

Proposed Comprehensive Development at Wo Shang Wai Yuen Long

Biannual EM&A Report on Ecology for
Nov 2014 - Apr 2015 (Rev A)

July 2015

Heng Shung Construction Co. Ltd.

Proposed Comprehensive Development at Wo Shang Wai Yuen Long

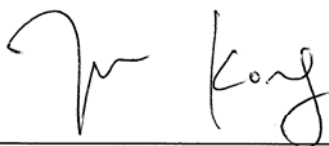
Biannual EM&A Report on Ecology for Nov 2014 - Apr 2015
(Rev A)

July 2015

Heng Shung Construction Co. Ltd.

**Pursuant to Condition 4.6 of Environmental Permit No. EP-311/2008/D,
this Biannual EM&A Report on ecological aspects for November 2014
to April 2015 has been reviewed, certified by the Environmental Team
Leader (ETL) and verified by the Independent Environmental Checker
(IEC).**

Certified by:



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

Date

7 July 2015

Verified by:



David Yeung
Independent Environmental Checker (IEC)
Ramboll Environ Hong Kong Limited

Date

22 July 2015

Contents

Chapter	Title	Page
1	Introduction	1
1.1	Background	1
1.2	Survey Area	1
1.3	EM&A Requirements on Ecological Impact	1
2	Ecological Monitoring	3
2.1	Introduction	3
2.2	Monitoring of Birds	3
2.3	Monitoring of Herpetofauna	4
2.4	Monitoring of Dragonflies and Butterflies	4
2.5	Monitoring of Mammals	4
2.6	Monitoring of Water Quality	4
3	Ecological Issues	5
3.1	Vegetation Management	5
3.2	Wildlife Management	5
4	Summary of Wetland Restoration Area Performance	6
4.1	Summary of Findings	6
4.2	WRA Performance for the Target Species	7
4.3	Conclusions	8
5	References	9
5.1	List of References	9

Tables

Table 1.1:	Summary of Ecological Impact EM&A Requirements	2
Table 4.1:	Summary of Ecological Monitoring in WRA and Survey Area	6
Table 4.2:	Annual Mean of the Three Bird Target Species Recorded at the WRA between May 2010 and Apr 2015	7

List of Figures

Figure 1.1 Survey Area and Transect Walked

List of Appendices

Appendix A	Schedule of Ecological Monitoring
Appendix B	Summary of Bird Surveys
Appendix C	Summary of Herpetofauna Monitoring, Mammals and Insects Surveys
Appendix D	Summary of Water Quality Monitoring

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) for construction of the comprehensive development in Wo Shang Wai was first granted by Environmental Protection Department (EPD) on 9 September 2008 (EP-311/2008) and has been subsequently varied, with the current version (EP-311/2008/D) issued by EPD on 20 March 2013.

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) were completed, except along the western and southern boundaries where the planting is affected by the existing site boundary and noise barrier, and for which a Variation to Environmental Permit (EP-311/2008/C) to defer planting at the location was approved. This factor remains applicable in the current valid EP (EP-311/2008/D) which also includes specific mitigation measures to minimise certain identified noise impacts during the operation phase of the Project.

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 Advisory Council on the Environment (ACE), EPD and Agriculture, Fisheries and Conservation Department (AFCD) on a biannual basis. This is the 10th Biannual EM&A report and it summarises the findings on EM&A results of ecological aspects during the period from 1 November 2014 to 30 April 2015. This report documents surveys and management activities conducted in the Survey Area and WRA from 1 November 2014 to 30 April 2015, which is based on ecological surveys and advices on management which were undertaken by the appointed Non-government Organisations (Green Power / Eco-Education & Resources Centre) during the reporting period.

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
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 six 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 were 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 64 bird species were recorded in the Survey Area (excluding the WRA) in November 2014 to April 2015, 35 of which were species of conservation importance and/or wetland-dependence. A summary of survey data is provided in [Appendix B](#).

A total of 66 species were recorded in the WRA in the survey periods, 36 of which were species of conservation importance and/or wetland-dependent species. Of all three target species (i.e. Little Egret *Egretta garzetta*, Eastern Cattle Egret *Bubulcus coromandus* and Chinese Pond Heron *Ardeola bacchus*), two of them i.e. Little Egret and Chinese Pond Heron were recorded in the WRA during regular survey; while Eastern Cattle Egret was recorded in the additional survey. The WRA has attracted a number of species of conservation interest, including Yellow Bittern, *Ixobrychus sinensis* and Cinnamon Bittern, *Ixobrychus cinnamomeus* which are both listed by Fellowes et al. as of “Local Concern” in 2002; Black-faced Spoonbill, *Platalea minor*, which is listed as “endangered” species on the International Union for Conservation of Nature (IUCN) red list and Collared Crow, *Corvus torquatus*, which is listed as “near threatened” species on the IUCN red list; indicating that the WRA was effective in providing habitats suitable for species of conservation interest.

A juvenile of Little Ringed-Plover, *Charadrius dubius*, was observed in the WRA, indicated that the WRA provided not only suitable wetland habitats but also important breeding ground for wetland-dependent birds.

The fish ponds 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, 36 bird species of conservation importance and /or wetland dependence, were observed using the site during survey period, including some bird species which are highly sensitive to disturbance and three target species (i.e. Little Egret, Eastern Cattle Egret and Chinese Pond Heron). Thus, the WRA is considered to be effective both in acting as a buffer against potential disturbance impacts from the construction site, 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 per month in November 2014 and April 2015. Further, notable herpetofauna observations during other surveys were also recorded.

A total of two herpetofauna species were recorded in the Survey Area (excluding WRA) in the reporting period; for amphibian, Gunther's Frog, *Hylarana guentheri*, was recorded, while for reptile, Changeable Lizard, *Calotes versicolor* was observed.

No amphibian species and reptile species were recorded in the WRA in the reporting period. 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 per month in November 2014 and March 2015 and twice per month in April 2015. Further, notable dragonfly and butterfly observations during other surveys were recorded.

A total of one dragonfly species and one butterfly species were recorded using the ponds in the Survey Area (excluding WRA) in the reporting period. At the WRA, a higher diversity of dragonfly species (5 species) and butterfly species (3 species) were recorded. 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. No mammal was recorded in the Survey Area (excluding WRA) within the reporting period.

Two unidentified bat species and scats of Leopard Cat, *Prionailurus bengalensis*, were recorded in the WRA during regular survey. 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 Cell 4 reached action level in December 2014; while the pH of Cell 2 and Cell 3 reached action levels in March 2015. Water level of Cell 2 and Cell 4 reached action levels from November 2014 to April 2015; while the water level of Cell 1 reached action levels from February 2015 to April 2015. According to the ecological monitoring data, the low water level in the WRA attracted wetland-dependent species including Chinese Penduline Tit, *Remiz consobrinus*. Yellow Bittern, *Ixobrychus sinensis* and Little Ringed Plover, *Charadrius dubius*. As the low water level attracts wetland-dependent birds, the existing water level will be maintained and monitored regularly. Monitoring data are presented in [Appendix D](#).

3 Ecological Issues

3.1 Vegetation Management

Removal of exotic vegetation in all cells was undertaken; these included but not limited to *Ipomoea* sp., *Mikania* sp., *Mimosa* sp., *Pennisetum* sp. and *Typha* sp..

Vegetation management activities undertaken at the site primarily involved watering of plants, tree pruning, weeding and grass cutting.

3.2 Wildlife Management

Golden Apple Snails were removed on an “as-seen” basis.

All red fire ant nests were treated with approved pesticide and covered with overturn baskets for a week. All pesticide used was in powder form and the pesticide usage was confined to Fire Ants’ nest found on terrestrial area which were further away from the Cells to prevent the contamination of water. All treated fire ant nests were inactive within one week of treatment.

Preliminary actions have been taken to increase the WRA utilization by birds. The mitigation actions are:

1. Lowering the water level;
2. Restocking the Cell in the WRA;
3. Installing flooding platform; and
4. Controlling the vegetation.

The first two measures aim to increase the foraging area and food sources for the target species respectively. The third measure aims to increase foraging ground for the target species. According to Horiuchi *et al* (2007), floating platform can gather fish in the pond and this provides opportunities for the target species to prey for the fish and they can use the platform as fishing platform. The fourth measure aims to maintain suitable habitat for target species.

4 Summary of Wetland Restoration Area Performance

4.1 Summary of Findings

Ecological monitoring between 1 November 2014 and 30 April 2015 was carried out following the survey methodology and frequency outlined in the EM&A Manual.

Summary of ecological monitoring in the Survey Area and WRA between November 2014 and April 2015 (**Table 4.1**):

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

Species	Number of species recorded in Survey Area (excluding WRA)	Number of species recorded in WRA
Birds (total)	64	66
Birds (of conservation importance and/or wetland-dependence)	35	36
Amphibians	1	0
Reptiles	1	0
Mammals	0	3
Dragonflies	1	5
Butterflies	1	3

A total of 66 bird species, 3 mammal species, 5 dragonfly species and 3 butterfly species were recorded in the WRA, including 36 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 indicate that the WRA is attracting the three target species to varying degrees. During the survey period (i.e. November 2014 to April 2015), the site was particularly attractive to Little Egret, which was recorded on nearly-weekly basis, with monthly means ranging from 3.0 to 6.3 birds per survey. Chinese Pond Heron was also recorded every month in regular survey under review (November 2014 to April 2015) with monthly means ranging from 1.2 to 2.8 birds per survey. Eastern Cattle Egret was least attracted to the site, Eastern Cattle Egret was only recorded in January under survey period (November 2014 to April 2015), out of the regular survey. A list of the bird species recorded at the WRA since completion of site formation is provided in **Appendix B (Table B4 to B6)**.

With the completion of planting as scheduled in the approved Habitat Creation and Management Plan (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/D) 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 during the review period in terms of target species attraction 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

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; they 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 when the target level for each of the three species is achieved. Whilst further discussion and agreement regarding the target level 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).

Of the three target species, all of them were recorded using the site under the reporting period (November 2014 – April 2015). Among all target species, Little Egret and Chinese Pond Heron were recorded in all six months and Eastern Cattle Egret was recorded in one month during the six-month reporting period.

Table 4.2: Annual Mean of the Three Bird Target Species Recorded at the WRA between May 2010 and Apr 2015

Common Name	Scientific Name	Conservation Status ⁽²⁾	Baseline Annual Mean ⁽³⁾	May 10 – Apr 11	May 11 – Apr 12	May 12 – Apr 13	May 13 – Apr 14	May 14 – Apr 15	May 14 – Oct 14	Reporting period (Nov 14 – Apr 15*)
Chinese Pond Heron	<i>Ardeola bacchus</i>	PRC, (RC)	1.3	0.2	2.7	1.3	1.9	2.0	1.9	2.2
Little Egret	<i>Egretta garzetta</i>	PRC, (RC)	5.5	1.6	1.0	0.9	2.3	2.0	2.0	4.4
Eastern Cattle Egret	<i>Bubulcus coromandus</i>	(LC)	1.3	0.0	1.2	0.0	0.1	0.0	/	/

Note:

(1) Values in **bold** indicate that the Target Level was achieved.

(2) Conservation Status follows that of Fellowes et. al. (2002). See Appendix B (Table B3).

(3) Annual mean number recorded during Baseline Ecological Monitoring.

* The mean number of the target species was calculated in annual basis.

Based on **Table 4.2** above, the target level of the Chinese Pond Heron have been achieved between November 2014 and April 2015 while the target levels for Little Egret and Eastern Cattle Egret have not been achieved.

As the Proposed Comprehensive Development at Wo Shang Wai is still under construction phase, it is considered acceptable. According to the ecological monitoring data of the survey area (excluding the WRA), Eastern Cattle Egret was observed only in one fourth of the regular ecological survey (i.e. 5 out of 21) and the annual mean of the Eastern Cattle Egret of the survey area (excluding the WRA) is 0.5 birds per survey, the results indicated the number of Eastern Cattle Egret in the whole area was low and the low number of Eastern Cattle Egret in the WRA is considered acceptable. However, should this situation continue, a review of the management of the WRA and adaptive management steps will be required.

In addition, though the target levels for Little Egret and Eastern Cattle Egret have not been achieved between November 2014 and April 2015, the WRA continuous to attract wetland dependent species. Among all the wetland dependent species, Little Grebe, *Tachybaptus ruficollis*, Grey Heron, *Ardea cinerea*, Great Egret, *Ardea alba*, White-breasted Waterhen, *Amaurornis phoenicurus*, Little Ringed Plover, *Charadrius dubius*, Common Sandpiper, *Actitis hypoleucos* and Common King Fisher, *Alcedo atthis*, were recorded in all six months between November 2014 and April 2015. Little Grebe, *Tachybaptus ruficollis* and Little Ringed Plover, *Charadrius dubius*, are listed by Fellowes et al. as of "Local Concern" in 2002. The presence of these wetland-dependent species indicates that the WRA was effective in providing habitat suitable for species of conservation interest.

Although the target level for Little Egret and Eastern Cattle Egret have not been achieved between November 2014 and April 2015; based on **Table 4.2** above, when comparing the annual mean of Little Egret between May 2014 to October 2014 and November 2014 to April 2015, it has increased from 2.0 bird per survey to 4.4 birds per survey. The increase of annual mean of the target species might indicate the mitigation actions taken in the WRA to increase the bird utilization showed positive results. The mitigation actions will be continued in the coming wet season and the result will be closely monitored.

4.3 Conclusions

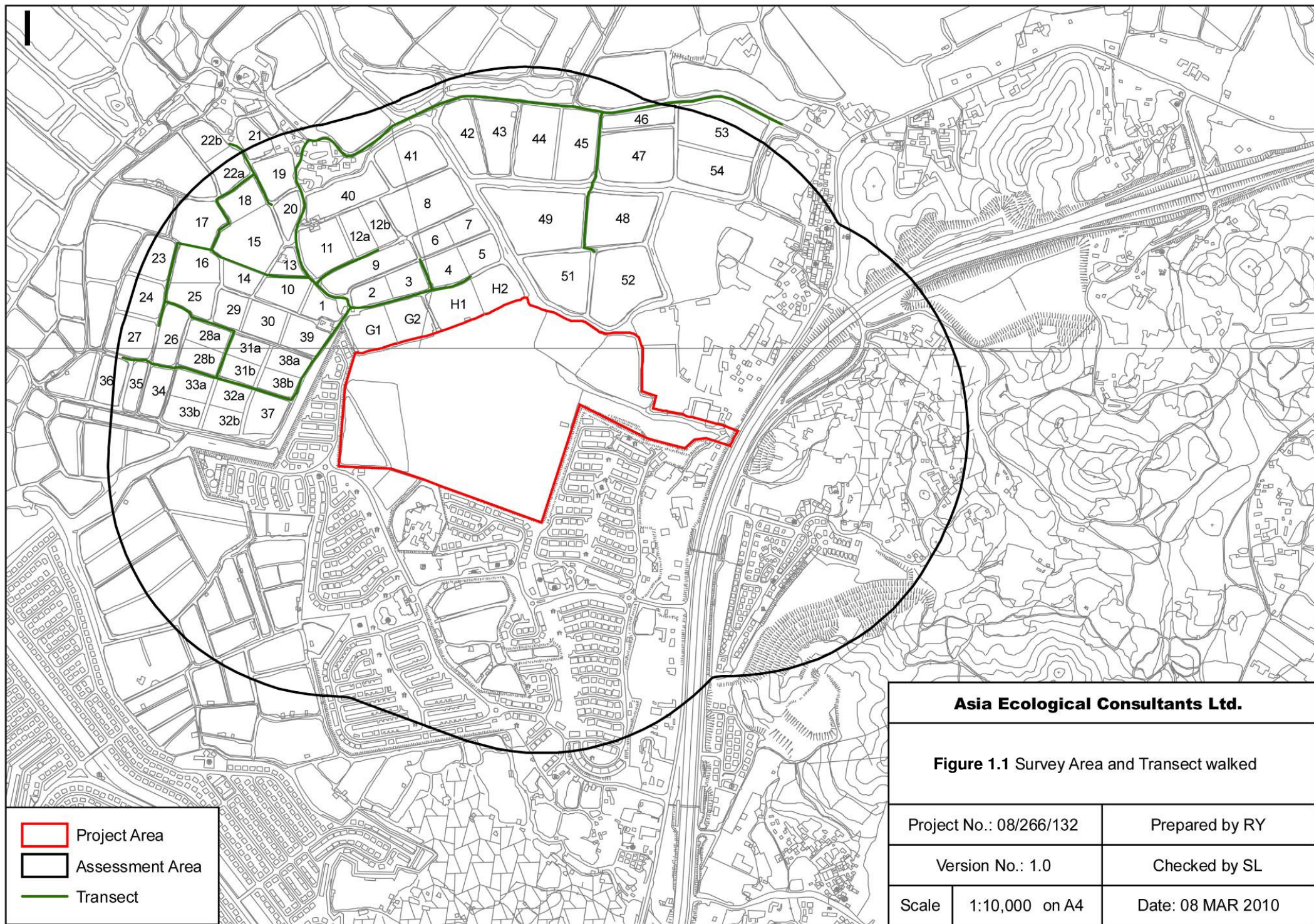
A total of 117 bird species have been recorded within the WRA since completion of site formation. Of the 117 species, 74 were species of conservation importance and/or wetland dependence - indicating that the WRA provides suitable habitats for these species despite the construction work within the residential portion of the Project Site.

The site continuously attracts bird species of conservation importance, indicating that the WRA not only provides a buffer for potential disturbance during construction phase, but also a valuable habitat for wetland dependent species and species of conservation importance.

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.
- Hong Kong Bird Watching Society 2014. List of Hong Kong Birds - 2015-1-12. <www.hkbws.org.hk>.
- Horiuchi, S., Odawara, T., Yonemura, S., Hayashi, Y., Kawaguchi, M., Asada, M., Kato, M. & Yasuhara, K. (2007, November). Floating structure using waste tires for water environmental remediation. In Scrap Tire Derived Geomaterials-Opportunities and Challenges: Proceedings of the International Workshop IW-TDGM 2007. p. 291. CRC Press.
- 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 **07 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.



Appendix A. Schedule of Ecological Monitoring

November 2014	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				✓			✓				✓			✓				✓			✓				✓			✓			
December 2014	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		✓			✓				✓			✓				✓			✓				✓				✓			✓	
January 2015	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		✓				✓			✓				✓			✓					✓		✓				✓			✓	

Proposed Comprehensive Development at Wo Shang Wai Yuen Long

Biannual EM&A Report on Ecology for Nov 2014 - Apr 2015 (Rev A)



February 2015	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			
Mammals			✓							✓							✓							✓							
Birds			✓							✓							✓							✓							
Herpetofauna																															
Dragonflies & Butterflies																															
Water Quality																										✓					
Inspection Visits			✓			✓				✓			✓				✓							✓			✓				
March 2015	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			✓			✓				✓			✓				✓			✓				✓			✓				
April 2015	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:

1. Light grey cells indicate public holidays, Saturdays or Sundays.
2. Dark cells indicate that no survey was required during the relevant month.

Appendix B. Summary of Bird Surveys

Table B1. Summary of bird monitoring (for species of conservation importance and/or wetland-dependence) within the Survey Area (excluding the WRA)

Common Name ⁽³⁾	Scientific Name ⁽³⁾	Conservation Status ⁽¹⁾	Wetland Dependent	Nov Mean ⁽²⁾	Dec Mean ⁽²⁾	Jan Mean ⁽²⁾	Feb Mean ⁽²⁾	Mar Mean ⁽²⁾	Apr Mean ⁽²⁾
Little Grebe	<i>Tachybaptus ruficollis</i>	LC	✓	12.5	6.4	3.8	4.0	3.4	4.8
Great Cormorant	<i>Phalacrocorax carbo</i>	PRC	✓	6.5	5.0	18.8	1.5	0.6	
Grey Heron	<i>Ardea cinerea</i>	PRC	✓	3.8	3.8	21.3	1.8	1.0	
Great Egret	<i>Ardea alba</i>	PRC, (RC)	✓	7.8	5.2	12.5	0.8	11.8	2.8
Little Egret	<i>Egretta garzetta</i>	PRC, (RC)	✓	9.0	13.8	8.0	4.3	15.4	13.8
Eastern Cattle Egret	<i>Bubulcus coromandus</i>	LC	✓	0.8		0.5		0.4	0.8
Chinese Pond Heron	<i>Ardeola bacchus</i>	PRC, (RC)	✓	15.8	10.4	3.5	3.0	6.0	9.5
Black-crowned Night Heron	<i>Nycticorax nycticorax</i>	(LC)	✓						1.5
Black-faced Spoonbill	<i>Platalea minor</i>	PGC	✓	V	V	1.8	V		
Northern Pintail	<i>Anas acuta</i>	RC	✓	0.8					
Northern Shoveler	<i>Anas clypeata</i>	RC	✓	1.0	24.8	4.3			
Tufted Duck	<i>Aythya fuligula</i>	LC	✓	3.0	28.6	42.5	30.3	16.8	
Black Kite	<i>Milvus migrans</i>	RC	✓		0.2	V	0.3	0.2	0.3
Common Kestrel	<i>Falco tinnunculus</i>	-	x		0.2				
Peregrine Falcon	<i>Falco peregrinus</i>	LC	✓						0.3
White-breasted Waterhen	<i>Amaurornis phoenicurus</i>	-	✓	1.5	0.6	V	0.8	0.6	0.5
Common Moorhen	<i>Gallinula chloropus</i>	-	✓	0.5	0.2		V	0.2	V
Black-winged Stilt	<i>Himantopus himantopus</i>	(RC)	✓		1.8	V		V	
Pied Avocet	<i>Recurvirostra avosetta</i>	RC	✓	8.0	4.4	0.8		2.8	0.3
Little Ringed Plover	<i>Charadrius dubius</i>	(LC)	✓	1.8	1.8	V			3.0
Common Greenshank	<i>Tringa nebularia</i>	LC	✓	0.3					

Proposed Comprehensive Development at Wo Shang Wai Yuen Long

Biannual EM&A Report on Ecology for Nov 2014 - Apr 2015 (Rev A)



Common Name ⁽³⁾	Scientific Name ⁽³⁾	Conservation Status ⁽¹⁾	Wetland Dependent	Nov Mean ⁽²⁾	Dec Mean ⁽²⁾	Jan Mean ⁽²⁾	Feb Mean ⁽²⁾	Mar Mean ⁽²⁾	Apr Mean ⁽²⁾
Green Sandpiper	<i>Tringa ochropus</i>	-	✓	V	V			V	0.8
Wood Sandpiper	<i>Tringa glareola</i>	(LC)	✓	0.3	1.6	V	V	V	1.5
Common Sandpiper	<i>Actitis hypoleucos</i>	-	✓	7.3	4.6	2.8	1.3	2.2	2.3
Common Snipe	<i>Gallinago gallinago</i>	-	✓	0.3	V				
Sharp-tailed Sandpiper	<i>Calidris acuminata</i>	LC	✓						0.5
Pied Kingfisher	<i>Ceryle rudis</i>	(LC)	✓	V	0.8	1.0		0.4	
White-throated Kingfisher	<i>Halcyon smyrnensis</i>	LC	✓	0.8	0.2	0.5	0.5	V	
Common Kingfisher	<i>Alcedo atthis</i>	-	✓	3.3	1.8	1.0	1.5	1.4	1.0
Eastern Yellow Wagtail	<i>Cecropis daurica</i>	-	✓	1.3	4.2	1.3	1.0	1.2	1.5
White Wagtail	<i>Motacilla alba</i>	-	✓	8.0	15.2	18.8	12.0	7.6	2.0
Richard's Pipit	<i>Anthus richardi</i>	-	✓	0.3		0.3	V	0.2	0.5
Zitting Cisticola	<i>Cisticola juncidis</i>	LC	✓		0.4		0.3	V	
Red-billed Starling	<i>Spodiopsar sericeus</i>	-	✓	V	32.4	1.3	49.0	14.2	0.5
Collared Crow	<i>Corvus torquatus</i>	LC	✓	0.3	0.4	0.3	1.3	0.4	1.3
			No. of species recorded	28	28	25	21	25	22

Note:

(1) Conservation status follows that of Fellowes et al. (2002) and BirdLife International listing (2010). See Table B3.

(2) Refers to the mean number of individuals recorded in each survey in the Survey Area (excluding the WRA).

(3) Follows HK bird list (dated 2015-1-12).

"V" Indicates the species is recorded outside regular surveys.

Table B2. Summary of bird monitoring (for species of conservation importance and/or wetland-dependence) in the WRA

Common Name ⁽³⁾	Scientific Name ⁽³⁾	Conservation Status ⁽¹⁾	Wetland Dependent	Nov	Dec	Jan	Feb	Mar	Apr
				Mean ⁽²⁾	Mean ⁽²⁾	Mean ⁽²⁾	Mean ⁽²⁾	Mean ⁽²⁾	Mean ⁽²⁾
Little Grebe	<i>Tachybaptus ruficollis</i>	LC	✓	2.5	1.2	2.0	2.0	2.0	0.8
Great Cormorant	<i>Phalacrocorax carbo</i>	PRC	✓	0.5	1.8	2.0	0.8	0.6	
Grey Heron	<i>Ardea cinerea</i>	PRC	✓	2.3	2.6	5.3	4.8	0.8	V
Great Egret	<i>Ardea alba</i>	PRC, (RC)	✓	0.5	1.6	0.8	0.3	V	0.3
Little Egret	<i>Egretta garzetta</i>	PRC, (RC)	✓	3.0	3.6	5.3	3.5	4.6	6.3
Eastern Cattle Egret	<i>Bubulcus coromandus</i>	LC	✓			V			
Chinese Pond Heron	<i>Ardeola bacchus</i>	PRC, (RC)	✓	2.0	2.8	2.3	2.8	1.2	1.8
Yellow Bittern	<i>Ixobrychus sinensis</i>	LC	✓	0.3	0.2			0.2	0.5
Cinnamon Bittern	<i>Ixobrychus cinnamomeus</i>	LC	✓						V
Black-faced Spoonbill	<i>Platalea minor</i>	PGC	✓		V	V		V	
Northern Shoveler	<i>Anas clypeata</i>	RC	✓		0.2				
Black Kite	<i>Milvus migrans</i>	RC	✓		0.4		0.3	0.4	0.5
Greater Spotted Eagle	<i>Clanga clanga</i>	(LC)	✓			0.3			
Eastern Imperial Eagle	<i>Aquila heliaca</i>	GC	✓				0.3		
Eastern Buzzard	<i>Buteo japonicus</i>	-	x				V	0.2	
White-breasted Waterhen	<i>Amaurornis phoenicurus</i>	-	✓	0.5	V	0.8	1.0	0.8	0.3
Common Moorhen	<i>Gallinula chloropus</i>	-	✓	V		V		0.2	
Black-winged Stilt	<i>Himantopus himantopus</i>	(RC)	✓				0.3	0.2	
Little Ringed Plover	<i>Charadrius dubius</i>	(LC)	✓	1.8	0.2	0.8	0.5	1.6	1.8
Common Greenshank	<i>Tringa nebularia</i>	LC	✓	V	V	V			
Green Sandpiper	<i>Tringa ochropus</i>	-	✓	0.3	0.2		0.3	0.2	
Wood Sandpiper	<i>Tringa glareola</i>	(LC)	✓		2.2	V	V	V	1.0
Common Sandpiper	<i>Actitis hypoleucos</i>	-	✓	0.8	1.2	3.0	2.0	2.2	0.5
Common Snipe	<i>Gallinago gallinago</i>	-	✓					V	
Eurasian Eagle Owl	<i>Bubo bubo</i>	RC	x		V		V		
Pied Kingfisher	<i>Ceryle rudis</i>	(LC)	✓		0.4	0.5	0.3	0.2	

Proposed Comprehensive Development at Wo Shang Wai Yuen Long

Biannual EM&A Report on Ecology for Nov 2014 - Apr 2015 (Rev A)



Common Name ⁽³⁾	Scientific Name ⁽³⁾	Conservation Status ⁽¹⁾	Wetland Dependent	Nov	Dec	Jan	Feb	Mar	Apr
				Mean ⁽²⁾	Mean ⁽²⁾	Mean ⁽²⁾	Mean ⁽²⁾	Mean ⁽²⁾	Mean ⁽²⁾
White-throated Kingfisher	<i>Halcyon smyrnensis</i>	LC	✓		0.2				0.3
Common Kingfisher	<i>Alcedo atthis</i>	-	✓	1.3	0.8	1.8	2.8	1.4	1.5
Eastern Yellow Wagtail	<i>Cecropis daurica</i>	-	✓	1.8	0.4	2.0	4.3	2.0	1.0
White Wagtail	<i>Motacilla alba</i>	-	✓	4.0	5.6	6.3	9.5	4.8	3.3
Richard's Pipit	<i>Anthus richardi</i>	-	✓	0.3		0.5	V		
Black-browed Reed Warbler	<i>Acrocephalus bistrigiceps</i>	-	✓		V				
Chinese Penduline Tit	<i>Remiz consobrinus</i>	RC	✓		0.4	1.5	4.5	3.2	V
Red-billed Starling	<i>Spodiopsar sericeus</i>	-	✓				24.5	V	
White-cheeked Starling	<i>Spodiopsar cineraceus</i>	PRC	✓		V				
Collared Crow	<i>Corvus torquatus</i>	LC	✓						V
				No. of species recorded					
				17	25	21	23	24	18

Note:

(1) Conservation status follows that of Fellowes et al. (2002) and BirdLife International listing (2010). See Table B3.

(2) Refers to the mean number of individuals recorded in each survey in the Survey Area (excluding the WRA)

(3) Follows HK bird list (dated 2015-1-12)

V Indicates the species is recorded outside regular surveys.

Table B3. Conservation 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 <i>et al.</i> (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	Wetland Dependent	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	<i>Tachybaptus ruficollis</i>	LC	✓					0.5						1.0	3.8	0.8	0.5	0.5		0.6		1.4	1.6	0.8	1.0	1.3	0.2		0.2
Great Cormorant	<i>Phalacrocorax carbo</i>	PRC	✓					0.8									0.3	0.3	0.4	1.2	0.7	0.2							
Grey Heron	<i>Ardea cinerea</i>	PRC	✓			1.0	1.6	2.0	2.0	0.4							1.0	2.5	1.8	0.8	2.3	0.8				0.3			0.4
Purple Heron	<i>Ardea purpurea</i>	RC	✓														0.3	0.3											
Great Egret	<i>Ardea alba</i>	PRC	✓				0.4	14.0	2.0	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	0.3		0.4	0.5	1.5
Intermediate Egret	<i>Egretta intermedia</i>	RC	✓					1.7	0.8	0.2						1.5	1.5	1.5	1.0	0.6	0.7	0.6	0.6				0.3	0.9	
Little Egret	<i>Egretta garzetta</i>	PRC	✓				1.8	8.0	2.0	0.4	0.5	0.8	0.3	0.3	1.0	1.0	0.5	1.5	1.6	1.4	2.0	1.6					0.8	0.3	1.2
Eastern Cattle Egret	<i>Bubulcus coromandus</i>	(LC)	✓										0.3	11.8		1.3	0.3			0.4					0.3		0.2		
Chinese Pond Heron	<i>Ardeola bacchus</i>	PRC	✓			1.0	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	0.8	2.0	1.8	2.2
Yellow Bittern	<i>Ixobrychus sinensis</i>	(LC)	✓														0.3	0.3											
Black-crowned Night Heron	<i>Nycticorax nycticorax</i>	LC	✓																										
Eurasian Spoonbill	<i>Platalea leucorodia</i>	LC	✓																										
Black-faced Spoonbill	<i>Platalea minor</i>	PGC, EN	✓					0.3	10.3											0.4									
Mandarin Duck	<i>Aix galericulata</i>	-	✓														0.3												
Eurasian Wigeon	<i>Anas penelope</i>	RC	✓				1.6	2.5																					
Eurasian Teal	<i>Anas crecca</i>	RC	✓					1.0																					
Northern Pintail	<i>Anas acuta</i>	RC	✓				0.2	7.0																					
Northern Shoveler	<i>Anas clypeata</i>	RC	✓																										
Tufted Duck	<i>Aythya fuligula</i>	LC	✓																										
Garganey	<i>Anas querquedula</i>	-	✓																										
Western Osprey	<i>Pandion haliaetus</i>	RC	✓				0.2																						
Black Kite	<i>Milvus migrans</i>	(RC)	x					0.8	0.3	0.2		0.3				0.3				0.2			0.2	0.5					0.4
Crested Serpent Eagle	<i>Spilornis cheela</i>	(LC)	x																										
Eastern Buzzard	<i>Buteo japonicus</i>	-	x							0.2																			
Common Kestrel	<i>Falco tinnunculus</i>	-	x			1.0	0.4	1.0	0.3	0.4																			
Eurasian Hobby	<i>Falco subbuteo</i>	(LC)	✓																										
Peregrine Falcon	<i>Falco peregrinus</i>	-	x																										
Imperial Eagle	<i>Aquila heliaca</i>	-	x																										
Japanese Quail	<i>Coturnix japonica</i>	LC	✓																										
White-breasted Waterhen	<i>Amauornis phoenicurus</i>	-	✓									0.5	0.8	1.3	2.6	1.3	1.5	0.3				0.4			0.5	1.0	0.5		
Common Moorhen	<i>Gallinula chloropus</i>	-	✓																							0.2			
Pheasant-tailed Jacana	<i>Hydrophasianus chirurgus</i>	LC	✓															0.3											

Common name	Scientific name	Conservation status	Wetland Dependent	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
Greater Painted-snipe	<i>Rostratula benghalensis</i>	LC	✓								0.5																		
Black-winged Stilt	<i>Himantopus himantopus</i>	RC	✓	8.0													1.0												
Pied Avocet	<i>Recurvirostra avosetta</i>	RC	✓				0.2															0.2							
Oriental Pratincole	<i>Glareola maldivarum</i>	LC	✓								2.5																		
Little Ringed Plover	<i>Charadrius dubius</i>	LC	✓	3.0		24.5	7.4	3.8	9.0	6.8	10.5	5.5	0.5		0.2						1.0	0.6							
Kentish Plover	<i>Charadrius alexandrinus</i>	RC	✓																										
Spotted Redshank	<i>Tringa erythropus</i>	RC	✓																										
Common Redshank	<i>Tringa totanus</i>	RC	✓																										
Marsh Sandpiper	<i>Tringa stagnatilis</i>	RC	✓																										
Common Greenshank	<i>Tringa nebularia</i>	RC	✓			0.5												0.3	0.8	0.2									
Green Sandpiper	<i>Tringa ochropus</i>	-	✓			1.0	0.4	0.5	0.5	0.4				0.3							0.2		0.2	0.4			0.2		
Wood Sandpiper	<i>Tringa glareola</i>	LC	✓						0.5	1.2											0.8	0.3					0.6		
Common Sandpiper	<i>Actitis hypoleucos</i>	-	✓	1.0		0.5	1.0		0.5	0.6	1.0	0.3			0.2								0.4	0.2					0.9
Eurasian Woodcock	<i>Scolopax rusticola</i>	-	✓																										
Pintail/Swinhoe's Snipe*	<i>Gallinago stenura/G. megala</i>	LC*,	✓			0.5											0.3												
Common Snipe	<i>Gallinago gallinago</i>		✓						0.3	0.2																			
Red-necked Stint	<i>Calidris ruficollis</i>	LC	✓	3.0																									
Temminck's Stint	<i>Calidris temminckii</i>	LC	✓			0.5			2.5	0.4	1.3																		
Long-toed Stint	<i>Calidris subminuta</i>	LC	✓																		0.3								
Whiskered Tern	<i>Chlidonias hybrida</i>	-	✓																					1.3					
Domestic Pigeon	<i>Columba livia</i>	-	x												DS														
Oriental Turtle Dove	<i>Streptopelia orientalis</i>	-	x													0.2													
Red Turtle Dove	<i>Streptopelia tranquebarica</i>	-	x																										
Spotted Dove	<i>Spilopelia chinensis</i>	-	x																DS		DS	DS		DS			DS		0.6
Asian Koel	<i>Eudynamys scolopaceus</i>	-	x																										
Greater Coucal#	<i>Centropus sinensis</i>	-	x																										
Eurasian Eagle Owl	<i>Bubo bubo</i>	RC	x																										
Savanna Nightjar	<i>Caprimulgus affinis</i>	-	x																										
Pacific Swift	<i>Apus pacificus</i>	(LC)	x								0.3																		
House Swift	<i>Apus nipalensis</i>	-	x	10.0						0.2											DS	DS							
Pied Kingfisher	<i>Ceryle rudis</i>	(LC)	✓				0.2	0.3	0.5	0.2			0.3									0.2				0.5			
Common Kingfisher	<i>Alcedo atthis</i>	-	✓				0.4	0.5	0.3		0.3	0.5	1.0	0.3	1.0	0.8	0.5	0.8	1.0	0.4		0.8					0.6		0.4

Common name	Scientific name	Conservation status	Wetland Dependent	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
White-throated Kingfisher	<i>Halcyon smyrnensis</i>	(LC)	x															0.3								0.3			
Barn Swallow	<i>Hirundo rustica</i>	-	x	25.0					1.5												DS	DS		DS		DS	DS	3.0	
Red-rumped Swallow	<i>Hirundo daurica</i>	-	x																										
Eastern Yellow Wagtail	<i>Motacilla tschutschensis</i>	-	✓			14.5	10.2	15.0	23.5	8.2	11.8	1.8			0.2	0.8	1.5	2.0	1.2	0.6		4.0	1.0						
Grey Wagtail	<i>Motacilla cinerea</i>	-	✓				0.2		0.3	0.2						0.3													
White Wagtail	<i>Motacilla alba</i>	-	✓	3.0			1.8												DS	DS	DS	DS	DS				DS	1.8	3.2
Richard's Pipit	<i>Anthus richardi</i>	-	✓			1.5	0.8	0.5	1.0	1.0	1.8	0.5					0.3		DS		DS	DS	DS						
Olive-backed Pipit	<i>Anthus hodgsoni</i>	-	x			0.5													DS										
Red-throated Pipit	<i>Anthus cervinus</i>	LC	x		2.0	2.5	1.2	0.5	0.5	0.2													0.4						0.7
Buff-bellied Pipit	<i>Anthus rubescens</i>	LC	x		1.0	1.5																							
Red-whiskered Bulbul	<i>Pycnonotus jocosus</i>	-	x																										
Chinese Bulbul	<i>Pycnonotus sinensis</i>	-	x																			DS		DS		DS			
Long-tailed Shrike	<i>Lanius schach</i>	-	x																	DS	DS					DS	DS		
Oriental Magpie Robin	<i>Copsychus saularis</i>	-	x																		DS								
Daurian Redstart	<i>Phoenicurus auroreus</i>	-	x																										
Stejneger's Stonechat	<i>Saxicola stejnegeri</i>	-	x		3.0	0.5	1.0	1.0	0.8	0.2	0.3						1.0		DS	DS		DS							
Masked Laughingthrush	<i>Garrulax perspicillatus</i>	-	x																							DS			
Lanceolated Warbler	<i>Locustella lanceolata</i>	-	✓														0.3												
Pallas's Grasshopper Warbler	<i>Locustella certhiola</i>	LC	✓														0.3												
Black-browed Reed Warbler	<i>Acrocephalus bistrigiceps</i>	-	✓														0.3												
Zitting Cisticola	<i>Cisticola juncidis</i>	LC	x							0.2	1.5	2.5	2.5	1.0	0.4		0.3	0.8	1.8	0.2	0.3	0.6					0.2		
Yellow-bellied Prinia	<i>Prinia flaviventris</i>	-	x																	DS		DS		DS		DS	DS	0.8	0.4
Plain Prinia	<i>Prinia inornata</i>	-	x																			DS		DS		DS	DS		
Dusky Warbler	<i>Phylloscopus fuscatus</i>	-	x														0.5		DS										
Yellow-browed warbler	<i>Phylloscopus inornatus</i>	-	x																										1.4
Chinese Penduline-Tit	<i>Remiz consobrinus</i>	RC	✓																			1.2	0.2						
Japanese White-eye	<i>Zosterops japonica</i>	-	x																										
Little Bunting	<i>Emberiza pusilla</i>	-	x			0.5																							
Black-faced Bunting	<i>Emberiza spodocephala</i>	-	x								0.5																		

Common name	Scientific name	Conservation status	Wetland Dependent	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
Chinese Grosbeak	<i>Eophona migratoria</i>	LC	x														0.3												
Scaly-breasted Munia	<i>Lonchura punctulata</i>	-	x	20.0				2.5		15.0	7.5													DS		DS	DS	1.5	
Eurasian Tree Sparrow	<i>Passer montanus</i>	-	x																			DS		DS		DS			
Red-billed Starling	<i>Spodiopsar sericeus</i>	GC	x													0.3		0.8	1.6	6.6	39.0	17.4							
White-cheeked Starling	<i>Spodiopsar cineraceus</i>	PRC	x												6.6														
Black-collared Starling	<i>Gracupica nigricollis</i>	-	x																DS	DS	DS	DS					DS		
White-shouldered Starling	<i>Sturnia sinensis</i>	(LC)	x									0.3		0.5	2.4														
Common Myna	<i>Acridotheres tristis</i>	-	✓																		DS								
Crested Myna	<i>Acridotheres cristatellus</i>	—	x	3.0															DS					DS			DS		V
Black-napped Oriole	<i>Oriolus chinensis</i>	LC	x													1.0													
Black Drongo	<i>Dicrurus macrocercus</i>	-	x																							DS	DS		
Azure-winged Magpie	<i>Cyanopica cyanus</i>	-	x																										
Eurasian Magpie	<i>Pica pica</i>	-	x																			DS					DS	0.3	
Large-billed Crow	<i>Corvus macrorhynchos</i>	-	x				0.4			0.2																			
Collared Crow	<i>Corvus torquatus</i>	LC, NT	x				0.2	0.3			0.5		0.3		0.8	0.8	0.8	0.5							0.8				
No. of species recorded	108																												

Note: Conservation Status follows that of Fellowes et. al. (2002)
* Pintail Snipe and Swinhoe's Snipe cannot be distinguished in field, conservation status refers to Swinhoe's Snipe.
V Indicates the species is recorded outside regular surveys.
DS Indicates species recorded during survey.
Greater Coucal is listed as vulnerable (VU) in China Red Data Book and it is protected under terrestrial wildlife state protection (category II).

Table B5. Summary of Bird Species Recorded at the WRA and their Respective Monthly Mean between November 2012 and October 2014

Common name	Scientific name	Conservation status	Wetland Dependent	Nov-12	Dec-12	Jan-13	Feb-13	Mar-13	Apr-13	May-13	Jun-13	Jul-13	Aug-13	Sep-13	Oct-13	Nov-13	Dec-13	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14	Aug-14	Sep-14	Oct-14
Little Grebe	<i>Tachybaptus ruficollis</i>	LC	✓	1.0	1.0	1.2	0.4	0.6	0.4	1.5	0.5		0.6	0.5	1.2	0.6	2.2	1.8	5.3	4.5	2.4	0.8	2.0	3.2	1.8	1.6	1.4
Great Cormorant	<i>Phalacrocorax carbo</i>	PRC	✓	0.8	3.2	0.8	1.0	0.0	0.0						0.2	V	0.4	0.6	0.5								V
Grey Heron	<i>Ardea cinerea</i>	PRC	✓	0.8	1.4	0.8	1.4	0.0	0.0					V	1.0	2.8	2.6	1.6	2.5							1.0	1.6
Purple Heron	<i>Ardea purpurea</i>	RC	✓																								
Great Egret	<i>Ardea alba</i>	PRC	✓	1.4	0.6	1.0	0.8	0.2	0.6		0.8	0.6			0.6	0.6	2.4	1.2	1.8	0.8	0.2	V	0.5	V	V	0.2	V
Intermediate Egret	<i>Egretta intermedia</i>	RC	✓	0.2	0.0	0.0	0.0	0.0	0.0										V								V
Little Egret	<i>Egretta garzetta</i>	PRC	✓	0.8	2.0	2.2	1.4	0.6	1.2	0.6	1.8	0.4	3.4	0.5	2.2	1.4	2.4	4.4	4.0	3.8	3.2	1.2	3.3	1.8	1.3	2.6	1.6
Eastern Cattle Egret	<i>Bubulcus coromandus</i>	(LC)	✓																	1.6	V						
Chinese Pond Heron	<i>Ardeola bacchus</i>	PRC	✓	1.6	2.2	2.4	0.4	0.0	0.0			0.8	2.0	0.5	1.4	1.4	2.6	6.8	3.5	2.5	1.0	1.6	1.0	1.4	1.5	4.2	1.4
Yellow Bittern	<i>Ixobrychus sinensis</i>	(LC)	✓						V	1.0	2.5	0.2	1.4	1.3	0.8	0.4	0.2			V	V	0.4	1.3	1.0	0.8	0.2	0.2
Black-crowned Night Heron	<i>Nycticorax nycticorax</i>	LC	✓	V			0.2				0.3				V					V		V					V
Eurasian Spoonbill	<i>Platalea leucorodia</i>	LC	✓																								
Black-faced Spoonbill	<i>Platalea minor</i>	PGC, EN	✓																V	V							
Mandarin Duck	<i>Aix galericulata</i>	-	✓																								
Eurasian Wigeon	<i>Anas penelope</i>	RC	✓																								
Eurasian Teal	<i>Anas crecca</i>	RC	✓																								
Northern Pintail	<i>Anas acuta</i>	RC	✓																								
Northern Shoveler	<i>Anas clypeata</i>	RC	✓			V											1.2	7.0	5.5	V							
Tufted Duck	<i>Aythya fuligula</i>	LC	✓			V																					
Garganey	<i>Anas querquedula</i>	-	✓																								
Western Osprey	<i>Pandion haliaetus</i>	RC	✓																								
Black Kite	<i>Milvus migrans</i>	(RC)	x	0.0	0.2	0.0	0.0	0.6	0.0	0.2	0.3		1.2	0.8	0.2	0.2		V	0.5	0.8	0.4	0.6	0.3	0.6			0.4
Crested Serpent Eagle	<i>Spilornis cheela</i>	(LC)	x																V								
Eastern Buzzard	<i>Buteo japonicus</i>	-	x																								V
Common Kestrel	<i>Falco tinnunculus</i>	-	x																								
Eurasian Hobby	<i>Falco subbuteo</i>	(LC)	✓																						V		
Peregrine Falcon	<i>Falco peregrinus</i>	-	x		V												V										
Imperial Eagle	<i>Aquila heliaca</i>	-	x			V																					
Japanese Quail	<i>Coturnix japonica</i>	LC	✓												V												
White-breasted Waterhen	<i>Amaurornis phoenicurus</i>	-	✓	0.2		0.2	0.0	0.4	0.2	V	1.8	0.2	0.2	V	0.8	0.4				V	0.2	0.2	V	1.4	0.5	0.5	0.2
Common Moorhen	<i>Gallinula chloropus</i>	-	✓																	V	0.2						
Pheasant-tailed Jacana	<i>Hydrophasianus chirurgus</i>	LC	✓																								
Greater Painted-snipe	<i>Rostratula benghalensis</i>	LC	✓	0.2	0.0	0.0	0.0	0.0	0.0																		
Black-winged Stilt	<i>Himantopus himantopus</i>	RC	✓									0.2	0.6	V	0.2	V										V	V

Common name	Scientific name	Conservation status	Wetland Dependent	Nov-12	Dec-12	Jan-13	Feb-13	Mar-13	Apr-13	May-13	Jun-13	Jul-13	Aug-13	Sep-13	Oct-13	Nov-13	Dec-13	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14	Aug-14	Sep-14	Oct-14
Pied Avocet	<i>Recurvirostra avosetta</i>	RC	✓	0.0	0.2	0.0	0.0	0.0	0.0																		
Oriental Pratincole	<i>Glareola maldivarum</i>	LC	✓																								
Little Ringed Plover	<i>Charadrius dubius</i>	LC	✓	0.0	0.0	0.4	1.0	0.2	0.0						V	0.4		V	0.5	0.8			0.3				1.2
Kentish Plover	<i>Charadrius alexandrinus</i>	RC	✓									0.8				V											
Spotted Redshank	<i>Tringa erythropus</i>	RC	✓												V												
Common Redshank	<i>Tringa totanus</i>	RC	✓																								
Marsh Sandpiper	<i>Tringa stagnatilis</i>	RC	✓																								
Common Greenshank	<i>Tringa nebularia</i>	RC	✓	V	V	V		V									V	V		V							V
Green Sandpiper	<i>Tringa ochropus</i>	-	✓						0.2						1.0	0.6	V			0.5					V		V
Wood Sandpiper	<i>Tringa glareola</i>	LC	✓		V		V	V							V	V	V	V	V	V				0.4	0.3		0.2
Common Sandpiper	<i>Actitis hypoleucos</i>	-	✓	0.2					0.2	0.2		V	0.6	V	0.8	1.6	0.2	V	0.3	1.3	0.2	0.4	V	V	0.3	2.6	4.4
Eurasian Woodcock	<i>Scolopax rusticola</i>	-	✓																								
Pintail/Swinhoe's Snipe*	<i>Gallinago stenura/G. megala</i>	LC*	✓													V											
Common Snipe	<i>Gallinago gallinago</i>	-	✓		V				V																		
Red-necked Stint	<i>Calidris ruficollis</i>	LC	✓																								
Temminck's Stint	<i>Calidris temminckii</i>	LC	✓																								0.6
Long-toed Stint	<i>Calidris subminuta</i>	LC	✓																								
Whiskered Tern	<i>Chlidonias hybrida</i>	-	✓																								
Domestic Pigeon	<i>Columba livia</i>	-	x																								
Eurasian Collared Dove	<i>Streptopelia decaocto</i>	-	x																								V
Oriental Turtle Dove	<i>Streptopelia orientalis</i>	-	x																								
Red Turtle Dove	<i>Streptopelia tranquebarica</i>	-	x																								
Spotted Dove	<i>Spilopelia chinensis</i>	-	x	0.4	1.2	0.4		0.2	0.2	0.4	0.5	0.8	2.8	2.0	2.6	2.6	3.0	6.2	2.3	2.0	1.0	0.6	1.6	1.2	1.3	2.2	3.6
Asian Koel	<i>Eudynamys scolopaceus</i>	-	x																		V						
Greater Coucal#	<i>Centropus sinensis</i>	-	x							0.2	0.3	0.2	0.2		0.2	0.2					0.4	0.8	0.3	0.8	0.5	0.2	0.2
Eurasian Eagle Owl	<i>Bubo bubo</i>	RC	x											V		V			V								
Savanna Nightjar	<i>Caprimulgus affinis</i>	-	x				V				V									V							
Pacific Swift	<i>Apus pacificus</i>	(LC)	x																								
House Swift	<i>Apus nipalensis</i>	-	x		0.4	V												V	0.5								
Pied Kingfisher	<i>Ceryle rudis</i>	(LC)	✓						V				V				0.4	V	0.3	V				V			
Common Kingfisher	<i>Alcedo atthis</i>	-	✓	0.2	0.2	0.5	0.4	0.2	0.2	0.6	0.3	0.4	0.4	0.8	1.0	2.0	1.6	1.2	2.3	0.8	1.0			V			
White-throated Kingfisher	<i>Halcyon smyrnensis</i>	(LC)	x													V	0.2					1.2	1.8	0.6	1.3	1.4	1.8
Barn Swallow	<i>Hirundo rustica</i>	-	x	0.2	1.0		0.2	9.2	23.0	11.2		1.4	1.8	1.0		V			0.5	7.8	15.4	18.0	1.5	1.0	1.5	0.4	V
Red-rumped Swallow	<i>Hirundo daurica</i>	-	x	1.2	1.2													0.6									

Common name	Scientific name	Conservation status	Wetland Dependent	Nov-12	Dec-12	Jan-13	Feb-13	Mar-13	Apr-13	May-13	Jun-13	Jul-13	Aug-13	Sep-13	Oct-13	Nov-13	Dec-13	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14	Aug-14	Sep-14	Oct-14
Eastern Yellow Wagtail	<i>Motacilla tschutschensis</i>	-	✓	0.2	0.2	1.4	2.8	2.2	2.2	0.2					0.4	0.2	0.6	0.6	1.0	0.3	0.2					0.6	0.2
Grey Wagtail	<i>Motacilla cinerea</i>	-	✓	0.6	0.0	0.0	0.0	0.0																			
White Wagtail	<i>Motacilla alba</i>	-	✓	2.6	1.0	1.0	3.0	4.8	2.0	1.0		1.2	0.4	3.5	2.8	3.6	2.6	1.2	1.3	2.5	1.6	0.6	1.2	0.8	1.8	1.8	3.2
Richard's Pipit	<i>Anthus richardi</i>	-	✓	0.2	0.4	1.2	0.4	0.4									0.4	0.8	2.0	2.3	3.0	V					V
Olive-backed Pipit	<i>Anthus hodgsoni</i>	-	x				0.6	1.2	1.4											0.2							
Red-throated Pipit	<i>Anthus cervinus</i>	LC	x																								
Buff-bellied Pipit	<i>Anthus rubescens</i>	LC	x																								
Red-whiskered Bulbul	<i>Pycnonotus jocosus</i>	-	x						0.2		0.3		0.2			V		0.8	1.3	0.3	0.2			0.2	0.3	1.2	
Chinese Bulbul	<i>Pycnonotus sinensis</i>	-	x		0.2	2.0	0.2	0.2	3.2	2.0	3.8		2.4	3.5	0.2	1.8	4.0	3.8	0.5	0.8	1.6	1.8	2.3	2.2	2.3	0.4	4.6
Bull-headed Shrike	<i>Lanius bucephalus</i>	-	x																								V
Long-tailed Shrike	<i>Lanius schach</i>	-	x	0.2		0.4			0.2		V	0.4	0.2	0.3	0.2		0.2	V	0.3			0.2	0.3	0.4	0.5	V	
Oriental Magpie Robin	<i>Copsychus saularis</i>	-	x		0.2					0.2	0.5		0.2	0.3	V	0.2	0.2	0.4			0.2		0.3	V	V	V	
Daurian Redstart	<i>Phoenicurus aureoreus</i>	-	x			0.2										0.2	0.2	0.4									V
Stejneger's Stonechat	<i>Saxicola stejnegeri</i>	-	x	0.4	0.4	0.8			0.6						V	0.2	0.2	0.4	0.5	0.3	V	0.2					0.4
Masked Laughingthrush	<i>Garrulax perspicillatus</i>	-	x					0.6	1.2					1.0			0.4	0.8	V	0.5	0.2	0.2	0.5	V	1.5	0.8	
Lanceolated Warbler	<i>Locustella lanceolata</i>	-	✓																								
Pallas's Grasshopper Warbler	<i>Locustella certhiola</i>	LC	✓																								
Oriental Reed Warbler	<i>Acrocephalus orientalis</i>	-	✓																							V	
Black-browed Reed Warbler	<i>Acrocephalus bistrigiceps</i>	-	✓	0.2	0.0	0.0	0.0	0.0	0.0																		
Common Tailorbird	<i>Orthotomus sutorius</i>	-	x																								0.2
Zitting Cisticola	<i>Cisticola juncidis</i>	LC	x		0.2			V										0.4		0.3	0.2						
Yellow-bellied Prinia	<i>Prinia flaviventris</i>	-	x		0.8	0.6	0.8	1.4	4.6	4.4	5.0	2.4	1.8	3.0	2.4	0.8	1.0	0.8	1.3	2.8	0.8	0.8	0.4			0.4	
Plain Prinia	<i>Prinia inornata</i>	-	x	1.2	0.4	V	1.4	0.2	0.2	0.2	0.5	0.8	0.4	0.3		0.4		0.2	V	0.8	2.0	1.0		2.6	4.3	3.4	
Dusky Warbler	<i>Phylloscopus fuscatus</i>	-	x												V	0.4		0.4	0.8	1.5	V					V	V
Yellow-browed warbler	<i>Phylloscopus inornatus</i>	-	x	0.8	0.6																			0.8	0.5		V
Chinese Penduline-Tit	<i>Remiz consobrinus</i>	RC	✓														V		4.5	V							
Japanese White-eye	<i>Zosterops japonica</i>	-	x															0.2			0.6			V			
Little Bunting	<i>Emberiza pusilla</i>	-	x																								
Black-faced Bunting	<i>Emberiza spodocephala</i>	-	x																	V							
Chinese Grosbeak	<i>Eophona migratoria</i>	LC	x																								

Common name	Scientific name	Conservation status	Wetland Dependent	Nov-12	Dec-12	Jan-13	Feb-13	Mar-13	Apr-13	May-13	Jun-13	Jul-13	Aug-13	Sep-13	Oct-13	Nov-13	Dec-13	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14	Aug-14	Sep-14	Oct-14
Scaly-breasted Munia	<i>Lonchura punctulata</i>	-	x				1.0	2.2	1.0			2.0	0.4	0.3			1.8	1.8	V	1.8	V	3.2	5.8	0.8	1.5	1.3	
Eurasian Tree Sparrow	<i>Passer montanus</i>	-	x												0.8	V									V	8.8	3.6
Red-billed Starling	<i>Spodiopsar sericeus</i>	GC	x																V			V				V	
White-cheeked Starling	<i>Spodiopsar cineraceus</i>	PRC	x																								
Black-collared Starling	<i>Gracupica nigricollis</i>	-	x			0.8	0.4	0.2	0.2	0.2				0.8		0.8	1.6	0.8	0.5	1.8	0.2	0.2	V	1.0	1.0	1.2	1.4
White-shouldered Starling	<i>Sturnia sinensis</i>	(LC)	x									0.2											V		V		V
Common Myna	<i>Acridotheres tristis</i>	-	✓																						V		
Crested Myna	<i>Acridotheres cristatellus</i>	-	x	0.6						0.2	0.3	0.8	0.2			2.0	1.8	1.4	0.5	1.3	1.0	0.6	1.0	1.2	3.5	0.2	1.8
Black-naped Oriole	<i>Oriolus chinensis</i>	LC	x																								
Black Drongo	<i>Dicrurus macrocercus</i>	-	x											0.3	0.4	V					V				1.5		0.2
Azure-winged Magpie	<i>Cyanopica cyanus</i>	-	x													V											
Eurasian Magpie	<i>Pica pica</i>	-	x								0.3					V		0.8	V	0.3	0.2						
Large-billed Crow	<i>Corvus macrorhynchos</i>	-	x								1.0												0.3				
Collared Crow	<i>Corvus torquatus</i>	LC, NT	x						V						0.2	0.2			V	0.5	0.8	0.4		0.6		0.4	V
No. of species recorded	111																										

Note: Conservation Status follows that of Fellowes et. al. (2002)
* Pintail Snipe and Swinhoe's Snipe cannot be distinguished in field, conservation status refers to Swinhoe's Snipe.
V Indicates the species is recorded outside regular surveys.
DS Indicates species recorded during survey.
Greater Coucal is listed as vulnerable (VU) in China Red Data Book and it is protected under terrestrial wildlife state protection (category II).

Table B6. Summary of Bird Species Recorded at the WRA and their Respective Monthly Mean between November 2014 and April 2015

Common name	Scientific name	Conservation status	Wetland Dependent	Nov-14	Dec-14	Jan-15	Feb-15	Mar-15	Apr-15
Little Grebe	<i>Tachybaptus ruficollis</i>	LC	✓	2.5	1.2	2.0	2.0	2.0	0.8
Great Cormorant	<i>Phalacrocorax carbo</i>	PRC	✓	0.5	1.8	2.0	0.8	0.6	
Grey Heron	<i>Ardea cinerea</i>	PRC	✓	2.3	2.6	5.3	4.8	0.8	V
Purple Heron	<i>Ardea purpurea</i>	RC	✓						
Great Egret	<i>Ardea alba</i>	PRC	✓	0.5	1.6	0.8	0.3	V	0.3
Intermediate Egret	<i>Egretta intermedia</i>	RC	✓						
Little Egret	<i>Egretta garzetta</i>	PRC	✓	3.0	3.6	5.3	3.5	4.6	6.3
Eastern Cattle Egret	<i>Bubulcus coromandus</i>	(LC)	✓			V			
Chinese Pond Heron	<i>Ardeola bacchus</i>	PRC	✓	2.0	2.8	2.3	2.8	1.2	1.8
Yellow Bittern	<i>Ixobrychus sinensis</i>	(LC)	✓	0.3	0.2			0.2	0.5
Cinnamon Bittern	<i>Ixobrychus cinnamomeus</i>	LC	✓						V
Black-crowned Night Heron	<i>Nycticorax nycticorax</i>	LC	✓						
Eurasian Spoonbill	<i>Platalea leucorodia</i>	LC	✓						
Black-faced Spoonbill	<i>Platalea minor</i>	PGC, EN	✓		V	V		V	
Mandarin Duck	<i>Aix galericulata</i>	-	✓						
Eurasian Wigeon	<i>Anas penelope</i>	RC	✓						
Eurasian Teal	<i>Anas crecca</i>	RC	✓						
Northern Pintail	<i>Anas acuta</i>	RC	✓						
Northern Shoveler	<i>Anas clypeata</i>	RC	✓		0.2				
Tufted Duck	<i>Aythya fuligula</i>	LC	✓						
Garganey	<i>Anas querquedula</i>	-	✓						
Western Osprey	<i>Pandion haliaetus</i>	RC	✓						
Black Kite	<i>Milvus migrans</i>	(RC)	x		0.4		0.3	0.4	0.5
Crested Serpent Eagle	<i>Spilornis cheela</i>	(LC)	x						
Eastern Buzzard	<i>Buteo japonicus</i>	-	x						
Common Kestrel	<i>Falco tinnunculus</i>	-	x						
Eurasian Hobby	<i>Falco subbuteo</i>	(LC)	✓						
Peregrine Falcon	<i>Falco peregrinus</i>	-	x			0.3			
Greater Spotted Eagle	<i>Clanga clanga</i>	GC	x				0.3		
Imperial Eagle	<i>Aquila heliaca</i>	-	x				V	0.2	
Japanese Quail	<i>Coturnix japonica</i>	LC	✓						
White-breasted Waterhen	<i>Amaurornis phoenicurus</i>	-	✓	0.5	V	0.8	1.0	0.8	0.3
Common Moorhen	<i>Gallinula chloropus</i>	-	✓	V		V		0.2	
Pheasant-tailed Jacana	<i>Hydrophasianus chirurgus</i>	LC	✓						
Greater Painted-snipe	<i>Rostratula benghalensis</i>	LC	✓						

Common name	Scientific name	Conservation status	Wetland Dependent	Nov-14	Dec-14	Jan-15	Feb-15	Mar-15	Apr-15
Black-winged Stilt	<i>Himantopus himantopus</i>	RC	✓				0.3	0.2	
Pied Avocet	<i>Recurvirostra avosetta</i>	RC	✓						
Oriental Pratincole	<i>Glareola maldivarum</i>	LC	✓						
Little Ringed Plover	<i>Charadrius dubius</i>	LC	✓	1.8	0.2	0.8	0.5	1.6	1.8
Kentish Plover	<i>Charadrius alexandrinus</i>	RC	✓						
Spotted Redshank	<i>Tringa erythropus</i>	RC	✓						
Common Redshank	<i>Tringa totanus</i>	RC	✓						
Marsh Sandpiper	<i>Tringa stagnatilis</i>	RC	✓						
Common Greenshank	<i>Tringa nebularia</i>	RC	✓	V	V	V			
Green Sandpiper	<i>Tringa ochropus</i>	-	✓	0.3	0.2		0.3	0.2	
Wood Sandpiper	<i>Tringa glareola</i>	LC	✓		2.2	V	V	V	1.0
Common Sandpiper	<i>Actitis hypoleucos</i>	-	✓	0.8	1.2	3.0	2.0	2.2	0.5
Eurasian Woodcock	<i>Scolopax rusticola</i>	-	✓		V				
Pintail/Swinhoe's Snipe*	<i>Gallinago stenura/G. megala</i>	LC*, -	✓						
Common Snipe	<i>Gallinago gallinago</i>	-	✓					V	
Red-necked Stint	<i>Calidris ruficollis</i>	LC	✓						
Temminck's Stint	<i>Calidris temminckii</i>	LC	✓						
Long-toed Stint	<i>Calidris subminuta</i>	LC	✓						
Whiskered Tern	<i>Chlidonias hybrida</i>	-	✓						
Domestic Pigeon	<i>Columba livia</i>	-	X						
Eurasian Collared Dove	<i>Streptopelia decaocto</i>	-	X						0.5
Oriental Turtle Dove	<i>Streptopelia orientalis</i>	-	X						
Red Turtle Dove	<i>Streptopelia tranquebarica</i>	-	X						
Spotted Dove	<i>Spilopelia chinensis</i>	-	X	1.5	4.2	3.8	1.3	2.2	6.0
Asian Koel	<i>Eudynamys scolopaceus</i>	-	X					V	
Greater Coucal#	<i>Centropus sinensis</i>		X	V	0.2	0.3	0.3	0.6	1.0
Eurasian Eagle Owl	<i>Bubo bubo</i>	RC	X				V		
Savanna Nightjar	<i>Caprimulgus affinis</i>	-	X				V		
Pacific Swift	<i>Apus pacificus</i>	(LC)	X						
House Swift	<i>Apus nipalensis</i>	-	X			14.5	105.8	14.4	0.8
Pied Kingfisher	<i>Ceryle rudis</i>	(LC)	✓		0.4	0.5	0.3	0.2	
Common Kingfisher	<i>Alcedo atthis</i>	-	✓	1.3	0.8	1.8	2.8	1.4	1.5
White-throated Kingfisher	<i>Halcyon smyrnensis</i>	(LC)	X		0.2				0.3
Eurasian Hoopoe	<i>Upupa epops</i>	-	X				0.3		
Barn Swallow	<i>Hirundo rustica</i>	-	X	0.5		13.0	15.3	14.4	9.8

Common name	Scientific name	Conservation status	Wetland Dependent	Nov-14	Dec-14	Jan-15	Feb-15	Mar-15	Apr-15
Red-rumped Swallow	<i>Hirundo daurica</i>	-	x						
Eastern Yellow Wagtail	<i>Motacilla tschutschensis</i>	-	✓	1.8	0.4	2.0	4.3	2.0	1.0
Grey Wagtail	<i>Motacilla cinerea</i>	-	✓						
White Wagtail	<i>Motacilla alba</i>	-	✓	4.0	5.6	6.3	9.5	4.8	3.3
Richard's Pipit	<i>Anthus richardi</i>	-	✓	0.3		0.5	V		
Olive-backed Pipit	<i>Anthus hodgsoni</i>	-	x	0.3	2.2	0.3	1.5	0.4	
Red-throated Pipit	<i>Anthus cervinus</i>	LC	x						
Buff-bellied Pipit	<i>Anthus rubescens</i>	LC	x						
Red-whiskered Bulbul	<i>Pycnonotus jocosus</i>	-	x	0.8	3.4	7.3	1.3	0.6	0.8
Chinese Bulbul	<i>Pycnonotus sinensis</i>	-	x	5.3	3.0	24.8	10.0	4.8	6.3
Bull-headed Shrike	<i>Lanius bucephalus</i>	-	x						
Brown Shrike	<i>Lanius cristatus</i>	-	x						0.3
Long-tailed Shrike	<i>Lanius schach</i>	-	x		0.2	0.8	0.5	0.4	
Oriental Magpie Robin	<i>Copsychus saularis</i>	-	x		0.2	0.5	0.8	0.6	0.5
Daurian Redstart	<i>Phoenicurus aureus</i>	-	x	0.3	1.6	0.8	0.5	0.6	
Stejneger's Stonechat	<i>Saxicola stejnegeri</i>	-	x	0.3	0.2	0.3	0.8	0.8	0.3
Masked Laughingthrush	<i>Garrulax perspicillatus</i>	-	x		1.2		1.5	1.0	1.3
Lanceolated Warbler	<i>Locustella lanceolata</i>	-	✓						
Pallas's Grasshopper Warbler	<i>Locustella certhiola</i>	LC	✓						
Oriental Reed Warbler	<i>Acrocephalus orientalis</i>	-	✓						
Black-browed Reed Warbler	<i>Acrocephalus bistrigiceps</i>	-	✓		V				
Common Tailorbird	<i>Orthotomus sutorius</i>	-	x	0.5	1.2	1.0	1.5	0.4	
Zitting Cisticola	<i>Cisticola juncidis</i>	LC	✓				V	V	
Yellow-bellied Prinia	<i>Prinia flaviventris</i>	-	x	0.5		0.3	0.3	2.6	0.8
Plain Prinia	<i>Prinia inornata</i>	-	x	2.8	0.2	1.3	3.5	1.6	2.8
Dusky Warbler	<i>Phylloscopus fuscatus</i>	-	x				V	V	
Pallas's Leaf Warbler	<i>Phylloscopus proregulus</i>		x		V				
Yellow-browed warbler	<i>Phylloscopus inornatus</i>	-	x	0.3	0.2	0.3			
Chinese Penduline-Tit	<i>Remiz consobrinus</i>	RC	✓		0.4	1.5	4.5	3.2	V
Japanese White-eye	<i>Zosterops japonica</i>	-	x		1.0	V	V	0.2	
Little Bunting	<i>Emberiza pusilla</i>	-	x						

Common name	Scientific name	Conservation status	Wetland Dependent	Nov-14	Dec-14	Jan-15	Feb-15	Mar-15	Apr-15
Black-faced Bunting	<i>Emberiza spodocephala</i>	-	x					V	
Chinese Grosbeak	<i>Eophona migratoria</i>	LC	x						
Scaly-breasted Munia	<i>Lonchura punctulata</i>	-	x	3.3	0.6	V	V	4.0	11.3
Eurasian Tree Sparrow	<i>Passer montanus</i>	-	x		V	4.5	4.0	1.4	
Red-billed Starling	<i>Spodiopsar sericeus</i>	GC	x				24.5	V	
White-cheeked Starling	<i>Spodiopsar cineraceus</i>	PRC	x		V				
Black-collared Starling	<i>Gracupica nigricollis</i>	-	x	0.3	3.0	1.3	2.0	4.2	2.3
White-shouldered Starling	<i>Sturnia sinensis</i>	(LC)	x						
Common Myna	<i>Acridotheres tristis</i>	-	x						
Crested Myna	<i>Acridotheres cristatellus</i>	–	x	2.8	4.0		0.5	2.2	2.3
Black-naped Oriole	<i>Oriolus chinensis</i>	LC	x						
Black Drongo	<i>Dicrurus macrocercus</i>	-	x		V				
Azure-winged Magpie	<i>Cyanopica cyanus</i>	-	x						
Eurasian Magpie	<i>Pica pica</i>	-	x			0.3	0.8	V	0.5
Large-billed Crow	<i>Corvus macrorhynchos</i>	-	x						
Collared Crow	<i>Corvus torquatus</i>	LC, NT	x						V
No. of species recorded	117								

Note: Conservation Status follows that of Fellowes et. al. (2002)
* Pintail Snipe and Swinhoe's Snipe cannot be distinguished in field, conservation status refers to Swinhoe's Snipe.
V Indicates the species is recorded outside regular surveys.
DS Indicates species recorded during survey.
Greater Coucal is listed as vulnerable (VU) in China Red Data Book and it is protected under terrestrial wildlife state protection (category II).

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⁾	
Amphibians			Nov	Apr
Gunther's Frog	<i>Rana guentheri</i>	-	-	0.5
		No. of Species Recorded	0	1
Reptiles			Nov	Apr
Changeable Lizard	<i>Calotes versicolor</i>	-	-	0.5
		No. of Species Recorded	0	1

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

(2) Refers to the mean number of individuals recorded in the reporting period (excluding the WRA)

v Indicates the species is recorded outside regular surveys.

Proposed Comprehensive Development at Wo Shang Wai Yuen Long

Biannual EM&A Report on Ecology for Nov 2014 - Apr 2015 (Rev A)



Table C2. Summary of herpetofauna monitoring in the WRA

Common Name	<i>Scientific Name</i>	Conservation Status ⁽¹⁾	Mean ⁽²⁾	
			Nov	Apr
Amphibians				
No records during the survey period	-	--		
		No. of Species Recorded	0	0
Reptiles				
(No records during the survey period)	-	-		
		No. of Species Recorded	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 mean number of individuals recorded in the reporting period (excluding the WRA)

v indicates the species is recorded outside regular surveys.

Table C3. Summary of mammal monitoring in the Survey Area (excluding the WRA)

Common Name	<i>Scientific Name</i>	Conservation Status ⁽¹⁾	Mean ⁽²⁾					
			Nov	Dec	Jan	Feb	Mar	Apr
No mammal was recorded during the survey period	-	-	0	0	0	0	0	0
		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 survey area (excluding WRA).

Table C4. Summary of mammal monitoring in the WRA

Common Name	Scientific Name	Conservation Status ⁽¹⁾	Mean ⁽²⁾					
			Nov	Dec	Jan	Feb	Mar	Apr
Bat sp. A	<i>Pipistrellus sp.</i>	-				V		
Bat sp. B	<i>Pipistrellus sp.</i>	-				V		
Leopard Cat	<i>Prionailurus bengalensis</i>	-				V		
No. of Species Recorded			0	0	0	3	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 survey area (excluding WRA)
 V indicates the species is recorded outside regular surveys

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

Common Name	Scientific Name	Conservation Status ⁽¹⁾	Mean ⁽²⁾		
Odonate			Nov	Mar	Apr
Variegated Flutterer	<i>Rhyothemis variegata arria</i>	-			0.5
		No. of Species Recorded	0	0	1
Butterfly			Nov	Mar	Apr
Indian Cabbage White	<i>Pieris canidia canidia</i>	-			2.5
		No. of Species Recorded	0	0	1

- (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)

Proposed Comprehensive Development at Wo Shang Wai Yuen Long

Biannual EM&A Report on Ecology for Nov 2014 - Apr 2015 (Rev A)



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

Common Name	Scientific Name	Conservation Status ⁽¹⁾	Mean ⁽²⁾		
Odonate			Nov	Mar	Apr
Asian Amberwing	<i>Brachythemis contaminata</i>	-			0.5
Common Bluetail	<i>Ischnura senegalensis</i>	-		1.0	
Green Skimmer	<i>Orthetrum sabina sabina</i>	-		1.0	1.5
Wandering Glider	<i>Pantala flavescens</i>	-			1.0
Variegated Flutterer	<i>Rhyothemis variegata arria</i>	-			0.5
No. of Species Recorded			0	2	4
Butterfly			Nov	Mar	Apr
Common Sailer	<i>Neptis hylas</i>	-		1.0	
Great Egg-fly	<i>Hypolimnas bolina</i>	-		1.0	
Indian Cabbage White	<i>Pieris canidia</i>	-		2.0	
No. of Species Recorded			0	3	0

(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)

Appendix D. Summary of Water Quality Monitoring

Table D1. Water quality at WRA

November 2014

Cell No.	Temp. (°C)	pH	Salinity (ppt)	Turbidity (mg/L)	DO (mg/L)	Water Level (cm)
1	23.6	7.98	0.38	7.6	5.7	160
2	23.5	7.93	0.34	8.0	5.9	140
3	23.7	7.91	0.25	8.7	5.8	160
4	23.6	7.98	0.26	8.4	5.9	140

December 2014

Cell No.	Temp. (°C)	pH	Salinity (ppt)	Turbidity (mg/L)	DO (mg/L)	Water Level (cm)
1	18.3	7.88	0.40	6.8	5.8	150
2	18.4	7.97	0.42	7.2	6.0	130
3	18.2	7.92	0.27	5.3	6.3	170
4	18.4	8.01	0.26	6.4	6.2	140

January 2015

Cell No.	Temp. (°C)	pH	Salinity (ppt)	Turbidity (mg/L)	DO (mg/L)	Water Level (cm)
1	19.3	7.91	0.51	9.1	5.6	150
2	19.2	7.86	0.47	9.5	5.9	130
3	19.4	7.84	0.38	10.2	5.8	170
4	19.3	7.91	0.39	9.9	5.9	140

Proposed Comprehensive Development at Wo Shang Wai Yuen Long

Biannual EM&A Report on Ecology for Nov 2014 - Apr 2015 (Rev A)



February 2015

Cell No.	Temp. (°C)	pH	Salinity (ppt)	Turbidity (mg/L)	DO (mg/L)	Water Level (cm)
1	21.0	7.88	0.50	8.8	6.0	140
2	21.2	7.91	0.48	7.6	6.1	120
3	21.2	7.86	0.39	9.2	6.0	160
4	21.4	7.84	0.40	8.9	6.2	130

March 2015

Cell No.	Temp. (°C)	pH	Salinity (ppt)	Turbidity (mg/L)	DO (mg/L)	Water Level (cm)
1	19.6	7.99	0.53	11.2	5.5	140
2	19.6	8.01	0.73	11.6	5.7	120
3	19.5	8.08	0.55	12.3	5.7	160
4	19.5	7.89	0.75	12.0	5.8	130

April 2015

Cell No.	Temp. (°C)	pH	Salinity (ppt)	Turbidity (mg/L)	DO (mg/L)	Water Level (cm)
1	24.8	7.97	0.55	11.5	5.6	130
2	24.7	7.90	0.75	11.9	5.9	100
3	24.7	7.91	0.57	12.6	5.8	150
4	24.7	7.90	0.77	12.3	5.9	120

Notes: Values **Bold** indicate Action Level exceedance.
 Values **Bold** indicate Limit Level exceedance.