Proposed Comprehensive Development at Wo Shang Wai, Yuen Long

Bi-annual Report on EM&A Results on Ecological Aspects for November 2023 to April 2024 (Rev A)

3 October 2024

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Profit Point Enterprises Limited

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Mott MacDonald Hong Kong Limited
registered in Hong Kong no. 236497

Pursuant to Condition 4.6 of Environmental Permit No. EP-311/2008/E, this Biannual EM&A Report on ecological aspects for November 2023 to April 2024 has been reviewed, certified by Environmental Team Leader (ETL) and verified by the Independent Environmental Checker (IEC).

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Date 24 October 2024

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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 then carried out under the EIA Ordinance (EIAO), and the Environmental Permit (EP-311/2008) for construction of the comprehensive development in Wo Shang Wai was first granted by EPD on 9 September 2008 and has been subsequently varied, with the current version (EP-311/2008/E) issued by EPD on 19 December 2017.

The Project involves the residential development, associated infrastructure, 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 (WRA) were completed on 15 November 2010, and the WRA was established by October 2012, within 30 months from the commencement of construction as stipulated in the EP. This indicated that planting works as scheduled in the approved Wetland Restoration and Creation Scheme (WRCS; November 2009) was completed, except along the western and southern boundary 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. The current valid EP (EP-311/2008/E) 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 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 28th Biannual EM&A report and it summarises the findings on EM&A results of ecological aspects during the period from 1 November 2023 to 30 April 2024. This report documents surveys and management activities conducted in the Survey Area and WRA from 1 November 2023 to 30 April 2024, which is based on ecological surveys and advice on management undertaken and provided by the appointed Non-Government Organisation (Eco-Institute) during the reporting period.

1.2 Survey Area

Surveys were conducted within 500m of the Project area. The WRA has been surveyed since early September 2010. The survey area and transect are provided in **Figure 1.1.**

1.3 EM&A Requirement on Ecological Impact

The EM&A programme requires environmental monitoring of ecology as specified in the approved EM&A Manual, summarised 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	Day-time: 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

Source: Extract from Table 7-1 of the Proposed Comprehensive Development at Wo Shang Wai, Yuen Long EM&A Manual (March 2008)

2 Ecological Monitoring

2.1 Ecological Monitoring

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 requirements 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 reporting period. A total of 68 bird species were recorded in the Survey Area (excluding the WRA) in the survey period (i.e. November 2023 to April 2024), 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 69 species were recorded in the WRA during the survey period, 28 of which were species of conservation importance and/or wetland-dependent species. Two of the three target species[1] (Little Egret (*Egretta garzetta*) and Chinese Pond Heron (*Ardeola bacchus*)) were recorded in the WRA during regular surveys.

The WRA continues to attract a number of species of conservation importance, including Little Grebe (*Tachybaptus ruficollis*), Great Cormorant (*Phalacrocorax carbo*), Grey Heron (*Ardea cinerea*), Purple Heron (*Ardea purpurea*), Great Egret (*Ardea alba*), Little Egret, Chinese Pond Heron, Yellow Bittern (*Ixobrychus sinensis*), Black-crowned Night Heron (*Nycticorax nycticorax*), Black-winged Kite (*Elanus caeruleus*), Black Kite (Milvus migrans), Eastern Imperial Eagle (*Aquila heliaca*), Greater Painted-snipe (*Rostratula benghalensis*), Black-winged Stilt (*Himantopus Himantopus*), Common Greenshank (*Tringa nebularia*), Wood Sandpiper (*Tringa glareola*), Pied Kingfisher (*Ceryle rudis*), White-throated Kingfisher (*Halcyon smyrnensis*) and Collared Crow (*Corvus torquatus*). Little Grebe, Yellow Bittern, Black-crowned Night Heron, Black-winged Kite, Greater Painted-snipe, Wood Sandpiper, Pied Kingfisher, White-throated Kingfisher and Collared Crow are listed by Fellowes et al. (2002) as of “Local Concern”. Great Cormorant, Grey Heron, Great Egret, Little Egret and Chinese Pond Heron are listed by Fellowes et al. (2002) as of “Potential Regional Concern”. Purple Heron, Black Kite, Black-winged Stilt and Common Greenshank are listed by Fellowes et al. (2002) as of “Regional Concern”. Eastern Imperial Eagle is listed by Fellowes et al. (2002) as of “Global Concern”. Collared Crow is also listed as “near threatened” species on the IUCN list.

In addition to wetland-dependence birds and/or species of conservation importance, the WRA also attracts a number of terrestrial birds including Besra (*Accipiter virgatus*), Eastern Buzzard (*Buteo japonicus*), Common Kestrel (*Falco tinnunculus*) and Greater Coucal (*Centropus sinensis*) which are protected under terrestrial

[1] The target species are: Little Egret, *Egretta garzetta*, Eastern Cattle Egret, *Bubulcus coromandus* (formerly known as Cattle Egret, *Bubulcus ibis*) and Chinese Pond Heron, *Ardeola bacchus*.

wildlife state protection (Category II). Greater Coucal is also listed as vulnerable (VU) in the China Red Data Book.

The fish ponds to the north of the WRA (i.e. within the Survey Area (excluding 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 (with 35 bird species of conservation importance and/or wetland-dependence recorded during the survey period). Nevertheless, 28 bird species of conservation importance and /or wetland dependence were also observed using the site within the WRA during the survey period, including some bird species which are highly sensitive to disturbance. The WRA is therefore considered to be effective both in acting as a buffer against potential disturbance and impact from the construction site, and in providing suitable wetland habitats at the fringe of the Deep Bay system which includes the Mai Po Marshes and the Ramsar Site as a whole.

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 2023 and April 2024. Night-time herpetofauna surveys were conducted once a month in March 2024 and April 2024. Further, notable herpetofauna observations during other surveys, site inspections and habitat management works were also recorded.

A total of two amphibian species (Brown Tree Frog (*Polypedates megacephalus*) and Asiatic Painted Frog (*Kaloula pulchra pulchra*)) and one reptile species (Bowring's Gecko (*Hemidactylus bowringii*)) were recorded in the Survey Area (excluding WRA) during the reporting period. Within the WRA, a total of three amphibian species (Brown Tree Frog, Asiatic Painted Frog and Ornate Pygmy Frog (*Microhyla fissipes)*), and two reptile species (Bowring's Gecko and Long-tailed Skink (*Eutropis longicaudata*)) were recorded during the reporting period.

A summary of survey data is provided in **Appendix C.**

2.4 Monitoring of Dragonfly and Butterflies

Monitoring of odonates and butterflies was conducted once a month in November 2023 and March 2024, and twice a month in April 2024. Further, notable odonate and butterfly observations during other surveys, site inspections and habitat management works were recorded.

A total of 10 odonate species and 9 butterfly species were recorded in the Survey Area (excluding WRA) during the survey period. Within the WRA, a higher diversity of odonate species (18 species) and butterfly species (21 species) were recorded.

Among the butterfly species recorded in the WRA in the survey period, Common Awl (*Hasora badra badra*) is listed by Fellowes et al. (2002) as of 'Local Concern'.

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. Further, notable mammals observed during site inspections and habitat management works were also recorded.

One mammal species, Japanese Pipistrelle (*Pipistrellus abramus*), was recorded in the Survey Area (excluding WRA) during the reporting period. Four mammal species were recorded within the WRA during the reporting period, including Short-nosed Fruit Bat (*Cynopterus sphinx*), Japanese Pipistrelle, Wild Boar (*Sus scrofa*) and Leopard Cat (*Prionailurus bengalensis*) scat indicating the species' presence 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. Water level of all Cells had been lowered to facilitate the clearance of exotic and excessive aquatic vegetation.

Water level of Cell 3 raised to 160cm on 30 April 2024 after heavy rainfalls in late April 2024. The sluice gate between Cell 3 and Cell 4 was opened to discharge water from Cell 3 to Cell 4 to maintain a lower water level in Cell 3 and so as to keep the island of Cell 3 well-exposed for water bird usage.

A certain level of water was kept suppressing the grow of weeds along the edges of the Cells, as well as, to maintain a suitable habitat for fish, aquatic invertebrate and water plants which will provide food and habitat for wetland birds.

Monitoring data is presented in **Appendix D**. Locations for the monitoring of water quality for the ecological monitoring are shown in **Figure 1.2**.

3 Ecological Issues

3.1 Vegetation Management

Vegetation management activities undertaken within the WRA included the removal of exotic and excessive vegetation in all cells and along the main access road. These activities primarily involved removal of excess grass and sedges, shrubs and tree branches, as well as excessive climbers and floating vegetation. Removal of vegetation included but was not limited to *Ludwigia spp., Typha angustifolia, Leucaena leucocephala, Macaranga tanarius, Ficus macrocarpa, Rhaphiolepis indica, Lantana camara, Mimosa sp., Pennisetum sp., Ipomea sp., Bidens alba, Paederia foetida and Mikania micrantha. Leucaena leucocephala* growing along Cell 2, Cell 3 and Cell 4 were mostly trimmed. The remaining tree trunks left during the previous clearance works were also cleared to ground level. Exotic Cattails (*Typha* sp.) growing in the Cells were cleared by hand. At the end of April 2024, all noticeable cattail stands were removed in the WRA. Clearance works were conducted over a period of several months to avoid a sudden and drastic change of vegetation cover within the Cells. (See Photos 1 to 3)

Photo 1 **Removal of Excessive Climbers (March 2024)**

Photo 2 **Weeding along Cell Bund (March 2024)**

Photo 3 **Weeding along WRA pond bund (December 2023)**

3.2 Wildlife Management

Golden Apple Snails and their eggs were removed on an “as-seen” basis. (See Photo 4)

During the site inspection works in the reporting period there were no active Red Imported Fire Ant nests found within the WRA. Site inspection works in the coming months will continue to check if there is any active Red Imported Fire Ant nest found. Active nests will be treated with approved pesticides during the dry season. Pesticide usage will only be confined to nests found on terrestrial areas which are further away from the Cells to prevent the contamination of water.

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

1. Maintaining the low water level of Cell 1, Cell 2, Cell 3 and Cell 4;
2. Controlling the vegetation at Cell 1, Cell 2, Cell 3 and Cell 4 (See Photo 5).

These mitigation actions aim to increase the foraging area and maintain a suitable habitat for target species, wetland-dependent species as well as species of conservation importance.

Photo 4 **Clearance of apple snails and their eggs (February 2024)**

Photo 5 **Clearance of floating vegetation (January 2024)**

4 Summary of Wetland Restoration Area Performance

4.1 Summary of Findings

Ecological monitoring between 1 November 2023 to 30 April 2024 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 2023 and April 2024 (**Table 4.1**):

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

Species	Number of species recorded in Survey Area (excluding WRA)	Number of species recorded in WRA
Birds (total)	68	69
Birds (of conservation importance and/or wetland-dependence)	35	28
Amphibians	2	3
Reptiles	1	2
Mammals	1	4
Dragonflies	10	18
Butterflies	9	21

A total of 69 bird species, 4 mammal species, 18 dragonfly species, 21 butterfly species, 3 amphibian species and 2 reptile species were recorded in the WRA, including 28 bird species of conservation importance and/or wetland-dependence. These findings indicate that the WRA is supporting wetland-dependent birds and other species of conservation importance. The biodiversity of WRA is higher than those in the survey area (excluding WRA), indicate that the wetland and vegetation management works have increased ecological values of the WRA.

Venn diagrams showing the number of common species and species only found in the WRA or Survey Area (excluding the WRA) are presented in Appendix B and Appendix C. An ecological connection between the WRA and Survey Area (excluding the WRA) is observed given the number of common species attracted to both areas. Particularly for birds, 53 common species were recorded within both the WRA and Survey Area (excluding the WRA) during the reporting period (see Appendix B, Chart B1). The WRA attracts a higher number of species (i.e., 16 birds, 1 amphibian, 1 reptile, 3 mammal, 9 dragonflies and 13 butterflies recorded only in the WRA), indicating that ecological restoration can enhance biodiversity (see Appendix C, Charts C2 to C5). From the species only recorded in the WRA, five birds, one amphibian (Ornate Pygmy Frog) and one butterfly (Common Awl) were of conservation importance and/or wetland-dependence.

Survey findings indicate that the WRA is attracting two of the three target species (Little Egret and Chinese Pond Heron) to varying degrees. During the survey period (i.e. November 2023 to April 2024), Little Egret was recorded in all months between November 2023 to April 2024, with monthly means ranging from 0.8 (March 2024) to 2.3 (February 2024) birds per survey. Chinese Pond Heron was also recorded in all months between November 2023 to April 2024, with monthly means ranging from 1.3 (March 2024) to 2.8 (February 2024).

A list of the bird species recorded within the WRA since the completion of the site formation is provided in **Appendix B (Tables B4 to B9)**. A total of 164 bird species have been recorded within the WRA since the completion of the site formation in November 2010. Of the 164 species, 90 were species of conservation importance and/or wetland dependence.

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 the planted vegetation is not intended to be maintained as a long-term tree density at the WRA. Regular horticultural/ arboricultural practice is applied in the WRA to remove excessive and less desired specimens to facilitate the successful growth of those which are of higher landscape and/or ecological value. Vegetation management is largely consistent of maintenance of planted trees and shrubs for the creation of suitable habitats for target species, as well as removal of excessive and exotic species. These works should maintain and uphold the long-term habitat structure and the overall biodiversity of the WRA.

4.2 WRA Performance for the Bird Target Species

The provision, maintenance and operation of a WRA are requirements 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: Little Egret, Eastern Cattle Egret and Chinese Pond Heron. Target levels of these species are the annual mean numbers 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 (November 2009, hereafter WCRS), the WRA is anticipated to be fully operational after an establishment period of 2.5 years (30 months).

Two of the three target species (Little Egret and Chinese Pond Heron) were recorded using the WRA during the survey period (November 2023 to April 2024). Among them, both of Little Egret and Chinese Pond Heron were recorded in all six months during regular surveys.

Table 4.2: Biannual mean & Annual mean of the three target species of the WRA from May 2022 to April 2024

Common Name	Scientific Name	Conservation Status [1]	Baseline Annual Mean [2]	Biannual Mean[3]				Annual Mean[3]	
				May 22 - Oct 22	Nov 22 - Apr 23	May 23 - Oct 23	Nov 23 - Apr 24	May 22 - Apr 23	May 23 - Apr 24
Chinese Pond Heron	*Ardeola bacchus*	PRC, (RC)	1.3	**3.9**	**2.0**	**2.2**	**1.7**	**3.0**	**2.0**
Little Egret	*Egretta garzetta*	PRC, (RC)	5.5	2.2	2.0	2.4	1.7	2.1	2.0
Eastern Cattle Egret	*Bubulcus coromandus*	(LC)	1.3	0.3	0.1	0.0	0.0	0.2	0.0

Notes:
(1) Conservation Status follows that of Fellow *et. al.* (2002). See Appendix B (Table B3).
(2) Annual mean number recorded during Baseline Ecological Monitoring.
(3) Values in **bold** indicated the Target Level was achieved.

Based on **Table 4.2** above, the target level of the Chinese Pond Heron has been achieved between November 2023 to April 2024, while the target levels for Little Egret and Eastern Cattle Egret have not been achieved.

According to the ecological monitoring data of the Survey Area (excluding the WRA), Eastern Cattle Egret was observed in 1 out of 26 regular surveys and the biannual mean of the Eastern Cattle Egret at the Survey Area (excluding the WRA) was <0.1 bird per survey (November 2023 – April 2024).

Eastern Cattle Egret is mainly a spring and autumn passage migrant in Hong Kong with peak count in August (*Carey et al. 2001*). This species mainly forages along short grass habitat, preying on insects, invertebrates and small vertebrates. The large expanse of grassland in the Survey Area (excluding the WRA) and the open storage areas in the vicinity of the WRA and the Survey Area (excluding the WRA) provide foraging sites for the Eastern Cattle Egret. Upon the completion of the WRA, the area had changed from open storage to restored open-water wetland, reedbeds, tall vegetation as well as short grassland along the cell bunds. Apart from short grassland habitat, most other habitats within the WRA are not typical foraging habitats for Eastern Cattle Egret. In the coming months the vegetation along the main access road and pond bunds of the cells will be closely monitored, controlled and maintained, in order to attract more insects and Eastern Cattle Egrets.

Although the biannual mean of Little Egret did not meet the target level, the species was recorded in 23 out of 26 regular surveys within the WRA. The highest count in this period was 2 birds in Cell 1 on 17 November 2023 and Cell 4 on 9 January 2024.

Although no Eastern Cattle Egret has been recorded between November 2023 and April 2024, the WRA continues to attract wetland dependent birds and/or species of conservation importance, as well as terrestrial birds of conservation importance.

The biannual change of bird species number and composition since the WRA establishment in Oct 2012 is presented in **Table 4.3**, which shows a steady number of conservation importance species and/or wetland-dependent species continuously recorded in the WRA. This indicates that the WRA provides a suitable habitat for these species.

Table 4.3: Total number of bird species of conservation importance and/or wetland-dependence recorded in the WRA from November 2010 to April 2024

Common Name	Nov 10 - Oct 11	Nov 11 - Oct 12	Nov 12 - Oct 13	Nov 13 - Oct 14	Nov 14 - Oct 15	Nov 15 - Oct 16	Nov 16 - Oct 17	Nov 17 - Oct 18	Nov 18 - Oct 19	Nov 19 - Oct 20	Nov 20 - Oct 21	Nov 21 - Oct 22	Nov 22 - Oct 23	Nov 23 - Apr 24(1)
Bird species of conservation importance and/ or wetland-dependence	48	33	36	39	45	46	46	42	34	52	51	47	49	28

Note:
(1) The annual data will be presented in next bi-annual report.

4.3 Adaptive Management for WRA

As the Proposed Comprehensive Development at Wo Shang Wai is still under construction phase, it is considered acceptable for the target species levels to have not been achieved. However, should this situation continue, a review of the management of the WRA and adaptive management steps will be required.

The mitigation actions including: 1) Controlling the water level; 2) Controlling the vegetation; and 3) Removal of Red Imported Fire Ant nests have been taken in the WRA during the survey period to increase the WRA utilization by birds, especially for the three target species of the WRA. The mitigation actions will be continued in the WRA, and monitoring will be carried out to investigate the effectiveness of the mitigation actions.

A summary of the annual mean of bird species of conservation importance and/or wetland-dependence recorded in the WRA from November 2023 and April 2024 is shown in **Table 4.4**. 16 additional species of conservation importance and/or wetland-dependence have been recorded in the WRA in the survey period when compared to the Baseline Ecological Monitoring. The increase in number of the species of conservation importance indicates that the WRA is providing a suitable habitat for them.

Table 4.4: Mean number of bird species of conservation importance and/or wetland-dependence in the WRA during reporting period

Common Name	Scientific Name [1]	Wetland Dependence	Conservation Status [2]	Annual mean number recorded during the Baseline Ecological Monitoring	Mean number recorded between November 2023 - April 2024 [3]
Little Grebe	*Tachybaptus ruficollis*	Y	LC	0.0	0.6
Great Cormorant	*Phalacrocorax carbo*	Y	PRC	0.5	0.7
Grey Heron	*Ardea cinerea*	Y	PRC	0.1	2.3
Purple Heron	*Ardea purpurea*	Y	RC	0.0	0.5
Great Egret	*Ardea alba*	Y	PRC, (RC)	V	1.8
Little Egret	*Egretta garzetta*	Y	PRC, (RC)	5.5	1.7
Chinese Pond Heron	*Ardeola bacchus*	Y	PRC, (RC)	1.3	1.7
Yellow Bittern	*Ixobrychus sinensis*	Y	(LC)	0.0	0.3
Black-crowned Night Heron	*Nycticorax nycticorax*	Y	(LC)	0.2	0.2
Black-winged Kite	*Elanus caeruleus*	Y	Class II, LC	0.0	<0.1
Black Kite#	*Milvus migrans*	Y	Class II, (RC)	1.2	0.6
Eastern Imperial Eagle	*Aquila heliaca*	Y	Class I, GC	0.0	<0.1
Eastern Buzzard#	*Buteo japonicus*	Y	Class II	0.0	V
White-breasted Waterhen	*Amaurornis phoenicurus*	Y	-	0.2	0.8
Common Moorhen	*Gallinula chloropus*	Y	-	0.0	0.5
Greater Painted-snipe	*Rostratula benghalensis*	Y	LC	0.0	0.1
Black-winged Stilt	*Himantopus himantopus*	Y	RC	0.0	0.1
Common Greenshank	*Tringa nebularia*	Y	RC	0.0	0.5
Green Sandpiper	*Tringa ochropus*	Y	-	0.0	0.5
Wood Sandpiper	*Tringa glareola*	Y	LC	0.0	0.1
Common Sandpiper	*Actitis hypoleucos*	Y	-	0.2	0.5
Pied Kingfisher	*Ceryle rudis*	Y	(LC)	0.0	0.6
White-throated Kingfisher	*Halcyon smyrnensis*	Y	Class II, (LC)	0.0	0.2
Common Kingfisher	*Alcedo atthis*	Y	-	0.0	0.9
Eastern Yellow Wagtail	*Motacilla tschutschensis*	Y	-	10.0	0.3
White Wagtail	*Motacilla alba*	Y	-	0.9	0.9
Oriental Reed Warbler	*Acrocephalus orientalis*	Y	-	0.1	0.1
Collared Crow	*Corvus torquatus*	Y	LC, NT	0.0	0.2

Notes:
(1) Follows the List of Hong Kong Birds (ver. 2020-03-10)
(2) Conservation status follows that of Fellowes *et al.* (2002) and BirdLife International listing (2017). Letters in parentheses indicate that the assessment is on the basis of restrictedness in breeding and/or roosting sites rather than in general occurrence. (Fellowes *et al.* 2002)
(3) Refers to the mean number of individuals recorded between November 2023 – April 2024 in the WRA
V indicates the species is recorded outside regular surveys

4.4 Conclusions

After commencement of works in May 2010, the site formation of the Wetland Restoration Area (WRA) was completed on 15 November 2010. In accordance with the requirement as stipulated in Clause 7.2.12 of the EM&A Manual, the WRA was in operation since October 2012 (i.e., within 2.5 years of commencement of construction).

The survey data shows that when compared with the surrounding fishponds which cover a much larger area, the WRA attracts a good number of wetland dependent birds or species of conservation importance, with 28 bird species of conservation importance and/or wetland-dependence recorded during the survey period.

The WRA is attracting two of the three target species (Little Egret and Chinese Pond Heron) identified during the EIA process, to varying degrees. Even though the target level for Little Egret was not met, the species was recorded in 23 out of 26 regular surveys within the WRA during the survey period. Although the Eastern Cattle Egret has not been recorded between November 2023 and April 2024, the WRA continues to attract wetland dependent birds and/or species of conservation importance and terrestrial birds of conservation importance. It is noted that 90 bird species of conservation importance and/or wetland dependence (out of 164 bird species) have been recorded within the WRA since the completion of its site formation.

The site is therefore considered to have achieved no net loss of wetland in terms of area and function because it 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.

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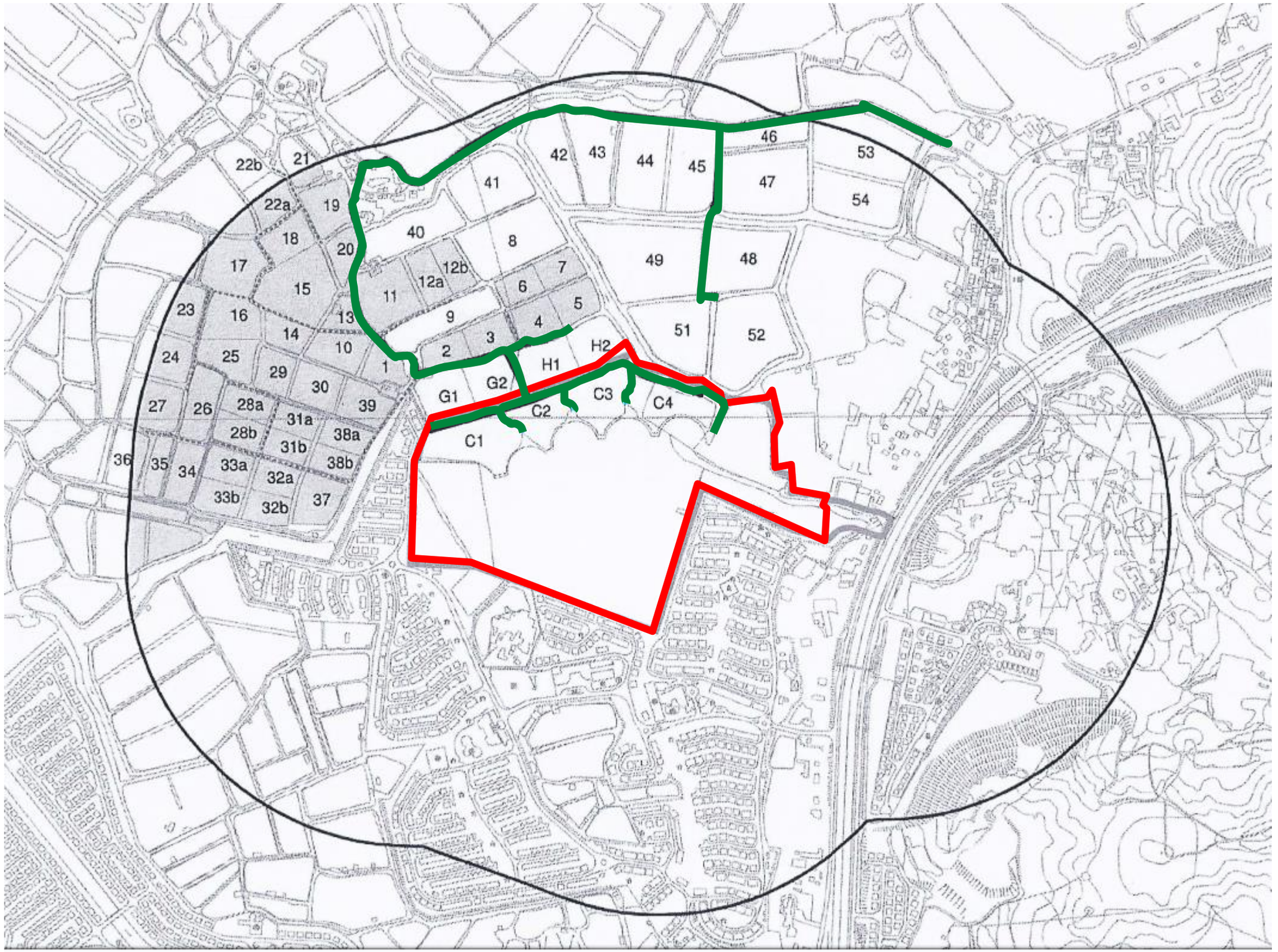
Figures



Notes

Key to symbols

Project Area

Assessment Area

Transect

Reference drawings

Rev	Date	Drawn	Description	Ch'k'd	App'd

MOTT MACDONALD

3/F Manulife Place
348 Kwun Tong Road
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Client

PROFIT POINT ENTERPRISES LIMITED

Project

PROPOSED COMPREHENSIVE DEVELOPMENT AT WO SHANG WAI, YUEN LONG

Title

Survey Area and Transect Walked

Designed			Eng check		
Drawn			Coordination		
Dwg check			Approved		
Scale at A1		Status		Rev	

Drawing Number

Figure 1.1

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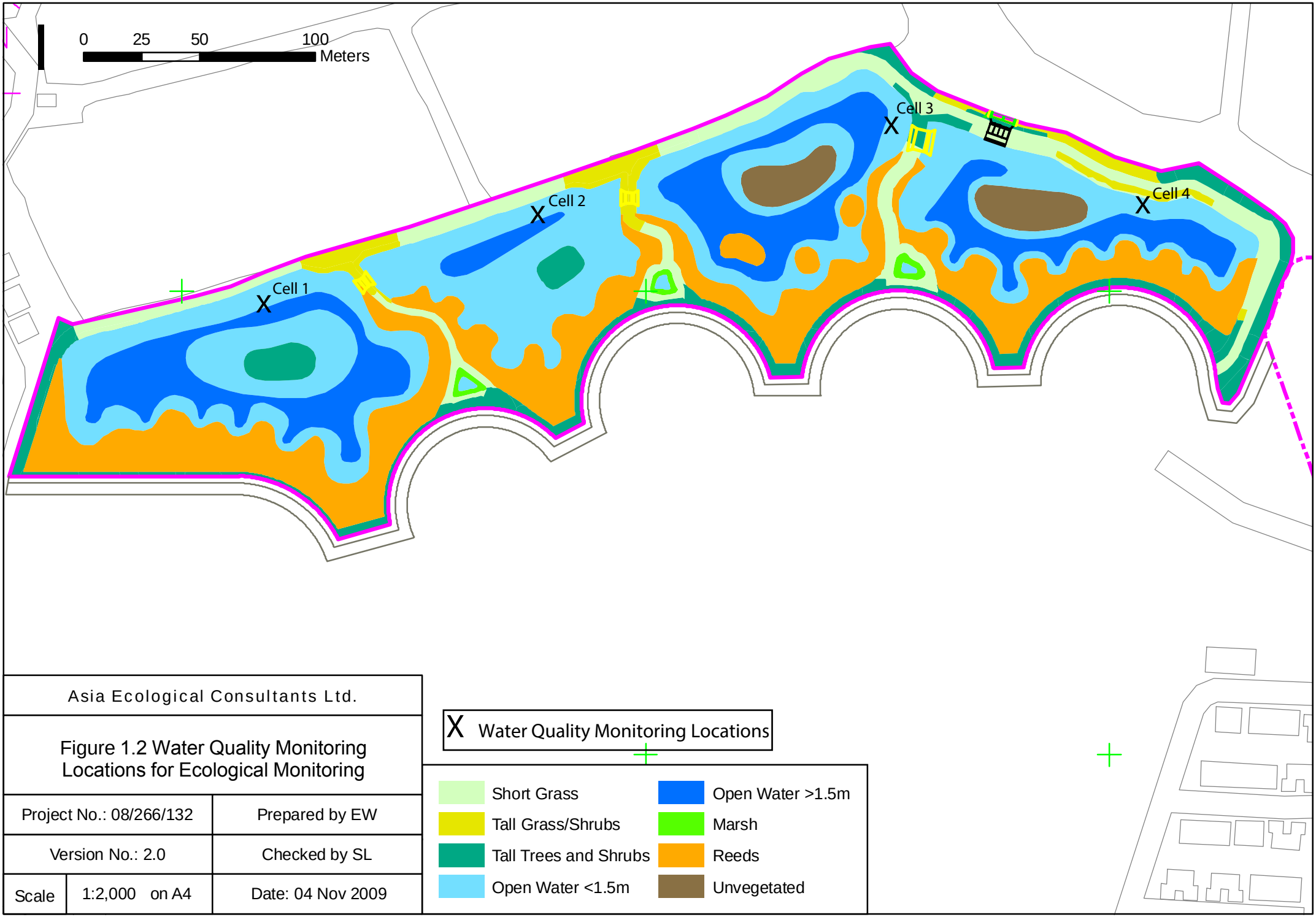


Asia Ecological Consultants Ltd.		
Figure 1.2 Water Quality Monitoring Locations for Ecological Monitoring		
Project No.: 08/266/132		Prepared by EW
Version No.: 2.0		Checked by SL
Scale	1:2,000 on A4	Date: 04 Nov 2009

Appendices

A. Schedule of Ecological Monitoring

Nov 2023	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																					✓(d)									
Dragonflies & butterflies							✓																							
Water Quality							+										✓											+		
Inspection Visits							✓										✓				✓							✓		
Vegetation and Exotic Species Control		✓	✓		✓																					✓	✓	✓		

Dec 2023	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					✓							✓							✓										✓		
Vegetation and Exotic Species Control				✓										✓	✓								✓			✓					

Jan 2024	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		✓							✓							✓														✓	
Vegetation and Exotic Species Control							✓							✓	✓						✓							✓			

Feb 2024	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			✓						✓						✓					✓							✓		
Vegetation and Exotic Species Control	✓																	✓		✓	✓							✓	✓

Mar 2024	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												✓(n)																			
Dragonflies & butterflies					✓																										
Water Quality					+													✓								+					
Inspection Visits					✓							✓							✓							✓					
Vegetation and Exotic Species Control		✓					✓					✓			✓		✓		✓						✓	✓		✓			

Apr 2024	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																✓(n)							✓(d)							
Dragonflies & butterflies									✓																					✓
Water Quality									+								✓													+
Inspection Visits						✓			✓							✓							✓							✓
Vegetation and Exotic Species Control								✓						✓			✓				✓							✓		

Notes: Light grey cells indicate public holidays, Saturdays or Sundays
✓Indicates corresponding works
+ Water level monitoring
# Additional pH measurement
e Ex-situ laboratory testing
“d” and “n” indicate day-time and night-time herpetofauna surveys respectively

B. Summary of Bird Surveys

Table B1: 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 *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 (2017)
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 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 quality for Critically Endangered or Vulnerable now; but is close to qualifying for or is likely to qualify for a threatened category in the near future.	

Table B2: Summary of bird monitoring data (for species of conservation importance and/or wetland-dependence) within the Survey Area (excluding the WRA)

Common Name	Scientific Name [1]	Wetland Dependent	Conservation Status [2]	Nov 2023 Mean [3]	Dec 2023 Mean [3]	Jan 2024 Mean [3]	Feb 2024 Mean [3]	Mar 2024 Mean [3]	Apr 2024 Mean [3]
Little Grebe	*Tachybaptus ruficollis*	Y	LC	12.5	13.5	8.6	11.8	11.8	3.0
Great Cormorant	*Phalacrocorax carbo*	Y	PRC	36.0	22.5	26.6	40.0	19.0	0.0
Grey Heron	*Ardea cinerea*	Y	PRC	10.0	9.0	6.4	9.3	11.8	1.2
Great Egret	*Ardea alba*	Y	PRC, (RC)	13.8	11.8	6.4	3.5	6.8	3.6
Intermediate Egret	*Egretta intermedia*	Y	RC	0.3	0.0	0.0	0.0	0.3	0.0
Little Egret	*Egretta garzetta*	Y	PRC, (RC)	13.0	13.5	3.8	6.3	11.8	6.2
Eastern Cattle Egret	*Bubulcus coromandus*	Y	(LC)	0.3	0.0	0.0	0.0	0.0	0.0
Chinese Pond Heron	*Ardeola bacchus*	Y	PRC, (RC)	5.8	5.0	3.6	9.3	6.0	4.4
Yellow Bittern	*Ixobrychus sinensis*	Y	(LC)	0.3	0.0	0.0	0.0	0.0	0.2
Black-crowned Night Heron	*Nycticorax nycticorax*	Y	(LC)	2.3	1.3	3.2	7.8	7.8	1.4
Northern Shoveler	*Anas clypeata*	Y	RC	0.0	4.5	2.2	8.8	4.8	0.0
Tufted Duck	*Aythya fuligula*	Y	LC	2.8	2.8	2.8	4.0	0.0	0.0
Black-winged Kite#	*Elanus caeruleus*	Y	Class II, LC	0.3	0.0	0.0	0.0	0.0	0.0
Black Kite#	*Milvus migrans*	Y	Class II, (RC)	0.5	0.0	0.8	0.8	1.0	0.0
Eastern Buzzard#	*Buteo japonicus*	Y	Class II	0.0	0.5	0.2	0.3	0.3	0.0
Water Rail	*Rallus aquaticus*	Y	LC	0.0	0.0	0.0	0.0	0.5	0.0

Common Name	Scientific Name [1]	Wetland Dependent	Conservation Status [2]	Nov 2023 Mean [3]	Dec 2023 Mean [3]	Jan 2024 Mean [3]	Feb 2024 Mean [3]	Mar 2024 Mean [3]	Apr 2024 Mean [3]
White-breasted Waterhen	*Amaurornis phoenicurus*	Y	-	1.5	0.8	0.6	0.5	1.5	1.2
Common Moorhen	*Gallinula chloropus*	Y	-	1.0	3.8	1.4	2.3	7.5	3.2
Black-winged Stilt	*Himantopus himantopus*	Y	RC	0.5	0.0	0.0	1.0	6.3	2.0
Pied Avocet	*Recurvirostra avosetta*	Y	RC	0.3	0.0	0.0	0.0	0.0	0.0
Little Ringed Plover	*Charadrius dubius*	Y	(LC)	3.5	1.3	0.0	1.3	0.3	0.0
Marsh Sandpiper	*Tringa stagnatilis*	Y	RC	0.0	0.0	0.0	0.0	0.3	0.0
Green Sandpiper	*Tringa ochropus*	Y	-	0.0	0.3	0.0	0.0	0.0	0.2
Wood Sandpiper	*Tringa glareola*	Y	LC	0.0	0.0	0.0	1.0	0.8	0.0
Common Sandpiper	*Actitis hypoleucos*	Y	-	0.8	2.0	0.6	0.8	4.0	1.2
Common Snipe	*Gallinago gallinago*	Y	-	0.0	0.0	0.0	0.3	0.8	0.0
Pied Kingfisher	*Ceryle rudis*	Y	(LC)	1.0	1.3	0.6	0.3	1.0	0.6
White-throated Kingfisher#	*Halcyon smyrnensis*	Y	Class II, (LC)	0.3	0.8	0.6	0.5	0.3	0.0
Common Kingfisher	*Alcedo atthis*	Y	-	1.3	1.0	0.4	1.3	1.5	0.4
Eastern Yellow Wagtail	*Motacilla tschutschensis*	Y	-	0.5	0.5	0.4	0.8	1.3	0.8
White Wagtail	*Motacilla alba*	Y	-	3.8	2.8	1.8	3.8	2.5	1.0
Red-billed Starling	*Spodiopsar sericeus*	Y	(RC)*	0.0	1.3	0.0	0.0	0.0	0.0

Common Name	Scientific Name [1]	Wetland Dependent	Conservation Status [2]	Nov 2023 Mean [3]	Dec 2023 Mean [3]	Jan 2024 Mean [3]	Feb 2024 Mean [3]	Mar 2024 Mean [3]	Apr 2024 Mean [3]
White-cheeked Starling	*Spodiopsar cineraceus*	Y	PRC	0.3	1.8	0.0	0.0	0.0	0.0
White-shouldered Starling	*Sturnia sinensis*	Y	(LC)	0.0	0.0	0.0	0.0	1.8	2.8
Collared Crow	*Corvus torquatus*	Y	LC, NT	0.0	0.5	0.0	0.5	0.0	0.2
		No. of Species Recorded		**25**	**23**	**19**	**24**	**26**	**18**

Notes:
(1) Follows the List of Hong Kong Birds (ver. 2020-03-10)
(2) Conservation status follows that of Fellowes et al. (2002) and BirdLife International listing (2017). See **Table B1** for the description of the codes.
Letters in parentheses indicate that the assessment is on the basis of restrictedness in breeding and for roosting sites rather than in general occurrence. (Fellowes et al. 2002)
(3) Refers to the mean number of individuals recorded in each survey in the Survey Area (excluding the WRA)
(4) Birds tagged with '#' are Category II protected under terrestrial wildlife state protection. Birds tagged with '##" are Category I protected under terrestrial wildlife state protection
(5) 'V' indicates the species is recorded outside regular surveys
(6) * Red-billed Starling is considered by Fellowes et al. (2002) to be of Global Concern. Since publication, however, the global population estimate has been revised and the species is not now considered threatened. A listing of Regional Concern (RC), based on the importance of the large roosts present near Deep Bay, is considered to be more appropriate.

Table B3: Summary of bird monitoring data (for species of conservation importance and/or wetland-dependence) in the WRA

Common Name	Scientific Name [1]	Wetland Dependent	Conservation Status [2]	Nov 2023 Mean [3]	Dec 2023 Mean [3]	Jan 2024 Mean [3]	Feb 2024 Mean [3]	Mar 2024 Mean [3]	Apr 2024 Mean [3]
Little Grebe	*Tachybaptus ruficollis*	Y	LC	0.5	0.8	1.4	0.0	0.8	0.0
Great Cormorant	*Phalacrocorax carbo*	Y	PRC	1.0	0.5	0.8	1.3	0.8	0.0
Grey Heron	*Ardea cinerea*	Y	PRC	4.5	2.8	2.6	1.8	2.3	0.6
Purple Heron	*Ardea purpurea*	Y	RC	1.0	0.3	0.6	1.0	0.3	0.0
Great Egret	*Ardea alba*	Y	PRC, (RC)	2.5	1.3	1.8	2.3	2.0	1.0
Little Egret	*Egretta garzetta*	Y	PRC, (RC)	1.5	1.0	2.0	2.3	0.8	2.2
Chinese Pond Heron	*Ardeola bacchus*	Y	PRC, (RC)	1.8	1.8	1.4	2.8	1.3	1.6
Yellow Bittern	*Ixobrychus sinensis*	Y	(LC)	0.8	0.0	0.0	0.0	0.0	0.8
Black-crowned Night Heron	*Nycticorax nycticorax*	Y	(LC)	0.3	0.0	0.0	0.0	0.3	0.4
Black-winged Kite	*Elanus caeruleus*	Y	Class II, LC	0.3	0.0	0.0	0.0	0.0	0.0
Black Kite	*Milvus migrans*	Y	Class II, (RC)	0.8	0.3	1.0	1.5	0.0	0.2
Eastern Imperial Eagle	*Aquila heliaca*	Y	Class I, GC	0.3	0.0	0.0	0.0	0.0	0.0
Eastern Buzzard	*Buteo japonicus*	Y	Class II	V	0.0	0.0	0.0	0.0	0.0
White-breasted Waterhen	*Amaurornis phoenicurus*	Y	-	1.0	0.5	0.2	0.8	0.8	1.4
Common Moorhen	*Gallinula chloropus*	Y	-	0.5	1.0	0.6	0.8	0.0	0.4
Greater Painted-snipe	*Rostratula benghalensis*	Y	LC	0.0	0.0	0.0	0.0	0.0	0.6
Black-winged Stilt	*Himantopus himantopus*	Y	RC	0.0	0.5	0.0	0.0	0.0	0.0
Common Greenshank	*Tringa nebularia*	Y	RC	0.0	0.0	0.4	1.5	0.8	0.6

Common Name	Scientific Name (1)	Wetland Dependent	Conservation Status (2)	Nov 2023 Mean (3)	Dec 2023 Mean (3)	Jan 2024 Mean (3)	Feb 2024 Mean (3)	Mar 2024 Mean (3)	Apr 2024 Mean (3)
Green Sandpiper	*Tringa ochropus*	Y	-	V	0.8	1.2	0.5	0.3	0.0
Wood Sandpiper	*Tringa glareola*	Y	LC	0.0	0.0	0.0	0.0	0.8	0.0
Common Sandpiper	*Actitis hypoleucos*	Y	-	0.3	0.3	0.0	0.8	1.3	0.8
Pied Kingfisher	*Ceryle rudis*	Y	(LC)	1.0	0.5	0.2	0.5	1.0	0.4
White-throated Kingfisher	*Halcyon smyrnensis*	Y	Class II, (LC)	0.5	0.0	0.2	0.0	0.3	0.2
Common Kingfisher	*Alcedo atthis*	Y	-	1.8	1.3	0.8	0.3	0.5	0.8
Eastern Yellow Wagtail	*Motacilla tschutschensis*	Y	-	0.3	0.0	0.2	0.0	0.8	0.6
White Wagtail	*Motacilla alba*	Y	-	0.5	0.5	1.2	1.3	0.8	1.0
Oriental Reed Warbler	*Acrocephalus orientalis*	Y	-	0.3	0.3	0.0	0.0	0.0	0.0
Collared Crow	*Corvus torquatus*	Y	LC, NT	0.5	0.3	0.2	0.0	0.0	0.4
	No. of Species Recorded			**24**	**18**	**18**	**15**	**18**	**18**

Notes:
(1) Follows the List of Hong Kong Birds (ver. 2020-03-10)
(2) Conservation status follows that of Fellows et al. (2002) and BirdLife international listing (2017). See **Table B1** for the description of the codes. Letters in parentheses indicate that the assessment is on the basis of restrictedness in breeding and for roosting sites rather than in general occurrence. (Fellowes et al. 2002).
(3) Refers to mean number of individuals recorded in each survey in the WRA.
(4) Birds tagged with '#' are Category II protected under terrestrial wildlife state protection. Birds tagged with '##" are Category I protected under terrestrial wildlife state protection
(5) 'V' indicates the species is recorded outside regular surveys

Table B4: Summary of Bird Species Recorded Annually at the WRA between 2010 and 2024

Common name	Scientific name	Wetland Dependence	Conservation status	2010[3]	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024[4]
Little Grebe	*Tachybaptus ruficollis*	Y	LC	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Great Cormorant	*Phalacrocorax carbo*	Y	PRC	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Grey Heron	*Ardea cinerea*	Y	PRC	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Purple Heron	*Ardea purpurea*	Y	RC	N	Y	N	N	N	Y	N	N	Y	Y	N	Y	Y	Y	Y
Great Egret	*Ardea alba*	Y	PRC, (RC)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Intermediate Egret	*Egretta intermedia*	Y	RC	N	Y	Y	N	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	N
Little Egret	*Egretta garzetta*	Y	PRC, (RC)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Eastern Cattle Egret	*Bubulcus coromandus*	Y	(LC)	N	Y	Y	N	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	N
Chinese Pond Heron	*Ardeola bacchus*	Y	PRC, (RC)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Yellow Bittern	*Ixobrychus sinensis*	Y	(LC)	N	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Cinnamon Bittern	*Ixobrychus cinnamomeus*	Y	LC	N	N	N	N	N	Y	N	Y	Y	N	N	N	N	Y	N
Great Bittern	*Botaurus stellaris*	Y	RC	N	N	N	N	N	N	N	N	N	N	Y	Y	Y	N	N
Black-crowned Night Heron	*Nycticorax nycticorax*	Y	(LC)	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Black Stork	*Ciconia nigra*	Y	RC	N	N	N	N	N	N	N	N	N	N	Y	N	N	N	N
Eurasian Spoonbill	*Platalea leucorodia*	Y	LC	N	N	N	N	N	N	N	N	N	N	Y	N	N	N	N
Black-faced Spoonbill	*Platalea minor*	Y	PGC, EN	N	Y	Y	N	Y	Y	Y	N	N	N	Y	N	N	N	N
Mandarin Duck	*Aix galericulata*	Y	-	N	Y	N	N	N	N	N	N	N	N	N	N	N	N	N
Eurasian Wigeon	*Anas penelope*	Y	RC	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	N
Eurasian Teal	*Anas crecca*	Y	RC	N	Y	N	N	N	N	N	Y	N	Y	N	Y	Y	N	N
Northern Pintail	*Anas acuta*	Y	RC	Y	Y	N	N	N	N	N	Y	N	N	N	N	N	N	N
Northern Shoveler	*Anas clypeata*	Y	RC	N	N	N	Y	Y	N	Y	N	N	N	N	N	N	N	N
Garganey	*Anas querquedula*	Y	-	N	N	N	N	N	N	N	N	N	N	N	Y	Y	N	N
Tufted Duck	*Aythya fuligula*	Y	LC	N	N	N	Y	N	N	N	N	N	N	N	N	N	N	N
Western Osprey	*Pandion haliaetus*	Y	RC	Y	N	N	N	N	Y	Y	N	N	N	Y	N	Y	Y	N
Crested Goshawk	*Accipiter trivirgatus*	N	-	N	N	N	N	N	N	Y	N	Y	N	Y	N	N	N	N
Besra	*Accipiter virgatus*	N	-	N	N	N	N	N	N	N	N	Y	N	Y	Y	Y	Y	Y
Black-winged Kite	*Elanus caeruleus*	Y	LC	N	N	N	N	N	Y	N	N	N	N	Y	Y	Y	Y	N
Black Kite	*Milvus migrans*	Y	(RC)	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Crested Serpent Eagle	*Spilornis cheela*	N	(LC)	N	N	N	N	Y	N	Y	N	Y	Y	Y	Y	N	N	N
Greater Spotted Eagle	*Clanga clanga*	Y	GC	N	N	N	N	N	Y	N	Y	Y	N	Y	Y	Y	N	N
Eastern Imperial Eagle	*Aquila heliaca*	Y	-	N	N	N	N	N	Y	N	Y	N	N	Y	Y	Y	Y	N

Common name	Scientific name	Wetland Dependence	Conservation status	2010[3]	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024[4]
Eastern Buzzard	*Buteo japonicus*	Y	-	N	Y	N	N	Y	Y	N	Y	Y	N	Y	Y	Y	Y	N
Common Kestrel	*Falco tinnunculus*	N	-	Y	Y	N	N	N	Y	Y	N	N	N	Y	Y	N	Y	Y
Peregrine Falcon	*Falco peregrinus*	N	(LC)	N	N	Y	Y	N	Y	Y	Y	N	Y	Y	N	Y	N	N
Eurasian Hobby	*Falco subbuteo*	Y	(LC)	N	N	N	N	Y	N	Y	N	Y	N	Y	Y	Y	Y	N
Japanese Quail	*Coturnix japonica*	N	LC	N	N	N	Y	N	N	N	N	N	N	N	N	N	N	N
Baillon's Crake	*Porzana pusilla*	Y	LC	N	N	N	N	N	Y	N	N	N	N	N	N	N	N	N
White-breasted Waterhen	*Amaurornis phoenicurus*	Y	-	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Watercock	*Gallicrex cinerea*	Y	RC	N	N	N	N	N	Y	N	N	N	N	N	N	N	N	N
Common Moorhen	*Gallinula chloropus*	Y	-	N	N	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Pheasant-tailed Jacana	*Hydrophasianus chirurgus*	Y	LC	N	Y	N	N	N	Y	N	N	Y	N	Y	N	N	N	N
Greater Painted-snipe	*Rostratula benghalensis*	Y	LC	N	Y	Y	N	N	N	N	N	Y	Y	N	N	N	N	Y
Black-winged Stilt	*Himantopus himantopus*	Y	RC	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N
Pied Avocet	*Recurvirostra avosetta*	Y	RC	Y	N	Y	N	N	N	Y	N	N	N	N	N	N	N	N
Grey-headed Lapwing	*Vanellus cinereus*	Y	LC	N	N	N	N	N	N	N	N	N	N	N	Y	N	N	N
Oriental Pratincole	*Glareola maldivarum*	Y	LC	N	Y	N	N	N	N	Y	Y	Y	N	Y	Y	N	N	N
Pacific Golden Plover	*Pluvialis fulva*	Y	LC	N	N	N	N	N	N	Y	N	N	N	Y	Y	N	N	N
Little Ringed Plover	*Charadrius dubius*	Y	(LC)	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	N
Kentish Plover	*Charadrius alexandrinus*	Y	RC	N	N	N	Y	N	N	Y	N	N	N	N	N	N	N	N
Spotted Redshank	*Tringa erythropus*	Y	RC	N	N	N	Y	N	N	Y	Y	N	N	N	N	N	N	N
Common Redshank	*Tringa totanus*	Y	RC	N	N	N	N	N	N	Y	N	N	N	N	N	N	N	N
Common Greenshank	*Tringa nebularia*	Y	RC	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Marsh Sandpiper	*Tringa stagnatilis*	Y	RC	N	N	N	N	N	N	N	Y	N	N	N	Y	N	N	N
Green Sandpiper	*Tringa ochropus*	Y	-	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Wood Sandpiper	*Tringa glareola*	Y	LC	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Common Sandpiper	*Actitis hypoleucos*	Y	-	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Pintail/Swinhoe's Snipe*	*Gallinago stenura/ G. megala*	Y	LC	Y	Y	N	Y	N	N	N	N	N	N	Y	N	N	Y	N
Common Snipe	*Gallinago gallinago*	Y	-	N	Y	Y	Y	N	Y	Y	N	Y	Y	Y	Y	Y	Y	N
Red-necked Stint	*Calidris ruficollis*	Y	LC	Y	N	N	N	N	N	N	N	N	N	Y	N	N	N	N
Temminck's Stint	*Calidris temminckii*	Y	LC	Y	Y	N	N	Y	N	N	N	N	N	N	N	N	N	N
Long-toed Stint	*Calidris subminuta*	Y	LC	N	N	Y	N	N	N	N	N	N	N	N	N	N	N	N
Black-headed Gull	*Chroicocephalus ridibundus*	Y	PRC	N	N	N	N	N	N	N	Y	N	N	Y	N	N	N	N
Whiskered Tern	*Chlidonias hybrida*	Y	-	N	N	Y	N	N	N	N	N	N	N	N	N	N	N	N

Common name	Scientific name	Wetland Dependence	Conservation status	2010[3]	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024[4]
White-winged Tern	*Chlidonias leucopterus*	Y	-	N	N	N	N	N	N	N	N	N	N	N	Y	Y	N	N
Domestic Pigeon	*Columba livia*	N	-	N	Y	N	N	N	N	N	N	N	N	Y	Y	Y	N	N
Oriental Turtle Dove	*Streptopelia orientalis*	N	-	N	Y	N	N	N	N	Y	N	N	N	N	N	N	Y	N
Red Turtle Dove	*Streptopelia tranquebarica*	N	-	N	N	N	N	N	Y	N	N	N	N	N	N	N	N	Y
Spotted Dove	*Spilopelia chinensis*	N	-	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Eurasian Collared Dove	*Streptopelia decaocto*	N	-	N	N	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Emerald Dove	*Chalcophaps indica indica*	N	-	N	N	N	N	N	N	N	N	N	N	Y	N	N	N	N
Asian Koel	*Eudynamys scolopaceus*	N	-	N	N	N	N	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y
Greater Coucal#	*Centropus sinensis*	N	-	N	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Indian Cuckoo	*Cuculus Micropterus*	N	-	N	N	N	N	N	N	N	N	N	N	N	Y	Y	Y	N
Large Hawk-Cuckoo	*Hierococcyx sparverioides*	N	-	N	N	N	N	N	N	N	N	N	N	N	Y	Y	Y	Y
Plaintive Cuckoo	*Cacomantis merulinus*	N	-	N	N	N	N	N	N	N	N	N	N	Y	Y	Y	Y	Y
Asian Barred Owlet	*Glaucidium cuculoides*	N	-	N	N	N	N	N	N	N	N	N	Y	Y	Y	Y	Y	N
Eurasian Eagle Owl	*Bubo bubo*	N	RC	N	N	N	Y	Y	Y	N	N	N	N	N	N	N	N	N
Savanna Nightjar	*Caprimulgus affinis*	N	-	N	N	N	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y
Himalayan Swiftlet	*Aerodramus brevirostris*	N	-	N	N	N	N	N	N	N	N	N	N	Y	Y	Y	N	N
Pacific Swift	*Apus pacificus*	N	(LC)	N	Y	N	N	N	N	Y	N	N	N	Y	N	Y	Y	N
House Swift	*Apus nipalensis*	N	-	Y	Y	Y	Y	Y	Y	Y	Y	N	N	Y	Y	Y	Y	N
Pied Kingfisher	*Ceryle rudis*	Y	(LC)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Black-capped Kingfisher	*Halcyon pileata*	Y	(LC)	N	N	N	N	N	N	Y	N	N	N	N	N	N	N	N
White-throated Kingfisher	*Halcyon smyrnensis*	Y	(LC)	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Common Kingfisher	*Alcedo atthis*	Y	-	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Eurasian Hoopoe	*Upupa epops*	N	-	N	N	N	N	N	Y	N	N	N	N	N	N	N	N	N
Barn Swallow	*Hirundo rustica*	N	-	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Red-rumped Swallow	*Hirundo daurica*	N	-	N	N	Y	N	Y	Y	Y	N	N	N	Y	Y	Y	Y	N
Sand Martin	*Riparia riparia*	Y	-	N	N	N	N	N	N	N	N	N	N	Y	N	Y	Y	N
Eastern Yellow Wagtail	*Motacilla tschutschensis*	Y	-	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Grey Wagtail	*Motacilla cinerea*	Y	-	Y	Y	Y	N	N	Y	Y	Y	Y	N	N	Y	Y	Y	N
White Wagtail	*Motacilla alba*	Y	-	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Richard's Pipit	*Anthus richardi*	N	-	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N
Olive-backed Pipit	*Anthus hodgsoni*	N	-	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Red-throated Pipit	*Anthus cervinus*	N	LC	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	Y	N

Common name	Scientific name	Wetland Dependence	Conservation status	2010[3]	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024[4]
Buff-bellied Pipit	*Anthus rubescens*	N	LC	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Red-whiskered Bulbul	*Pycnonotus jocosus*	N	-	N	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Light-vented Bulbul	*Pycnonotus sinensis*	N	-	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Sooty-headed Bulbul	*Pycnonotus aurigaster*	N	-	N	N	N	N	N	N	Y	Y	N	N	Y	Y	Y	N	N
Black-winged Cuckooshrike	*Lalage melaschistos*	N	-	N	N	N	N	N	N	N	N	N	N	Y	N	N	N	N
Bull-headed Shrike	*Lanius bucephalus*	N	-	N	N	N	N	Y	N	N	N	N	N	N	N	N	N	N
Brown Shrike	*Lanius cristatus*	N	-	N	N	N	N	N	Y	N	Y	N	N	Y	Y	Y	N	N
Long-tailed Shrike	*Lanius schach*	N	-	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N
Oriental Magpie Robin	*Copsychus saularis*	N	-	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Red-flanked Bluetail	*Tarsiger cyanurus*	N	-	N	N	N	N	N	N	N	Y	N	N	N	N	N	N	N
Bluethroat	*Luscinia svecica*	N	LC	N	N	N	N	N	N	N	N	Y	N	N	N	N	N	N
Siberian Rubythroat	*Calliope calliope*	N	-	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	Y
Daurian Redstart	*Phoenicurus auroreus*	N	-	N	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Stejneger's Stonechat	*Saxicola stejnegeri*	N	-	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Chinese Blackbird	*Turdus mandarinus*	N	-	N	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y	Y	Y
Grey-backed thrush	*Turdus hortulorum*	N	-	N	N	N	N	N	N	Y	N	N	N	N	N	Y	Y	Y
White's Thrush	*Zoothera aurea*	N	-	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	N
Masked Laughingthrush	*Garrulax perspicillatus*	N	-	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Lanceolated Warbler	*Locustella lanceolata*	Y	-	N	Y	N	N	N	N	N	Y	N	N	N	N	N	N	N
Pallas's Grasshopper Warbler	*Locustella certhiola*	Y	LC	N	Y	N	N	N	N	N	N	N	N	N	N	N	N	N
Oriental Reed Warbler	*Acrocephalus orientalis*	Y	-	N	N	N	N	Y	N	Y	N	Y	Y	Y	Y	Y	Y	N
Thick-billed Warbler	*Acrocephalus aedon*	Y	LC	N	N	N	N	N	Y	N	N	N	N	N	N	N	N	N
Black-browed Reed Warbler	*Acrocephalus bistrigiceps*	Y	-	N	Y	Y	N	Y	Y	N	Y	Y	Y	Y	Y	Y	N	N
Manchurian Bush Warbler	*Horornis canturians*	N	-	N	N	N	N	N	N	N	N	N	N	Y	N	N	N	N
Common Tailorbird	*Orthotomus sutorius*	N	-	N	N	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Dusky Warbler	*Phylloscopus fuscatus*	N	-	N	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Pallas's Leaf Warbler	*Phylloscopus proregulus*	N	-	N	N	N	N	Y	Y	Y	Y	N	N	Y	N	Y	N	N
Yellow-browed warbler	*Phylloscopus inornatus*	N	-	N	N	Y	N	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	N
Sakhalin Leaf Warbler	*Phylloscopus borealoides*	N	-	N	N	N	N	N	N	N	N	N	N	Y	N	N	N	N
Eastern Crowned Warbler	*Phylloscopus coronatus*	N	-	N	N	N	N	N	N	N	N	N	N	Y	N	N	N	N

Common name	Scientific name	Wetland Dependence	Conservation status	2010[3]	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024[4]
Pale-legged Leaf Warbler	*Phylloscopus tenellipes*	N	-	N	N	N	N	N	N	N	N	N	N	Y	Y	Y	N	N
Zitting Cisticola	*Cisticola juncidis*	Y	LC	N	Y	Y	Y	Y	Y	Y	N	N	N	Y	Y	Y	Y	N
Yellow-bellied Prinia	*Prinia flaviventris*	N	-	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Plain Prinia	*Prinia inornata*	N	-	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Grey-streaked Flycatcher	*Muscicapa griseisticta*	N	-	N	N	N	N	N	N	N	N	N	N	N	Y	Y	N	N
Asian Brown Flycatcher	*Muscicapa dauurica*	N	-	N	N	N	N	N	Y	N	N	N	Y	Y	Y	Y	N	N
Red-throated Flycatcher	*Ficedula albicilla*	N	-	N	N	N	N	N	N	N	N	N	N	N	N	Y	N	Y
Yellow-rumped Flycatcher	*Ficedula zanthopygia*	N	-	N	N	N	N	N	N	N	N	N	N	N	N	Y	N	N
Grey-headed Canary-Flycatcher	*Culicicapa ceylonensis*	N	LC	N	N	N	N	N	N	N	N	N	N	Y	N	N	N	N
Amur Paradise Flycatcher	*Terpsiphone incei*	N	LC	N	N	N	N	N	N	N	N	N	N	Y	N	N	N	N
Japanese Paradise Flycatcher	*Terpsiphone atrocaudata*	N	LC	N	N	N	N	N	N	N	N	N	N	Y	N	N	N	N
Chinese Penduline-Tit	*Remiz consobrinus*	Y	RC	N	N	Y	Y	Y	Y	Y	N	N	Y	Y	Y	Y	Y	N
Cinereous Tit	*Parus cinereus*	N	-	N	N	N	N	N	N	Y	Y	N	Y	Y	Y	Y	Y	Y
Japanese Tit	*Parus minor*	N	-	N	N	N	N	N	N	N	N	N	Y	N	N	N	N	N
Swinhoe's White-eye	*Zosterops simplex*	N	-	N	N	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Fork-tailed Sunbird	*Aethopyga christinae*	N	-	N	N	N	N	N	N	N	N	N	N	Y	Y	Y	N	Y
Little Bunting	*Emberiza pusilla*	N	-	Y	N	N	N	N	N	N	N	N	N	Y	Y	Y	Y	N
Black-faced Bunting	*Emberiza spodocephala*	N	-	N	Y	N	N	Y	Y	Y	N	Y	N	Y	Y	Y	Y	N
Chinese Grosbeak	*Eophona migratoria*	Y	LC	N	Y	N	N	N	N	N	N	N	N	N	N	Y	N	N
Scaly-breasted Munia	*Lonchura punctulata*	N	-	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
White-headed Munia	*Lonchura maja*	N	-	N	N	N	N	N	N	N	N	N	N	Y	N	N	N	N
Chestnut Munia	*Lonchura atricapilla*	N	-	N	N	N	N	N	N	N	N	N	N	N	Y	Y	N	N
Eurasian Tree Sparrow	*Passer montanus*	N	-	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N
Yellow-fronted Canary	*Crithagra mozambica*	N	-	N	N	N	N	N	N	N	N	N	N	Y	Y	Y	N	N
Red-billed Starling	*Spodiopsar sericeus*	Y	(RC)*	N	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N
White-cheeked Starling	*Spodiopsar cineraceus*	Y	PRC	N	Y	N	N	Y	Y	Y	Y	Y	N	Y	Y	Y	N	N
Black-collared Starling	*Gracupica nigricollis*	N	-	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
White-shouldered Starling	*Sturnia sinensis*	Y	(LC)	N	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N
Common Myna	*Acridotheres tristis*	N	-	N	N	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N

Common name	Scientific name	Wetland Dependence	Conservation status	2010[3]	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024[4]
Crested Myna	*Acridotheres cristatellus*	N	-	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Great Myna	*Acridotheres grandis*	N	-	N	N	N	N	N	N	N	N	N	N	Y	N	N	N	N
Black-naped Oriole	*Oriolus chinensis*	Y	LC	N	Y	N	N	N	N	N	Y	N	N	N	N	N	N	N
Black Drongo	*Dicrurus macrocercus*	N	-	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Hair-crested Drongo	*Dicrurus hottentottus*	N	-	N	N	N	N	N	N	N	N	N	Y	N	N	N	N	N
Azure-winged Magpie	*Cyanopica cyanus*	N	-	N	N	N	Y	N	N	N	Y	Y	Y	Y	Y	N	Y	N
Oriental Magpie	*Pica serica*	N	-	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N
Red-billed Blue Magpie	*Urocissa erythrorhyncha*	N	-	N	N	N	N	N	N	N	N	N	N	Y	Y	Y	Y	Y
Large-billed Crow	*Corvus macrorhynchos*	N	-	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y
Collared Crow	*Corvus torquatus*	Y	LC, NT	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	No. of Species Recorded			**34**	**63**	**56**	**59**	**73**	**85**	**86**	**78**	**76**	**69**	**112**	**102**	**104**	**89**	**58**

Notes:
(1) Conservation Status follows that of *Fellows et. al. (2002) and BirdLife International listing (2017).* See **Table B1** for the description of the codes. Letters in parentheses indicate that the assessment is on the basis of restrictedness in breeding and for roosting sites rather than in general occurrence. (*Fellowes et al. 2002*)
(2) Updated species names used in the report include Eurasian Magpie (*Pica serica*) as Oriental Magpie (*Pica pica*), Japanese White-eye (*Zosterops japonica*) as Swinhoe's White-eye (*Zosterops simplex*), Chinese Bulbul (*Pycnonotus sinensis*) as Light-vented Bulbul (*Pycnonotus sinensis*) and Pale Martin (*Riparia diluta*) as Sand Martin (*Riparia riparia*)
(3) Species recorded between September and December 2010 only
(4) Species recorded between January and April 2024 only
^ Pintail Snipe and Swinhoe's Snipe cannot be distinguished in field, conservation status refers to Swinhoe's Snipe.
# Greater Coucal is listed as vulnerable (VU) in China Red Data Book and it is protected terrestrial wildlife state protection (category II).
* 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 now not considered globally threatened. A listing of Regional Concern (RC) based on the importance of the large roosts present near Deep Bay, is considered to be more appropriate. (Wetland Restoration Plan, Mott, 2008). Red-billed Starling is now listed as Least Concern by IUCN. (IUCN, 2016)

Table B5: Summary of Bird Species Recorded at the WRA and their Respective Monthly Mean between November 2023 and April 2024

Common name	Scientific name	Wetland Dependence	Conservation status	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24	Apr-24
Little Grebe	*Tachybaptus ruficollis*	Y	LC	0.5	0.8	1.4	0.0	0.8	0.0
Great Cormorant	*Phalacrocorax carbo*	Y	PRC	1.0	0.5	0.8	1.3	0.8	0.0
Grey Heron	*Ardea cinerea*	Y	PRC	4.5	2.8	2.6	1.8	2.3	0.6
Purple Heron	*Ardea purpurea*	Y	RC	1.0	0.3	0.6	1.0	0.3	0.0
Great Egret	*Ardea alba*	Y	PRC, (RC)	2.5	1.3	1.8	2.3	2.0	1.0
Intermediate Egret	*Egretta intermedia*	Y	RC	0.0	0.0	0.0	0.0	0.0	0.0
Little Egret	*Egretta garzetta*	Y	PRC, (RC)	1.5	1.0	2.0	2.3	0.8	2.2
Eastern Cattle Egret	*Bubulcus coromandus*	Y	(LC)	0.0	0.0	0.0	0.0	0.0	0.0
Chinese Pond Heron	*Ardeola bacchus*	Y	PRC, (RC)	1.8	1.8	1.4	2.8	1.3	1.6
Yellow Bittern	*Ixobrychus sinensis*	Y	(LC)	0.8	0.0	0.0	0.0	0.0	0.8
Cinnamon Bittern	*Ixobrychus cinnamomeus*	Y	LC	0.0	0.0	0.0	0.0	0.0	0.0
Great Bittern	*Botaurus stellaris*	Y	RC	0.0	0.0	0.0	0.0	0.0	0.0
Black-crowned Night Heron	*Nycticorax nycticorax*	Y	(LC)	0.3	0.0	0.0	0.0	0.3	0.4
Black Stork	*Ciconia nigra*	Y	RC	0.0	0.0	0.0	0.0	0.0	0.0
Eurasian Spoonbill	*Platalea leucorodia*	Y	LC	0.0	0.0	0.0	0.0	0.0	0.0
Black-faced Spoonbill	*Platalea minor*	Y	PGC, EN	0.0	0.0	0.0	0.0	0.0	0.0
Mandarin Duck	*Aix galericulata*	Y	-	0.0	0.0	0.0	0.0	0.0	0.0
Eurasian Wigeon	*Anas penelope*	Y	RC	0.0	0.0	0.0	0.0	0.0	0.0
Eurasian Teal	*Anas crecca*	Y	RC	0.0	0.0	0.0	0.0	0.0	0.0
Northern Pintail	*Anas acuta*	Y	RC	0.0	0.0	0.0	0.0	0.0	0.0
Northern Shoveler	*Anas clypeata*	Y	RC	0.0	0.0	0.0	0.0	0.0	0.0
Garganey	*Anas querquedula*	Y	-	0.0	0.0	0.0	0.0	0.0	0.0
Tufted Duck	*Aythya fuligula*	Y	LC	0.0	0.0	0.0	0.0	0.0	0.0
Western Osprey	*Pandion haliaetus*	Y	RC	0.0	0.0	0.0	0.0	0.0	0.0
Crested Goshawk	*Accipiter trivirgatus*	N	-	0.0	0.0	0.0	0.0	0.0	0.0
Besra	*Accipiter virgatus*	N	-	0.0	0.3	0.2	0.3	0.0	0.0
Black-winged Kite	*Elanus caeruleus*	Y	LC	0.3	0.0	0.0	0.0	0.0	0.0
Black Kite	*Milvus migrans*	Y	(RC)	0.8	0.3	1.0	1.5	0.0	0.2
Crested Serpent Eagle	*Spilornis cheela*	N	(LC)	0.0	0.0	0.0	0.0	0.0	0.0
Greater Spotted Eagle	*Clanga clanga*	Y	GC	0.0	0.0	0.0	0.0	0.0	0.0
Eastern Imperial Eagle	*Aquila heliaca*	Y	-	0.3	0.0	0.0	0.0	0.0	0.0

Common name	Scientific name	Wetland Dependence	Conservation status	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24	Apr-24
Eastern Buzzard	*Buteo japonicus*	Y	-	0.0	0.0	0.0	0.0	0.0	0.0
Common Kestrel	*Falco tinnunculus*	N	-	0.0	0.3	0.0	0.3	0.0	0.0
Peregrine Falcon	*Falco peregrinus*	N	(LC)	0.0	0.0	0.0	0.0	0.0	0.0
Eurasian Hobby	*Falco subbuteo*	Y	(LC)	0.0	0.0	0.0	0.0	0.0	0.0
Japanese Quail	*Coturnix japonica*	N	LC	0.0	0.0	0.0	0.0	0.0	0.0
Baillon's Crake	*Porzana pusilla*	Y	LC	0.0	0.0	0.0	0.0	0.0	0.0
White-breasted Waterhen	*Amaurornis phoenicurus*	Y	-	1.0	0.5	0.2	0.8	0.8	1.4
Watercock	*Gallicrex cinerea*	Y	RC	0.0	0.0	0.0	0.0	0.0	0.0
Common Moorhen	*Gallinula chloropus*	Y	-	0.5	1.0	0.6	0.8	0.0	0.4
Pheasant-tailed Jacana	*Hydrophasianus chirurgus*	Y	LC	0.0	0.0	0.0	0.0	0.0	0.0
Greater Painted-snipe	*Rostratula benghalensis*	Y	LC	0.0	0.0	0.0	0.0	0.0	0.6
Black-winged Stilt	*Himantopus himantopus*	Y	RC	0.0	0.5	0.0	0.0	0.0	0.0
Pied Avocet	*Recurvirostra avosetta*	Y	RC	0.0	0.0	0.0	0.0	0.0	0.0
Grey-headed Lapwing	*Vanellus cinereus*	Y	LC	0.0	0.0	0.0	0.0	0.0	0.0
Oriental Pratincole	*Glareola maldivarum*	Y	LC	0.0	0.0	0.0	0.0	0.0	0.0
Pacific Golden Plover	*Pluvialis fulva*	Y	LC	0.0	0.0	0.0	0.0	0.0	0.0
Little Ringed Plover	*Charadrius dubius*	Y	(LC)	0.0	0.0	0.0	0.0	0.0	0.0
Kentish Plover	*Charadrius alexandrinus*	Y	RC	0.0	0.0	0.0	0.0	0.0	0.0
Spotted Redshank	*Tringa erythropus*	Y	RC	0.0	0.0	0.0	0.0	0.0	0.0
Common Redshank	*Tringa totanus*	Y	RC	0.0	0.0	0.0	0.0	0.0	0.0
Common Greenshank	*Tringa nebularia*	Y	RC	0.0	0.0	0.4	1.5	0.8	0.6
Marsh Sandpiper	*Tringa stagnatilis*	Y	RC	0.0	0.0	0.0	0.0	0.0	0.0
Green Sandpiper	*Tringa ochropus*	Y	-	0.0	0.8	1.2	0.5	0.3	0.0
Wood Sandpiper	*Tringa glareola*	Y	LC	0.0	0.0	0.0	0.0	0.8	0.0
Common Sandpiper	*Actitis hypoleucos*	Y	-	0.3	0.3	0.0	0.8	1.3	0.8
Pintail/Swinhoe's Snipe*	*Gallinago stenura/ G. megala*	Y	LC	0.0	0.0	0.0	0.0	0.0	0.0
Common Snipe	*Gallinago gallinago*	Y	-	0.0	0.0	0.0	0.0	0.0	0.0
Red-necked Stint	*Calidris ruficollis*	Y	LC	0.0	0.0	0.0	0.0	0.0	0.0
Temminck's Stint	*Calidris temminckii*	Y	LC	0.0	0.0	0.0	0.0	0.0	0.0
Long-toed Stint	*Calidris subminuta*	Y	LC	0.0	0.0	0.0	0.0	0.0	0.0
Black-headed Gull	*Chroicocephalus ridibundus*	Y	PRC	0.0	0.0	0.0	0.0	0.0	0.0
Whiskered Tern	*Chlidonias hybrida*	Y	-	0.0	0.0	0.0	0.0	0.0	0.0

Common name	Scientific name	Wetland Dependence	Conservation status	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24	Apr-24
White-winged Tern	*Chlidonias leucopterus*	Y	-	0.0	0.0	0.0	0.0	0.0	0.0
Domestic Pigeon	*Columba livia*	N	-	0.0	0.0	0.0	0.0	0.0	0.0
Oriental Turtle Dove	*Streptopelia orientalis*	N	-	0.0	0.0	0.0	0.0	0.0	0.0
Red Turtle Dove	*Streptopelia tranquebarica*	N	-	0.0	0.0	0.0	0.0	0.8	0.0
Spotted Dove	*Spilopelia chinensis*	N	-	1.8	1.8	1.8	1.3	0.3	0.8
Eurasian Collared Dove	*Streptopelia decaocto*	N	-	0.0	0.5	1.6	2.0	0.5	0.4
Emerald Dove	*Chalcophaps indica indica*	N	-	0.0	0.0	0.0	0.0	0.0	0.0
Asian Koel	*Eudynamys scolopaceus*	N	-	0.3	0.5	0.4	0.3	0.5	0.2
Greater Coucal#	*Centropus sinensis*	N	-	0.8	0.3	0.8	0.5	1.0	1.2
Indian Cuckoo	*Cuculus Micropterus*	N	-	0.0	0.0	0.0	0.0	0.0	0.0
Large Hawk-Cuckoo	*Hierococcyx sparverioides*	N	-	0.0	0.0	0.0	0.0	0.3	V
Plaintive Cuckoo	*Cacomantis merulinus*	N	-	0.0	0.0	0.0	0.3	0.0	0.0
Asian Barred Owlet	*Glaucidium cuculoides*	N	-	0.0	0.0	0.0	0.0	0.0	0.0
Eurasian Eagle Owl	*Bubo bubo*	N	RC	0.0	0.0	0.0	0.0	0.0	0.0
Savanna Nightjar	*Caprimulgus affinis*	N	-	0.0	0.0	0.0	0.0	V	V
Himalayan Swiftlet	*Aerodramus brevirostris*	N	-	0.0	0.0	0.0	0.0	0.0	0.0
Pacific Swift	*Apus pacificus*	N	(LC)	0.0	0.0	0.0	0.0	0.0	0.0
House Swift	*Apus nipalensis*	N	-	3.3	0.0	0.0	0.0	0.0	0.0
Pied Kingfisher	*Ceryle rudis*	Y	(LC)	1.0	0.5	0.2	0.5	1.0	0.4
Black-capped Kingfisher	*Halcyon pileata*	Y	(LC)	0.0	0.0	0.0	0.0	0.0	0.0
White-throated Kingfisher	*Halcyon smyrnensis*	Y	(LC)	0.5	0.0	0.2	0.0	0.3	0.2
Common Kingfisher	*Alcedo atthis*	Y	-	1.8	1.3	0.8	0.3	0.5	0.8
Eurasian Hoopoe	*Upupa epops*	N	-	0.0	0.0	0.0	0.0	0.0	0.0
Barn Swallow	*Hirundo rustica*	N	-	1.3	7.0	0.6	0.0	1.0	3.8
Red-rumped Swallow	*Hirundo daurica*	N	-	0.0	0.0	0.0	0.0	0.0	0.0
Sand Martin	*Riparia riparia*	Y	-	0.0	0.0	0.0	0.0	0.0	0.0
Eastern Yellow Wagtail	*Motacilla tschutschensis*	Y	-	0.3	0.0	0.2	0.0	0.8	0.6
Grey Wagtail	*Motacilla cinerea*	Y	-	0.0	0.0	0.0	0.0	0.0	0.0
White Wagtail	*Motacilla alba*	Y	-	0.5	0.5	1.2	1.3	0.8	1.0
Richard's Pipit	*Anthus richardi*	N	-	0.0	0.0	0.0	0.0	0.0	0.0
Olive-backed Pipit	*Anthus hodgsoni*	N	-	0.0	2.3	2.2	2.3	0.0	0.0
Red-throated Pipit	*Anthus cervinus*	N	LC	0.0	0.0	0.0	0.0	0.0	0.0

Common name	Scientific name	Wetland Dependence	Conservation status	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24	Apr-24
Buff-bellied Pipit	*Anthus rubescens*	N	LC	0.0	0.0	0.0	0.0	0.0	0.0
Red-whiskered Bulbul	*Pycnonotus jocosus*	N	-	3.0	4.0	7.8	5.8	2.3	0.8
Light-vented Bulbul	*Pycnonotus sinensis*	N	-	2.8	3.3	2.6	4.0	2.0	1.2
Sooty-headed Bulbul	*Pycnonotus aurigaster*	N	-	0.0	0.0	0.0	0.0	0.0	0.0
Black-winged Cuckooshrike	*Lalage melaschistos*	N	-	0.0	0.0	0.0	0.0	0.0	0.0
Bull-headed Shrike	*Lanius bucephalus*	N	-	0.0	0.0	0.0	0.0	0.0	0.0
Brown Shrike	*Lanius cristatus*	N	-	0.0	0.0	0.0	0.0	0.0	0.0
Long-tailed Shrike	*Lanius schach*	N	-	0.5	V	0.0	0.0	0.0	0.0
Oriental Magpie Robin	*Copsychus saularis*	N	-	0.5	0.8	0.2	0.0	1.8	0.8
Red-flanked Bluetail	*Tarsiger cyanurus*	N	-	0.0	0.0	0.0	0.0	0.0	0.0
Bluethroat	*Luscinia svecica*	N	LC	0.0	0.0	0.0	0.0	0.0	0.0
Siberian Rubythroat	*Calliope calliope*	N	-	0.0	0.0	0.0	0.3	0.0	0.0
Daurian Redstart	*Phoenicurus auroreus*	N	-	2.0	3.3	0.6	0.8	1.0	0.0
Stejneger's Stonechat	*Saxicola stejnegeri*	N	-	1.3	0.5	0.0	0.3	0.8	0.4
Chinese Blackbird	*Turdus mandarinus*	N	-	0.3	0.5	0.6	0.0	0.0	0.0
Grey-backed thrush	*Turdus hortulorum*	N	-	0.0	0.0	0.2	0.0	0.3	0.0
White's Thrush	*Zoothera aurea*	N	-	0.0	0.0	0.0	0.0	0.0	0.0
Masked Laughingthrush	*Garrulax perspicillatus*	N	-	6.0	V	5.2	3.3	2.0	3.4
Lanceolated Warbler	*Locustella lanceolata*	Y	-	0.0	0.0	0.0	0.0	0.0	0.0
Pallas's Grasshopper Warbler	*Locustella certhiola*	Y	LC	0.0	0.0	0.0	0.0	0.0	0.0
Oriental Reed Warbler	*Acrocephalus orientalis*	Y	-	0.3	0.3	0.0	0.0	0.0	0.0
Thick-billed Warbler	*Acrocephalus aedon*	Y	LC	0.0	0.0	0.0	0.0	0.0	0.0
Black-browed Reed Warbler	*Acrocephalus bistrigiceps*	Y	-	0.0	0.0	0.0	0.0	0.0	0.0
Manchurian Bush Warbler	*Horornis canturians*	N	-	0.0	0.0	0.0	0.0	0.0	0.0
Common Tailorbird	*Orthotomus sutorius*	N	-	1.3	1.3	0.6	1.3	0.0	1.2
Dusky Warbler	*Phylloscopus fuscatus*	N	-	1.5	3.0	1.0	1.0	0.5	0.8
Pallas's Leaf Warbler	*Phylloscopus proregulus*	N	-	0.0	0.0	0.0	0.0	0.0	0.0
Yellow-browed warbler	*Phylloscopus inornatus*	N	-	0.5	0.3	0.0	0.0	0.0	0.0
Sakhalin Leaf Warbler	*Phylloscopus borealoides*	N	-	0.0	0.0	0.0	0.0	0.0	0.0
Eastern Crowned Warbler	*Phylloscopus coronatus*	N	-	0.0	0.0	0.0	0.0	0.0	0.0

Common name	Scientific name	Wetland Dependence	Conservation status	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24	Apr-24
Pale-legged Leaf Warbler	*Phylloscopus tenellipes*	N	-	0.0	0.0	0.0	0.0	0.0	0.0
Zitting Cisticola	*Cisticola juncidis*	Y	LC	0.0	0.0	0.0	0.0	0.0	0.0
Yellow-bellied Prinia	*Prinia flaviventris*	N	-	1.0	1.3	1.6	0.5	1.5	1.4
Plain Prinia	*Prinia inornata*	N	-	1.3	0.5	0.4	1.0	1.5	2.0
Grey-streaked Flycatcher	*Muscicapa griseisticta*	N	-	0.0	0.0	0.0	0.0	0.0	0.0
Asian Brown Flycatcher	*Muscicapa dauurica*	N	-	0.0	0.0	0.0	0.0	0.0	0.0
Red-throated Flycatcher	*Ficedula albicilla*	N	-	0.0	0.0	0.4	0.3	0.3	0.0
Yellow-rumped Flycatcher	*Ficedula zanthopygia*	N	-	0.0	0.0	0.0	0.0	0.0	0.0
Grey-headed Canary-Flycatcher	*Culicicapa ceylonensis*	N	LC	0.0	0.0	0.0	0.0	0.0	0.0
Amur Paradise Flycatcher	*Terpsiphone incei*	N	LC	0.0	0.0	0.0	0.0	0.0	0.0
Japanese Paradise Flycatcher	*Terpsiphone atrocaudata*	N	LC	0.0	0.0	0.0	0.0	0.0	0.0
Chinese Penduline-Tit	*Remiz consobrinus*	Y	RC	0.0	0.0	0.0	0.0	0.0	0.0
Cinereous Tit	*Parus cinereus*	N	-	0.0	0.3	0.0	0.0	0.0	0.6
Japanese Tit	*Parus minor*	N	-	0.0	0.0	0.0	0.0	0.0	0.0
Swinhoe's White-eye	*Zosterops simplex*	N	-	1.3	5.0	1.0	1.3	0.0	0.4
Fork-tailed Sunbird	*Aethopyga christinae*	N	-	0.0	0.0	0.2	0.0	0.3	0.0
Little Bunting	*Emberiza pusilla*	N	-	0.5	0.0	0.0	0.0	0.0	0.0
Black-faced Bunting	*Emberiza spodocephala*	N	-	0.0	0.0	0.0	0.0	0.0	0.0
Chinese Grosbeak	*Eophona migratoria*	Y	LC	0.0	0.0	0.0	0.0	0.0	0.0
Scaly-breasted Munia	*Lonchura punctulata*	N	-	2.0	4.3	5.2	0.0	0.0	0.0
White-headed Munia	*Lonchura maja*	N	-	0.0	0.0	0.0	0.0	0.0	0.0
Chestnut Munia	*Lonchura atricapilla*	N	-	0.0	0.0	0.0	0.0	0.0	0.0
Eurasian Tree Sparrow	*Passer montanus*	N	-	0.0	0.0	0.0	0.0	0.0	0.0
Yellow-fronted Canary	*Crithagra mozambica*	N	-	0.0	0.0	0.0	0.0	0.0	0.0
Red-billed Starling	*Spodiopsar sericeus*	Y	(RC)*	0.0	0.0	0.0	0.0	0.0	0.0
White-cheeked Starling	*Spodiopsar cineraceus*	Y	PRC	0.0	0.0	0.0	0.0	0.0	0.0
Black-collared Starling	*Gracupica nigricollis*	N	-	1.8	1.5	0.8	1.5	3.0	0.8
White-shouldered Starling	*Sturnia sinensis*	Y	(LC)	0.0	0.0	0.0	0.0	0.0	0.0
Common Myna	*Acridotheres tristis*	N	-	0.0	0.0	0.0	0.0	0.0	0.0
Crested Myna	*Acridotheres cristatellus*	N	-	0.5	0.5	0.4	2.3	0.5	0.8
Great Myna	*Acridotheres grandis*	N	-	0.0	0.0	0.0	0.0	0.0	0.0

Common name	Scientific name	Wetland Dependence	Conservation status	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24	Apr-24
Black-naped Oriole	*Oriolus chinensis*	Y	LC	0.0	0.0	0.0	0.0	0.0	0.0
Black Drongo	*Dicrurus macrocercus*	N	-	0.3	0.0	0.0	0.0	0.0	0.2
Hair-crested Drongo	*Dicrurus hottentottus*	N	-	0.0	0.0	0.0	0.0	0.0	0.0
Azure-winged Magpie	*Cyanopica cyanus*	N	-	0.0	0.0	0.0	0.0	0.0	0.0
Oriental Magpie	*Pica serica*	N	-	0.0	0.0	0.0	0.0	0.0	0.0
Red-billed Blue Magpie	*Urocissa erythrorhyncha*	N	-	0.0	0.3	0.0	0.0	0.0	0.6
Large-billed Crow	*Corvus macrorhynchos*	N	-	0.0	0.8	0.0	0.8	0.5	0.2
Collared Crow	*Corvus torquatus*	Y	LC, NT	0.5	0.3	0.2	0.0	0.0	0.4

Notes:

(5) Conservation Status follows that of *Fellows et. al. (2002) and BirdLife International listing (2017).* See **Table B1** for the description of the codes. Letters in parentheses indicate that the assessment is on the basis of restrictedness in breeding and for roosting sites rather than in general occurrence. (*Fellowes et al. 2002*)

(6) Updated species names used in the report include Eurasian Magpie (*Pica serica*) as Oriental Magpie (*Pica pica*), Japanese White-eye (*Zosterops japonica*) as Swinhoe's White-eye (*Zosterops simplex*), Chinese Bulbul (*Pycnonotus sinensis*) as Light-vented Bulbul (*Pycnonotus sinensis*) and Pale Martin (*Riparia diluta*) as Sand Martin (*Riparia riparia*)

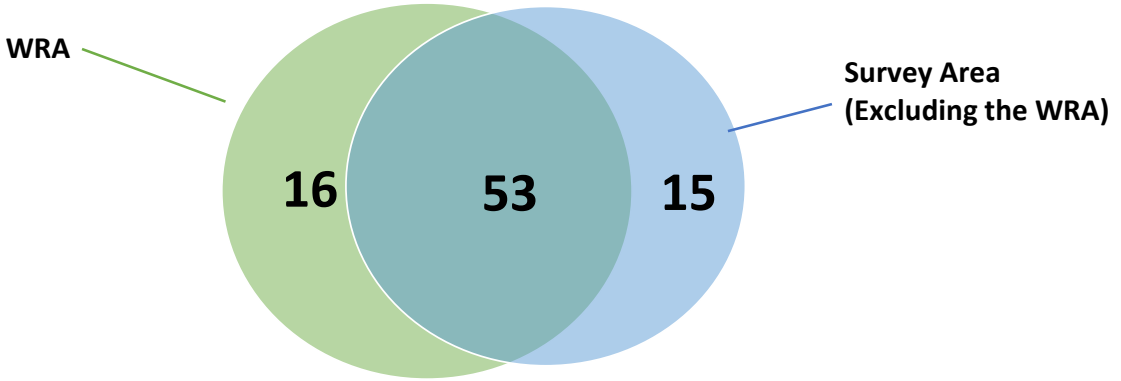
^ Pintail Snipe and Swinhoe's Snipe cannot be distinguished in field, conservation status refers to Swinhoe's Snipe.

V Indicates the species is recorded outside regular surveys.

Greater Coucal is listed as vulnerable (VU) in China Red Data Book and it is protected terrestrial wildlife state protection (category II).

* 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 now not considered globally threatened. A listing of Regional Concern (RC) based on the importance of the large roosts present near Deep Bay, is considered to be more appropriate. (Wetland Restoration Plan, Mott, 2008). Red-billed Starling is now listed as Least Concern by IUCN. (IUCN, 2016)

Chart B1: Number of Common Bird Species and Bird Species Only Found in the WRA or Survey Area (Excluding the WRA) During the Reporting Period



Species Only Found in the WRA
Purple Heron
Besra
Eastern Imperial Eagle
Common Kestrel
Greater Painted-snipe
Common Greenshank
Plaintive Cuckoo
Savanna Nightjar
Siberian Rubythroat
Chinese Blackbird
Oriental Reed Warbler
Yellow-browed warbler
Red-throated Flycatcher
Fork-tailed Sunbird
Red-billed Blue Magpie
Large-billed Crow
16

Common Species Found in Both the WRA and Survey Area (Excluding the WRA)	
Little Grebe	Barn Swallow
Great Cormorant	Eastern Yellow Wagtail
Grey Heron	White Wagtail
Great Egret	Olive-backed Pipit
Little Egret	Red-whiskered Bulbul
Chinese Pond Heron	Light-vented Bulbul
Yellow Bittern	Long-tailed Shrike
Black-crowned Night Heron	Oriental Magpie Robin
Black-winged Kite	Stejneger's Stonechat
Black Kite	Daurian Redstart
Eastern Buzzard	Grey-backed thrush
White-breasted Waterhen	Masked Laughingthrush
Common Moorhen	Common Tailorbird
Black-winged Stilt	Dusky Warbler
Green Sandpiper	Pallas's Leaf Warbler
Wood Sandpiper	Yellow-bellied Prinia
Common Sandpiper	Plain Prinia
Red Turtle Dove	Cinereous Tit
Spotted Dove	Swinhoe's White-eye
Eurasian Collared Dove	Little Bunting
Asian Koel	Black-faced Bunting
Greater Coucal	Scaly-breasted Munia
Large Hawk-Cuckoo	Black-collared Starling
House Swift	Crested Myna
Pied Kingfisher	Black Drongo
White-throated Kingfisher	Collared Crow
Common Kingfisher	
53	

Species Only Found in the Survey Area (Excluding the WRA)
Intermediate Egret
Eastern Cattle Egret
Northern Shoveler
Tufted Duck
Water Rail
Pied Avocet
Little Ringed Plover
Marsh Sandpiper
Common Snipe
White-rumped Munia
Eurasian Tree Sparrow
Red-billed Starling
White-cheeked Starling
White-shouldered Starling
Common Myna
15

C. Summary of Herpetofauna Monitoring, Mammals and Insect Surveys

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

Common Name	Scientific Name	Conservation Status (1)	Mean (2)					
Amphibians			**Nov 2023**	**Dec 2023**	**Jan 2024**	**Feb 2024**	**Mar 2024**	**Apr 2024**
Brown Tree Frog	*Polypedates megacephalus*	-	0.0	0.0	0.0	0.0	0.0	1.0
Asiatic Painted Frog	*Kaloula pulchra pulchra*	-	0.0	0.0	0.0	0.0	0.0	0.5
	No. of Species Recorded		**0**	**0**	**0**	**0**	**0**	**2**
Reptiles			**Nov 2023**	**Dec 2023**	**Jan 2024**	**Feb 2024**	**Mar 2024**	**Apr 2024**
Bowring's Gecko	Hemidactylus bowringii	-	0.0	0.0	0.0	0.0	0.0	2.0
	No. of Species Recorded		**0**	**0**	**0**	**0**	**0**	**1**

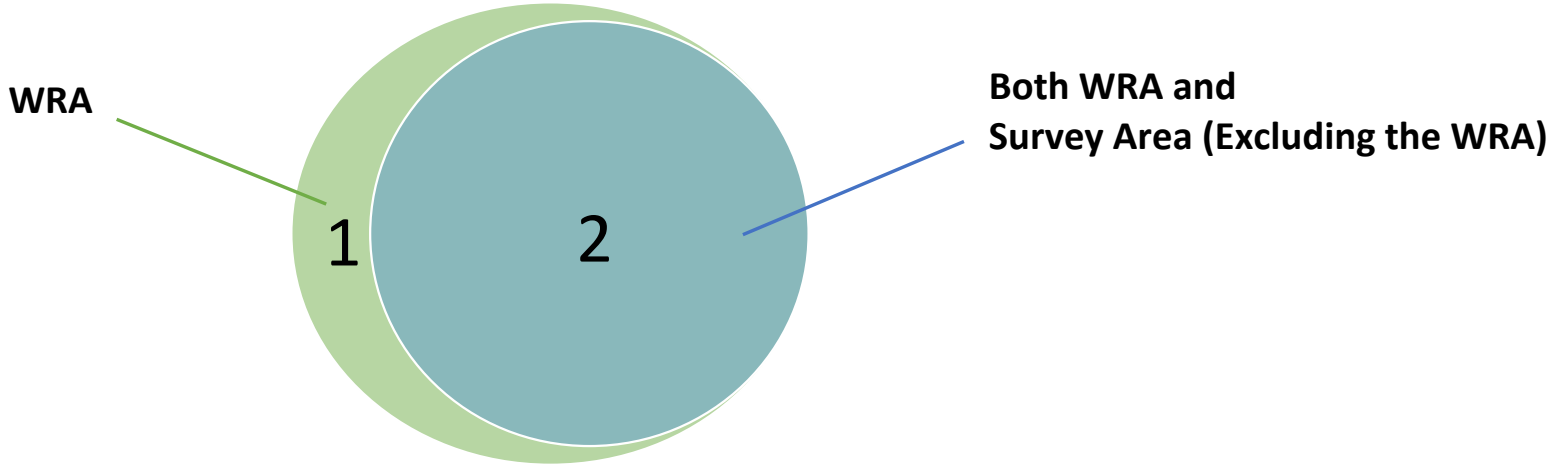
(1) Conservation status follows that of Fellows that of Fellowes et al. (2002), Chan et al. (2005) and Karsen et al. (1998).
(2) Refers to the mean number of individuals recorded in the reporting period (excluding the WRA)
V Indicates the species is recorded outside regular surveys.

Table C2: Summary of herpetofauna monitoring in the WRA

Common Name	Scientific Name	Conservation Status (1)	Mean (2)					
Amphibians			**Nov 2023**	**Dec 2023**	**Jan 2024**	**Feb 2024**	**Mar 2024**	**Apr 2024**
Brown Tree Frog	*Polypedates megacephalus*	-	0.0	0.0	0.0	0.0	0.0	0.5
Asiatic Painted Frog	*Kaloula pulchra pulchra*	-	0.0	0.0	0.0	0.0	0.0	3.5
Ornate Pygmy Frog	*Microhyla fissipes*	-	0.0	0.0	0.0	0.0	1.0	3.5
	No. of Species Recorded		**0**	**0**	**0**	**0**	**1**	**3**
Reptiles			**Nov 2023**	**Dec 2023**	**Jan 2024**	**Feb 2024**	**Mar 2024**	**Apr 2024**
Bowring's Gecko	*Hemidactylus bowringii*	-	1.0	0.0	0.0	0.0	V	7.0
Long-tailed Skink	*Eutropis longicaudata*	-	0.0	V	0.0	0.0	0.0	0.0
	No. of Species Recorded		**1**	**1**	**0**	**0**	**1**	**1**

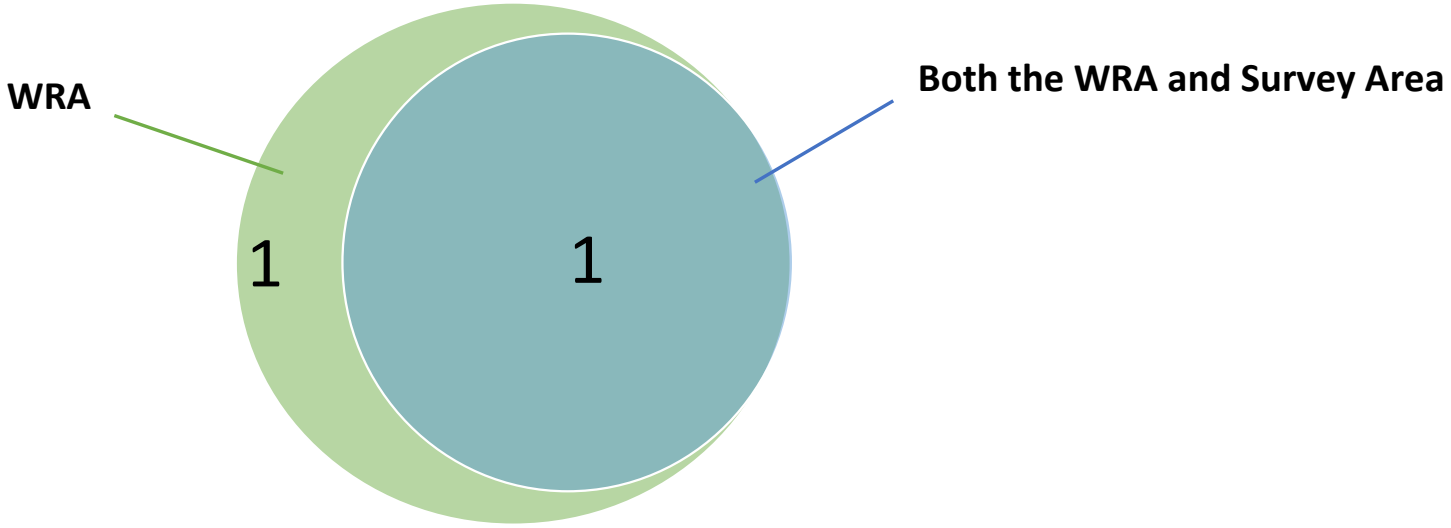
(1) Conservation status follows that of Fellows that of Fellowes et al. (2002), Chan et al. (2005) and Karsen et al. (1998).
(2) Refers to the mean number of individuals recorded in the reporting period at WRA.
V Indicates the species is recorded outside regular surveys.

Chart C1: Number of Common Amphibian Species and Amphibian Species Only Found in the WRA or Survey Area (Excluding the WRA) During the Reporting Period



Species Only Found in the WRA	Common Species Found in Both the WRA and Survey Area (Excluding the WRA)	Species Only Found in the Survey Area (Excluding the WRA)
Ornate Pygmy Frog	Brown Tree Frog Asiatic Painted Frog	
1	**2**	**0**

Chart C2: Number of Common Reptile Species and Reptile Species Only Found in the WRA or Survey Area (Excluding the WRA) During the Reporting Period



Species Only Found in the WRA	Common Species Found in Both the WRA and Survey Area (Excluding the WRA)	Species Only Found in the Survey Area (Excluding the WRA)
Long-tailed Skink	Bowring's Gecko	
1	**1**	**0**

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

Common Name	Scientific Name	Conservation Status [1]	Max [2]					
Mammal			**Nov 2023**	**Dec 2023**	**Jan 2024**	**Feb 2024**	**Mar 2024**	**Apr 2024**
Japanese Pipistrelle	*Pipistrellus abramus*	-	0.0	0.0	0.0	0.0	3.0	2.0
	No. of Species Recorded		**0**	**0**	**0**	**0**	**1**	**1**

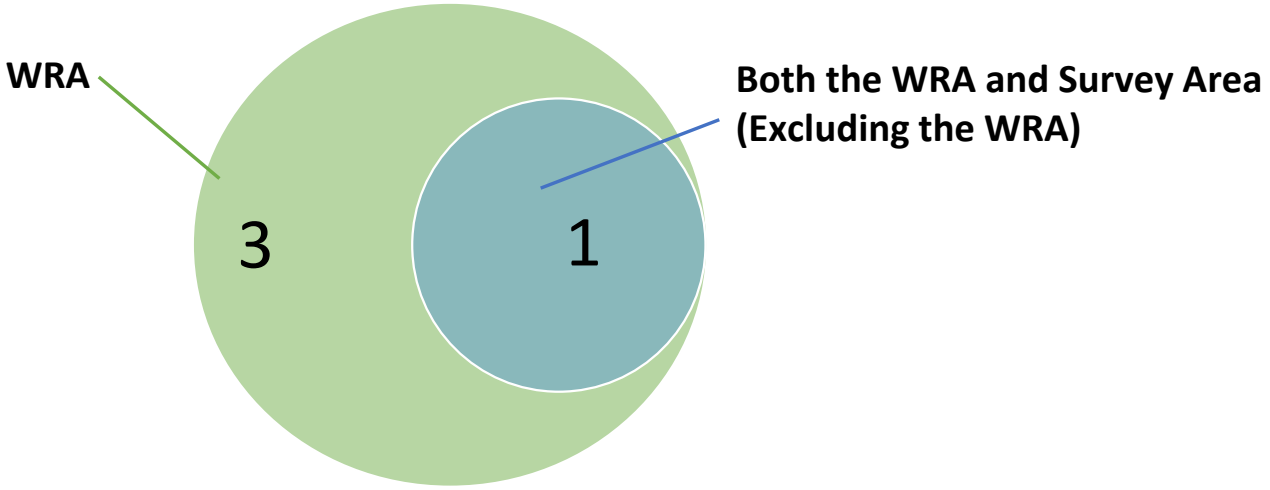
(1) Conservation status follows that of Fellows et al. (2002) and Shek (2006).
(2) Refers to the maximum number of individuals recorded in each month in the survey area (excluding WRA).
V Indicates the species is recorded outside regular surveys.

Table C4: Summary of mammal monitoring in the WRA

Common Name	Scientific Name	Conservation Status [1]	Max [2]					
Mammal			**Nov 2023**	**Dec 2023**	**Jan 2024**	**Feb 2024**	**Mar 2024**	**Apr 2024**
Short-nosed Fruit Bat	*Cynopterus sphinx*	-	0.0	0.0	0.0	0.0	2.0	0.0
Japanese Pipistrelle	*Pipistrellus abramus*	-	0.0	0.0	0.0	0.0	1.0	1.0
Leopard Cat#	*Prionailurus bengalensis*	Class II	0.0	V	1.0	1.0	1.0	0.0
Wild Boar	*Sus scrofa*	-	0.0	0.0	1.0	0.0	0.0	0.0
	No. of Species Recorded		**0**	**1**	**2**	**1**	**3**	**1**

(1) Conservation status follows that of Fellows et al. (2002) and Shek (2006).
(2) Refers to the maximum number of individuals recorded in each month at WRA.
V Indicates the species is recorded outside regular surveys.

Chart C3: Number of Common Mammal Species and Mammal Species Only Found in the WRA or Survey Area (Excluding the WRA) During the Reporting Period



Species Only Found in the WRA	Common Species Found in Both the WRA and Survey Area (Excluding the WRA)	Species Only Found in the Survey Area (Excluding the WRA)
Short-nosed Fruit Bat	Japanese Pipistrelle	
Leopard Cat		
Wild Boar		
3	**1**	**0**

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

Common Name	Scientific Name	Conservation Status[1]	Mean[2]					
Odonata			**Nov 2023**	**Dec 2023**	**Jan 2024**	**Feb 2024**	**Mar 2024**	**Apr 2024**
Wandering Midget	*Agriocnemis pygmaea*	-	0.0	0.0	0.0	0.0	0.0	0.5
Orange-tailed Sprite	*Ceriagrion auranticum ryukyuanum*	-	0.0	0.0	0.0	0.0	0.0	1.0
Common Bluetail	*Ischnura senegalensis*	-	0.0	0.0	0.0	0.0	1.0	2.5
Asian Pintail	*Acisoma panorpoides*	-	0.0	0.0	0.0	0.0	0.0	V
Asian Amberwing	*Brachythemis contaminata*	-	0.0	0.0	0.0	0.0	0.0	0.5
Coastal Glider	*Macrodiplax cora*	LC	0.0	0.0	0.0	0.0	0.0	0.5
Russet Percher	*Neurothemis fulvia*	-	0.0	0.0	0.0	0.0	0.0	0.5
Wandering Glider	*Pantala flavescens*	-	1.0	0.0	0.0	0.0	0.0	1.0
Pied Skimmer	*Pseudothemis zonata*	-	0.0	0.0	0.0	0.0	0.0	1.5
Variegated Flutterer	*Rhyothemis variegata arria*	-	0.0	0.0	0.0	0.0	0.0	27.0
	No. of Species Recorded		**1**	**0**	**0**	**0**	**1**	**10**
Butterfly			**Nov 2023**	**Dec 2023**	**Jan 2024**	**Feb 2024**	**Mar 2024**	**Apr 2024**
Common Sailor	*Neptis hylas hylas*	-	0.0	0.0	0.0	0.0	0.0	0.5
Angled Castor	*Ariadne ariadne alterna*	-	1.0	0.0	0.0	0.0	0.0	0.0
Dark Brand Bush Brown	*Mycalesis mineus mineus*	-	0.0	0.0	0.0	0.0	0.0	1.0
Pale Grass Blue	*Pseudozizeeria maha serica*	-	1.0	0.0	0.0	0.0	0.0	2.5
Common Hedge Blue	*Acytolepis puspa*	-	0.0	0.0	0.0	0.0	2.0	0.0
Red-base Jezebel	*Delias pasithoe pasithoe*	-	7.0	0.0	0.0	0.0	1.0	1.0
Small Cabbage White	*Pieris rapae crucivora*	-	2.0	0.0	0.0	0.0	5.0	3.5
Common Grass Yellow	*Eurema hecabe hecabe*	-	0.0	0.0	0.0	0.0	0.0	0.5
Common Mormon	*Papilio polytes polytes*	-	0.0	0.0	0.0	0.0	1.0	0.5
	No. of Species Recorded		**4**	**0**	**0**	**0**	**4**	**7**

(1) Conservation status follows that of Fellows et al. (2002) and Shek (2006), 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)
V indicates the species is recorded outside regular surveys

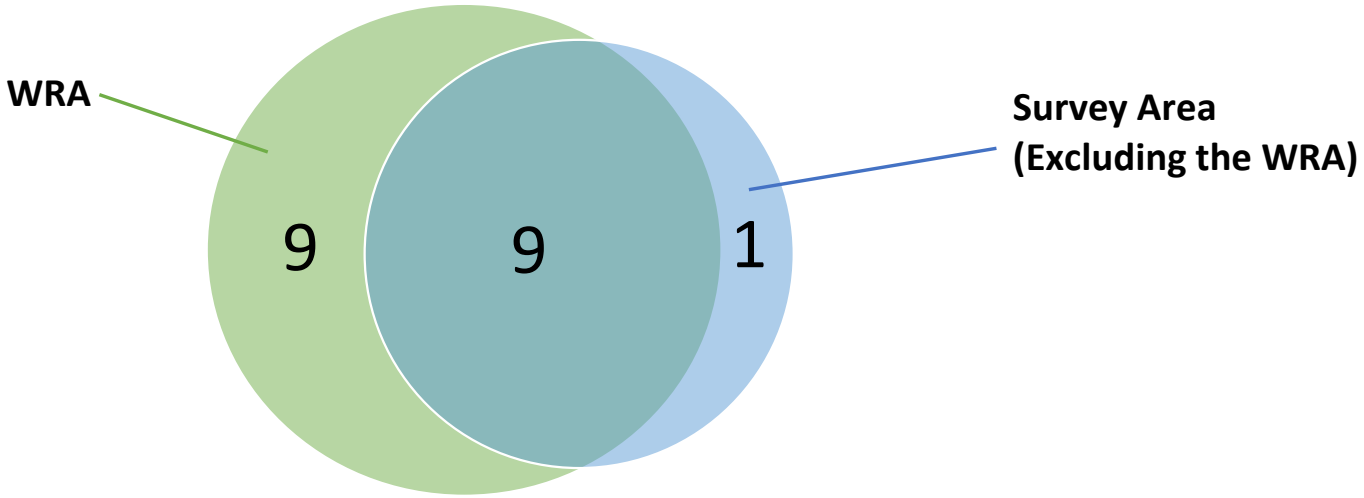
Table C6: Summary of dragonfly and butterfly monitoring in the WRA

Common Name	Scientific Name	Conservation Status[1]	Mean[2]					
Odonate			**Nov 2023**	**Dec 2023**	**Jan 2024**	**Feb 2024**	**Mar 2024**	**Apr 2024**
Wandering Midget	*Agriocnemis pygmaea*	-	0.0	0.0	0.0	0.0	0.0	1.0
Orange-tailed Sprite	*Ceriagrion auranticum ryukyuanum*	-	8.0	0.0	0.0	0.0	0.0	2.0
Common Bluetail	*Ischnura senegalensis*	-	1.0	0.0	0.0	0.0	1.0	4.0
Yellow Featherlegs	*Copera marginipes*	-	0.0	0.0	0.0	0.0	0.0	2.5
Common Flangetail	*Ictinogomphus pertinax*	-	2.0	0.0	0.0	0.0	0.0	0.0
Asian Pintail	*Acisoma panorpoides*	-	1.0	0.0	0.0	0.0	0.0	2.5
Blue Dasher	*Brachydiplax chalybea flavovi ttata*	-	0.0	0.0	0.0	0.0	0.0	1.0
Asian Amberwing	*Brachythemis contaminata*	-	2.0	0.0	0.0	0.0	V	5.0
Crimson Darter	*Crocothemis servilia servilia*	-	0.0	0.0	0.0	0.0	0.0	0.5
Russet Percher	*Neurothemis fulvia*	-	0.0	0.0	0.0	0.0	0.0	V
Pied Percher	*Neurothemis tullia tullia*	-	9.0	0.0	0.0	0.0	0.0	V
Red-faced Skimmer	*Orthetrum chrysis*	-	0.0	0.0	0.0	0.0	0.0	1.0
Green Skimmer	*Orthetrum sabina sabina*	-	1.0	0.0	0.0	0.0	0.0	2.0
Wandering Glider	*Pantala flavescens*	-	23.0	0.0	0.0	0.0	0.0	1.5
Pied Skimmer	*Pseudothemis zonata*	-	0.0	0.0	0.0	0.0	0.0	3.0
Variegated Flutterer	*Rhyothemis variegata arria*	-	2.0	0.0	0.0	0.0	V	21.0
Evening Skimmer	*Tholymis tillarga*	-	0.0	0.0	0.0	0.0	0.0	0.5
Saddlebag Glider	*Tramea virginia*	-	0.0	0.0	0.0	0.0	0.0	0.5
	No. of Species Recorded		**9**	**0**	**0**	**0**	**3**	**17**

Butterfly			Nov 2023	Dec 2023	Jan 2024	Feb 2024	Mar 2024	Apr 2024
Blue-spotted Crow	*Euploea midamus midamus*	-	1.0	0.0	0.0	0.0	0.0	0.0
Great Egg-fly	*Hypolimnas bolina kezia*	-	3.0	0.0	0.0	0.0	1.0	1.0
Common Sailor	*Neptis hylas hylas*	-	2.0	0.0	0.0	0.0	0.0	0.5
Angled Castor	*Ariadne ariadne alterna*	-	0.0	V	0.0	0.0	1.0	0.0
Common Evening Brown	*Melanitis leda*	-	4.0	0.0	0.0	0.0	0.0	0.0
Common Palmfly	*Elymnias hypermnestra hainana*	-	0.0	0.0	0.0	0.0	0.0	0.5
Dark Brand Bush Brown	*Mycalesis mineus mineus*	-	17.0	0.0	0.0	0.0	1.0	3.0
Pale Grass Blue	*Pseudozizeeria maha serica*	-	10.0	0.0	0.0	0.0	17.0	9.5
Lesser Grass Blue	*Zizina otis*	-	0.0	0.0	0.0	0.0	V	0.0
Common Hedge Blue	*Acytolepis puspa*	-	0.0	0.0	0.0	0.0	0.0	1.0
Plains Cupid	*Chilades pandava*	-	1.0	0.0	0.0	0.0	0.0	0.0
Painted Jezebel	*Delias hyparete*	-	1.0	0.0	0.0	0.0	0.0	0.0
Red-base Jezebel	*Delias pasithoe pasithoe*	-	12.0	0.0	0.0	0.0	10.0	1.5
Small Cabbage White	*Pieris rapae crucivora*	-	0.0	V	0.0	0.0	3.0	1.0
Three-spot Grass Yellow	*Eurema blanda hylama*	-	1.0	0.0	0.0	0.0	1.0	0.0
Common Bluebottle	*Graphium sarpedon sarpedon*	-	1.0	0.0	0.0	0.0	1.0	0.5
Tailed Jay	*Graphium agamemnon agamemnon*	-	1.0	0.0	0.0	0.0	0.0	0.0
Common Mormon	*Papilio polytes polytes*	-	4.0	0.0	0.0	0.0	0.0	1.0
Common Awl	*Hasora badra badra*	LC	0.0	V	0.0	0.0	0.0	0.0
Paintbrush Swift	*Baoris farri*	-	0.0	0.0	0.0	0.0	0.0	0.5
Common Straight Swift	*Parnara guttata*	-	1.0	0.0	0.0	0.0	0.0	0.5
No. of Species Recorded			**14**	**3**	**0**	**0**	**9**	**12**

(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 at WRA
V indicates the species is recorded outside regular surveys

Chart C4: Number of Common Dragonfly Species and Dragonfly Species Only Found in the WRA or Survey Area (Excluding the WRA) During the Reporting Period

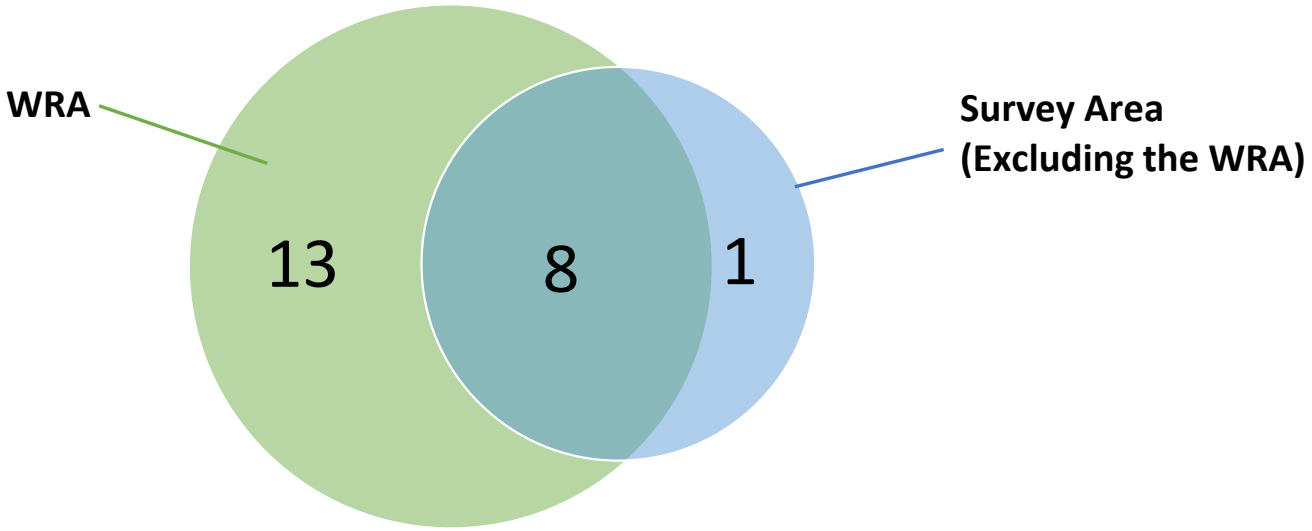


Species Only Found in the WRA	
Yellow Featherlegs	Red-faced Skimmer
Common Flangetail	Green Skimmer
Blue Dasher	Evening Skimmer
Crimson Darter	Saddlebag Glider
Pied Percher	
9	

Common Species Found in Both the WRA and Survey Area (Excluding the WRA)	
Wandering Midget	Russet Percher
Orange-tailed Sprite	Wandering Glider
Common Bluetail	Pied Skimmer
Asian Pintail	Variegated Flutterer
Asian Amberwing	
9	

Species Only Found in the Survey Area (Excluding the WRA)
Coastal Glider
1

Chart C5: Number of Common Butterfly Species and Butterfly Species Only Found in the WRA or Survey Area (Excluding the WRA) During the Reporting Period



Species Only Found in the WRA	
Blue-spotted Crow	Paintbrush Swift
Great Egg-fly	Common Straight Swift
Common Evening Brown	
Common Palmfly	
Lesser Grass Blue	
Plains Cupid	
Painted Jezebel	
Three-spot Grass Yellow	
Common Bluebottle	
Tailed Jay	
Common Awl	
13	

Common Species Found in Both the WRA and Survey Area (Excluding the WRA)
Common Sailor
Angled Castor
Dark Brand Bush Brown
Pale Grass Blue
Common Hedge Blue
Red-base Jezebel
Small Cabbage White
Common Mormon
8

Species Only Found in the Survey Area (Excluding the WRA)
Common Grass Yellow
1

D. Summary of Water Quality Monitoring

Table D1. Water quality at WRA

Nov 2023

Cell No.	Temp. (°C)	pH	Salinity (ppt)	Turb. (NTU)	DO (mg/L)	Water Level (7 Nov) (cm)	Water Level (28 Nov) (cm)
1	21.1	7.1	0.3	11.1	8.1	180	170
2	20.6	7.8	0.3	6.4	8.8	170	160
3	21/5	7.9	0.3	9.0	8.8	215	210
4	21.6	7.8	0.3	2.2	7.0	210	200

Dec 2023

Cell No.	Temp. (°C)	pH	Salinity (ppt)	Turb. (NTU)	DO (mg/L)	Water Level (cm) (12 Dec)	Water Level (cm) (29 Dec)
1	17.3	7.9	0.4	8.9	6.0	165	160
2	16.3	7.8	0.4	6.2	8.2	155	150
3	16.7	7.9	0.4	8.3	8.1	195	180
4	17.8	7.8	0.3	3.3	7.0	190	175

Jan 2024

Cell No.	Temp. (°C)	pH	Salinity (ppt)	Turb. (NTU)	DO (mg/L)	Water Level (cm) (16 Jan)	Water Level (cm) (30 Jan)
1	21.6	7.9	0.4	46.8	7.7	150	**145**
2	20.5	7.8	0.4	17.2	8.0	**135**	**130**
3	20.9	7.9	0.4	34.7	7.4	185	175
4	20.5	7.9	0.3	3.2	6.8	160	160

Feb 2024

Cell No.	Temp. (°C)	pH	Salinity (ppt)	Turb. (NTU)	DO (mg/L)	Water Level (cm) (9 Feb)	Water Level (cm) (27 Feb)
1	23.5	7.9	0.2	109.9	7.9	**140**	**140**
2	23.1	7.8	0.2	90.6	7.4	**130**	**120**
3	23.3	7.9	0.2	17.6	6.7	175	165
4	23.2	7.9	0.2	4.0	6.5	160	**135**

Mar 2024

Cell No.	Temp. (°C)	pH	Salinity (ppt)	Turb. (NTU)	DO (mg/L)	Water Level (cm) (5 Mar)	Water Level (cm) (26 Mar)
1	24.2	7.6	0.2	82.5	9.7	**135**	**135**
2	24.0	7.8	0.2	63.4	9.8	**120**	**115**
3	24.3	7.9	0.2	122.8	9.4	165	160
4	24.2	7.5	0.2	15.2	6.9	**120**	**135**

Apr 2024

Cell No.	Temp. (°C)	pH	Salinity (ppt)	Turb. (NTU)	DO (mg/L)	Water Level (cm) (9 Apr)	Water Level (cm) (30 Apr)
1	29.2	7.3	0.2	44.0	8.6	**135**	**160**
2	29.9	6.8	0.2	37.9	10.1	**115**	**145**
3	29.5	7.4	0.3	16.8	6.8	160	185
4	29.9	7.0	0.2	2.3	7.2	**120**	160

Action / Limit Level	Temp. (°C)	pH	Salinity (ppt)	Turb. (NTU)	DO (mg/L)	Water Level (cm)
Action Level	-	<6.5 or >8.0	>2	-	<2	<150 or >250
Limit Level	-	<6.0 or >8.5	>5	-	<1	-

Notes: Values highlighted in **bold** indicate that action level is reached; whereas values in **bold and underlined** indicate that limit level is reached
Additional water level monitoring was conducted

Table D2. Water quality monitoring (Laboratory Testing) at WRA

Apr 2024

Monitoring Location	Ammonia-N (mg/L)	NOx-N (mg/L)	Total P (mg/L)	Reactive P (mg/L)	BOD (mg/L)
Cell 1-1	0.19	<0.01	0.44	<0.01	20.0
Cell 1-2	0.25	0.02	0.43	<0.01	19.0
Cell 1-3	0.23	0.03	0.42	<0.01	20.0
Cell 2-1	0.26	0.03	0.36	0.02	24.0
Cell 2-2	0.18	0.03	0.36	<0.01	29.0
Cell 2-3	0.19	0.03	0.37	<0.01	30.0
Cell 3-1	0.08	0.02	0.05	0.02	<2.0
Cell 3-2	0.08	0.02	0.04	0.02	<2.0
Cell 3-3	0.08	0.02	0.04	0.02	<2.0
Cell 4-1	0.86	0.08	0.15	<0.01	8.0
Cell 4-2	0.91	0.06	0.14	<0.01	8.0
Cell 4-3	0.78	0.08	0.14	<0.01	9.0
Action Level	>3	>5	>5	-	-
Limit Level	>6	>10	>10	-	-

Note: Values highlighted in **bold** indicate that action level is reached; whereas values in **bold and underlined** indicate that limit level is reached.
The additional water samples for ex-situ laboratory analysis were collected on 17 April 2024.