

Proposed Comprehensive Development at Wo Shang Wai, Yuen Long

Biannual EM&A Report on Ecology for May 2012 to Oct 2012 (Rev. B)

April 2013

Report No.: 266567/49/B

Mott MacDonald

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Pursuant to Condition 4.6 of Environmental Permit No. EP-311/2008/D, this Biannual EM&A Report (Rev B) on ecological aspects for May 2012 to October 2012 has been reviewed, certified by the Environmental Team Leader (ETL) and verified by the Independent Environmental Checker (IEC).

Certified by:

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6 June 2013

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1. Introduction

1.1 Background

In March 2005, the Project Proponent, Profit Point Enterprises Limited, acquired the development site at Wo Shang Wai in Yuen Long. An Environmental Impact Assessment (EIA) was then carried out and approved under the EIA Ordinance (EIAO), and the Environmental Permit (EP-311/2008) for construction of the comprehensive development in Wo Shang Wai was first granted by EPD on 9 September 2008 and has been subsequently varied, with the current version (EP-311/2008/C) issued by EPD on 2 November 2012.

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. The site formation construction works of the Wetland Restoration Area (hereafter WRA) were completed on 15 November 2010, while the 30-month establishment period of the WRA was concluded in October 2012 – this indicated that planting works as scheduled in the approved Wetland Restoration and Creation Scheme (WRCS; Nov 2009) was complete, except along the western and southern boundary where the planting is affected by the existing site boundary and noise barrier, and for which an approved Variation to Environmental Permit (EP-311/2008/C) to defer planting at the location applies.

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 5th Biannual EM&A report and it summarises the findings on EM&A results of ecological aspects during the period from 1 May 2012 to 31 October 2012. This report documents surveys and management activities conducted in the Survey Area and WRA between 1 May 2012 and 31 October 2012, which is based on ecological surveys and advices on management were undertaken by AEC Ltd between May and August 2012, and data and management advice provided by the subsequently appointed ecological consultant (Green Power/Ecological Resource Centre) for the months of September and October 2012.

1.2 Survey Area

Surveys were conducted within 500m of the Project area. The WRA was surveyed since early September 2010. The survey area and transect are 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

Descriptions	Locations	Frequencies
Dragonflies and Butterflies	Within the Project Area and Assessment Area of 500m	Once per month during Mar and Sep to Nov, and twice per month during Apr to Aug
Herpetofauna	Within the Project Area and Assessment Area of 500m	Daytime: Once per month during Apr to Nov Night-time: Once per month during Mar to Aug
Water quality of Wetland Restoration Area (WRA)	WRA	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 and frequency outlined in the EM&A Manual (Table 7-1). Since September 2010, monitoring included the newly formed cells to monitor faunal usage of this area.. 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 throughout the period. A total of 47 bird species were recorded in the Survey Area (excluding the WRA) in May to October 2012, 24 of which were species of conservation importance and/or wetland-dependence. A summary of survey data is provided in **Appendix B**.

A total of 35 species were recorded in the WRA in the survey periods, 21 of which were species of conservation importance and/or wetland-dependent species. All three target species (i.e. Little Egret *Egtretta garzetta*, Eastern Cattle Egret *Bubulcus coromandus* and Chinese Pond Heron *Ardeola bacchus*), and up to three individuals of Collared Crow *Corvus torquatus*, a near-threatened species (IUCN 2012), were recorded in the WRA. Outside routine surveys, one Greater Painted-snipe *Rostratula benghalensis* and one Black-crowned Night Heron *Nycticorax nycticorax* were observed in WRA in October 2012; both are wetland dependent and of Local Concern (Fellowes *et al.*, 2002).

The fishponds to the north of the WRA are at a greater distance from the residential portion and any disturbance impact(s) from the construction works would have first affected the WRA. Further, 60 bird species of conservation importance and/or wetland-dependence, were observed using the site, including some bird species which are highly sensitive to disturbance and all three bird target species. Thus, the WRA is considered to be effective both in acting as a buffer against potential disturbance impacts from the construction site and in providing suitable wetland habitats at the fringe of the Deep Bay system.

2.3 Monitoring of Herpetofauna

Monitoring was undertaken following the survey methodology in the EM&A Manual. Day-time herpetofauna surveys were conducted once a month between May 2012 and October 2012, while night-time herpetofauna surveys were conducted once per month between May 2012 and August 2012. Further, notable herpetofauna observations during other surveys were also recorded.

Six amphibian species and three reptile species were recorded using the ponds in the survey area (excluding WRA) in the survey period, while three amphibian species and one reptile species were recorded in the WRA in the surveys conducted in the reporting period. One Chinese Soft-shelled Turtle *Pelodiscus sinensis* was found in one of the ponds north of the WRA on 8 August, which is a species

considered as Global Concern (Fellowes *et al*., 2002) and listed as Vulnerable in IUCN Red List and China Red Data Book. A summary of survey data is provided in **Appendix C**.

2.4 Monitoring of Dragonflies and Butterflies

Monitoring of dragonflies and butterflies was conducted twice-monthly between May 2012 and August 2012, and once a month in September 2012 and October 2012. Further, notable dragonfly and butterfly observations during other surveys were recorded.

A total of 13 dragonfly species and nine butterfly species were recorded in the survey area (excluding WRA) in the survey period. At the WRA, including two dragonfly species of conservation importance, comprising Coastal Glider *Macrodiplax cora* (observed during May to Aug with peak count of 11 individuals) and Scarlet Basker *Urothemis signata* (observed in May & August 2012 with peak count of 2 individuals). At the WRA, a higher diversity of dragonfly species (19 species) and eight butterfly species were recorded. Both Coastal Glider (observed in June to August 2012 with peak count of 4 individuals) and Scarlet Basker (observed in May with peak count of 5 individuals) were also recorded in WRA.. A summary of the survey findings is provided in **Appendix C**.

2.5 Monitoring of Mammals

Monitoring of mammals was conducted concurrently with other surveys. Three species were recorded in the Study Area (excluding WRA) in the survey period, while one species, Brown Rat *Rattus norvegicus*, was recorded in the WRA. None of these species have conservation interest.

Notable records in the WRA outside surveys in October 2012 included Small Asian Mongoose *Herpestes javanicus* and Japanese Pipistrelles *Pipistrellus abramus*, both species are considered as Local Concern (Fellowes et al., 2002) and are common and widespread in the area. A summary of the survey findings is provided in **Appendix C**.

2.6 Monitoring of Water Quality

Monthly water quality monitoring continued during the reporting period. Monitoring parameters followed that in the EM&A Manual. pH of all cells in July 2012 reached action levels, but returned to acceptable levels in the following month. In September 2012, pH of cell 4 reached action level but improved again in October. However, pH of cell 1 and cell 2 reached action level in October 2012. The wet season in 2012 was noted for its drier condition than normal, except for spells of monsoon-associated rainfall. Further, the pH levels only marginally exceeded the action limit. Thus, water quality improved after heavy rainfall. Monitoring data are presented in **Appendix D**.

2.7 Monitoring of Soil Quality

Pedology samples were collected on the 24 May 2012 for analysis of soil quality. Results of analysis are presented in **Appendix D**.

3. Ecological issues

3.1 Vegetation Management

Vegetation management activities undertaken at the site primarily involved watering of plants, weeding and grass cutting. Some supplemental planting was undertaken at end of August 2012.

On top of the routine vegetation management items, a site visit to inspect potential damage after Typhoon Vicente in July was undertaken, which resulted in an instruction to provide tree support (ties and stakes) for some of the damaged planted whips and shrubs.

3.2 Wildlife Management

Removal of Golden Apple Snails was undertaken on an “as-seen” basis.

All fire ant nests were treated with an AFCD-approved method.

4. Conclusions

4.1 Summary of Findings

Ecological monitoring between 1 May 2012 and 31 October 2012 was carried out following the survey methodology and frequency outlined in the EM&A Manual.

Summary of survey findings listed as follow:

Table 4.1: Summary of Ecological Monitoring in WRA and Survey Area

Number of Species	Survey Area (excluding WRA)	WRA
Birds (total)	47	35
Birds (of conservation importance and/or wetland-dependence)	24	21
Amphibians	6	3
Reptiles	3	1
Mammals	3	1
Dragonflies	13	19
Butterflies	9	8

A total of 35 bird species, three amphibian species, one reptiles species, one mammal species, 19 dragonfly species and 8 butterfly species were recorded in the WRA, including 21 bird species of conservation importance and/or wetland-dependence, while all dragonfly species are wetland-dependent. These findings indicate that the WRA is supporting wetland-dependent birds and other species of conservation importance.

Survey findings support that the WRA is attracting the three target bird species to varying degrees. The site was particularly attractive to Chinese Pond Heron, which was recorded on a near-weekly basis, with monthly means ranging from 0.8 to 2.2 birds per survey. Little Egret was recorded in three out of the six months under review (August to October 2012), with monthly means ranging from 0.3 to 1.2 birds per survey. Eastern Cattle Egret was least attracted to the site, with records from two of the six months under review (June and August 2012), and monthly means ranging from 0.2 to 0.3 bird per survey.

With the completion of planting as scheduled in the approved HCMP in August 2012, establishment work at the WRA is considered complete (except along the western and southern boundary where the planting is affected by the existing site boundary and noise barrier, and for which an approved Variation to Environmental Permit (EP-311/2008/C) to defer planting at the location applies), and the 30-month establishment period concluded in October 2012. A review of the performance of the WRA in terms of target species attraction over the 30-month establishment period is provided in Section 4.2 below.

It should be noted that the high planting density was intended to ensure a rapid establishment of the site prior to occupation intake, and not intended to be maintained as a long-term tree density at the WRA. It is a standard arboricultural practice to apply appropriate horticultural/arboricultural maintenance methods in the subsequent five or six years after initial planting to remove less desired specimens to facilitate the successful growth of those which are of higher landscape and/or ecological value. Further, some fine-tuning of planting locations and tree/shrub mix is required in order to fulfill the design intent of the habitat structure at WRA after reviewing the site configuration following site formation. Vegetation management

hereafter should largely consist of maintenance of planted trees and shrubs for the creation of suitable habitats for target species and long-term habitat structure of the site.

4.2 WRA Performance for the Target Species during the Establishment Period

The provision, maintenance and operation of a WRA are a requirement under the Environmental Permit for compensation for predicted ecological impacts to species of conservation importance. Three bird target species were identified during the EIA process; these are Little Egret, Eastern Cattle Egret and Chinese Pond Heron. Target levels of these species are the annual mean number recorded during the Baseline Ecological Monitoring (i.e. a mean of 5.5 Little Egret, 1.3 Eastern Cattle Egret and 1.3 Chinese Pond Heron over a 12-month period). Thus, the ecological impact of the project to the species concerned is considered to have been fully compensated for when the target level for each of the three species is achieved. Whilst further discussion and agreement regarding the target levels is yet to be undertaken with the relevant Government departments prior to the operation of the WRA, the proposed level offers a clear reference to the effectiveness of the mitigation measures. According to the approved Wetland Creation and Restoration Scheme (Nov 2009, hereafter WCRS), the WRA is anticipated to be fully operational after an establishment period of 2.5 years (30 months).

All three bird target species were recorded using the site, with the Chinese Pond Heron recorded most regularly (recorded in 25 out of 30 months), followed by Little Egret (recorded in 18 out of 30 months) and most infrequently by Eastern Cattle Egret (only recorded in 7 out of 30 months). Table 4.2 below presents the target level achievement of the three target bird species during the establishment period.

Table 4.2: Annual Mean of the Three Bird Target Species Recorded at the WRA between May 2010 and Oct 2012

Common Name	Scientific name	Conservation Status	May10-Apr11	May11-Apr12	May12-Oct12*
Little Egret	*Egretta garzetta*	PRC	1.59	1.00	0.38*
Eastern Cattle Egret	*Bubulcus coromandus*	(LC)	0.00	1.18	0.08*
Chinese Pond Heron	*Ardeola bacchus*	PRC	0.19	**2.74**	**1.43***

Values in bold indicates that the Target Level was achieved

Conservation Status follows that of Fellowes *et. al.* (2002)

* note that this period cover six monthly only (and excludes the dry season when these species might be expected to be more abundant within the WRA.

Based on Table 4.2 above, the target level for Chinese Pond Heron is achieved between May 2011 and April 2012. Target levels for Little Egret and Eastern Cattle Egret have not been achieved in the 30 months under review. This is considered acceptable as the WRA was still being established in that period. However, should this situation continue, a review of the management of the WRA and adaptive management steps will be required.

A total of 95 bird species have been recorded within the WRA since completion of site formation. Of the 95 species, 60 were species of conservation importance and/or wetland dependence - indicating that the WRA provides suitable habitat for these species despite the construction work within the residential portion of the Project Site. A list of the bird species recorded at the WRA since completion of site formation is provided in **Appendix B** (Table B4).

5. References

5.1 List of References

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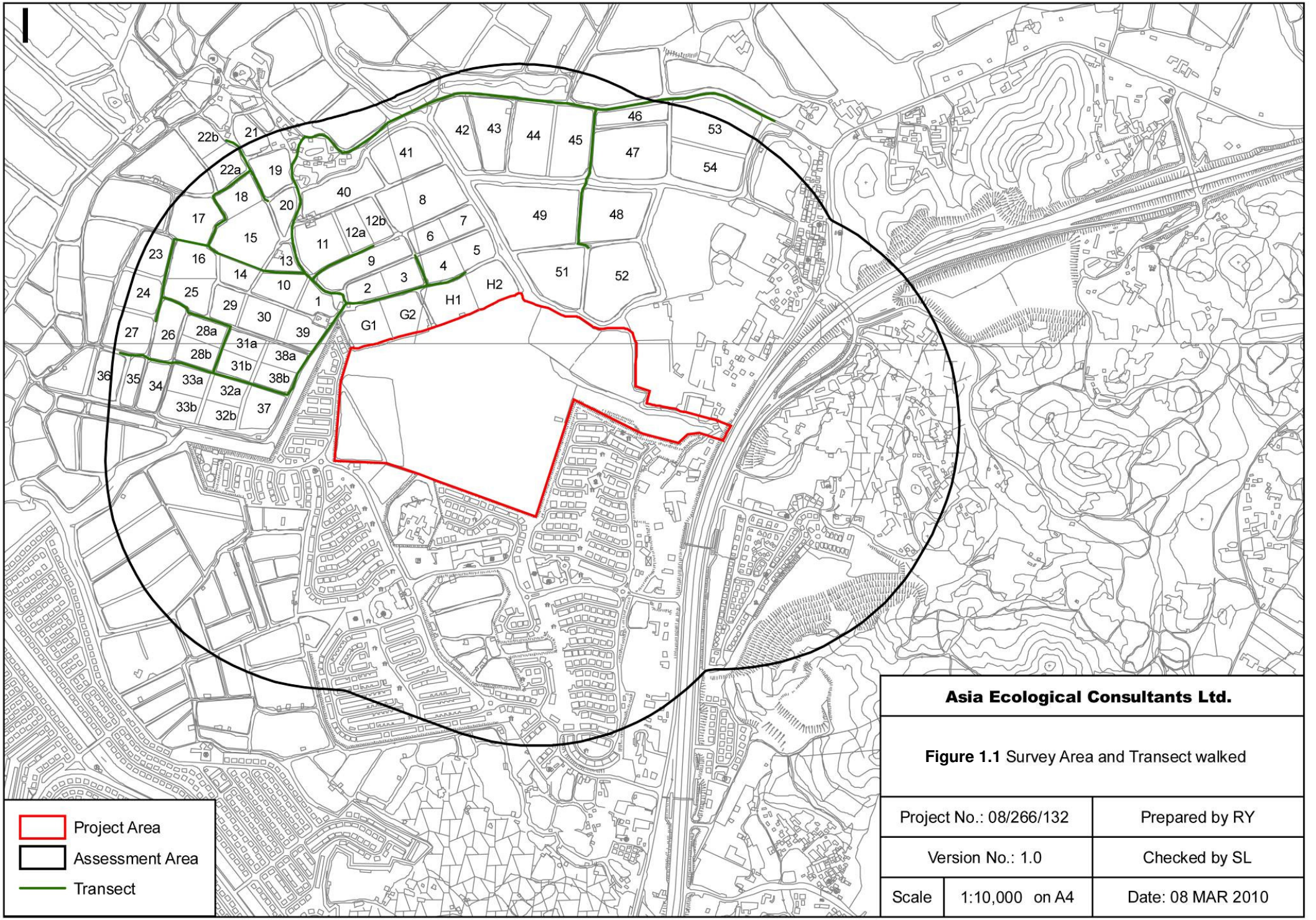

Asia Ecological Consultants Ltd.

Figure 1.1 Survey Area and Transect walked

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 2012	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									✓							✓															
Water Quality															✓																
Inspection Visits				✓							✓					✓						✓									✓

Jun 2012	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	✓																			✓										
Water Quality																						✓								
Inspection Visits					✓								✓						✓			✓					✓			

Jul 2012	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									✓							✓															
Water Quality																	✓														
Inspection Visits					✓					✓								✓									✓				

Aug 2012	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						✓										✓															
Water Quality							✓																								
Inspection Visits	✓							✓							✓								✓					✓			

Sep 2012	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											✓																			
Water Quality																								✓						
Inspection Visits				✓										✓			✓													

Oct 2012	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												✓																			
Water Quality																								✓							
Inspection Visits					✓								✓							✓							✓				

Note:

* Light grey cells indicate public holidays, Saturdays or Sundays.

Appendix B. Summary of Bird Surveys

Table B1. Summary of bird monitoring within the Survey Area (excluding the WRA)

Common Name[2]	*Scientific Name*[2]	Conservation Status [3]	Mean[4]					
			May	Jun	Jul	Aug	Sep[1]	Oct[1]
Little Grebe	*Tachybaptus ruficollis*	LC, (5)	7.3	0.5	8	12.6	15.5	18
Great Cormorant	*Phalacrocorax carbo*	PRC, (5)	0	0	0	0	0	2.6
Grey Heron	*Ardea cinerea*	PRC, (5)	0.3	0	0	0.4	3.3	0.8
Great Egret	*Ardea alba*	PRC, (5)	5.8	7.3	7.3	7.2	5	4
Intermediate Egret	*Egretta intermedia*	RC, (5)	0.5	0	0	0	0	3.9
Little Egret	*Egretta garzetta*	PRC, (RC), (5)	8.5	8.3	22.8	14.6	6	11.8
Eastern Cattle Egret	*Bubulcus coromandus*	(LC), (5)	0.8	0.8	0.3	2	0	0
Chinese Pond Heron	*Ardeola bacchus*	PRC, (RC), (5)	6.3	2.3	23.8	18.6	5.5	10
Black-crowned Night Heron	*Nycticorax nycticorax*	(LC), (5)	1	1.8	3.3	1.4	0	0
Yellow Bittern	*Ixobrychus sinensis*	(LC), (5)	0	0	0.3	0	0.3	0
Black Kite	*Milvus migrans*	(RC)	0	0	0	0	0	0.4
White-breasted Waterhen	*Amaurornis phoenicurus*	(5)	0	0	4.8	1.8	1.8	4.1
Common Moorhen	*Gallinula chloropus*	(5)	0	0	0.3	0	0	0
Pied Avocet	*Recurvirostra avosetta*	RC, (5)	48.8	0	0	0	0	0
Little Ringed Plover	*Charadrius dubius*	(LC), (5)	0.5	0	0.5	0	0	0
Common Greenshank	*Tringa nebularia*	RC, (5)	0	0	0	0	0	1.9
Green Sandpiper	*Tringa ochropus*	(5)	0	0	0	0	0.8	1.4
Common Sandpiper	*Actitis hypoleucos*	(5)	0	0	0.3	3.4	1.8	1.9
Whiskered Tern	*Chlidonias hybrida*	(5)	0.3	0	0	0	0	3.1
Pied Kingfisher	*Ceryle rudis*	(LC), (5)	0	0	0	0.6	0	0
Common Kingfisher	*Alcedo atthis*	(5)	0	0	1.3	3.2	1.8	5.6
White-throated Kingfisher	*Halcyon smyrnensis*	(LC)	0	0	0.5	0.6	0.3	0
Zitting Cisticola	*Anas penelope*	LC	0	0.3	0	0	0	0
Collared Crow	*Corvus torquatus*	LC, NT	0	0	0	0.2	0.3	0
No. of Species Recorded			**11**	**7**	**13**	**13**	**12**	**15**

(1) Surveys in September and October 2012 were conducted by Green Power/Ecological Resource Centre.
(2) Follows HK bird list (dated 2012-9-03)
(3) Conservation status follows that of Fellowes *et al.* (2002) and BirdLife International listing (2010).
(4) Refers to the mean number of individuals recorded in each survey in the Survey Area (excluding the WRA)
(5) Indicates wetland-dependant or wetland-associated species.

Table B2. Summary of bird monitoring in the WRA

Common Name[2]	*Scientific Name*[2]	Conservation Status[3]	Mean[4]					
			May	Jun	Jul	Aug	Sep[2]	Oct[2]
Little Grebe	*Tachybaptus ruficollis*	LC, (5)	0.8	1	1.3	0.2	0	0.2
Grey Heron	*Ardea cinerea*	PRC, (5)	0	0	0.3	0	0	0.4
Great Egret	*Ardea alba*	PRC, (5)	1	0.3	0	0.4	0.5	1.5
Intermediate Egret	*Egretta intermedia*	RC, (5)	0	0	0	0	0.3	0.9
Little Egret	*Egretta garzetta*	PRC, (5)	0	0	0	0.8	0.3	1.2
Eastern Cattle Egret	*Bubulcus coromandus*	(LC), (5)	0	0.3	0	0.2	0	0
Chinese Pond Heron	*Ardeola bacchus*	PRC, (RC), (5)	0.8	1	0.8	2	1.8	2.2
Yellow Bittern	*Ixobrychus sinensis*	LC, (5)	0	0	0	0	0.3	0.2
Black Kite	*Milvus migrans*	RC	0.5	0	0	0	0	0.4
White-breasted Waterhen	*Amaurornis phoenicurus*	(5)	0	0	0.5	1	0.5	0
Common Moorhen	*Gallinula chloropus*	(5)	0	0	0	0.2	0	0
Green Sandpiper	*Tringa ochropus*	(5)	0	0	0	0.2	0	0
Wood Sandpiper	*Tringa glareola*	LC, (5)	0	0	0	0.6	0	0
Common Sandpiper	*Actitis hypoleucos*	(5)	0	0	0	0	0	0.9
Whiskered Tern	*Chlidonias hybrida*	(5)	1.3	0	0	0	0	0
Pied Kingfisher	*Ceryle rudis*	(LC), (5)	0	0	0.5	0	0	0
Common Kingfisher	*Alcedo atthis*	(5)	0	0	0	0.6	0	0.4
White-throated Kingfisher	*Halcyon smyrnensis*	(LC)	0	0	0.3	0	0	0
Red-throated Pipit	*Anthus cervinus*	LC	0	0	0	0	0	0.7
Zitting Cisticola	*Cisticola juncidis*	LC	0	0	0	0.2	0	0
Collared Crow	*Corvus torquatus*	LC, NT	0	0.8	0	0	0	0
No. of Species Recorded			**5**	**5**	**6**	**11**	**6**	**11**

(1) Surveys in September and October 2012 were conducted by Green Power/Ecological Resource Centre.
(2) Follows HK bird list (dated 2012-9-03)
(3) Conservation status follows that of Fellowes *et al.* (2002) and BirdLife International listing (2010).
(4) Refers to the mean number of individuals recorded in each survey in the Survey Area (excluding the WRA)
(5) Indicates wetland-dependant or wetland-associated species.

Table B3. Status Categories of Bird Species

Code	Category	Brief Description	Source
GC	Global Concern	Habitat loss/damage in Hong Kong would pose significant threat to global survival	Fellowes *et al.* (2002)
RC	Regional Concern	Habitat loss/damage in Hong Kong would pose significant threat to regional survival.	
LC	Local Concern	Habitat loss/damage in Hong Kong would pose significant threat to local survival.	
PGC	Potential Global Concern	Large, secure population in Hong Kong is of global significance.	
PRC	Potential Regional Concern	Large, secure population in Hong Kong is of regional significance.	
CR	Critically Endangered	Best available evidence indicates that it meets any of the criteria A to E for Critically Endangered, and it is therefore considered to be facing an extremely high risk of extinction in the wild.	BirdLife International (2010)
EN	Endangered	Best available evidence indicates that it meets any of the criteria A to E for Endangered, and it is therefore considered to be facing a very high risk of extinction in the wild.	
VU	Vulnerable	Best available evidence indicates that it meets any of the criteria A to E for Vulnerable, and it is therefore considered to be facing a high risk of extinction in the wild.	
NT	Near Threatened	Does not qualify for Critically Endangered, Endangered or Vulnerable now, but is close to qualifying for or is likely to qualify for a threatened category in the near future.	

Table B4. Summary of Bird Species Recorded at the WRA and Their Respective Monthly Mean Between September 2010 and October 2012.

Common Name	Scientific name	Conservation Status	Sep-10	Oct-10	Nov-10	Dec-10	Jan-11	Feb-11	Mar-11	Apr-11	May-11	Jun-11	Jul-11	Aug-11	Sep-11	Oct-11	Nov-11	Dec-11	Jan-12	Feb-12	Mar-12	Apr-12	May-12	Jun-12	Jul-12	Aug-12	Sep-12	Oct-12
Little Grebe	*Tachybaptus ruficollis*	LC, (1)					0.5						1	3.8	0.8	0.5	0.5		0.6		1.4	1.6	0.8	1	1.3	0.2		0.2
Great Cormorant	*Phalacrocorax carbo*	PRC, (1)					0.8									0.3	0.3	0.4	1.2	0.7	0.2							
Grey Heron	*Ardea cinerea*	PRC, (1)			1	1.6	2	2	0.4							1	2.5	1.8	0.8	2.3	0.8				0.3			0.4
Purple Heron	*Ardea purpurea*	RC, (1)														0.3	0.3											
Great Egret	*Ardea alba*	PRC, (1)				0.4	14	2	0.2	0.5	0.3	0.5	0.3		1.5	1.8	0.8	1.2	0.6	0.7	0.6	0.6	1	0.3		0.4	0.5	1.5
Intermediate Egret	*Egretta intermedia*	RC, (1)					1.7	0.8	0.2						1.5	1.5	1.5	1	0.6	0.7	0.6	0.6					0.3	0.9
Little Egret	*Egretta garzetta*	PRC, (1)				1.8	8	2	0.4	0.5	0.8	0.3	0.3	1	1	0.5	1.5	1.6	1.4	2	1.6					0.8	0.3	1.2
Eastern Cattle Egret	*Bubulcus coromandus*	(LC), (1)										0.3	11.8		1.3	0.3			0.4					0.3		0.2		
Chinese Pond Heron	*Ardeola bacchus*	PRC, (1)			1	0.2				0.3	0.3	0.3	1.5	4.2	7.8	4.5	5.3	2.4	0.3	2.3	2.6	1.4	0.8	1	0.8	2	1.8	2.2
Yellow Bittern	*Ixobrychus sinensis*	(LC), (1)														0.5	0.3											
Eurasian Spoonbill^	*Platalea leucorodia*	LC, (1)																										
Black-faced Spoonbill	*Platalea minor*	PGC, EN, (1)					0.3	10.3											0.4									
Mandarin Duck	*Aix galericulata*	(1)														0.3												
Eurasian Wigeon	*Anas penelope*	RC, (1)				1.6	2.5																					
Eurasian Teal	*Anas crecca*	RC, (1)					1																					
Northern Pintail	*Anas acuta*	RC, (1)				0.2	7																					
Garganey^	*Anas querquedula*	(1)																										
Western Osprey	*Pandion haliaetus*	RC, (1)				0.2																						
Black Kite	*Milvus migrans*	(RC)					0.8	0.3	0.2		0.3				0.3				0.2			0.2	0.5					0.4
Eastern Buzzard	*Buteo japonicus*	-							0.2																			
Common Kestrel	*Falco tinnunculus*	-			1	0.4	1	0.3	0.4																			
Eurasian Hobby^	*Falco subbuteo*	(LC), (1)																										
Peregrine Falcon	*Falco peregrinus*	-																										
Japanese Quail	*Coturnix japonica*	LC, (1)																										
White-breasted Waterhen	*Amaurornis phoenicurus*	(1)									0.5	0.8	1.3	2.6	1.3	1.5	0.3					0.4			0.5	1	0.5	
Common Moorhen	*Gallinula chloropus*	(1)																								0.2		
Pheasant-tailed Jacana	*Hydrophasianus chirurgus*	LC, (1)															0.3											
Greater Painted-snipe	*Rostratula benghalensis*	LC, (1)								0.5																		
Black-winged Stilt	*Himantopus himantopus*	RC, (1)	8													1												
Pied Avocet	*Recurvirostra avosetta*	RC, (1)				0.2															0.2							
Oriental Pratincole	*Glareola maldivarum*	LC, (1)								2.5																		
Little Ringed Plover	*Charadrius dubius*	LC, (1)	3		24.5	7.4	3.8	9	6.8	10.5	5.5	0.5		0.2						1	0.6							
Kentish Plover^	*Charadrius alexandrinus*	RC, (1)																										
Spotted Redshank^	*Tringa erythropus*	RC, (1)																										
Common Redshank^	*Tringa totanus*	RC, (1)																										
Marsh Sandpiper^	*Tringa stagnatilis*	RC, (1)																										
Common Greenshank	*Tringa nebularia*	RC, (1)			0.5											0.3	0.8	0.2										
Green Sandpiper	*Tringa ochropus*	(1)			1	0.4	0.5	0.5	0.4				0.3						0.2		0.2	0.4				0.2		
Wood Sandpiper	*Tringa glareola*	LC, (1)						0.5	1.2										0.8	0.3						0.6		
Common Sandpiper	*Actitis hypoleucos*	(1)	1		0.5	1		0.5	0.6	1	0.3			0.2							0.4	0.2						0.9
Eurasian Woodcock^	*Scolopax rusticola*	(1)																										
Pintail/Swinhoe's Snipe*	*Gallinago stenura/G. megala*	LC*, (1)			0.5											0.3												
Common Snipe	*Gallinago gallinago*	(1)						0.3	0.2																			
Red-necked Stint	*Calidris ruficollis*	LC, (1)	3																									
Temminck's Stint	*Calidris temminckii*	LC, (1)			0.5			2.5	0.4	1.3																		
Long-toed Stint	*Calidris subminuta*	LC, (1)																		0.3								
Whiskered Tern	*Chlidonias hybrida*	(1)																					1.3					
Domestic Pigeon	*Columba livia*	-												v														

Common Name	Scientific name	Conservation Status	Sep-10	Oct-10	Nov-10	Dec-10	Jan-11	Feb-11	Mar-11	Apr-11	May-11	Jun-11	Jul-11	Aug-11	Sep-11	Oct-11	Nov-11	Dec-11	Jan-12	Feb-12	Mar-12	Apr-12	May-12	Jun-12	Jul-12	Aug-12	Sep-12	Oct-12
Oriental Turtle Dove	*Streptopelia orientalis*	-													0.2													
Red Turtle Dove^	*Streptopelia tranquebarica*	-																										
Spotted Dove	*Spilopelia chinensis*	-																v		v	v		v			v		v
Savanna Nightjar^	*Caprimulgus affinis*	-																										
Pacific Swift	*Apus pacificus*	(LC)								0.3																		
House Swift	*Apus nipalensis*	-	10						0.2											v	v							
Pied Kingfisher	*Ceryle rudis*	(LC), (1)				0.2	0.3	0.5	0.2			0.3									0.2				0.5			
Common Kingfisher	*Alcedo atthis*	(1)				0.4	0.5	0.3		0.3	0.5	1	0.3	1	0.8	0.5	0.8	1	0.4		0.8					0.6		0.4
White-throated Kingfisher	*Halcyon smyrnensis*	(LC)															0.3								0.3			
Barn Swallow	*Hirundo rustica*	-	25					1.5												v	v		v		v	v	v	
Eastern Yellow Wagtail	*Motacilla tschutschensis*	(1)			14.5	10.2	15	23.5	8.2	11.8	1.8			0.2	0.8	1.5	2	1.2	0.6		4	1						
Grey Wagtail	*Motacilla cinerea*	(1)				0.2		0.3	0.2						0.3													
White Wagtail	*Motacilla alba*	(1)	3			1.8												v	v	v	v	v				v	v	v
Richard's Pipit	*Anthus richardi*	(1)			1.5	0.8	0.5	1	1	1.8	0.5					0.3		v		v	v	v						
Olive-backed Pipit	*Anthus hodgsoni*	-			0.5													v										
Red-throated Pipit	*Anthus cervinus*	LC		2	2.5	1.2	0.5	0.5	0.2													0.4						0.7
Buff-bellied Pipit	*Anthus rubescens*	LC		1	1.5																							
Chinese Bulbul	*Pycnonotus sinensis*	-																			v		v		v			
Long-tailed Shrike	*Lanius schach*	-																	v	v					v	v		
Oriental Magpie Robin	*Copsychus saularis*	-																		v								
Stejneger's Stonechat	*Saxicola stejnegeri*	-		3	0.5	1	1	0.8	0.2	0.3						1		v	v		v							
Masked Laughingthrush	*Garrulax perspicillatus*	-																							v			
Lanceolated Warbler	*Locustella lanceolata*	(1)														0.3												
Pallas's Grasshopper Warbler	*Locustella certhiola*	LC, (1)														0.3												
Black-browed Reed Warbler	*Acrocephalus bistrigiceps*	(1)														0.3												
Zitting Cisticola	*Cisticola juncidis*	LC							0.2	1.5	2.5	2.5	1	0.4		0.3	0.8	1.8	0.2	0.3	0.6					0.2		
Yellow-bellied Prinia	*Prinia flaviventris*	-																	v		v		v		v	v	v	v
Plain Prinia	*Prinia inornata*	-																			v		v		v	v		
Dusky Warbler	*Phylloscopus fuscatus*	-														0.5		v										
Yellow-browed warbler	*Phylloscopus inornatus*	-																										v
Chinese Penduline-Tit	*Remiz consobrinus*	RC, (1)																			1.2	0.2						
Little Bunting	*Emberiza pusilla*	-			0.5																							
Black-faced Bunting	*Emberiza spodocephala*	-								0.5																		
Chinese Grosbeak	*Eophona migratoria*	LC														0.3												
Scaly-breasted Munia	*Lonchura punctulata*	-	20					2.5		15	7.5												v		v	v	v	
Eurasian Tree Sparrow	*Passer montanus*	-	20																		v		v		v			
Red-billed Starling	*Spodiopsar sericeus*	GC													0.3		0.8	1.6	6.6	39	17.4							
White-cheeked Starling	*Spodiopsar cineraceus*	PRC												6.6														
Black-collared Starling	*Gracupica nigricollis*	-																v	v	v	v					v		
White-shouldered Starling	*Sturnia sinensis*	(LC)									0.3		0.5	2.4														
Common Myna	*Acridotheres tristis*	(1)																		v								
Crested Myna	*Acridotheres cristatellus*	-	3															v					v			v		v
Black-naped Oriole	*Oriolus chinensis*	LC													1													
Black Drongo	*Dicrurus macrocercus*	-																							v	v		
Eurasian Magpie	*Pica pica*	-																			v					v	v	

Common Name	Scientific name	Conservation Status	Sep-10	Oct-10	Nov-10	Dec-10	Jan-11	Feb-11	Mar-11	Apr-11	May-11	Jun-11	Jul-11	Aug-11	Sep-11	Oct-11	Nov-11	Dec-11	Jan-12	Feb-12	Mar-12	Apr-12	May-12	Jun-12	Jul-12	Aug-12	Sep-12	Oct-12
Large-billed Crow	*Corvus macrorhynchos*	-				0.4			0.2																			
Collared Crow	*Corvus torquatus*	LC, NT				0.2	0.3			0.5		0.3		0.8	0.8	0.8	0.5							0.8				
No. of Species Recorded: 95 during regular surveys 10 during other surveys																												

Conservation Status follows that of Fellowes et. al. (2002)

(1) Indicates the bird species is wetland dependent.

* Pintail Snipe and Swinhoe's Snipe cannot be distinguished in field, conservation status refers to Swinhoe's Snipe.

^ Indicates the species is recorded outside regular surveys.

v Indicates species recorded during surveys.

Appendix C. Summary of Herpetofauna Monitoring, Mammals and Insects Surveys

Table C1. Summary of herpetofauna monitoring within the Survey Area (excluding the WRA)

Common Name	*Scientific Name*	Conservation Status[2]	Mean[3]					
Amphibian			**May**	**Jun**	**Jul**	**Aug**	**Sep[1]**	**Oct[1]**
Asian Common Toad	*Duttaphrynus melanostictus*	-	2	0	2	3	0	0
Asiatic Painted Frog	*Kaloula pulchra*	-	0	6	5	0.5	0	0
Ornate Pigmy Frog	*Microhyla ornata*	-	0	0	0	1	0	0
Paddy Frog	*Fejervarya limnocharis*	-	2	1.5	1	0	0	0
Günther's Frog	*Rana guentheri*	-	5	6.5	18	6.5	0	0
Brown Tree Frog	*Polypedates megacephalus*	-	0	0	1	0	0	0
No. of Species Recorded			**3**	**3**	**5**	**4**	**0**	**0**
Reptile			**May**	**Jun**	**Jul**	**Aug**	**Sep[1]**	**Oct[1]**
Bowring's Gecko	*Hemidactylus bowringii*	-	8	2	0.5	4	0	0
Chinese Soft-shelled Turtle	*Pelodiscus sinensis*	VU, GC	0	0	0	1	0	0
Checkered Keelback	*Xenochrophis piscator*	-	0	0	0	0	1	0
No. of Species Recorded			**1**	**1**	**1**	**2**	**1**	**0**

(1) Surveys in September and October 2012 were conducted by Green Power/Ecological Resource Centre.
(2) Conservation status follows that of Fellowes *et al.* (2002), Chan *et al.* (2005), Karsen *et al.* (1998), IUCN Red List (2012) and China Red Data Book (1998).
(3) Refers to the number of individuals recorded in each month in the survey area (excluding the WRA)

Table C2. Summary of herpetofauna monitoring conducted in the WRA

Common Name	*Scientific Name*	Conservation Status[2]	Mean[3]					
Amphibian			**May**	**Jun**	**Jul**	**Aug**	**Sep[1]**	**Oct[1]**
Ornate Pigmy Frog	*Microhyla ornata*	-	0.5	0	0	0	0	0
Paddy Frog	*Fejervarya limnocharis*	-	0.5	0	0	0	0	0
Günther's Frog	*Rana guentheri*	-	0.5	0	0.5	1.5	0	0
	No. of Species Recorded		**3**	**0**	**1**	**1**	**0**	**0**
Reptile			**May**	**Jun**	**Jul**	**Aug**	**Sep[1]**	**Oct[1]**
Bowring's Gecko	*Hemidactylus bowringii*	-	0	0	0	0.5	0	0
	No. of Species Recorded		**0**	**0**	**0**	**1**	**0**	**0**

(1) Surveys in September and October 2012 were conducted by Green Power/Ecological Resource Centre.
(2) Conservation status follows that of Fellowes *et al.* (2002), Chan *et al.* (2005) and Karsen *et al.* (1998).
(3) Refers to the number of individuals recorded in each month in the survey area within the WRA

Table C3. Summary of mammal monitoring within the Study Area (excluding the WRA)

Common Name	*Scientific Name*	Conservation Status[2]	Max[3]					
			May	**Jun**	**Jul**	**Aug**	**Sep[1]**	**Oct[1]**
Musk Shrew	*Suncus murinus*	-	0	0	1	0	0	0
Brown Rat	*Rattus norvegicus*	-	0	0	0	1	0	0
Asiatic House Rat	*Rattus tanezumi*	-	0	0	1	1	0	0
	No. of Species Recorded		**0**	**0**	**2**	**2**	**0**	**0**

(1) Surveys in September and October 2012 were conducted by Green Power/Ecological Resource Centre.
(2) Conservation status follows that of Fellowes *et al.* (2002) and Shek (2006).
(3) Refers to the maximum number of individuals recorded in each month in the survey area (excluding WRA)

Table C4. Summary of mammal monitoring conducted in the WRA

Common Name	*Scientific Name*	Conservation Status[2]	Max[3]					
			May	Jun	Jul	Aug	Sep[1]	Oct[1]
Brown Rat	*Rattus norvegicus*	-	0	0	0	1	0	0
No. of Species Recorded			**0**	**0**	**0**	**1**	**0**	**0**

(1) Surveys in September and October 2012 were conducted by Green Power/Ecological Resource Centre.
(2) Conservation status follows that of Fellowes et al. (2002) and Shek (2006).
(3) Refers to the maximum number of individuals recorded in each month in the survey area within the WRA

Table C5. Summary of dragonfly and butterfly monitoring within the Survey Area (excluding the WRA)

Common Name	*Scientific Name*	Conservation Status[2]	Mean[3]					
Odonate			May	Jun	Jul	Aug	Sep[1]	Oct[1]
Common Bluetail	*Aschnura senegalensis*	-	42.5	2	3	1	0	0
Common Flangetail	*Ictinogomphus pertinax*	-	2	2	2	1	0	0
Asian Pintail	*Acisoma panorpoides*	-	1	1	0	0	0	0
Blue Dasher	*Brachydiplax chalybea flavovittata*	-	0	1	0	1	0	0
Asian Amberwing	*Brachythemis contaminata*	-	17	30.5	205	80.5	0	0
Crimson Darter	*Crocothemis servilia*	-	0	0	1	0	0	0
Coastal Glider	*Macrodiplax cora*	LC	1	7	3	9	0	0
Green Skimmer	*Orthetrum sabina*	-	14.5	12	18.5	6	40	0
Wandering Glider	*Pantala flavescens*	-	1.5	2	0	8	7	0
Variegated Flutterer	*Rhyothemis variegata*	-	14.5	16.5	6	18.5	7	0
Evening Skimmer	*Tholymis tillarga*	-	0	0	0	0	61	0
Saddlebag Glider	*Tramea virginia*	-	0	1	0.5	1.5	28	2
Scarlet Basker	*Urothemis signata*	LC	1	0	0	1	0	0
No. of Species Recorded			**9**	**10**	**8**	**10**	**5**	**1**
Butterfly			**May**	**Jun**	**Jul**	**Aug**	**Sep[1]**	**Oct[1]**
Pale Grass Blue	*Zizeeria maha*	-	2	2	0	0.5	0	0
Plain Tiger	*Danaus chrysippus*	-	0	0	0	1	0	0
Dark-brand Bush Brown	*Mycalesis mineus*	-	0	0	0	0.5	0	0

Common bluebottle	*Graphium sarpedon*	-	0	0	0	0	0	1
Common Mormon	*Papilio polytes*	-	0	0	0.5	0	0	0
Lemon Emigrant	*Catopsilia Pomona*	-	1	4	0	0	0	0
Common Grass Yellow	*Eurema hecabe*	-	1	1	1.5	0.5	0	0
Red-base Jezebel	*Delias pasithoe*	-	1	0	0	0	0	3
Indian Cabbage White	*Pieris canidia*	-	4	1	0	0	0	0
		No. of Species Recorded	**5**	**4**	**2**	**4**	**0**	**2**

(1) Surveys in September and October 2012 were conducted by Green Power/Ecological Resource Centre.
(2) Conservation status follows that of Fellowes *et al.* (2002), Lo & Hui (2004), Wilson (2004) and Young & Yiu (2002).
(3) Refers to the mean number of individuals recorded in each month in the survey area (excluding the WRA)

Table C6. Summary of dragonfly and butterfly monitoring conducted in the WRA

Common Name	*Scientific Name*	Conservation Status[2]	Mean[3]					
Odonate			**May**	**Jun**	**Jul**	**Aug**	**Sep[1]**	**Oct[1]**
Orange-tailed Midget	*Agriocnemis femina*	-	2	1	0	0	0	0
Orange-tailed Sprite	*Ceriagrion auranticum*	-	1.5	0	0	0	0	0
Common Bluetail	*Aschnura senegalensis*	-	61	5	0	0.5	1	0
Pale-spotted Emperor	*Anax guttatus*	-	0	0	0	1	0	0
Common Flangetail	*Ictinogomphus pertinax*	-	4	5	7	4	0	3
Regal Pond Cruiser	*Epophthalmia elegans*	-	0	1	0	0	0	0
Asian Pintail	*Acisoma panorpoides*	-	2.5	0.5	0	0	0	0
Blue Dasher	*Brachydiplax chalybea*	-	8.5	9.5	0.5	0	0	0
Asian Amberwing	*Brachythemis contaminata*	-	6	17.5	4	7.5	10	0
Crimson Darter	*Crocothemis servilia*	-	2.5	4	4	15	0	0
Amber-winged Glider	Hydrobasileus croceus	-	0	0	2.5	2	0	0
Coastal Glider	Macrodiplax cora	LC	0	1	2	3	0	0
Pied Percher	Neurothemis tullia	-	2.5	4	0.5	0.5	0	0
Green Skimmer	Orthetrum sabina	-	3	5	4	3.5	4	6
Wandering Glider	Pantala flavescens	-	1.5	1	0	3	2	10
Variegated Flutterer	Rhyothemis variegata	-	68	53.5	22.5	30.5	25	3
Evening Skimmer	Tholymis tillarga	-	0	0	0	0	2	0
Saddlebag Glider	Tramea virginia	-	3	2	0.5	2	1	0
Scarlet Basker	Urothemis signata	LC	3	0	0	0	0	0
	No. of Species Recorded		**14**	**14**	**10**	**12**	**7**	**4**
Butterfly			**May**	**Jun**	**Jul**	**Aug**	**Sep[1]**	**Oct[1]**
Long-tailed Blue	*Lampides boeticus*	-	0	0	0	0	0	7
Dark-brand Bush Brown	*Mycalesis mineus*	-	0	0	0	0.5	0	0
Common Mormon	*Papilio polytes*	-	0	0	0.5	0	0	0
Spangle	*Papilio protenor*	-	0	0	0	0	0	1
Lemon Emigrant	*Catopsilia pomona*	-	0	2	0	0	0	1
Common Grass Yellow	*Eurema hecabe*	-	0	1	2	0	0	3

Red-base jezebel	*Delias pasithoe*	-	0	0	0	0	0	1
Indian Cabbage White	*Pieris canidia*	-	0	0	0	0	0	1
No. of Species Recorded			**0**	**2**	**2**	**1**	**0**	**6**

(1) Surveys in September and October 2012 were conducted by Green Power/Ecological Resource Centre.
(2) Conservation status follows that of Fellowes *et al.* (2002), Lo & Hui (2004), Wilson (2004) and Young & Yiu (2002).
(3) Refers to the mean number of individuals recorded in each month in the survey area (excluding the WRA)

Appendix D. Summary of Water and Soil Quality Monitoring

Table D1. Water quality at WRA

May 2012

Cell No.	Temp. (℃)	pH	Salinity (ppt)	Turbidity (mg/L)	DO (mg/L)
1	32.5	7.16	0.91	12	3.48
2	31.2	7.24	1.20	3	2.54
3	31.8	7.55	1.12	9	4.51
4	30.4	7.49	1.26	6	3.17

June 2012

Cell No.	Temp. (℃)	pH	Salinity (ppt)	Turbidity (mg/L)	DO (mg/L)
1	30.9	7.95	0.76	20	3.28
2	30.8	7.54	0.88	8	2.19
3	30.6	7.47	0.94	10	2.69
4	30.4	7.55	1.04	6	2.74

July 2012

Cell No.	Temp. (℃)	pH	Salinity (ppt)	Turbidity (mg/L)	DO (mg/L)
1	34.0	**6.40**	0.75	26	2.63
2	33.0	**6.42**	0.85	9	3.69
3	32.8	**6.44**	0.91	11	3.63
4	32.9	**6.34**	1.00	10	3.63

August 2012

Cell No.	Temp. (℃)	pH	Salinity (ppt)	Turbidity (mg/L)	DO (mg/L)
1	28.9	7.49	1.01	11	3.72
2	29.8	7.50	1.07	4	4.86
3	29.4	7.58	1.20	6	5.57
4	29.0	7.41	1.33	6	3.32

September 2012

Cell No.	Temp. (℃)	pH	Salinity (ppt)	Turbidity (mg/L)	DO (mg/L)
1	30.4	7.98	0.57	26.9	5.65
2	30.6	7.85	0.65	14.3	2.72
3	30.2	7.96	0.65	19.0	5.16
4	30.7	**8.02**	0.74	24.9	6.48

(1) Surveys in September and October 2012 were conducted by Green Power/Ecological Resource Centre.

October 2012

Cell No.	Temp. (℃)	pH	Salinity (ppt)	Turbidity (mg/L)	DO (mg/L)
1	28.9	**8.30**	0.72	39.9	8.60
2	29.5	**8.18**	0.85	45.3	7.69
3	28.8	7.93	0.80	28.4	7.29
4	29.9	7.73	0.92	14.0	6.59

(1) Surveys in September and October 2012 were conducted by Green Power/Ecological Resource Centre.

Notes:

Values **Bold** indicate Action Level exceedance.

Values **Underlined and Bold** indicate Limit Level exceedance.

Table D2. Soil quality at WRA

Cell No.	Volatile Solids (%)	Oxidation Reduction Potential (mV)	pH	Total Nitrogen (mg/kg)	Total Organic Carbon (mg/kg)	Total Phosphorus (mg/kg)	Total Reactive Phosphorus (mg/kg)	Total Solids (%)
1	4	50	6.7	400	10,033	190	<1	70
2	5	41	6.4	253	14,633	220	<1	67
3	4	82	6.5	250	12,300	193	<1	73
4	5	75	6.7	473	8,200	180	<1	66