Planning Application For

Proposed Public Utility Installation (Solar Photovoltaic System) in "Conservation Area" and "Residential (Group C)" Zone, Lot 3018 S.A in D.D. 104, Mai Po, Yuen Long

Ecological Impact Assessment Report

December 2025

Ecosystems Limited

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1. INTRODUCTION

1.1 Background

1.1.1 This Ecological Impact Assessment ("EcoIA") is prepared to apply the planning permission to use the Site for proposed public utility installations (solar photovoltaic system).

1.1.2 The Application Site falls into an area designated as "Conservation Area" ("CA") according to the approved OZP No. S/YL-MP/8. According to the Notes of the OZP for the "CA" zone, 'public utility installation' is under Column 2 use which requires planning permission from the Town Planning Board.

1.1.3 This report provided the ecological baseline results recorded from February 2024 to January 2025 and potential ecological impact assessment on the proposed Master Layout Plan. The Application Site falls within the Wetland Buffer Area and Conservation Area, other recognized sites of conservation importance in the proximity of the 500m Study Area around the Application Site include the Wetland Conservation Area and the other designated Conservation Areas. The potential ecological impacts on the recognized and the wetland habitats adjacent to the Application Site are evaluated, and the corresponding mitigation measures are recommended.

1.2 Application Site and Study Area

1.2.1 The Application Site mainly includes two ponds surrounded by residential area i.e. Palm Springs and Royal Palms. It falls within an area mainly zoned "Conservation Area" ("CA") (about 98%) with a minor portion (about 2%) zoned "residential (Group C)"("R(C)") on the Mai Po and Fairview Park Outline Zoning Plan (OZP) NO. S/YL-MP/8. The Study Area for this Ecological Impact Assessment covers the area within 500m from the Application Site boundary and the areas likely to be affected by the proposed development (**Figure 1**).

1.2.2 The history and condition of the Application Site indicate that the ponds have been idle and inactive, with no aquaculture activity since 1990. From the year 2000 onwards, the water level in both ponds gradually decreased, leading to overgrowth of weedy plants such as *Bidens alba* and *Brachiaria mutica*. As the ponds were not actively managed as fishponds, resulting in a lack of pond drain down practices which attract waterbirds to forage. The lack of management in the ponds with overgrowth of weedy plants indicates a degrading habitat, due to the blockage of sunlight reaching the water as well as decomposition of dead plants which consumes oxygen in the waters. Hence, the water quality was deteriorated and no longer favourable for aquatic life. In addition, the overgrown ponds could not provide an open water habitat for waterbirds that recorded in the vicinity (e.g. ardeids, waders etc.). In 2021, the ponds were nearly dried out.

1.2.3 To facilitate the proposed use of the solar photovoltaic system, management on these ponds has been conducted since 2023, as the presence of dense plants would interfere with installation and impair the operation of the solar photovoltaic system, the weedy

plants were hence removed, and the ponds were filled with waters which aimed to lift up the proposed solar panels, and to limit the growth of terrestrial weedy plants. The ponds were hence restored from degrading/dried out to managed ponds to facilitate the proposed application.

2. APPROACH AND METHODOLOGY

2.1 Legislation, Standards and Guidelines

2.1.1 The HKSAR ordinances and regulations that are relevant to ecology include the following:

- Forests and Countryside Ordinance (Cap. 96) and its subsidiary legislation, the Forestry Regulations (Cap. 96A);
- Town Planning Ordinance (Cap. 131);
- Wild Animals Protection Ordinance (Cap. 170);
- Environmental Impact Assessment Ordinance (Cap. 499) and the associated Technical Memorandum on Environmental Impact Assessment Process; and
- The Protection of Endangered Species of Animals and Plants Ordinance (Cap. 586) and its subsidiary legislation.

2.1.2 The present EcoIA also made reference to the following guidelines and standards as well as international conventions:

- Hong Kong Planning Standards and Guidelines (HKPSG) Chapter 10, "Conservation";
- EIAO Guidance Note No. 6/2010 - Some Observations on Ecological Assessment from the Environmental Impact Assessment Ordinance Perspective;
- EIAO Guidance Note No. 7/2023 – Ecological Baseline Survey for Ecological Assessment; and
- EIAO Guidance Note No. 10/2023 – Methodologies for Terrestrial and Freshwater Ecological Baseline Surveys.

2.1.3 The ecological baseline evaluation refers to the following Mainland legislations:

- List of State Protected Wild Animals, promulgated by the State Council 國家重點保護野生動物名錄;
- List of State Protected Wild Plants, promulgated by the State Council 國家重點保護野生植物名錄;

2.1.4 International conventions and guidelines that are relevant to this study include the following:

- **Convention on International Trade in Endangered Species of Wild Fauna and Flora ("CITES").** This Convention regulates international trade in animal and plant species considered to be at risk from such trade. The main categories of species relevant to Hong Kong are Appendices I and II. Species listed in Appendix I are species threatened with extinction that are or may be affected by trade; species listed in Appendix II are those that, while not necessarily under current threat of extinction, may become threatened unless trade is subject to strict regulation. Hong Kong's obligations under this Convention are

enforced via the Protection of Endangered Species of Animals and Plants Ordinance.

- **The International Union for Conservation of Nature (IUCN) Red List of Threatened Species.** IUCN established the IUCN Red List of Threatened Species™, which has since evolved into the world's most comprehensive data source on the global extinction risk of species. The IUCN Red List is considered the authoritative publication to classify species into nine groups, but only CR, EN and VU are considered as Threatened Category:
  - Extinct (EX) - No individuals remaining;
  - Extinct in the Wild (EW) - Known only to survive in captivity, or as a naturalized population outside its historic range;
  - Critically Endangered (CR) - Extremely high risk of extinction in the wild;
  - Endangered (EN) - Very high risk of extinction in the wild;
  - Vulnerable (VU) - High risk of extinction in the wild;
  - Near Threatened (NT) - Likely to become endangered in the near future;
  - Least Concern (LC) - Lowest risk. Does not qualify for a higher risk category.
  - Data Deficient (DD) - Knowledge of the species is inadequate to enable assessment its risk of extinction; and
  - Not Evaluated (NE) - Species not yet evaluated against the criteria.

2.2 Criteria of Evaluating Species of Conservation importance

2.2.1 Species listed under local legislation and international conventions for conservation of flora and fauna will be given special attention. In accordance with Table 3, Annex 8 of the EIAO-TM, the ecological value of species should be assessed in terms of protection status, species distribution, and rarity. For fauna species, criteria relating to these three aspects were considered, such as being protected under Cap. 170 (except birds and the species listed under the ordinance are exotic or regarded as common / widely distributed), Cap. 586, and/or regional/global legislations/conventions (i.e. the protection status), whether they are endemic species (i.e. species distribution and being considered rare or restricted and highlighted in publications such as Fellowes *et al.* (2002)) (i.e. rarity). References were also made to those protected by law in China. Flora species are considered of conservation importance when it is protected/listed under the regional/global legislations/conventions (e.g. listed under Protection of Endangered Species of Animals and Plants Ordinance (Cap. 586); Forestry Regulations (Cap. 96A); Category I or II protected species in mainland China; listed by IUCN (2024) or CITES), and concerned due to species distribution and rarity (e.g. considered rare by Agriculture, Fisheries and Conservation Department (AFCD) (2003, 2007); Xing *et al.* (2000); Wu and Lee (2000); or Siu (2000). However, this excludes exotic weeds, escaped cultivars or captive species, vagrants and introduced species which have lower ecological value. Species which are classified by IUCN as Near Threatened (NT), Least Concern (LC), Data Deficient (DD), or Not Evaluated

(NE), and not covered by any other laws/regulations/conventions are not considered of conservation importance. In short, flora or fauna species protected by the following conventions and/or endemic to Hong Kong were considered to be species of conservation importance:

- The International Union for Conservation of Nature and Natural Resources (IUCN) Red List of Threatened Species;
- China Plant Red Data Book;
- China Species Red List;
- China Red Data Book of Endangered Animals;
- Category I or II protected species in mainland China;
- Threatened Species List of China's Higher Plants (Qin *et al.* 2017);
- Red List of China's Vertebrates;
- The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES);
- Forestry Regulations (Cap. 96A) which are subsidiary legislation of the Forests and Countryside Ordinance (Cap. 96);
- Wild Animals Protection Ordinance (Cap. 170) (except mammals and birds as all wild mammals and birds are protected under the ordinance but their conservation importance is not equal);
- Protection of Endangered Species of Animals and Plants Ordinance (Cap. 586);
- PRC Wild Animal Protection Law;
- Plant species considered 'Rare' or 'Very Rare' listed by Corlett *et al.* (2000), or regarded as rare by Yip *et al.* (2010) where applicable; and
- Fauna species considered of concern in Fellowes *et al.* (2002).

2.2.2 The species identified as having conservation importance will be further categorised in accordance with their relevance to potential impacts, which will be assessed in accordance with the EIAO-TM criteria.

2.3 Key ecological issues

2.3.1 Key ecological issues identified include the following:

- Conservation area (CA)
- Wetland Conservation Area (WCA)
- Wetland Buffer Area (WBA)

2.4 Review of Existing Information

2.4.1 Literature review was conducted to characterize the existing conditions within the Study Area and to identify important habitats and species of conservation importance

in the area. The literature included Government and private sector reports, independent and Government published literature, academic studies, vegetation maps and land use maps.

2.4.2 Reviewed information included, but not be limited to the following:

- AFCD publications and website
- Annual reports and other publications of The Hong Kong Bird Watching Society
- Hong Kong Biodiversity – Newsletter of the Department of Agriculture, Fisheries and Conservation
- Methodologies for monitoring fireflies in Hong Kong (Yiu Vor 2020)
- Porcupine! – Newsletter of Division of Ecology & Biodiversity of University of Hong Kong
- The Terrestrial Biodiversity Survey conducted by HKU
- Relevant EIA reports including AEIAR-120/2008 - Proposed Comprehensive Development at Wo Shang Wai, Yuen Long; AEIAR-189/2015 - Comprehensive Development and Wetland Protection near Yau Mei San Tsuen.; and AEIAR-261/2024 - San Tin / Lok Ma Chau Development Node.

2.5 Ecological Survey Methodology

2.5.1 The baseline ecological survey programme covered a 12-month duration from February 2024 to January 2025 including dry and wet seasons. The ecological surveys covered but were not limited to flora, fauna and any other habitats/species of conservation importance. The ecological surveys have covered different habitats according to the results after ground-truthing. Detailed methodology is stated below.

Habitat and Vegetation

2.5.2 Habitats within the Study Area were mapped based on the latest government aerial photos and database combined with field ground-truthing. Representative areas of each habitat type were surveyed on foot. Plant species of each habitat type encountered and their relative abundance were recorded with special attention to species of conservation importance. Vegetation survey was conducted by direct observation. A plant list was produced, and the dominant plant species were reported as such information is a useful indication of habitat quality. Identification of flora species and status in Hong Kong made reference to Xing *et al.* (2000), Hu *et al.* (2003), Lai *et al.* (2008), Hong Kong Herbarium (2022), and Hong Kong Herbarium and South China Botanical Gardens (2007; 2008; 2009; 2011).

Terrestrial Mammal

2.5.3 Mammal surveys (including day and night-time surveys) were carried out in representative habitats within the Study Area along the transects (Figure 2). In accordance with EIAO Guidance Note No. 10/2023, as mammals in Hong Kong which are of conservation importance are mostly secretive and nocturnal, all sightings, tracks, and signs of mammals (including droppings) were actively searched within the representative habitats of the Study Area. Night surveys were conducted to survey nocturnal mammal species (e.g., bats). As it is a common practice to conserve bat

roost as direct impact on bat roost would affect the species population, attention was paid to bat roost location. Active search was carried out in the potential roosting locations (e.g. cave, mine, tunnel, abandoned buildings, palm trees etc.). Ultrasonic bat detector was used for locating and identifying bats after sunset. Camera traps were installed to survey the cryptic mammals at representative locations within the Application Site. Nomenclature for mammals follows that available from the Hong Kong Biodiversity Information Hub.

Avifauna

2.5.4 The avifauna of representative habitats within the Study Area were surveyed in the active period of bird activities (i.e. early morning and dusk) using transect count method (Figure 2). The presence and abundance of avifauna species at various habitats observed or heard from survey transects were recorded. Behaviours relating to roosting (including night roosting sites, if any), breeding (e.g., nest building) and feeding observed during the surveys were recorded. Night surveys were also conducted to record nocturnal avifauna (e.g., owls). The location(s) of any encountered avifauna species of conservation importance were recorded, along with any notable behaviours. Ornithological nomenclature in this study follows the latest Hong Kong Bird Watching Society List of Hong Kong Birds.

Herpetofauna

2.5.5 Herpetofauna surveys (including day and night survey) were carried out and covered representative habitats within the Study Area along the transect (Figure 2). Particular attention was given to streams/watercourses or other water bodies. Herpetofauna surveys were conducted through direct observation and active searching in all potential hiding places such as among leaf litter, inside holes, under stones and logs within the Study Area. During the surveys, all reptiles and amphibians sighted and heard were recorded. Nocturnal auditory detection of species-specific calls was used to survey frogs and toads during night surveys. The nomenclature follows that available from the Hong Kong Biodiversity Information Hub.

Butterfly and Odonate

2.5.6 Butterfly and Odonate surveys were conducted by transect survey (Figure 2) during daytime and under fine weather when most butterflies and dragonflies are active. All encountered dragonflies and butterflies were recorded by species by direct observation with binoculars and their abundance will be recorded. The nomenclature follows that available from the Hong Kong Biodiversity Information Hub.

Firefly

2.5.7 Firefly surveys were conducted between April 2024 to June 2024 and October 2024 to December 2024. The survey was conducted by transect survey (Figure 2). The firefly survey was conducted at dusk, day-time and night-time. During the survey, any firefly observed was identified to the species level, where possible. The abundance and distribution of fireflies were recorded.

Freshwater fish and invertebrates

2.5.8 Surveys of freshwater communities were undertaken at streams/watercourses and other water bodies (either natural or man-made) within the Study Area by direct observation during day-time and night-time. All freshwater fauna found were

identified to the lowest practicable taxonomic level and their abundance was recorded. The nomenclature for fish follows that available from the Hong Kong Biodiversity Information Hub.

2.6 Ecological Survey Programme

2.6.1 The survey programme is presented in **Table 2.1**.

Table 2.1 Ecological Survey Programme

Year	2024											2025
Month	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan
Season	Dry		Wet							Dry		
Habitat and Vegetation	D		D							D		
Mammal Survey	D, Du&N	D, Du&N	D, Du&N	D, Du&	D, Du&	D, Du&	D, Du&	D, Du&	D, Du&	D, Du&	D, Du&	D, Du&
Bird Survey	EM, Du&N	EM, Du&N	EM, Du&N	EM, Du&N	EM, Du&N	EM, Du&N	EM, Du&N	EM, Du&N	EM, Du&N	EM, Du&N	EM, Du&N	EM, Du&N
Butterfly	-	D	D	D	D	D	D	D	D	D	-	-
Odonate	-	-	D	D	D	D	D	D	D	-	-	-
Reptiles	-	-	D&N	D&N	D&N	D&N	D&N	D&N	D&N	-	-	-
Amphibians	-	D&N	D&N	D&N	D&N	D&N	D&N	D&N	D&N	-	-	-
Firefly	-	-	D, Du &N	D, Du &N	D, Du &N	-	-	-	D, Du &N	D, Du &N	D, Du &N	-
Freshwater fish and invertebrates	-	D&N	D&N	D&N	D&N	D&N	D&N	D&N	D&N	D&N	-	-

Notes:
1. Abbreviations: EM = Early Morning-survey; D = Day-time survey; Du = Dusk-time survey; N= Night-time survey.
2. Fauna observed (i.e., daytime and/or night-time) beyond their active period in other surveys will also be recorded.

3. RESULTS OF LITERATURE REVIEW

3.1 Recognized Sites of Conservation Importance

3.1.1 Although the Application Site is surrounded by residential area, there are several recognized sites of conservation importance within or in the vicinity of the Application Site Boundary and Study Area. The locations of the recognized sites of conservation importance are shown in **Figure 1**.

Conservation Area (CA)

3.1.2 The Application Site falls within an area mainly zoned "Conservation Area" ("CA") according to the Outline Zoning Plan (OZP) No. S/YL-MP/8 (Figure 1), the CA zone

comprises ponds between Palm Springs and Ryal Palms which is to conserve the ecological value of wetland and fish ponds which form an integral part of the wetland ecosystem in the Deep Bay Area.

Wetland Conservation Area (WCA)

3.1.3 The WCA The Wetland Conservation Area (WCA) was designated by Town Planning Board (TPB) to conserve the ecological value of the fish ponds in the Deep Bay wetland ecosystem (TPB Guideline No. 12B). The WCA comprises existing active and abandoned fish ponds within the Deep Bay wetland system continuous with the Mai Po Inner Deep Bay Ramsar Site, while the aim is to conserve the ecological value and functions of the fish ponds as an integral part of the system. Except for permitted essential conservation or infrastructural works, no development involving pond-filling or other works detrimental to the ecological function of the wetland are allowed within the WCA. All essential works conducted within the WCA should comply with the "No-Net-Loss in Wetland" principle. The Application Site is over 100m from the WCA.

Wetland Buffer Area (WBA)

3.1.4 The WBA is a buffer zone of approximately 500 m width along the landward boundary of the Wetland Conservation Area (WCA). The planning intention is to protect the ecological integrity of wetland habitats within the WCA (TPB Guideline No. 12C). Any works within the WBA causing negative impacts on the ecological value of the WCA should be avoided unless appropriate mitigation measures are implemented. However, residential or recreational development may be allowed with appropriate conditions where undesirable open storage area is removed, and wetlands are restored. Again, such development should satisfy the "No-Net-Loss in Wetland" principle. The Application Site is within the WBA.

3.2 Species of Conservation Importance

3.2.1 In this study, only those species of conservation importance, which have been previously documented in the vicinity of the present Study Area (specifically within a 500-meter radius) are subject to review due to their potential susceptibility to the impacts of the proposed works. Two Environmental Impact Assessment (EIA) reports are particularly pertinent to the current project: 1) AEIAR-120/2008, which pertains to the Proposed Comprehensive Development at Wo Shang Wai, Yuen Long, and 2) AEIAR-189/2015, which addresses Comprehensive Development and Wetland Protection in the vicinity of Yau Mei San Tsuen. The study periods of both EIAs were 12 months.

Flora

3.2.2 Pursuant to AEIAR-189/2015, a total of 49 plant species were identified, and according to AEIAR-120/2008, 66 plant species were recorded. None of these species are classified as conservation importance; all are deemed common and prevalent across the region. Referring to AEIAR-261/2024, only a portion of the Assessment Area overlaps with this application including the habitats of the develop area,

modified watercourse and plantation, no flora species of conservation are recorded within the Study Area.

Fauna

3.2.3 AEIAR-120/2008 indicates that among the 5 mammal species observed, Ryukyu Mouse *Mus caroli* and Japanese Pipistrelle *Pipistrellus abramus* are considered as conservation importance. The study identified 73 avifaunal species, with 27 of them being of conservation importance. Additionally, 3 reptilian and 5 amphibian species were recorded but none are considered as species of conservation importance. A total of 21 butterfly species recorded, only the Danaid Egg-fly *Hypolimnas misippus* is considered as species of conservation importance. 19 odonate species were observed, with the Scarlet Basker *Urothemis signata* being the sole species of conservation importance.

3.2.4 AEIAR-189/2015 reports that two bat species, the Short-nosed Fruit Bat *Cynopterus sphinx* and the Japanese Pipistrelle *Pipistrellus abramus*, roost at Palm Springs. The study recorded 95 avifaunal species, of which 35 are recognized for their conservation importance. Among the six reptilian species observed, only the Many-banded Krait *Bungarus multicinctus multicinctus* is classified as species of conservation importance. The study also recorded nine amphibian species, but none of them are considered as species of conservation importance. Furthermore, 38 butterfly species were noted, with two species including the Plain Hedge Blue *Celastrina lavendularis* and the Danaid Egg-fly *Hypolimnas misippus*, identified as species of conservation importance. 25 odonate species were recorded, including two of conservation importance i.e. the Coastal Glider *Macrodiplax cora* and the Scarlet Basker *Urothemis signata*.

3.2.5 Referring to AEIAR-261/2024, only a portion of the Assessment Area overlaps with this application including the habitats of the develop area, modified watercourse and plantation. No fauna species of conservation importance recorded in AEIAR-261/2024 falls into the Study Area of this application.

3.2.6 All species of conservation importance identified in previous EIAs are concisely summarized and enumerated in **Table 3.1**.

Table 3.1 List of fauna species of conservation importance recorded within and in the vicinity of the present Study Area from reviewed literature

Common Names	Rarity and Distribution in Hong Kong [1]	Conservation status [2,3,4,5,6,7]	Location	Source
Mammal				
Ryukyu Mouse *Mus caroli*	Rare. Found only in Mai Po and Hong Kong Wetland Park.	AFCD Assessment: Rare	Within the Study Area in previous study	MOTT CONNELL LTD (2008).
Short-nosed Fruit Bat *Cynopterus sphinx*	Very common. Very widely distributed in urban and countryside areas throughout Hong Kong.	Cap. 170	Roosting at Palm Springs	ENVIRON HONG KONG LTD (2015)

Common Names	Rarity and Distribution in Hong Kong [1]	Conservation status [2,3,4,5,6,7]	Location	Source
Japanese Pipistrelle *Pipistrellus abramus*	Very common. Widely distributed throughout Hong Kong.	Cap. 170	Roosting at Palm Springs	ENVIRON HONG KONG LTD (2015)
Bird (Remark: all wild bird species are protected under Cap. 170 Wild Animals Protection Ordinance in Hong Kong 2)				
Eurasian Wigeon *Mareca penelope*	Winter visitor. Found in Deep Bay area, Tai Lam Chung.	Fellowes *et al.* (2002): RC	Pond within the Study Area in previous study	MOTT CONNELL LTD (2008).
Northern Shoveler *Spatula clypeata*	Abundant winter visitor. Found in Deep Bay area.	Fellowes *et al.* (2002): RC	Pond within the Study Area in previous study	MOTT CONNELL LTD (2008) ENVIRON HONG KONG LTD (2015)
Northern Pintail *Anas acuta*	Abundant winter visitor. Found in Deep Bay area, Shuen Wan, Long Valley, Kam Tin.	Fellowes *et al.* (2002): RC	Pond within the Study Area in previous study	MOTT CONNELL LTD (2008)
Eurasian Teal *Anas crecca*	Common winter visitor. Found in Deep Bay area, Shuen Wan, Tai Lam Chung Reservoir, Victoria Harbour, urban parks.	Fellowes *et al.* (2002): RC	Pond within the Study Area in previous study	MOTT CONNELL LTD (2008) ENVIRON HONG KONG LTD (2015)
Little Grebe *Tachybaptus ruficollis*	Common resident. Found in Deep Bay area.	Fellowes *et al.* (2002): LC	Pond within the Study Area in previous study	MOTT CONNELL LTD (2008) ENVIRON HONG KONG LTD (2015)
Black-faced Spoonbill *Platalea minor*	Common winter visitor. Found in Deep Bay area.	IUCN Red List: EN; Fellowes et al. (2002): PGC; List of Wild Animals under State Priority Conservation: Class I; Red List of China's Vertebrates: EN	Pond within the Study Area in previous study	MOTT CONNELL LTD (2008)
Yellow Bittern *Ixobrychus sinensis*	Uncommon summer visitor and common passage migrant. Found in Deep Bay area, Chek Keng, Tai Long Wan.	Fellowes *et al.* (2002): (LC)	Pond within the Study Area in previous study	ENVIRON HONG KONG LTD (2015)
Cinnamon Bittern *Ixobrychus cinnamomeus*	Uncommon passage migrant and scarce summer visitor. Found in Deep Bay area, Long Valley, Tai Yuen (Sheung Shui), Pui O.	Fellowes *et al.* (2002): LC	Pond within the Study Area in previous study	ENVIRON HONG KONG LTD (2015)
Black-crowned Night Heron *Nycticorax nycticorax*	Common resident and migrant. Widely distributed in Hong Kong.	Fellowes *et al.* (2002): LC	Agricultural land and Pond within the Study Area in previous study	MOTT CONNELL LTD (2008) ENVIRON HONG KONG LTD (2015)
Striated Heron *Butorides striata*	Common summer visitor. Widely distributed in Hong Kong.	Fellowes *et al.* (2002): LC	Pond within the Study Area in previous study	MOTT CONNELL LTD (2008) ENVIRON HONG KONG LTD (2015)
Chinese Pond Heron *Ardeola bacchus*	Common resident. Widely distributed in Hong Kong.	Fellowes *et al.* (2002): PRC	Agricultural land and Pond within the Study Area in previous study	MOTT CONNELL LTD (2008) ENVIRON HONG KONG LTD (2015)

Common Names	Rarity and Distribution in Hong Kong [1]	Conservation status [2,3,4,5,6,7]	Location	Source
Eastern Cattle Egret *Bubulcus coromandus*	Resident and common passage migrant. Widely distributed in Hong Kong.	Fellowes *et al.* (2002): LC	Pond within the Study Area in previous study	MOTT CONNELL LTD (2008)
Grey Heron *Ardea cinerea*	Common winter visitor. Found in Deep Bay area, Starling Inlet, Kowloon Park, Cape D'Aguilar.	Fellowes *et al.* (2002): PRC	Pond within the Study Area in previous study	MOTT CONNELL LTD (2008) ENVIRON HONG KONG LTD (2015)
Purple Heron *Ardea purpurea*	Uncommon passage migrant. Found in Deep Bay area.	Fellowes *et al.* (2002): RC	Pond within the Study Area in previous study	ENVIRON HONG KONG LTD (2015)
Great Egret *Ardea alba*	Common resident, migrant and winter visitor. Widely distributed in Hong Kong.	Fellowes *et al.* (2002): PRC	Agricultural land and Pond within the Study Area in previous study	MOTT CONNELL LTD (2008) ENVIRON HONG KONG LTD (2015)
Intermediate Egret *Ardea intermedia*	Resident and passage migrant. Found in Deep Bay area, Tai Long Wan, Starling Inlet, Tai O, Cape D'Aguilar.	Fellowes *et al.* (2002): RC	Agricultural land and Pond within the Study Area in previous study	MOTT CONNELL LTD (2008) ENVIRON HONG KONG LTD (2015)
Little Egret *Egretta garzetta*	Common resident, migrant and winter visitor. Widely distributed in coastal area throughout Hong Kong.	Fellowes *et al.* (2002): PRC	Agricultural land and Pond within the Study Area in previous study	MOTT CONNELL LTD (2008) ENVIRON HONG KONG LTD (2015)
Great Cormorant *Phalacrocorax carbo*	Common winter visitor. Widely distributed in coastal areas throughout Hong Kong.	Fellowes *et al.* (2002): PRC	Pond within the Study Area in previous study	MOTT CONNELL LTD (2008) ENVIRON HONG KONG LTD (2015)
Western Osprey *Pandion haliaetus*	Common winter visitor. Widely distributed in coastal areas throughout Hong Kong	Fellowes *et al.* (2002): RC; Cap. 586; List of Wild Animals under State Priority Conservation: Class II; CITES: Appendix II	Pond within the Study Area in previous study	MOTT CONNELL LTD (2008).
Black Kite *Milvus migrans*	Common resident and winter visitor. Widely distributed in Hong Kong.	Fellowes *et al.* (2002): (RC); Cap. 586; List of Wild Animals under State Priority Conservation: Class II; CITES: Appendix II	Developed Area, Pond and Modified Watercourse within the Study Area in previous study	MOTT CONNELL LTD (2008) ENVIRON HONG KONG LTD (2015)
White-bellied Sea Eagle *Haliaeetus leucogaster*	Locally common resident. Widely distributed in coastal areas throughout Hong Kong.	Fellowes *et al.* (2002): (RC); Cap. 586; List of Wild Animals under State Priority Conservation: Class I; CITES: Appendix II	Pond within the Study Area in previous study	MOTT CONNELL LTD (2008)
Eastern Buzzard *Buteo japonicus*	Common winter visitor. Widely distributed in Hong Kong.	Cap. 586; List of Wild Animals under State Priority Conservation: Class II; CITES: Appendix II	Pond within the Study Area in previous study	ENVIRON HONG KONG LTD (2015)

Common Names	Rarity and Distribution in Hong Kong [1]	Conservation status [2,3,4,5,6,7]	Location	Source
Black-winged Stilt *Himantopus himantopus*	Common migrant and wintor visitor. Found in Deep Bay area, Long Valley, Kam Tin.	Fellowes *et al.* (2002): RC	Pond within the Study Area in previous study	ENVIRON HONG KONG LTD (2015)
Little Ringed Plover *Charadrius dubius*	Resident, common winter visitor and passage migrant. Widely distributed in freshwater areas throughout Hong Kong.	Fellowes *et al.* (2002): (LC)	Pond within the Study Area in previous study	MOTT CONNELL LTD (2008) ENVIRON HONG KONG LTD (2015)
Greater Painted-snipe *Rostratula benghalensis*	Locally common resident. Found in Ha Tsuen, Lok Ma Chau, Kam Tin, Long Valley, Hong Kong Wetland Park.	Fellowes *et al.* (2002): LC	Agricultural land and Pond within the Study Area in previous study	ENVIRON HONG KONG LTD (2015)
Swinhoe's Snipe *Gallinago megala*	Uncommon passage migrant. Found in Long Valley.	Fellowes *et al.* (2002): LC	Agricultural land within the Study Area in previous study	ENVIRON HONG KONG LTD (2015)
Common Greenshank *Tringa nebularia*	Abundant passage migrant and winter visitor. Found in Deep Bay area.	Fellowes *et al.* (2002): RC	Pond within the Study Area in previous study	ENVIRON HONG KONG LTD (2015)
Wood Sandpiper *Tringa glareola*	Common migrant and winter visitor. Widely distributed in wetland area throughout Hong Kong.	Fellowes *et al.* (2002): LC	Agricultural land within the Study Area in previous study	ENVIRON HONG KONG LTD (2015)
Oriental Pratincole *Glareola maldivarum*	Passage migrant. Found in Mai Po, Tsim Bei Tsui.	Fellowes *et al.* (2002): LC	Pond within the Study Area in previous study	MOTT CONNELL LTD (2008)
Black-headed Gull *Chroicocephalus ridibundus*	Abundant winter visitor. Found in Deep Bay area and costal waters.	Fellowes *et al.* (2002): PRC	Pond within the Study Area in previous study	MOTT CONNELL LTD (2008)
Pacific Swift *Apus pacificus*	Uncommon spring migrant and summer visitor. Mainly found in Deep Bay area and islands.	Fellowes *et al.* (2002): (LC)	Pond within the Study Area in previous study	MOTT CONNELL LTD (2008)
White-throated Kingfisher *Halcyon smyrnensis*	Common resident. Widely distributed in coastal areas throughout Hong Kong	Fellowes *et al.* (2002): (LC); List of Wild Animals under State Priority Conservation: Class II	Agricultural land and Pond within the Study Area in previous study	MOTT CONNELL LTD (2008) ENVIRON HONG KONG LTD (2015)
Pied Kingfisher *Ceryle rudis*	Common resident. Widely distributed in lakes and ponds throughout Hong Kong.	Fellowes *et al.* (2002): (LC)	Pond within the Study Area in previous study	MOTT CONNELL LTD (2008) ENVIRON HONG KONG LTD (2015)
Collared Crow *Corvus torquatus*	Locally common resident. Found in Inner Deep Bay area, Nam Chung, Kei Ling Ha, Tai Mei Tuk, Pok Fu Lam, Chek lap Kok, Shuen Wan, Lam Tsuen.	IUCN Red List: VU; Fellowes *et al.* (2002): LC	Developed Area and Pond within the Study Area in previous study	MOTT CONNELL LTD (2008) ENVIRON HONG KONG LTD (2015)

Common Names	Rarity and Distribution in Hong Kong [1]	Conservation status [2,3,4,5,6,7]	Location	Source
Chinese Penduline Tit *Remiz consobrinus*	Common autumn migrant and winter visitor. Found in Deep Bay area, Tai O , Mui Wo, Long Valley, Luk Keng, Chek Lap Kok.	Fellowes *et al.* (2002): RC	Pond within the Study Area in previous study	ENVIRON HONG KONG LTD (2015)
Pallas's Grasshopper Warbler *Helopsaltes certhiola*	Common autumn passage migrant. Found in wetland areas throughout Hong Kong.	Fellowes *et al.* (2002): LC	Pond within the Study Area in previous study	ENVIRON HONG KONG LTD (2015)
Zitting Cisticola *Cisticola juncidis*	Common passage migrant and winter visitor. Widely distributed in grassland throughout Hong Kong.	Fellowes *et al.* (2002): LC	Agricultural land within the Study Area in previous study	MOTT CONNELL LTD (2008) ENVIRON HONG KONG LTD (2015)
Red-billed Starling *Spodiopsar sericeus*	Abundant winter visitor. Widely distributed in Hong Kong.	Fellowes *et al.* (2002): GC	Agricultural land and Pond within the Study Area in previous study	MOTT CONNELL LTD (2008) ENVIRON HONG KONG LTD (2015)
White-cheeked Starling *Spodiopsar cineraceus*	Locally common winter visitor. Found in Deep Bay area, Kam Tin, Long Valley.	Fellowes *et al.* (2002): PRC	Within the Study Area in previous study	ENVIRON HONG KONG LTD (2015)
Daurian Starling *Agropsar sturninus*	Uncommon autumn passage migrant. Found in Mai Po, Long Valley, Kam Tin, Lam Tsuen, Tolo Harbour area, Kowloon Park, Mui Wo, Ho Chung.	Fellowes *et al.* (2002): LC	Agricultural land and Pond within the Study Area in previous study	ENVIRON HONG KONG LTD (2015)
White-shouldered Starling *Sturnia sinensis*	Locally common passage migrant and uncommon winter visitor. Found in Kam Tin, Deep Bay area, Po Toi Island, Long Valley, Victoria Park, Ho Chung, Ma Tso Lung, Mui Wo, Lam Tsuen Valley.	Fellowes *et al.* (2002): (LC)	Agricultural land and Pond within the Study Area in previous study	MOTT CONNELL LTD (2008) ENVIRON HONG KONG LTD (2015)
Bluethroat *Luscinia svecica*	Locally common winter visitor. Widely distributed in wet agricultural areas throughout Hong Kong.	Fellowes *et al.* (2002): LC; List of Wild Animals under State Priority Conservation: Class II	Agricultural land within the Study Area in previous study	ENVIRON HONG KONG LTD (2015)
Red-throated Pipit *Anthus cervinus*	Common passage migrant and winter visitor. Widely distributed in dry agricutural areas throughout Hong Kong.	Fellowes *et al.* (2002): LC	Agricultural land within the Study Area in previous study	ENVIRON HONG KONG LTD (2015)
Butterfly				
Plain Hedge Blue *Celastrina lavendularis*	Very rare. Chuen Lung, Kap Lung, Tai Po Kau, Shing Mun Country Park, Tai Lam Country Park, Kadoorie Farm and Botanic Garden, Ngau Ngak Shan.	Fellowes *et al.* (2002): LC	Agricultural land within the Study Area in previous study	ENVIRON HONG KONG LTD (2015)
Danaid Egg-fly *Hypolimnas misippus*	Uncommon. Ngau Ngak Shan, Lung Kwu Tan, Hong Kong Wetland Park, Mount Parker, Cloudy Hill, Lin Ma Hang	Fellowes *et al.* (2002): LC	Agricultural land, Pond and Modified Watercourse within the Study Area in previous study	MOTT CONNELL LTD (2008) ENVIRON HONG KONG LTD (2015)
Odonate				

Common Names	Rarity and Distribution in Hong Kong [1]	Conservation status [2,3,4,5,6,7]	Location	Source
Coastal Glider *Macrodiplax cora*	Common. Frequents marshes and ponds with dense vegetation, especially adjacent to coastal areas.	Fellowes *et al.* (2002): LC	Agricultural land within the Study Area in previous study	ENVIRON HONG KONG LTD (2015)
Scarlet Basker *Urothemis signata*	Common. Common in areas with abandoned fish ponds throughout Hong Kong.	Fellowes *et al.* (2002): LC	Pond within the Study Area in previous study	MOTT CONNELL LTD (2008) ENVIRON HONG KONG LTD (2015)

Notes

1. Agriculture, Fisheries and Conservation Department (2024). Species Database of the Hong Kong Biodiversity Information Hub
2. Cap. 170 Wild Animals Protection Ordinance
3. Cap. 586 Protection of Endangered Species of Animals and Plants Ordinance.
4. Fellowes *et al.* (2002). Wild animals to watch: Terrestrial and freshwater fauna of conservation concern in Hong Kong.
   - For conservation status listed by Fellowes *et al.* (2002), letters in parentheses indicate that the assessment is on the basis of restrictedness in breeding and/or roosting sites rather than in general occurrence.
5. IUCN Red List of Threatened Species(2024). The International Union for Conservation of Nature's Red List of Threatened Species (IUCN) Red List Version 2024.
6. Jiang, Z. G., Jiang, J. P., Wang, Y. Z., Zhang, E., Zhang, Y. Y., Li, L. L., ... & Dong, L. (2016). Red list of China's vertebrates.
7. List of State Protected Wild Animals, promulgated by the State Council

Abbreviations:

Conservation Status in Fellowes *et al.* (2002): GC: Global Concern; LC = Local Concern; PGC = Potential Global Concern; PRC = Potential Regional Concern; RC = Regional Concern

4. RESULTS OF ECOLOGICAL SURVEY

4.1 Habitat

4.1.1 There were six habitats identified within the Study Area, namely agricultural land, developed area, overgrown pond, plantation, pond and modified watercourse (**Figure 3**). Pond and developed area were the habitats found within the Application Site. A habitat map based on recent aerial photographs and detailed ground-truthing is given in **Figure 3**. Representative photos of the habitats are shown in **Figure 4**. The area of each habitat was calculated, and these are presented in **Table 4.1**.

Table 4.1 Habitat Size within the Study Area

Habitat	Area Size (ha)		
	Application Site	Study Area	Total Study Area
Agricultural Land	-	11.02 ha	11.02 ha
Developed Area (Other Urban Area)	0.11	65.78 ha	65.89 ha
Modified Watercourse	-	0.16 ha	0.16 ha
Overgrown Pond (Artificial Pond)	-	3.02 ha	3.02 ha
Plantation (Green Urban Area)	-	3.57 ha	3.57 ha
Pond (Artificial Pond)	0.21 ha	9.32ha	9.52 ha
Total	0.32 ha	92.86 ha	93.18 ha

4.1.2 **Agricultural land** – Agricultural lands within the Study Area have scattered distribution mainly at the southern and eastern parts of the Study Area. Most of the agricultural lands were abandoned, which farming practice has been terminated and leaving a bare ground with wet in nature. Thus, hydrophilic species, such as *Brachiaria mutica*, *Colocasia esculenta* and *Cyclosorus interruptus*, were commonly found. Weedy climbers *Ipomoea cairica* and *Mikania micrantha* were also prominent. While the remaining agricultural land was under active farming practice that fruit trees, such as *Dimocarpus longan* and *Musa x paradisiaca* were the major vegetation found there.

4.1.3 **Developed Area (Other Urban Area)** – Developed Area within the Application Site was the pond bund nearby the two ponds within the Application Site. Some fruit trees such as *Litchi chinensis, Musa* x *paradisiaca* and *Artocarpus heterophyllus* could be found at the western part of the developed area within Application Site, while the eastern part was colonized by weedy species, such as *Echinochloa colona*, *Mikania micrantha* and *Ipomoea cairica*. Developed area within the Study Area consisted of villages, residential areas, roads, and other anthropogenic structures in general. The residential area, the Palm Springs, contribute most of the developed area and located at the center of the Study Area. This habitat was largely paved with concrete and was prone to human disturbance. Vegetation colonizing in this habitat mainly consisted of plantation/ornamental species such as *Ficus microcarpa*, *Livistona chinensis*, *Melaleuca cajuputi subsp. Cumingiana* and *Calliandra haematocephala*.

4.1.4 **Modified watercourse** – A section of modified watercourse was identified at the eastern part of the Study Area. The modified watercourse associated with developed area inside the Study Area. The beds and banks of the watercourse were modified and generally composed of boulders and stones. Associating with the village and urbanized areas, this section of watercourse was prone to human disturbance, and exotic species, such as *Ipomoea cairica* and *Ludwigia erecta*, were commonly found.

4.1.5 **Overgrown pond (Artificial Pond)** – This habitat had been active fishpond in the past according to aerial photos. However, it is currently abandoned with overgrown vegetation and lentic waterbodies with surface water extensively covered with both weedy and aquatic species, such as *Phragmites australis*, *Mikania micrantha* and *Ipomoea cairica*, and obviously without fish farming practice. They mainly scattered at the western and central part of the Study Area.

4.1.6 **Plantation (Green Urban Area)** – Plantation within the Study Area was mainly in form of roadside and hillside plantation. Trees found in this habitat were mainly landscape/plantation species such as *Eucalyptus citriodora*, *Acacia confusa* and *Ficus microcarpa* and pioneer tree species such as *Macaranga tanarius var. tomentosa*. Whilst the understorey was rather bare or with simple structure and was covered weedy species in the like of *Arachis duranensis, Bidens alba* and *Lindernia antipoda*.

4.1.7 **Pond (Artificial Pond)** – In order to facilitate the proposed solar photovoltaic system, ponds within the Application Site were transformed from overgrown ponds to ponds with management. Only a few aquatic species, such as *Lemna minor, Eichhornia crassipes*, were found with low abundance inside the waterbodies. Some hydrophilic and/or weedy species were also found along the pond bund but submerged or on top of the water surface, such as *Commelina diffusa, Echinochloa colona* and *Mikania micrantha*. While ponds within the Study Area but outside Application Site were scattered among the developed area inside the Study Area. The ponds were actively managed by fish farmer, thus, only a few aquatic species, such as *Typha angustifolia* and *Phragmites australis*, and weedy species, such as *Mikania micrantha* and *Ipomoea cairica*, were recorded at the pond and pond bunds respectively.

4.2 Vegetation

4.2.1 A total of 152 plant species were recorded within the Study Area, among which 70 and 82 are known to be native and exotic to Hong Kong respectively (**Appendix A).** *Ceratopteris thalictroides* are the only flora species of conservation importance recorded within the Study Area. Locations of these species of conservation importance within the Study Area are shown in **Figure 3**.

4.2.2 During the initial dry season vegetation survey, one individual of *Ceratopteris thalictroides* was identified in the pond within the Application Site. However, during the subsequent wet and dry season, this individual could no longer be recorded within the Application Site. *Ceratopteris thalictroides* is a rare fern found in wetlands and is listed as vulnerable in China by the book Rare and Precious Plants of Hong Kong. Furthermore, wild individuals of *Ceratopteris thalictroides* are scheduled under State protection (category II).

4.2.3 *Araucaria heterophylla* is listed as Vulnerable by IUCN (2023), however, it is exotic, and the recorded individual was cultivated. Thus, they are not considered as species of conservation.

4.2.4 *Citrus reticulata* is exotic to Hong Kong and not considered of conservation importance, despite being listed under Category II in the List of Wild Plants under State Protection.

4.2.5 *Dimocarpus longan* and *Lichi chinensis* are exotic to Hong Kong and not considered of conservation importance, despite being listed as Vulnerable by IUCN (2023), listed as endangered or vulnerable in Threatened Species List of China's Higher Plants, listed as vulnerable in China Plant Red Data Book, and/or listed under Category II in the List of Wild Plants under State Protection.

4.2.6 *Dalbergia* spp. are listed under Appendix II of CITES and protected under Cap. 586 Protection of Endangered Species of Animals and Plants Ordinance in Hong Kong as species in this genus is facing threat due to the overexploitation for its valuable wood (known as rosewood). In the current study, *Dalbergia benthamii* was recorded. As the recorded Dalbergia are climber which is not relevant to the timber exploitation. In addition, the species are considered 'common' in Hong Kong by Corlett *et al.* (2000). Thus, they are not considered as species of conservation importance in the current Study.

4.2.7 *Cyperus odoratus*, *Typha angustifolia* and *Coccinia grandis* are regarded as rare by Corlett *et al.* (2000), yet they are exotic or cultivated. They are not considered as species of conservation importance.

4.3 Fauna

Mammal

4.3.1 A total of 3 mammal species (except bats) were recorded within the Study Area (as detailed in **Appendix B**). None of the recorded species are of conservation importance, all recorded mammal species are common and widespread in Hong Kong.

Mammal - Bat species

4.3.2 Echolocation calls recorded by bat detector (Wildlife Acoustics – Echo Meter Touch 2 PRO) were analyzed. 3 bat species were identified within the Study Area in total (**Appendix C**). Bat species recorded within the Study Area include Chinese Noctule *Nyctalus plancyi*, Japanese Pipistrelle *Pipistrellus abramus* and Least Pipistrelle *Pipistrellus tenuis*. Only 1 very common and widely distributed bat species i.e. Japanese Pipistrelle *Pipistrellus abramus* was identified within the Application Site. All bat species are protected under Cap. 170. Chinese Noctule *Nyctalus plancyi* is listed as Potential Regional Concern (PRC) by Fellowes *et al.* 2002. No bat roost was recorded within the Application Site as well as the Study Area during the survey period.

Avifauna

4.3.3 A total of 52 bird species were recorded within the Study Area (as detailed in **Appendix D**). Among these, 16 species were species of conservation importance

(summarized in **Table 4.8**). Most of the bird species of conservation importance were observed in the Agricultural Land and Pond outside the Application Site. Due to the small area size and surrounding nature (surrounded by residential area) of the Application Site, very low diversity and abundance of waterbirds were recorded, and no dabbling waterbirds (e.g. ducks and grebe) were recorded. Striated Heron *Butorides striata* and Chinese Pond Heron *Ardeola bacchus* were recorded on Pond bund within Application Site, they are species of conservation importance recorded specifically within the Application Site, but the abundance was very low. Additionally, the majority of the recorded bird species are common and widely distributed throughout Hong Kong. Owing to the maneuverability and large home range of birds as well as the abundance of those of conservation importance, these species are not spatially pinpointed on map. List of bird species of conservation importance recorded within the Assessment Area is presented in **Table 4.8** and **Appendix D**.

Odonates and Butterflies

4.3.4 29 butterfly species were recorded within the Study Area, only Danaid Eggfly *Hypolimnas misippus* are of conservation importance (**Appendix E** and **Table 4.8**). The recorded butterfly species are common and widespread in Hong Kong. Most of the butterfly species were recorded in Agricultural Land habitats within the Study Area.

4.3.5 17 odonate species were recorded within the Assessment, none of which are of conservation importance (**Appendix F**). The recorded odonate species are common and widespread in Hong Kong. Most of the odonate species were recorded in Pond within the Study Area.

Herpetofauna

4.3.6 4 species of reptile were recorded within the Study Area, none of which are of conservation importance (**Appendix G**). The recorded reptile species are common and widespread in Hong Kong. Most of the reptile species were recorded in the Developed Area within the Study Area.

4.3.7 6 species of amphibian were recorded within the Study Area, none of which are of conservation importance (**Appendix H**). The recorded amphibian species are common and widespread in Hong Kong. Most of the amphibian species were recorded in the Developed Area and Pond within the Study Area.

Aquatic Fauna

4.3.8 4 aquatic fauna species were recorded within the Study Area, none of which are of conservation importance (**Appendix I**).

Firefly

4.3.9 None of the firefly species was recorded.

4.4 Evaluation of Habitats and Species of Conservation Importance

4.4.1 The ecological value of the habitats within the Study Area as well as the Application Site was evaluated in accordance with the criteria stipulated in Annex 8 of TM-EIAO. Although the locations of those species of conservation importance recorded in the reviewed literature were not specified in the respective literature, those species were also considered when evaluating the ecological value of the habitats (**Table 4.2** to **4.8**). While the bat species recorded in the present study are highly mobile without showing prominent habitat utilization, and therefore bat species recorded are not specially assigned to specific habitats due to the detection range of the bat detector. All bat species identified by recordings from acoustic bat detector were evaluated in **Table 4.10**.

4.4.2 In accordance with Table 3, Annex 8 of the TM-EIAO, the ecological value of species recorded within the Study Area was assessed in terms of protection status (e.g. fauna protected under WAPO (except birds), and flora and fauna protected under regional/global legislation/conventions), species distribution (e.g. endemic), and rarity (e.g. rare or restricted). Flora and fauna species of conservation importance recorded within the 500m Study Area were evaluated according to the TM-EIAO in **Table 4.9** and **Table 4.10**.

Table 4.2 Evaluation of the Application Site

Criterion	**Description**	
	Developed Area (Other Urban Area)	**Pond (Artificial Pond)**
Naturalness	Man-made	Man-made
Size (ha)	0.11 ha within Application Site	0.21 ha within Application Site
Diversity	Low plant species diversity. Very low faunal diversity within Application Site	Low plant species diversity. Low faunal diversity within Application Site
Rarity	No species of conservation importance was recorded during the ecological survey	1 flora species of conservation importance: *Ceratopteris thalictroides* was recorded during the initial dry season vegetation survey. However, during the subsequent wet and dry seasons, this individual could no longer be recorded within Application Site. 2 bird species of conservation importance: Striated Heron and Chinese Pond Heron
Re-creatability	Readily re-created	Readily re-created
Fragmentation	None observed	Ponds within Application Site are isolated by the development area of Palm Springs.

Criterion	Description	
	Developed Area (Other Urban Area)	**Pond (Artificial Pond)**
Ecological linkage	No significant linkages with other habitats of ecological importance	The ecological linkage of the habitats is established with the vicinity habitats pond and overgrown pond. However, this linkage is severed from the wetland near the Deep Bay area due to the development of Palm Springs.
Potential value	Very low potential value, given the intensive and incessant anthropogenic disturbance	Value would be improved if managed for wildlife.
Nursery/ breeding ground	No significant nursery or breeding ground known or observed during the ecological surveys.	Provide suitable nursery/breeding habitats for bird, herpetofauna and Odonate species, but no significant recorded during ecological survey.
Age	Ecologically non-applicable	Unknown. Aerial photo revealed that in the last decade the ponds within the Study Area maintained with water coverage.
Abundance/ richness of wildlife	Low abundance and diversity of wildlife relatively to area size	Low abundance and diversity of wildlife
Overall ecological value	Very low	Low

Table 4.3 Evaluation of Agricultural Land within Study Area

Criterion	Description
	Agricultural Land
Naturalness	Man-made
Size (ha)	11.02 ha in total
Diversity	Low to medium plant species diversity Low fauna diversity.
Rarity	No flora species of conservation importance was recorded during the ecological survey 5 bird of conservation importance: Intermediate Egret, Little Egret, Common Greenshank, Greater Coucal and Collared Crow
Re-creatability	Readily re-created
Fragmentation	No significant fragmentation
Ecological linkage	Linkages with other high-value habitats in Deep Bay area for those remaining active and within / closer to WCA, but not significant for those dry/overgrown, or outside WCA and isolated by developed area.
Potential value	Value would be improved if farming is resumed or managed for wildlife.
Nursery/ breeding ground	Provide suitable nursery/breeding habitats for bird and herpetofauna species.
Age	Unknown
Abundance/ richness of wildlife	Low to medium
Overall ecological value	Low to medium

Table 4.4 Evaluation of Developed Area (Other Urban Area) within Study Area

Criterion	Description
	Developed Area (Other Urban Area)
Naturalness	Entirely man-made
Size (ha)	65.89 ha in total
Diversity	Low to medium flora diversity. Low fauna diversity.
Rarity	No species of conservation importance was recorded during the ecological survey
Re-creatability	Readily re-created
Fragmentation	None observed
Ecological linkage	No significant linkages with other habitats of ecological importance
Potential value	Very low potential value, given the intensive and incessant anthropogenic disturbance
Nursery/ breeding ground	No significant nursery or breeding ground known or observed during the ecological surveys.
Age	Ecologically non-applicable
Abundance/ richness of wildlife	Low abundance and diversity of wildlife relatively to area size
Overall ecological value	Very low

Table 4.5 Evaluation of Modified Watercourse within Study Area

Criterion	Description
	Modified Watercourse
Naturalness	Originated from modified streams or man-made channels serving the watercourse during channelize
Size (ha)	0.16 ha in total
Diversity	Low flora diversity. Low fauna diversity.
Rarity	No flora species of conservation importance was recorded during the ecological survey 1 bird of conservation importance: Little Egret
Re-creatability	Readily re-created
Fragmentation	Highly fragmented by developed area
Ecological linkage	No significant linkages with habitats of ecological significance
Potential value	Limited potential due to the disturbance of roadside.
Nursery/ breeding ground	No significant nursery or breeding ground was discovered during survey period.
Age	Unknown. Likely to have been modified following infrastructure/channelization works
Abundance/ richness of wildlife	Very low abundance and diversity of wildlife
Overall ecological value	Very low

Table 4.6 Evaluation of Overgrown Pond (Artificial Pond) within Study Area

Criterion	Description
	Overgrown Pond (Artificial Pond)
Naturalness	Mostly man-made origin.
Size (ha)	3.02 ha in total
Diversity	Low plant species diversity.

Criterion	Description
	Overgrown Pond (Artificial Pond)
	Low fauna diversity
Rarity	No flora species of conservation importance was recorded during the ecological survey 4 bird species of conservation importance: Black-crowned Night Heron, Chinese Pond Heron, Little Egret and Greater Coucal 1 butterfly species of conservation importance: Danaid Eggfly
Re-creatability	Readily re-created
Fragmentation	No significant fragmentation
Ecological linkage	Linkages with other high-value habitats in Deep Bay area for those remaining active and within / closer to WCA, but not significant for those dry/overgrown, or outside WCA and isolated by developed area.
Potential value	Value would be improved if farming is resumed or managed for wildlife.
Nursery/ breeding ground	No significant record but may provide suitable nursery/breeding habitats for bird, herpetofauna and Odonate species.
Age	Unknown. Aerial photo revealed that in the last decade the ponds within the Study Area maintained with water coverage.
Abundance/ richness of wildlife	Low
Overall ecological value	Low

Table 4.7 Evaluation of Plantation (Green Urban Area) within Study Area

Criterion	Description
	Plantation (Green Urban Area)
Naturalness	Planted for amenity and visual purposes, most were in proximity of Developed Area. Dominated by exotic species.
Size (ha)	3.57 ha in total
Diversity	Low to medium flora diversity. Low fauna diversity.
Rarity	No species of conservation importance was recorded during the ecological survey
Re-creatability	Readily re-created
Fragmentation	Roadside plantations are highly fragmented by developed area
Ecological linkage	No significant linkages with habitats of ecological significance
Potential value	Limited potential due to disturbance and high proportion of exotic species.
Nursery/ breeding ground	No significant nursery or breeding ground known
Age	At least 30 years, likely to have been planted following infrastructure works
Abundance/ richness of wildlife	Low abundance and diversity of species, comprise mainly widespread and disturbance tolerant species
Overall ecological value	Low

Table 4.8 Evaluation of Pond (Artificial Pond) within Study Area

Criterion	Description
	Pond (Artificial Pond)
Naturalness	Man-made

Criterion	Description
	Pond (Artificial Pond)
Size (ha)	9.52 ha in total
Diversity	Low plant species diversity Low to medium fauna diversity.
Rarity	No flora species of conservation importance was recorded during the ecological survey 14 bird species of conservation importance: Little Grebe, Black-crowned Night Heron, Chinese Pond Heron, Grey Heron, Intermediate Egret, Great Egret, Little Egret, Black-winged Stilt, Little Ringed Plover, Greater Painted-snipe, Spotted Redshank, Wood Sandpiper, Greater Coucal and Collared Crow
Re-creatability	Readily re-created
Fragmentation	No significant fragmentation within Study Area.
Ecological linkage	Linkages with other high-value habitats in Deep Bay area for those remaining active and within / closer to WCA, but not significant for those dry/overgrown, or outside WCA and isolated by developed area.
Potential value	Value would be improved if managed for wildlife.
Nursery/ breeding ground	Provide suitable nursery/breeding habitats for bird, herpetofauna and Odonate species.
Age	Unknown. Aerial photo revealed that in the last decade the ponds within the Study Area maintained with water coverage.
Abundance/ richness of wildlife	Low to medium
Overall ecological value	Low to medium

Table 4.9 Evaluation of Flora Species of Conservation Importance

Species Names [1,2]	Rarity and Distribution in Hong Kong [2]	Conservation status [2,3,4]	Location
Flora			
Ceratopteris thalictroides	Rare Wetlands	Rare and Precious Plants of Hong Kong (Vulnerable in China); Wild plant under State protection (category II)	Pond within Application Site *(Only found in dry season vegetation survey)

Notes:
1. Agriculture, Fisheries and Conservation Department (2022). Hong Kong Herbarium.
2. Corlett *et al*. (2000). Hong Kong vascular plants: distribution and status.
3. Hu *et al.* (2003). Rare and Precious Plants of Hong Kong.
4. State Forestry Administration & Ministry of Agriculture. (2021). List of Wild Plants under State Protection.

Table 4.10 Evaluation of Fauna Species of Conservation Importance

Species Names [1]	Rarity and Distribution in Hong Kong [1]	Conservation status [3,4,5,6,7,8]	Location
Mammal (Remark: all wild bat species are protected under Cap. 170 Wild Animals Protection Ordinance in Hong Kong) [2]			
Chinese Noctule *Nyctalus plancyi*	Common. Fairly widely distributed in countryside areas throughout Hong Kong.	Fellowes *et al*. (2002): PRC	Recorded within Study Area but outside Application Site by Bat Detector
Avifauna (Remark: all wild bird species are protected under Cap. 170 Wild Animals Protection Ordinance in Hong Kong) [2]			

Little Grebe *Tachybaptus ruficollis*	Common resident. Found in Deep Bay area.	Fellowes *et al.* (2002): LC	Pond outside Application Site but within Study Area
Black-crowned Night Heron *Nycticorax nycticorax*	Common resident and migrant. Widely distributed in Hong Kong.	Fellowes *et al.* (2002): LC	Overgrown Pond and Pond outside Application Site but within Study Area
Striated Heron *Butorides striata*	Common summer visitor. Widely distributed in Hong Kong.	Fellowes *et al.* (2002): LC	Pond within Application Site
Chinese Pond Heron *Ardeola bacchus*	Common resident. Widely distributed in Hong Kong.	Fellowes *et al.* (2002): PRC	Pond within Application Site; Overgrown Pond and Pond within Study Area
Grey Heron *Ardea cinerea*	Common winter visitor. Found in Deep Bay area, Starling Inlet, Kowloon Park, Cape D'Aguilar.	Fellowes *et al.* (2002): PRC	Pond outside Application Site but within Study Area
Great Egret *Ardea alba*	Common resident, migrant and winter visitor. Widely distributed in Hong Kong.	Fellowes *et al.* (2002): PRC	Pond outside Application Site but within Study Area
Intermediate Egret *Ardea intermedia*	Resident and passage migrant. Found in Deep Bay area, Tai Long Wan, Starling Inlet, Tai O, Cape D'Aguilar.	Fellowes *et al.* (2002): RC	Agricultural Land and Pond outside Application Site but within Study Area
Little Egret *Egretta garzetta*	Common resident, migrant and winter visitor. Widely distributed in coastal area throughout Hong Kong.	Fellowes *et al.* (2002): PRC	Agricultural Land, Overgrown Pond, Pond and Modified Watercourse outside Application Site but within Study Area
Black-winged Stilt *Himantopus himantopus*	Common migrant and wintor visitor. Found in Deep Bay area, Long Valley, Kam Tin.	Fellowes *et al.* (2002): RC	Pond outside Application Site but within Study Area
Little Ringed Plover *Charadrius dubius*	Resident, common winter visitor and passage migrant. Widely distributed in freshwater areas throughout Hong Kong.	Fellowes *et al.* (2002): (LC)	Pond outside Application Site but within Study Area
Greater Painted-snipe *Rostratula benghalensis*	Locally common resident. Found in Ha Tsuen, Lok Ma Chau, Kam Tin, Long Valley, Hong Kong Wetland Park.	China Red Data Book Status: VU; Fellowes *et al.* (2002): LC	Pond outside Application Site but within Study Area
Spotted Redshank *Tringa erythropus*	Common spring passage migrant. Found in Deep Bay area.	Fellowes *et al.* (2002): RC	Pond outside Application Site but within Study Area
Common Greenshank *Tringa nebularia*	Abundant passage migrant and winter visitor. Found in Deep Bay area.	Fellowes *et al.* (2002): RC	Agricultural Land outside Application Site but within Study Area
Wood Sandpiper *Tringa glareola*	Common migrant and winter visitor. Widely distributed in wetland area throughout Hong Kong.	Fellowes *et al.* (2002): LC	Pond outside Application Site but within Study Area
Greater Coucal *Centropus sinensis*	Common resident. Widely distributed in Hong Kong.	China Red Data Book Status: VU; List of Wild Animals under State Priority Conservation: Class II	Agricultural Land, Overgrown Pond and Pond outside Application Site but within Study Area
Collared Crow *Corvus torquatus*	Locally common resident. Found in Inner Deep Bay area, Nam Chung, Kei Ling Ha, Tai Mei Tuk, Pok Fu Lam, Chek lap Kok, Shuen Wan, Lam Tsuen.	IUCN Red List: VU; Fellowes *et al.* (2002): LC	Agricultural Land and Pond outside Application Site but within Study Area
Butterfly			
Danaid Eggfly *Hypolimnas misippus*	Uncommon. Ngau Ngak Shan, Lung Kwu Tan, Hong Kong Wetland Park, Mount Parker, Cloudy Hill, Lin Ma Hang	Fellowes *et al.* (2002): LC	Overgrown Pond outside Application Site but within Study Area

Notes

1. Agriculture, Fisheries and Conservation Department (2024). Species Database of the Hong Kong Biodiversity Information Hub AFCD. Hong Kong Biodiversity Database.
2. Cap. 170 Wild Animals Protection Ordinance.
3. Convention on International Trade in Endangered Species of Wild Flora and Fauna. Appendices I, II and III.
4. Fellowes *et al.* (2002). Wild animals to watch: Terrestrial and freshwater fauna of conservation concern in Hong Kong.

- For conservation status listed by Fellowes *et al.* (2002), letters in parentheses indicate that the assessment is on the basis of

restrictedness in breeding and/or roosting sites rather than in general occurrence
5. International Union of Conservation for Nature. (2024). The IUCN Red List of Threatened Species. Version 2024.
6. Shek (2006). A Field Guide to the Terrestrial Mammals of Hong Kong
7. National Forestry and Grassland Administration and the Ministry of Agricultural and Rural Affairs. (2023). List of Wild Animals under State Priority Conservation
8. Yue and Chen (1998). China Red Data Book of Endangered Animals: Pisces.

Abbreviations:

- Conservation Status in Fellowes *et al.* (2002): LC = local concern, PRC = potential regional concern, RC = regional concern, GC = global concern; 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).

5. IMPACT IDENTIFICATION AND PREDICTION

5.1.1 The project elements of the present application include the following:

- Installation of floating solar photovoltaic system of about 0.067ha on top of the water bodies (31% of Pond surface within the Application Site), With the deduction of the gaps among solar panels, the actual area of pond surface occupied by the SPV system would be about 0.055 ha (about 26.4% of the pond surface).
- Installation of solar photovoltaic system on floating platforms which were already fixed on pond bund
- Connection of cables to the existing meter room (Total Gross Floor Area = 0.56m^2), wall-hanged meters and transformers on the pond bund

5.1.2 The potential impact associated with the proposed development includes:

- Occupation of water surface
- Disturbance impacts surrounding habitats and fauna during construction; and
- Disturbance impacts surrounding fauna, habitats and recognized sites of conservation importance during operation.

5.2 Construction Phase

Direct Impact

Habitat Loss

5.2.1 As mentioned in Section 1.2, the two ponds within the Application Site were degrading and nearly dried out with mainly weedy aquatic plants. The weedy plants were removed with floating platforms installed, and the ponds were then filled with waters to facilitate the proposed use of the solar photovoltaic system. Hence, a net wetland area (i.e. the ponds) of 0.21ha within the Application was restored.

5.2.2 In this application, among the 0.21ha of restored ponds, only 0.067 ha (representing 31% of pond surface within Application Site) of the pond's surface will be spared for the solar photovoltaic system. With the deduction of the gaps among solar panels, the actual area of pond surface occupied by the SPV system would be about 0.055 ha (about 26.4% of the pond surface). No water column or pond bed will be lost. The solar photovoltaic system will be mounted on floating platforms which have already been fixed on the pond bund; therefore, no dredging/pond filling will be required. As pond draining is not required for the proposed installation work, no temporary loss of the pond will occur. Unlike ground-mounted panels, this floating approach can minimize the disturbances to the existing habitat or ecosystem structure, as the existing water capacity within the ponds will be maintained. As the ponds within the Application Site were overgrown with weedy plants, which were not favorable to waterbirds such as ardeids and waders recorded in the vicinity of the Application Site. With the provision of weedy plant clearance and refilling with waters, positive impacts from the proposed works to wildlife are expected. Besides, as there is net increase of wetland habitat, no mitigation measures or compensation are considered necessary.

5.2.3 While the cable connection works will be conducted in the existing wall-hanged meter and transformers that are mounted on the concrete wall within the developed area of the Application Site. Due to the ecological value of the developed area is ranked as very low, the potential impacts to this habitat are considered **Insignificant**.

5.2.4 No mitigation measures or compensation are considered necessary for the proposed works. However, with the restoration of the ponds from degrading/dried ponds within the Application Site, a management protocol is formulated (**Appendix J**). The management protocol aims to maintain the site conditions and ensure the effective operation of the solar photovoltaic system as well as providing direction on pond management. For example, the management protocol recommends fish stocking in the ponds, which provide foraging and feeding opportunities for waterbirds.

Indirect Impact

Water Quality

5.2.5 The water quality of the ponds within the Application Site will be prone to disturbance by the works inside the ponds and surface runoff from land during construction phase. However, the ecological value of the ponds within the Application Site was ranked as **Low**. Due to the nature and scale of the works inside the Application Site, it is expected the impact from surface runoff would be transient, hence the potential impact due to surface runoff to the ponds are considered as **Minor**. To avoid contamination of water in the Application Site, the construction runoff and the water quality should be controlled by good site practice.

Construction Disturbance (Noise, Light, Dust and Other Human Activities)

5.2.6 The construction phase may indirectly influence habitats and associated fauna due to increased human disturbance. The noise and dust emanating from construction activities within the project boundary could temporarily curtail the wildlife's use of adjacent habitats. This is particularly applicable to birds and mammals, given their sensitivity to noise and light.

5.2.7 Most of the proposed structures are pre-casted with simple installation methods, and no night work is expected. The immediate surroundings of the Application Site comprise developed areas and overgrown pond. These habitats are deemed to possess **Low** ecological value. The potential impact on these habitats, including their associated wildlife and species of conservation importance, due to construction disturbances is considered **Negligible**. Even though there are ponds with **low to medium** ecological value located outside the Application Site, due to the scale and works nature of the proposed solar photovoltaic system, the potential impacts on the ponds are considered **Insignificant**. Indirect impacts arising from noise, dust, and other human activities can be further mitigated through the implementation of good site practices and other mitigation measures as proposed in **Section 6**.

5.3 Operational Phase

Direct Impact

Habitat Loss

5.3.1 During the operation phase, direct impacts within the Application Site would be the same as the construction phase. There will be no habitat loss during the operational phase. To maintain the site conditions and ensure the effective operation of the solar photovoltaic system and pond management, a management protocol is specified in **Appendix J**.

Impacts on wildlife

5.3.2 Open water habitats (ponds in this case) generally provide foraging/ feeding grounds for water-dependent bird species. However, very limited water-dependent bird species were recorded in pond habitat within the Application Site during the survey period. No anatids species (dabbling and diving ducks) or other waterbird species utilized the water surface within the Application Site. Apart from the Application Site, only three individuals of Garganey *Spatula querquedula* and one individual of Little Grebe *Tachybaptus ruficollis* were recorded within pond habitat outside Application Site but within Study Area. Though the Application Site is located within "CA" zone and Wetland Buffer Area, due to the scale and works nature of the proposed solar photovoltaic system as well as the diversity and abundance of wildlife in the vicinity, the potential impacts on the wildlife are considered **Insignificant**.

5.3.3 Furthermore, with reference to the San Tin Flood Protection Scheme from the Drainage Services Department, floating photovoltaic systems may provide resting places for birds (DSD, 2022). Given that the ponds within the Application Site were poorly managed with limited water capacity prior to the application, the restored ponds and the reintroduction of fish in the ponds could provide potential foraging and resting habitat for wildlife.

Indirect Impact

Impact due to Human Disturbance

5.3.4 Potential indirect impacts during the operational phase may include disturbances to wildlife and their habitats in the surrounding area due to increased human activity associated with the maintenance and management of the proposed facilities. However, the ponds within the Application Site are mainly operated for floating photovoltaic systems, maintenance works and human activities are expected to be limited compared with the typical operation of fish farms or fish ponds. Given that the maintenance of these facilities is expected to be occasional and transient, the indirect impacts on wildlife are deemed to be **Insignificant**. A management protocol with the aims to further minimize the potential impacts to wildlife is specified in **Appendix J**.

Operational Potential Impacts on Recognized Site of Conservation Importance and Species of Conservation Importance

5.3.5 Most of the Application Site is situated within the Conservation Area ("CA"), and the entire of the Application Site is located within WBA, while a substantial portion of the Study Area is encompassed by the Conservation Area ("CA"), Wetland Conservation Area (WCA), and Wetland Buffer Area (WBA). It is expected that the proposed works are small in scale and are not expected to compromise the Conservation Area ("CA"), Wetland Conservation Area (WCA), and Wetland Buffer Area (WBA). Given that the operational maintenance is expected to be occasional and small in scale and hence the ecological impact on the recognized sites of conservation importance during both the construction and operational phases is deemed to be **Insignificant**.

5.3.6 One individual of the *Ceratopteris thalictroides* was recorded within the pond area of the Application Site during the dry season vegetation survey, but no further observation was made during the subsequent survey. Hence, no direct impact on this species is anticipated. Nevertheless, as the primary installation tasks for the proposed application are planned to be executed within the pond surface, this floral species of conservation importance is not expected to be directly affected. Retainment of any *Ceratopteris thalictroides* individual observed is recommended during the construction and operational phase.

5.3.7 Only sparse records of Striated Heron *Butorides striata* and Chinese Pond Heron *Ardeola bacchus* were observed on Pond bund within the Application Site. However, due to the high mobility of the species and suitable habitats in the region, potential impacts to this two birds of conservation importance are considered **Minor**.

5.3.8 Besides the species of conservation importance recorded in the reviewed literature, one bat species, sixteen avifauna species and one butterfly species of conservation importance were identified within the Study Area. Among these, only the Chinese Pond Heron and Striated Heron are of conservation importance and were observed within the Application Site. The other species of conservation importance within the Study Area from the present study or reviewed literature might also pass over the Application Site, given the high mobility of birds and bats as well as other species of conservation importance recorded in the reviewed literature. On the other hand, they can readily relocate to similar or identical habitats nearby, and none of them demonstrated habitat fidelity. In addition, no bird and bat roots were recorded during the survey period, while the bat roosts recorded from the reviewed literature were at Palm Springs. Therefore, no direct impact is expected to be imposed on them, and the potential impacts during both the construction and operational phases are considered to be **Minor**.

6. MITIGATION OF ECOLOGICAL IMPACTS

6.1 General

6.1.1 Mitigation measures will follow the hierarchy detailed in Annex 16 of EIAO-TM, following the order of priority: avoidance, minimization and compensation. Wherever possible, on-site mitigation measures are preferred over off-site mitigations.

6.2 Avoidance

6.2.1 Floral species of conservation importance, if found, should be protected and retained in-situ as far as practicable. The location / design of the proposed installation works has been considered to avoid direct impact / removal of floral species of conservation importance. No removal of species of conservation importance and no tree felling are required under the latest design for this Project.

6.2.2 This application does not propose any night-time construction works, thereby avoiding noise and lighting disturbances to the fauna species recorded in the Conservation Area ("CA") and Wetland Buffer Area (WBA).

6.3 Minimization

6.3.1 The scale and footprint of the proposed implementation of the solar photovoltaic system have been minimized to reduce the associated impacts.

6.3.2 Major lighting sources should be directed inwards and downwards to reduce light disturbance. The intensity of the lighting, if required, should be controlled to the lowest possible level. Unnecessary lighting should be turned off outside working hours of the construction sites and only minimal lighting for safety and security purposes should be provided during the operation phase.

6.3.3 Bird-friendly measures should be taken when conducting the maintenance of solar photovoltaic system. For example, nests of wild birds should not be removed during maintenance and advice from the AFCD should be sought, if necessary. A management protocol with the aims to further minimize the potential impacts to wildlife is specified in **Appendix J**. This can be implemented during the regular site inspection / maintenance by the Contractor / the Engineer.

6.3.4 Mitigation measures for air, noise and water quality impacts shall be implemented properly to reduce the associated indirect ecological impacts.

6.3.5 Good site practice listed as follows should be implemented to minimize potential impacts due to noise, dust and runoff to the surrounding environment.

- Regular checking should be undertaken to ensure that the work site boundaries are not exceeded and that no damage occurs to surrounding areas;
- Implementation of dust control measures at all construction sites to minimize dust nuisance to adjacent wildlife habitats during construction activities;
- Implementation of noise control measures at all construction sites to reduce impacts of construction noise to wildlife habitats adjacent works areas;
- Implementation of mitigation measures specified in ProPECC PN 2/23 to control site runoff and drainage at all work sites during construction;
- Construction debris and spoil should be covered up and/ or properly disposed of as soon as possible to avoid being washed into nearby waterbodies by rain;
- Construction effluent, site run-off and sewage should be properly collected and/ or treated.

- Dusty materials remaining after a stockpile is removed should be wetted with water; and
- All dusty materials shall be sprayed with water prior to any loading, unloading or transfer operation so as to maintain the dusty material wet.

6.4 Residual Impact

6.4.1 With the implementation of the mitigation measures recommended, no adverse residual impact would be expected from construction and operation of the solar photovoltaic system.

6.5 Cumulative Impact

6.5.1 Cumulative impacts may occur when there are concurrent projects implemented in the vicinity of the present Project, either during construction phase or operational phase. The commonest potential cumulative impacts from concurrent projects mainly include habitat loss, disturbance during construction phase and disturbance during operation phase:

- AEIAR-120/2008 - Proposed Comprehensive Development at Wo Shang Wai
- AEIAR-261/2024 - San Tin / Lok Ma Chau Development Node

6.5.2 Regarding pond's surface occupied, as the present project footprint is located on a site dominated by **Low** value habitats which support **Very Low** diversity and abundance of wildlife, the loss of such habitat for the duration of the proposed development is not expected to attribute to the cumulative loss of ecological resources in the area.

6.6 Monitoring and Aduit Requirement

6.6.1 Weekly site audit will be conducted by the Engineer for checking the implementation of the proposed good site practice during construction phase. No specific ecological monitoring is required.

6.6.2 Pond habitat provides an important foraging ground for waterbird species in Hong Kong. However, without proper management, water depth may gradually decrease and lead to overgrowth by aquatic plant weeds. To facilitate the proposed solar photovoltaic system and to restore the existing pond habitat within the Application Site, pond management is therefore necessary to maintain the habitat condition and quality in order to support wildlife nearby. A Management Protocol has been prepared under **Appendix J** to specify the maintenance works during operational phase in order to propose detailed measures to further minimize the potential impacts to wildlife within the Application Site.

7. CONCLUSIONS

7.1.1 Information on the ecological baseline conditions of the Application Site was collected through literature review and surveys, and they were integrated into this EcoIA to support the technical aspect of the Application.

7.1.2 The Application Site mainly comprised of two ponds, but the two ponds were degrading and nearly dried out with mainly weedy aquatic plants before formulation of the present proposal. The ponds were hence restored from degrading/dried out to managed ponds to facilitate the proposed application. A net wetland area (i.e. the ponds) of 0.21ha within the Application Site was restored. Only 0.067 ha (representing 31% of pond surface within Application Site) of the pond's surface will be spared for the solar photovoltaic system. With the deduction of the gaps among solar panels, the actual area of pond surface occupied by the SPV system would be about 0.055 ha (about 26.4% of the pond surface). No water column or pond bed will be lost.

7.1.3 As a net increase of wetland area was induced from the proposed works, no mitigation measures or compensation are considered necessary for the proposed works. However, with the restoration of the ponds from degrading/dried ponds within the Application Site, a management protocol is formulated, which aims to maintain the site conditions and ensure the effective operation of the solar photovoltaic system as well as providing direction on pond management.

7.1.4 The planning application would satisfy the requirements listed in TPB PG-No. 12C i.e. no-net-loss in wetland area or function at any scale. The ponds within the Application Site were under poor condition prior to formulation of the present proposal, the restoration of the ponds improves the habitat quality which provide potential foraging habitat for birds and wildlife. This EcolA and management protocol (**Appendix J**) demonstrate that the proposed development would not have significant disturbance impacts to the surroundings habitats and any recognized site of conservation importance.

8. References

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Figure 1 Recognized Sites of Conservation Importance in vicinity to the Study Area

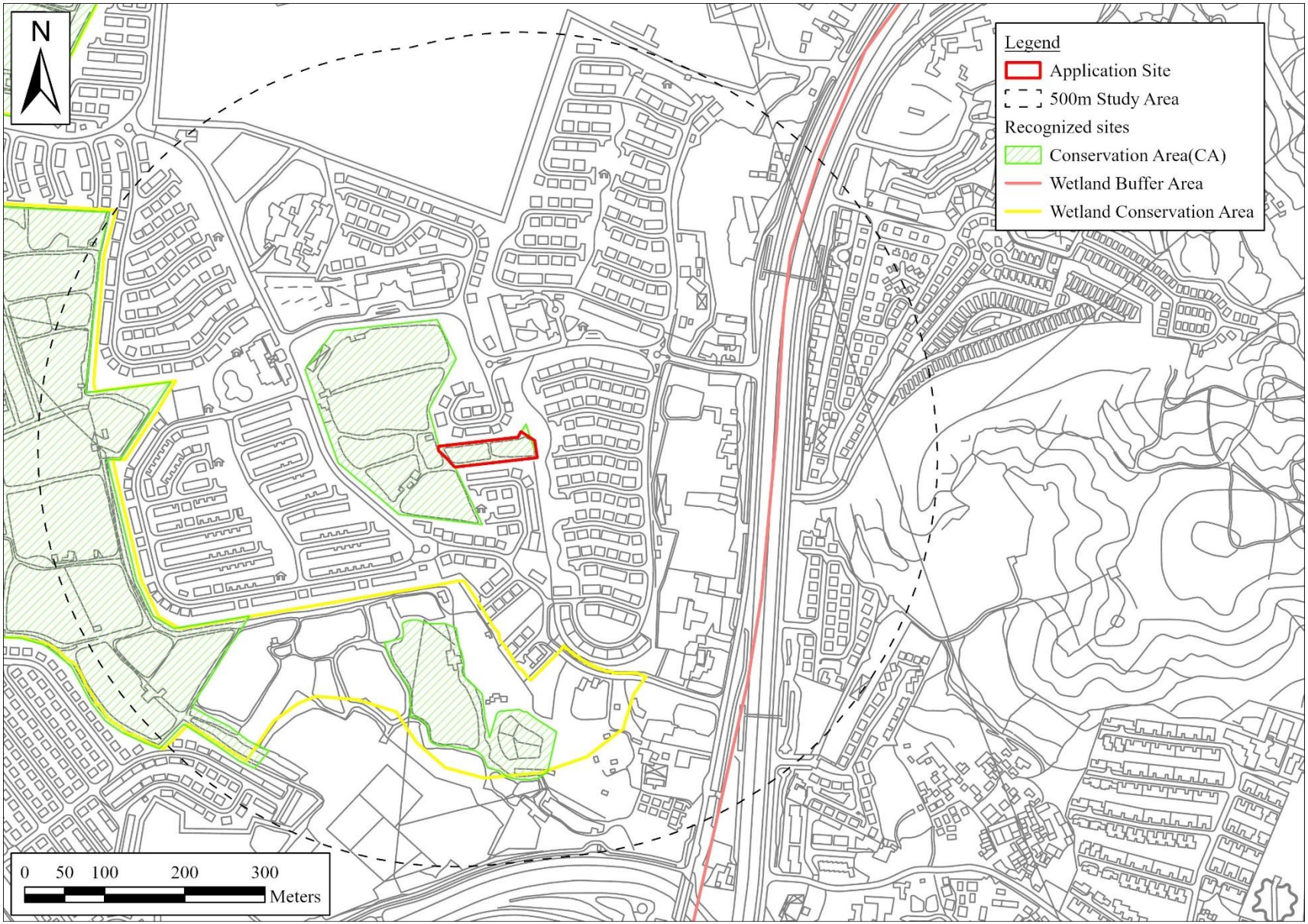
N
Legend
Application Site
500m Study Area
Recognized sites
Conservation Area(CA)
Wetland Buffer Area
Wetland Conservation Area
0 50 100 200 300
Meters

Figure 2 Survey Transects

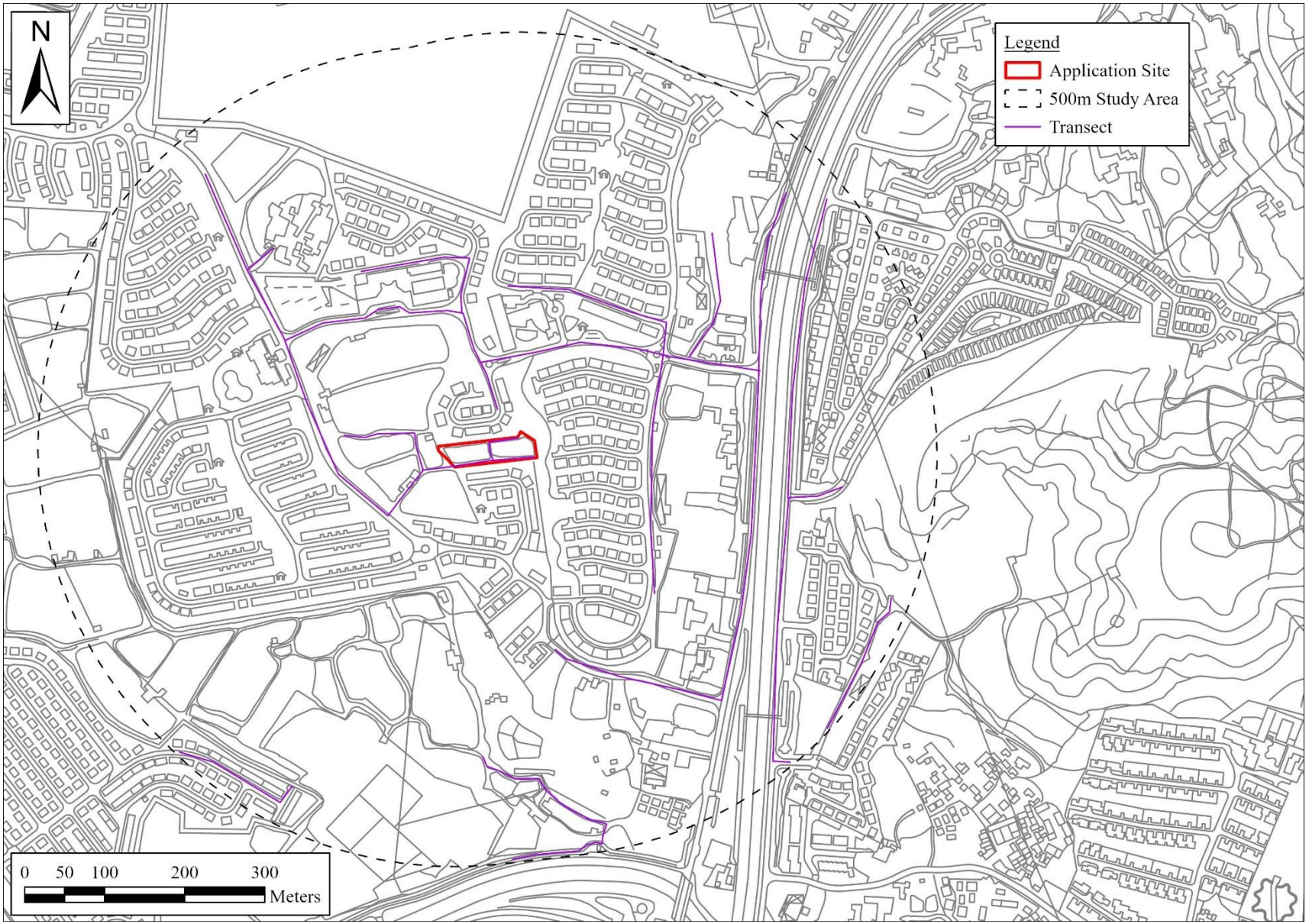
N
Legend
Application Site
500m Study Area
Transect
0 50 100 200 300
Meters

Figure 3 Habitats and Locations of Species of Conservation Importance within Study Area

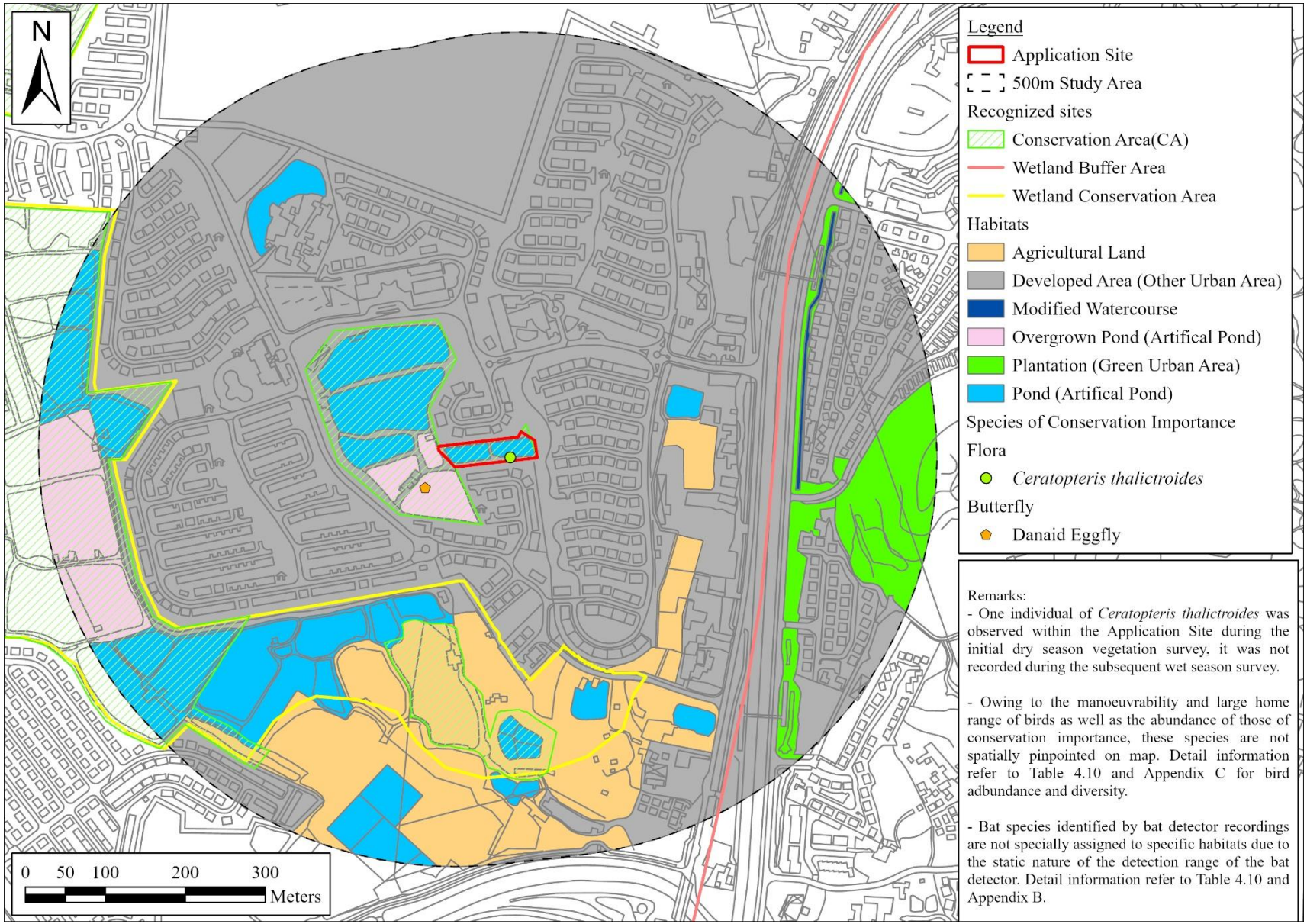
N
Legend
Application Site
500m Study Area
Recognized sites
Conservation Area(CA)
Wetland Buffer Area
Wetland Conservation Area
Habitats
Agricultural Land
Developed Area (Other Urban Area)
Modified Watercourse
Overgrown Pond (Artifical Pond)
Plantation (Green Urban Area)
Pond (Artifical Pond)
Species of Conservation Importance
Flora
Ceratopteris thalictroides
Butterfly
Danaid Eggfly
0 50 100 200 300
Meters
Remarks:
- One individual of Ceratopteris thalictroides was observed within the Application Site during the initial dry season vegetation survey, it was not recorded during the subsequent wet season survey.
- Owing to the manoeuvrability and large home range of birds as well as the abundance of those of conservation importance, these species are not spatially pinpointed on map. Detail information refer to Table 4.10 and Appendix C for bird adbundance and diversity.
- Bat species identified by bat detector recordings are not specially assigned to specific habitats due to the static nature of the detection range of the bat detector. Detail information refer to Table 4.10 and Appendix B.

Figure 4 Representative Photos of Habitats within Study Area

Figure 4 Representative Photos of Habitats within Study Area

			
Application Site Developed Area (Other Urban Area)	Application Site Pond (Artificial Pond)	Study Area Agricultural Land	Study Area Developed Area (Other Urban Area)
			
Study Area Modified Watercourse	Study Area Overgrown Pond (Artificial Pond)	Study Area Plantation (Green Urban Area)	Study Area Pond (Artificial Pond)

Figure 5a Representative Photos of Flora Species of Conservation Importance within Study Area

Figure 5a Representative Photos of Flora Species of Conservation Importance within Study Area

Ceratopteris thalictroides

Figure 5b Representative Photos of Fauna Species of Conservation Importance within Study Area

Figure 5b Representative Photos of Fauna Species of Conservation Importance within Study Area

		
Collared Crow	Black-winged Stilt	Black Kite

Appendix A to G

Appendix A Plant Species Recorded within the Study Area

Scientific name	Chinese name	Growth form	Origin	Rarity in Hong Kong	Protection/Conservation status	Application Site		Study Area					
						Da	Po	AL	DA	MoWa	OP	PL	Po
Abutilon indicum	磨盤草	Herb	Native	Restricted				s					
Acacia auriculiformis	耳果相思	Tree	Exotic	-				s				s	
Acacia confusa	台灣相思	Tree	Exotic	-								o	
Acanthus ilicifolius	老鼠簕	Shrub	Native	Common							s		
Acanthus ilicifolius var. xiamenensis	廈門老鼠簕	Shrub	Native	-							o		
Acrostichum aureum	鹵蕨	Herb	Native	Restricted							s		
Allium fistulosum	蔥	Herb	Exotic	-									
Alocasia macrorrhizos	海芋	Herb	Native	Very common				o		s	s	s	
Alternanthera philoxeroides	空心莧	Herb	Exotic	Common						s			
Alternanthera sessilis	蝦鉗菜	Herb	native	Common				s					
Amaranthus viridis	綠莧	Herb	native	Very common									
Aporusa dioica	銀柴	Tree	Native	Very common				s				s	
Arachis duranensis	蔓花生	Herb	Exotic	-					s			s	

Araucaria heterophylla	異葉南洋杉	Tree	Exotic	-	IUCN Red List (Vulnerable)				s				
Archontophoenix alexandrae	假檳榔	Tree	Exotic	-					s				
Artemisia indica	五月艾	Herb	Native	-				s					
Artocarpus heterophyllus	菠蘿蜜	Tree	Exotic	-		s							
Asparagus cochinchinensis	天門冬	Herb	Native	Common					s				
Averrhoa carambola	楊桃	Tree	Exotic	-				s					
Bauhinia x blakeana	洋紫荊	Tree	Native	-					s				
Bidens alba	白花鬼針草	Herb	Exotic	Very common		o	s	o		o	o	s	
Bischofia javanica	秋楓	Tree	Native	Common				s	s			s	
Bombax ceiba	木棉	Tree	Exotic	-								s	
Bougainvillea glabra	光葉子花	Shrub	Exotic	-				s	s		s		
Brachiaria mutica	巴拉草	Herb	Exotic	Common				o			o		s
Bridelia tomentosa	土蜜樹	Shrub	Native	Very common					s			s	
Broussonetia papyrifera	構樹	Tree	Native	Very common				o					
Calliandra haematocephala	朱纓花	Shrub	Exotic	-					s				

Callipteris esculenta	菜蕨	Herb	Native	Common				o				s	s
Callistemon viminalis	串錢柳	Tree	Exotic	-								s	
Cardamine flexuosa	彎曲碎米薺	Herb	Native	Common			s						
Carica papaya	番木瓜	Tree	Exotic	-		s		s			s		
Caryota mitis	短穗魚尾葵	Tree	Exotic	-				s	s				
Celtis sinensis	朴樹	Tree	Native	Common				s	s			s	
Centella asiatica	積雪草	Herb	Native	Very common					**s**				
Ceratopteris thalictroides	**水蕨**	**Herb**	**Native**	**Rare**	**Rare and Precious Plants of Hong Kong (Vulnerable in China) Wild plant under State protection (category II)**		**s**						
Cinnamomum burmannii	陰香	Tree	Native	-		s			s			s	
Cinnamomum camphora	樟	Tree	Native	Common				s					

Citrus reticulata	柑橘	Tree	Exotic	-	Wild plant under State protection (category II)			s					
Clausena lansium	黃皮	Tree	Exotic	-				s					
Coccinia grandis	紅瓜	Climber	Native	Very rare		s							
Codiaeum variegatum	變葉木	Shrub	Exotic	-					s			s	
Colocasia esculenta	芋	Herb	Exotic	-				o					
Commelina diffusa	節節草	Herb	Native	Common		s	c			s	o		
Cordia dichotoma	破布木	Tree	Native	Restricted								s	
Cordyline fruticosa	朱蕉	Shrub	Exotic	-					s				
Cyclosorus interruptus	間斷毛蕨	Herb	Native	Common				o			o		s
Cyclosorus parasiticus	華南毛蕨	Herb	Native	Very common				s				s	
Cynodon dactylon	狗牙根	Herb	native	Very common				s					
Cyperus difformis	異型莎草	Herb	native	Very common						s			
Cyperus imbricatus	疊穗莎草	Herb	Native	Common				s					
Cyperus involucratus	風車草	Herb	Exotic	Restricted						s		s	
Cyperus odoratus	斷節莎	Herb	Exotic	Rare				s					

Dalbergia millettii	香港黃檀	Climber	Native	Common	Cap. 586 CITES Appendix II							s	
Delonix regia	鳳凰木	Tree	Exotic	-					s				
Desmos chinensis	假鷹爪	Shrub	Native	Common								s	
Dimocarpus longan	龍眼	Tree	Exotic	Restricted	China Plant Red Data Book (Vulnerable) Wild plant under State protection (category II) Threatened Species List of China's Higher Plants (Vulnerable)			o	s		s		
Duranta erecta	假連翹	Climber	Exotic	-					s			s	
Echinochloa colona	光頭稗	Herb	native	Very common		c	o	s					
Eclipta prostrata	鱧腸	Herb	Native	-				s					
Eichhornia crassipes	鳳眼藍	Herb	Exotic	Common			s						
Eriobotrya japonica	枇杷	Tree	Exotic	-									
Erythrina spp.	刺桐屬	Tree	Exotic	-		s							
Eucalyptus citriodora	檸檬桉	Tree	Exotic	-								c	

Ficus elastica	印度榕	Tree	Exotic	-					s				
Ficus hispida	對葉榕	Shrub	Native	Very common				s	s	s		s	
Ficus microcarpa	榕樹	Tree	Native	Common					c			o	
Ficus variegata var. chlorocarpa	青果榕	Tree	Native	Common				s				s	
Flueggea virosa	白飯樹	Shrub	Native	Common				s		s		s	
Garcinia subelliptica	菲島福木	Tree	Exotic	-								s	
Hibiscus rosa-sinensis	朱槿	Shrub	Exotic	-					s			s	
Hylocereus undatus	量天尺	Herb	Exotic	-									
Ipomoea aquatica	蕹菜	Herb	Exotic	Very common		s	s	s					
Ipomoea batatas	番薯	Herb	Exotic	-				s					
Ipomoea cairica	五爪金龍	Climber	Exotic	Very common		o	s	o		o	o	s	o
Ipomoea triloba	三裂葉薯 , 三裂葉牽牛	Herb	Native	-									
Ixora coccinea	細葉龍船花	Shrub	Exotic	-					s				
Lactuca sativa	萵苣	Herb	Exotic	-									
Lactuca sativa var. longifolia	油麥菜	Herb	Exotic	-				s					

Lantana camara	馬纓丹	Shrub	Exotic	Very common					s				
Lemna minor	浮萍	Herb	Native	Common			s						
Leucaena leucocephala	銀合歡	Tree	Exotic	Common				s	o		s	s	
Ligustrum sinense	山指甲	Tree	Native	Common					s			s	
Lindernia antipoda	泥花草	Herb	Native	Common								s	
Lindernia rotundifolia	圓葉母草	Herb	Exotic	-				s					
Litchi chinensis	荔枝	Tree	Exotic	Restricted	China Plant Red Data Book (Vulnerable) Threatened Species List of China's Higher Plants (Endangered)	s		o					
Livistona chinensis	蒲葵	Tree	Exotic	-					c				
Loropetalum chinense f. rubrum	紅花檵木	Shrub	Exotic	-								s	
Ludwigia erecta	美洲水丁香	Herb	Exotic	-						o			
Ludwigia hyssopifolia	草龍	Herb	Native	-				s					

Lycopersicon esculentum	番茄	Herb	Exotic	-				o					
Lygodium japonicum	海金沙	Herb	Native	Very common				s	s			s	
Macaranga tanarius var. tomentosa	血桐	Tree	Native	Common				s			s	s	
Macroptilium lathyroides	大翼豆	Herb	Exotic	Common		s							
Mangifera indica	芒果	Tree	Exotic	-				s					
Manihot esculenta	木薯	Shrub	Exotic	-				s					
Melaleuca cajuputi subsp. cumingiana	白千層	Tree	Exotic	-					o			s	
Melia azedarach	苦楝	Tree	Exotic	Common					s	s			
Merremia hederacea	魚黃草	Climber	Native	Restricted		s	s	s					
Microcos nervosa	破布葉	Shrub	Native	Common				s				s	
Microlepia hancei	華南鱗蓋蕨	Herb	Native	Restricted				s					
Microstegium ciliatum	剛莠竹	Herb	Native	Very common				s					
Mikania micrantha	薇甘菊	Herb	Exotic	Very common		o	c	o		s	o		o
Miscanthus floridulus	五節芒	Herb	Native	Common		s		s					s

Morus alba	桑	Tree	Native	Common				s					
Murraya paniculata	九里香	Tree	Exotic	-					s			s	
Musa x paradisiaca	大蕉	Herb	Exotic	-		s		o			s		
Mussaenda pubescens	玉葉金花	Climber	Native	Very common		s							
Myosoton aquaticum	鵝腸菜	Herb	Native	Common				s					
Oplismenus compositus	竹葉草	Herb	Native	Very common				s				s	
Oxalis debilis subsp. corymbosa	紅花酢漿草	Herb	Exotic	Common		s							
Paederia scandens	雞矢藤	Climber	Native	Very common									
Panicum maximum	大黍	Herb	Exotic	Common		s	s	s		s			
Passiflora foetida	龍珠果	Climber	Exotic	Very common		s		s				s	
Persicaria barbata	毛蓼	Herb	Native	Common				s					
Persicaria chinensis	火炭母	Herb	Native	Common				s			s		
Persicaria pubescens	伏毛蓼	Herb	Native	Common			s						
Phoenix roebelenii	江邊刺葵	Tree	Exotic	-					s				
Phragmites australis	蘆葦	Herb	Native	Very common				s			c		s
Phyllanthus reticulatus	小果葉下珠	Shrub	Native	Common		s							

Phyllanthus tenellus	纖梗葉下珠	Herb	Exotic	-						s			
Physalis angulata	苦蘵	Herb	Native	Restricted				s			s		
Pilea microphylla	小葉冷水花	Herb	Exotic	Very common				s					
Platycladus orientalis	側柏	Tree	Exotic	-					s				
Pluchea sagittalis	翼莖闊苞菊	Herb	Exotic	-		s		s					
Pouzolzia zeylanica	霧水葛	Herb	Native	Common		s							
Praxelis clematidea	假臭草	Herb	Exotic	Very common				s					
Psidium guajava	番石榴	Tree	Exotic	Common				s					
Pteris vittata	蜈蚣蕨	Herb	Native	Very common		s		s					
Pueraria lobata var. montana	葛麻姆	Climber	Native	Common					s				
Ranunculus sceleratus	石龍芮	Herb	Native	Restricted				s					
Roystonea regia	大王椰子	Tree	Exotic	-					o				
Ruellia coerulea	蘭花草	Herb	Exotic	-								s	
Rumex trisetifer	長刺酸模	Herb	Native	Common				s					
Saccharum officinarum	甘蔗	Herb	Exotic	-									
Sansevieria trifasciata	虎尾蘭	Herb	Exotic	-				s					

Schefflera arboricola	鵝掌藤	Climber	Exotic	-					s			s	
Senna siamea	鐵刀木	Tree	Exotic	-					s				
Sesbania cannabina	田菁	Herb	Exotic	Common				s					
Solanum americanum	少花龍葵	Herb	Exotic	-				s					
Solanum torvum	水茄	Shrub	Exotic	Common		s				s			
Sonneratia caseolaris	海桑	Tree	Exotic	-							o		
Stephania longa	糞箕篤	Climber	Native	Common		s						s	
Syzygium jambos	蒲桃	Tree	Exotic	Common				s			s		
Syzygium levinei	山蒲桃	Tree	Native	Common				s					
Tinospora sinensis	中華青牛膽	Climber	Native	Common									
Trema tomentosa	山黃麻	Shrub	Native	Common								s	
Tridax procumbens	羽芒菊	Herb	Exotic	Very common					s				
Typha angustifolia	水燭	Herb	Exotic	Rare							o		s
Wedelia trilobata	三裂葉蟛蜞菊	Herb	Exotic	Common						o			
Youngia japonica	黃鶴菜	Herb	Native	Very common					s				
Zanthoxylum piperitum	胡椒木	Shrub	Exotic	-					s				
Total number of flora species recorded within the Study Area					152	26	13	72	40	16	22	43	8

Notes:

1. Corlett *et al*. (2000). Hong Kong vascular plants: distribution and status.
2. International Union of Conservation for Nature (2024). The IUCN Red List of Threatened Species. Version 2024.
3. Convention on International Trade in Endangered Species of Wild Flora and Fauna (2023 Nov). Appendices I, II and III.
4. Qin *et al*. (2017). Threatened Species List of China's Higher Plants.
5. Fu & Chin (1992). China Plant Red Data Book – Rare and Endangered Plants.
6. Wu et al. (1988). Illustration of Rare & endangered plant in Guangdong Province.
7. Hu *et al*. (2003). Rare and Precious Plants of Hong Kong.
8. Cap. 586 Protection of Endangered Species of Animals and Plants Ordinance.
9. State Forestry Administration & Ministry of Agriculture. (2021). List of Wild Plants under State Protection.
10. AFCD (2022) Hong Kong Herbarium.
11. **Species in bold are considered of conservation importance.**

- *Araucaria heterophylla* is listed as Vulnerable by IUCN (2023), however, it is exotic and the recorded individual was cultivated. Thus, they are not considered as species of conservation.
- *Citrus reticulata* is exotic to Hong Kong and not considered of conservation importance, despite being listed under Category II in the List of Wild Plants under State Protection.
- *Dimocarpus longan* and *Lichi chinensis* are exotic to Hong Kong and not considered of conservation importance, despite being listed as Vulnerable by IUCN (2023), listed as endangered or vulnerable in Threatened Species List of China's Higher Plants, listed as vulnerable in China Plant Red Data Book, and/or listed under Category II in the List of Wild Plants under State Protection.
- Dalbergia spp. are listed under Appendix II of CITES and protected under Cap. 586 Protection of Endangered Species of Animals and Plants Ordinance in Hong Kong as species in this genus is facing threat due to the overexploitation for its valuable wood (known as rosewood). In the current study, *Dalbergia benthamii* was recorded. As the recorded Dalbergia are climber which is not relevant to the timber exploitation. In addition, the species are considered 'common' in Hong Kong by Corlett *et al.* (2000). Thus, they are not considered as species of conservation importance in the current Study.
- *Cyperus odoratus*, *Typha angustifolia* and *Coccinia grandis* are regarded as rare by Corlett (2000), yet they are exotic or cultivated. They are not considered as species of conservation.

Abbreviations:

- Habitat: AL = Agricultural Land; DA = Developed Area; MoWa = Modified Watercourse; OP = Overgrown Pond; Pl = Plantation; Po = Pond
- Relative abundance: C = Common; O = Occasional; S = Scarce

Appendix B Abundance of Mammal Species Recorded within the Study Area

Common Names	Scientific Names	Rarity and Distribution in Hong Kong[1]	Conservation status	Application Site		Study Area					
				Da	Po	AL	DA	MoWa	OP	Pl	Po
Domestic Dog	*Canis lupus familiaris*	Common. Widely distributed in urban and countryside areas throughout Hong Kong.	-				3				
Domestic Cat	*Felis catus*	Uncommon. Widely distributed in urban and countryside areas throughout Hong Kong.	-	2		1	5				1
Musk Shrew	*Suncus murinus*	Common. Fairly widely distributed in countryside areas throughout Hong Kong.	-	1							
Total number of species recorded within each habitat				**2**	**0**	**1**	**2**	**0**	**0**	**0**	**0**
Total number of species recorded within the location				**2**		**3**					

Notes:
1. Agriculture, Fisheries and Conservation Department (2024). Species Database of the Hong Kong Biodiversity Information Hub
2. The number of the abundance represents the total number of individuals recorded in surveys.

Abbreviations:
- Habitat: AL = Agricultural Land; DA = Developed Area; MoWa = Modified Watercourse; OP = Overgrown Pond; Pl = Plantation; Po = Pond

Appendix C Bat Species Recorded within the Assessment Area using Ultrasonic Bat Detector

Common Names[1,4]	Scientific Names[1,4]	Rarity and Distribution in Hong Kong[1,4]	Conservation status[2,3,4]	Recorded within Application Site	Recorded within Study Area but outside Application Site
Chinese Noctule	***Nyctalus plancyi***	**Common. Fairly widely distributed in countryside areas throughout Hong Kong.**	**Fellowes *et al.* (2002): PRC; Cap. 170**		✓
Japanese Pipistrelle	*Pipistrellus abramus*	Widely distributed throughout Hong Kong.	(Cap. 170)	✓	✓
Least Pipistrelle	*Pipistrellus tenuis*	Recent records were found in Nam Chung, Sheung Woo Hang, Shek Pik, Shing Mun and Plover Cove Country Park.	(Cap. 170)		✓
			Total number of species recorded within the location	1	3

Notes:

1. Agriculture, Fisheries and Conservation Department (2024). Species Database of the Hong Kong Biodiversity Information Hub
2. Cap. 170 Wild Animals Protection Ordinance.
3. Fellowes *et al.* (2002). Wild animals to watch: Terrestrial and freshwater fauna of conservation concern in Hong Kong.
    - For conservation status listed by Fellowes *et al.* (2002), letters in parentheses indicate that the assessment is on the basis of restrictedness in breeding and/or roosting sites rather than in general occurrence.
4. Shek (2006). A Field Guide to the Terrestrial Mammals of Hong Kong
5. **Species in bold are considered of conservation importance.**

Abbreviations:

- Conservation Status in Fellowes *et al.* (2002): PRC = Potential Regional Concern

Appendix D Abundance of Bird Species Recorded within the Study Area

Common Names [1]	Scientific Names[1]	Rarity and Distribution in Hong Kong[1]	Conservation status[2,3,4,5]	Application Site		Study Area					
				DA	Po	AL	DA	MoWa	OP	Pl	Po
Garganey	*Spatula querquedula*	Common passage migrant. Found in Deep Bay area, Long Valley, Kam Tin.	-								3
Little Grebe	***Tachybaptus ruficollis***	**Common resident. Found in Deep Bay area.**	**Fellowes *et al.* (2002): LC**								**1**
Black-crowned Night Heron	***Nycticorax nycticorax***	**Common resident and migrant. Widely distributed in Hong Kong.**	**Fellowes *et al.* (2002): LC**						**1**		**3**
Striated Heron	***Butorides striata***	**Common summer visitor. Widely distributed in Hong Kong.**	**Fellowes *et al.* (2002): LC**		**1**						
Chinese Pond Heron	***Ardeola bacchus***	**Common resident. Widely distributed in Hong Kong.**	**Fellowes *et al.* (2002): PRC**		**2**				**1**		**1**
Grey Heron	***Ardea cinerea***	**Common winter visitor. Found in Deep Bay area, Starling Inlet, Kowloon Park, Cape D'Aguilar.**	**Fellowes *et al.* (2002): PRC**								**2**
Great Egret	***Ardea alba***	**Common resident, migrant and winter visitor. Widely distributed in Hong Kong.**	**Fellowes *et al.* (2002): PRC**								**2**
Intermediate Egret	***Ardea intermedia***	**Resident and passage migrant. Found in Deep Bay area, Tai Long Wan, Starling Inlet, Tai O, Cape D'Aguilar.**	**Fellowes *et al.* (2002): RC**			**1**					**2**
Little Egret	***Egretta garzetta***	**Common resident, migrant and winter visitor. Widely distributed in coastal area throughout Hong Kong.**	**Fellowes *et al.* (2002): PRC**			**2**		**1**	**1**		**2**
White-breasted Waterhen	*Amaurornis phoenicurus*	Common resident. Widely distributed in wetland throughout Hong Kong.	-		3	2	1		2		6
Black-winged Stilt	***Himantopus himantopus***	**Common migrant and wintor visitor. Found in Deep Bay area, Long Valley, Kam Tin.**	**Fellowes *et al.* (2002): RC**								**12**
Little Ringed Plover	***Charadrius dubius***	**Resident, common winter visitor and passage migrant. Widely distributed in freshwater areas throughout Hong Kong.**	**Fellowes *et al.* (2002): (LC)**								**8**
Greater Painted-snipe	***Rostratula benghalensis***	**Locally common resident. Found in Ha Tsuen, Lok Ma Chau, Kam Tin, Long Valley, Hong Kong Wetland Park.**	**China Red Data Book Status: VU; Fellowes *et al.* (2002): LC**								**3**
Spotted Redshank	***Tringa erythropus***	**Common spring passage migrant. Found in Deep Bay area.**	**Fellowes *et al.* (2002): RC**								**1**
Common Greenshank	***Tringa nebularia***	**Abundant passage migrant and winter visitor. Found in Deep Bay area.**	**Fellowes *et al.* (2002): RC**			**1**					

Common Names [1]	Scientific Names[1]	Rarity and Distribution in Hong Kong[1]	Conservation status[2,3,4,5]	Application Site		Study Area					
				DA	Po	AL	DA	MoWa	OP	Pl	Po
Green Sandpiper	*Tringa ochropus*	Common migrant and winter visitor. Found in Deep Bay area, Shuen Wan, Long Valley, Kam Tin, Shek Kong, Ho Chung.	-			2					4
Wood Sandpiper	***Tringa glareola***	**Common migrant and winter visitor. Widely distributed in wetland area throughout Hong Kong.**	**Fellowes *et al.* (2002): LC**								**3**
Rock Dove	*Columba livia*	Locally common resident. Widely distributed in urban area throughout Hong Kong.	-				4				
Spotted Dove	*Spilopelia chinensis*	Abundant resident. Widely distributed in Hong Kong.	-	3		15	32		2	5	
Greater Coucal	***Centropus sinensis***	**Common resident. Widely distributed in Hong Kong.**	**China Red Data Book Status: VU; List of Wild Animals under State Priority Conservation: Class II**			**1**			**2**		**1**
Asian Koel	*Eudynamys scolopaceus*	Common resident. Widely distributed in Hong Kong.	-			4	17		2	15	9
Large Hawk-Cuckoo	*Hierococcyx sparverioides*	Locally common spring and summer visitor. Widely distributed in woodland throughout in Hong Kong.	-			1					
House Swift	*Apus nipalensis*	Abundant spring migrant and common resident. Widely distributed in Hong Kong.	-								2
Common Kingfisher	*Alcedo atthis*	Common passage migrant and winter visitor. Widely distributed in wetland habitat throughout Hong Kong.	-								5
Scarlet Minivet	*Pericrocotus speciosus*	Common resident. Found in Tai Po Kau, the Peak, Lam Tsuen, Cape D'Aguilar Road, Peel Rise, Shing Mun.	-							2	
Long-tailed Shrike	*Lanius schach*	Common resident. Widely distributed in open areas throughout Hong Kong.	-						1		1
Black Drongo	*Dicrurus macrocercus*	Common summer visitor. Widely distributed in open area throughout Hong Kong.	-								2
Hair-crested Drongo	*Dicrurus hottentottus*	Common migrant and winter visitor, and locally common resident. Widely distributed in wooded area throughout Hong Kong.	-							2	

Common Names [1]	Scientific Names[1]	Rarity and Distribution in Hong Kong[1]	Conservation status[2,3,4,5]	Application Site		Study Area					
				DA	Po	AL	DA	MoWa	OP	Pl	Po
Azure-winged Magpie	*Cyanopica cyanus*	Locally common breeding resident. Found in Mai Po.	-				18		1		
Collared Crow	***Corvus torquatus***	**Locally common resident. Found in Inner Deep Bay area, Nam Chung, Kei Ling Ha, Tai Mei Tuk, Pok Fu Lam, Chek lap Kok, Shuen Wan, Lam Tsuen.**	**IUCN Red List: VU; Fellowes *et al.* (2002): LC**			**2**					**1**
Cinereous Tit	*Parus cinereus*	Common resident. Widely distributed in Hong Kong.	-				3				5
Red-whiskered Bulbul	*Pycnonotus jocosus*	Abundant resident. Widely distributed in Hong Kong.	-	2			39			16	20
Chinese Bulbul	*Pycnonotus sinensis*	Abundant resident. Widely distributed in Hong Kong.	-				21	2		4	8
Barn Swallow	*Hirundo rustica*	Abundant passage migrant and summer visitor. Widely distributed in Hong Kong.	-				17		14		37
Dusky Warbler	*Phylloscopus fuscatus*	Abundant winter visitor and migrant. Widely distributed in shrubland and waterside vegetation throughout Hong Kong.	-						3		4
Yellow-browed Warbler	*Phylloscopus inornatus*	Abundant winter visitor and migrant. Widely distributed in woodland throughout Hong Kong.	-			2	2			6	
Yellow-bellied Prinia	*Prinia flaviventris*	Common resident. Widely distributed in Hong Kong.	-			3			5		
Plain Prinia	*Prinia inornata*	Locally common resident. Widely distributed in grassland throughout Hong Kong.	-						1		
Common Tailorbird	*Orthotomus sutorius*	Common resident. Widely distributed in Hong Kong.	-		1		2				
Masked Laughingthrush	*Pterorhinus perspicillatus*	Abundant resident. Widely distributed in shrubland throughout Hong Kong.	-			5	20			6	6
Swinhoe's White-eye	*Zosterops simplex*	Abundant resident. Widely distributed in Hong Kong.	-				10			4	
Crested Myna	*Acridotheres cristatellus*	Abundant resident. Widely distributed in Hong Kong.	-				3		7		3
Common Myna	*Acridotheres tristis*	Locally common resident. Found in Mai Po, Sheung Uk Tsuen, Sheung Shui, Kam Tin, Shek Kong, Ping Shan, Mong Tseng.	-				11				

Common Names [1]	Scientific Names[1]	Rarity and Distribution in Hong Kong[1]	Conservation status[2,3,4,5]	Application Site		Study Area					
				DA	Po	AL	DA	MoWa	OP	Pl	Po
Black-collared Starling	*Gracupica nigricollis*	Common resident. Widely distributed in Hong Kong.	-	2	2		23		8	10	11
Chinese Blackbird	*Turdus mandarinus*	Common winter visitor and migrant. Widely distributed in Hong Kong.	-				4			2	1
Oriental Magpie-Robin	*Copsychus saularis*	Abundant resident. Widely distributed in Hong Kong.	-				7				5
Asian Brown Flycatcher	*Muscicapa dauurica*	Common passage migrant and winter visitor. Widely distributed in Hong Kong.	-							1	
Amur Stonechat	*Saxicola stejnegeri*	Common passage migrant and winter visitor. Widely distributed in open cultivated fields throughout Hong Kong.	-								4
Eurasian Tree Sparrow	*Passer montanus*	Abundant resident. Widely distributed in Hong Kong.	-	5		14	72		7	14	10
Scaly-breasted Munia	*Lonchura punctulata*	Abundant resident. Widely distributed in Hong Kong.	-	10	17						19
Eastern Yellow Wagtail	*Motacilla tschutschensis*	Common passage migrant and winter visitor. Widely distributed in agricultural fields and marsh edges throughout Hong Kong.	-								1
White Wagtail	*Motacilla alba*	Resident, common passage migrant and winter visitor. Widely distributed in Hong Kong.	-			4	2	2	3		4
Olive-backed Pipit	*Anthus godlewskii*	Common passage migrant and winter visitor. Widely distributed in Hong Kong.	-			1				5	2
Total number of species recorded within each habitat				5	6	16	20	3	17	14	38
Total number of species recorded within the location				9			52				

Notes:
1. Agriculture, Fisheries and Conservation Department (2024). Species Database of the Hong Kong Biodiversity Information Hub
2. Fellowes *et al.* (2002). Wild animals to watch: Terrestrial and freshwater fauna of conservation concern in Hong Kong.
    - For conservation status listed by Fellowes *et al.* (2002), letters in parentheses indicate that the assessment is on the basis of restrictedness in breeding and/or roosting sites rather than in general occurrence.
3. International Union of Conservation for Nature. (2024). The IUCN Red List of Threatened Species. Version 2024.
4. National Forestry and Grassland Administration and the Ministry of Agricultural and Rural Affairs. (2023). List of Wild Animals under State Priority Conservation
5. Yue and Chen (1998). China Red Data Book of Endangered Animals: Pisces.
6. The number of the abundance represents the total number of individuals recorded in surveys
7. **Species in bold are considered of conservation importance.**

Abbreviations:

- Habitat: AL = Agricultural Land; DA = Developed Area; MoWa = Modified Watercourse; OP = Overgrown Pond; Pl = Plantation; Po = Pond
- Conservation Status in Fellowes *et al.* (2002): LC = local concern, PRC = potential regional concern, RC = regional concern, GC = global concern; 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).

Appendix E Abundance of Butterfly Species Recorded within the Study Area

Common Names[1]	Scientific Names[1]	Rarity and Distribution in Hong Kong[1]	Conservation status[2]	Application Site		Assessment Area					
				Da	Po	AL	Da	MoWa	OP	Pl	Po
Formosan Swift	*Borbo cinnara*	Common. Widely distributed throughout Hong Kong.	-			1				1	
Indian Palm Bob	*Suastus gremius*	Uncommon.Widely distributed throughout Hong Kong.	-						1		
Common Hedge Blue	*Acytolepis puspa*	Common. Widely distributed throughout Hong Kong	-			3			1		5
Plains Cupid	*Chilades pandava*	Uncommon. Widely distributed throughout Hong Kong	-				2				
Dark Cerulean	*Jamides bochus*	Common. Widely distributed throughout Hong Kong.	-			3					
Long-tailed Blue	*Lampides boeticus*	Common. Widely distributed throughout Hong Kong.	-			2					3
Transparent 6-line Blue	*Nacaduba kurava*	Common. Widely distributed throughout Hong Kong	-			2					4
Pale Grass Blue	*Pseudozizeeria maha*	Very common. Widely distributed throughout Hong Kong	-	3			3				5
Plum Judy	*Abisara echerius*	Very common. Widely distributed throughout Hong Kong	-							3	2
Punchinello	*Zemeros flegyas*	Common. Widely distributed throughout Hong Kong	-							3	
Blue-spotted Crow	*Euploea midamus*	Very common. Widely distributed throughout Hong Kong	-			2	3				
Blue Tiger	*Tirumala limniace*	Common. Widely distributed throughout Hong Kong	-			1					
Red Ring Skirt	*Hestina assimilis*	Common. Widely distributed throughout Hong Kong.	-			4				3	
Great Eggfly	*Hypolimnas bolina*	Common. Widely distributed throughout Hong Kong	-			1					2
Danaid Eggfly	***Hypolimnas misippus***	**Uncommon. Ngau Ngak Shan, Lung Kwu Tan, Hong Kong Wetland Park, Mount Parker, Cloudy Hill, Lin Ma Hang**	**Fellowes *et al.* (2002): LC**						**1**		
Common Archduke	*Lexias pardalis*	Suspected species. Widely distributed throughout Hong Kong.	-							2	
Common Sailer	*Neptis hylas*	Very common. Widely distributed throughout Hong Kong	-			3	3			2	
Shan Nawab	*Polyura nepenthes*	Uncommon. Cloudy Hill, Shing Mun, Tai Po Kau, Victoria Peak, Lai Chi Wo, Pak Sha O	-				1				
Large Faun	*Faunis eumeus*	Common. Widely distributed throughout Hong Kong.	-				3			1	
Common Palmfly	*Elymnias hypermnestra*	Common. Widely distributed throughout Hong Kong.	-						4		
Dark-brand Bush Brown	*Mycalesis mineus*	Very common. Widely distributed throughout Hong Kong	-						3	2	2
Tailed Jay	*Graphium agamemnon*	Common. Widely distributed throughout Hong Kong	-						2		
Great Mormon	*Papilio memnon*	Very common. Widely distributed throughout Hong Kong	-			3	2			4	

Common Names[1]	Scientific Names[1]	Rarity and Distribution in Hong Kong[1]	Conservation status[2]	Application Site		Assessment Area					
				Da	Po	AL	Da	MoWa	OP	Pl	Po
Common Mormon	*Papilio polytes*	Very common. Widely distributed throughout Hong Kong	-	4		1	2		2	5	2
Spangle	*Papilio protenor*	Very common. Widely distributed throughout Hong Kong	-				4		1		1
Lemon Emigrant	*Catopsilia pomona*	Common. Widely distributed throughout Hong Kong	-			2	3		3		4
Red-base Jezebel	*Delias pasithoe*	Very common. Widely distributed throughout Hong Kong	-				5				
Common Grass Yellow	*Eurema hecabe*	Very common. Widely distributed throughout Hong Kong	-			4			2	3	1
Indian Cabbage White	*Pieris canidia*	Very common. Widely distributed throughout Hong Kong	-	1		14	17		2		16
Total number of species recorded within each habitat				3	0	15	12	0	11	11	0
Total number of species recorded within the location				3		29					

Notes:
1. Agriculture, Fisheries and Conservation Department (2024). Species Database of the Hong Kong Biodiversity Information Hub
2. Fellowes *et al.* (2002). Wild animals to watch: Terrestrial and freshwater fauna of conservation concern in Hong Kong.
    - For conservation status listed by Fellowes *et al.* (2002), letters in parentheses indicate that the assessment is on the basis of restrictedness in breeding and/or roosting sites rather than in general occurrence.
3. The number of the abundance represents the total number of individuals recorded in surveys
4. **Species in bold are considered of conservation importance.**

Abbreviations:
- Habitat: AL = Agricultural Land; DA = Developed Area; MoWa = Modified Watercourse; OP = Overgrown Pond; Pl = Plantation; Po = Pond
- Conservation Status in Fellowes *et al.* (2002): LC = local concern; 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).

Appendix F Abundance of Odonate Species Recorded within the Study Area

Common Names[1]	Scientific Names[1]	Rarity and Distribution in Hong Kong[1]	Conservation status	**Application Site**		Assessment Area					
				Da	Po	AL	DA	MoWa	OP	Pl	Po
Common Evening Hawker	*Anaciaeschna jaspidea*	Common. Semi-crepuscular and gregarious; found around marshes and wet lowland agricultural areas. Population scattered in Hong Kong, but more commonly seen in the north New Territories.	-								4
Pale-spotted Emperor	*Anax guttatus*	Common. Widely distributed in ponds and sluggish streams throughout Hong Kong.	-								2
Lesser Emperor	*Anax parthenope*	Common. Often found in lowland ponds and sluggish rivers. Widely distributed throughout Hong Kong.	-								3
Orange-tailed Sprite	*Ceriagrion auranticum*	Abundant. Widely distributed in weedy ponds, marshes, abandoned fields or grasslands adjacent to waters.	-		7		2	3	3		12
Common Bluetail	*Ischnura senegalensis*	Abundant. Widely distributed in all wetland habitats except fast flowing rivers throughout Hong Kong.	-		28						18
Common Flangetail	*Ictinogomphus pertinax*	Common. Widely distributed in ponds and still water throughout Hong Kong.	-								2
Asian Pintail	*Acisoma panorpoides*	Common. Widely distributed in marshes and weedy ponds throughout Hong Kong.	-								5
Blue Dasher	*Brachydiplax chalybea*	Common. Widely distributed in marshes and weedy ponds throughout Hong Kong.	-		3						4
Asian Amberwing	*Brachythemis contaminata*	Abundant. Widely distributed in weedy ponds and sluggish streams.	-		6	3					26
Crimson Darter	*Crocothemis servilia*	Abundant. Widely distributed in cultivated areas, ponds and marshes throughout the New Territories.	-								3
Pied Percher	*Neurothemis tullia*	Common. Favours marshes and abandoned rice paddies. Widely distributed throughout Hong Kong.	-								2
Green Skimmer	*Orthetrum sabina sabina*	Abundant. Widely distributed in all wetland habitats throughout Hong Kong.	-			3			2		11

Common Names[1]	Scientific Names[1]	Rarity and Distribution in Hong Kong[1]	Conservation status	**Application Site**		Assessment Area					
				Da	Po	AL	DA	MoWa	OP	Pl	Po
Wandering Glider	*Pantala flavescens*	Abundant. Widely distributed all over Hong Kong.	-		28			6	10		34
Pied Skimmer	*Pseudothemis zonata*	Common. Widely distributed in woodlands adjacent to reservoirs, sluggish streams, ponds, tanks and marshes throughout Hong Kong.	-		5						8
Variegated Flutterer	*Rhyothemis variegata arria*	Common. Widely distributed in marshes, ponds and tanks throughout Hong Kong.	-		1	17		5	10		32
Crimson Dropwing	*Trithemis aurora*	Abundant. Found in marshes, ponds, streams, andor even ornamental ponds in urban areas. Widely distributed throughout Hong Kong.	-		3						3
Regal Pond Cruiser	*Epophthalmia elegans*	Common. Always patrols along the edge of large ponds with a regular path. Widely distributed in reservoirs and large ponds throughout Hong Kong.	-								1
Total number of species recorded within each habitat				0	8	3	1		4	0	3
Total number of species recorded within the location				8			17				

Notes:
1. Agriculture, Fisheries and Conservation Department (2024). Species Database of the Hong Kong Biodiversity Information Hub
2. The number of the abundance represents the total number of individuals recorded in surveys.

Abbreviations:
- Habitat: AL = Agricultural Land; DA = Developed Area; MoWa = Modified Watercourse; OP = Overgrown Pond; Pl = Plantation; Po = Pond

Appendix G Abundance of Reptile Species Recorded within the Study Area

Common Names	Scientific Names	Rarity and Distribution in Hong Kong	Conservation status	Application Site	Study Area					
				Po	AL	DA	MoWa	OP	Pl	Po
Changeable Lizard	*Calotes versicolor*	Widely distributed throughout Hong Kong.	-			1				1
Chinese Gecko	*Gekko chinensis*	Widely distributed throughout Hong Kong.	-	2		5				2
Bowring's Gecko	*Hemidactylus bowringii*	Distributed throughout Hong Kong.	-			2			2	2
Long-tailed Skink	*Eutropis longicaudata*	Widely distributed throughout Hong Kong.	-			1			1	1
Total number of species recorded within each habitat				1	0	4		0	2	0
Total number of species recorded within the location				1		4				

Notes:
1. Agriculture, Fisheries and Conservation Department (2024). Species Database of the Hong Kong Biodiversity Information Hub
2. The number of the abundance represents the total number of individuals recorded in surveys.

Abbreviations:
- Habitat: AL = Agricultural Land; DA = Developed Area; MoWa = Modified Watercourse; OP = Overgrown Pond; Pl = Plantation; Po = Pond

Appendix H Abundance of Amphibian Species Recorded within the Study Area

Common Names	Scientific Names	Rarity and Distribution in Hong Kong[1]	Conservation status	Application Site	Study Area					
				Po	AL	DA	MoWa	OP	Pl	Po
Asian Common Toad	*Duttaphrynus melanostictus*	Widely distributed in Hong Kong.	-	14	1	3			1	17
Asiatic Painted Frog	*Kaloula pulchra*	Widely distributed in Hong Kong.	-	3		11				
Ornate Pigmy Frog	*Microhyla fissipes*	Widely distributed in Hong Kong.	-	2	5			2		
Paddy Frog	*Fejervarya limnocharis*	Widely distributed in Hong Kong.	-					5		20
Gunther's Frog	*Sylvirana guentheri*	Widely distributed throughout Hong Kong.	-	13			1	10		12
Greenhouse Frog	*Eleutherodactylus planirostris*	Widely distributed throughout Hong Kong.	-	2	3	8		2	2	3
Total number of species recorded within each habitat				5	2	3		4	1	0
Total number of species recorded within the location				5		6				

Notes:
12. Agriculture, Fisheries and Conservation Department (2024). Species Database of the Hong Kong Biodiversity Information Hub
13. The number of the abundance represents the total number of individuals recorded in surveys.

Abbreviations:
- Habitat: AL = Agricultural Land; DA = Developed Area; MoWa = Modified Watercourse; OP = Overgrown Pond; Pl = Plantation; Po = Pond

Appendix I Relative Abundance of Aquatic Species Recorded within the Study Area

Common Name	Scientific Name	Rarity and Distribution in Hong Kong / Conservation status [1]	Application Site	Study Area	
			Po	Po	MoWa
Fish					
Common carp	*Cyprinus carpio*	Not common in streams but occurs in many reservoirs and cultivated in fishponds as food fish.	+	+	
Mosquito fish	*Gambusia affinis*	Introduced as a mosquito-control agent, widespread in local freshwater bodies	+	+++	+++
Mozambique tilapia	*Oreochromis mossambicus*	Common	+	++	
Mud carp	*Cirrhinus molitorella*	Not common in streams but occurs in large numbers in many reservoirs and cultivated in fishponds as food fish.	+	+++	
Dwarf snakehead	*Channa gachua*	Probably an introduced species. Records from a few streams in North District.			++
Snakehead murrel	*Channa striata*	Uncommon in the wild and is an introduced species. Records from a few streams in North District and on Lantau Island.			++
		Total number of species recorded within each habitat	**4**	**4**	**3**
		Total number of fish species recorded	**4**	**6**	
Invertebrates					
Apple snail	*Pomacea canaliculata*	-	+	+++	
		Total number of species recorded within each habitat	**1**	**1**	**0**
		Total number of invertebrate species recorded	**1**	**1**	

Note:
1. Agriculture, Fisheries and Conservation Department (2024). Species Database of the Hong Kong Biodiversity Information Hub

Keys:
Relative abundance: + = Rare, ++ = Occasional, +++ = Common

Abbreviations:
- Habitat: Po: Pond; MoWa = Modified Watercourse

Appendix J
Management Protocol of the Solor Photovoltaic System during Operational Phase

1. BACKGROUND

1.1 Site History

1.1.1 The Application Site was originally two abandoned fish ponds in 1980s. However, the water depth of the ponds has become shallower and overgrown with weeds without proper management since 2000. Due to the accumulation of organic matter from dead leaves or grass clippings, overgrowing of algae was observed. Without proper management, the ponds nearly dried out in 2021.

1.1.2 To facilitate the proposed use of the solar photovoltaic system, management on these ponds has been conducted since 2023. The overgrown weeds in the ponds were removed. Both ponds were refilled with water with regular maintenance water-depth monitoring and stocked with fish.

1.2 Proposed Works

1.2.1 The solar photovoltaic (PV) system at the Application Site comprises a total of 152 PV panels, with an installed generation capacity of 50 kilowatts. The PV panels are non-glare plates installed on two floating platforms fabricated with hazardous free materials.

1.2.2 The installation of floating solar panel of about 0.067ha on top of the water bodies (with the reduction of the space among solar panels, it will be about 0.055ha), which only contributes about 31% (26.4%) of pond habitat within the Application Site.

1.3 Objective of the Management Protocol

1.3.1 The Application Site is located within the Conservation Area under the Mai Po and Fairview Park Outline Zoning Plan (OZP) No. S/YL-MP/8, and Wetland Buffer Area designated by Town Planning Board, which aims to conserve the ecological value of the fishponds in the Deep Bay Area. The potential ecological impacts during the construction phase and operational phase have been assessed in the EcoIA. With the implementation of the mitigation measures recommended, no adverse residual impact would be expected. Given that the Application Site is located within the Conservation Area and Wetland Buffer Area, a management protocol is therefore prepared, to specify the maintenance and monitoring works during operational phase in order to propose detailed measures to further minimize the potential impacts and maintain the habitat quality within the Application Site at the same time.

1.3.2 The Applicant will engage a contractor/landscape contractor as well as a qualified ecologist with 7 years relevant experience to conduct the following maintenance / management works and monitoring works.

2. MAINTENANCE WORKS DURING OPERATIONAL PHASE

2.1 The Solar photovoltaic (PV) System

2.1.1 Regular inspection and clearance of the floating PV system are essential for ensuring optimal performance. Monthly checks will be conducted to identify any signs of damaged dirt accumulation or shading issues of the solar panels and associated components that could affect performance. The solar panels will be cleaned as needed to remove dust, debris, and bird droppings, which can significantly reduce efficiency. All bird traces or droppings will be paid particular attention to the panels. This is particularly important as the floating solar system unintentionally provides a resting place for birds, which may lead to increased droppings on the panels.

2.1.2 Cleaning will be performed using a soft brush and water jet to avoid damaging the panels while ensuring that the surfaces remain clear for optimal sunlight exposure.

2.2 Invasive Plant

2.2.1 Regular inspections will be conducted to identify and assess any invasive plant species that may threaten native vegetation and disrupt the pond's ecosystem or the operation of the solar photovoltaic system. If any invasive species are detected, they will be promptly removed manually.

2.2.2 Additionally, monthly grass cutting and maintenance will be performed to prevent overgrowth of vegetation around the solar photovoltaic system and its components, ensuring optimal operation.

2.3 Pond Management

General

2.3.1 To protect excessive organic matters and pathogens, garbage would be disposed properly. Maintenance work for pond bed and bunds would be undertaken approximately every three years. As the ponds were restored to facilitate installation of the proposed solar photovoltaic system, management of the ponds as well as the water quality and water depth is therefore required. In accordance with the planning intention of the "Conservation Area" zone, which is to conserve the ecological value of the wetland and fish ponds, small number of fish will be stocked to echo the planning intention. However, the proposed management works is considered minimal when compared to the operation of commercial fish ponds.

Water quality

2.3.2 As small numbers of fish will be stocked, and in order to minimize the nuisance to nearby residential area (e.g. odor), regular inspections and measurements of water quality will be conducted monthly. The levels of dissolved oxygen and pH will be closely monitored to prevent deterioration of water quality and to promptly address any identified issues.

2.3.3 According to Environmental Management of Pond Fish Culture published by AFCD, the pH value of water in fishpond should be between 6 and 8.5. Hence, it is suggested adding lime into the ponds if the pH value of pond water and soil consistently below pH 6 for a period of time (AFCD, 2009).

2.3.4 Algal growth may affect aquatic life and affect water quality, which might produce odor during decomposition that cause nuisance to nearby residential area. Manual removal of the algae should be considered subject to the site condition and water level of the water body. Deployment of herbaceous fish species such as Grass Carp and Bighead to control algae might be required.

Water level

2.3.5 Regular monitoring of water level in the fishponds within the application site will be conducted. Should there be significant fluctuations in water levels, appropriate remedial measures will be implemented.

2.3.6 Soil in the area is considered drained marine clays which are sufficiently impermeable to maintain the ponds. The water depth will be monitored to determine if water leakage occurred. Clay liner will be required if water leakage is discovered.

Fish/fry restocking

2.3.7 Regular restocking is essential for maintaining a stable fish population, compensating for natural mortality rates caused by predation, disease, or environmental factors. Fish also play a crucial role in controlling algae growth by grazing on algae and other aquatic plants, thereby helping to maintain water quality. Additionally, the fish stock may provide potential foraging and feeding opportunities for wildlife.

2.3.8 According to the Environmental Management of Pond Fish Culture by AFCD, recommended fish species for sustaining a healthy pond environment include Bighead Carp, Silver Carp, edible goldfish, and Common Carp. *Herbaceous* species will be selected, hence no feeding of fish will be required. These species will be stocked in the pond annually. However, the numbers for fish stocking would be much fewer than the density for the commercial fish ponds.

3. MEASURES TO FURTHER MINIMIZE THE POTENTIAL IMPACTS TO WILDLIFE

3.1 Selection of Materials

3.1.1 As the Application Site is located within a Conservation Area and Wetland Buffer Area, waterbirds might be present in the vicinity, although the ecological value of the Application Site is ranked as low. As a precautionary measure, non-reflective surfaces will be adopted for the panels to minimize the potential impacts of reflection on birds.

3.2 Measures to Minimize Human Disturbance

3.2.1 The floating solar system might unintentionally provide a resting place for birds, maintenance and management work should only be conducted when the resting birds are left.

3.2.2 Besides, attention will also be paid on if any birds make use of the Application Site as breeding habitat. If signs of breeding behavior are noted during inspection, maintenance and management works near the breeding location should be halted, advice from qualified ecologists or AFCD should be sought.

3.3 Measures to Minimize Noise Disturbance

3.3.1 Should mechanical equipment to be used for the maintenance and management works, the Quality Powered Mechanical Equipment (QPME) approved by EPD should be adopted, to minimize the noise disturbance to the wildlife within the Application Site as well as the surrounding sensitive habitats.

4. ECOLOGICAL MONITORING DRUING OPERATIONAL PAHSE

4.1 Objective

4.1.1 To verify wildlife utilization of the restored ponds after installation and to evaluate that the claims of ecological enhancement (e.g., habitat restoration and wildlife attraction) are upheld during the operational phase. The monitoring duration will be 2 years after the installation is completed. The main aspects of ecological monitoring include fauna surveys (including waterbird /water-dependent bird, dragonfly, and amphibian surveys), fish population monitoring, and habitat quality assessments.

4.2 Monitoring Programme

4.2.1 The bird communities in the Application Site will be monitored. A transect count / point count survey will be conducted to determine the presence and abundance of all bird species encountered. The survey will be conducted once a month. Utilization of the Site as breeding habitat by birds will also be studied. During the surveys, observed birds will be classified according to their behavior i.e. feeding, roosting, breeding etc.

4.2.2 The herpetofauna survey will be conducted during the wet season (i.e. between April and October) by using transect count method. The presence and abundance of species encountered visually or aurally on the transect will be recorded.

4.2.3 Presence and abundance of adult dragonfly target species will be estimated using transect count method. Surveys will be conducted monthly between April and October, when the key species are more active (Tam *et al.* 2011).

4.2.4 If any other species of conservation importance including but not limited to mammal or butterfly are encountered, they will be recorded and reported in the quarterly monitoring reports.

4.2.5 Monitoring of fish number and species will be conducted bi-monthly with using bank-side count and/or hand net to actively search for fish. Fish species and crustaceans found in the surveyed ponds will be recorded and identified to the lowest possible taxon, and their relative abundance will be reported. The range of the majority size will be recorded as <10cm and >10cm. Additionally, the special behaviour of fish will be recorded, if any.

4.2.6 Regular inspections and measurements of water quality will be conducted monthly during the management work. The levels of dissolved oxygen and pH will be closely monitored to prevent deterioration of water quality and to promptly address any identified issues.

4.2.7 The monitoring data will be compared with the ecological baseline in the EcoIA or the Environmental Management of Pond Fish Culture published by AFCD, should any abnormal results are found during the monitoring period, investigation will be conducted including but not limited to reviewing the adaptive management regime.

4.3 Reporting

4.3.1 A Quarterly Monitoring and Management Report will be prepared for the Application Site. This Report includes a summary of species richness and abundance trends of the

Application Site, habitat quality metrics and the management activities undertaken during the reporting quarter.