

Proposed Comprehensive Development at Wo Shang Wai, Yuen Long

Biannual EM&A Report on Ecology for Nov 2011 to Apr 2012 (Rev. A)

June 2012

Report No.: 266567/41/A

Mott MacDonald

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

this Biannual EM&A Report on ecological aspects for November 2011 to April 2012 has been reviewed, certified by the Environmental Team Leader (ETL) and verified by the Independent Environmental Checker (IEC)

Certified by:

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

Date 22 June 2012

Verified by:

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Independent Environmental Checker (IEC)
ENVIRON Hong Kong Limited

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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 4th Biannual EM&A report and it summarises the findings on EM&A results of ecological aspects during the period from 1 November 2011 to 30 April 2012.

1.2 Survey Area

Surveys were conducted within 500m of the Project area. The Wetland Restoration Area (hereafter WRA) was surveyed since early September 2010. 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 throughout the period. A total of 50 bird species of conservation importance and/or wetland-dependence were recorded in the Survey Area (excluding WRA). A summary of survey data is provided in **Appendix B**.

A total of 61 species were recorded in the WRA in the survey periods, 30 of which were species of conservation importance and/or wetland-dependent species. All three target species (i.e. Little Egret *Egtretta garzetta*, Cattle Egret *Bubulcus ibis* and Chinese Pond Heron *Ardeola bacchus*) were recorded in the WRA, including high counts of 12 Chinese Pond Heron. The species composition and abundance of the avifauna recorded within the Study Area were typical of fish pond areas between November and April (i.e. dry season/early wet season). Further, the WRA has attracted a number of species of conservation interest, including the near-threatened Collared Crow *Corvys torquatus*; indicating that the WRA was effective in providing habitat suitable for species of interest and acting as a buffer between the site and the fishpond areas. A summary of survey data is provided in **Appendix B**.

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 in November 2011 and April 2012, while night-time herpetofauna surveys were conducted twice per month between March and April 2012. Further, notable herpetofauna observations during other surveys were also recorded.

Four amphibian species and two reptile species were recorded using the ponds in the survey area (excluding WRA) in the survey period, while four amphibian species and no reptile species were recorded in the WRA in the surveys conducted in the reporting period. No species of conservation interest was recorded. A summary of survey data is provided in **Appendix C**.

2.4 Monitoring of Dragonflies and Butterflies

Monitoring of dragonflies and butterflies was conducted once a month in November 2011 and March 2012 and twice-monthly in April 2012. Further, notable dragonfly and butterfly observations during other surveys were recorded.

A total of eight dragonfly species and eight butterfly species were recorded using the ponds in the survey area (excluding WRA) in the survey period. At the WRA, a higher diversity of dragonfly species (14 species) and six butterfly species were recorded. One dragonfly species of conservation importance (Coastal Glider *Macrodiplax cora*) was recorded in the survey area (excluding 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. Two species were recorded in the Study Area in the survey period. There was no mammal sighting in the WRA. 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. No action/limit level exceedances were observed.

Monitoring data are presented in **Appendix D**.

3. Ecological issues

3.1 Vegetation Management

Vegetation management activities undertaken at the site primarily involved watering of plants, reviewing and adjusting tree supports, some replacement planting, patching up hydroseeding where germination was considered unsatisfactory and treating unhealthy/heavily infested *Litsea* and *Sapium* plants with fungicide.

3.2 Wildlife Management

All red fire ant nests were treated with approved pesticide and covered with overturn baskets for a week. All treated fire ant nests were inactive within one week of treatment.

4. Conclusions

4.1 Summary of Findings

Ecological monitoring between 1 November 2011 and 30 April 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)	93	61
Birds (of conservation importance and/or wetland-dependence)	50	30
Amphibians	4	4
Reptiles	2	0
Mammals	2	0
Dragonflies	8	14
Butterflies	8	6

61 bird species, 4 amphibian species, 14 dragonfly species and 6 butterfly species were recorded in the WRA, including 30 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 was effective in providing habitat for some species of conservation interest known to occur in the fringes of the Deep Bay Area and in acting as a buffer between the residential portion of the site in the north and the fishpond areas in the south.

5. References

5.1 List of References

Chan, S. K.F., K.S. Cheung, C.Y. Ho, F.N Lam & W.S. Tam, 2005. *A Field Guide to the Amphibians of Hong Kong*. Cosmos Books Ltd., Hong Kong.

Fellowes *et al*., 2002. *Wild Animals to Watch: Terrestrial and Freshwater Fauna of Conservation Concern in Hong Kong*.

Karsen, S., M.W.N. Lau & A. Bogadek, 1998. *Hong Kong Amphibians and Reptiles*. Provisional Urban Council, Hong Kong.

IUCN 2011. IUCN Red List of Threatened Species. Version 2011.1. <www.iucnredlist.org>. Downloaded on 7 October 2011.

Lo, P. Y. F. and W.L. Hui, 2004. *Hong Kong Butterflies*. Hong Kong, Cosmos Books Ltd.

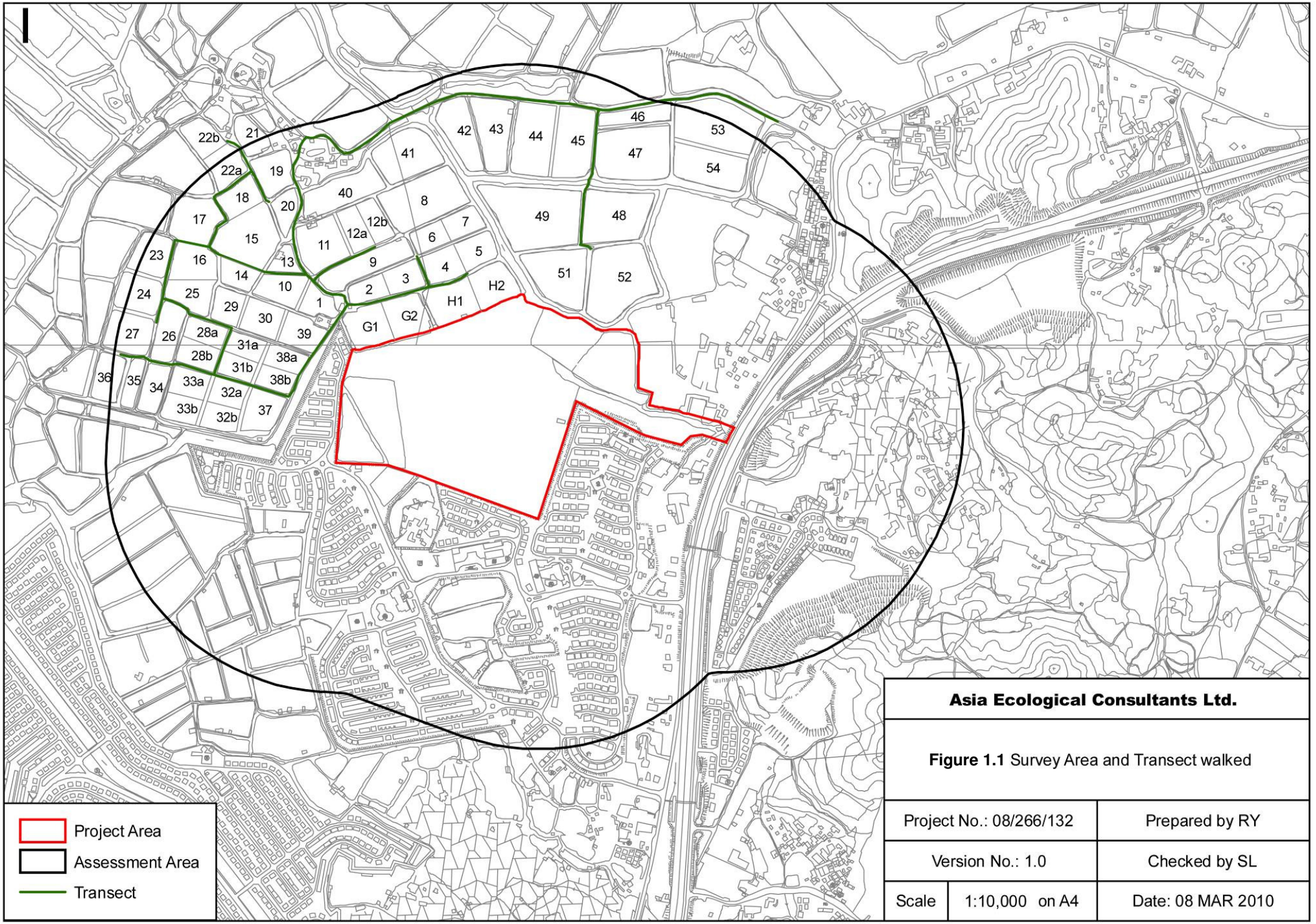
Mott, 2008. *WSW Environmental Monitoring and Audit Manual (March 2008)*.

Mott, 2008. *WSW Environmental Impact Assessment Report Volumes 1 to 3 (March 2008).*

Shek, C. T. 2006. *A Field Guide to the Terrestrial Mammals of Hong Kong*. Friends of the Country Parks Cosmos Books Ltd., Hong Kong.

Tam, T. W., K.K. Leung, B.S.P. Kwan, K.K.Y. Wu, S.S.H. Tang, I.W.Y. So, J.C.Y. Cheng, E.F.M. Yuen, Y.M. Tsang, and W.L. Hui, 2011. *The Dragonflies of Hong Kong (1st edition).* Agriculture, Fisheries and Conservation Department. Friends of Country Parks and Cosmos Books Ltd., Hong Kong .

Young, J.J. & Yiu, V., 2002. *Butterfly Watching In Hong Kong*. Wan Li Book Co. Ltd., Hong Kong.



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

Nov 2011	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			✓							✓					✓									✓						

Dec 2011	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	✓				✓							✓					✓		✓											✓	

Jan 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				✓	✓						✓								✓										✓		✓

Feb 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
Mammals										✓									✓			✓							
Birds										✓									✓			✓							
Herpetofauna																													
Dragonflies & butterflies																													
Water Quality														✓															
Inspection Visits										✓							✓		✓			✓		✓				✓	

Mar 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	✓							✓						✓						✓									✓		

Apr 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		✓											✓			✓										✓				✓

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[4]	*Scientific Name*[4]	Conservation Status [2]	Mean[3]					
			Nov	Dec	Jan	Feb	Mar	Apr
Eurasian Wigeon	*Anas penelope*	(RC)	0.0	0.0	0.0	0.0	0.4	0.0
Northern Shoveler	*Anas clypeata*	RC, (1)	0.0	0.0	0.4	0.0	0.0	0.0
Eurasian Teal	*Anas crecca*	RC, (1)	0.0	5.0	0.0	0.0	0.0	0.0
Little Grebe	*Tachybaptus ruficollis*	LC, (1)	26.8	14.6	9.6	9.0	8.4	3.2
Eurasian Spoonbill	*Platalea leucorodia*	PGC, (1)	0.0	0.0	0.0	0.0	0.2	0.2
Black-faced Spoonbill	*Platalea minor*	EN, PGC, (1)	2.5	3.2	3.8	2.0	0.6	3.6
Black-crowned Night Heron	*Nycticorax nycticorax*	(LC), (1)	0.0	0.0	0.0	0.0	0.0	0.4
Chinese Pond Heron	*Ardeola bacchus*	PRC, (1)	0.0	26.6	3.0	3.7	10.8	13.2
Eastern Cattle Egret	*Bubulcus coromandus*	(LC), (1)	0.0	0.2	0.2	5.3	4.0	8.0
Grey Heron	*Ardea cinerea*	PRC, (1)	10.5	6.8	7.6	8.3	1.8	0.0
Eastern Great Egret	*Ardea alba*	PRC, (1)	30.3	3.4	2.6	2.3	2.0	5.0
Intermediate Egret	*Egretta intermedia*	RC, (1)	1.0	1.0	0.4	1.0	0.2	0.0
Little Egret	*Egretta garzetta*	PRC, (1)	115.3	46.0	9.8	10.7	12.0	40.8
Great Cormorant	*Phalacrocorax carbo*	PRC, (1)	8.8	6.6	0.0	20.3	14.0	0.4
Western Osprey	*Pandion haliaetus*	RC	0.3	0.0	0.2	0.3	0.0	0.0
Black Kite	*Milvus migrans*	(RC)	0.5	0.8	0.4	0.0	0.2	0.0
White-breasted Waterhen	*Amaurornis phoenicurus*	(1)	0.8	1.0	0.4	0.0	2.2	0.6
Common Moorhen	*Gallinula chloropus*	(1)	4.0	2.6	0.8	0.0	1.2	0.0
Black-winged Stilt	*Himantopus himantopus*	RC, (1)	1.0	4.5	0.2	0.0	0.0	1.6
Pied Avocet	*Recurvirostra avosetta*	RC, (1)	0.5	9.3	0.6	0.3	0.8	3.0
Grey-headed Lapwing	*Vanellus cinereus*	LC, (1)	0.3	0.0	0.0	0.0	0.0	0.0
Little Ringed Plover	*Charadrius dubius*	LC, (1)	7.8	10.0	4.0	2.7	2.4	4.8
Kentish Plover	*Charadrius alexandrinus*	RC, (1)	0.3	0.0	0.0	0.0	0.0	0.0
Pheasant-Tailed Jacana	*Hydrophasianus chirurgus*	LC, (1)	0.3	0.0	0.0	0.0	0.0	0.0
Common Snipe	*Gallinago gallinago*	(1)	0.0	0.6	0.0	0.0	0.0	0.0
Spotted Redshank	*Tringa erythropus*	RC, (1)	0.0	2.0	0.4	0.3	0.0	0.0

Common Name[4]	*Scientific Name*[4]	Conservation Status [2]	Mean[3]					
			Nov	Dec	Jan	Feb	Mar	Apr
Marsh Sandpiper	*Tringa stagnatilis*	RC, (1)	3.0	2.5	0.2	0.3	0.0	1.2
Common Greenshank	*Tringa nebularia*	PRC, (1)	0.0	3.4	2.8	4.7	1.2	1.6
Green Sandpiper	*Tringa ochropus*	(1)	2.5	2.6	2.8	0.0	0.0	0.6
Wood Sandpiper	*Tringa glareola*	LC, (1)	3.3	3.4	3.8	7.0	2.6	4.4
Common Sandpiper	*Actitis hypoleucos*	(1)	0.0	8.4	8.8	0.0	0.0	0.4
Red-necked Stint	*Calidris ruficollis*	LC, (1)	0.0	0.0	0.0	0.0	0.0	2.6
Little Stint	*Calidris minuta*	LC, (1)	0.0	0.0	0.0	0.0	0.0	0.2
Temminck's Stint	*Calidris temminckii*	LC, (1)	0.0	0.4	0.0	1.0	0.2	1.2
Long-toed Stint	*Calidris subminuta*	LC, (1)	0.0	0.0	0.0	0.0	0.0	5.4
Red-necked Phalarope	*Phalaropus lobatus*	(1)	0.0	0.0	0.0	0.0	0.0	0.2
Black-headed Gull	*Chroicocephalus ridibundus*	PRC, (1)	0.0	0.0	0.4	0.3	0.0	0.0
Whiskered Tern	*Chlidonias hybrida*	(1)	0.3	0.0	0.0	0.0	0.0	0.0
White-throated Kingfisher	*Halcyon smyrnensis*	(LC)	0.8	0.2	0.2	0.3	0.0	0.0
Common Kingfisher	*Alcedo atthis*	(1)	3.8	3.6	3.8	0.0	2.0	0.2
Pied Kingfisher	*Ceryle rudis*	(LC), (1)	0.0	0.0	0.2	0.0	0.0	0.2
Collared Crow	*Corvus torquatus*	NT, LC	0.0	1.2	0.2	1.0	0.2	0.6
Oriental Reed Warbler	*Acrocephalus orientalis*	(1)	0.0	0.0	0.0	0.0	0.0	1.0
Zitting Cisticola	*Cisticola juncidis*	LC	0.0	0.2	0.0	0.3	0.8	0.0
Red-billed Starling	*Spodiopsar sericeus*	GC[5]	0.0	100.8	80.2	52.0	11.6	0.0
White-cheeked Starling	*Spodiopsar cineraceus*	PRC	0.0	0.0	0.2	0.0	0.0	0.0
White-shouldered Starling	*Sturnia sinensis*	(LC)	0.0	0.8	0.0	0.0	0.0	0.0
Eastern Yellow Wagtail	*Motacilla tschutschensis*	(1)	4.3	6.6	3.8	0.0	0.6	0.0
Grey Wagtail	*Motacilla cinerea*	(1)	0.3	0.8	0.0	0.0	0.0	0.0
Red-throated Pipit	*Anthus cervinus*	LC	0.0	1.0	1.4	0.3	1.4	0.4
No. of Species Recorded			**25**	**33**	**31**	**23**	**25**	**28**

(1) Indicates wetland-dependant or wetland-associated species.
(2) Conservation status follows that of Fellowes *et al.* (2002) and BirdLife International listing (2010). See Table B3 for brief description of status codes.
(3) Refers to the mean number of individuals recorded in each survey in the Survey Area (excluding the WRA)
(4) Follows HK bird list (dated 4 Dec 2011)
(5) Red-billed Starling is considered by Fellows *et al.* (2002) to be of Global Concern. Since publication, however, the global population estimate has been revised and the species is no longer considered globally threatened (BirdLife International 2010). A listing of Regional Concern (RC), based on the importance of the large roost present near Deep Bay, is considered to be more appropriate.

Table B2. Summary of bird monitoring in the WRA

Common Name[4]	*Scientific Name*[4]	Conservation Status[2]	Mean[3]					
			Nov	Dec	Jan	Feb	Mar	Apr
Little Grebe	*Tachybaptus ruficollis*	LC, (1)	0.5	0.0	0.6	0.0	1.4	1.6
Black-faced Spoonbill	*Platalea minor*	PGC, (1)	0.0	0.0	0.4	0.0	0.0	0.0
Yellow Bittern	*Ixobrychus sinensis*	(LC), (1)	0.3	0.0	0.0	0.0	0.0	0.0
Chinese Pond Heron	*Ardeola bacchus*	PRC, (1)	5.3	2.4	0.3	2.3	2.6	1.4
Eastern Cattle Egret	*Bubulcus coromandus*	(LC), (1)	0.0	0.0	0.4	0.0	0.0	0.0
Grey Heron	*Ardea cinerea*	PRC, (1)	2.5	1.8	0.8	2.3	0.8	0.0
Purple Heron	*Ardea purpurea*	RC, (1)	0.3	0.0	0.0	0.0	0.0	0.0
Eastern Great Egret	*Ardea alba*	PRC, (1)	0.8	1.2	0.6	0.7	0.6	0.6
Intermediate Egret	*Ardea intermedia*	RC, (1)	1.5	1.0	0.6	0.7	0.6	0.6
Little Egret	*Egretta garzetta*	PRC, (1)	1.5	1.6	1.4	2.0	1.6	0.0
Great Cormorant	*Phalacrocorax carbo*	PRC, (1)	0.3	0.4	1.2	0.7	0.2	0.0
Black Kite	*Milvus migrans*	(RC)	0.0	0.0	0.2	0.0	0.0	0.2
White-breasted Waterhen	*Amaurornis phoenicurus*	(1)	0.3	0.0	0.0	0.0	0.0	0.4
Pied Avocet	*Recurvirostra avosetta*	RC, (1)	0.0	0.0	0.0	0.0	0.2	0.0
Little Ringed Plover	*Charadrius dubius*	LC, (1)	0.0	0.0	0.0	1.0	0.6	0.0
Pheasant-tailed Jacana	*Hydrophasianus chirurgus*	LC, (1)	0.3	0.0	0.0	0.0	0.0	0.0
Common Greenshank	*Tringa nebularia*	RC, (1)	0.8	0.2	0.0	0.0	0.0	0.0
Green Sandpiper	*Tringa ochropus*	(1)	0.0	0.0	0.2	0.0	0.2	0.4
Wood Sandpiper	*Tringa glareola*	LC, (1)	0.0	0.0	0.8	0.3	0.0	0.0
Common Sandpiper	*Actitis hypoleucos*	(1)	0.0	0.0	0.0	0.0	0.4	0.2
Long-toed Stint	*Calidris subminuta*	LC, (1)	0.0	0.0	0.0	0.3	0.0	0.0
White-throated Kingfisher	*Halcyon smyrnensis*	(LC)	0.3	0.0	0.0	0.0	0.0	0.0
Common Kingfisher	*Alcedo atthis*	(1)	0.8	1.0	0.4	0.0	0.8	0.0
Pied Kingfisher	*Ceryle rudis*	(LC), (1)	0.0	0.0	0.0	0.0	0.2	0.0
Collared Crow	*Corvus torquatus*	NT, LC	0.5	0.0	0.0	0.0	0.0	0.0
Chinese Penduline-Tit	*Remiz consobrinus*	RC, (1)	0.0	0.0	0.0	0.0	1.2	0.2
Zitting Cisticola	*Cisticola juncidis*	LC	0.8	1.8	0.2	0.3	0.6	0.0
Red-billed Starling	*Spodiopsar sericeus*	GC	0.8	1.6	6.6	39.0	17.4	0.0
Eastern Yellow Wagtail	*Motacilla tschutschensis*	(1)	2.0	1.2	0.6	0.0	4.0	1.0
Red-throated Pipit	*Anthus cervinus*	LC	0.0	0.0	0.0	0.0	0.0	0.4
No. of Species Recorded			**18**	**11**	**16**	**11**	**17**	**11**

(1) Indicates wetland-dependant or wetland-associated species
(2) Conservation status follows that of Fellowes *et al.* (2002) and BirdLife International listing (2010). See Table B3 for brief description of status codes.
(3) Refers to the mean number of individuals recorded in each survey in the WRA
(4) Follows HK bird list (dated 4 Dec 2011)

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.	

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[1]	Mean[2]		
Amphibian			**Nov**	**Mar**	**Apr**
Asian Common Toad	*Bufo melanostictus*	-	0.0	7.0	2.0
Asiatic Painted Frog	*Kaloula pulchra*	-	0.0	0.0	1.0
Günther's Frog	*Rana guentheri*	-	0.0	2.0	2.0
Brown Tree Frog	*Polypedates megacephalus*	-	0.0	0.0	0.5
		No. of Species Recorded	**0**	**2**	**4**
Reptile			**Nov**	**Mar**	**Apr**
Chinese Gecko	*Gekko chinensis*	-	0.0	0.0	1.0
Bowring's Gecko	*Hemidactylus bowringii*	-	1.0	0.0	2.0
		No. of Species Recorded	**1**	**0**	**2**

(1) Conservation status follows that of Fellowes *et al.* (2002), Chan *et al.* (2005) and Karsen *et al.* (1998).
(2) 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[1]	Mean[2]		
Amphibian			**Nov**	**Mar**	**Apr**
Asian Common Toad	*Bufo melanostictus*	-	0.0	2.0	0.0
Ornate Pigmy Frog	*Microhyla ornata*	-	0.0	0.0	0.5
Paddy Frog	*Fejervarya limnocharis*	-	0.0	0.0	1.0
Günther's Frog	*Rana guentheri*	-	0.0	5.0	10.5
		No. of Species Recorded	**0**	**2**	**3**
Reptile			**Nov**	**Mar**	**Apr**
No records in the reporting period					
		No. of Species Recorded	**0**	**0**	**0**

(1) Conservation status follows that of Fellowes *et al.* (2002), Chan *et al.* (2005) and Karsen *et al.* (1998).
(2) Refers to the number of individuals recorded in each month in the WRA

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

Common Name	*Scientific Name*	Conservation Status[1]	Max[2]					
			Nov	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**
Unidentified Rat	*Rattus sp.*	-	0.0	0.0	0.0	0.0	1.0	1.0
Japanese Pipistrelle	*Pipistrellus abramus*	-	0.0	0.0	0.0	0.0	2.0	0.0
		No. of Species Recorded	**0**	**0**	**0**	**0**	**2**	**1**

(1) Conservation status follows that of Fellowes et al. (2002) and Shek (2006).
(2) 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[1]	Max[2]					
			Nov	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**
No records in the reporting period								
		No. of Species Recorded	**0**	**0**	**0**	**0**	**0**	**0**

(1) Conservation status follows that of Fellowes et al. (2002) and Shek (2006).
(2) Refers to the maximum number of individuals recorded in each month in the WRA.

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

Common Name	*Scientific Name*	Conservation Status[1]	Mean[2]		
Odonate			**Nov**	**Mar**	**Apr**
Orange-tailed Midget	*Agriocnemis femina*	-	0.0	0.0	0.5
Common Bluetail	*Aschnura senegalensis*	-	3.0	1.0	13.5
Asian Amberwing	*Brachythemis contaminate*	-	0.0	0.0	15.5
Green Skimmer	*Orthetrum Sabina*	-	0.0	0.0	8.5
Coastal Glider	*Macrodiplax cora*	LC	2.0	0.0	0.0
Wandering Glider	*Pantala flavescens*	-	25.0	0.0	1.5
Variegated Flutterer	*Rhyothemis variegate*	-	0.0	0.0	0.5
Saddlebag Glider	*Tramea Virginia*	-	1.0	0.0	0.5
		No. of Species Recorded	**4**	**1**	**7**
Butterfly			**Nov**	**Mar**	**Apr**
Common Mormon	*Papikio polytes*	-	0.0	0.0	0.5
Red-base Jezebel	*Delias pasithoe*	-	0.0	0.0	0.5
Mottled Emigrant	*Catopsilia pyranthe*	-	3.0	0.0	0.0
Common Grass Yellow	*Eurema hecabe*	-	5.0	0.0	0.0
Indian Cabbage White	*Pieris canidia*	-	3.0	2.0	15.5
Long-tailed Blue	*Lampides boeticus*	-	0.0	0.0	3.0
Pale Grass Blue	*Zizeeria maha*	-	0.0	0.0	3.5
Great Egg-fly	*Hypolimnas bolina*	-	3.0	0.0	0.0
		No. of Species Recorded	**4**	**1**	**5**

(1) Conservation status follows that of Fellowes *et al.* (2002), Lo & Hui (2004), Wilson (2004) and Young & Yiu (2002).
(2) 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[1]	Mean[2]		
Odonate			**Nov**	**Mar**	**Apr**
Orange-tailed Midget	*Agriocnemis femina*	-	0.0	0.0	19.5
Orange-tailed Spirit	*Ceriagrion auranticum*	-	0.0	0.0	2.5
Common Bluetail	*Aschnura senegalensis*	-	0.0	8.0	82.0
Pale-spotted Emperor	*Anax guttatus*	-	4.0	0.0	0.0
Common Flangetail	*Ictinogomphus pertinax*	-	2.0	0.0	0.0
Regal Pond Cruiser	*Epophthalmia elegans*	-	2.0	0.0	0.0
Asian Pintail	*Acisoma panorpoides*	-	0.0	0.0	2.5
Blue Dasher	*Brachydiplax chalybea*	-	0.0	0.0	1.0
Asian Amberwing	*Brachythemis contaminate*	-	3.0	0.0	4.0
Crimson Darter	*Crocothemis servilia*	-	2.0	0.0	0.5
Pied Percher	*Neurothemis tullia*	-	0.0	0.0	4.5
Green Skimmer	*Orthetrum sabina*	-	10.0	0.0	2.0
Wandering Glider	*Pantala flavescens*	-	0.0	0.0	1.0
Variegated Flutterer	*Rhyothemis variegata*	-	0.0	0.0	2.0
No. of Species Recorded			**6**	**1**	**11**
Butterfly			**Nov**	**Mar**	**Apr**
Red-base Jezebel	*Delias pasithoe*	-	0.0	0.0	0.5
Mottled Emigrant	*Catopsilia pyranthe*	-	3.0	0.0	0.0
Common Grass Yellow	*Eurema hecabe*	-	1.0	0.0	0.0
Indian Cabbage White	*Pieris canidia*	-	0.0	0.0	1.0
Dark Brand Bush Brown	*Mycalesis mineus*	-	0.0	1.0	0.0
Great Egg-fly	*Hypolimnas bolina*	-	1.0	0.0	0.0
No. of Species Recorded			**3**	**1**	**2**

(1) Conservation status follows that of Fellowes *et al.* (2002), Lo & Hui (2004), Wilson (2004) and Young & Yiu (2002).
(2) Refers to the mean number of individuals recorded in each month in the WRA

Appendix D. Summary of Water Quality Monitoring

Table D1. Water quality at WRA

November 2011

Cell No.	Temp. (℃)	pH	Salinity (ppt)	Turb (mg/L)	DO (mg/L)
1	25.2	7.80	0.920	11	3.94
2	26.2	7.71	1.110	10	4.51
3	25.9	7.80	1.110	18	5.48
4	25.6	7.47	1.260	2	3.07

December 2011

Cell No.	Temp. (℃)	pH	Salinity (ppt)	Turb (mg/L)	DO (mg/L)
1	17.3	7.85	0.960	17	6.12
2	17.8	7.88	1.280	12	8.24
3	17.8	7.99	1.160	8	6.65
4	18.8	7.74	1.370	2	5.46

January 2012

Cell No.	Temp. (℃)	pH	Salinity (ppt)	Turb (mg/L)	DO (mg/L)
1	17.2	7.86	1.100	36	5.87
2	17.3	7.85	1.457	8	5.03
3	17.7	7.78	1.333	12	5.94
4	18.3	7.72	1.597	2	6.12

February 2012

Cell No.	Temp. (℃)	pH	Salinity (ppt)	Turb (mg/L)	DO (mg/L)
1	18.9	7.71	1.027	31	3.67
2	18.9	7.77	1.380	11	6.36
3	18.9	7.63	1.240	17	4.27
4	20.3	7.63	1.457	23	5.50

March 2012

Cell No.	Temp. (℃)	pH	Salinity (ppt)	Turb (mg/L)	DO (mg/L)
1	25.1	7.53	1.060	18	4.13
2	24.4	7.49	1.440	9	3.56
3	23.9	7.71	1.303	14	3.67
4	23.7	7.61	1.453	2	3.93

April 2012

Cell No.	Temp. (℃)	pH	Salinity (ppt)	Turb (mg/L)	DO (mg/L)
1	28.0	7.26	0.923	219	3.66
2	27.1	7.26	1.087	16	2.16
3	27.6	7.55	1.180	23	5.97
4	27.9	7.81	1.147	12	7.08

Notes:

Values **Bold** indicate Action Level exceedance.

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