



## Proposed Comprehensive Development at Wo Shang Wai, Yuen Long


Biannual EM&A Report on Ecology for May - Oct 2010 (Rev. B)

December 2010  
Report No.: 266567/12/B

Pursuant to Condition 4.6 of Environmental Permit No. EP-311/2008/B,

this Biannual EM&A Report on ecological aspects for May to Oct  
2010 has been reviewed, certified by Environmental Team Leader  
(ETL) and verified by the Independent Environmental Checker (IEC)

Certified by:



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Florence Yuen  
Environmental Team Leader (ETL)  
Mott MacDonald Hong Kong Ltd.

Date 22 December 2010

Verified by:



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David Yeung  
Independent Environmental Checker (IEC)  
ENVIRON Hong Kong Limited

22 Dec 2010

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# 1. Introduction

## 1.1 Background

In March 2005, the Project Proponent, Profit Point Enterprises Limited, acquired the development site in Yuen Long at Wo Shang Wai. An Environmental Impact Assessment (EIA) was carried out under the EIA Ordinance (EIAO) since then and the Environmental Permit (EP-311/2008B) for construction of the comprehensive development in Wo Shang Wai was granted by EPD on 29 July 2010. The Project involves the residential development and associated infrastructure and wetland restoration area and linear landscape area. The construction works under the Environmental Permit commenced on 12 May 2010.

Mott MacDonald Hong Kong Ltd. (“MMHK”) has been commissioned by the Contractor, Heng Shung Construction Co. Ltd., to undertake the Environmental Team (ET) services to carry out environmental monitoring and audit (EM&A) for both pre-construction and construction phases of the Proposed Comprehensive Development at Wo Shang Wai, Yuen Long.

According to the EP Condition 4.6, the EM&A results on ecological aspects during the construction phase should be reported to the EIA Subcommittee of the ACE, EPD and AFCD on a biannual basis. This is the 1<sup>st</sup> Biannual EM&A report and it summarises the findings on EM&A results of ecological aspects during the period from 12 May to 31 October 2010.

## 1.2 Survey Area

Surveys were conducted within 500 m of the Project area. The Wetland Restoration Area (hereafter WRA) was surveyed starting September 2010 as the area was accessible since early September. The survey transect is provided in **Figure 1.1**.

## 1.3 EM&A Requirements on Ecological impact

The EM&A programme requires environmental monitoring of ecology as specified in the approved EM&A Manual. A summary of ecological impact EM&A requirements is presented in **Table 1.1**:

Table 1.1: Summary of ecological Impact EM&A Requirements

Descriptions	Locations	Frequencies
Birds	Within the Project Area and Assessment Area of 500m	Weekly
Dragonflies and Butterflies	Within the Project Area and Assessment Area of 500m	Once per month during Mar and Sep to November, and twice per month during Apr to Aug
Herpetofauna	Within the Project Area and Assessment Area of 500m	Once per month during Apr to Nov
Water quality of WRA	Wetland Restoration Area	After filling of WRA with water, monthly for in situ water quality and every size months (end of wet season and end of dry season) for laboratory testing
Site Inspections	Within the Project Area and Assessment Area of 500m	Weekly

## 2. Ecological Monitoring

### 2.1 Introduction

In accordance with the EM&A requirements, monitoring of birds, dragonflies and butterflies, and herpetofauna was carried out during the reporting period. In addition, monitoring of mammals was also conducted concurrently with other surveys and the results were reported although it is not required by the EM&A manual. The dates of surveys are summarised in **Appendix A**.

### 2.2 Monitoring of Birds

Monitoring was undertaken following the survey methodology in the EM&A Manual. In addition, low intensity monitoring of the WRA was undertaken (on a monthly basis) to monitor faunal usage of the newly formed cells since September 2010; monitoring intensity will follow that outlined in the EM&A Manual at the completion of the WRA. All bird species of conservation importance and/or wetland dependent were identified and enumerated. Flying birds were not recorded unless they were foraging and/or associated with the habitat (such as swifts). Further, notable bird observations during other surveys were also recorded.

Bird surveys were conducted on a weekly basis. A total of 49 bird species of conservation importance and/or wetland-dependence were recorded within 500 m of the Project area in the survey period. This number includes all bird of prey species recorded and any locally uncommon or rare species. A summary of survey data is provided in **Appendix B**.

A total of 25 bird species were recorded in the Wetland Restoration Area (WRA) between September and October 2010. Of these 25 species, 14 of these bird species of conservation importance and/or wetland-dependence. Bird species of conservation importance recorded so far included four species of ardeids (two of which are target species Little Egret *Egretta garzetta* and Chinese Pond Heron *Ardeola bacchus*), three species of bird of prey and other species of conservation importance such as Black-winged Stilt *Himantopus himantopus*, Little Ringed Plover *Charadrius dubius*, Red-necked Stint *Calidris ruficollis* and Buff-bellied Pipit *Anthus rubescens*. A summary of survey data is provided in **Appendix B**.

Species and numbers recorded in this survey period are typical of fish pond areas during the period indicating that birds in the area are not presently being adversely affected by the construction of the WRA. These findings indicate that the WRA is already starting to support wetland-dependent birds and other species of conservation importance.

### 2.3 Monitoring of Herpetofauna

Monitoring was undertaken following the survey methodology in the EM&A Manual. Day-time herpetofauna surveys were conducted monthly between May and October 2010 and while night-time herpetofauna surveys were conducted once per month between May and August. Further, notable herpetofauna observations during other surveys were also recorded.

A total of five amphibian species and two reptiles species were recorded using the ponds within 500 m of the Project area in the survey period. A summary of survey data is provided in **Appendix C**.

No herpetofauna were recorded in the WRA in the surveys conducted in September and October 2010.

Other significant herpetofauna observations include sightings of Chinese Soft-shelled Turtle *Pelodiscus sinensis* in bird survey on 29 July 2010 and 24 August 2010 in the ponds within 500 m of the Project area. One Common Rat Snake *Ptyas mucosus* was also recorded in the same area on 24 August 2010. Chinese Soft-shelled Turtle is listed as vulnerable in the IUCN red list and the China Red Data Book, while Common Rat Snake is listed as endangered in the China Red data book.

## **2.4 Monitoring of Dragonflies and Butterflies**

Monitoring of dragonflies and butterflies was conducted on a twice-monthly basis between May and August 2010 and on a monthly basis between September and October 2010. Further, notable dragonfly and butterfly observations during other surveys were also recorded.

A total of 17 dragonfly species and 14 butterfly species were recorded using the ponds within 500 m of the Project in the survey period. While ten dragonfly species and three butterfly species were recorded in the WRA. A summary of the survey findings is provided in **Appendix C**.

Other significant sightings of dragonflies and butterflies include a record of one Dancing Dropwing (*Trithemis pallidinervis*) in the WRA on 29 September 2010 during ad hoc site visit. This is an uncommon dragonfly species that occurs in marshes and still waters in Hong Kong. It is a pioneer species in newly created ponds (Wilson 2004). Furthermore, 28 and 14 Coastal Gliders (*Macrodiplex cora*) were observed in the WRA in the survey conducted in September and October respectively. This species is listed as a species of conservation importance by Fellowes et al. (2002; Local Concern).

## **2.5 Monitoring of Mammals**

Monitoring of mammals was conducted concurrently with other surveys but no mammal was recorded during the reporting period.

## 3. Ecological issues

### 3.1 Ecological Issues/Management Activities

No ecological issues or management activities were identified.

### 3.2 Implications to the WRA Design

There were no additional implications to the WRA design from the survey findings.

## 4. Conclusions

### 4.1 Summary of findings

Ecological monitoring between 12 May and 31 October 2010 was carried out following the survey methodology and frequency outlined in the EM&A Manual.

A total of 49 bird species, 5 amphibian species, 2 reptile species, 17 dragonfly species and 14 butterfly species were recorded in the ponds within 500 m of the Project area in the survey period. Survey findings indicate that the ponds within the Survey Area supported numbers and diversity of wetland-dependent birds and other species of conservation importance typical of fish pond areas in the autumn months.

25 bird species, 10 dragonfly species and 3 butterfly species were recorded in the WRA, including 14 bird species of conservation importance and/or wetland-dependence, while all dragonfly species are wetland-dependent. These findings indicate that the WRA is already starting to support wetland-dependent birds and other species of conservation importance.

## 5. References

### 5.1 List of references

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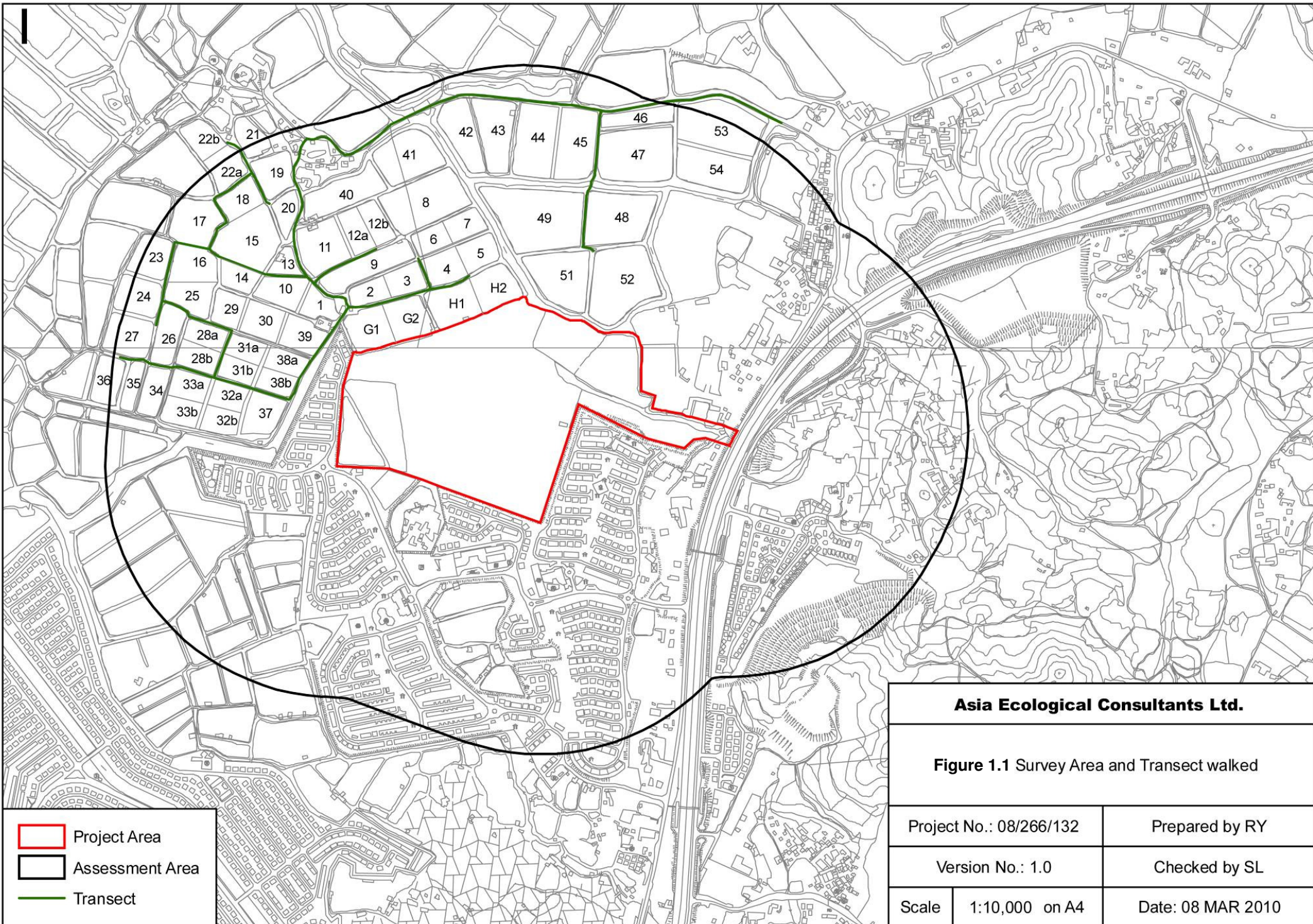
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<b>Asia Ecological Consultants Ltd.</b>		
<b>Figure 1.1 Survey Area and Transect walked</b>		
Project No.: 08/266/132		Prepared by RY
Version No.: 1.0		Checked by SL
Scale	1:10,000 on A4	Date: 08 MAR 2010

## Appendix A. Schedule of Ecological Monitoring

May 2010	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31																
Mammals	/											✓	✓	✓	✓		✓	✓	✓	✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					
Birds												✓											✓											✓													
Herpetofauna																							✓														✓										
Dragonflies & butterflies																							✓														✓										
Inspection Visits												✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	

June 2010	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30						
Mammals	✓			✓				✓	✓					✓	✓						✓															
Birds	✓							✓						✓							✓															
Herpetofauna				✓					✓																											
Dragonflies & butterflies				✓										✓																						
Inspection Visits	✓							✓						✓				✓			✓		✓		✓											

July 2010	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31					
Mammals		✓				✓								✓					✓										✓	✓						
Birds		✓				✓								✓						✓													✓			
Herpetofauna						✓																						✓								
Dragonflies & butterflies														✓																						
Inspection Visits		✓				✓								✓						✓														✓		

August 2010	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31					
Mammals			✓										✓			✓								✓					✓						✓	
Birds			✓										✓				✓							✓											✓	
Herpetofauna																✓											✓									
Dragonflies & butterflies			✓																								✓									
Inspection Visits			✓										✓			✓								✓											✓	

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September 2010	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Mammals							✓										✓								✓					✓
Birds							✓										✓								✓					✓
Herpetofauna							✓																							
Dragonflies & butterflies							✓			✓																				
Inspection Visits		✓				✓	✓						✓		✓		✓							✓		✓		✓	✓	

October 2010	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Mammals								✓			✓									✓								✓			
Birds								✓			✓										✓							✓			
Herpetofauna						✓		✓																							
Dragonflies & butterflies						✓		✓																							
Inspection Visits								✓			✓										✓							✓		✓	

Note:

\* Light grey cells indicated public holidays or Sundays.

One herpetofauna, dragonfly & butterfly survey was conducted within the WRA only on the 6th October 2010. The other survey was conducted in the wider Survey Area (excluding WRA) only on the 8th October 2010. Hence, one complete herpetofauna, dragonfly & butterfly survey was conducted in October.

## Appendix B. Summary of bird surveys

Table B1. Summary of bird monitoring within the Study Area

Species Name	Scientific Name	Conservation Status <sup>(2)</sup>	Mean <sup>(4)</sup>					
			May	Jun	Jul	Aug	Sep	Oct
Little Grebe	<i>Tachybaptus ruficollis</i>	LC, (1)	14.7	11.8	15.2	27.8	13.8	41.3
Great Cormorant	<i>Phalacrocorax carbo</i>	(1)	0.0	0.0	0.0	0.0	0.0	3.0
Grey Heron	<i>Ardea cinerea</i>	PRC, (1)	0.0	0.0	0.0	0.0	3.5	17.8
Great Egret	<i>Egretta alba</i>	PRC, (1)	26.3	30.5	13.0	12.0	40.0	34.3
Intermediate Egret	<i>Egretta intermedia</i>	RC, (1)	0.3	0.0	0.0	0.0	2.8	2.5
Little Egret	<i>Egretta garzetta</i>	PRC, (1)	71.7	56.3	46.0	47.8	108.8	131.5
Cattle Egret	<i>Bubulcus ibis</i>	(LC), (1)	2.0	0.5	0.8	1.2	8.3	11.5
Chinese Pond Heron	<i>Ardeola bacchus</i>	PRC, (1)	23.7	25.0	34.6	48.0	42.5	48.0
Striated Heron	<i>Butorides striatus</i>	(LC), (1)	0.0	0.0	0.0	0.0	0.3	0.0
Black-crowned Night Heron	<i>Nycticorax nycticorax</i>	LC, (1)	3.0	10.8	5.4	3.6	2.8	0.3
Yellow Bittern	<i>Ixobrychus sinensis</i>	(LC), (1)	0.0	0.3	0.0	0.2	0.3	0.5
Black-faced Spoonbill	<i>Platalea minor</i>	PGC, EN, (1)	0.0	0.0	0.0	0.4	0.0	0.0
Black Kite	<i>Milvus migrans</i>	(RC)	0.3	0.0	0.2	0.0	0.8	0.3
Common Kestrel	<i>Falco tinnunculus</i>	-	0.0	0.0	0.0	0.0	0.0	0.3
Japanese Quail	<i>Coturnix japonica</i>	LC, (1)	0.0	0.0	0.0	0.0	0.0	0.3
White-breasted Waterhen	<i>Amaurornis phoenicurus</i>	(1)	4.3	5.8	5.2	4.2	4.0	8.8
Common Moorhen	<i>Gallinula chloropus</i>	(1)	0.0	0.0	0.0	0.4	0.8	7.0
Black-winged Stilt	<i>Himantopus himantopus</i>	RC, (1)	0.7	0.0	0.0	0.0	0.8	11.8
Little Ringed Plover	<i>Charadrius dubius</i>	LC, (1)	5.3	10.8	3.2	6.0	2.0	12.3
Kentish Plover	<i>Charadrius alexandrinus</i>	RC, (1)	0.0	0.0	0.0	0.0	0.0	0.0
Spotted Redshank	<i>Tringa erythropus</i>	RC, (1)	0.0	0.0	0.0	0.0	0.0	0.3
Marsh Sandpiper	<i>Tringa stagnatilis</i>	RC, (1)	0.0	0.0	0.0	0.0	0.0	7.5
Common Greenshank	<i>Tringa nebularia</i>	(1)	0.3	1.0	0.0	0.0	0.0	3.3
Green Sandpiper	<i>Tringa ochropus</i>	(1)	0.0	0.0	0.0	3.0	4.0	9.0
Wood Sandpiper	<i>Tringa glareola</i>	LC, (1)	0.0	0.0	0.4	1.8	1.0	11.8
Common Sandpiper	<i>Actitis hypoleucos</i>	(1)	5.7	0.0	1.8	9.2	12.0	22.3

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Pintail/Swinhoe's Snipe <sup>(3)</sup>	<i>Gallinago stenura/megala</i>	LC, (1)	0.0	0.0	0.0	0.2	0.3	0.0
Common Snipe	<i>Gallinago gallinago</i>	(1)	0.0	0.0	0.0	0.0	0.0	2.3
Temminck's Stint	<i>Calidris temminckii</i>	LC, (1)	0.0	0.0	0.0	0.0	0.0	2.3
Whiskered Tern	<i>Chlidonias hybridus</i>	(1)	3.0	0.0	0.0	0.0	0.0	0.0
White-winged Tern	<i>Chlidonias leucopterus</i>	(1)	14.0	0.0	0.0	0.0	0.0	0.0
Pied Kingfisher	<i>Ceryle rudis</i>	(LC), (1)	0.3	1.0	0.2	0.8	0.0	0.3
Common Kingfisher	<i>Alcedo atthis</i>	(1)	3.3	3.3	4.8	8.2	10.8	12.0
White-throated Kingfisher	<i>Halcyon smyrnensis</i>	(LC)	0.0	0.0	1.4	2.2	1.3	2.8
Red-rumped Swallow	<i>Hirundo daurica</i>	-	0.0	1.3	0.0	0.0	0.0	0.0
Yellow Wagtail	<i>Motacilla flava</i>	(1)	12.7	0.0	0.0	0.6	5.0	13.8
Grey Wagtail	<i>Motacilla cinerea</i>	(1)	0.0	0.0	0.0	0.0	0.0	0.5
Richard's Pipit	<i>Anthus richardi</i>	(1)	0.0	0.0	0.2	0.0	0.0	1.0
Red-throated Pipit	<i>Anthus cervinus</i>	LC	0.0	0.0	0.0	0.0	0.0	0.0
Pallas's Grasshopper Warbler	<i>Locustella certhiola</i>	LC, (1)	0.0	0.0	0.0	0.0	0.3	0.0
Black-browed Reed Warbler	<i>Acrocephalus bistrigiceps</i>	(1)	0.0	0.0	0.0	0.0	0.3	2.5
Oriental Reed Warbler	<i>Acrocephalus orientalis</i>	(1)	0.3	0.0	0.0	0.0	0.3	6.0
Zitting Cisticola	<i>Cisticola juncidis</i>	LC	1.3	0.8	1.2	1.2	0.5	2.5
Red-billed Starling	<i>Sturnus sericeus</i>	GC	0.0	0.0	0.0	7.8	0.0	7.5
White-cheeked Starling	<i>Sturnus cineraceus</i>	PRC	0.0	0.0	0.0	1.6	0.0	0.3
White-shouldered Starling	<i>Sturnus sinensis</i>	(LC)	3.7	5.5	9.2	7.2	0.8	0.0
Collared Crow	<i>Corvus torquatus</i>	LC, NT	0.0	0.0	0.4	3.6	0.3	0.8
<b>No. of Species Recorded</b>			<b>21</b>	<b>15</b>	<b>18</b>	<b>24</b>	<b>29</b>	<b>39</b>

(1) indicates wetland-dependant or -associated species.

(2) conservation status follows that of Fellowes *et al.* (2002) and BirdLife International listing (2010).

(3) includes one species pair, Swinhoe's/Pintail Snipe, not distinguishable in the field.

(4) equals the average number of individual species surveyed in each month (i.e. total counts in all surveys divided by number of surveys in that month).

**Table B2. Summary of bird monitoring in the WRA**

Species Name	Scientific Name	Conservation Status <sup>(2)</sup>	Mean <sup>(3)</sup>		Records outside survey <sup>(4)</sup>
			Sep	Oct	
Grey Heron	<i>Ardea cinerea</i>	PRC, (1)	0	0	✓
Great Egret	<i>Egretta alba</i>	PRC, (1)	0	0	✓

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Little Egret	<i>Egretta garzetta</i>	PRC, (1)	0	0	✓
Chinese Pond Heron	<i>Ardeola bacchus</i>	PRC, (1)	0	0	✓
Black Kite	<i>Milvus migrans</i>	(RC)	0	0	✓
Common Kestrel	<i>Falco tinnunculus</i>	-	0	0	✓
Peregrine Falcon	<i>Falco peregrinus</i>	-	0	0	✓
Black-winged Stilt	<i>Himantopus himantopus</i>	RC, (1)	8	0	✓
Little Ringed Plover	<i>Charadrius dubius</i>	LC, (1)	3	0	✓
Common Sandpiper	<i>Actitis hypoleucos</i>	(1)	1	0	
Red-necked Stint	<i>Calidris ruficollis</i>	LC, (1)	3	0	
Spotted Dove	<i>Spilopelia chinensis</i>	-	0	0	✓
Little Swift	<i>Apus affinis</i>	-	10	0	
Barn Swallow	<i>Hirundo rustica</i>	-	25	0	
Yellow Wagtail	<i>Motacilla flava</i>	(1)	0	0	✓
White Wagtail	<i>Motacilla alba</i>	(1)	3	0	
Richard's Pipit	<i>Anthus richardi</i>	(1)	0	0	✓
Red-throated Pipit	<i>Anthus cervinus</i>	LC	0	2	
Buff-bellied Pipit	<i>Anthus rubescens</i>	LC	0	1	
Common Stonechat	<i>Saxicola torquata</i>	-	0	3	✓
Plain Prinia	<i>Prinia inornata</i>	-	0	0	✓
Dusky Warbler	<i>Phylloscopus fuscatus</i>	-	0	0	✓
Scaly-breasted Munia	<i>Lonchura punctulata</i>	-	20	0	
Eurasian Tree Sparrow	<i>Passer montanus</i>	-	20	0	✓
Crested Myna	<i>Acridotheres cristatellus</i>	-	3	0	
<b>No. of Species Recorded</b>			<b>10</b>	<b>3</b>	<b>16</b>

(1) indicates wetland-dependant or -associated species.

(2) conservation status follows that of Fellowes *et al.* (2002) and BirdLife International listing (2010).

(3) equals the average number of individual species surveyed in each month (i.e. total counts in all surveys divided by number of surveys in that month).

(4) includes observations during other surveys and/or site visits.

## Appendix C. Summary of herpetofauna monitoring, mammals and insects surveys

Table C1. Summary of herpetofauna monitoring within the Study Area

Species Name	Scientific Name	Conservation Status <sup>(1)</sup>	Mean <sup>(42)</sup>					
			May	Jun	Jul	Aug	Sep	Oct
Asian Common Toad	<i>Bufo melanostictus</i>	-	0.0	0.0	0.5	1.5	0.0	0.0
Asiatic Painted Frog	<i>Kaloula pulchra</i>	-	0.0	0.0	25.5	0.0	0.0	0.0
Ornate Pigmy Frog	<i>Microhyla ornata</i>	-	0.0	0.5	15.0	0.0	0.0	0.0
Günther's Frog	<i>Rana guentheri</i>	-	9.5	2.0	1.0	3.5	0.0	0.0
Brown Tree Frog	<i>Polypedates megacephalus</i>	-	0.0	0.0	1.0	1.0	0.0	0.0
<b>No. of Species Recorded</b>			<b>1</b>	<b>2</b>	<b>5</b>	<b>3</b>	<b>0</b>	<b>0</b>
Species Name	Scientific Name	Conservation Status <sup>(1)</sup>	Mean <sup>(2)</sup>					
			May	Jun	Jul	Aug	Sep	Oct
Bowring's Gecko	<i>Hemidactylus bowringii</i>	-	0.0	1.0	3.0	3.0	0.0	0.0
Checkered Keelback	<i>Xenochrophis piscator</i>	-	0.0	0.0	0.0	0.5	0.0	0.0
<b>No. of Species Recorded</b>			<b>0</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>0</b>	<b>0</b>

Notes:

(1) conservation status follows that of Fellowes et al. (2002) and Shek (2006).

(2) equals the average number of individual species surveyed in each survey (i.e. total counts in all surveys divided by number of surveys in that month).

(3) there was no record of herpetofauna in the WRA in September and October 2010.

Table C2. Summary of mammal monitoring within the Study Area

Species Name	Scientific Name	Conservation Status <sup>(1)</sup>	Max <sup>(2)</sup>					
			May	Jun	Jul	Aug	Sep	Oct
No record	-	-	-	-	-	-	-	-

Notes:

(1) conservation status follows that of Fellowes et al. (2002), Chan et al. (2005) and Karsen et al. (1998).

(2) refers to the maximum number of individuals recorded in each month

Table C3. Summary of dragonfly and butterfly monitoring conducted within the Study Area

Species Name	Scientific Name	Conservation Status <sup>(1)</sup>	Mean <sup>(2)</sup>					
			May	Jun	Jul	Aug	Sep	Oct
<b>Odonate</b>								
Orange-tailed Midget	<i>Agriocnemis femina</i>	-	0.0	0.0	0.0	0.0	1.0	0.0
Orange-tailed Sprite	<i>Ceriagrion auranticum</i>	-	0.5	0.0	0.0	0.0	0.0	0.0
Common Bluetail	<i>Ischnura senegalensis</i>	-	4.5	2.0	1.0	0.5	4.0	1.0
Pale-spotted Emperor	<i>Anax guttatus</i>	-	0.0	0.5	0.5	0.0	0.0	0.0
Common Flangetail	<i>Ictinogomphus pertinax</i>	-	0.5	0.0	3.5	1.5	1.0	0.0
Golden Flangetail	<i>Sinictinogomphus clavatus</i>	-	0.5	0.0	0.0	0.0	0.0	0.0
Regal Pond Cruiser	<i>Epopthalmia elegans</i>	-	0.0	0.0	0.5	0.0	0.0	0.0
Blue Dasher	<i>Brachydiplax chalybea</i>	-	0.5	0.0	0.5	0.0	0.0	0.0
Asian Amberwing	<i>Brachythemis contaminata</i>	-	10.0	6.0	33.5	9.0	47.0	25.0
Crimson Darter	<i>Crocothemis servilia</i>	-	0.5	0.0	1.5	1.0	0.0	1.0
Amber-winged Glider	<i>Hydrobasileus croceus</i>	-	0.5	0.0	1.0	0.0	0.0	0.0
Coastal Glider	<i>Macrodiplax cora</i>	LC	2.5	14.0	11.0	16.0	64.0	14.0
Green Skimmer	<i>Orthetrum sabina</i>	-	3.5	5.0	7.5	9.5	11.0	12.0
Wandering Glider	<i>Pantala flavescens</i>	-	1.5	0.5	2.5	3.5	59.0	47.0
Variiegated Flutterer	<i>Rhyothemis variegata</i>	-	4.0	12.5	13.5	6.0	2.0	1.0
Saddlebag Glider	<i>Tramea virginia</i>	-	3.5	0.5	0.0	0.0	0.0	0.0
Scarlet Basker	<i>Urothemis signata</i>	LC	0.0	1.5	2.5	0.5	0.0	0.0
<b>No. of Species Recorded</b>			<b>13</b>	<b>9</b>	<b>13</b>	<b>9</b>	<b>8</b>	<b>7</b>
<b>Butterfly</b>								
Dart Species	<i>Potanthus</i> sp.	-	0.0	0.0	0.0	0.5	0.0	0.0
Common Bluebottle	<i>Graphium sarpedon</i>	-	0.0	0.0	0.0	0.0	0.0	1.0
Common Mormon	<i>Papilio polytes</i>	-	0.0	0.0	0.0	0.0	0.0	1.0
Spangle	<i>Papilio protenor</i>	-	0.0	0.5	0.0	0.0	0.0	0.0
Paris Peacock	<i>Papilio paris</i>	-	0.5	0.0	0.0	0.0	0.0	0.0
Red-base Jezebel	<i>Delias pasithoe</i>	-	0.5	1.0	0.5	0.0	0.0	0.0
Indian Cabbage White	<i>Pieris canidia</i>	-	1.5	7.0	1.5	0.0	0.0	0.0
Mottled Emigrant	<i>Catopsilia pyranthe</i>	-	1.0	1.5	0.0	0.5	0.0	1.0

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Common Grass Yellow	<i>Eurema hecabe</i>	-	0.0	2.5	3.5	1.0	3.0	6.0
Pale Grass Blue	<i>Zizeeria maha</i>	-	3.0	1.5	0.0	2.5	1.0	4.0
Lesser Grass Blue	<i>Zizina otis</i>	-	0.0	0.5	0.0	0.0	0.0	0.0
Dark-brand Bush Brown	<i>Mycalesis mineus</i>	-	1.5	0.0	0.0	0.0	0.0	0.0
Common Tiger	<i>Danaus genutia</i>	-	0.0	0.0	0.0	0.0	0.0	2.0
Blue-Spotted Crow	<i>Euploea midamus</i>	-	0.0	0.0	0.0	0.0	1.0	0.0
<b>No. of Species Recorded</b>			<b>6</b>	<b>7</b>	<b>3</b>	<b>4</b>	<b>3</b>	<b>6</b>

Notes:

(1) conservation status follows that of Fellowes *et al.* (2002), Lo & Hui (2004), Wilson (2004) and Young & Yiu (2002).

(2) equals the average number of individual species surveyed in each survey (i.e. total counts in all surveys divided by number of surveys in that month)

Table C4. Summary of dragonfly and butterfly monitoring conducted in the WRA

Species Name	Scientific Name	Conservation Status <sup>(1)</sup>	Mean <sup>(2)</sup>	
			Sep	Oct
<b>Odonate</b>				
Common Bluetail	<i>Ischnura senegalensis</i>	-	1.0	12.0
Pale-spotted Emperor	<i>Anax guttatus</i>	-	1.0	0.0
Common Flangetail	<i>Ictinogomphus pertinax</i>	-	1.0	0.0
Asian Amberwing	<i>Brachythemis contaminata</i>	-	27.0	58.0
Blue Percher	<i>Diplacodes trivialis</i>	-	0.0	2.0
Coastal Glider	<i>Macrodiplax cora</i>	LC	28.0	14.0
Green Skimmer	<i>Orthetrum sabina</i>	-	19.0	11.0
Wandering Glider	<i>Pantala flavescens</i>	-	198.0	38.0
Variiegated Flutterer	<i>Rhyothemis variegata</i>	-	0.0	1.0
Saddlebag Glider	<i>Tramea virginia</i>	-	6.0	0.0
<b>No. of Species Recorded</b>			<b>8</b>	<b>7</b>
<b>Butterfly</b>				
Tailed Jay	<i>Graphium agamemnon</i>	-	0.0	1.0
Mottled Emigrant	<i>Catopsilia pyranthe</i>	-	2.0	0.0
Common Grass Yellow	<i>Eurema hecabe</i>	-	2.0	2.0
<b>No. of Species Recorded</b>			<b>2</b>	<b>2</b>

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Notes:

- (1) conservation status follows that of Fellowes *et al.* (2002), Lo & Hui (2004), Wilson (2004) and Young & Yiu (2002).
- (2) equals the average number of individual species surveyed in each survey (i.e. total counts in all surveys divided by number of surveys in that month)