-	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Northern Shoveler	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	221	52	35	-	-	-	-	-	-	-	-	-	-	-	-	-	15	-	-
	Tufted Duck	-	-	-	-	-	5	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
TOTAL	0	154	0	0	0	0	5	1	0	6	0	0	0	0	0	0	0	0	0	259	61	71	23	0	0	5	0	0	0	0	0	0	0	0	23	0	0			

APPENDIX IVd - Roosting Anatidae Count Data : Winter 2008/09 (cont')

Date	Species	Category A Ponds										Other Ponds						Other Gei wai											Weather/ Comments									
		15a	15b	20a	20b	20c	20d	20e	20f	24f	24g	15c	16b	17b	24a	24b	24c	24d	24e	3	4	6	7	8	9	10	11	12		13	14	16/17	18	19	21	22	23	
06-Mar-09	Chinese Spot-billed Duck	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9	-	2	Overcast.	
	Eurasian Teal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Eurasian Wigeon	1	176	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Northern Pintail	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Northern Shoveler	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Tufted Duck	-	-	-	-	-	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	TOTAL	2	178	0	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	0	2		
18-Mar-09	Chinese Spot-billed Duck	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	18	Clear.	
	Eurasian Teal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Eurasian Wigeon	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Mallard	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		2
	Northern Shoveler	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Tufted Duck	-	-	-	-	-	-	-	11	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-
	TOTAL	2	0	0	0	0	0	11	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	20		
06-Apr-09	Northern Pintail	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Overcast.	
	Tufted Duck	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	TOTAL	0	0	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
21-Apr-09	Chinese Spot-billed Duck	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	Overcast and windy.	
	Northern Shoveler	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
	Tufted Duck	-	-	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	TOTAL	0	0	0	0	4	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0		

APPENDIX IVe - Roosting Anatidae Count Data : Winter 2009/10 (cont')

Date	Species	Category A Ponds										Other Ponds								Other Gei wai													Weather/ Comments				
		15a	15b	20a	20b	20c	20d	20e	20f	24f	24g	8a	15c	16b	17b	24a	24b	24c	24d	24e	3	4	6	7	8	9	10	11	12	13	14	16/17		18	19	21	22
29-Dec-09	Chinese Spot-billed Duck	-	-	-	-	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	3	Overcast.
	Eurasian Teal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Eurasian Wigeon	-	55	-	-	3	13	-	-	-	-	-	-	-	15	-	-	-	-	-	-	-	-	-	-	14	-	-	5	-	-	47	-	-			
	Garganey	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
	Greater Scaup	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
	Mallard	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
	Northern Pintail	-	5	-	-	2	204	-	-	-	-	39	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	102	-	-	232	-	-				
	Northern Shoveler	-	-	-	-	-	1	-	-	-	-	-	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	1	-	5	147	1	-				
	Tufted Duck	-	-	73	15	50	19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	54	-	-	2	-	39	18	-	-			
TOTAL	0	62	73	15	57	244	0	0	0	0	39	0	0	0	0	21	0	0	126	154	116	0	2	0	0	68	0	0	0	110	0	44	444	1	3		
11-Jan-10	Chinese Spot-billed Duck	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	Poor light condition.		
	Eurasian Wigeon	-	101	1	-	-	-	-	-	-	6	-	-	-	-	11	-	-	-	5	-	-	-	-	-	-	-	-	-	-	-	25	-	-			
	Mallard	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
	Northern Pintail	-	5	-	-	3	-	-	-	-	468	-	-	-	-	8	-	-	-	59	136	-	-	-	-	-	-	1	-	-	101	-	-				
	Northern Shoveler	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-	2	55	8	-	-	-	-	-	-	-	-	-	4	-	-				
	Tufted Duck	-	-	35	8	120	19	-	-	-	-	-	-	-	1	-	-	-	-	5	-	-	-	-	-	-	-	-	-	9	44	-	-				
TOTAL	0	106	36	8	123	24	0	0	0	0	474	0	0	0	0	23	0	66	196	8	0	0	0	0	0	0	0	0	0	1	0	9	174	0	2		
18-Jan-10	Chinese Spot-billed Duck	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	3	Clear.		
	Eurasian Wigeon	-	130	-	-	-	-	-	-	-	-	-	-	-	5	-	-	-	2	8	19	-	-	-	-	-	-	-	-	-	-	84	-	2			
	Garganey	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
	Greater Scaup	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
	Mallard	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
	Northern Pintail	-	7	-	-	-	-	-	-	-	1	8	-	-	-	7	-	-	119	84	15	-	-	-	-	-	-	-	-	-	48	-	-				
	Northern Shoveler	-	-	2	-	-	2	-	-	-	-	-	-	-	3	-	-	66	87	-	-	-	-	-	4	-	-	-	-	-	34	-	-				
Tufted Duck	-	-	187	47	-	13	-	-	-	-	5	-	-	-	1	-	-	15	-	-	-	-	-	129	-	-	-	-	76	75	-	-					
TOTAL	0	138	191	47	0	15	2	0	0	1	13	0	0	0	0	16	0	187	194	34	0	0	0	0	0	133	0	0	0	0	0	76	244	0	5		
27-Jan-10	Chinese Spot-billed Duck	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	Overcast.		
	Eurasian Teal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-				
	Eurasian Wigeon	-	121	-	-	-	-	-	-	-	14	-	-	-	15	-	-	-	-	22	11	-	-	-	-	-	-	-	-	-	80	-	-				
	Gadwall	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	-	-					
	Garganey	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
	Greater Scaup	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-					
	Mallard	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
	Northern Pintail	-	10	-	-	-	2	-	-	-	14	-	-	-	2	-	-	95	140	-	-	-	-	1	-	-	-	-	-	265	-	-					
	Northern Shoveler	-	-	2	-	-	-	-	-	-	-	-	-	-	6	-	-	40	238	-	-	-	-	4	-	-	-	-	-	6	-	-					
Tufted Duck	-	-	169	18	-	14	-	-	-	29	-	-	-	-	-	-	-	-	-	-	-	-	156	-	-	-	-	65	43	-	-						
TOTAL	0	131	172	18	0	18	0	0	0	29	28	0	0	0	0	23	0	135	400	11	0	0	0	0	161	0	0	0	0	1	0	66	398	0	10		

APPENDIX Va – Roosting Anatidae Count Summary : Winter 2005/06

Date	No. of Birds		No. of Species		Tide ¹	
	Category A Ponds	MPNR TOTAL	Category A Ponds	MPNR TOTAL	Height ²	Condition ³
17-Oct-05	2	N/A	1	N/A	0.8m	↑
31-Oct-05	221	N/A	6	N/A	1.3m	↑
14-Nov-05	466	N/A	5	N/A	1.7m	↑
30-Nov-05	2153	N/A	7	N/A	1.8m	↑
19-Dec-05	1180	N/A	8	N/A	1.7m	↑
29-Dec-05	5285	N/A	7	N/A	1.8m	↑
09-Jan-06	2822	N/A	7	N/A	2.1m	↑
15-Jan-06	1632	N/A	9	N/A	1.2m	↑
23-Jan-06	2261	N/A	7	N/A	1.8m	↓
07-Feb-06	3590	N/A	8	N/A	2.0m	↓
20-Feb-06	1333	N/A	7	N/A	1.4m	↓
27-Feb-06	2949	N/A	8	N/A	1.5m	↑
09-Mar-06	1670	N/A	9	N/A	2.1m	↔
22-Mar-06	1212	N/A	10	N/A	1.4m	↓
18-Apr-06	114	N/A	8	N/A	0.8m	↓
25-Apr-06	54	N/A	7	N/A	1.4m	↑

1 – Data from the HK Observatory (tide data relates to Tsim Bei Tsui tidal station).

2 – At mid-point of observation period.

3 – General tidal condition during observation period (↑ = Rising, ↓ = Falling, ↔ = coincides with max or min tide).

APPENDIX Vb – Roosting Anatidae Count Summary : Winter 2006/07

Date	No. of Birds		No. of Species		Tide ¹	
	Category A Ponds	MPNR TOTAL	Category A Ponds	MPNR TOTAL	Height ²	Condition ³
09-Oct-06	3	N/A	1	N/A	0.9m	↓
24-Oct-06	64	N/A	1	N/A	1.0m	↑
06-Nov-06	261	N/A	6	N/A	1.3m	↑
20-Nov-06	219	N/A	7	N/A	2.0m	↑
04-Dec-06	276	N/A	7	N/A	2.1m	↑
18-Dec-06	2737	N/A	7	N/A	2.1m	↑
29-Dec-06	2846	N/A	7	N/A	2.0m	↑
08-Jan-07	2531	N/A	8	N/A	1.3m	↓
12-Jan-07	6027	N/A	8	N/A	1.8m	↓
29-Jan-07	1745	N/A	9	N/A	2.0m	↓
14-Feb-07	623	N/A	9	N/A	1.4m	↓
26-Feb-07	164	N/A	8	N/A	1.5m	↑
12-Mar-07	428	N/A	6	N/A	2.1m	↔
27-Mar-07	120	N/A	5	N/A	1.4m	↓
12-Apr-07	33	N/A	6	N/A	0.8m	↓
23-Apr-07	2	N/A	2	N/A	1.4m	↑

1 – Data from the HK Observatory (tide data relates to Tsim Bei Tsui tidal station).

2 – At mid-point of observation period.

3 – General tidal condition during observation period (↑ = Rising, ↓ = Falling, ↔ = coincides with max or min tide).

APPENDIX Vc – Roosting Anatidae Count Summary : Winter 2007/08

Date	No. of Birds		No. of Species		Tide ¹	
	Category A Ponds	MPNR TOTAL	Category A Ponds	MPNR TOTAL	Height ²	Condition ³
05-Oct-07	0	0	0	0	1.4m	↑
22-Oct-07	4	15	1	4	1.3m	↑
12-Nov-07	20	221	2	6	1.2m	↔
22-Nov-07	245	1452	5	6	1.8m	↑
07-Dec-07	1996	3847	5	8	1.3m	↑
20-Dec-07	1441	2959	6	8	2.2m	↑
28-Dec-07	584	1031	6	8	1.3m	↓
04-Jan-08	1374	3232	5	8	2.1m	↓
11-Jan-08	68	604	5	7	1.1m	↔
18-Jan-08	513	1198	5	7	2.4m	↔
01-Feb-08	645	1165	4	6	2.1m	↓
18-Feb-08	604	1712	6	9	2.0m	↑
07-Mar-08	110	662	5	7	1.0m	↑
17-Mar-08	1	561	1	5	2.2m	↔
02-Apr-08	2	6	1	3	2.1m	↑
21-Apr-08	0	23	0	3	0.3m	↑

1 – Data from the HK Observatory (tide data relates to Tsim Bei Tsui tidal station).

2 – At mid-point of observation period.

3 – General tidal condition during observation period (↑ = Rising, ↓ = Falling, ↔ = coincides with max or min tide).

APPENDIX Vd – Roosting Anatidae Count Summary : Winter 2008/09

Date	No. of Birds		No. of Species		Tide ¹	
	Category A Ponds	MPNR TOTAL	Category A Ponds	MPNR TOTAL	Height ²	Condition ³
09-Oct-08	0	0	0	0	1.4m	↑
29-Oct-08	0	18	0	2	1.1m	↑
14-Nov-08	106	282	2	4	1.4m	↔
24-Nov-08	217	635	2	6	1.6m	↑
02-Dec-08	207	596	2	5	1.3m	↓
09-Dec-08	240	2016	4	6	2.0m	↑
23-Dec-08	334	1437	7	7	2.1m	↑
09-Jan-09	300	498	6	8	2.2m	↑
22-Jan-09	406	603	8	8	2.2m	↑
29-Jan-09	295	436	7	8	0.9m	↓
09-Feb-09	237	598	6	7	1.3m	↑
20-Feb-09	166	624	4	6	1.3m	↑
06-Mar-09	191	937	3	6	2.2m	↔
18-Mar-09	20	119	2	6	1.5m	↓
06-Apr-09	9	9	2	2	2.1m	↑
21-Apr-09	4	7	2	3	1.8m	↑

1 – Data from the HK Observatory (tide data relates to Tsim Bei Tsui tidal station).

2 – At mid-point of observation period.

3 – General tidal condition during observation period (↑ = Rising, ↓ = Falling, ↔ = coincides with max or min tide).

APPENDIX Ve – Roosting Anatidae Count Summary : Winter 2009/10

Date	No. of Birds		No. of Species		Tide ¹	
	Category A Ponds	MPNR TOTAL	Category A Ponds	MPNR TOTAL	Height ²	Condition ³
08-Oct-09	0	0	0	0	1.5m	↓
20-Oct-09	0	67	0	5	1.1m	↓
13-Nov-09	5	327	2	7	1.6m	↑
19-Nov-09	48	410	6	8	1.4m	↑
01-Dec-09	85	684	5	7	2.0m	↑
15-Dec-09	161	1349	4	6	1.5m	↑
29-Dec-09	451	1579	8	9	2.0m	↑
11-Jan-10	297	1250	5	6	2.1m	↑
18-Jan-10	394	1296	7	8	1.0m	↓
27-Jan-10	368	1601	7	10	2.1m	↑
09-Feb-10	265	1412	4	6	2.2m	↔
25-Feb-10	309	1363	4	6	2.4m	↑
11-Mar-10	100	1085	4	9	2.0m	↑
25-Mar-10	20	158	3	7	2.2m	↑
12-Apr-10	2	36	1	4	1.3m	↑
23-Apr-10	3	17	1	4	2.1m	↓

1 – Data from the HK Observatory (tide data relates to Tsim Bei Tsui tidal station).

2 – At mid-point of observation period.

3 – General tidal condition during observation period (↑ = Rising, ↓ = Falling, ↔ = coincides with max or min tide).

APPENDIX VIa – Roosting Anatidae Count Species Summary : Winter 2005/06

Species	Category A Ponds		
	Mean Count	Peak Count	No. of counts
Chinese Spot-billed Duck	0.6	3	5
Common Pochard	0.3	3	2
Eurasian Teal	236.9	630	14
Eurasian Wigeon	271.6	480	16
Falcated Duck*	0.1	1	1
Ferruginous Duck	0.8	3	5
Gadwall	9.2	31	11
Garganey	48.2	257	15
Greater Scaup*	0.1	1	1
Greater White-fronted Goose	0.1	1	1
Hybrid Duck*	0.1	1	1
Mallard	0.1	1	1
Northern Pintail	768.6	2289	14
Northern Shoveler	193.9	1478	15
Tufted Duck	149.8	634	12

* - birds from captive origin
 (shaded = species of global conservation concern)

APPENDIX VIb – Roosting Anatidae Count Species Summary : Winter 2006/07

Species	Category A Ponds		
	Mean Count	Peak Count	No. of counts
Baikal Teal	0.1	1	2
Chinese Spot-billed Duck	0.8	12	1
Common Pochard	0.1	1	1
Eurasian Teal	51.9	221	7
Eurasian Wigeon	173.0	720	14
Falcated Duck	0.2	1	3
Ferruginous Duck	0.2	1	3
Gadwall	4.3	25	7
Garganey	28.1	119	14
Lesser Whistling Duck	0.4	1	6
Mallard	0.1	1	1
Northern Pintail	213.6	1112	13
Northern Shoveler	120.3	1104	13
Tufted Duck	537.0	4174	12

(shaded = species of global conservation concern)

APPENDIX VIc – Roosting Anatidae Count Species Summary : Winter 2007/08

Species	Category A Ponds			MPNR TOTAL		
	Mean Count	Peak Count	No. of counts	Mean Count	Peak Count	No. of counts
Chinese Spot-billed Duck	0.1	2	1	8.8	25	9
Common Pochard	0.0	0	0	0.1	1	1
Eurasian Teal	0.8	5	5	42.4	128	13
Eurasian Wigeon	87.4	225	12	147.5	475	15
Gadwall	0.9	12	2	2.9	13	5
Garganey	5.3	24	8	6.8	25	11
Mallard	0.0	0	0	0.3	2	3
Northern Pintail	226.9	1071	11	500.2	2095	13
Northern Shoveler	14.4	65	8	231.8	509	15
Tufted Duck	139.8	650	10	227.8	1153	10

APPENDIX VI d – Roosting Anatidae Count Species Summary : Winter 2008/09

Species	Category A Ponds			MPNR TOTAL		
	Mean Count	Peak Count	No. of counts	Mean Count	Peak Count	No. of counts
Chinese Spot-billed Duck	4.8	20	5	10.8	25	12
Eurasian Teal	0.5	4	3	11.8	48	10
Eurasian Wigeon	106.0	204	12	181.5	560	13
Gadwall	0.1	1	1	0.9	7	3
Garganey	1.1	7	4	1.6	8	5
Mallard	0.1	1	1	0.2	2	2
Northern Pintail	31.4	144	12	195.7	1326	13
Northern Shoveler	4.4	19	8	109.5	329	13
Tufted Duck	23.5	138	11	39.1	148	13

APPENDIX VI e – Roosting Anatidae Count Species Summary : Winter 2009/10

Species	Category A Ponds			MPNR TOTAL		
	Mean Count	Peak Count	No. of counts	Mean Count	Peak Count	No. of counts
Chinese Spot-billed Duck	1.3	6	6	4.5	11	13
Eurasian Teal	0.3	4	1	28.1	188	10
Eurasian Wigeon	44.9	130	11	138.7	271	15
Gadwall	0.0	0	0	0.6	4	3
Garganey	0.4	2	5	2.1	18	7
Greater Scaup	0.4	2	3	0.4	2	4
Mallard	0.5	2	5	0.7	2	7
Northern Pintail	18.7	211	8	260.4	855	12
Northern Shoveler	1.9	13	8	175.9	583	14
Philippine duck	0.0	0	0	0.2	1	3
Tufted Duck	88.4	277	14	178.2	548	14

(shaded = species of global conservation concern)

APPENDIX VIIa – Tam Kon Chau Roosting Ardeidae Count Data Summary: 2006

Date	Chinese Pond Heron	Great Egret	Little Egret	Cattle Egret	TOTAL	Weather/Comment
WINTER COUNTS						
1st-half Jan	Not counted					
25-Jan-06	0	0	0	0	0	Clear with light breeze.
03-Feb-06	36	0	0	0	36	Clear.
24-Feb-06	0	0	0	0	0	Hazy.
SUMMER COUNTS						
29-Jun-06	170	260	323	0	753	Overcast.
11-Jul-06	220	135	213	0	568	Clear with light breeze.
25-Jul-06	122	176	205	2	505	Hazy.
15-Aug-06	121	190	367	1	679	Overcast.
ADDITIONAL COUNTS						
07-Mar-06	2	0	0	0	2	Overcast.
07-Apr-06	176	50	64	36	326	Overcast and windy.
24-Apr-06	203	59	127	13	402	Overcast and windy.
04-May-06	164	75	91	22	352	Rain and windy.
30-May-06	146	143	129	130	548	Very hazy.
13-Jun-06	147	161	170	58	536	Overcast with occasional shower.
28-Aug-06	53	204	341	5	603	Clear and thunder.
12-Sep-06	64	106	381	6	557	Clear.
26-Sep-06	11	160	383	44	598	Overcast and windy.
10-Oct-06	3	197	250	17	467	Hazy.
25-Oct-06	0	183	384	15	582	Hazy. Bird of prey flushing bird at 17:56.
07-Nov-06	2	449	536	14	1001	Overcast.
22-Nov-06	7	246	653	41	947	Hazy.
05-Dec-06	0	39	61	0	100	Hazy.
19-Dec-06	0	0	0	0	0	Windy and cold.

APPENDIX VIIb – Tam Kon Chau Roosting Ardeidae Count Data Summary: 2007

Date	Chinese Pond Heron	Great Egret	Little Egret	Cattle Egret	TOTAL	Weather/Comment
WINTER COUNTS						
05-Jan-07	2	395	524	0	921	Windy and cold.
23-Jan-07	0	557	398	6	961	Windy and cold.
08-Feb-07	0	887	929	12	1828	Clear.
23-Feb-07	12	290	491	0	793	Very windy. Strong wind prevented birds roosting.
SUMMER COUNTS						
22-Jun-07	122	218	199	21	560	Clear and windy.
04-Jul-07	251	218	289	19	777	Clear and breezy.
16-Jul-07	187	334	298	0	819	Clear and breezy.
13-Aug-07	180	268	232	0	680	Overcast with shower.
ADDITIONAL COUNTS						
14-Mar-07	15	548	554	28	1145	Overcast.
26-Mar-07	27	318	225	6	576	Stormy. Wind and rain prevented birds roosting.
11-Apr-07	104	233	228	30	595	Overcast with light breeze.
25-Apr-07	133	233	215	52	633	Overcast.
09-May-07	154	183	133	54	524	Overcast and breezy.
22-May-07	131	137	130	119	517	Overcast.
11-Jun-07	135	172	133	46	486	Overcast and windy.
23-Aug-07	190	161	196	21	568	Clear and humid.
12-Sep-07	11	95	145	31	282	Clear.
27-Sep-07	5	1	26	0	32	Clear.
10-Oct-07	1	0	0	0	1	Overcast.

APPENDIX VIIc – Tam Kon Chau Roosting Ardeidae Count Data Summary: 2008

Date	Chinese Pond Heron	Great Egret	Little Egret	Cattle Egret	TOTAL	Weather/Comment
WINTER COUNTS						
14-Jan-08	8	431	473	0	912	Clear and cold.
22-Jan-08	38	348	454	0	840	Clear.
04-Feb-08	18	536	563	0	1117	Clear.
20-Feb-08	29	365	486	0	880	Overcast.
SUMMER COUNTS						
27-Jun-08	25	4	17	0	46	Overcast.
07-Jul-08	26	8	26	0	60	Overcast.
21-Jul-08	1	2	0	0	3	Sunny and breezy.
07-Aug-08	0	0	0	0	0	Shower and breezy.

APPENDIX VIId – Tam Kon Chau Roosting Ardeidae Count Data Summary: 2009

Date	Chinese Pond Heron	Great Egret	Little Egret	Cattle Egret	TOTAL	Weather/Comment
WINTER COUNTS						
08-Jan-09	0	0	0	0	0	Hazy.
21-Jan-09	0	0	0	0	0	Clear.
02-Feb-09	2	416	365	0	783	Clear.
17-Feb-09	0	0	0	0	0	Clear.
SUMMER COUNTS						
25-Jun-09	5	17	2	0	24	Clear.
09-Jul-09	1	9	3	0	13	Clear.
21-Jul-09	1	10	0	0	11	Clear.
06-Aug-09	3	0	0	0	3	Hazy.

APPENDIX VIIe – Tam Kon Chau Roosting Ardeidae Count Data Summary: 2010

Date	Chinese Pond Heron	Great Egret	Little Egret	Cattle Egret	TOTAL	Weather/Comment
WINTER COUNTS						
07-Jan-10	0	0	0	0	0	Rainy.
18-Jan-10	0	0	0	0	0	Overcast.
12-Feb-10	0	0	0	0	0	Overcast.
24-Feb-10	0	0	0	0	0	Overcast.
SUMMER COUNTS						
23-Jun-10	0	0	0	0	0	Overcast.
08-Jul-10	0	0	0	0	0	Overcast.
23-Jul-10	0	0	0	0	0	Overcast.
04-Aug-10	0	0	0	0	0	Overcast.

APPENDIX VIIIa – Roosting Collared Crow Count Data Summary: 2005-06

Date	Total	Final Roost Location	Weather
WINTER COUNTS			
28-Dec-05	41	Unknown. Poor visibility and birds at several locations.	Breezy with shower.
11-Jan-06	41	Trees along the FCA road by the seaward end of <i>Gei wai</i> #16/17.	Clear and breezy.
23-Jan-06	38	Trees along the FCA road by the seaward end of <i>Gei wai</i> #16/17.	Clear and breezy.
08-Feb-06	44	Several locations.	Breezy.
SUMMER COUNTS			
13-Jul-06	99	Intertidal mangrove trees located in the FCA.	Hazy.
27-Jul-06	81	Trees along the FCA road by the seaward end of <i>Gei wai</i> #16/17.	Overcast.
11-Aug-06	103	Intertidal mangrove trees located in the FCA.	Overcast.
25-Aug-06	83	Intertidal mangrove trees located in the FCA.	Hazy.
ADDITIONAL COUNTS			
14-Sep-05	68	Trees located on the internal bund at <i>Gei wai</i> #22	Clear.
30-Sep-05	70	Trees located on the internal bund at <i>Gei wai</i> #22	Clear.
12-Oct-05	59	Trees located on the internal bund at <i>Gei wai</i> #22 and trees located on the bund between Pond #20 and <i>Gei wai</i> #21.	Clear.
27-Oct-05	45	Trees located on the bund between <i>Gei wai</i> #14 & #16/17.	Clear.
09-Nov-05	28	Trees located on the bund between <i>Gei wai</i> #14 & #16/17.	Clear.
21-Nov-05	64	Trees along the FCA road by the seaward end of <i>Gei wai</i> #16/17.	Clear and cold.
14-Dec-05	58	Unknown. Birds dispersed at dusk.	Very breezy.
21-Feb-06	43	Trees along the FCA road by the seaward end of <i>Gei wai</i> #16/17.	Overcast.
15-Mar-06	52	Trees along the FCA road by the seaward end of <i>Gei wai</i> #16/17.	Hazy.
30-Mar-06	53	Trees along the FCA road by the seaward end of <i>Gei wai</i> #16/17.	Hazy and breezy.
12-Apr-06	58	Trees located on the bund between <i>Gei wai</i> #21 and #22b.	Breezy.
28-Apr-06	27	Trees along the FCA road by the seaward end of <i>Gei wai</i> #16/17 and trees located on the bund between <i>Gei wai</i> #21 and #22b.	Heavy rain.
10-May-06	81	Intertidal mangrove trees located in the FCA.	Overcast.
25-May-06	94	Trees along the FCA road by the seaward end of <i>Gei wai</i> #16/17.	Overcast.
14-Jun-06	73	Trees along the FCA road by the seaward end of <i>Gei wai</i> #16/17 and intertidal mangrove trees located in the FCA.	Hazy.
28-Jun-06	48	Intertidal mangrove trees located in the FCA.	Overcast.
CASUAL OBSERVATIONS			
15-Nov-05	64	Trees located on the bund between <i>Gei wai</i> #14 and #16/17.	Clear.
23-Nov-05	64	Not recorded.	Clear.
08-Dec-05	61	Trees along the FCA road by the seaward end of <i>Gei wai</i> #16/17.	Clear.
05-Jan-06	38	Trees along the FCA road by the seaward end of <i>Gei wai</i> #16/17.	Hazy.
10-Jan-06	48	Trees along the FCA road by the seaward end of <i>Gei wai</i> #16/17.	Very hazy.
08-May-06	63	Trees located on the bund between <i>Gei wai</i> #19 and Pond #24g.	Clear.
11-May-06	90	Trees along the FCA road by the seaward end of <i>Gei wai</i> #16/17 and intertidal mangrove trees located in the FCA.	Hazy.
15-Jun-06	61	Trees along the FCA road by the seaward end of <i>Gei wai</i> #16/17 and intertidal mangrove trees located in the FCA.	Overcast.
29-Jun-06	53	Intertidal mangrove trees located in the FCA.	Overcast.

APPENDIX VIIIb – Roosting Collared Crow Count Data Summary: 2006-07

Date	Total	Final Roost Location	Weather
WINTER COUNTS			
22-Dec-06	57	Intertidal mangrove trees located in the FCA.	Overcast and breezy.
04-Jan-07	61	Intertidal mangrove trees located in the FCA.	Clear.
22-Jan-07	50	Trees along the FCA road by the seaward end of <i>Gei wai</i> #16/17 and intertidal mangrove trees located in the FCA.	Clear and breezy.
08-Feb-07	51	Trees along the FCA road by the seaward end of <i>Gei wai</i> #16/17.	Overcast.
SUMMER COUNTS			
12-Jul-07	96	Trees along the FCA road by the seaward end of <i>Gei wai</i> #16/17.	Clear.
31-Jul-07	35	Intertidal mangrove trees located in the FCA.	Clear.
07-Aug-07	84	Intertidal mangrove trees located in the FCA.	Clear.
22-Aug-07	94	Intertidal mangrove trees located in the FCA.	Hazy.
ADDITIONAL COUNTS			
12-Sep-06	82	Intertidal mangrove trees located in the FCA.	Overcast and breezy.
25-Sep-06	84	Intertidal mangrove trees located in the FCA.	Overcast and breezy.
10-Oct-06	94	Intertidal mangrove trees located in the FCA.	Hazy.
26-Oct-06	71	Intertidal mangrove trees located in the FCA.	Hazy.
08-Nov-06	86	Intertidal mangrove trees located in the FCA.	Hazy.
27-Nov-06	76	Intertidal mangrove trees located in the FCA.	Hazy and humid.
06-Dec-06	74	Intertidal mangrove trees located in the FCA.	Overcast and breezy.
22-Feb-07	54	Intertidal mangrove trees located in the FCA.	Clear.
CASUAL OBSERVATIONS			
13-Oct-06	95	Not recorded.	Overcast.
01-Nov-06	84	Not recorded.	Overcast and breezy.
23-Nov-06	68	Intertidal mangrove trees located in the FCA.	Overcast.
22-May-07	81	Not recorded.	Overcast.
20-Jun-07	99	Not recorded.	Clear.

APPENDIX VIIIc – Roosting Collared Crow Count Data Summary: 2007-08

Date	Total	Final Roost Location	Weather
WINTER COUNTS			
17-Dec-07	70	Intertidal mangrove trees located in the FCA.	Hazy.
10-Jan-08	64	Intertidal mangrove trees located in the FCA.	Hazy.
22-Jan-08	48	Intertidal mangrove trees located in the FCA.	Low cloud.
04-Feb-08	50	Trees along the FCA road by the seaward end of <i>Gei wai</i> #16/17.	Low cloud.
SUMMER COUNTS			
09-Jul-08	32	Intertidal mangrove trees located in the FCA.	Overcast.
23-Jul-08	100	Trees along the FCA road by the seaward end of <i>Gei wai</i> #16/17.	Clear.
04-Aug-08	73	Trees along the FCA road by the seaward end of <i>Gei wai</i> #16/17.	Hazy.
20-Aug-08	83	Intertidal mangrove trees located in the FCA.	Clear.

APPENDIX VIII d – Roosting Collared Crow Count Data Summary: 2008-09

Date	Total	Final Roost Location	Weather
WINTER COUNTS			
22-Dec-08	68	Intertidal mangrove trees located in the FCA.	Clear and windy.
07-Jan-09	62	Intertidal mangrove trees located in the FCA.	Hazy.
21-Jan-09	56	Intertidal mangrove trees located in the FCA.	Clear.
10-Feb-09	42	Intertidal mangrove trees located in the FCA.	Hazy.
SUMMER COUNTS			
08-Jul-09	106	Intertidal mangrove trees located in the FCA.	Clear.
22-Jul-09	107	Intertidal mangrove trees located in the FCA.	Clear.
14-Aug-09	109	Intertidal mangrove trees located in the FCA.	Clear.
21-Aug-09	112	Intertidal mangrove trees located in the FCA.	Clear.

APPENDIX VIII e – Roosting Collared Crow Count Data Summary: 2009-10

Date	Total	Final Roost Location	Weather
WINTER COUNTS			
30-Dec-09	74	Intertidal mangrove trees located in the FCA.	Overcast.
06-Jan-10	69	Intertidal mangrove trees located in the FCA.	Overcast.
26-Jan-10	54	Intertidal mangrove trees located in the FCA.	Overcast.
11-Feb-10	54	Intertidal mangrove trees located in the FCA.	Overcast.
SUMMER COUNTS			
06-Jul-10	70	Intertidal mangrove trees located in the FCA.	Clear.
30-Jul-10	109	Intertidal mangrove trees located in the FCA.	Clear.
10-Aug-10	119	Intertidal mangrove trees located in the FCA.	Clear.
30-Aug-10	126	Intertidal mangrove trees located in the FCA.	Hazy.

APPENDIX IX – Breeding Black-winged Stilt Count Data Summary: 2007-10

Date	Pond/ <i>gei wai</i>												Total no. of Nest	Total no. of Juvenile	Comment/weather
	No. of Nest						No. of Juvenile								
	15a	15b	17b	16/17	21	23	8a	15a	15b	17b	16/17	18			
11-May-07	3	0	-	5	-	15	0	0	0	-	0	-	23	0	-
23-May-07	1	0	-	18	0	3	0	0	0	-	7	-	22	7	<i>Gei wai</i> #23 islands covered in tall grasses.
08-May-08	1	5	-	8	0	0	0	0	0	-	0	-	14	0	-
20-May-08	2	0	-	7	0	0	0	10	13	-	2	-	9	25	Rainy.
12-May-09	0	0	1	27	0	0	0	0	0	0	0	-	28	0	-
25-May-09	0	0	1	11	0	0	0	0	0	0	18	1	12	19	Rainy.
12-May-10	0	0	0	9	0	0	0	0	0	0	11	5	9	16	-
27-May-10	0	0	0	1	1	0	2	0	0	0	19	0	2	21	-

APPENDIX Xa – Odonate Adult Transect Count Data: 2006

Date	Species	Pond										Comments	
		16b	17b	20c	20d	20e	20f	24a	24c	24e	24f		24g
28-Mar-06	<i>Agriocnemis pygmaea</i>	17	-	N/A	N/A	N/A	N/A	2	1	5	4	1	Survey not include Pond #20 to prevent disturbance to wintering waterfowl.
	<i>Ceriagrion auranticum</i>	47	-	N/A	N/A	N/A	N/A	17	15	132	42	17	
	<i>Ischnura senegalensis</i>	358	1	N/A	N/A	N/A	N/A	11	63	85	162	121	
	<i>Paracercion melanotum</i>	2	-	N/A	N/A	N/A	N/A	-	-	-	-	-	
	<i>Pseudagrion microcephalum</i>	-	-	N/A	N/A	N/A	N/A	-	-	-	-	-	
	<i>Acisoma panorpoides</i>	-	-	N/A	N/A	N/A	N/A	-	-	-	-	1	
	<i>Brachythemis contaminata</i>	-	-	N/A	N/A	N/A	N/A	-	-	3	-	9	
	<i>Crocothemis servilia</i>	3	-	N/A	N/A	N/A	N/A	-	-	4	1	4	
	<i>Neurothemis tullia</i>	13	-	N/A	N/A	N/A	N/A	-	3	11	1	8	
	<i>Orthetrum sabina</i>	-	-	N/A	N/A	N/A	N/A	-	-	-	-	1	
	<i>Pantala flavescens</i>	1	-	N/A	N/A	N/A	N/A	67	-	2	2	6	
	<i>Rhyothemis variegata</i>	-	-	N/A	N/A	N/A	N/A	-	-	1	-	-	
TOTAL		441	1	N/A	N/A	N/A	N/A	97	82	243	212	170	
19-Apr-06	<i>Ceriagrion auranticum</i>	79	-	79	79	158	237	2	239	241	480	721	Vegetation on bunds at Ponds #16b, #24f and #24g were recently cut.
	<i>Ischnura senegalensis</i>	148	2	150	152	302	454	5	459	464	923	1387	
	<i>Pseudagrion microcephalum</i>	2	-	2	2	4	6	-	6	6	12	18	
	<i>Pseudagrion rubriceps</i>	2	-	2	2	4	6	-	6	6	12	18	
	<i>Anax guttatus/A. parthenope</i>	1	-	1	1	2	3	-	3	3	6	9	
	<i>Sinictinogomphus clavatus</i>	1	-	1	1	2	3	-	3	3	6	9	
	<i>Acisoma panorpoides</i>	8	-	8	8	16	24	-	24	24	48	72	
	<i>Brachydiplax chalybea</i>	1	-	1	1	2	3	-	3	3	6	9	
	<i>Brachythemis contaminata</i>	15	-	15	15	30	45	1	46	47	93	140	
	<i>Crocothemis servilia</i>	12	-	12	12	24	36	-	36	36	72	108	
	<i>Diplacodes trivialis</i>	1	-	1	1	2	3	-	3	3	6	9	
	<i>Neurothemis tullia</i>	25	-	25	25	50	75	-	75	75	150	225	
	<i>Orthetrum sabina</i>	6	-	6	6	12	18	-	18	18	36	54	
<i>Rhyothemis variegata</i>	8	-	8	8	16	24	-	24	24	48	72		
TOTAL		309	2	311	313	624	937	8	945	953	1898	2851	
26-Apr-06	<i>Agriocnemis pygmaea</i>	2	-	9	-	2	-	-	-	7	1	-	Vegetation on bund between <i>Gei wai</i> #19 and Pond #24g was recently cut.
	<i>Ceriagrion auranticum</i>	24	1	7	3	-	-	1	13	18	12	13	
	<i>Ischnura senegalensis</i>	15	-	364	331	99	69	3	22	31	35	31	
	<i>Mortonagrion hirosei</i>	-	-	-	-	1	-	-	-	-	-	-	
	<i>Anax guttatus/A. parthenope</i>	-	-	-	-	1	-	-	-	-	-	-	
	<i>Sinictinogomphus clavatus</i>	1	-	-	-	-	-	-	-	-	-	1	
	<i>Acisoma panorpoides</i>	39	-	-	6	2	-	-	11	5	3	6	
	<i>Brachydiplax chalybea</i>	15	-	17	8	4	6	-	3	13	7	1	
	<i>Brachythemis contaminata</i>	5	-	9	7	4	9	2	-	17	23	16	
	<i>Crocothemis servilia</i>	4	-	3	3	4	3	-	-	-	-	-	
	<i>Diplacodes trivialis</i>	-	-	-	2	5	2	-	-	-	-	-	
	<i>Macrodiplax cora</i>	1	-	-	1	-	-	-	-	-	-	-	
	<i>Neurothemis tullia</i>	31	-	1	-	-	-	-	2	8	11	2	
	<i>Orthetrum sabina</i>	2	-	-	-	1	1	-	-	-	1	-	
	<i>Pantala flavescens</i>	-	-	-	-	-	-	-	-	-	3	1	
	<i>Rhyothemis variegata</i>	28	-	7	16	3	11	7	12	10	4	-	
<i>Tholymis tillarga</i>	1	-	-	-	-	-	-	-	1	-	-		
<i>Tramea virginia</i>	-	-	-	2	-	-	-	-	-	-	-		
<i>Urothemis signata</i>	-	-	-	1	-	-	-	-	-	-	-		
TOTAL		168	1	417	380	126	101	13	63	110	100	71	
09-May-06	<i>Agriocnemis pygmaea</i>	-	-	5	-	3	-	-	-	-	-	1	Vegetation on bund between <i>Gei wai</i> #19 and Pond #24g was recently cut.
	<i>Ceriagrion auranticum</i>	3	2	5	5	2	-	2	3	4	3	6	
	<i>Ischnura senegalensis</i>	3	2	134	63	66	16	-	7	12	22	9	
	<i>Mortonagrion hirosei</i>	-	-	-	-	-	-	-	-	-	-	1	
	<i>Anax guttatus/A. parthenope</i>	-	-	1	1	-	-	-	-	1	-	-	
	<i>Sinictinogomphus clavatus</i>	-	-	-	-	3	-	-	-	-	-	1	
	<i>Ictinogomphus pertinax</i>	-	-	1	1	1	3	-	-	-	-	-	
	<i>Acisoma panorpoides</i>	36	-	4	4	-	-	-	4	6	3	11	
	<i>Brachydiplax chalybea</i>	28	-	29	42	8	2	2	13	23	15	13	
	<i>Brachythemis contaminata</i>	1	-	3	4	-	6	4	-	1	4	3	
	<i>Crocothemis servilia</i>	5	-	2	3	-	1	-	-	-	-	-	
	<i>Diplacodes trivialis</i>	2	2	3	2	2	-	-	-	-	-	-	
	<i>Macrodiplax cora</i>	-	-	-	-	1	-	-	-	-	-	-	
	<i>Neurothemis tullia</i>	18	-	1	-	2	1	-	2	7	-	-	
	<i>Orthetrum sabina</i>	1	-	5	-	2	8	1	-	1	-	-	
<i>Rhyothemis variegata</i>	122	3	30	40	19	20	46	105	51	16	29		
<i>Tramea virginia</i>	-	-	5	6	2	2	-	1	-	-	-		
<i>Urothemis signata</i>	2	-	3	6	2	-	-	3	3	1	3		
TOTAL		221	9	231	177	113	59	55	138	109	64	77	

APPENDIX Xa – Odonate Adult Transect Count Data: 2006 (cont')

Date	Species	Pond										Comments	
		16b	17b	20c	20d	20e	20f	24a	24c	24e	24f		24g
05-Jun-06	<i>Agriocnemis pygmaea</i>	2	-	5	-	-	-	-	1	8	-	1	Dense and tall vegetation on bunds between <i>Gei wai</i> #23 and Ponds #24f and g.
	<i>Ceriagrion auranticum</i>	2	-	5	-	-	-	-	-	3	-	5	
	<i>Ischnura senegalensis</i>	4	-	45	4	22	-	5	-	-	5	20	
	<i>Pseudagrion microcephalum</i>	-	-	-	-	-	-	-	-	1	-	-	
	<i>Sinictinogomphus clavatus</i>	1	-	-	-	-	-	-	-	-	-	1	
	<i>Acisoma panorpoides</i>	12	-	2	-	1	-	-	1	3	1	3	
	<i>Brachydiplax chalybea</i>	10	-	47	37	8	10	4	20	40	17	31	
	<i>Brachythemis contaminata</i>	5	-	2	7	3	6	1	-	1	8	8	
	<i>Crocothemis servilia</i>	7	-	2	18	2	1	-	1	-	1	-	
	<i>Diplacodes trivialis</i>	-	-	-	-	-	1	-	-	-	-	-	
	<i>Neurothemis tullia</i>	10	-	-	-	-	-	-	-	2	-	-	
	<i>Orthetrum sabina</i>	3	-	-	-	-	2	-	1	1	-	-	
	<i>Pantala flavescens</i>	10	-	5	-	-	-	-	-	-	1	-	
	<i>Rhyothemis variegata</i>	80	1	12	12	7	3	6	71	17	39	17	
<i>Tramea virginia</i>	1	-	-	-	-	-	1	-	-	-	-		
TOTAL	147	1	125	78	43	23	17	95	76	72	86		
16-Jun-06	<i>Agriocnemis pygmaea</i>	-	-	-	-	-	-	-	1	2	2	4	Heavy rain throughout the week before survey date.
	<i>Ceriagrion auranticum</i>	1	-	-	-	1	-	-	-	3	1	8	
	<i>Ischnura senegalensis</i>	2	-	43	5	3	-	-	-	1	43	53	
	<i>Pseudagrion microcephalum</i>	-	-	-	-	-	-	-	-	-	-	1	
	<i>Anax guttatus/A. parthenope</i>	-	-	-	-	-	-	-	-	1	-	-	
	<i>Ictinogomphus pertinax</i>	1	-	1	1	1	4	-	-	-	2	4	
	<i>Sinictinogomphus clavatus</i>	-	-	-	-	-	-	-	-	-	2	3	
	<i>Acisoma panorpoides</i>	3	-	1	-	-	-	-	-	-	-	-	
	<i>Brachydiplax chalybea</i>	6	-	15	11	5	1	1	3	13	22	26	
	<i>Brachythemis contaminata</i>	-	-	7	9	6	-	-	1	-	3	10	
	<i>Crocothemis servilia</i>	1	-	3	7	1	-	-	3	4	1	2	
	<i>Neurothemis tullia</i>	1	-	-	-	-	-	-	1	-	1	-	
	<i>Orthetrum sabina</i>	3	-	1	-	-	-	-	-	1	-	1	
	<i>Pantala flavescens</i>	-	-	-	2	-	-	-	-	-	-	-	
<i>Rhyothemis variegata</i>	82	2	29	36	12	26	16	32	36	54	45		
<i>Tramea virginia</i>	-	-	1	3	-	-	1	-	-	-	-		
<i>Urothemis signata</i>	2	-	4	7	-	6	1	2	-	6	5		
TOTAL	102	2	105	81	29	37	19	43	61	137	162		
29-Jun-06	<i>Agriocnemis pygmaea</i>	-	-	-	-	-	-	-	1	1	-	-	Vegetation on bunds between <i>Gei wai</i> #23 and Ponds #24f and g were recently cut.
	<i>Ceriagrion auranticum</i>	-	-	-	-	-	-	-	-	1	2	1	
	<i>Ischnura senegalensis</i>	2	-	1	-	-	-	-	2	-	28	11	
	<i>Pseudagrion microcephalum</i>	-	-	-	-	-	-	-	-	-	-	1	
	<i>Anax guttatus/A. parthenope</i>	2	-	2	-	-	-	-	-	-	-	1	
	<i>Sinictinogomphus clavatus</i>	-	-	1	-	3	-	-	-	-	-	1	
	<i>Ictinogomphus pertinax</i>	3	-	1	-	3	1	-	-	-	1	1	
	<i>Acisoma panorpoides</i>	2	-	-	-	-	-	-	-	-	-	-	
	<i>Brachydiplax chalybea</i>	28	-	18	37	25	5	2	13	14	39	41	
	<i>Brachythemis contaminata</i>	2	-	17	20	5	15	5	6	3	9	21	
	<i>Crocothemis servilia</i>	4	-	1	11	-	-	-	-	-	-	3	
	<i>Neurothemis tullia</i>	4	-	-	-	-	-	-	1	-	-	2	
	<i>Orthetrum sabina</i>	-	-	-	-	-	-	-	1	-	-	-	
	<i>Rhyothemis variegata</i>	52	9	26	27	22	38	13	38	41	38	36	
<i>Urothemis signata</i>	-	-	-	-	-	-	-	2	-	-	-		
TOTAL	99	9	67	95	58	59	20	64	60	117	119		
14-Jul-06	<i>Agriocnemis pygmaea</i>	-	-	-	1	-	-	-	-	-	-	-	Pond #16b was drained since 10-Jul-06. Water-level at Pond #20 was low due to draining of Pond #20b. Vegetation on Pond #24e path was recently cut.
	<i>Ceriagrion auranticum</i>	-	-	-	4	-	-	-	-	1	1	-	
	<i>Ischnura senegalensis</i>	-	-	29	26	1	2	-	3	16	24	2	
	<i>Pseudagrion microcephalum</i>	-	-	-	-	-	-	1	-	2	-	3	
	<i>Anax guttatus/A. parthenope</i>	-	-	1	-	1	-	-	-	-	-	-	
	<i>Ictinogomphus pertinax</i>	-	-	1	1	3	1	1	-	2	2	2	
	<i>Acisoma panorpoides</i>	-	-	-	6	1	-	-	-	-	1	5	
	<i>Brachydiplax chalybea</i>	4	2	6	16	9	6	3	6	10	16	12	
	<i>Brachythemis contaminata</i>	-	-	13	4	2	12	5	1	9	6	24	
	<i>Crocothemis servilia</i>	5	-	8	24	-	1	-	1	4	1	3	
	<i>Neurothemis tullia</i>	2	-	1	-	1	6	-	1	-	12	5	
	<i>Orthetrum sabina</i>	-	-	1	-	-	-	1	2	1	-	1	
	<i>Pantala flavescens</i>	1	1	1	-	-	1	-	3	-	1	-	
	<i>Rhyothemis variegata</i>	9	13	42	35	32	17	12	53	64	60	41	
<i>Urothemis signata</i>	-	-	-	-	-	-	-	5	7	8	3		
TOTAL	21	16	103	117	50	46	23	75	116	132	101		

APPENDIX Xa – Odonate Adult Transect Count Data: 2006 (cont')

Date	Species	Pond											Comments
		16b	17b	20c	20d	20e	20f	24a	24c	24e	24f	24g	
31-Jul-06	<i>Agriocnemis pygmaea</i>	-	-	14	23	1	1	-	1	-	2	-	Draining at Pond #16b has finished, water-level is back to normal. Water-level at Pond #20 was low due to draining of Pond #20b. Vegetation on bund between Pond #24e and #f was recently cut.
	<i>Ceriagrion auranticum</i>	3	-	-	-	-	-	-	2	6	3	3	
	<i>Ischnura senegalensis</i>	12	-	32	16	5	-	-	4	25	14	5	
	<i>Pseudagrion microcephalum</i>	-	-	-	-	-	-	1	-	1	-	1	
	<i>Anax guttatus/A. parthenope</i>	2	-	-	1	-	1	-	-	1	1	1	
	<i>Ictinogomphus pertinax</i>	-	-	-	-	-	1	-	-	-	-	1	
	<i>Acisoma panorpoides</i>	5	-	1	1	-	-	-	-	-	-	-	
	<i>Brachydiplax chalybea</i>	5	2	16	13	11	3	3	7	2	9	2	
	<i>Brachythemis contaminata</i>	1	-	5	13	1	5	10	-	2	21	22	
	<i>Crocothemis servilia</i>	4	-	-	2	3	1	-	4	-	-	-	
	<i>Diplacodes trivialis</i>	1	-	-	-	-	-	-	-	-	-	-	
	<i>Neurothemis tullia</i>	10	-	-	2	-	1	-	1	3	2	-	
	<i>Orthetrum sabina</i>	2	-	-	-	-	-	1	1	2	-	-	
	<i>Pantala flavescens</i>	6	3	-	-	-	-	-	-	-	-	-	
	<i>Rhyothemis variegata</i>	29	11	8	18	19	9	5	17	30	24	34	
	<i>Tholymis tillarga</i>	-	-	1	1	1	1	-	-	-	-	-	
<i>Urothemis signata</i>	-	-	-	-	-	-	-	-	-	1	3		
	TOTAL	80	16	77	90	41	23	20	37	72	77	72	
15-Aug-06	<i>Agriocnemis pygmaea</i>	2	-	-	15	1	1	1	5	26	1	3	Water-level at Pond #20 is back to normal. Water-level at Pond #24a, #c and e are low.
	<i>Ceriagrion auranticum</i>	3	-	-	4	2	-	-	2	4	-	6	
	<i>Ischnura senegalensis</i>	10	-	21	19	3	-	-	12	18	60	20	
	<i>Pseudagrion microcephalum</i>	2	-	-	-	-	-	-	-	-	-	4	
	<i>Anax guttatus/A. parthenope</i>	1	-	-	-	-	1	-	-	-	-	1	
	<i>Ictinogomphus pertinax</i>	3	-	1	1	2	1	-	-	4	3	3	
	<i>Epophthalmia elegans</i>	-	-	1	1	-	-	-	-	-	-	1	
	<i>Acisoma panorpoides</i>	2	-	2	5	-	-	-	-	-	1	-	
	<i>Brachydiplax chalybea</i>	1	3	5	1	4	-	17	-	8	10	1	
	<i>Brachythemis contaminata</i>	-	-	-	10	5	2	7	3	4	6	29	
	<i>Crocothemis servilia</i>	6	-	1	7	-	-	-	1	5	6	3	
	<i>Diplacodes trivialis</i>	-	-	-	-	-	-	-	-	2	-	-	
	<i>Hydrobasileus croceus</i>	-	-	-	-	-	-	-	-	-	-	2	
	<i>Neurothemis tullia</i>	8	-	-	-	4	1	-	-	-	2	-	
	<i>Orthetrum sabina</i>	5	1	-	-	-	1	-	-	1	-	1	
	<i>Pantala flavescens</i>	-	-	-	1	-	-	-	-	-	-	-	
<i>Rhyothemis variegata</i>	54	4	19	24	13	10	3	15	48	37	37		
<i>Urothemis signata</i>	2	-	1	1	-	-	-	-	4	9	4		
	TOTAL	99	8	51	89	34	17	28	38	124	135	115	
30-Aug-06	<i>Agriocnemis pygmaea</i>	2	-	4	-	-	-	-	5	12	7	12	Water-level at Pond #24a is low.
	<i>Ceriagrion auranticum</i>	2	-	-	1	4	-	1	-	2	4	4	
	<i>Ischnura senegalensis</i>	9	1	6	20	-	-	-	5	7	44	28	
	<i>Paracercion melanotum</i>	2	-	-	-	-	-	-	-	-	-	-	
	<i>Anax guttatus/A. parthenope</i>	2	-	2	-	1	-	-	-	1	1	2	
	<i>Ictinogomphus pertinax</i>	-	-	-	-	2	-	-	-	-	-	-	
	<i>Epophthalmia elegans</i>	-	-	1	2	-	-	-	-	-	-	-	
	<i>Acisoma panorpoides</i>	-	-	1	1	-	-	-	2	-	2	-	
	<i>Brachydiplax chalybea</i>	22	-	5	9	1	-	4	2	5	25	26	
	<i>Brachythemis contaminata</i>	7	-	2	7	-	4	6	4	3	9	43	
	<i>Crocothemis servilia</i>	-	-	-	8	-	-	-	-	-	3	-	
	<i>Macrodiplax cora</i>	-	-	-	-	-	1	-	-	-	-	-	
	<i>Neurothemis tullia</i>	18	-	-	-	-	-	-	-	-	2	-	
	<i>Orthetrum sabina</i>	5	1	-	-	-	-	-	1	-	-	-	
	<i>Pantala flavescens</i>	-	-	-	-	-	1	-	-	-	1	-	
	<i>Rhyothemis variegata</i>	9	2	15	37	14	21	5	21	19	29	12	
<i>Tholymis tillarga</i>	5	-	1	1	-	-	-	-	2	1	3		
<i>Urothemis signata</i>	-	-	2	1	-	1	-	-	-	1	-		
	TOTAL	83	4	39	87	22	28	16	40	51	129	130	

APPENDIX Xa – Odonate Adult Transect Count Data: 2006 (cont')

Date	Species	Pond										Comments		
		16b	17b	20c	20d	20e	20f	24a	24c	24e	24f		24g	
19-Sep-06	<i>Agriocnemis pygmaea</i>	-	-	17	6	1	-	-	-	-	-	-	-	Water-level at Pond #24f and #g is very high.
	<i>Ceriagrion auranticum</i>	1	1	-	2	9	-	-	-	-	-	-	9	
	<i>Ischnura senegalensis</i>	6	-	45	18	5	-	4	2	4	28	20	-	
	<i>Pseudagrion microcephalum</i>	-	-	-	-	-	-	-	-	-	-	-	1	
	<i>Anax guttatus/A. parthenope</i>	1	-	1	-	1	-	-	-	-	-	-	1	
	<i>Ictinogomphus pertinax</i>	-	-	9	6	4	2	-	-	2	4	3	-	
	<i>Epophthalmia elegans</i>	1	-	-	1	2	-	-	1	-	-	-	-	
	<i>Acisoma panorpoides</i>	-	-	-	1	-	-	-	-	-	1	1	-	
	<i>Brachydiplax chalybea</i>	1	1	2	1	2	-	1	1	3	7	4	-	
	<i>Brachythemis contaminata</i>	-	-	3	4	-	-	2	-	-	5	26	-	
	<i>Crocothemis servilia</i>	3	-	6	3	1	1	-	2	-	5	2	-	
	<i>Macrodiplax cora</i>	2	-	-	-	-	-	-	-	-	-	-	-	
	<i>Neurothemis tullia</i>	6	-	-	1	3	1	-	-	-	3	6	-	
	<i>Orthetrum sabina</i>	6	-	2	4	1	-	-	-	-	1	6	-	
	<i>Pantala flavescens</i>	39	1	2	18	12	3	23	44	7	8	18	-	
	<i>Rhyothemis variegata</i>	12	-	18	21	10	4	-	12	25	37	30	-	
<i>Tramea virginia</i>	-	-	-	-	-	1	-	-	-	-	-	-		
<i>Urothemis signata</i>	3	-	4	-	1	-	-	-	-	6	1	-		
	TOTAL	81	3	109	86	52	12	30	62	41	105	128		
26-Sep-06	<i>Agriocnemis pygmaea</i>	2	-	24	1	-	-	-	1	-	1	3		
	<i>Ceriagrion auranticum</i>	3	-	-	1	8	-	1	1	2	-	10		
	<i>Ischnura senegalensis</i>	9	-	64	15	3	-	4	4	15	27	31		
	<i>Pseudagrion microcephalum</i>	2	-	-	-	-	-	-	-	-	-	-		
	<i>Anax guttatus/A. parthenope</i>	1	-	-	-	-	1	-	-	1	-	1		
	<i>Epophthalmia elegans</i>	-	-	-	-	-	-	-	-	1	-	1		
	<i>Acisoma panorpoides</i>	-	-	-	-	-	-	-	-	2	2	1		
	<i>Brachydiplax chalybea</i>	5	-	4	2	6	-	-	3	2	10	10		
	<i>Brachythemis contaminata</i>	4	-	-	5	1	-	1	1	2	3	46		
	<i>Crocothemis servilia</i>	1	-	-	1	1	-	-	-	1	1	1		
	<i>Hydrobasileus croceus</i>	-	-	-	-	-	-	1	-	-	-	-		
	<i>Macrodiplax cora</i>	1	-	1	-	-	-	-	-	1	-	-		
	<i>Neurothemis tullia</i>	6	-	-	-	-	-	-	1	2	5	4		
	<i>Orthetrum sabina</i>	4	-	-	-	-	-	-	1	-	-	4		
	<i>Pantala flavescens</i>	-	-	1	1	2	4	-	-	-	-	-		
	<i>Rhyothemis variegata</i>	5	-	-	-	-	3	2	6	11	12	3		
<i>Tholymis tillarga</i>	-	-	14	9	4	6	1	1	5	1	-			
<i>Urothemis signata</i>	1	-	-	-	-	1	-	-	-	-	-			
	TOTAL	44	0	108	35	25	15	10	19	45	62	115		
13-Oct-06	<i>Agriocnemis pygmaea</i>	-	-	47	1	2	-	-	-	-	-	8		
	<i>Ceriagrion auranticum</i>	-	-	1	1	3	-	-	-	9	2	17		
	<i>Ischnura senegalensis</i>	7	-	284	119	5	-	5	8	30	45	78		
	<i>Paracercion melanotum</i>	2	-	-	-	-	-	-	-	-	-	-		
	<i>Pseudagrion microcephalum</i>	5	-	-	-	-	-	-	-	-	-	2		
	<i>Anax guttatus/A. parthenope</i>	-	-	-	1	1	-	-	-	-	-	1		
	<i>Ictinogomphus pertinax</i>	-	-	2	2	1	1	-	-	-	-	1		
	<i>Epophthalmia elegans</i>	-	-	-	-	-	1	-	-	-	-	1		
	<i>Acisoma panorpoides</i>	-	-	3	1	-	-	-	1	-	4	-		
	<i>Brachydiplax chalybea</i>	-	-	27	10	4	1	-	1	1	13	4		
	<i>Brachythemis contaminata</i>	8	-	1	8	-	-	-	-	-	-	34		
	<i>Crocothemis servilia</i>	2	-	7	5	3	-	-	-	-	5	2		
	<i>Hydrobasileus croceus</i>	-	-	-	-	-	-	-	-	-	-	2		
	<i>Macrodiplax cora</i>	4	-	-	-	-	-	-	-	-	-	-		
	<i>Neurothemis tullia</i>	16	-	-	-	4	1	-	-	-	8	-		
	<i>Orthetrum sabina</i>	-	-	-	-	-	-	1	-	1	3	4		
<i>Pantala flavescens</i>	1	-	-	-	-	-	-	-	-	-	-			
<i>Rhyothemis variegata</i>	7	-	17	14	5	-	-	1	14	13	6			
<i>Tholymis tillarga</i>	1	-	1	-	-	-	-	-	4	1	1			
<i>Tramea virginia</i>	2	-	-	-	-	-	-	-	-	-	-			
<i>Urothemis signata</i>	-	-	-	1	-	-	-	-	-	6	1			
	TOTAL	55	0	390	163	28	4	6	11	59	100	162		

APPENDIX Xb – Odonate Adult Transect Count Data: 2009

Date	Species	Pond										Comments	
		16b	17b	20c	20d	20e	20f	24a	24c	24e	24f		24g
17-Mar-09	<i>Agriocnemis pygmaea</i>	-	-	N/A	N/A	N/A	N/A	-	-	1	-	-	Survey not include Pond #20 to prevent disturbance to wintering waterfowl. Pond edge vegetation was recently cut at Pond #16b, #24g and #f.
	<i>Ceriagrion auranticum</i>	-	-	N/A	N/A	N/A	N/A	-	15	85	-	1	
	<i>Ischnura senegalensis</i>	7	-	N/A	N/A	N/A	N/A	-	27	9	17	4	
	<i>Mortonagrion hirosei</i>	-	-	N/A	N/A	N/A	N/A	-	-	-	-	1	
	<i>Acisoma panorpoides</i>	-	-	N/A	N/A	N/A	N/A	-	1	4	1	-	
	<i>Brachythemis contaminata</i>	2	-	N/A	N/A	N/A	N/A	1	6	7	4	6	
	<i>Crocothemis servilia</i>	1	-	N/A	N/A	N/A	N/A	-	-	-	-	-	
	<i>Neurothemis tullia</i>	-	-	N/A	N/A	N/A	N/A	-	5	7	-	-	
	TOTAL	10	0	N/A	N/A	N/A	N/A	1	54	113	22	12	
01-Apr-09	<i>Agriocnemis pygmaea</i>	2	-	N/A	N/A	N/A	N/A	-	-	-	-	1	Survey not include Pond #20 to prevent disturbance to wintering waterfowl. Tall vegetation on pond edges.
	<i>Ceriagrion auranticum</i>	-	-	N/A	N/A	N/A	N/A	-	30	102	-	-	
	<i>Ischnura senegalensis</i>	16	-	N/A	N/A	N/A	N/A	-	5	14	4	17	
	<i>Mortonagrion hirosei</i>	1	-	N/A	N/A	N/A	N/A	-	-	-	-	2	
	<i>Paracercion melanotum</i>	3	-	N/A	N/A	N/A	N/A	-	-	-	-	-	
	<i>Anax sp.</i>	1	-	N/A	N/A	N/A	N/A	-	1	-	-	-	
	<i>Epophthalmia elegans</i>	-	-	N/A	N/A	N/A	N/A	-	1	2	-	-	
	<i>Acisoma panorpoides</i>	-	-	N/A	N/A	N/A	N/A	-	-	15	-	-	
	<i>Brachydiplax chalybea</i>	-	-	N/A	N/A	N/A	N/A	-	-	1	-	-	
	<i>Brachythemis contaminata</i>	2	-	N/A	N/A	N/A	N/A	-	1	2	-	17	
	<i>Crocothemis servilia</i>	-	-	N/A	N/A	N/A	N/A	-	-	1	-	-	
	<i>Neurothemis tullia</i>	-	-	N/A	N/A	N/A	N/A	-	17	30	-	-	
	<i>Orthetrum sabina</i>	-	-	N/A	N/A	N/A	N/A	-	2	-	1	1	
	<i>Pantala flavescens</i>	18	-	N/A	N/A	N/A	N/A	-	-	1	-	2	
	<i>Rhyothemis variegata</i>	1	-	N/A	N/A	N/A	N/A	-	1	-	-	-	
	TOTAL	44	0	N/A	N/A	N/A	N/A	0	58	168	5	40	
28-Apr-09	<i>Agriocnemis pygmaea</i>	-	-	-	-	-	-	-	-	-	1	1	Windy condition might have affected odonata movements. Bund between Pond #20c and #d is partly submerged.
	<i>Ceriagrion auranticum</i>	6	-	-	-	-	-	6	19	43	-	1	
	<i>Ischnura senegalensis</i>	8	-	26	196	19	120	-	12	9	9	81	
	<i>Mortonagrion hirosei</i>	2	-	-	-	-	-	-	-	-	-	-	
	<i>Pseudagrion microcephalum</i>	-	-	-	-	-	1	-	-	-	-	-	
	<i>Sinictinogomphus clavatus</i>	-	-	-	-	-	-	-	1	-	-	-	
	<i>Acisoma panorpoides</i>	1	-	-	-	-	-	-	1	16	-	-	
	<i>Brachydiplax chalybea</i>	-	-	-	-	-	-	-	7	3	-	-	
	<i>Brachythemis contaminata</i>	2	-	-	-	2	2	-	13	5	-	12	
	<i>Neurothemis tullia</i>	-	-	-	-	-	-	-	2	9	-	-	
	<i>Orthetrum sabina</i>	-	-	-	-	-	-	-	-	1	-	1	
	<i>Pantala flavescens</i>	-	-	-	-	-	-	-	-	-	1	-	
	<i>Rhyothemis variegata</i>	-	-	-	-	-	-	3	-	2	-	-	
	<i>Tholymis tillarga</i>	-	-	-	-	-	-	-	-	-	-	1	
	TOTAL	19	0	26	196	21	123	9	55	88	11	97	
13-May-09	<i>Ceriagrion auranticum</i>	2	-	-	-	-	-	1	9	6	1	-	
	<i>Ischnura senegalensis</i>	15	8	87	231	108	646	-	29	3	23	18	
	<i>Pseudagrion microcephalum</i>	-	-	-	-	1	-	-	-	-	-	-	
	<i>Sinictinogomphus clavatus</i>	-	-	-	-	-	-	-	-	-	-	1	
	<i>Ictinogomphus pertinax</i>	3	-	2	1	1	2	-	1	3	5	-	
	<i>Epophthalmia elegans</i>	-	-	1	-	-	-	-	-	-	-	-	
	<i>Acisoma panorpoides</i>	-	-	-	-	-	-	-	12	5	-	-	
	<i>Brachydiplax chalybea</i>	2	1	-	-	-	-	-	15	7	-	-	
	<i>Brachythemis contaminata</i>	15	1	8	4	7	6	3	4	1	38	45	
	<i>Crocothemis servilia</i>	-	-	-	-	-	-	-	-	1	-	-	
	<i>Neurothemis tullia</i>	-	-	-	-	-	-	-	14	1	-	-	
	<i>Orthetrum sabina</i>	1	1	5	10	2	20	-	-	1	-	-	
	<i>Rhyothemis variegata</i>	-	7	1	1	-	5	18	29	26	1	2	
	<i>Tholymis tillarga</i>	-	1	-	-	-	-	-	-	-	-	-	
	TOTAL	38	19	104	247	119	679	22	113	54	68	66	

APPENDIX Xb – Odonate Adult Transect Count Data: 2009 (cont')

Date	Species	Pond											Comments	
		16b	17b	20c	20d	20e	20f	24a	24c	24e	24f	24g		
26-May-09	<i>Ceriagrion auranticum</i>	9	-	-	-	-	-	-	4	17	-	-	Water-level high on most ponds, due to heavy rains from previous days. Pond #20f is fully drained.	
	<i>Ischnura senegalensis</i>	18	2	8	54	29	11	-	8	2	35	2		
	<i>Mortonagrion hirosei</i>	-	-	-	-	1	-	-	-	-	-	-		
	<i>Pseudagrion microcephalum</i>	1	-	-	-	-	-	-	-	-	-	-		
	<i>Anax sp.</i>	1	-	-	-	-	-	-	-	-	-	-		
	<i>Sinictinogomphus clavatus</i>	-	-	-	-	-	-	-	1	-	-	-		
	<i>Ictinogomphus pertinax</i>	6	-	-	-	-	-	-	-	-	2	1		
	<i>Acisoma panorpoides</i>	-	-	-	-	-	2	-	6	6	1	-		
	<i>Brachydiplax chalybea</i>	4	-	-	-	-	-	-	20	8	1	-		
	<i>Brachythemis contaminata</i>	6	-	3	4	3	1	-	13	5	36	47		
	<i>Neurothemis tullia</i>	-	-	-	-	-	-	-	2	2	-	-		
	<i>Orthetrum sabina</i>	-	-	-	6	1	2	-	-	-	-	-		
	<i>Pantala flavescens</i>	-	-	-	-	1	-	-	1	1	-	-		
	<i>Rhyothemis variegata</i>	8	3	-	-	1	-	4	27	37	12	5		
<i>Tholymis tillarga</i>	1	-	-	-	-	-	-	-	1	-	-			
<i>Tramea virginia</i>	2	-	-	-	1	-	-	-	-	-	1			
	TOTAL	56	5	11	64	37	16	4	82	79	87	56		
12-Jun-09	<i>Ceriagrion auranticum</i>	-	-	-	-	-	-	-	10	5	1	-	Survey shifted to afternoon due to bad weather. Tall vegetation at Pond #16b. Pond #20c, #d and #f were drained and refilled since last survey, water-level low. Water-level is high at Pond #20e. Pond edge vegetation recently cut at Pond #24a, #f and #g.	
	<i>Ischnura senegalensis</i>	2	1	-	-	6	5	1	6	2	2	3		
	<i>Paracercion melanotum</i>	1	-	-	-	-	-	-	-	-	-	-		
	<i>Sinictinogomphus clavatus</i>	-	-	-	-	-	-	-	-	-	1	-		
	<i>Ictinogomphus pertinax</i>	11	-	-	-	-	-	1	1	1	2	1		
	<i>Acisoma panorpoides</i>	-	-	-	-	-	-	-	2	4	-	-		
	<i>Brachydiplax chalybea</i>	10	-	-	-	-	-	-	13	10	-	-		
	<i>Brachythemis contaminata</i>	2	-	13	10	7	16	2	5	17	79	6		
	<i>Crocothemis servilia</i>	-	-	-	-	-	-	-	1	-	-	-		
	<i>Neurothemis tullia</i>	-	-	1	-	-	-	-	8	-	-	-		
	<i>Orthetrum sabina</i>	1	1	8	20	3	14	-	-	2	3	2		
	<i>Pantala flavescens</i>	-	-	3	1	-	1	-	-	-	-	-		
	<i>Rhyothemis variegata</i>	14	-	-	1	-	1	7	24	23	4	1		
	<i>Tramea virginia</i>	2	-	-	-	-	-	-	-	-	-	-		
	TOTAL	43	2	25	32	16	37	11	70	64	92	13		
24-Jun-09	<i>Ceriagrion auranticum</i>	-	-	-	-	-	-	-	3	-	-	-	Tall vegetation at Ponds #16b and #24g. Pond edge vegetation recently cut at Pond #20. Water-level low on Pond #20c, #d and #f. Pond #24f is 90% drained.	
	<i>Ischnura senegalensis</i>	-	-	-	1	-	1	2	2	-	-	-		
	<i>Anax sp.</i>	1	-	-	-	-	-	-	-	-	-	-		
	<i>Ictinogomphus pertinax</i>	16	-	-	-	-	-	-	1	3	-	-		
	<i>Acisoma panorpoides</i>	-	-	-	-	-	-	-	1	-	-	-		
	<i>Brachydiplax chalybea</i>	3	-	-	-	-	-	-	38	2	-	-		
	<i>Brachythemis contaminata</i>	2	1	16	13	13	19	1	6	10	22	3		
	<i>Crocothemis servilia</i>	-	-	-	-	-	-	-	-	-	1	-		
	<i>Neurothemis tullia</i>	-	-	-	-	-	-	-	4	3	-	1		
	<i>Orthetrum sabina</i>	1	1	22	38	12	33	-	-	3	-	5		
	<i>Pantala flavescens</i>	-	-	3	-	-	-	-	-	-	3	-		
	<i>Rhyothemis variegata</i>	13	3	-	1	2	11	7	27	12	10	-		
		TOTAL	36	5	41	53	27	64	10	82	33	36		9
	03-Jul-09	<i>Ceriagrion auranticum</i>	-	-	-	-	-	-	-	1	-	-		-
<i>Ischnura senegalensis</i>		-	-	15	1	6	49	-	-	-	-	-		
<i>Paracercion melanotum</i>		2	-	-	-	-	-	-	-	-	-	-		
<i>Anax sp.</i>		1	-	1	-	-	-	-	-	-	-	-		
<i>Ictinogomphus pertinax</i>		5	1	1	-	-	-	-	2	2	2	-		
<i>Epophthalmia elegans</i>		1	-	1	-	-	-	-	-	-	-	-		
<i>Brachydiplax chalybea</i>		-	-	-	-	-	-	-	2	1	-	-		
<i>Brachythemis contaminata</i>		-	1	6	4	4	9	-	2	-	15	1		
<i>Crocothemis servilia</i>		2	-	1	-	-	1	-	-	-	-	-		
<i>Macrodiplax cora</i>		-	-	-	-	-	1	-	1	-	6	4		
<i>Neurothemis tullia</i>		-	-	-	-	-	-	-	1	3	-	-		
<i>Orthetrum sabina</i>		-	-	7	25	6	29	-	-	1	4	1		
<i>Pantala flavescens</i>		-	-	-	-	-	1	-	3	-	1	-		
<i>Rhyothemis variegata</i>		8	-	1	1	-	8	8	13	4	3	-		
	TOTAL	19	2	33	31	16	98	8	25	11	31	6		

APPENDIX Xb – Odonate Adult Transect Count Data: 2009 (cont')

Date	Species	Pond											Comments	
		16b	17b	20c	20d	20e	20f	24a	24c	24e	24f	24g		
15-Jul-09	<i>Ceriagrion auranticum</i>	2	-	-	-	-	-	-	-	-	-	-	-	Pond edge vegetation recently cut at Pond #16b. Pond #17b is fully drained. Pond #24f is 70% drained. Pond #24g is 50% drained.
	<i>Ischnura senegalensis</i>	5	-	3	49	1	482	-	2	-	-	-	-	
	<i>Paracercion melanotum</i>	1	-	-	-	-	-	-	-	-	-	-	-	
	<i>Anax sp.</i>	1	-	-	-	-	-	-	-	-	-	-	-	
	<i>Ictinogomphus pertinax</i>	5	-	2	1	-	1	-	2	1	3	-	-	
	<i>Epopthalmia elegans</i>	-	-	1	-	-	-	-	-	-	-	-	-	
	<i>Acisoma panorpoides</i>	-	-	-	-	-	-	-	-	1	-	1	-	
	<i>Brachydiplax chalybea</i>	4	-	-	-	-	-	-	-	-	-	-	-	
	<i>Brachythemis contaminata</i>	-	-	1	29	1	18	-	3	-	36	7	-	
	<i>Crocothemis servilia</i>	1	-	-	1	-	-	-	1	-	-	1	-	
	<i>Macrodiplax cora</i>	-	-	2	2	1	-	-	-	-	-	-	-	
	<i>Neurothemis tullia</i>	-	-	-	1	-	5	-	3	8	-	-	-	
	<i>Orthetrum sabina</i>	-	-	3	18	-	12	1	-	-	10	-	-	
	<i>Rhyothemis variegata</i>	8	4	-	-	3	3	3	16	4	4	7	-	
	<i>Tholymis tillarga</i>	-	-	-	-	-	-	-	-	1	-	-	-	
<i>Tramea virginia</i>	-	-	1	-	-	-	-	-	-	-	-	-		
	TOTAL	27	4	13	101	6	521	4	27	15	53	16		
07-Aug-09	<i>Agriocnemis pygmaea</i>	-	-	-	-	-	1	-	-	-	-	-	Tall vegetation at Pond #16b, #24f and #g. Pond #17b is fully drained.	
	<i>Ceriagrion auranticum</i>	-	-	-	-	-	-	-	2	7	1	-		
	<i>Ischnura senegalensis</i>	2	-	4	42	4	61	-	-	-	3	-		
	<i>Anax sp.</i>	1	-	-	-	-	-	-	-	-	-	-		
	<i>Ictinogomphus pertinax</i>	9	-	4	-	-	3	1	2	5	3	10		
	<i>Epopthalmia elegans</i>	-	-	-	-	1	-	-	-	-	-	-		
	<i>Acisoma panorpoides</i>	-	-	-	-	-	-	-	-	4	1	-		
	<i>Brachydiplax chalybea</i>	4	-	-	-	-	-	2	8	1	-	-		
	<i>Brachythemis contaminata</i>	1	1	1	2	2	1	1	4	4	7	3		
	<i>Crocothemis servilia</i>	3	-	-	1	-	-	-	3	1	1	-		
	<i>Macrodiplax cora</i>	-	-	1	-	-	-	-	1	-	1	-		
	<i>Neurothemis tullia</i>	-	-	-	-	-	7	-	17	4	-	-		
	<i>Orthetrum sabina</i>	3	-	22	33	12	45	-	2	2	6	18		
	<i>Pantala flavescens</i>	-	-	-	-	-	-	-	-	-	1	2		
	<i>Rhyothemis variegata</i>	3	-	5	1	-	3	5	16	18	8	2		
	TOTAL	26	1	37	79	19	121	9	55	46	32	35		
19-Aug-09	<i>Agriocnemis pygmaea</i>	-	-	-	1	-	-	-	-	-	-	-	Tall vegetation at Pond #16b, #20c, #24a, #24f and #g.	
	<i>Ceriagrion auranticum</i>	-	-	-	-	-	-	3	1	6	-	-		
	<i>Ischnura senegalensis</i>	-	-	-	12	1	6	-	-	-	-	3		
	<i>Anax sp.</i>	1	-	-	-	-	-	-	1	-	-	-		
	<i>Sinictinogomphus clavatus</i>	-	-	-	-	1	-	-	-	-	-	1		
	<i>Ictinogomphus pertinax</i>	1	-	3	-	-	-	-	2	-	-	-		
	<i>Epopthalmia elegans</i>	-	-	-	-	1	-	-	-	-	-	-		
	<i>Acisoma panorpoides</i>	-	-	-	-	-	-	-	-	2	-	-		
	<i>Brachydiplax chalybea</i>	4	-	-	-	-	-	1	4	3	-	-		
	<i>Brachythemis contaminata</i>	14	4	1	7	1	2	1	35	4	8	22		
	<i>Crocothemis servilia</i>	-	-	-	-	-	-	-	1	-	2	1		
	<i>Macrodiplax cora</i>	-	-	-	2	-	-	-	-	-	-	-		
	<i>Neurothemis tullia</i>	-	-	-	-	-	1	-	1	4	1	-		
	<i>Orthetrum sabina</i>	-	-	19	32	18	22	2	3	2	-	10		
	<i>Pantala flavescens</i>	5	11	1	2	3	2	-	3	1	9	8		
<i>Rhyothemis variegata</i>	2	-	5	4	2	6	3	8	8	2	5			
<i>Tholymis tillarga</i>	2	1	-	-	-	-	1	2	1	1	1			
	TOTAL	29	16	29	60	27	39	11	61	31	23	51		
17-Sep-09	<i>Agriocnemis pygmaea</i>	-	-	1	-	-	-	-	-	1	-	-	Survey postponed to 2nd half of the month due to prolonged bad weather the week before. Tall vegetation at Pond #16b. Vegetation on bunds around Pond #24c, #f & #g were recently cut.	
	<i>Ceriagrion auranticum</i>	-	-	-	-	-	-	1	1	3	-	-		
	<i>Ischnura senegalensis</i>	2	-	18	10	-	1	1	2	5	9	3		
	<i>Anax sp.</i>	2	-	1	1	-	-	-	1	1	-	-		
	<i>Ictinogomphus pertinax</i>	5	1	4	1	4	1	-	7	1	-	-		
	<i>Epopthalmia elegans</i>	-	-	1	-	-	-	-	1	-	-	-		
	<i>Brachydiplax chalybea</i>	2	-	-	-	-	-	2	2	1	7	1		
	<i>Brachythemis contaminata</i>	6	-	-	3	6	1	1	6	-	23	41		
	<i>Crocothemis servilia</i>	-	-	1	-	-	-	-	2	-	1	2		
	<i>Macrodiplax cora</i>	-	1	-	1	-	-	-	-	-	-	-		
	<i>Neurothemis tullia</i>	-	-	1	-	-	-	-	-	5	-	-		
	<i>Orthetrum sabina</i>	-	3	7	5	8	15	-	11	-	2	2		
	<i>Pantala flavescens</i>	3	2	2	-	-	2	4	9	1	2	5		
	<i>Rhyothemis variegata</i>	1	-	6	2	1	1	1	8	17	7	2		
	<i>Tramea virginia</i>	2	-	-	-	-	-	-	-	-	-	-		
	TOTAL	23	7	42	23	19	21	10	50	34	52	56		

APPENDIX Xb – Odonate Adult Transect Count Data: 2009 (cont')

Date	Species	Pond										Comments	
		16b	17b	20c	20d	20e	20f	24a	24c	24e	24f		24g
25-Sep-09	<i>Agriocnemis pygmaea</i>	-	-	5	2	-	-	-	1	3	5	-	Tall vegetation at Pond #16b.
	<i>Ceriatricornis auranticum</i>	-	-	1	-	1	-	4	-	3	-	-	
	<i>Ischnura senegalensis</i>	-	-	26	73	1	-	-	3	9	50	51	
	<i>Anax sp.</i>	2	-	1	-	2	-	-	1	-	1	1	
	<i>Ictinogomphus pertinax</i>	1	-	-	-	-	-	-	-	-	-	-	
	<i>Epophthalmia elegans</i>	1	-	-	-	-	-	-	-	-	-	-	
	<i>Brachydiplax chalybea</i>	5	-	1	-	1	-	1	2	2	13	4	
	<i>Brachythemis contaminata</i>	4	5	18	29	1	9	2	31	5	110	260	
	<i>Crocothemis servilia</i>	-	-	-	1	-	1	-	1	-	1	-	
	<i>Macrodiplax cora</i>	-	-	1	-	1	-	-	-	-	-	-	
	<i>Neurothemis tullia</i>	-	-	2	-	1	-	-	2	7	-	-	
	<i>Ortherum sabina</i>	-	-	3	2	1	6	2	7	3	1	-	
	<i>Pantala flavescens</i>	2	4	3	2	7	3	8	24	10	-	-	
	<i>Rhyothemis variegata</i>	1	-	-	-	-	-	-	2	1	1	3	
<i>Tholymis tillarga</i>	2	1	7	2	5	3	10	8	7	5	-		
	TOTAL	18	10	68	111	21	22	27	82	50	187	319	
13-Oct-06	<i>Agriocnemis pygmaea</i>	-	-	-	6	-	-	-	-	-	-	-	Vegetation on bunds at Pond #20 were recently cut.
	<i>Ceriatricornis auranticum</i>	-	-	-	-	-	-	-	-	7	3	-	
	<i>Ischnura senegalensis</i>	1	-	26	62	-	97	-	13	12	122	141	
	<i>Anax sp.</i>	1	-	-	-	-	-	-	-	-	-	-	
	<i>Ictinogomphus pertinax</i>	1	-	2	3	2	-	-	-	-	-	1	
	<i>Epophthalmia elegans</i>	-	-	-	-	-	-	-	-	-	-	-	
	<i>Acisoma panorpoides</i>	-	-	-	-	-	-	-	-	11	1	-	
	<i>Brachydiplax chalybea</i>	-	-	-	-	-	-	-	-	3	7	2	
	<i>Brachythemis contaminata</i>	1	8	3	15	5	1	1	5	2	33	199	
	<i>Crocothemis servilia</i>	-	-	1	-	-	-	-	1	1	3	1	
	<i>Neurothemis tullia</i>	1	-	2	-	-	10	-	5	10	2	-	
	<i>Ortherum sabina</i>	-	2	4	2	1	3	-	3	2	5	1	
	<i>Pantala flavescens</i>	1	-	1	5	2	-	-	3	-	-	1	
	<i>Rhyothemis variegata</i>	2	-	3	-	-	-	-	4	16	15	13	
	TOTAL	8	10	42	93	10	111	1	34	64	191	359	

APPENDIX XIa – Odonate Adult Transect Count Data Summary: 2006

Date	Pond											TOTAL	No. of species	Survey Time	Starting Location	Weather
	16b	17b	20c	20d	20e	20f	24a	24c	24e	24f	24g					
28-Mar-06	450	1	-	-	-	-	97	82	243	212	170	1255	12	Afternoon	Pond #16b	25.5°C, Sunny/overcast.
19-Apr-06	194	2	82	206	65	113	8	35	110	180	180	1175	16	Morning	Pond #16b	26.5°C, Sunny with light breeze.
26-Apr-06	168	1	417	380	126	101	13	63	110	100	71	1550	19	Afternoon	Pond #20e	30°C, Sunny and windy.
09-May-06	221	9	231	177	113	59	55	138	109	64	77	1253	18	Morning	Pond #20e	29°C, Sunny.
05-Jun-06	147	1	125	78	43	23	17	95	76	72	86	763	15	Afternoon	Pond #16b	30°C, Cloudy with breeze.
16-Jun-06	102	2	105	81	29	37	19	43	61	137	162	778	17	Morning	Pond #16b	29°C, Cloudy.
29-Jun-06	99	9	67	95	58	59	20	64	60	117	119	767	15	Afternoon	Pond #20e	32°C, Sunny/cloudy with occasional light shower.
14-Jul-06	21	16	103	117	50	46	23	75	116	132	101	800	15	Morning	Pond #20e	31°C, Sunny and windy.
31-Jul-06	80	16	77	90	41	23	20	37	72	77	72	605	17	Afternoon	Pond #16b	30°C, Sunny and windy.
15-Aug-06	99	8	51	89	34	17	28	38	124	135	115	738	18	Morning	Pond #16b	31°C, Sunny with light breeze.
30-Aug-06	83	4	39	87	22	28	16	40	51	129	130	629	18	Afternoon	Pond #20e	31°C, Sunny with light breeze.
19-Sep-06	81	3	109	86	52	12	30	62	41	105	128	709	18	Morning	Pond #20e	29°C, Sunny with light breeze.
29-Sep-06	44	0	108	35	25	15	10	19	45	62	115	478	18	Afternoon	Pond #16b	30°C, Sunny/cloudy and windy.
13-Oct-06	55	0	390	163	28	4	6	11	59	100	162	978	21	Morning	Pond #16b	29°C, Cloudy with occasional sunshine.
TOTAL	1844	72	1904	1684	686	537	362	802	1277	1622	1688	12478				
Mean	245.9	9.6	272	240.6	98	76.71	48.27	106.9	170.3	216.3	225.1	1663.7				
Peak	450	16	417	380	126	113	97	138	243	212	180	1550				
Cumulative no. of species	23	7	20	20	22	19	14	15	20	17	23	25				

(Boxed and shaded numbers = peak count)

APPENDIX XIb – Odonate Adult Transect Count Data Summary: 2009

Date	Pond											TOTAL	No. of species	Survey Time	Starting Location	Weather
	16b	17b	20c	20d	20e	20f	24a	24c	24e	24f	24g					
17-Mar-09	10	0	-	-	-	-	1	54	113	22	12	212	8	Afternoon	Pond #16b	26 °C, Breezy.
01-Apr-09	44	0	-	-	-	-	0	58	168	5	40	315	15	Morning	Pond #16b	24 °C, Sunny.
28-Apr-09	19	0	26	196	21	123	9	55	88	11	97	645	14	Afternoon	Pond #20e	27 °C, Sunny and breezy.
13-May-09	38	19	104	247	119	679	22	113	54	68	66	1529	14	Morning	Pond #20e	32 °C, Sunny.
26-May-09	56	5	11	64	37	16	4	82	79	87	56	497	16	Afternoon	Pond #16b	29 °C, Sunny.
12-Jun-09	43	2	25	32	16	37	11	70	64	92	13	405	14	Afternoon	Pond #16b	27 °C, Cloudy and clam.
24-Jun-09	36	5	41	53	27	64	10	82	33	36	9	396	12	Afternoon	Pond #20e	30 °C, Overcast with high humidity.
03-Jul-09	19	2	33	31	16	98	8	25	11	31	6	280	14	Afternoon	Pond #16b	30 °C, Clear and occasionally breezy.
15-Jul-09	27	4	13	101	6	521	4	27	15	53	16	787	16	Morning	Pond #20e	30 °C, Overcast and breezy with occasional shower.
07-Aug-09	26	1	37	79	19	121	9	55	46	32	35	460	15	Morning	Pond #16b	32 °C, Hazy.
19-Aug-09	29	16	29	60	27	39	11	61	31	23	51	377	17	Afternoon	Pond #20e	32 °C, Clear.
17-Sep-09	23	7	42	23	19	21	10	50	34	52	56	337	15	Morning	Pond #20e	30 °C, Clear.
25-Sep-09	18	10	68	111	21	22	27	82	50	187	319	915	15	Afternoon	Pond #16b	31 °C, Clear.
09-Oct-09	8	10	42	93	10	111	1	34	64	191	359	923	13	Morning	Pond #16b	29 °C, Clear.
TOTAL	396	81	471	1090	338	1852	127	848	850	890	1135	8078				
Mean	28.3	5.8	39.3	90.8	28.2	154.3	9.1	60.6	60.7	63.6	81.1	577.0				
Peak	56	19	104	247	119	679	27	113	168	191	359	1529				
Cumulative no. of species	19	9	15	11	16	12	9	16	15	16	18	21				

(Boxed and shaded numbers = peak count)

APPENDIX XIIIa – Odonate Adult Transect Count Species Summary: 2006

Species	28-Mar	19-Apr	26-Apr	09-May	05-Jun	16-Jun	29-Jun	14-Jul	31-Jul	15-Aug	30-Aug	19-Sep	29-Sep	13-Oct	MEAN	PEAK
<i>Agriocnemis pygmaea</i>	30	2	21	9	17	9	2	1	42	55	42	24	32	58	24.6	58
<i>Ceriagrion auranticum</i>	270	186	92	35	15	14	4	6	17	21	18	22	26	33	54.2	270
<i>Ischnura senegalensis</i>	801	627	1000	334	105	150	44	103	113	163	120	132	172	581	317.5	1000
<i>Mortonagrion hirosei</i>	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0.1	1
<i>Paracerion melanotum</i>	2	0	0	0	0	0	0	0	0	0	2	0	0	2	0.4	2
<i>Pseudagrion microcephalum</i>	2	2	0	0	1	1	1	6	3	6	0	1	2	7	2.3	7
<i>Pseudagrion rubriceps</i>	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0.1	2
<i>Anax guttatus / A. parthenope</i>	0	3	1	3	0	1	5	2	7	3	9	4	4	3	3.2	9
<i>Ictinogomphus pertinax</i>	0	0	0	6	0	14	10	13	2	18	2	30	0	7	7.3	30
<i>Sinictinogomphus clavatus</i>	0	1	2	4	2	5	5	0	0	0	0	0	0	0	1.4	5
<i>Epophthalmia elegans</i>	0	0	0	0	0	0	0	0	0	3	3	5	2	2	1.1	5
<i>Acisoma panorpoides</i>	1	48	72	68	23	4	2	13	7	10	6	3	5	9	19.4	72
<i>Brachydiplax chalybea</i>	0	26	74	175	224	103	222	90	73	50	99	23	42	61	90.1	224
<i>Brachythemis contaminata</i>	12	47	92	26	41	36	103	76	80	66	85	40	63	51	58.4	103
<i>Crocothemis servilia</i>	12	44	17	11	32	22	19	47	14	29	11	23	6	24	22.2	47
<i>Diplacodes trivialis</i>	0	6	9	11	1	0	0	0	1	2	0	0	0	0	2.1	11
<i>Hydrobasileus croceus</i>	0	0	0	0	0	0	0	0	0	2	0	0	1	2	0.4	2
<i>Macrodiplax cora</i>	0	0	2	1	0	0	0	0	0	0	1	2	3	4	0.9	4
<i>Neurothemis tullia</i>	36	85	55	31	12	3	7	28	19	15	20	20	18	29	27.0	85
<i>Orthetrum sabina</i>	1	23	5	18	7	6	1	6	6	9	7	20	9	9	9.1	23
<i>Pantala flavescens</i>	87	10	4	0	16	2	0	8	9	1	2	175	8	1	23.1	175
<i>Rhyothemis variegata</i>	1	63	98	481	265	370	340	378	204	264	184	169	42	77	209.7	481
<i>Tholymis tillarga</i>	0	0	2	0	0	0	0	0	4	0	13	0	41	8	4.9	41
<i>Tramea virginia</i>	0	0	2	16	2	5	0	0	0	0	0	1	0	2	2.0	16
<i>Urothemis signata</i>	0	0	1	23	0	33	2	23	4	21	5	15	2	8	9.8	33

(Boxed and shaded numbers = peak count)

APPENDIX XIIb – Odonate Adult Transect Count Species Summary: 2009

Species	17-Mar	01-Apr	28-Apr	13-May	26-May	12-Jun	24-Jun	03-Jul	15-Jul	07-Aug	19-Aug	17-Sep	25-Sep	09-Oct	MEAN	PEAK
<i>Agrion pygmaea</i>	1	3	2	0	0	0	0	0	0	1	1	2	16	6	2.3	16
<i>Ceragrion auranticum</i>	101	132	75	19	30	16	3	1	2	10	10	5	9	10	30.2	132
<i>Ischnura senegalensis</i>	64	56	480	1168	169	28	6	71	542	116	22	51	213	474	247.1	1168
<i>Mortonagrion hirosei</i>	1	3	2	0	1	0	0	0	0	0	0	0	0	0	0.5	3
<i>Paracercion melanotum</i>	0	3	0	0	0	1	0	2	1	0	0	0	0	0	0.5	3
<i>Pseudagrion microcephalum</i>	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0.2	1
<i>Anax guttatus/A. parthenope</i>	0	2	0	0	1	0	1	2	1	1	2	6	8	1	1.8	8
<i>Ictinogomphus pertinax</i>	0	0	0	18	9	17	20	13	15	37	6	24	1	9	12.1	37
<i>Sinictinogomphus clavatus</i>	0	0	1	1	1	1	0	0	0	0	2	0	0	0	0.4	2
<i>Epophthalmia elegans</i>	0	3	0	1	0	0	0	2	1	1	1	2	1	0	0.9	3
<i>Acisoma panorpoides</i>	6	15	18	17	15	6	1	0	2	5	2	0	0	12	7.1	18
<i>Brachydiplax chalybea</i>	0	1	10	25	33	33	43	3	4	15	12	15	29	12	16.8	43
<i>Brachythemis contaminata</i>	26	22	36	132	118	157	106	42	95	27	99	87	474	273	121.0	474
<i>Crocothemis servilia</i>	1	1	0	1	0	1	1	4	4	9	4	6	4	7	3.1	9
<i>Macrodiplax cora</i>	0	0	0	0	0	0	0	12	5	3	2	2	2	0	1.9	12
<i>Neurothemis tullia</i>	12	47	11	15	4	9	8	4	17	28	7	6	12	30	15.0	47
<i>Orthetrum sabina</i>	0	4	2	40	9	54	115	73	44	143	108	53	25	23	49.5	143
<i>Pantala flavescens</i>	0	21	1	0	3	5	6	5	0	3	45	30	63	13	13.9	63
<i>Rhyothemis variegata</i>	0	2	5	90	97	75	86	46	52	61	45	46	8	53	47.6	97
<i>Tholymis tillarga</i>	0	0	1	1	2	0	0	0	1	0	9	0	50	0	4.6	50
<i>Tramea virginia</i>	0	0	0	0	4	2	0	0	1	0	0	2	0	0	0.6	4

(Boxed and shaded numbers = peak count)

APPENDIX XIIIa – Odonate Exuviae Count Data: 2006

Pond	Species	Mar	Apr	May	Jun	Jul	Aug	Sep	TOTAL
#16b	<i>Agriocnemis pygmaea</i>	1	19	4	-	-	-	1	25
	<i>Ischnura senegalensis</i>	-	17	3	1	-	1	2	24
	<i>Anax parthenope</i>	2	-	-	-	-	-	-	2
	<i>Ictinogomphus pertinax</i>	-	-	-	1	-	-	-	1
	<i>Brachydiplax chalybea</i>	-	1	3	1	3	8	-	16
	<i>Crocothemis servilia</i>	-	3	-	-	-	-	-	3
	<i>Diplacodes trivialis</i>	2	5	4	-	-	-	-	11
	<i>Hydrobasileus croceus</i>	-	-	2	-	-	5	-	7
	<i>Rhyothemis variegata</i>	-	-	-	3	1	-	-	4
	<i>Tramea virginia</i>	-	3	-	-	-	-	-	3
	Total no. of exuviae	5	48	16	6	4	14	3	96
	Total no. of species	3	6	5	4	2	3	2	10
#20d	<i>Agriocnemis pygmaea</i>	N/A	1	-	-	-	2	-	3
	<i>Ischnura senegalensis</i>	N/A	4	-	-	-	-	-	4
	<i>Ictinogomphus pertinax</i>	N/A	-	2	1	-	-	-	3
	<i>Sinictinogomphus clavatus</i>	N/A	-	1	-	-	-	-	1
	<i>Brachydiplax chalybea</i>	N/A	20	2	1	-	1	-	24
	<i>Brachythemis contaminata</i>	N/A	1	-	1	-	-	-	2
	<i>Diplacodes trivialis</i>	N/A	3	-	-	-	-	-	3
	<i>Orthetrum sabina</i>	N/A	1	3	-	-	-	-	4
	<i>Rhyothemis variegata</i>	N/A	6	11	-	-	1	-	18
		Total no. of exuviae	N/A	36	19	3	0	4	0
	Total no. of species	N/A	7	5	3	0	3	0	9
#20f	<i>Ischnura senegalensis</i>	N/A	5	1	-	-	-	-	6
	<i>Ictinogomphus pertinax</i>	N/A	5	13	8	3	-	-	29
	<i>Sinictinogomphus clavatus</i>	N/A	-	1	-	-	-	-	1
	<i>Brachythemis contaminata</i>	N/A	15	13	-	-	-	-	28
	<i>Crocothemis servilia</i>	N/A	4	1	-	-	-	-	5
	<i>Diplacodes trivialis</i>	N/A	1	-	-	-	-	-	1
	<i>Orthetrum sabina</i>	N/A	21	11	2	-	-	-	34
	<i>Rhyothemis variegata</i>	N/A	1	-	-	-	1	-	2
		Total no. of exuviae	N/A	52	40	10	4	0	0
	Total no. of species	N/A	7	6	2	2	0	0	8
#24e	<i>Ischnura senegalensis</i>	-	1	1	-	-	-	-	2
	<i>Ictinogomphus pertinax</i>	-	1	4	-	-	-	-	5
	<i>Brachydiplax chalybea</i>	1	-	-	-	-	-	-	1
	<i>Brachythemis contaminata</i>	2	-	-	-	-	-	-	2
	<i>Crocothemis servilia</i>	1	-	-	-	-	-	-	1
	<i>Rhyothemis variegata</i>	1	-	1	1	-	-	-	3
	<i>Tholymis tillarga</i>	-	-	-	-	1	-	-	1
		Total no. of exuviae	5	2	6	1	1	0	0
	Total no. of species	4	2	3	1	1	0	0	7
#24g	<i>Agriocnemis pygmaea</i>	-	1	-	-	-	-	-	1
	<i>Ischnura senegalensis</i>	1	15	-	-	-	-	-	16
	<i>Ictinogomphus pertinax</i>	-	-	1	-	-	-	1	2
	<i>Brachydiplax chalybea</i>	1	7	-	-	-	1	-	9
	<i>Brachythemis contaminata</i>	3	6	1	-	-	-	1	11
	<i>Crocothemis servilia</i>	-	3	-	-	-	-	-	3
	<i>Diplacodes trivialis</i>	-	1	-	-	-	-	-	1
	<i>Rhyothemis variegata</i>	-	4	-	1	-	3	-	8
		Total no. of exuviae	5	37	2	1	0	4	2
	Total no. of species	3	7	2	1	0	2	2	8

APPENDIX XIIIb – Odonate Exuviae Count Data: 2009

Pond	Species	Mar	Apr	May	Jun	Jul	Aug	Sep	TOTAL
#16b	<i>Ictinogomphus pertinax</i>	-	2	5	-	-	-	-	7
	<i>Brachydiplax chalybea</i>	-	-	-	-	-	1	-	1
	Total no. of exuviae	0	2	5	0	0	1	0	8
	Total no. of species	0	1	1	0	0	1	0	2
#20d	<i>Ischnura senegalensis</i>	N/A	N/A	13	24	5	1	1	44
	<i>Ictinogomphus pertinax</i>	N/A	N/A	21	2	-	-	-	23
	<i>Epophthalmia elegans</i>	N/A	N/A	-	-	-	1	-	1
	<i>Brachydiplax chalybea</i>	N/A	N/A	-	2	-	-	-	2
	<i>Brachythemis contaminata</i>	N/A	N/A	12	10	15	3	-	40
	<i>Hydrobasileus croceus</i>	N/A	N/A	-	-	6	-	-	6
	<i>Orthetrum sabina</i>	N/A	N/A	34	39	22	6	2	103
	<i>Rhyothemis variegata</i>	N/A	N/A	6	2	1	-	-	9
	<i>Tramea virginia</i>	N/A	N/A	-	1	-	-	-	1
	Total no. of exuviae	N/A	N/A	86	80	49	11	3	229
Total no. of species	N/A	N/A	5	7	5	4	2	9	
#20f	<i>Ischnura senegalensis</i>	N/A	N/A	8	10	46	13	-	77
	<i>Anax Parthenope</i>	N/A	N/A	-	-	-	3	-	3
	<i>Ictinogomphus pertinax</i>	N/A	N/A	1	1	-	-	-	2
	<i>Brachythemis contaminata</i>	N/A	N/A	-	4	1	-	-	5
	<i>Hydrobasileus croceus</i>	N/A	N/A	-	2	12	-	-	14
	<i>Orthetrum sabina</i>	N/A	N/A	4	11	28	8	1	52
	<i>Rhyothemis variegata</i>	N/A	N/A	4	-	-	-	-	4
	Total no. of exuviae	N/A	N/A	17	28	87	24	1	157
Total no. of species	N/A	N/A	4	5	4	3	1	7	
#24e	<i>Ictinogomphus pertinax</i>	-	-	1	-	1	-	-	2
	<i>Brachydiplax chalybea</i>	-	-	2	-	-	-	-	2
	<i>Brachythemis contaminata</i>	-	-	-	-	1	-	-	1
	Total no. of exuviae	0	0	3	0	2	0	0	5
Total no. of species	0	0	2	0	2	0	0	2	
#24g	<i>Ischnura senegalensis</i>	-	2	1	-	-	-	-	3
	<i>Ictinogomphus pertinax</i>	-	1	1	1	-	-	-	3
	<i>Brachydiplax chalybea</i>	-	2	-	1	-	-	-	3
	<i>Brachythemis contaminata</i>	-	-	7	-	-	-	-	7
	<i>Rhyothemis variegata</i>	-	1	-	-	-	-	-	1
	<i>Tholymis tillarga</i>	-	-	-	-	-	1	-	1
	Total no. of exuviae	0	6	9	2	0	1	0	18
Total no. of species	0	4	3	2	0	1	0	6	

APPENDIX XIVa – Odonate Exuviae Count Species Summary: 2006

Species	Month							TOTAL
	Mar	Apr	May	Jun	Jul	Aug	Sep	
<i>Agriocnemis pygmaea</i>	1	21	4	0	0	2	1	29
<i>Ischnura senegalensis</i>	1	42	5	1	0	1	2	52
<i>Anax parthenope</i>	2	0	0	0	0	0	0	2
<i>Ictinogomphus pertinax</i>	0	6	20	10	3	0	1	40
<i>Sinictinogomphus clavatus</i>	0	0	2	0	0	0	0	2
<i>Brachydiplax chalybea</i>	2	28	5	2	3	10	0	50
<i>Brachythemis contaminata</i>	5	22	14	1	0	0	1	43
<i>Crocothemis servilla</i>	1	10	1	0	0	0	0	12
<i>Diplacodes trivialis</i>	2	10	4	0	0	0	0	16
<i>Hydrobasileus croceus</i>	0	0	2	0	0	5	0	7
<i>Orthetrum sabina</i>	0	22	14	2	0	0	0	38
<i>Rhyothemis variegata</i>	1	11	12	5	2	4	0	35
<i>Tholymis tillarga</i>	0	0	0	0	1	0	0	1
<i>Tramea virginia</i>	0	3	0	0	0	0	0	3
Total no. of exuviae	15	175	83	21	9	22	5	330
Total no. of species	8	10	11	6	4	5	4	14

APPENDIX XIVb – Odonate Exuviae Count Species Summary: 2009

Species	Month							TOTAL
	Mar	Apr	May	Jun	Jul	Aug	Sep	
<i>Ischnura senegalensis</i>	0	2	22	34	51	14	1	124
<i>Anax parthenope</i>	0	0	0	0	0	3	0	3
<i>Ictinogomphus pertinax</i>	0	3	29	4	1	0	0	37
<i>Epophthalmia elegans</i>	0	0	0	0	0	1	0	1
<i>Brachydiplax chalybea</i>	0	2	2	3	0	1	0	8
<i>Brachythemis contaminata</i>	0	0	19	14	17	3	0	53
<i>Hydrobasileus croceus</i>	0	0	0	2	18	0	0	20
<i>Orthetrum sabina</i>	0	0	38	50	50	14	3	155
<i>Rhyothemis variegata</i>	0	1	10	2	1	0	0	14
<i>Tholymis tillarga</i>	0	0	0	0	0	1	0	1
<i>Tramea virginia</i>	0	0	0	1	0	0	0	1
Total no. of exuviae	0	8	120	110	138	37	4	417
Total no. of species	0	4	6	8	6	7	2	11

APPENDIX XV – Pond #15 Water Quality Data Summaries

Appendix XVa. 2005-06

Month	Pond #15a			Pond #15b		
	DO (mg/L)	pH	Salinity (ppt)	DO (mg/L)	pH	Salinity (ppt)
Nov-05	-	-	-	-	-	-
Dec-05	-	-	-	-	-	-
Jan-06	6.3	7.0	-	3.1	5.6	-
Feb-06	5.5	6.6	-	1.9	7.3	-
Mar-06	7.4	6.7	-	4.2	6.2	-

Appendix XVb. 2006-07

Month	Pond #15a			Pond #15b		
	DO (mg/L)	pH	Salinity (ppt)	DO (mg/L)	pH	Salinity (ppt)
Nov-06	11.5	7.6	-	10.2	7.3	-
Dec-06	6.8	7.3	-	10.1	7.3	-
Jan-07	6.2	7.3	-	1.8	7.2	-
Feb-07	14.6	7.9	-	9.8	7.5	-
Mar-07	6.4	7.6	-	3.9	7.6	-

Appendix XVc. 2007-08

Month	Pond #15a			Pond #15b		
	DO (mg/L)	pH	Salinity (ppt)	DO (mg/L)	pH	Salinity (ppt)
Nov-07	9.9	8.5	7.9	10.6	8.2	4.6
Dec-07	9.3	8.6	9.1	11.4	8.0	5.4
Jan-08	10.5	9.3	10.0	12.3	9.1	6.0
Feb-08	18.2	9.4	9.8	16.6	8.8	6.1
Mar-08	15.1	9.6	11.9	29.4	9.3	7.1

Appendix XVd. 2008-09

Month	Pond #15a			Pond #15b		
	DO (mg/L)	pH	Salinity (ppt)	DO (mg/L)	pH	Salinity (ppt)
Nov-08	5.8	7.6	4.0	3.6	7.7	3.2
Dec-08	10.3	8.8	6.3	10.6	8.5	5.1
Jan-09	11.6	9.0	9.2	13.5	8.8	6.8
Feb-09	4.3	8.6	12.0	10.9	8.8	8.4
Mar-09	2.6	8.4	16.7	2.1	7.9	10.6

Appendix XVe. 2009-10

Month	Pond #15a			Pond #15b		
	DO (mg/L)	pH	Salinity (ppt)	DO (mg/L)	pH	Salinity (ppt)
Nov-09	8.9	8.4	6.7	9.6	8.5	3.8
Dec-09	6.5	6.5	8.0	2.9	6.9	4.3
Jan-10	2.3	8.7	8.5	3.9	8.7	4.7
Feb-10	4.0	9.2	6.8	1.1	9.1	3.6
Mar-10	1.6	7.4	6.8	1.0	8.0	3.6