
CONTENTS

1	RECOGNISED SITES OF CONSERVATION IMPORTANCE	3
2	METHODOLOGY	4
3	LITERATURE REVIEW	9
4	FIELD SURVEY RESULTS	21
5	ECOLOGICAL EVALUATION.....	36
	REFERENCES.....	48

LIST OF TABLES

Table 1.	<i>Ecological Survey Programme from July 2019 to July 2020</i>
Table 2.	<i>Mammal species of conservation importance in assessment area recorded by AFCD</i>
Table 3a.	<i>Bird species of conservation importance recorded by Mott MacDonald (2013) and AFCD</i>
Table 3b.	<i>Maximum number of ardeid nests counted from the TSL Egretty in the past ten years</i>
Table 4.	<i>Herpetofauna species of conservation importance recorded from the assessment area by AFCD</i>
Table 5.	<i>Butterfly species of conservation importance recorded from the assessment area by AFCD</i>
Table 6.	<i>Odonate species of conservation importance recorded from the assessment area by AFCD</i>
Table 7.	<i>Habitats present within the Project Site and the 500m assessment area</i>
Table 8.	<i>List of bird species of conservation importance recorded during the survey period</i>
Table 9.	<i>Bird diversity and abundance in YLTN and adjacent major watercourses</i>
Table 10.	<i>Bird diversity and abundance in channelised KTR and adjacent major watercourses</i>
Table 11a.	<i>Number of ardeid species recorded at the night roost at KTR</i>
Table 11b.	<i>Number of ardeid nests counted in the Tung Shing Lei Egretty from April to July 2020</i>
Table 12.	<i>Flight-lines of waterbirds at the proposed barrage and parapet wall at Kam Tin River</i>
Table 13.	<i>List of herpetofauna species of conservation importance recorded during the survey period</i>
Table 14.	<i>List of butterfly species of conservation importance recorded during the survey period</i>
Table 15.	<i>List of odonate species of conservation importance recorded during the survey period</i>
Table 16.	<i>Results of Van Veen benthic grab surveys conducted in SPR</i>
Table 17.	<i>Results of Van Veen benthic grab surveys conducted in KTR</i>
Table 18.	<i>Habitat evaluation for channelised watercourse (YLTN)</i>
Table 19.	<i>Habitat evaluation for channelised watercourse (SPR and KTR)</i>
Table 20.	<i>Habitat evaluation for other channelised watercourses (YLB, SCR and other minor channelised watercourses)</i>
Table 21.	<i>Habitat evaluation for semi-natural watercourse (Old KTR)</i>
Table 22.	<i>Habitat evaluation for pond</i>
Table 23.	<i>Habitat evaluation for tidal marsh and mangrove</i>
Table 24.	<i>Habitat evaluation for reedbed</i>
Table 25.	<i>Habitat evaluation for abandoned wet agricultural land/freshwater marsh</i>
Table 26.	<i>Habitat evaluation for mitigation wetland</i>
Table 27.	<i>Habitat evaluation for shrubland</i>
Table 28.	<i>Habitat evaluation for agricultural land</i>
Table 29.	<i>Habitat evaluation for mixed woodland</i>
Table 30.	<i>Habitat evaluation for plantation</i>
Table 31.	<i>Habitat Evaluation for developed area and wasteland</i>
Table 32.	<i>Evaluation for floral species of conservation importance</i>
Table 33.	<i>Evaluation for faunal species of conservation importance</i>

LIST OF ANNEXES

Annex 1.	<i>Floral species recorded within the Project Site and the assessment area</i>
Annex 2.	<i>Faunal species recorded within the Project Site and the assessment area</i>
Annex 3.	<i>Representative photographs of habitats and species of conservation importance recorded within the assessment area</i>

LIST OF FIGURES

Figure A1. Recognised Sites of Conservation Importance

Figure A2a-c. Surveys Transects and Sampling Locations

Figure A3. Major Watercourses within the 500m assessment area

Figure A4a-c. Habitat Map with Indicative Locations of Non-bird Species of Conservation Importance

Figure A5a-5c Flight-lines of Waterbirds

Figure A6. Indicative Distribution of Mai Po Bent-winged Firefly

1 RECOGNISED SITES OF CONSERVATION IMPORTANCE

- 1.1.1 **Figure A1** shows the recognized sites of conservation importance identified within and near the 500m assessment area of the Project.
- 1.1.2 About 1,500 ha of wetland in the Mai Po and Inner Deep Bay region has been listed as a Ramsar Site under the Ramsar Convention since 1995. The site has a shallow bay with extensive intertidal mudflats backed by mangroves, tidal shrimp ponds (*gei wais*), commercial fishponds and reedbeds. The site serves as an important over-wintering and refueling station site for the waterbirds along the East Asian-Australasian Flyway. About 400 species, representing around 70% of the Hong Kong birds, have been recorded there. The Site regularly supports some 50,000-80,000 waterbirds in winter, including a number of globally threatened species, such as Black-faced Spoonbill *Platalea minor*, Saunders's Gull *Chroicocephalus saundersi* and Nordmann's Greenshank *Tringa guttifer*. The Mai Po Marshes and the Inner Deep Bay area were also designated as Sites of Special Scientific Interest (SSSI) in 1976 and 1986, respectively. The Mai Po Marshes SSSI covers an area of about 393 ha, while the Inner Deep Bay SSSI is approximately 1036 ha in size. Part of the Mai Po Marshes SSSI, largely the *gei wais*, was designated as Mai Po Nature Reserve (MPNR) and has been actively managed by World Wide Fund for Nature Hong Kong since 1983 for conservation and education purposes. Whilst the Ramsar Site, SSSIs and MPNR are situated outside of the 500m assessment area, they are about 1.5 to 2km from the proposed Project Sites boundary, and are, to varying extent, hydrologically and ecologically linked to the current assessment area and Project Sites.
- 1.1.3 An approximately 1011.6 ha of land in the Deep Bay area comprised mainly of commercial fishponds is designated as a Priority Site for Enhanced Conservation (namely Deep Bay Wetland Outside Ramsar Site) under the New Nature Conservation Policy drawn up in 2004. Part of the 500m assessment area including reedbeds, developed areas, ponds and watercourses near Nam Sang Wai (NSW), and a small part of the Project Site in Kam Tin River (KTR) fall within this Priority Site (see **Figure A1**).
- 1.1.4 The northern parts of the Project Sites and assessment area overlap with the Wetland Conservation Area (WCA) and Wetland Buffer Area (WBA). To conserve the ecological value of the Ramsar site and prevent habitat fragmentation from development, the Town Planning Board adopts a two-pronged approach to land use planning control through the designation of WCA and WBA. The WCA basically covers the existing contiguous and adjoining active or inactive fishponds in the landward part of the Ramsar Site with the planning intention to conserve the ecological value of the fishponds which form an integral part of the wetland ecosystem in the Deep Bay area. A strip of land of about 500m wide along the landward side of the WCA is designated as the WBA to protect the ecological integrity of the fishponds and wetlands within the WCA and to prevent developments that would have a negative off-site impact on the ecological value of fishponds.
- 1.1.5 Two small areas in Chung Hau Yu Man San Tsuen and Kai Shan are under the zoning of Conservation Area in the Nam Sang Wai Outline Zoning Plan No. S/YL-NSW/8 and Ping Shan Outline Zoning Plan No. S/YL-PS/18, respectively. A small hillside area near Au Tau and a series of man-made mitigation wetland associated with the West Rail Line are under the same zoning as Conservation Area in the Kam Tin North Outline Zoning Plan No. S/YL-KTN/9 and Kam Tin South Outline Zoning Plan No. S/YL-KTS/15. This zoning is intended to protect and retain the existing natural landscape, ecological or topographical features of the area for conservation, educational and research purposes.
- 1.1.6 The active Tung Shing Lei (TSL) Egretty is located between the two major Project Sites in the KTR and the YLTN where the proposed barrage is located. An area of ardeid night roost is known along the Kam Tin River Channel near Au Tau.

2 METHODOLOGY

2.1 Location and Area

- 2.1.1 The assessment area for terrestrial ecological field surveys included all area within 500m from the proposed boundary of the Project, any associated works, as well as areas likely to be impacted by the project. The boundary of the 500m assessment area is illustrated in **Figure A1**.

2.2 General

- 2.2.1 The ecological surveys addressed the requirements in establishing the ecological baseline profile and followed the requirements of the pertinent of Annexes 8 and 16 of the Technical Memorandum as well as Environmental Impact Assessment Ordinance Guidance Note No. 7/2010 “Ecological Baseline Survey for Ecological Assessment”, No. 10/2010 “Methodologies for Terrestrial and Freshwater Ecological Baseline Survey” and No. 11/2010 “Methodologies for Marine Ecological Baseline Surveys”.

2.3 Literature Review

- 2.3.1 Desktop literature review on the existing ecological and fisheries baseline condition were carried out upon commencement of the study. Findings of relevant studies or surveys, including but not limited to relevant Environmental Impact Assessment reports, newsletter related to local ecology and conservation (such as Hong Kong Biodiversity by Agriculture, Fisheries, and Conservation Department (AFCD) and Connections by Kadoorie Farm and Botanic Garden (KFBG)), published scientific papers, as well as the Biodiversity Database and other publications on the conservation status and distribution of local flora and fauna etc.
- 2.3.2 All available information were collated and evaluated to identify any information gap relating to the establishment of the ecological profile of the aquatic and terrestrial environment, and to determine the ecological surveys needed for an ecological impact assessment.

2.4 Ecological Field Surveys

- 2.4.1 The survey period covered both wet and dry seasons in the period of 12 months from July 2019 to June 2020, while the egret survey was carried out from April to July 2020. A programme of the Study showing the survey frequency is presented below in **Table 1**:

Table 1. Ecological Survey Programme from July 2019 to July 2020

Ecological Field Surveys	2019						2020						
	Wet Season				Dry Season			Wet Season					
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul
Habitat and Vegetation Survey		✓	✓						✓				
Terrestrial Mammal Survey	✓		✓		✓		✓		✓		✓		
Terrestrial Mammal Survey (Nighttime)	✓		✓		✓		✓		✓		✓		
Infra-red Camera Surveys for Eurasian Otters	Carried out continuously throughout the 12-month survey period												/
Avifauna Transect Survey	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Avifauna Transect Survey (Nighttime)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	

Ecological Field Surveys	2019						2020						
	Wet Season				Dry Season			Wet Season					
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul
Survey of Ardeid Night Roost at KTR	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Survey of flight behaviour of waterbirds	✓ [#]	✓ [#]	✓	✓	✓ [*]	✓ [*]	✓ [*]	✓ [*]	✓	✓ [#]	✓ [#]	✓	
Egrettry Survey										✓	✓	✓	✓
Herpetofauna Survey	✓	✓	✓		✓				✓		✓		
Herpetofauna Survey (Nighttime)	✓	✓	✓		✓				✓		✓		
Butterflies and Odonates Survey	✓	✓	✓		✓				✓		✓		
Fireflies	✓	✓	✓							✓	✓	✓	
Aquatic Assemblages Survey			✓						✓				
Intertidal / Benthic Survey			✓						✓				

*survey of flight behaviour of roosting waterbirds in winter

#survey for flight behaviour of ardeids during breeding season

2.4.2 All ecological field surveys were carried out in a manner that would not cause any unnecessary stress or damage to any species or habitats. Permission under the Wild Animal Protection Ordinance (Cap. 170) for using hand-nets and traps during the field surveys was obtained from AFCD prior to the surveys.

2.4.3 All floral and faunal species of conservation importance recorded during the surveys were photographed as far as possible and the locations of the records were marked with a GPS device.

Habitat Survey

2.4.4 Habitats within the assessment area were identified by referring to the latest available aerial photographs obtained from Lands Department and also ground-truthing. Habitats identified were illustrated on a habitat map of an appropriate scale to show the distribution and coverage of each habitat type.

2.4.5 Ecological characteristics of each identified habitat type, such as size, vegetation type, dominant floral species present, species abundance and diversity, community structure, naturalness, seasonal patterns and inter-dependence of habitats and species, and presence of any features of ecological importance, were recorded and discussed. For watercourses, physical attributes such as type of riparian zone, substrate type, and any signs of disturbance were reported. Representative photographs of each habitat type and any importance ecological features were provided.

Vegetation Survey

2.4.6 Vegetation survey was conducted via transects. Floral species observed during the surveys were identified to species level, with their relative abundance recorded. A plant species list presenting the recorded plant species and presence of species of conservation importance was established for the Survey Area. The plant species list also presented the conservation status, the form (e.g. herbaceous,

shrub, tree) and categorise whether the species is native or exotic. Nomenclature and conservation status of floral species follows Xing *et al.* (2000), Siu (2000) and Barretto *et al.* (2011) as well as AFCD (2003, 2007, 2008, 2009 and 2011).

Terrestrial Mammal Survey

- 2.4.7 Surveys for terrestrial mammals were conducted along transects. Since most mammalian species in Hong Kong occur at low densities, surveys for mammals included both direct observation and active searching for signs of mammal occurrence (including potential roost, footprints and droppings). Night-time surveys were also conducted to supplement the findings from day-time surveys. With regards to bats, night-time transect surveys using bat detector were also carried out mainly at and near the proposed works area, where direct impact to bats and/or bat roost(s) may occur. Due to the limited information published in Hong Kong, identification of bats recorded may not be possible.
- 2.4.8 Special attention was paid to the Eurasian Otter that may potentially occur within the 500m assessment area. Due to the cryptic nature and apparently low population size, a total of four infra-red auto-trigger cameras were deployed at the same time in the 500m assessment area.
- 2.4.9 Nomenclature of species follows AFCD Hong Kong Biodiversity Database. The commonness and conservation status (including status from Red List of China's Vertebrates, the latest IUCN red list and other scientific research study e.g. Fellowes *et al.* (2002)) for each species were presented.

Avifauna Survey

- 2.4.10 Surveys for birds were conducted monthly by transect count with the aid of a pair of binoculars at a suitable time (usually in early morning) when birds are most active. Night-time surveys were also conducted to detect presence of nocturnal species.
- 2.4.11 Avifauna species were detected either by direct sighting or by their call. Species recorded were identified and quantified, with special reference to behaviours such as feeding, roosting and breeding. Observations of birds within the Project Areas including YLTN, KTR, Sham Chung River (SCR) and Yuen Long Bypass Floodway (YLBF) were recorded separately (see **Figure A3**). Birds observed in YLTN will be recorded by four sections: Section to the south of Yuen Long Highway (Section 1), Shap Pat Heung Road to Long Ping MTR Station (Section 2), Long Ping MTR Station to the existing inflatable dam (Section 3), and the existing inflatable dam to the location of the proposed barrage (Section 4). Observations of birds in Shan Pui River (SPR) to the north of the proposed barrage outside of the Project Boundary were also recorded separately.
- 2.4.12 A comprehensive list of species recorded from the assessment area was prepared, with wetland-dependence, conservation and/or protection status indicated. Nomenclature of species follows the updated List of Hong Kong Birds published by the Hong Kong Bird Watching Society.

Survey of Ardeid Night Roost at KTR

- 2.4.13 The ardeid night roost survey at KTR near Yuen Long Highway was surveyed monthly, with number, species, and the time when the ardeids return to the roost recorded. Survey commenced one hour before sunset and was conducted at a vantage point (see **Figure A2**). Location of the night roost was presented on a habitat map.

TSL Egretty Survey

- 2.4.14 The breeding ardeid population of TSL Egretty was surveyed in one continuous breeding season from April to July 2020. Species of breeding birds were recorded, along with the number of nests with

chicks and/or incubating adults counted during each survey. Location of the egretty was marked on the habitat map. Search of newly established egretty within the 500m assessment area were also conducted during April to July, though none was recorded.

Survey for Flight Behaviour of Waterbirds

- 2.4.15 Flight behaviour of waterbirds in areas around the proposed location of the barrage was studied. As the flight behaviour of waterbirds covered ardeids in the areas, no specific survey was conducted for the ardeids roosting beside Kam Tin River. Surveys were conducted in three 30-minute sessions (morning, noon and afternoon) in each month throughout the study period. Flight directions and heights of waterbirds were recorded by species. The vantage point of conducting the survey is indicated on **Figure A2**. The records were summarised as major flight lines and flight heights summarised in groups in the report.
- 2.4.16 Additional survey for the flight behaviour of roosting waterbirds (i.e. mainly Great Cormorant) at major roost at NSW was conducted between November and February, with one morning session and one evening session each month. The morning session commenced one hour before sunrise, while the evening one started one hour before sunset. Flight directions and heights, where appropriate, of waterbirds taking off from the roost in the morning and returning to the roost in the evening were recorded. The vantage point of conducting the survey is indicated on **Figure A2**. The records were summarised as major flight lines and flight heights summarised in groups in the report. Number of birds was presented.
- 2.4.17 The use of feeding habitats by ardeids during the breeding season in the TSL Egretty was studied. Surveys were conducted monthly in July and August 2019, and April to May 2020, with two sessions per month – once during low-tide and once during high-tide. Surveys were carried out at vantage points with the aid of binoculars, observing the flight directions and landing locations, if possible. Flight height of each ardeid observed was estimated as far as possible. The location of the vantage points is presented in **Figure A2**. The records were summarised as major flight lines and flight heights, where appropriate, summarised in groups in the report.

Herpetofauna Survey

- 2.4.18 Herpetofauna survey was conducted via transects. All potential habitats for amphibian and reptile were actively searched throughout the survey. Microhabitats were examined (e.g. stones, crevices or rotten log) or deliberately uncovered to reveal the presence of the amphibians and reptiles hiding under these covers. Active searching for eggs and tadpoles of amphibians in aquatic habitats was conducted to indicate breeding activities.
- 2.4.19 All life form of amphibians, including adult, tadpole, juvenile and egg, were recorded to indicate the breeding potential in the survey sites. Owing to the nocturnal behaviour of most herpetofauna species, night-time surveys were also conducted.
- 2.4.20 Nomenclature of species follows AFCD Hong Kong Biodiversity Database. The commonness and conservation status (including status from Red List of China's Vertebrates, the latest IUCN red list and other scientific research study e.g. Fellowes *et al.* (2002)) for each species were presented.

Butterfly and Odonate Survey

- 2.4.21 Transect surveys were conducted for butterflies and odonates, with species mainly detected by direct observation. For butterflies, active searching for larvae and pupae within 5m of the transects was also conducted. For odonates, special attention was paid to aquatic habitats such as watercourses. All species observed were identified to species level and quantified. Species occurring

outside 5m of the transects but within the assessment area were also recorded. The surveys were conducted at suitable weather condition to avoid overcast weather when butterflies and odonates are mostly less active and less easy to be detected.

- 2.4.22 Nomenclature of butterfly and odonate species follows AFCD Hong Kong Biodiversity Database. The commonness and conservation status (including status from China Red Data Book, the latest IUCN red list and other scientific research study e.g. Fellowes *et al.* (2002)) for each species were provided.

Firefly Survey

- 2.4.23 Firefly surveys were conducted monthly from July to September 2019 and April to June 2020 following the survey transects for terrestrial fauna focusing on mangrove habitat. The firefly surveys were conducted shortly after dusk for at least 3-4 hours. During the survey, any adult firefly observed was identified to the species level, where possible. The abundance and distribution of fireflies, in particular Bent-winged Firefly, were recorded.

Assemblages Survey

- 2.4.24 Aquatic fauna survey was conducted at designated sampling points (shown in **Figure A2**) once in the dry season and once in the wet season. Aquatic fauna including freshwater macro-invertebrates and fishes were studied by direct observation and active searching by nets, traps and standard field sampling techniques as appropriate.
- 2.4.25 Nomenclature of species follows AFCD Hong Kong Biodiversity Database. The commonness and conservation status (including status from Red List of China's Vertebrates, the latest IUCN red list and other scientific research study e.g. Fellowes *et al.* (2002)) for each species will be presented.

Intertidal/Benthic Survey

- 2.4.26 The intertidal and benthic survey consisted of walk-through surveys and quantitative sampling at the designated sampling locations within the 500m assessment area (see **Figure A2**), subject to accessibility with particular attention to mangrove and mudflat habitats. For walk-through surveys, the accessible shorelines along SPR and KTR were surveyed. Organisms encountered were recorded and their relative abundance noted. For quantitative sampling, at each survey location, three replicates of grab samples over a 0.1m² area substrate were collected using a Van Veen Grab. Sampling locations are shown in **Figure A2**. The samples were gently washed through a sieve of mesh size of 0.5mm to retain the benthic in-fauna. All organisms found in each sample were identified and recorded to the lowest possible taxonomic level to allow density per quadrat/core to be calculated.
- 2.4.27 Abundance and species diversity H' and evenness J were calculated for the pooled data, using the formulae:

$$H' = -\sum (N_i/N) \ln (N_i/N); \text{ and } J = H' / \ln S$$

where S is the total number of species in the sample, N is the total number of individuals, and N_i is the number of individuals of the i^{th} species.

3 LITERATURE REVIEW

3.1 Materials Reviewed

3.1.1 Major literature reviewed in this ecological assessment included:

- A field guide to the terrestrial mammals of Hong Kong (Shek 2006);
- The Hong Kong Biodiversity Database of AFCD;
- Hong Kong Biodiversity – newsletter of AFCD;
- A new species of firefly from Hong Kong – *Pteroptyx maipo* Ballantyne, 2011 (Yiu 2011);
- *Pteroptyx maipo* Ballantyne, a new species of bent-winged firefly (Coleoptera: Lampyridae) from Hong Kong, and its relevance to firefly biology and conservation (Ballantyne *et al.* 2011);
- Construction of Cycle Tracks and the Associated Supporting Facilities at Nam Sang Wai, Yuen Long – Final Environmental Impact Assessment Report (EIA-205/2012; Mott MacDonald 2013);
- Elevated Pedestrian Corridor in Yuen Long Town Connecting with Long Ping Station – Investigation, Design and Construction – Environmental Impact Assessment Report (AEIAR-200/2016; Arup 2016);
- Yuen Long Effluent Polishing Plant – Investigation, Design and Construction – Environmental Impact Assessment Report (AEIAR-220/2019; AECOM 2019)

3.1.2 A checklist of faunal species (including mammals, birds, herpetofauna, butterflies, dragonflies, freshwater fishes and fireflies) recorded within the current 500m assessment area under AFCD's territory-wide long-term biodiversity survey was also obtained from the Department. However, no specific locations of the species recorded were given.

3.2 Habitat and Flora

3.2.1 Areas relevant to the current study covered in the assessment carried out in Mott MacDonald (2013) include:

- the confluence area of SPR and KTR;
- the section of KTR from Tung Shing Lei and Cheung Chun San Tsuen to the confluence;
- the section of SPR from Shan Pui Chung Hau Tsuen to the confluence;
- much of the NSW area;
- semi-natural or unchannellised sections of KTR;
- the lower section of YLBF that drains into KTR;
- TSL Egretty and its vicinity;
- Chu Wong Ling; and
- Yuen Long Industrial Estate

3.2.2 Arup (2016) studied the section of the YLTN stretching from Long Ping MTR Station to Ma Tin Road, and the associated 500m assessment area, which is highly urbanised and developed.

3.2.3 A total of 14 types of habitats were identified by Mott MacDonald (2013) and Arup (2016) in the current 500m assessment area, namely drainage channel/channelised watercourse, woodland, shrubland, hillside grassland, plantation, marsh, mangrove, developed area, open field, wasteland, pond, water ditch, low-lying grassland/abandoned agricultural land, wet agricultural land.

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- 3.2.4 The following sections present the findings from Mott MacDonald (2013) and Arup (2016) on habitat and flora in the current assessment area.

Drainage Channel/Channelised Watercourse

- 3.2.5 Major drainage channels or channelised watercourses located within the assessment area are the channelised KTR and SPR, the YLTN, and the YLBF. Most of these channels were observed to be heavily polluted. However, the mangrove and mudflat along the lower course of SPR are favourite feeding grounds of waterbirds during the low tide period.
- 3.2.6 YLTN is the major channelised watercourse in the west of the current assessment area and is a major part of the current Project Area. It flows from the south of Yuen Long, directing the flow from various contributing village areas and the town centre north to SPR and eventually the Deep Bay Area. Vegetation along the banks of YLTN included *Ficus microcarpa*, *Bombax ceiba*, *Lagerstroemia speciosa*, *Dimocarpus longan*, and *Bauhinia x blakeana*.

Woodland

- 3.2.7 Within the current assessment area, small blocks of woodland were identified near Tung Shing Lei and Au Tau. These three woodlands are secondary woodlands developed on hills. Dominant plant species include *Celtis sinensis*, *Dimocarpus longan*, *Acacia confusa*, *Cinnamomum camphora*.

Shrubland

- 3.2.8 A shrubland area was found in hillside area at Chu Wong Ling. This type of habitat is a subsequent succession stage of grassland. Most of these habitats are situated on hillsides where human disturbance, particularly hill fire events is not too frequent. Common shrub species include *Lantana camara*, *Mussaenda pubescens* and *Trema tomentosa*.

Hillside Grassland

- 3.2.9 A small patch of hillside grassland was identified at the southeastern slope on the small hill at Tung Shing Lei. Common plant species include *Ischaemum barbatum*, *Neyraudia reynaudiana* and *Miscanthus sinensis*.

Plantation

- 3.2.10 Plantation refers to those habitats dominated by planted trees and shrubs for landscaping. Common plant species include *Ficus microcarpa*, *Litchi chinensis*, *Spathodea campanulata*, *Ixora chinensis* and *Duranta erecta*. Some plantation areas along SPR were established for ecological and landscape mitigation measure for the channelisation works of these river channels, which were found dominated by *Eucalyptus* species.

Marsh

- 3.2.11 Majority of the marsh habitats found within the area are derived from abandoned fishponds. Dominant plant species include *Phragmites australis*, *Brachiaria mutica* and *Paspalum paspaloides*.

Mangrove

- 3.2.12 Major mangrove habitats were found locating along the embankments of the channelised SPR. The mangroves along SPR were planted in 1996 during the river channelisation works as an environmentally friendly channel design measure for ecological enhancement and compensation for

the loss of habitats. Dominant mangrove species found in this habitat are *Kandelia obovata* and *Acanthus ilicifolius*. Invasive exotic mangrove species *Sonneratia caseolaris* and *Sonneratia apeltala* were also recorded in these habitats.

Developed Area

- 3.2.13 Most of the area within the current assessment area is highly urbanised and developed. It mainly consists of urban and rural residential developments. There are road-side planting and plantations in rural residential area within the assessment area. Flora recorded in the area are mainly common horticultural species including *Ficus microcarpa*, *Bombax ceiba*, *Lagerstroemia speciosa*, *Dimocarpus longan*, *Bauhinia x blakeana*, *Acacia confusa*, *Melaleuca cajuputi*, *Celtis sinensis*, *Bidens alba*, *Ipomoea cairica* and *Duranta repens*.

Open Field

- 3.2.14 Open field refers to bare ground, construction site or wasteland. This habitat was found to be distributed along KTR and near Chung Hau Yu Man San Tsuen. Except for some common weed species such as *Bidens alba*, *Eleusine indica* and *Mimosa diplotricha*, these habitats are virtually free of vegetation cover.

Wasteland

- 3.2.15 Wasteland refers to those areas of undetermined land use currently and heavily vegetated by invasive plant species such as *Leucaena leucocephala*. The dominance of *Leucaena leucocephala* can hinder habitat regeneration by inhibiting re-colonisation of native plant species. Small, isolated patches of wasteland were identified near Sha Po and Tung Shing Lei.

Pond

- 3.2.16 Pond is a major type of habitat found within the assessment area. These pond habitats can be roughly divided into three areas separated by the two drainage channels. Only a few scattered ponds occur in the current assessment area. Dominant plant species includes *Brachiaria mutica*, *Bidens alba*, *Phragmites australis*, *Commelina diffusa*, *Panicum* spp. and *Paspalum* spp.
- 3.2.17 A floodwater storage pond is located further south at Ma Tin Road. It is managed by Drainage Services Department (DSD). The area is fenced off, with the bed lined with concrete and grasscrete lining. The area was dry at the time of site visit. The vegetation included *Senna surattensis* and *Acacia confusa*. It should not be considered similar to other active or abandoned fishponds within or near the assessment area.

Water Ditch

- 3.2.18 Water ditch refers to the semi-natural sections of KTR retained after the major channelisation works. Common riparian vegetation recorded in this habitat includes *Brachiaria mutica*, *Panicum* spp. and *Paspalum* spp.

Low-Lying Grassland/Abandoned Agricultural Land

- 3.2.19 These habitats were established by the abandonment of cultivation or backfilling of fishponds. Their distribution is quite scattered throughout the assessment area. Common plant species include *Bidens alba*, *Panicum maximum*, *Mikania micrantha* and *Mimosa pudica*.

Wet Agricultural Land

- 3.2.20 There is one piece of wet agricultural land located to the east of the YLTN near Long Ping MTR Station, which is dominated by lotus. This area of wet agricultural land is located to the south of the Long Ping West Rail Station and is fragmented from other similar habitats in the far north by the surrounding urban developments. Apart from the lotus patch, the area is surrounded by some common plants species including *Macaranga tanarius* var. *tomentosa*, *Ficus microcarpa*, *Ravenala madagascariensis*, *Ligustrum sinense* and *Leucaena leucocephala*.

Floral Species of Conservation Importance

- 3.2.21 No floral species of conservation importance were recorded from the two studies.

3.3 Fauna

- 3.3.1 The following sections present the findings from AFCD (unpub. Data), Mott MacDonald (2013) and Arup (2016), and other literature where relevant, on fauna in the current assessment area.

Mammal

- 3.3.2 Given the wide and open fishpond landscape and high level of human activities for fishpond operation, large mammals are rare in the area. During the transect surveys by Mott MacDonald (2013), no large mammals were recorded. Small-sized bats were recorded but were not identified as no acoustics surveys were carried out. No mammals were recorded in Arup (2016).
- 3.3.3 AFCD recorded six bats and eleven terrestrial mammals within the assessment area; with twelve being of conservation importance. A summary of these species has been provided in **Table 2** below. A major concern of the Study is the rare species Eurasian Otter. However, AFCD has confirmed that no Eurasian Otters were recorded within the current 500m assessment area; the nearest record of the species was at the confluence area of KTR and SPR (AFCD pers. comm.).

Table 2. Mammal species of conservation importance in assessment area recorded by AFCD

Species	Conservation and Protection Status ¹	Status in Hong Kong ²
Short-nosed Fruit Bat <i>Cynopterus sphinx</i>	RLCV(NT); Cap.170	Very Common
Chinese Horseshoe Bat <i>Rhinolophus sinicus</i>	Cap.170	Very Common
Japanese Pipistrelle <i>Pipistrellus abramus</i>	Cap.170	Very Common
Lesser Bamboo Bat <i>Tylonycteris pachypus</i>	(LC); Cap.170	Very Common
Lesser Yellow Bat <i>Scotophilus kuhlii</i>	(LC); Cap.170	Uncommon
Lesser Bent-winged Bat <i>Miniopterus pusillus</i>	(LC); RLCV(NT); Cap.170	Uncommon
Ryukyu Mouse <i>Mus caroli</i>	-	Rare
East Asian Porcupine <i>Hystrix brachyura</i>	PGC; Cap.170	Very Common
Small-toothed Ferret Badger <i>Melogale moschata</i>	RLCV(NT); Cap.170	Common
Small Indian Civet <i>Viverricula indica</i>	RLCV(VU); CSMPs(II); CITES(III); Cap.170; Cap.586	Very Common
Small Asian Mongoose <i>Herpestes javanicus</i>	RLCV(VU); CITES(III); Cap.170; Cap.586	Uncommon

Species	Conservation and Protection Status ¹	Status in Hong Kong ²
Leopard Cat <i>Prionailurus bengalensis</i>	RLCV(VU); CITES(II); Cap.170; Cap.586	Uncommon

Notes:

1. Conservation and protection status refers to Fellowes *et al.* (2002), Red List of China's Vertebrates (Jiang *et al.* 2016), IUCN (2020), China State Major Protection Status, CITES (2020), Cap. 170 and Cap. 586.
 - a. Conservation status by Fellowes *et al.* (2002): LC = Local Concern; PRC = Potential Regional Concern; RC = Regional Concern; PGC = Potential Global 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.
 - b. Conservation status by Red List of China's Vertebrates (RLCV) (Jiang *et al.* 2016): NT = Near Threatened; EN = Endangered.
 - c. Conservation status by IUCN (2020): NT = Near Threatened; EN = Endangered.
 - d. Protection status by China State Major Protection Status (CSMPS): II = Class II Protected Species in China.
 - e. Protection status by CITES (2020): II = Listed in CITES Appendix II; III = listed in CITES Appendix III.
 - f. Cap. 170 = Wild Animals Protection Ordinance.
 - g. Cap. 586 = Protection of Endangered Species of Animals and Plants Ordinance.
2. Status in Hong Kong follows AFCD (2020).

Avifauna

- 3.3.4 A high diversity of waterbirds was recorded in the wetland habitats, including fishponds, mudflats, channelised watercourses and mangroves, which provide significant foraging grounds for both resident and migratory waterbirds.
- 3.3.5 Significant number of waterbirds was found foraging and roosting along both KTR and SPR, and at the confluence areas of the two channels. In both channels, waterbirds recorded are in high abundance and diversity, showing ardeid and duck species to be the most dominant species groups. Foraging activities on the exposed mudflat and river banks varied under different tidal conditions; higher abundance of waterbirds was recorded during low tide periods. When the tide rises and the mudflat is submerged, waterbirds that utilise the exposed mudflat either leave the river channels or roost at the periphery of the mangrove and river banks. In KTR, ardeid would aggregate at the river section with higher deposition of sediment, notably at the section underneath Castle Peak Road.
- 3.3.6 Wader species, including Common Greenshank, Common Sandpiper, Wood Sandpiper, Marsh Sandpiper, Little-ringed Plover, Eurasian Curlew, Pied Avocet and Black-winged Stilt, are sparsely populated in both channels. Ducks, including Common Teal, Northern Pintail, Northern Shoveler and Eurasian Wigeon, are the most active feeding group recorded along the banks of both rivers in winter. Moreover, gull species (dominantly Black-headed Gull) is another waterbirds group commonly found feeding and roosting in KTR and SPR. Abundance of waterbirds peaked in November, December, January and February when a large wintering population are present.
- 3.3.7 Point count surveys were carried out in both SPR and KTR to compare bird usage and abundance between the upper and the lower sections of the two river channels. Data analysis suggested that in both rivers, the abundance and species richness were both significantly higher in the lower sections than in the upper sections. Abundance of birds and their species diversity increase towards to confluence of KTR and SPR, and decrease towards the upstream directions in both river channels. This finding suggests that the two Project Areas in KTR and YLTN are less important as foraging or roosting grounds when compared to their lower courses outside and downstream of the current assessment area.
- 3.3.8 The mosaic of wetland habitats in NSW area, including watercourses, ponds, mangrove and reedbed, is also an important site for migratory waterbirds. Furthermore, the NSW area is an important roosting site for Great Cormorants. In winter, large roosting aggregations of Great Cormorants on the gum trees in the NSW fishpond area were often seen after feeding at Inner Deep Bay.

3.3.9 The bird species of conservation importance recorded by AFCD and by Mott MacDonald (2013) in SPR, KTR and NSW are summarised in **Table 3a** below:

Table 3a. Bird species of conservation importance recorded by Mott MacDonald (2013) and AFCD

Species	Principal Status ¹	Conservation and Protection Status ²	Wetland-dependent?	Recorded in Mott MacDonald (2013) from:			Recorded by AFCD (location not given)
				KTR	SPR	NSW	
Northern Shoveler <i>Spatula clypeata</i>	W	RC	Y	✓	✓	✓	✓
Eurasian Wigeon <i>Mareca penelope</i>	W	RC	Y	✓	✓	✓	✓
Northern Pintail <i>Anas acuta</i>	W	RC	Y	✓	✓	✓	✓
Eurasian Teal <i>Anas crecca</i>	W	RC	Y	✓	✓	✓	✓
Common Pochard <i>Aythya ferina</i>	W	IUCN(VU)	Y			✓	
Tufted Duck <i>Aythya fuligula</i>	W	LC	Y	✓		✓	✓
Little Grebe <i>Tachybaptus ruficollis</i>	P	LC	Y	✓		✓	✓
Black-faced Spoonbill <i>Platalea minor</i>	W	PGC; RLCV(EN); IUCN(EN); CSMPS(II)	Y	✓	✓	✓	✓
Yellow Bittern <i>Ixobrychus sinensis</i>	M,Su	(LC)	Y				✓
Von Schrenck's Bittern <i>Ixobrychus eurhythmus</i>	M	RC	Y			✓	
Cinnamon Bittern <i>Ixobrychus cinnamomeus</i>	M	LC	Y				✓
Black Bittern <i>Dupetor flavicollis</i>	M	LC	Y				✓
Black-crowned Night Heron <i>Nycticorax nycticorax</i>	P	(LC)	Y	✓	✓	✓	✓
Striated Heron <i>Butorides striata</i>	Su	(LC)	Y				✓
Chinese Pond Heron <i>Ardeola bacchus</i>	P	PRC (RC)	Y	✓	✓	✓	✓
Eastern Cattle Egret <i>Bubulcus coromandus</i>	P	(LC)	Y	✓			✓
Grey Heron <i>Ardea cinerea</i>	W	PRC	Y	✓	✓	✓	✓
Purple Heron <i>Ardea purpurea</i>	AM,P	RC	Y				✓
Great Egret <i>Ardea alba</i>	P	PRC (RC)	Y	✓	✓	✓	✓
Intermediate Egret <i>Ardea intermedia</i>	M,P	RC	Y			✓	✓
Little Egret <i>Egretta garzetta</i>	P	PRC (RC)	Y	✓	✓	✓	✓
Great Cormorant <i>Phalacrocorax carbo</i>	W	PRC	Y	✓	✓	✓	✓
Western Osprey <i>Pandion haliaetus</i>	W	RC; RLCV(NT); CITES(II); CSMPS(II); Cap.586	Y	✓		✓	
Crested Serpent Eagle <i>Spilornis cheela</i>	R,M	(LC); RLCV(NT); CITES(II); CSMPS(II); Cap.586	N			✓	✓
Greater Spotted Eagle <i>Clanga clanga</i>	W	GC; RLCV(EN); IUCN(VU); CITES(II); CSMPS(II); Cap.586	N				✓
Eastern Imperial Eagle <i>Aquila heliaca</i>	W	GC; RLCV(EN); IUCN(VU); CITES(II); CSMPS(I); Cap.586	N				✓

Species	Principal Status ¹	Conservation and Protection Status ²	Wetland-dependent?	Recorded in Mott MacDonald (2013) from:			Recorded by AFCD (location not given)
				KTR	SPR	NSW	
Bonelli's Eagle <i>Aquila fasciata</i>	R	(RC); RLCV(VU); CITES(II); CSMPS(II); Cap.586	N				✓
Crested Goshawk <i>Accipiter trivirgatus</i>	R	RLCV(NT); CITES(II); CSMPS(II); Cap.586	N				✓
Besra <i>Accipiter virgatus</i>	R	CSMPS(II); CITES(II); Cap.586	N				✓
Eastern Marsh Harrier <i>Circus spilonotus</i>	W	LC; RLCV(NT); CITES(II); CSMPS(II); Cap.586	N			✓	✓
Black Kite <i>Milvus migrans</i>	W,R	(RC); CITES(II); CSMPS(II); Cap.586	N	✓	✓	✓	✓
White-bellied Sea Eagle <i>Haliaeetus leucogaster</i>	R	(RC); RLCV(VU); CSMPS(I); CITES(II); Cap.586	Y*				✓
Eastern Buzzard <i>Buteo japonicus</i>	W	CSMPS(II); CITES(II); Cap.586	N	✓	✓	✓	✓
Slaty-breasted Rail <i>Gallirallus striatus</i>	R	RC	Y	✓			
Eurasian Coot <i>Fulica atra</i>	W	RC	Y				✓
Black-winged Stilt <i>Himantopus himantopus</i>	W	RC	Y	✓	✓	✓	✓
Pied Avocet <i>Recurvirostra avosetta</i>	W	RC	Y	✓	✓		✓
Grey-headed Lapwing <i>Vanellus cinereus</i>	W	LC	Y				✓
Little Ringed Plover <i>Charadrius dubius</i>	W,R	(LC)	Y	✓	✓	✓	✓
Kentish Plover <i>Charadrius alexandrinus</i>	W	RC	Y		✓		
Greater Painted-snipe <i>Rostratula benghalensis</i>	M,R	LC	Y				✓
Pheasant-tailed Jacana <i>Hydrophasianus chirurgus</i>	M	LC; RLCV(NT)	Y				✓
Eurasian Curlew <i>Numenius arquata</i>	W/M	RC; RLCV(NT); IUCN(NT)	Y	✓			
Curlew Sandpiper <i>Calidris ferruginea</i>	SpM	RC; IUCN(NT)	Y				✓
Temminck's Stint <i>Calidris temminckii</i>	M,W	LC	Y				✓
Marsh Sandpiper <i>Tringa stagnatilis</i>	M,W	RC	Y	✓	✓		✓
Wood Sandpiper <i>Tringa glareola</i>	M,W	LC	Y	✓	✓	✓	✓
Spotted Redshank <i>Tringa erythropus</i>	W/M	RC	Y		✓		✓
Common Greenshank <i>Tringa nebularia</i>	M,W	RC	Y	✓	✓		✓
Oriental Pratincole <i>Glareola maldivarum</i>	M	LC	Y			✓	
Black-headed Gull <i>Chroicocephalus ridibundus</i>	W	PRC	Y	✓	✓		✓
Lesser Black-backed Gull <i>Larus fuscus</i>	W,M	LC	Y	✓			
Little Tern <i>Sternula albifrons</i>	M	LC	Y				✓
Greater Coucal <i>Centropus sinensis</i>	R	CSMPS(II)	N			✓	✓
Lesser Coucal <i>Centropus bengalensis</i>	R	CSMPS(II)	N			✓	

Species	Principal Status ¹	Conservation and Protection Status ²	Wetland-dependent?	Recorded in Mott MacDonald (2013) from:			Recorded by AFCD (location not given)
				KTR	SPR	NSW	
Asian Barred Owlet <i>Glaucidium cuculoides</i>	R	CITES(II); CSMPS(II); Cap.586	N			✓	
Pacific Swift <i>Apus pacificus</i>	SpM,Su	(LC)	N				✓
White-throated Kingfisher <i>Halcyon smyrnensis</i>	AM,P	(LC)	Y	✓	✓	✓	✓
Black-capped Kingfisher <i>Halcyon pileata</i>	AM,W	(LC)	Y	✓			✓
Pied Kingfisher <i>Ceryle rudis</i>	R	(LC)	Y	✓	✓	✓	✓
Common Kestrel <i>Falco tinnunculus</i>	AM,W	CITES(II); CSMPS(II); Cap.586	N				✓
Peregrine Falcon <i>Falco peregrinus</i>	R,W	(LC); RLCV(NT); CITES(I); CSMPS(II); Cap.586	N	✓			✓
Black-naped Oriole <i>Oriolus chinensis</i>	AM	LC	N				✓
Collared Crow <i>Corvus torquatus</i>	R	LC; RLCV(NT); IUCN(VU)	Y	✓	✓	✓	✓
Chinese Penduline Tit <i>Remiz consobrinus</i>	M,W	RC	N				✓
Oriental Skylark <i>Alauda gulgula</i>	W,P	LC	N				✓
Thick-billed Warbler <i>Arundinax aedon</i>	AM	LC	N				✓
Zitting Cisticola <i>Cisticola juncidis</i>	W	LC	N				✓
Golden-headed Cisticola <i>Cisticola exilis</i>	W	LC	N				✓
Red-billed Starling <i>Spodiopsar sericeus</i>	W	GC	N	✓		✓	✓
White-cheeked Starling <i>Spodiopsar cineraceus</i>	W	PRC	N				✓
Daurian Starling <i>Agropsar sturninus</i>	M	LC	N			✓	✓
White-shouldered Starling <i>Sturnia sinensis</i>	M,W,Su	(LC)	N			✓	✓
Naumann's Thrush <i>Turdus naumanni</i>	(Not included)	LC	N				✓
Red-throated Pipit <i>Anthus cervinus</i>	M,W	LC	N				✓
Chinese Grosbeak <i>Eophona migratoria</i>	M	LC	N				✓
Yellow-breasted Bunting <i>Emberiza aureola</i>	M	RC; RLCV(EN); IUCN(CR)	N			✓	
Total no. of species				33	25	35	66

Notes:

- Principal status refers to Carey *et al.* (2001): R = Resident; W = Winter Visitor; Su = Summer Visitor; M = Migrant; A = Autumn; Sp = Spring; P = Present all year, exact composition unknown.
- Conservation and protection status refers to Fellowes *et al.* (2002), Red List of China's Vertebrates (Jiang *et al.* 2016), IUCN (2020), China State Major Protection Status, CITES (2020), Cap. 170 and Cap. 586.
 - Conservation status by Fellowes *et al.* (2002): LC = Local Concern; PRC = Potential Regional Concern; RC = Regional Concern; PGC = Potential Global 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.
 - Conservation status by Red List of China's Vertebrates (RLCV) (Jiang *et al.* 2016): NT = Near Threatened; EN = Endangered.
 - Conservation status by IUCN (2019): NT = Near Threatened; EN = Endangered.
 - Protection status by China State Major Protection Status (CSMPS): II = Class II Protected Species in China.

- e. Protection status by CITES (2019): II = Listed in CITES Appendix II.
- f. All wild birds in Hong Kong are protected under Cap. 170 Wild Animals Protection Ordinance.
- g. Cap. 586 = Protection of Endangered Species of Animals and Plants Ordinance.

3.3.10 No species of conservation importance were identified within the YLTN south of Long Ping Station. The nullah itself and the vicinity were largely dominated by a few common bird species. Wetland birds such as Little Egrets, Chinese Pond Heron, Grey Heron, Black-winged Stilt, Black-headed Gull and Common Redshank were occasionally recorded in the section of YLTN between Long Ping Station and Fu Yip Street in very low abundance.

Egretty

3.3.11 The TSL Egretty was the third largest egretty in Hong Kong in the 2018 census, with 84 nests which accounted for 7.8% of the total number of nests in Hong Kong in that year (Anon 2019). However, hard pruning of trees within the nesting area in previous years was noted in the egretty in May 2019, while Typhoon Mangkhut (which took place in September 2018) resulted in thinning of vegetation in the same egretty (Anon 2020). According to the census data provided by HKBWS, the number of ardeid nest in the TSL Egretty decreased by 22.6% from 2018 to 2019 (Anon 2020). The egretty count results over the past ten years are provided below in **Table 3b**.

Table 3b. Maximum number of ardeid nests counted from the TSL Egretty in the past ten years (data extracted from Anon 2010, 2012a, 2012b, 2013, 2014, 2015, 2016, 2017, 2018 and 2020)

Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
No. of nests of Little Egret	26	40	37	34	36	30	20	21	49	27
No. of nests of Chinese Pond Heron	24	21	29	21	46	47	41	61	35	38
Total no. of nests recorded	50	61	66	55	82	77	61	82	84	65
Percentage of total no. nests in Hong Kong	6.8%	7.6%	7.7%	7.3%	8.5%	5.4%	4.9%	6.6%	7.8%	4.0%

Flight Behaviour of Roosting Migratory/Overwintering Waterbirds

3.3.12 The only migratory/overwintering bird species forming major roosts near the assessment area is Great Cormorant. The species is known to form large evening roosts in MPNR, NSW and Lok Ma Chau Mitigation Wetland. The peak roost counts of the species in the NSW area in recent years were 3,990 in December 2013, 4,360 in December 2014, 4,039 in December 2015, 4,272 in December 2016 and 3,713 in January 2018; however, the major roosting tree groups are outside of the current 500m assessment area (Mott MacDonald 2013, AECOM 2019). No information regarding their flight behaviour over the NSW area or near the Project Site was available.

Flight Behaviour of Breeding Ardeids

3.3.13 Flight paths of breeding ardeids in the area were not studied in detail or mapped in Arup (2016) or Mott MacDonald (2013), although in Mott MacDonald (2013), it was stated that field observations suggested the existing vehicular bridges and viaducts did not appear to impede flight paths of breeding ardeids along SPR and KTR. According to the EcoIA conducted for Town Planning Board's planning application, the observed flight directions from Tung Shing Lei egretty mainly flying a general northward direction (flying across the Yuen Long Highway and the Yuen Long Bypass Channel) with occasional individuals landing at the ponds in front of the egretty or flying western to Yuen Long Town direction.

Herpetofauna

- 3.3.14 In Arup (2016) and Mott MacDonald (2013), only a low diversity of common species was recorded in the assessment area; with none being of conservation importance. Two amphibian species of conservation importance and nine reptile species of conservation importance were recorded within the assessment area by AFCD (AFCD unpub. data). Nevertheless, the exact locations of these records were not provided. These species are summarised below in **Table 4**.

Table 4. *Herpetofauna species of conservation importance recorded from the assessment area by AFCD*

Species	Conservation and Protection Status ¹	Status in Hong Kong ²
Amphibians		
Spotted Narrow-mouthed Frog <i>Kalophrynus interlineatus</i>	RLCV(NT)	Widely distributed from low to moderate altitudes in northern and central New Territories.
Chinese Bullfrog <i>Hoplobatrachus rugulosus</i>	PRC; RLCV(EN); CSMPS(II)	Widely distributed in Lantau Island and New Territories.
Reptiles		
Reeves' Turtle <i>Mauremys reevesii</i>	GC; RLCV(EN); IUCN(EN); CITES(III); Cap.170; Cap.586	Widespread in the territory. Rare in recent years. Found in most local reservoirs.
Four-clawed Gecko <i>Gehyra mutilata</i>	RLCV(VU)	Widely but thinly distributed throughout Hong Kong.
Taiwan Kukri Snake <i>Oligodon formosanus</i>	RLCV(NT)	Widely distributed throughout Hong Kong.
Indo-Chinese Rat Snake <i>Ptyas korros</i>	PRC; RLCV(VU)	Widely distributed throughout Hong Kong.
Common Rat Snake <i>Ptyas mucosus</i>	PRC; RLCV(EN); CITES(II); Cap.586	Widely distributed throughout Hong Kong.
Many-banded Krait <i>Bungarus multicinctus</i>	PRC; RLCV(EN)	Widely distributed in New Territories, Hong Kong Island and Lantau Island.
Chinese Cobra <i>Naja atra</i>	PRC; RLCV(VU); IUCN(VU); CITES(II); Cap.586	Found throughout the territory.
Chinese Water Snake <i>Myrrophis chinensis</i>	RLCV(VU)	Distributed in freshwater or brackish wetlands in central and northern New Territories.
Buff-striped Keelback <i>Amphiesma stolatum</i>	LC	Distributed in lowland in central and northern New Territories and Lantau Island.

Notes:

- Conservation and protection status refers to Fellowes *et al.* (2002), Red List of China's Vertebrates (Jiang *et al.* 2016), IUCN (2020), China State Major Protection Status, CITES (2020), Cap. 170 and Cap. 586.
 - Conservation status by Fellowes *et al.* (2002): LC = Local Concern; PRC = Potential Regional Concern; GC = Global Concern. Conservation status by Red List of China's Vertebrates (RLCV) (Jiang *et al.* 2016): NT = Near Threatened; VU = Vulnerable; EN = Endangered.
 - Conservation status by IUCN (2020): VU = Vulnerable; EN = Endangered.
 - Protection status by China State Major Protection Status (CSMPS): II = Class II Protected Species in China.
 - Protection status by CITES (2020): II = Listed in CITES Appendix II; III = Listed in CITES Appendix III.
 - Cap. 170 = Wild Animals Protection Ordinance.
 - Cap. 586 = Protection of Endangered Species of Animals and Plants Ordinance.
- Status in Hong Kong follows AFCD (2020).

Butterflies and Odonates

- 3.3.15 Only common and widespread species were recorded previously by Arup (2016) and Mott MacDonald (2013) in the current assessment area, with none being of conservation importance. AFCD recorded 82 species of butterflies from the current assessment area, with fifteen species of conservation importance. These species are listed below in **Table 5**.

Table 5. *Butterfly species of conservation importance recorded from the assessment area by AFCD*

Species	Conservation and Protection Status ¹	Status in Hong Kong ²
Common Awl <i>Hasora badra</i>	LC	Very Rare
Grey Scrub Hopper <i>Aeromachus jhora</i>	-	Rare
Paintbrush Swift <i>Baoris farri</i>	-	Rare
Colon Swift <i>Caltoris bromus</i>	-	Very Rare
Dark Brown Ace <i>Halpe porus</i>	LC	Very Rare; Species of Conservation Concern
Pale Palm Dart <i>Telicota colon</i>	LC	Rare
Grass Demon <i>Udaspes folus</i>	-	Rare
Forget-me-not <i>Catochrysops strabo</i>	-	Very Rare; Species of Conservation Concern
Metallic Cerulean <i>Jamides alecto</i>	-	Very Rare
Tiny Grass Blue <i>Zizula hylax</i>	-	Very Rare; Species of Conservation Concern
Danaid Egg-fly <i>Hypolimnas misippus</i>	LC	Uncommon
Glassy Bluebottle <i>Graphium cloanthus</i>	LC	Uncommon
Tailed Sulphur <i>Dercas verhuelli</i>	-	Rare
Common Albatross <i>Appias albina</i>	LC	Rare
Small Cabbage White <i>Pieris rapae</i>	-	Rare

Notes:

- Conservation and protection status refers to Fellowes *et al.* (2002), IUCN (2020), China State Major Protection Status, CITES (2020), Cap. 170 and Cap. 586.
 - Conservation status by Fellowes *et al.* (2002): LC = Local Concern.
- Status in Hong Kong follows AFCD (2020).

3.3.16 A total of 38 species of odonates were recorded from the current *assessment area* by AFCD, with eight species of conservation importance. These species are listed below in **Table 6**.

Table 6. Odonate species of conservation importance recorded from the assessment area by AFCD

Species	Conservation and Protection Status ¹	Status in Hong Kong ²
Coastal Glider <i>Macrodiplex cora</i>	LC	Common
Four-spot Midget <i>Mortonagrion hirosei</i>	GC; IUCN(NT)	Common
Mangrove Skimmer <i>Orthetrum poecilops</i>	GC; IUCN(VU)	Uncommon
Blue Sprite <i>Pseudagrion microcephalum</i>	LC	Common
Ruby Darter <i>Rhodothemis rufa</i>	LC	Common
Sapphire Flutterer <i>Rhyothemis triangularis</i>	LC	Common
Scarlet Basker <i>Urothemis signata</i>	LC	Common
Emerald Cascader <i>Zygonyx iris</i>	PGC	Abundant

Notes:

1. Conservation and protection status refers to Fellowes *et al.* (2002), IUCN (2020), China State Major Protection Status, CITES (2020), Cap. 170 and Cap. 586.
 - a. Conservation status by Fellowes *et al.* (2002): LC = Local Concern; PGC = Potential Global Concern; GC = Global Concern.
 - b. Conservation status by IUCN (2020): NT = Near Threatened; VU = Vulnerable.
2. Status in Hong Kong follows AFCD (2020).

Firefly

- 3.3.17 An endemic species of firefly, Mai Po Bent-winged Firefly, was first recorded from Hong Kong Wetland Park in July 2009 (Cheng *et al.* 2010). This genus is primarily mangrove-dependent (Ballantyne *et al.* 2011). The species has been recorded in several localities within the Ramsar Site, including Hong Kong Wetland Park, MPNR, Tin Shui Wai and near Tsim Bei Tsui. Small numbers were present in mangrove in SPR and KTR (Yiu 2011); both situated within the current 500m *assessment area*. AFCD also recorded this species within the *assessment area* (AFCD unpub. Data). Given that this species of firefly is endemic to Hong Kong, it is considered as a species of conservation importance. However, the species has not been listed in any literature as being of conservation concern or importance. Another two species, namely *Pyrocoelia analis* and *Rhagophthalmus motschulskyi*, were also recorded by AFCD in the *assessment area*, though the exact location(s) were not given. Both species are fairly widespread in Hong Kong, while the latter one is endemic.

Freshwater Assemblages

- 3.3.18 Freshwater fishes found in the *assessment area* are mostly non-native. No aquatic fauna was reported from the YLTN upstream of the Long Ping Station. No species of conservation importance were reported in the current *assessment area* from previous literature, except Rice Fish and Topmouth Gudgeon, which are recorded by AFCD.
- 3.3.19 Rice Fish is uncommon and restricted in Hong Kong (AFCD 2020), and is considered to be of Global Concern in Fellowes *et al.* (2002) and listed as a Species of Conservation Concern (AFCD 2020). Topmouth Gudgeon is uncommon (AFCD 2020) and is listed as being of Local Concern in Fellowes *et al.* (2002).

Intertidal/Benthic Fauna

- 3.3.20 Benthic grab sampling surveys were conducted by AECOM (2019) at three sampling sites near the confluent of KTR and SPR. No species of conservation importance were identified from the grab samples. A total of 7 species from 5 groups (Amphipod, Crab, Gastropod, Oligochaete and Polychaete) were identified. Only 3 to 5 species were recorded from each sampling site. The abundance of benthos recorded varied from 7 individuals to 101 individuals at each sampling site. A total of 62 individuals of 6 species, with polychaetes being the dominant benthos, were recorded during the wet season surveys and a total of 185 individuals of 5 species, with polychaetes and amphipods being the dominant benthos, were recorded during the dry season surveys.

4 FIELD SURVEY RESULTS

4.1 Habitat and Vegetation

- 4.1.1 Within the 500m *assessment area*, a total of 14 habitats were identified, including Channelised Watercourse, Semi-natural Watercourse, Pond, Abandoned Wet Agricultural Land/Freshwater Marsh, Tidal Marsh, Mangrove, Reedbed, Mitigation Wetland, Shrubland, Agricultural Land, Mixed Woodland, Plantation, Wasteland and Developed Area.
- 4.1.2 The areas of each type of habitats present within the Project Site and the 500m *assessment area* are listed in **Table 7**, while a habitat map is provided in **Figure A4a-c**. Representative photographs of these habitats are provided in **Annex 3**.

Table 7. Habitats present within the Project Site and the 500m assessment area

Habitats	Area of Each Habitat Identified (ha)		
	Project Site	500m assessment area	Total
Channelised Watercourse	13.53 (2.85 km)	45.95 (12.94 km)	59.47 (15.79 km)
Semi-natural Watercourse	-	6.02 (3.29 km)	6.02 (3.29 km)
Pond	-	26.72	26.72
Tidal Marsh	-	3.36	3.36
Mangrove	-	3.30	3.30
Reedbed	-	23.50	23.50
Abandoned Wet Agricultural Land/Freshwater Marsh	-	1.75	1.75
Mitigation Wetland	-	22.22	22.23
Shrubland	-	8.18	8.18
Agricultural Land	0.08	2.50	2.58
Mixed Woodland	-	1.24	1.24
Plantation	0.14	51.05	51.19
Wasteland	-	16.27	16.27
Developed Area	4.96	471.56	476.64
Total¹	18.72	683.74	702.46

Notes:

1. Figures above are rounded to the nearest decimal place. Hence, figures may not add to the total value.

- 4.1.3 A list of floral species recorded during the surveys with their relative abundance within each habitat is provided in **Annex 1**.

Channelised Watercourse

- 4.1.4 The YLTN is the longest channelised watercourse within the *assessment area*, spanning from Tai Tong and Shap Pat Heung to the Yuen Long Industrial Estates. In this study, the YLTN is divided into four sections, which is illustrated in **Figure A3** for easy reference. The entire YLTN from Section 1 to 4 is highly straightened to increase water flow rate for resolving the odour issues due to illegal discharge from the town, and to alleviate flooding in the low-lying areas of Yuen Long South. Both the width and the depth of YLTN gradually increase from Section 1 towards Section 4. Sections 1, 2 and 3 are trapezoidal or rectangular drainage channels, with both the channel bed and bank lined entirely with concrete, with a narrow dry weather flow channel in the centre of the channel. Between Sections 3 and 4 is an inflatable rubber dam for pollution control, and Section 4 of the YLTN lies between the inflatable dam and the confluent of the YLTN, SPR, and the semi-natural KTR. Section 4 is hydrologically connected to the Deep Bay and is therefore under tidal influence. This section still has concrete-lined banks but the channel bed has been deposited with mud sediments

originated from the Deep Bay area. During low tide, the deposited sediments exposed with waterbirds utilizing the channel.

- 4.1.5 In most time of the year, water flow in the YLTN is restricted to the narrow dry weather flow channel, and hence vegetation could only developed in crevices in the concrete bed and banks, and along the concreted drains. In Sections 1 to 2, wetland herbs, including *Alternanthera sessilis*, *Commelina diffusa*, *Cyperus difformis*, *Cyperus iria*, *Lindernia rotundifolia* and *Persicaria lapathifolia*, were recorded along the dry weather flow channel, but in low abundant. Some young tree seedlings of *Ficus microcarpa*, *Ficus religiosa*, *Ficus virens*, *Macaranga tanarius* var. *tomentosa* and *Melia azedarach* have developed in the crevices of the concrete walls and beds.
- 4.1.6 For Sections 3 to 4, part of the banks have been lined with grasscrete, which was found to be covered by grass (including *Bothriochloa* spp., *Imperata cylindrica* var. *major* and *Panicum maximum*), common ruderal vegetation (such as *Bidens alba* and *Tridax procumbens*) and self-sown trees (such as *Celtis sinensis*, *Leucaena leucocephala* and *Macaranga tanarius* var. *tomentosa*).
- 4.1.7 Within the assessment area, SPR is situated downstream of the YLTN. The channel bed of SPR is composed of soft muddy sediments deposited through tidal movement. Rip-rap embankment has been provided at both sides of the channel. No vegetation was found at the centre of the SPR, presumably due to the inundation caused by tidal actions. At the shallower edges, strips of wetland herbs such as *Alternanthera sessilis* and *Cyperus malaccensis* were found. The rip-rap embankment also provided opportunities for ruderal or weedy vegetation. During low tide, the tidal mudflat exposed which attracts relatively higher abundance of waterbirds.
- 4.1.8 The remaining major channelised watercourse is the KTR, which is a wide river channel with concrete-lined bed, and masonry and grasscrete fixed along both channel sides. The channel bed has been deposited with mud sediments originated from the Deep Bay area. Vegetation growing along the KTR channel is very similar between the Project Site and *assessment area*, which is dominated by grass (*Imperata cylindrica* var. *major* and *Panicum maixum*), herb (*Bidens alba* and *Wedelia trilobata*) and exotic weedy tree *Leucaena leucocephala*. Common wetland herbs such as *Alternanthera sessilis*, *Commelina diffusa* and *Cyperus malaccensis* var. *brevifolius*) also develop quite extensively along both sides. Groups of seedlings of mangrove (*Kandelia obovata* and *Sonneratia caseolaris*) and mangrove associates (*Acanthus ilicifolius*) concentrate along the bottom of the channel sides, particularly for the section closer to Nam Sang Wai. Plant composition and structure of channelised watercourse are low and simple, with regular human disturbance (e.g. grass cutting) to deter vegetation development. During low tide, the tidal mudflat exposed which attracts relatively higher abundance of waterbirds.
- 4.1.9 Some minor channelised watercourses are found near Lam Hau Tsuen, Chu Wong Ling, Shui Tau Village and etc. Most of these watercourses are entirely lined with concrete with virtually no vegetation.

Semi-natural Watercourse

- 4.1.10 Semi-natural watercourses within the *assessment area* mainly comprise tributaries and meanders of KTR (e.g. next to Nam Sang Wai Road, Pok Wai South Road and Chi Ho Road) that are directly connected with the channelised KTR and are thus under tidal influence. They are remnant sections of the original KTR, of which the channel course and hydrology has been largely altered following river training works in the early 2000s.
- 4.1.11 A section of the semi-natural KTR is located to the south of NSW, linking between KTR and SPR (referred to as “Old KTR” hereafter). The riverbanks were semi-natural, though a few small-scale

village houses and structures could be seen along the banks. This section of river is mainly vegetated with true mangrove *Acrostichum aureum*, *Kandelia obovata*, mangrove associates *Acanthus ilicifolius*, *Clerodendrum inerme*, and wetland herb *Cyperus malaccensis*. Two exotic mangroves *Sonneratia apetala* and *Sonneratia caseolaris*, which are believed to have dispersed into Deep Bay area via propagules from Futian, Shenzhen since 1990s, have also established along Old KTR.

4.1.12 The riparian zones along the meanders next to the channelised KTR are vegetated with common herbs (such as *Brachiaria mutica*, *Commelina diffusa*, *Kyllinga polyphylla*, *Microstegium ciliatum* and *Persicaria chinensis*) and trees (such as *Celtis sinensis*, *Ficus hispida*, *Leucaena leucocephala*, *Melia azedarach* and *Macaranga tanarius* var. *tomentosa*). A few seedlings of mangrove and mangrove associate (*Acanthus ilicifolius*, *Aegiceras corniculatum* and *Kandelia obovata*) also colonise along these meanders.

4.1.13 There are other smaller watercourses close to Kam Hing Wai, and within the mitigation wetlands for Sha Po residential development and West Rail Line. These are largely covered by herbaceous vegetation.

Pond

4.1.14 Two small, inactive ponds were found to the east and west of Chung Hau Tsuen, and were surrounded by grass *Brachiaria mutica*, climbers *Ipomoea cairica* and *Mikania micrantha* and weedy tree *Leucaena leucocephala*. Larger abandoned fishponds were also found at the south of NSW, with pond bunds vegetated with grass *Brachiaria mutica* and *Panicum maximum*, climbers *Mikania micrantha* and *Paederia scandens*, and trees *Ficus hispida* and *Melia azedarach*.

4.1.15 Ponds were also identified in NSW, TSL, and near Shui Tau Village and Cheung Chun San Tsuen. These ponds are either actively operated for pond fish culture or inactive/abandoned. Ponds within the *assessment area* are vegetated with grass (*Brachiaria mutica* and *Panicum maximum*), (*Achyranthes aspera*, *Bidens alba* and *Macroptilium lathyroides*) and climbers (*Ipomoea cairica* and *Mikania micrantha*). A few fruit trees and self-seeded trees were sometimes recorded on the pond bunds. Managed fish ponds were found within AFCD Au Tau Fisheries Office, and vegetation is largely restricted to ruderal grass and herbs.

Tidal Marsh

4.1.16 Small patches of tidal marsh interspersed with mangrove habitat along the Old KTR and the channelised SPR. The marshy vegetation in this habitat is periodically influenced by tidal actions and is dominated by common wetland plants such as *Alternanthera philoxeroides*, *Cyperus malaccensis* and reed *Phragmites australis*.

4.1.17 Narrow strips of tidal marsh were found along banks of the meander located to the south of AFCD Au Tau Fisheries Office. This tidal marsh is dominated by wetland herbs *Alternanthera sessilis*, *Commelina diffusa*, *Cyperus malaccensis*, and grass *Brachiaria mutica*, *Panicum brevifolium* and *Paspalum distichum*.

Mangrove

4.1.18 Mangrove patches were found along the Old KTR and the channelised SPR. This habitat is dominated by mangroves *Acrostichum aureum* and *Kandelia obovata*, and mangrove associates *Acanthus ilicifolius* and *Clerodendrum inerme*. Exotic mangroves *Sonneratia apetala* and *Sonneratia caseolaris* have established and colonised part of the KTR.

- 4.1.19 Very small mangrove groups have developed along the downstream of the meander to the south of AFCD Au Tau Fisheries Office. This habitat is dominated by mangrove (native *Kandelia obovata* and exotic *Sonneratia caseolaris*) and mangrove associates (*Acanthus ilicifolius*) commonly found in Nam Sang Wai area. A few trees of *Melia azedarach* and *Celtis sinensis* were found at the drier upper bank along the meander.

Reedbed

- 4.1.20 Extensive reedbed habitat was found in NSW to the northeast of the Project Site, presumably derived from abandoned commercial fishponds. Reed *Phragmites australis* dominated this habitat, with other common wetland herbs including *Alternanthera* spp., *Cyclosorus interruptus*, *Ludwigia octovalvis*, and mangrove *Kandelia obovata* interspersed within. Exotic wetland herb *Typha angustifolia*, and climbers *Ipomoea cairica* and *Mikania micrantha* were often found colonising in these ponds and creeping on grassy vegetation at drier areas respectively. Bunds of these reedbeds were commonly vegetated with exotic trees *Eucalyptus* sp., *Melaleuca cajuputi* subsp. *cumingiana* and *Melia azedarach*.

Abandoned Wet Agricultural Land/Freshwater Marsh

- 4.1.21 A small abandoned wet agricultural land/freshwater marsh is located next to Shui Tau Village. This habitat is extensively covered by the fern *Phymatodes longissima* and other herbs including *Commelina diffusa*, *Eichhornia crassipes*, *Ipomoea aquatica* and *Ludwigia hyssopifolia*. Climbers *Lygodium japonicum* and *Mikania micrantha* were quite often observed and creeping among the wetland vegetation. The fern *Phymatodes longissima* is only recorded in limited localities in Hong Kong, and is regarded as rare by Wu and Lee (2000).
- 4.1.22 Two small pieces of abandoned wet agricultural land/freshwater marsh were found in TSL, and these are extensively covered by exotic *Hedychium coronarium*, although common climbers (*Ipomoea cairica* and *Mikania micrantha*) and herbs (*Bidens alba*) are common along the edges. Another small abandoned wet agricultural land/freshwater marsh was found in Shui Tsiu San Tsuen, and is also dominated by exotic *Hedychium coronarium* and *Mikania micrantha*.

Mitigation Wetland

- 4.1.23 There are three mitigation wetland groups within the *assessment area*, including mitigation wetlands for the West Rail Line in Kam Tin, the engineered wetland for YLBF in Nam Sang Wai, and compensatory wetlands for the residential development in Sha Po.
- 4.1.24 Mitigation wetlands for West Rail Line and YLBF are constructed on formed land, and planted with common wetland plants and woody vegetation for wildlife utilisation. These two wetland groups have been self-sustained, and covered by common grass (*Brachiaria mutica*, *Imperata cylindrica* var. *major*, *Panicum maximum* and *Panicum repens*), wetland herb (such as *Alternanthera sessilis*, *Commelina diffusa*, *Cyclosorus interruptus*, *Cyperus malaccensis*, *Ipomoea aquatica*, *Persicaria barbata* and *Phragmites australis*) and other herbs (such as *Bidens alba*, *Lygodium japonicum* and *Mimosa pudica*). Shrubs (*Gardenia* spp. and *Raphiolepis indica*) and/or trees (*Celtis sinensis*, *Ficus* spp., *Ilex rotunda* and *Melia azedarach*) were either planted or self-seeded around the boundary fences of these wetlands for screening human disturbance from the nearby road.
- 4.1.25 Except two small constructed mitigation ponds with ornamental plants at the entrance of Park Yoho Venezia, mitigation wetlands in Sha Po are extensively covered by reed *Phragmites australis* and sedge *Cyperus malaccensis*. Mangrove groups of *Kandelia obovata* and *Acanthus ilicifolius*, and self-seeded trees (*Celtis sinensis*, *Hibiscus tiliaceus* and *Leucaena leucocephala*) scatter in these wetlands,

while other grass (*Brachiaria mutica* and *Pennisetum purpureum*) and climbers (*Ipomoea cairica* and *Mikania micrantha*) cover extensively in the northern portion. Ornamental shrubs and trees were also planted along the boardwalk section at the southwest portion of this wetland system.

Shrubland

- 4.1.26 Hillside shrubland was found at Chu Wong Ling (i.e. to the north of Wang Chau Tung Tau Wai) and to the north of Yeung Uk San Tsuen. Shrubland at Chu Wong Ling was found to be vegetated by grasses (*Cymbopogon tortilis*, *Miscanthus* spp., *Neyraudia reynaudiana*, *Pennisetum alopecuroides*), ferns (*Blechnum orientale* and *Dicranopteris pedata*), shrubs (*Clerodendrum fortunatum*, *Helicteres angustifolia*, *Melastoma malabathricum* and *Raphiolepis indica*) and small trees (*Bridelia tomentosa*, *Litsea cubeba*, *Litsea rotundifolia* var. *oblongifolia* and *Mallotus paniculatus*), which are species typically found in hillside shrublands in Hong Kong. Exotic trees (such as *Acacia auriculiformis*, *Ficus benjamina*, *Michelia x alba*, *Pinus elliotii* and *Platyclusus orientalis*) and ornamental shrub *Hibiscus rosa-sinensis* were also recorded along the footpath.
- 4.1.27 A young seedling of the protected tree *Aquilaria sinensis* was recorded next to the footpath in the shrubland at Chu Wong Ling. *Aquilaria sinensis* is common in lowland areas in Hong Kong (AFCD 2008). However, this species is listed as “Near Threatened” and under State protection (Category II) in China (AFCD 2003) and is classified as “Vulnerable” on the IUCN Red List of Threatened Species (IUCN 2019). The wild population of this species is protected under Cap. 586.

Agricultural Land

- 4.1.28 Small pieces of dry agricultural land were found in Shui Tau Village and Ko Po San Tsuen. Cultivation of fruit trees (*Carica papaya* and *Psidium guajava*) and dry crop was recorded in this kind of small-scale farming.

Mixed Woodland

- 4.1.29 A mixed woodland is located on a small hill adjacent to the mitigation wetland near YLBF. It is a young woodland vegetated by native shrubs (*Lantana camara*, *Ligustrum sinense* and *Psychotria asiatica*) and trees (*Celtis sinensis*, *Cinnamomum camphora*, *Leucaena leucocephala* and *Macaranga tanarius* var. *tomentosa*), and interspersed with fruit trees (*Dimocarpus longan*, *Artocarpus heterophyllus*, *Mangifera indica* and *Musa x paradisiaca*). The woodland edge was found to be disturbed by villagers.

Plantation

- 4.1.30 Plantations were found along Chung Yip Road, in fenced areas to the east and west of Chung Hau Tsuen, and along the west side of NSW. Those plantations close to village areas were dominated by weedy trees *Leucaena leucocephala*, and low number of planted trees *Albizia lebbbeck*, *Bombax ceiba* and *Eucalyptus* sp., and self-sown trees *Ficus hispida*, *Macaranga tanarius* var. *tomentosa* and *Melia azedarach*. Herbaceous vegetation, such as grass *Brachiaria mutica*, *Panicum maximum*, *Pennisetum purpureum*, climbers *Ipomoea cairica*, *Mikania micrantha* and herb *Wedelia trilobata*, colonised part of the understorey or in open gaps of these plantation areas.
- 4.1.31 A plantation strip is present along Nam Sang Wai Road, and is dominated by planted exotic trees *Acacia confusa*, *Albizia lebbbeck*, *Eucalyptus* sp., *Melaleuca cajuputi* subsp. *cumingiana*. Its understorey is rather simple, and vegetated by grass, herbs (such as *Alocasia macrorrhizos*) and low number of self-sown tree seedlings. Floristic richness of plantation habitat in the *assessment area* is low and its structure is quite simple.

- 4.1.32 Various plantation stands are present along highways, Castle Peak Road, Nam Sang Wai Road, Kam Tin Road and other vehicular roads in Kam Tin area. Roadside plantations along highways and Castle Peak Road are planted with *Acacia confusa*, *Corymbia citriodora*, *Eucalyptus tereticornis* and *Melaleuca cajuputi* subsp. *cumingiana*. Other plantation stands along vehicular roads and in Kam Tin area comprise common exotic trees and more self-seeded trees (such as *Celtis sinensis*, *Bauhinia variegata*, *Leucaena leucocephala*, *Litsea glutinosa*, *Melia azedarach*, *Macaranga tanarius* var. *tomentosa* and *Schefflera heptaphylla*) and understorey vegetation (shrubs *Bridelia tomentosa*, *Lantana camara*, *Ligustrum sinense* and herbs *Alocasia macrorrhizos*, *Bidens alba* and *Mimosa pudica*).

Wasteland

- 4.1.33 In the *assessment area*, wasteland is present near the Project Site at SCR, and near Nam Sang Wai, close to Pai Wai Tsuen, Cheung Chun San Tsuen and Kam Tin Low Flow Pumping Station and Inflatable Dams. These wasteland are either low-lying areas developed from abandoned agricultural land or concrete area overgrown by ruderal vegetation. This habitat is often dominated by grass (*Brachiaria mutica*, *Imperata cylindrica* var. *major* and *Panicum maximum*), herbs (*Achyranthes aspera*, *Bidens alba*, *Kyllinga polyphylla* and *Mimosa pudica*) and climbers (*Ipomoea cairica* and *Mikania micrantha*).

Developed Area

- 4.1.34 Developed Area within the Project Site includes streets and roadside planters running along YLTN in the town centre, as well as along Wang Lok Street in Yuen Long Industrial Estate. Vegetation recorded in this habitat was largely planted for ornamental and screening uses, including trees *Acacia confusa*, *Cinnamomum burmannii*, *Ficus microcarpa*, *Lagerstroemia speciosa* and *Melaleuca cajuputi* subsp. *cumingiana*, shrubs *Calliandra haematocephala*, *Excoecaria cochinchinensis*, *Ficus microcarpa* 'Golden Leaf' and *Schefflera arboricola* 'Variegata', and herb *Tradescantia spathacea*. Sign of small-scale planting by villagers was noted in a fenced, vegetated developed area close to the northeastern part of Project Area adjacent to Wang Lok Street. Self-sown vegetation recorded within this developed area was mainly common herbaceous plants and weedy trees *Leucaena leucocephala*.
- 4.1.35 Developed area in the *assessment area* comprises road infrastructures, residential development, open storage, villages and government facilities. This habitat is covered by high diversity of ornamental plants and self-sown vegetation but in low abundance. Vegetation is mainly planted for ornamental use and visual screening along roads, such as exotic trees (*Acacia confusa*, *Koelreuteria bipinnata*, *Lagerstroemia speciosa* and *Terminalia mantaly*) and shrubs (*Allamanda schottii*, *Calliandra haematocephala*, *Duranta erecta*, *Ficus microcarpa* 'Golden Leaf', *Hibiscus rosa-sinensis* and *Nerium oleander*). Vegetation in residential development is largely exotic, while that in villages and open storages is usually naturally developed (such as fruit trees) or ruderal in nature.

4.2 Mammal

- 4.2.1 Mammal species recorded within the Project Site and the *assessment area* have been reported in **Annex 2** with their habitat(s) and conservation and protection status presented. Locations of species of conservation importance recorded in the surveys are presented on **Figure A4a-c**.
- 4.2.2 A total of seven mammal species were recorded from the *assessment area*, with two (Small Indian Civet and Leopard Cat) being of conservation importance. Camera traps deployed only captured images of wandering individuals of Domestic Dog. No Eurasian Otter was recorded within the *assessment area*.

- 4.2.3 A single Small Indian Civet was sighted in reedbed within NSW in night-time. Small Indian Civet is listed as Vulnerable in China (Jiang *et al.* 2016), as Class II protected species in China, in Appendix III of CITES; and is locally protected under Cap. 170 and Cap. 586. It is considered to be very common and widespread in Hong Kong (AFCD 2019).
- 4.2.4 A single Leopard Cat was found on a tree in the plantation strip within NSW in night-time. The species is listed as Vulnerable in China (Jiang *et al.* 2016), in Appendix II of CITES; and is locally protected under Cap. 170 and Cap. 586. It is considered to be uncommon but widespread in Hong Kong (AFCD 2019).
- 4.2.5 In terms of bats, the only species recorded during the surveys was Japanese Pipistrelle. The species was recorded in developed areas throughout the *assessment area*. It is protected under Cap. 170 but is very common in Hong Kong (AFCD 2020).

4.3 Avifauna

General

- 4.3.1 Maximum count of all bird species recorded within the Project Site and the *assessment area* has been reported in **Annex 2**, with their habitat(s) and conservation and protection status presented.
- 4.3.2 Between July 2019 and June 2020, a total of 36 species of birds were recorded from the Project Site, with 116 in the 500m *assessment area*. Among the birds recorded, 14 and 51 species are considered to be of conservation importance were recorded within the Project Site and assessment area, respectively. Species of conservation importance recorded are listed below in **Table 8** with their maximum abundance presented.
- 4.3.3 Most of the migratory and overwintering waterbirds recorded were from the major channelised watercourses (in particular SPR and KTR), where large areas of exposed mud become available for foraging during low tide. Other habitats, such as mitigation wetland (in Sha Po and near West Rail), ponds, reedbed and semi-natural watercourses (Old KTR) were also utilised but to a far less extent.
- 4.3.4 Given the high diversity and abundance, it is impossible to map the presence of bird species of conservation importance on habitat maps. Instead, the detailed location and habitat use were provided in **Annex 2**.

Table 8. List of bird species of conservation importance recorded during the survey period

Species	Conservation and Protection Status ¹	Maximum abundance recorded in:	
		Project Site	assessment area
Northern Shoveler <i>Spatula clypeata</i>	RC	2	98
Northern Pintail <i>Anas acuta</i>	RC		2
Eurasian Teal <i>Anas crecca</i>	RC		56
Tufted Duck <i>Aythya fuligula</i>	LC		20
Little Grebe <i>Tachybaptus ruficollis</i>	LC		2
Eurasian Spoonbill <i>Platalea leucorodia</i>	LC; RLCV(NT); CITES(II); CSMPs(II); Cap.586		1
Black-faced Spoonbill <i>Platalea minor</i>	PGC; RLCV(EN); IUCN(EN); CSMPs(II)		10
Yellow Bittern <i>Ixobrychus sinensis</i>	(LC)		2

Species	Conservation and Protection Status ¹	Maximum abundance recorded in:	
		Project Site	assessment area
Black-crowned Night Heron <i>Nycticorax nycticorax</i>	(LC)		13
Striated Heron <i>Butorides striata</i>	(LC)		1
Chinese Pond Heron <i>Ardeola bacchus</i>	PRC (RC)	9	29
Eastern Cattle Egret <i>Bubulcus coromandus</i>	(LC)		16
Grey Heron <i>Ardea cinerea</i>	PRC	8	38
Purple Heron <i>Ardea purpurea</i>	RC		2
Great Egret <i>Ardea alba</i>	PRC (RC)	6	42
Intermediate Egret <i>Ardea intermedia</i>	RC		1
Little Egret <i>Egretta garzetta</i>	PRC (RC)	22	37
Great Cormorant <i>Phalacrocorax carbo</i>	PRC	3	12
Crested Serpent Eagle <i>Spilornis cheela</i>	(LC); RLCV(NT); CITES(II); CSMPS(II); Cap.586		1
Black Kite <i>Milvus migrans</i>	(RC); CITES(II); CSMPS(II); Cap.586		3
Eastern Buzzard <i>Buteo japonicus</i>	CSMPS(II); CITES(II); Cap.586		2
Black-winged Stilt <i>Himantopus himantopus</i>	RC	16	65
Pied Avocet <i>Recurvirostra avosetta</i>	RC	3	133
Grey-headed Lapwing <i>Vanellus cinereus</i>	LC		14
Pacific Golden Plover <i>Pluvialis fulva</i>	LC		1
Little Ringed Plover <i>Charadrius dubius</i>	(LC)	2	16
Pheasant-tailed Jacana <i>Hydrophasianus chirurgus</i>	LC; RLCV(NT)	2	3
Common Redshank <i>Tringa totanus</i>	RC	2	15
Marsh Sandpiper <i>Tringa stagnatilis</i>	RC	2	11
Wood Sandpiper <i>Tringa glareola</i>	LC		12
Spotted Redshank <i>Tringa erythropus</i>	RC		16
Common Greenshank <i>Tringa nebularia</i>	RC	3	21
Black-headed Gull <i>Chroicocephalus ridibundus</i>	PRC	6	32
Greater Coucal <i>Centropus sinensis</i>	CSMPS(II)		1
Collared Scops Owl <i>Otus lettia</i>	CITES(II); CSMPS(II); Cap.586		1
Asian Barred Owlet <i>Glaucidium cuculoides</i>	CITES(II); CSMPS(II); Cap.586		1
White-throated Kingfisher <i>Halcyon smyrnensis</i>	(LC)		3

Species	Conservation and Protection Status ¹	Maximum abundance recorded in:	
		Project Site	assessment area
Pied Kingfisher <i>Ceryle rudis</i>	(LC)		2
Peregrine Falcon <i>Falco peregrinus</i>	(LC); RLCV(NT); CITES(I); CSMPS(II); Cap.586		1
Black-naped Oriole <i>Oriolus chinensis</i>	LC		1
Collared Crow <i>Corvus torquatus</i>	LC; RLCV(NT); IUCN(VU)		5
Chinese Penduline Tit <i>Remiz consobrinus</i>	RC		8
Thick-billed Warbler <i>Arundinax aedon</i>	LC		1
Pallas's Grasshopper Warbler <i>Helopsaltes certhiola</i>	LC		3
Lanceolated Warbler <i>Locustella lanceolata</i>	RLCV(NT)		1
Zitting Cisticola <i>Cisticola juncidis</i>	LC		1
Red-billed Starling <i>Spodiopsar sericeus</i>	GC		3
White-cheeked Starling <i>Spodiopsar cineraceus</i>	PRC		17
White-shouldered Starling <i>Sturnia sinensis</i>	(LC)		10
Chestnut-eared Bunting <i>Emberiza fucata</i>	LC		1
Yellow-breasted Bunting <i>Emberiza aureola</i>	RC; RLCV(EN); IUCN(CR)		3

Notes:

- Conservation and protection status refers to Fellowes *et al.* (2002), Red List of China's Vertebrates (Jiang *et al.* 2016), IUCN (2020), China State Major Protection Status, CITES (2020), Cap. 170 and Cap. 586.
 - Conservation status by Fellowes *et al.* (2002): LC = Local Concern; PRC = Potential Regional Concern; RC = Regional Concern; PGC = Potential Global 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.
 - Conservation status by Red List of China's Vertebrates (RLCV) (Jiang *et al.* 2016): NT = Near Threatened; EN = Endangered.
 - Conservation status by IUCN (2002): NT = Near Threatened; EN = Endangered.
 - Protection status by China State Major Protection Status (CSMPS): II = Class II Protected Species in China.
 - Protection status by CITES (2020): II = Listed in CITES Appendix II.
 - All wild birds in Hong Kong are protected under Cap. 170 Wild Animals Protection Ordinance.
 - Cap. 586 = Protection of Endangered Species of Animals and Plants Ordinance.

Bird use of Channelised / Semi-natural Watercourses within the assessment area

4.3.5 Bird use of the YLTN and adjacent watercourses are presented in **Table 9** below.

Table 9. Bird diversity and abundance in YLTN and adjacent major watercourses

	YLTN S. 1	YLTN S. 2	YLTN S. 3	YLTN S. 4	SCR	YLBF (Section adjacent to YLTN and SCR)	Old KTR	SPR
No. of species recorded	6	8	8	22	10	13	29	33
No. of wetland-dependent species recorded	2	0	6	16	3	6	18	25
Total abundance of wetland-dependent species	6	0	62	228	33	25	219	1143
Total abundance of all	24	1579	112	279	100	104	290	1177

birds recorded								
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- 4.3.6 Sections 1 to 3 of the YLTN were only utilised by a few species. Chinese Pond Heron and Little Egret were occasionally recorded in singles from Section 1 of YLTN, but the overall diversity and abundance for this section are both very low. For Section 2 and 3, the apparent high bird abundance was contributed by aggregation of Rock Dove (Feral Pigeon), a non-native species, which were attracted by bird feed deliberately left inside of the channel. No species of conservation importance or wetland-dependent species were recorded in Section 2. In Section 3, species of conservation importance (mainly ardeids) were sometimes observed loafing near the inflatable dam, but were in low numbers only. This section is completely lined with concrete and offers very little foraging opportunity to waterbirds.
- 4.3.7 Section 4, which is directly linked with SPR and KTR, has the highest bird diversity and abundance of the YLTN surveyed. Nevertheless, SPR has a much higher diversity and abundance, as well as number of wetland-dependent species. Besides, a high tide roost of Black-winged Stilt was observed on the western hard bank of the channel, directly opposite the observation point (in proximity to the proposed barrage location)(**Figure A4b**). The roost was observed in surveys conducted in September, October, November and December 2019, and January, February and March 2020, under high-tide conditions during which the mudflat for foraging became unavailable. Maximum number of Black-winged Stilts observed using this high-tide roost is 129 (recorded in February 2020). Monthly average of individuals of Black-winged Stilts observed using the roost across the 12-month study period is about 26 individuals.
- 4.3.8 SCR and the adjacent upper section of the YLBF are also dominated by species that are not wetland-dependent, such as Rock Dove, Black-collared Starling, Spotted Dove and Eurasian Tree Sparrow.
- 4.3.9 Bird use of the channelised KTR and adjacent watercourses are presented in **Table 10** below.

Table 10. Bird diversity and abundance in channelised KTR and adjacent major watercourses

	Channelised KTR (Adjacent to Project Site)	Channelised KTR (Downstream of Project Site)	Channelised KTR (Upstream of Project Site)	Old KTR	YLBF (Section next to the channelised KTR)
No. of species recorded	34	32	6	12	13
No. of wetland-dependent species recorded	24	27	3	9	11
Total abundance of wetland- dependent species recorded	1570	1273	18	243	111
Total abundance of birds recorded	1604	1305	24	76	124

- 4.3.10 Within the channelised section of the KTR, bird composition, diversity and abundance are similar between area adjacent to the Project Site and the area downstream of that. The upstream sections of KTR, however, were completely concrete-lined and hence both diversity and abundance were very low. Bird composition, diversity and abundance of SPR are very similar to that of the channelised section of the KTR. During low tide, the larger, channelised sections of KTR and SPR provided shallow water and exposed mud that favours foraging birds. In the dry season, high number of wintering and migratory waterbirds were found foraging in these channel sections. In the wet season, however, both bird abundance and diversity are much lower.
- 4.3.11 The original KTR were fragmented into several meanders or short sections following the previous major channelisation works. Some wetland-dependent birds species (such as Eurasian Teal, ardeids, Grey-headed Lapwing and Common Snipe) were still observed in these fragmented watercourse, though the abundance and diversity is much lower than in the main channel.

- 4.3.12 The lower section of the YLBF that drains into the channelised KTR also offers foraging opportunities for some wetland-dependent species (including Black-faced Spoonbill, ardeids and Pied Avocet). However, the diversity and abundance is much lower than those of the main channel of KTR, presumably due to the small size of the Bypass Floodway.
- 4.3.13 Black-faced Spoonbill was recorded exclusively in channelised watercourses, including SPR, KTR and the lower section of YLBF. Only low numbers of Black-faced Spoonbill were recorded (maximum count of this species was 10 individuals in Kam Tin River), and it is observed they were feeding in the watercourse during low tide. However, no roosting of Black-faced Spoonbill was observed within the 500m assessment area.
- 4.3.14 Great Cormorant was found mostly feeding in KTR and SPR, though small numbers were also recorded from other habitats such as mitigation wetland (near West Rail), ponds in NSW, and the Old KTR. A small day-time roost of Great Cormorant was noted at the southwest of Nam Sang Wai, about 180m from the proposed barrage. Low numbers of Great Cormorants (max 12 individuals observed) were observed loafing in *Sonneratia* spp. after foraging in this roost. Besides the small day-time roost, no other night roost of Great Cormorant was recorded within the 500m assessment area.
- 4.3.15 To summarise, in the wet season, bird diversity and abundance are far lower than in the dry season across all wetland habitats within the assessment area. In the dry season, with the influx of wintering and migratory waterbirds, bird diversity and abundance in wetland habitats increase significantly, especially in larger channel sections of KTR and SPR.

Ardeid Night Roost at KTR

- 4.3.16 Other than the ardeid night roost at KTR, no major bird roosts were recorded from the 500m assessment area. The ardeid night roost at KTR near Yuen Long Highway was found to be regularly utilised by Little Egrets and Great Egrets. Maximum numbers of the two species recorded during the 12-month survey period were 22 for Little Egret and 42 for Great Egret. Chinese Pond Heron and Grey Heron were only recorded once in the study period (**Table 11a**).

Table 11a. Number of ardeid species recorded at the night roost at KTR

Species	2019						2020					
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Little Egret	11	9	12	15	17	22	9	12	8	18	19	11
Great Egret	34	39	42	16	21	21	18	20	15	12	8	19
Chinese Pond Heron	-	-	1	-	-	-	-	-	-	-	-	-
Grey Heron	-	-	5	-	-	-	-	-	-	-	-	-
Time of return	18:21 to 18:45	18:02 to 18:37	17:43 to 18:28	17:01 to 17:59	16:52 to 17:40	16:50 to 17:49	17:13 to 17:57	17:35 to 18:23	17:41 to 18:39	17:50 to 18:43	18:05 to 18:46	18:12 to 19:05
Total no. of birds	45	48	60	31	38	43	27	32	23	30	27	30

TSL Egretty

- 4.3.17 The survey in 2020 showed that only Chinese Pond Heron and Little Egret were breeding in the Tung Shing Lei Egretty. Number of nests counted during the surveys are presented in **Table 11b** below.

Table 11b. Number of ardeid nests counted in the Tung Shing Lei Egretty from April to July 2020

	April 2020	May 2020	June 2020	July 2020
No. of nests of Little Egret	25	19	14	10
No. of nests of Chinese Pond Heron	18	17	15	8
Total no. of nests recorded	43	36	29	18

4.3.18 No newly established egretries were found within the 500m *assessment area* during the current study. However, a new egretty at SPR was discovered in May 2019, with 5 nests of Little Egret and 86 nests of Chinese Pond Heron (Anon 2020). The egretty is located at and near Yuen Long Sewage Treatment Works (AFCD pers. comm.) and is located well outside of the current *assessment area*. As there are abundant suitable wetland habitats near the new egretty, the breeding ardeids forage near the Project Site are not likely.

Flight Behaviour of Waterbirds

4.3.19 The surveys for flight behaviour of waterbirds as well as the specific survey for flight behavior of roosting waterbirds in winter (i.e. Great Cormorant) and use of feeding habitat of ardeids in breeding season were summarized. There were a total of 937 flight-lines of waterbirds with different flight-height recorded from all the vantage points (**Table 12**). There was a total of 410 observations and 83 observations of waterbirds passing across the proposed barrage and the parapet wall at Kam Tin River, respectively. Some of these among the 937 flight-lines were very localised movements i.e. birds moving among different locations of the exposed mudflats. The flight-lines recorded were summarized in **Figure A5**.

4.3.20 Among the 937 observations of flight-lines passing through the proposed barrage, they are summarized as 19 flight-lines, a total of 4 and 3 major flight-lines were identified passing through the proposed barrage and parapet wall at Kam Tin River, respectively (**Figure A5**). The flight height varied from less than 5m to over 20m. As there are no high-rise building or structures to the north of the proposed barrage (i.e. Shan Pui River, Nam Sang Wai), the flight height of waterbirds were low. On the other hand, the flight-lines passed through the proposed parapet wall at Kam Tin River were all above 10m in height, as there are existing man-made structures in the vicinity of the proposed parapet walls. It was observed that they could adjust their flight height to avoid structures.

Table 12. Flight-lines of waterbirds at the proposed barrage and parapet wall at Kam Tin River

Height/Location	Pass through proposed barrage	Pass through proposed parapet wall at Kam Tin River	Other	Total
0-5m	292	0	221	513
5-10m	55	0	92	147
10-15m	22	23	67	112
15-20m	31	54	60	145
>20m	10	6	4	20
Total	410	83	444	937

4.4 Herpetofauna

4.4.1 Maximum counts of all reptile and amphibian species recorded within the Project Site and the *assessment area* have been reported in **Annex 2**, with their habitat(s) and conservation and protection status presented. Locations of species of conservation importance recorded in the surveys are presented on **Figure A4a-c**.

4.4.2 Ten amphibian and ten reptile species were recorded from the *assessment area*. The only herpetofauna species recorded within the Project Site is Red-eared Slider, which was sighted at the location of the proposed barrage. Within the *assessment area*, one amphibian and four reptile species recorded are of conservation importance. These species are listed in **Table 13** below:

Table 12. List of herpetofauna species of conservation importance recorded during the survey period

Species	Conservation and Protection Status ¹	Status in HK ²	Recorded in:	
			Project Site	assessment area
Amphibian				
Spotted Narrow-mouthed Frog <i>Kalophrynus interlineatus</i>	RLCV(NT)	Widely distributed from low to moderate altitudes in northern and central N.T.	-	MW
Reptile				
Chinese Soft-shelled Turtle <i>Pelodiscus sinensis</i>	GC; RLCV(EN); IUCN(VU); Cap.170	Locally found in reservoirs and fishponds in Deep Bay area.	-	RB
Common Wolf Snake <i>Lycodon aulicus</i>	RLCV(NT)	Widely distributed at low elevations throughout Hong Kong.	-	DA
Common Rat Snake <i>Ptyas mucosus</i>	PRC; RLCV(EN); CITES(II); Cap.586	Widely distributed throughout Hong Kong.	-	MW
Buff-striped Keelback <i>Amphiesma stolatum</i>	LC	Distributed in lowland in central and northern New Territories and Lantau Island.	-	FM

Notes:

- Conservation and protection status refers to Fellowes *et al.* (2002), Red List of China's Vertebrates (Jiang *et al.* 2016), IUCN (2020), China State Major Protection Status, CITES (2020), Cap. 170 and Cap. 586.
 - Conservation status by Fellowes *et al.* (2002): LC = Local Concern; PRC = Potential Regional Concern; GC = Global Concern.
 - Conservation status by Red List of China's Vertebrates (RLCV) (Jiang *et al.* 2016): NT = Near Threatened; EN = Endangered.
 - Conservation status by IUCN (2002): VU = Vulnerable.
 - Protection status by CITES (2020): II = Listed in CITES Appendix II.
 - Cap. 170 = Wild Animals Protection Ordinance.
 - Cap. 586 = Protection of Endangered Species of Animals and Plants Ordinance.
- Habitats: DA = Developed Area; FM = Abandoned Wet Agricultural Land/Freshwater Marsh; MW = Mitigation Wetland; RB = Reedbed.

4.5 Butterflies and Odonates

- Maximum count of butterflies and odonates recorded within the Project Site and the *assessment area* has been reported in **Annex 2**, with their habitat(s) and conservation and protection status presented. Locations of species of conservation importance recorded in the surveys are presented on **Figure A4a-c**.
- Five and 69 species of butterflies were recorded from the Project Site and *assessment area*, respectively. Among the recorded species, a total of nine species are of conservation importance. All of these species are recorded from the Assessment Area. These species are listed in **Table 14** below, with their conservation and protection status presented.

Table 13. List of butterfly species of conservation importance recorded during the survey period

Species	Conservation and Protection Status ¹	Status in HK ²	Recorded in:	
			Project Site	assessment area
Common Awl <i>Hasora badra</i>	LC	Very Rare	-	MG
Lesser Band Dart <i>Potanthus trachala</i>	-	Rare	-	SH
Pale Palm Dart <i>Telicota colon</i>	LC	Rare	-	SH
Forget-me-not <i>Catochrysops strabo</i>	-	Very Rare; Species of Conservation Concern	-	SH
Metallic Cerulean <i>Jamides alecto</i>	-	Very Rare	-	FM; MW
Malayan <i>Megisba malaya</i>	LC	Very Rare; Species of Conservation Concern	-	SH

Species	Conservation and Protection Status ¹	Status in HK ²	Recorded in:	
			Project Site	assessment area
Tiny Grass Blue <i>Zizula hylax</i>	-	Very Rare; Species of Conservation Concern	-	SH
Danaid Egg-fly <i>Hypolimnas misippus</i>	LC	Uncommon	-	SH
Swallowtail <i>Papilio xuthus</i>	-	Rare	-	MW; SH

Notes:

- Conservation and protection status refers to Fellowes *et al.* (2002)
 - Conservation status by Fellowes *et al.* (2002): LC = Local Concern.
- Habitats: FM = Abandoned Wet Agricultural Land/Freshwater Marsh; MG = Mangrove; MW = Mitigation Wetland; SH = Shrubland.

- 4.5.3 Six and 33 species of odonates were recorded from the Project Site and *assessment area*, respectively. Among the recorded species, a total of three species are of conservation importance. All of these species are recorded from the *assessment area*. These species are listed in **Table 15** below, with their conservation and protection status presented.

Table 14. List of odonate species of conservation importance recorded during the survey period

Species	Conservation and Protection Status ¹	Status in HK ²	Recorded in:	
			Project Site	assessment area
Coastal Glider <i>Macrodiplax cora</i>	LC	Common	-	PO; RB
Ruby Darter <i>Rhodothemis rufa</i>	LC	Common	-	RB
Scarlet Basker <i>Urothemis signata</i>	LC	Common	-	PO; RB

Notes:

- Conservation and protection status refers to Fellowes *et al.* (2002)
 - Conservation status by Fellowes *et al.* (2002): LC = Local Concern.
- Habitats: PO = Pond; RB = Reedbed.

4.6 Firefly

- 4.6.1 The only firefly species recorded during the 12-month study period was Mai Po Bent-winged Firefly. Maximum number of individuals recorded per survey was 70 in May 2020. Details of these records are presented in **Annex 2**.

- 4.6.2 Distribution of the species within the assessment area is restricted to the banks of Old KTR, as well as the associated mangrove and tidal marsh, particularly those near Chung Hau Yu Man San Tsuen (see **Figure A6**).

4.7 Aquatic Assemblages

- 4.7.1 Maximum count of aquatic fauna recorded within the Project Site and the *assessment area* has been reported in **Annex 2**, with their habitat(s) and conservation and protection status presented. Locations of species of conservation importance recorded in the surveys are presented on **Figure A4a-c**.
- 4.7.2 A total of 22 fish species and 15 aquatic invertebrate species were recorded from the surveys. Most of the species are fairly common in similar habitats in Hong Kong and widespread in the region. Only goby *Gobiopterus macrolepis* is considered to be of conservation importance.

- 4.7.3 The goby *Gobiopterus macrolepis* is endemic to China and is restricted to the Pearl River Delta (Cheng 1965). The species was observed in large schools of up to over a thousand individuals, staying near reedbed edges in NSW, and along channel margins at Section 4 of YLTN (approximately 50-100 individuals sighted), SPR, KTR and the lower YLBF. Therefore, it is rather widespread within the *assessment area*. It is listed as Vulnerable in the context of China (Jiang *et al.* 2016). Ecology and distribution of this species in Hong Kong and the wider Pearl River Delta region is unknown.
- 4.7.4 Greasyback Shrimp was recorded from SPR, KTR and reedbeds in NSW. The species was listed as Vulnerable in the China Species Red List (Wan & Xie 2004) due to over-exploitation as it is a commercially important species. However, Greasyback Shrimp is thought to be common in mangroves and estuaries in Hong Kong (Leung, 1999; Vance, 1999). Hence, it is not considered as species of conservation importance in present Study.

4.8 Intertidal/Benthic Fauna

- 4.8.1 Walk-over surveys during low tide levels only recorded individuals of Blue-spotted Mudskipper and fiddler crab *Tubuca arcuata* foraging on exposed mudflat.
- 4.8.2 A total of ten species of benthic fauna were recorded from the Van Veen grab surveys. A comprehensive list of intertidal/benthic species recorded from the surveys and abundance of each species is provided in **Annex 2**.
- 4.8.3 Number of species recorded, density per sampling location, Shannon-weiner Diversity Index (H') and Pielou's Species Evenness (J) are summarised in **Tables 16 and 17** below.

Table 15. Results of Van Veen benthic grab surveys conducted in SPR

	Wet Season			Dry Season		
	Upper	Middle	Lower	Upper	Middle	Lower
Total no. of species recorded per location	4	7	6	5	6	8
Density (No. of individuals recorded per location)	17	26	25	19	58	45
Shannon-Weaver Diversity Index (H')	1.12	1.71	1.49	1.13	1.45	1.77
Pielou's Species Evenness (J)	0.81	0.88	0.83	0.7	0.81	0.85

Table 16. Results of Van Veen benthic grab surveys conducted in KTR

	Wet Season		Dry Season	
	Upper	Lower	Upper	Lower
Total no. of species recorded per location	4	6	5	7
Density (No. of individuals recorded per location)	11	41	27	56
Shannon-Weaver Diversity Index (H')	1.24	1.47	1.35	1.29
Pielou's Species Evenness (J)	0.89	0.83	0.84	0.66

5 ECOLOGICAL EVALUATION

5.1 General

5.1.1 Evaluation of the habitats and species of conservation importance is provided in the following sections, with reference made to the guidance of Tables 2 and 3 of Annex 8 of EIAO-TM.

5.2 Evaluation of Habitats

5.2.1 The ecological importance of habitats recorded from the current study is presented in **Table 18 - 31**.

Table 17. Habitat evaluation for channelised watercourse (YLTN)

Criteria	YLTN		
	Sections 1 and 2	Section 3	Section 4
Naturalness	Artificial habitat for drainage and flood control, with very little opportunity offered to wildlife as the channel itself is completely lined with concrete (only section 4 has some natural substrate in the bed). Also bordered by highly urbanised areas where most wildlife would avoid.		
Size	5.66 ha	4.53 ha	4.02 ha
Diversity	Very low		Low to moderate
Rarity	Engineered channels are common in Hong Kong especially in the lowlands of New Territories. Chinese Pond Heron, Grey Heron, Little Egret and Black-winged Stilt were recorded but in very low abundance.		Engineered channels are common in Hong Kong especially in the lowlands of New Territories. Northern Shoveler, Chinese Pond Heron, Grey Heron, Great Egret, Little Egret, Great Cormorant, Black-winged Stilt, Pied Avocet, Little Ringed Plover, Pheasant-tailed Jacana, Common Redshank, Marsh Sandpiper and Common Greenshank were recorded in low to moderate abundance. The fish <i>Gobiopertus macrolepis</i> was also recorded. A high tide roost of Black-winged Stilt was found here.
Re-creatability	Readily recreated		
Fragmentation	Some fragmentation by urban infrastructures.		Not fragmented
Ecological Linkage	Very little ecological linkage. Much of the low-lying area in the drainage basin of the YLTN has been developed, leaving virtually no natural habitats suitable for wildlife. Within the assessment area, Sections 1 to 3 of the YLTN is within town centre and industrial area with high level of human disturbances deterring wildlife use. Further, the inflatable dam creates marked differences between these upper Sections (i.e. 1-3) and Section 4 in terms of habitat characteristics (such as water depth and sediment content). This discourages wildlife from in Section 4 entering Section 3, in particular waterbirds. The dam also disrupts the continuum of the water flow, preventing aquatic fauna in the downstream from entering the upstream area.		Though bordered by developed areas, this Section is considered ecologically and hydrologically linked with the lower SPR, which in turn is linked to the Deep Bay area, allowing the movement of fauna, nutrients and sediment. The section is also linked with the KTR, tidal marsh, reedbed and mangrove in the vicinity.
Potential Value	Very low. Even if the nullah itself is ecologically enhanced or revitalised, the proposed barrage and the disturbed nature of the drainage basin (which implies pollution, human activities, lack of natural habitats, etc.) mean that native aquatic flora and fauna would have very little chance of colonising the nullah.		Value could further increase by adopting ecological enhancement measures such as planting of mangrove and improvement of the concrete banks.
Nursery/ breeding Ground	Not likely		Not known to be significant
Age	Constructed in the 1960s		
Abundance/ richness of wildlife	Very low		Low to moderate
Ecological Value	VERY LOW	VERY LOW	LOW TO MIDDLE

Table 18. Habitat evaluation for channelised watercourse (SPR and KTR)

Criteria	SPR	KTR
Naturalness	SPR was channelised as part of the river training works for flood control in Yuen Long. Nevertheless, the natural meandering of the original river has been almost entirely preserved. River bed is composed of natural sediment brought in from Deep Bay through tidal actions, allowing wetland plants to colonise. Naturalness is moderate.	KTR was channelised as part of the river training works for flood control in Yuen Long. The channel was largely straightened. River bed is composed of natural sediment brought in from Deep Bay through tidal actions, although few wetland plants have established. Naturalness is low to moderate.
Size	8.33 ha	27.93 ha
Diversity	Moderate	
Rarity	Engineered channels are common in Hong Kong especially in the lowlands of New Territories. Species of conservation importance recorded from this habitat include 25 avifauna species, and <i>Gobiopterus macrolepis</i> .	Engineered channels are common in Hong Kong especially in the lowlands of New Territories. Species of conservation importance recorded from this habitat include 30 avifauna species, and <i>Gobiopterus macrolepis</i> .
Re-creatability	Could be recreated under suitable hydrological conditions	
Fragmentation	Not fragmented	
Ecological Linkage	Hydrologically and functionally linked with nearby water channels (YLTN, KTR, lower SPR) and wetland habitats (tidal marsh, reedbed, mangrove and pond).	
Potential Value	Value could further increase when vegetation along and within the channel becomes mature	
Nursery/ breeding Ground	Potentially nursery ground for invertebrates	
Age	River training works completed in 2000s	
Abundance/ richness of wildlife	Low in the wet season; moderate to high in the dry season	
Ecological Value	MIDDLE	MIDDLE

Table 20. Habitat evaluation for other channelised watercourses (YLBF, SCR and other minor channelised watercourses)

Criteria	YLBF	SCR	Minor Channelised Watercourses
Naturalness	Artificial habitats created for flood control purposes. The channel bed and banks of these watercourses within the assessment area are completely lined with concrete, offering very little opportunities for wildlife.		
Size	3.96 ha	0.63 ha	4.46 ha
Diversity	Low to moderate	Very low	
Rarity	Engineered channels are common in Hong Kong especially in the lowlands of New Territories. In the upper section near SCR, the only species of conservation importance recorded were Chinese Pond Heron and Little Egret. In the lower section near KTR, nine birds of species of conservation importance, and <i>Gobiopterus macrolepis</i> were recorded.	Engineered channels are common in Hong Kong especially in the lowlands of New Territories. The only species of conservation importance recorded were Chinese Pond Heron and Little Egret.	Engineered channels are common in Hong Kong especially in the lowlands of New Territories. No Species of conservation importance were recorded.
Re-creatability	Easily recreated		
Fragmentation	Some fragmentation	Highly fragmented	
Ecological Linkage	Some linkages to adjacent water channels and wetland	Very little linkage as these watercourses are located well within developed areas	
Potential Value	Very low for the upper section; low to moderate for the lower section	Very low potential given the disturbed nature of the surrounding environment	
Nursery/ breeding Ground	Potentially nursery ground for invertebrates	Not likely	
Age	Constructed in 2006	Not known	
Abundance/ richness of wildlife	Very low for the upper section; low to moderate for the lower section	Very low	
Ecological Value	Upper Section: LOW Lower Section: LOW TO MIDDLE	LOW	VERY LOW

Table 21. Habitat evaluation for semi-natural watercourse (Old KTR)

Criteria	Old KTR
Naturalness	Largely natural as this section is a remnant of the original KTR, which had been left untouched in the previous river training works. Some human disturbances were noted from nearby villages.
Size	5.66 ha
Diversity	Low to moderate
Rarity	Tidal watercourses of this level of naturalness are not common in Hong Kong. Eurasian Teal, Chinese Pond Heron, Grey Heron, Great Egret, Little Egret, Black-winged Stilt, Pied Avocet, Common Greenshank, Collared Crow, Pallas's Grasshopper Warbler were recorded. <i>Gobiopterus macrolepis</i> are likely to occur as well, though not recorded in the survey period.
Re-creatability	Difficult to recreate
Fragmentation	Not considered fragmented
Ecological Linkage	Functionally and hydrologically linked with nearby water channels (YLTN, SPR) and wetland habitats (tidal marsh, reedbed, mangrove and pond). Also serves as a movement corridor between the SPR and Kam Tin main channel.
Potential Value	Value could further increase if nearby human disturbances are reduced
Nursery/ breeding Ground	Potentially nursery ground for invertebrates
Age	Old
Abundance/ richness of wildlife	Low to moderate
Ecological Value	MIDDLE

Table 22. Habitat evaluation for pond

Criteria	Abandoned Ponds within NSW	Other Ponds within the assessment area
Naturalness	Originally a man-made habitat created for aquaculture, but naturalness has gradually increased following abandonment of these ponds due to vegetation succession and reduction in human disturbance and interference	
Size	26.72 ha in total	
Diversity	Low	Very low
Rarity	Fishponds are fairly common in the northwest New Territories but are in decline. Species of conservation importance recorded include ten species of birds and three species of odonates. Chinese Soft-shelled Turtle, and <i>Gobiopterus macrolepis</i> are likely to occur as well.	Fishponds are fairly common in the northwest New Territories but are in decline. Species of conservation importance recorded include seven species of birds.
Re-creatability	Could be recreated under suitable soil and hydrological conditions	
Fragmentation	Not fragmented	Some fragmented and isolated
Ecological Linkage	Functionally linked with adjacent wetland habitats, in particular reedbed	Some linkages with adjacent water channels
Potential Value	High potential value if these abandoned ponds receive active management	Low given the disturbed nature of the surrounding environment
Nursery/ breeding Ground	Not known to be significant	
Age	At least 30 to 50 years judging from previous aerial photographs	
Abundance/ richness of wildlife	Low to moderate	Low
Ecological Value	MIDDLE	LOW TO MIDDLE

Table 23. Habitat evaluation for tidal marsh and mangrove

Criteria	Tidal Marsh	Mangrove
Naturalness	Natural habitat established by wetland plants at channel margins	
Size	3.36 ha	3.3 ha
Diversity	Low to moderate	
Rarity	Not a common habitat in Hong Kong's context. High concentration of Mai Po Bent-winged Firefly. Other species of conservation importance recorded include Collared Crow.	Not a common habitat in Hong Kong's context. High concentration of Mai Po Bent-winged Firefly. Other species of conservation importance recorded include Striated Heron, Chinese Pond Heron, Little Egret, Greater Coucal and Common Awl.
Re-creatability	Difficult to recreate	
Fragmentation	Not severely fragmented but rather small in size; might imply a high edge effect	
Ecological Linkage	Hydrologically and functionally linked with adjacent channels (Kam Tin and SPRs) and some linkages to the reedbed and ponds nearby	
Potential Value	Moderate to high if human disturbances nearby (primarily artificial light) could be minimized for the survival of Mai Po Bent-winged Firefly	
Nursery/ breeding Ground	Breeding ground of Mai Po Bent-winged Firefly	
Age	At least over 30 to 50 years judging from previous aerial photographs	
Abundance/ richness of wildlife	Low to moderate	
Ecological Value	MIDDLE	MIDDLE

Table 24. Habitat evaluation for reedbed

Criteria	Reedbed
Naturalness	Semi-natural habitat evolved from abandoned commercial fishponds through natural colonisation of reed and long-term succession
Size	23.5 ha within the assessment area, but is part of a large reedbed habitat spanning across the whole NSW area, which is an important component of the inner Deep Bay wetland system
Diversity	Moderate
Rarity	Uncommon in Hong Kong and is restricted to several locations. Species of conservation importance recorded include Small Indian Civet, 16 species of birds, 3 odonates species, Chinese Soft-shelled Turtle, and <i>Gobiopterus macrolepis</i> . Leopard Cat (recorded in the adjacent plantation) may also utilise this habitat.
Re-creatability	Not impossible to recreate by planting reed in areas of suitable hydrological conditions but could take long time to reach the current size and maturity
Fragmentation	Not fragmented, and is one of the largest reedbed in Hong Kong and potentially the Pearl River Delta region
Ecological Linkage	Hydrologically and functionally linked with adjacent channels (Kam Tin and SPRs) and some linkages to the mangrove, tidal marsh and ponds nearby
Potential Value	Value could further increase by adopting ecological enhancement measures and implementing habitat management practices
Nursery/ breeding Ground	Potential breeding ground for some wetland birds species
Age	At least several decades
Abundance/ richness of wildlife	Moderate
Ecological Value	MIDDLE TO HIGH

Table 25. Habitat evaluation for abandoned wet agricultural land/freshwater marsh

Criteria	Abandoned Wet Agricultural Land/Freshwater Marsh
Naturalness	Semi-natural habitat evolved from abandoned agricultural land through natural colonisation of wetland plants and long-term succession
Size	1.75 ha
Diversity	Very low
Rarity	Uncommon in Hong Kong and is declining. Species of conservation importance recorded include <i>Phymatodes longissima</i> , Metallic Cerulean and Buff-striped Keelback.
Re-creatability	Could be recreated under suitable hydrological conditions
Fragmentation	Fragmented by developed areas
Ecological Linkage	No or little ecological linkage
Potential Value	Value could further increase by adopting ecological enhancement measures and implementing habitat management practices
Nursery/ breeding Ground	Not known
Age	Not known
Abundance/ richness of wildlife	Low
Ecological Value	LOW TO MIDDLE

Table 26. Habitat evaluation for mitigation wetland

Criteria	Mitigation Wetland
Naturalness	Semi-natural habitat created for conservation purpose
Size	22.23 ha
Diversity	Moderate
Rarity	Not common in Hong Kong. Species of conservation importance recorded include 26 bird species, Spotted Narrow-mouthed Frog and Common Rat Snake.
Re-creatability	Could be recreated under suitable hydrological conditions
Fragmentation	Some fragmentation
Ecological Linkage	Hydrologically and functionally linked with adjacent channels (KTR and SPR) and some linkages to the mangrove, tidal marsh and ponds nearby
Potential Value	Value could further increase by enhancing habitat management practices
Nursery/ breeding Ground	Potential breeding ground for some wetland birds species
Age	Less than 20 years
Abundance/ richness of wildlife	Moderate
Ecological Value	MIDDLE

Table 27. Habitat evaluation for shrubland

Criteria	Shrubland
Naturalness	Semi-natural habitat at an early stage of natural vegetation succession
Size	8.18 ha
Diversity	High for butterflies; low for other wildlife
Rarity	A common habitat in Hong Kong. <i>Aquilaria sinensis</i> , Black-naped Oriole, Lesser Band Dart, Pale Palm Dart, Forget-me-not, Malayan, Tiny Grass Blue, Danaid Egg-fly and Swallowtail were recorded.
Re-creatability	Readily recreated
Fragmentation	Fragmented by urban areas
Ecological Linkage	Very little linkage as the surrounding areas are developed and disturbed
Potential Value	Value could increase when vegetation becomes mature under natural succession
Nursery/ breeding Ground	Not known but could potentially be breeding ground for some butterfly species
Age	Unknown
Abundance/ richness of wildlife	Low to moderate
Ecological Value	LOW TO MIDDLE

Table 28. Habitat evaluation for agricultural land

Criteria	Agricultural Land
Naturalness	Man-made habitat created for cultivation of crops
Size	2.58 ha
Diversity	Low
Rarity	Agricultural land of this small size is common in rural areas in the New Territories. No species of conservation importance recorded.
Re-creatability	Readily recreated
Fragmentation	Highly fragmented
Ecological Linkage	No or very little linkage
Potential Value	Very low given the small size and disturbed surroundings
Nursery/ breeding Ground	Not known
Age	Not known
Abundance/ richness of wildlife	Very low
Ecological Value	VERY LOW

Table 29. Habitat evaluation for mixed woodland

Criteria	Mixed Woodland
Naturalness	Semi-natural habitat mixed with native and exotic tree species
Size	1.24 ha
Diversity	Low
Rarity	Common habitat in rural areas in the New Territories. Greater Coucal and Red-billed Starling were recorded but were in low numbers only.
Re-creatability	Could be recreated
Fragmentation	Highly fragmented
Ecological Linkage	Very little linkage
Potential Value	Very low given the small size
Nursery/ breeding Ground	Not known
Age	Not known
Abundance/ richness of wildlife	Very low
Ecological Value	LOW

Table 30. Habitat evaluation for plantation

Criteria	Plantation in NSW	Remaining Plantations in the assessment area
Naturalness	Low naturalness with exotic species dominated	
Size	51.19 ha	
Diversity	Low diversity for both flora and fauna	
Rarity	Common habitat in Hong Kong. Collared Scops Owl, Asian Barred Owlet and Leopard Cat were recorded but are considered transient.	Common habitat in Hong Kong. A night roost of ardeids was identified beside Kam Tin River, and an egret was identified at Tung Shing Lei.
Re-creatability	Easily recreated	
Fragmentation	Fairly fragmented	
Ecological Linkage	Functionally linked with wetland habitats of relatively high ecological value.	Little functional linkage as mostly adjoined by developed or disturbed areas.
Potential Value	Low given the small size, though plantation in NSW can provide some screening effect against human disturbances along the vehicular access road and footpath.	
Nursery/ breeding Ground	Not likely	
Age	Not known	
Abundance/ richness of wildlife	Low	
Ecological Value	LOW TO MIDDLE	LOW, but the locations with egret and night roost of ardeids are considered MIDDLE

Table 31. Habitat Evaluation for developed area and wasteland

Criteria	Developed Area / Wasteland
Naturalness	Entirely man-made habitat with high human disturbance
Size	476.64 ha for developed area; 16.27 ha for wasteland
Diversity	Very low flora and fauna diversity
Rarity	Common habitat in Hong Kong. A Common Wolf Snake (road-kill) was recorded but should be regarded as transient.
Re-creatability	Re-creatable
Fragmentation	Not fragmented
Ecological Linkage	None observed
Potential Value	Very low
Nursery/ breeding Ground	Not known
Age	Less than 50 years
Abundance/ richness of wildlife	Very low
Ecological Value	VERY LOW

5.3 Evaluation of Species

5.3.1 The ecological importance of the species of conservation importance recorded is evaluated and presented in **Tables 32** and **33**.

Table 19. Evaluation for floral species of conservation importance

Species	Conservation and Protection Status ¹	Distribution ¹	Rarity ¹	Location Recorded
<i>Aquilaria sinensis</i>	Cap. 586; Near Threatened[a]; Wild plant under State Protection (Category II)[a]; Vulnerable[b][c]	Commonly found in lowland forest and fung shui wood	Common	Chu Wong Ling
<i>Phymatodes longissima</i>	-	Streamside habitats	Rare; only found in limited number of localities	Near Shui Tau

Note:

- Conservation and Protection Status, and Status in Hong Kong refer to the below literature.
 - AFC (2003);
 - IUCN (2019);
 - Pang *et al.* (2011);
 - Wu and Lee (2000).

Table 20. Evaluation for faunal species of conservation importance

Species	Conservation and Protection Status ¹	Distribution ²	Rarity ²	Location Recorded
Mammals				
Japanese Pipistrelle <i>Pipistrellus abramus</i>	Cap.170	Widespread	Very Common	Various
Small Indian Civet <i>Viverricula indica</i>	RLCV(VU); CSMPS(II); CITES(III); Cap.170; Cap.586	Widespread	Very Common	NSW
Leopard Cat <i>Prionailurus bengalensis</i>	RLCV(VU); CITES(II); Cap.170; Cap.586	Widespread	Uncommon	NSW
Avifauna				
Northern Shoveler <i>Spatula clypeata</i>	RC	Primarily in Deep Bay area	Abundant	KTR; SPR; YLTN S4
Northern Pintail <i>Anas acuta</i>	EC	Primarily in Deep Bay area	Abundant but declining	KTR
Eurasian Teal <i>Anas crecca</i>	RC	Primarily in Deep Bay area	Abundant but declining	KTR; Old KTR; SPR; West Rail Mitigation Wetland

Species	Conservation and Protection Status ¹	Distribution ²	Rarity ²	Location Recorded
Tufted Duck <i>Aythya fuligula</i>	LC	Primarily in Deep Bay area	Abundant	KTR; NSW
Little Grebe <i>Tachybaptus ruficollis</i>	LC	Primarily in Deep Bay area	Common	West Rail Mitigation Wetland; NSW; TSL
Eurasian Spoonbill <i>Platalea leucorodia</i>	LC; RLCV(NT); CITES(II); CSMPS(II); Cap.586	Deep Bay area	Uncommon	West Rail Mitigation Wetland
Black-faced Spoonbill <i>Platalea minor</i>	PGC; RLCV(EN); IUCN(EN); CSMPS(II)	Deep Bay area	Common	KTR; SPR; YLBF (Lower)
Yellow Bittern <i>Ixobrychus sinensis</i>	(LC)	Widespread	Common	NSW; Sha Po; SPR; West Rail Mitigation Wetland; KTR
Black-crowned Night Heron <i>Nycticorax nycticorax</i>	(LC)	Widespread	Common	NSW; Sha Po; West Rail Mitigation Wetland; YLBF (Upper and Lower); Old KTR; KTR
Striated Heron <i>Butorides striata</i>	(LC)	Widespread	Common	NSW
Chinese Pond Heron <i>Ardeola bacchus</i>	PRC (RC)	Widespread	Common	Au Tau Fisheries Office; KTR; West Rail Mitigation Wetland; NSW; SCR; Sha Po; SPR; TSL YLBF (Upper and Lower); YLTN S1, S3 and S4; Old KTR
Eastern Cattle Egret <i>Bubulcus coromandus</i>	(LC)	Widespread	Common	Sha Po; West Rail Mitigation Wetland
Grey Heron <i>Ardea cinerea</i>	PRC	Primarily in Deep Bay area	Common	Au Tau Fisheries Office; KTR; NSW; Sha Po; SPR; West Rail Mitigation Wetland; YLBF (Upper and Lower); YLTN S3 and S4; Old KTR
Purple Heron <i>Ardea purpurea</i>	RC	Deep Bay area	Uncommon	NSW

Species	Conservation and Protection Status ¹	Distribution ²	Rarity ²	Location Recorded
Great Egret <i>Ardea alba</i>	PRC (RC)	Widespread	Abundant	Au Tau Fisheries Office; KTR; NSW; Old KTR; Sha Po; SPR; TSL; West Rail Mitigation Wetland; YLBF (Upper and Lower); YLTN S3 and S4
Intermediate Egret <i>Ardea intermedia</i>	RC	Primarily in Deep Bay area	Uncommon	Sha Po
Little Egret <i>Egretta garzetta</i>	PRC (RC)	Widespread	Abundant	Au Tau Fisheries Office; KTR; NSW; Old KTR; Sha Po; SPR; TSL; West Rail Mitigation Wetland; YLBF (Upper and Lower); YLTN S1, S3 and S4
Great Cormorant <i>Phalacrocorax carbo</i>	PRC	Primarily in Deep Bay area	Abundant	KTR; NSW; Old KTR; SPR; West Rail Mitigation Wetland; YLTN S4
Crested Serpent Eagle <i>Spilornis cheela</i>	(LC); RLCV(NT); CITES(II); CSMPS(II); Cap.586	Widespread	Locally common	NSW
Black Kite <i>Milvus migrans</i>	(RC); CITES(II); CSMPS(II); Cap.586	Widespread	Common	NSW
Eastern Buzzard <i>Buteo japonicus</i>	CSMPS(II); CITES(II); Cap.586	Widespread	Common	NSW; Sha Po; West Rail Mitigation Wetland
Black-winged Stilt <i>Himantopus himantopus</i>	RC	Widespread	Common	KTR; NSW; Old KTR; SPR; West Rail Mitigation Wetland; YLBF (Lower); YLTN S3 and S4
Pied Avocet <i>Recurvirostra avosetta</i>	RC	Deep Bay area	Abundant	KTR; Old KTR; SPR; YLBF (Lower); YLTN S4
Grey-headed Lapwing <i>Vanellus cinereus</i>	LC	Primarily in Kam Tin area	Locally Common	KTR; Old KTR
Pacific Golden Plover <i>Pluvialis fulva</i>	LC	Primarily in Deep Bay area	Common	KTR
Little Ringed Plover <i>Charadrius dubius</i>	(LC)	Widespread	Common	KTR; SPR; YLTN S4
Pheasant-tailed Jacana <i>Hydrophasianus chirurgus</i>	LC; RLCV(NT)	Restricted	Uncommon/rare	SPR; YLTN S4

Species	Conservation and Protection Status ¹	Distribution ²	Rarity ²	Location Recorded
Common Redshank <i>Tringa totanus</i>	RC	Deep Bay area	Abundant	KTR; Old KTR; SPR; YLTN S4
Marsh Sandpiper <i>Tringa stagnatilis</i>	RC	Primarily in Deep Bay area	Abundant	KTR; Old KTR; SPR; YLTN S4
Wood Sandpiper <i>Tringa glareola</i>	LC	Widespread	Common	KTR; Old KTR; SPR
Spotted Redshank <i>Tringa erythropus</i>	RC	Primarily in Deep Bay area	Common but declining	KTR
Common Greenshank <i>Tringa nebularia</i>	RC	Primarily in Deep Bay area	Abundant	KTR; Old KTR; SPR; YLTN S4
Black-headed Gull <i>Chroicocephalus ridibundus</i>	PRC	Deep Bay area	Abundant	KTR; SPR; YLTN S3
Greater Coucal <i>Centropus sinensis</i>	CSMPS(II)	Widespread	Common	Chu Wong Ling; NSW; Sha Po; West Rail Mitigation Wetland
Collared Scops Owl <i>Otus lettia</i>	CITES(II); CSMPS(II); Cap.586	Widespread	Common	NSW
Asian Barred Owlet <i>Glaucidium cuculoides</i>	CITES(II); CSMPS(II); Cap.586	Widespread	Common	NSW
White-throated Kingfisher <i>Halcyon smyrnensis</i>	(LC)	Widespread	Common	KTR; NSW; Sha Po; SPR; West Rail Mitigation Wetland; YLBF Lower
Pied Kingfisher <i>Ceryle rudis</i>	(LC)	Primarily in Deep Bay area	Common	Sha Po; SPR; West Rail Mitigation Wetland
Peregrine Falcon <i>Falco peregrinus</i>	(LC); RLCV(NT); CITES(I); CSMPS(II); Cap.586	Widespread	Common	NSW
Black-naped Oriole <i>Oriolus chinensis</i>	LC	Widespread	Common	Chu Wong Ling
Collared Crow <i>Corvus torquatus</i>	LC; RLCV(NT); IUCN(VU)	Mainly in coastal areas	Locally Common	NSW; Old KTR;
Chinese Penduline Tit <i>Remiz consobrinus</i>	RC	Primarily in Deep Bay area	Common	NSW; Sha Po; West Rail Mitigation Wetland
Thick-billed Warbler <i>Arundinax aedon</i>	LC	Widespread	Scarce	NSW
Pallas's Grasshopper Warbler <i>Helopsaltes certhiola</i>	LC	Widespread	Common	NSW; Old KTR; West Rail Mitigation Wetland
Lanceolated Warbler <i>Locustella lanceolata</i>	RLCV(NT)	Widespread	Uncommon	NSW; West Rail Mitigation Wetland
Zitting Cisticola <i>Cisticola juncidis</i>	LC	Widespread	Common	Sha Po
Red-billed Starling <i>Spodiopsar sericeus</i>	GC	Open country areas, mainly northwest N.T.	Abundant	West Rail Mitigation Wetland

Species	Conservation and Protection Status ¹	Distribution ²	Rarity ²	Location Recorded
White-cheeked Starling <i>Spodiopsar cineraceus</i>	PRC	Open country areas, mainly Deep Bay area	Locally Common	NSW; West Rail Mitigation Wetland
White-shouldered Starling <i>Sturnia sinensis</i>	(LC)	Open country and village edge habitats mainly in the northwest N.T.	Locally Common	West Rail Mitigation Wetland
Chestnut-eared Bunting <i>Emberiza fucata</i>	LC	Widespread	Uncommon	NSW; near West Rail Mitigation Wetland
Yellow-breasted Bunting <i>Emberiza aureola</i>	RC; RLCV(EN); IUCN(CR)	Open country areas	Common but declining	near West Rail Mitigation Wetland
Herpetofauna				
Spotted Narrow-mouthed Frog <i>Kalophrynus interlineatus</i>	RLCV(NT)	Widespread from low to moderate altitudes in northern and central N.T.	Common	West Rail Mitigation Wetland
Chinese Soft-shelled Turtle <i>Pelodiscus sinensis</i>	GC; RLCV(EN); IUCN(VU); Cap.170	Locally found in reservoirs and fishponds in Deep Bay area.	Rare	NSW
Common Wolf Snake <i>Lycodon aulicus</i>	RLCV(NT)	Widespread at low elevations throughout Hong Kong.	Uncommon	Near West Rail Mitigation Wetland
Common Rat Snake <i>Ptyas mucosus</i>	PRC; RLCV(EN); CITES(II); Cap.586	Widespread throughout Hong Kong.	Common	Sha Po
Buff-striped Keelback <i>Amphiesma stolatum</i>	LC	Distributed in lowland in central and northern N.T. and Lantau Island.	Uncommon	TSL
Butterflies				
Common Awl <i>Hasora badra</i>	LC	Wu Kau Tang, Lai Chi Wo, Hong Kong Wetland Park	Very Rare	Near NSW
Lesser Band Dart <i>Potanthus trachala</i>	-	Widespread	Rare	Chu Wong Ling
Pale Palm Dart <i>Telicota colon</i>	LC	Widespread	Rare	Chu Wong Ling
Forget-me-not <i>Catochrysops strabo</i>	-	Widespread	Very Rare	Chu Wong Ling
Metallic Cerulean <i>Jamides alecto</i>	-	Widespread	Very Rare	Sha Po; Shui Tsiu San Tsuen
Malayan <i>Megisba malaya</i>	LC	North Lantau Island	Very Rare	Chu Wong Ling
Tiny Grass Blue <i>Zizula hylax</i>	-	Lung Kwu Tan, Fung Yuen, Sha Lo Wan	Uncommon	Chu Wong Ling
Danaid Egg-fly <i>Hypolimnys misippus</i>	LC	Widespread	Rare	Chu Wong Ling
Swallowtail <i>Papilio xuthus</i>	-	Widespread	Rare	Chu Wong Ling; Sha Po
Odonates				
Coastal Glider <i>Macrodiplax cora</i>	LC	Hong Kong Wetland Park, Kam Tin, Lai Chi Wo, Nim Wan and Luk Keng	Common	NSW
Ruby Darer <i>Rhodothermis rufa</i>	LC	Widely distributed in ponds and marshes throughout Hong Kong	Common	NSW

Species	Conservation and Protection Status ¹	Distribution ²	Rarity ²	Location Recorded
Scarlet Basker <i>Urothemis signata</i>	LC	Common in areas containing abandoned fish ponds throughout Hong Kong	Common	NSW
Aquatic Assemblages				
<i>Gobiopterus macrolepis</i>	RLCV(VU)	Endemic to China; restricted to Pearl River Delta	Unknown	NSW; KTR; Old KTR; SPR; YLBF (Lower); YLTN S4
Firefly				
Mai Po Bent-winged Firefly <i>Pteroptyx maipo</i>	-	Endemic to Hong Kong. Found in mangrove habitats in Deep Bay area.	Unknown	NSW; Old KTR

Notes:

- Conservation and protection status refers to Fellowes *et al.* (2002), Red List of China's Vertebrates (Jiang *et al.* 2016), IUCN (2020), China State Major Protection Status, CITES (2020), Cap. 170 and Cap. 586.
 - Conservation status by Fellowes *et al.* (2002): LC = Local Concern; PRC = Potential Regional Concern; RC = Regional Concern; PGC = Potential Global 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.
 - Conservation status by Red List of China's Vertebrates (RLCV) (Jiang *et al.* 2016): NT = Near Threatened; VU = Vulnerable; EN = Endangered.
 - Conservation status by China Species Red List (CSRL) (Wan & Xie 2004): VU = Vulnerable.
 - Conservation status by IUCN (2020): NT = Near Threatened; VU = Vulnerable; EN = Endangered.
 - Protection status by China State Major Protection Status (CSMPS): I = Class I Protected Species in China; II = Class II Protected Species in China.
 - Protection status by CITES (2020): II = Listed in CITES Appendix II; III = Listed in CITES Appendix III.
 - Cap. 170. Wild Animal Protection Ordinance. All wild birds in Hong Kong are protected under Cap. 170
 - Cap. 586 = Protection of Endangered Species of Animals and Plants Ordinance.
- Distribution and rarity follow AFCD (2020), Allcock *et al.* (2019), Leung (1999), Vance (1999) and Ballantyne *et al.* (2011).

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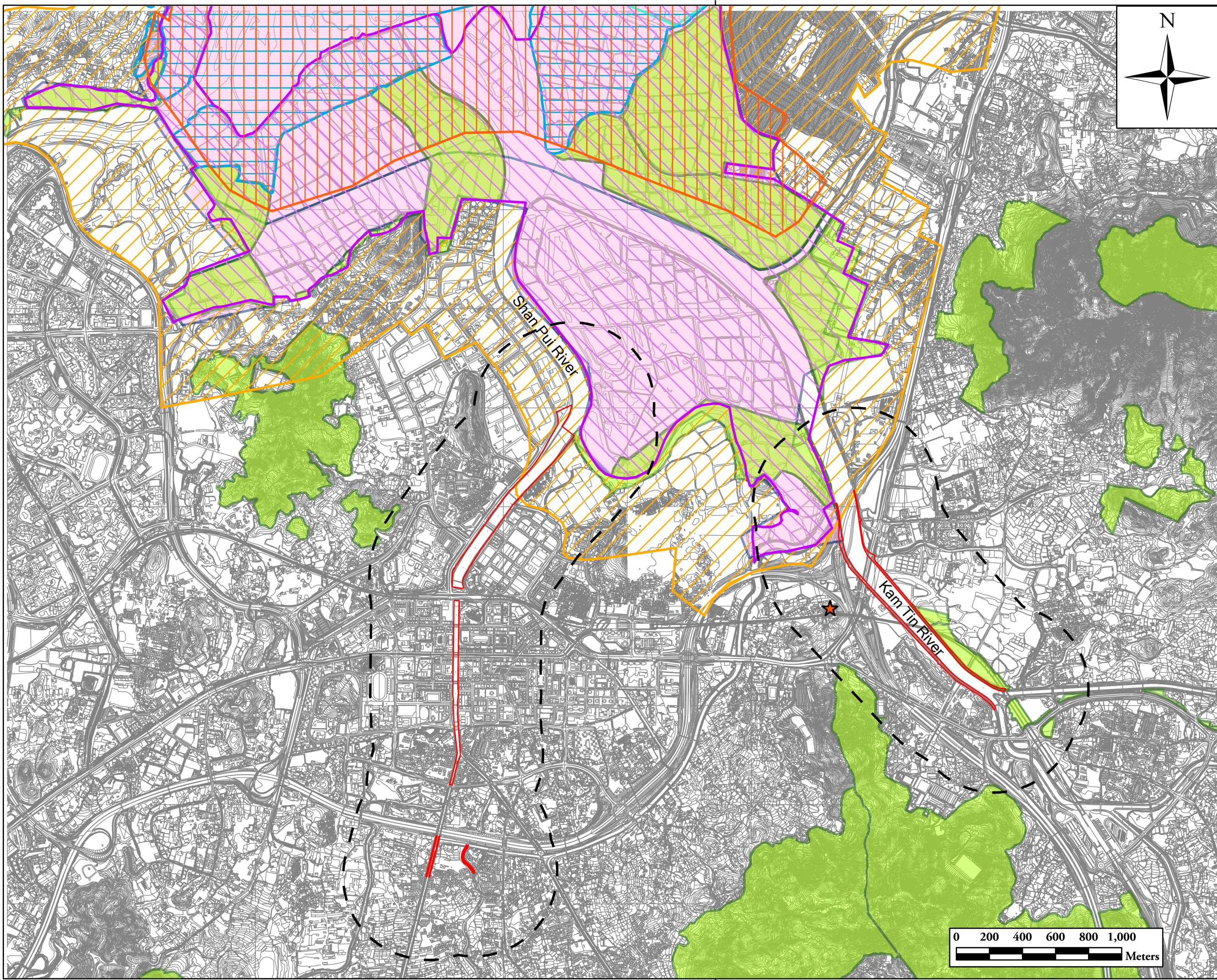
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Figures



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Legend

- Project Site
- 500m Assessment Area
- Map Po Inner Deep Bay Ramsar site
- Wetland Buffer Area
- Wetland Conservation Area
- Mai Po Nature Reserve
- Site of Special Scientific Interest
- Conservation Area
- Priority Sites for Enhanced Conservation
- Tung Shing Lane Egrettry

Revision	Date	Description	Initial
	Designed	Checked	Drawn
Initial			
Date			
Approved			

Agreement No.

CE 93/2017 (DS)

Contract Title


YUEN LONG BARRAGE SCHEME - INVESTIGATION, DESIGN AND CONSTRUCTION

Drawing Title


Recognised Sites of Conservation Importance

Drawing No.	Revision
Figure A1	-

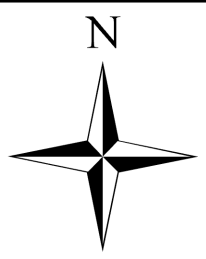
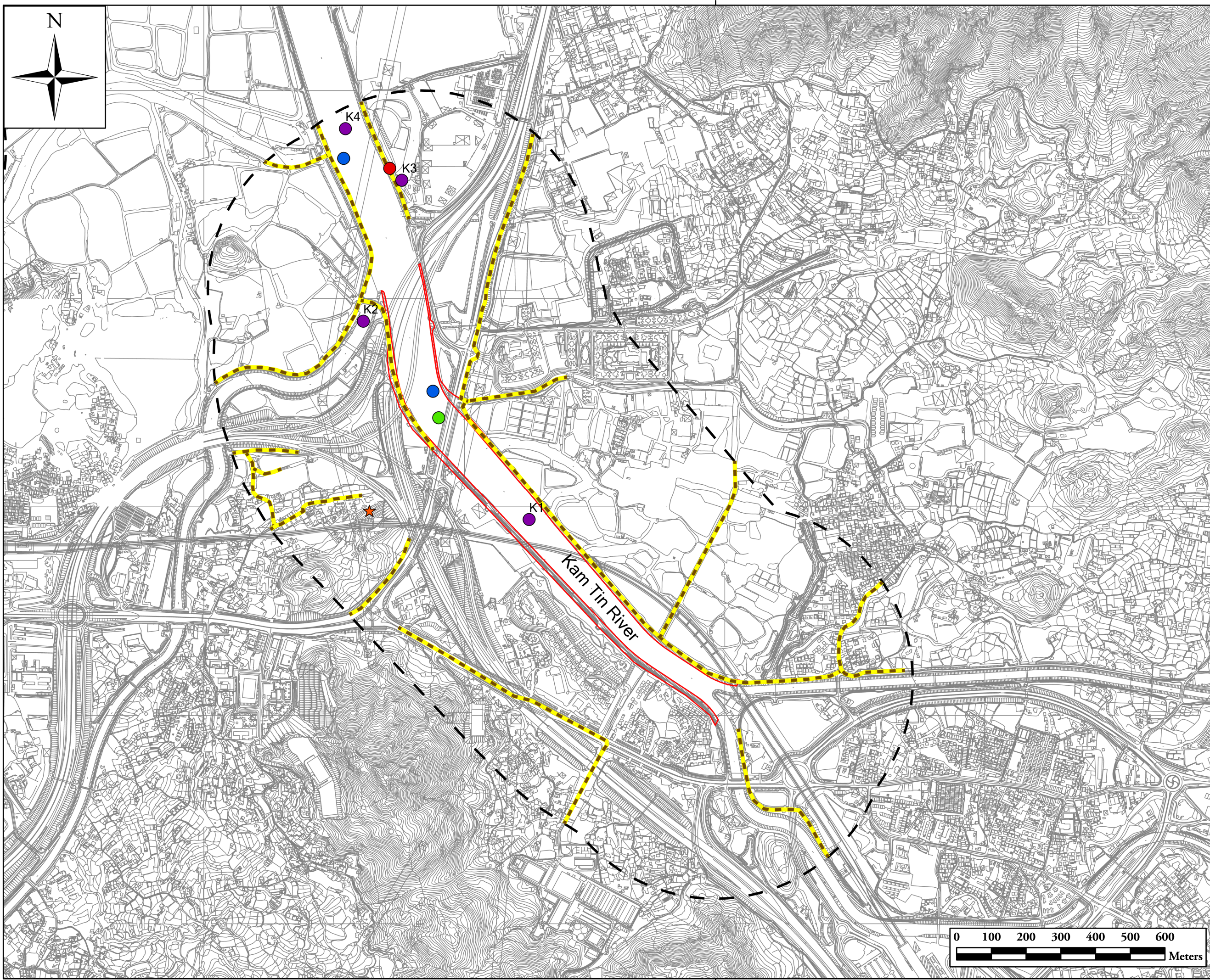
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- Legend**
- Project Site
 - 500m Assessment Area
 - Survey Transects
 - Freshwater Sampling Locations
 - Vantage Points for Great Cormorants Flight Path
 - Vantage Points for Ardeid Night Roost
 - Intertidal Benthic Sampling Locations
 - Tung Shing Lane Egretty

Revision	Date	Description	Initial
	Designed	Checked	Drawn
Initial			
Date			

Approved

Agreement No. CE 93/2017 (DS)

Contract Title
YUEN LONG BARRAGE SCHEME -
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Drawing Title

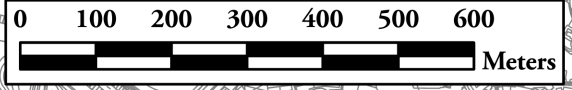
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(Kam Tin)

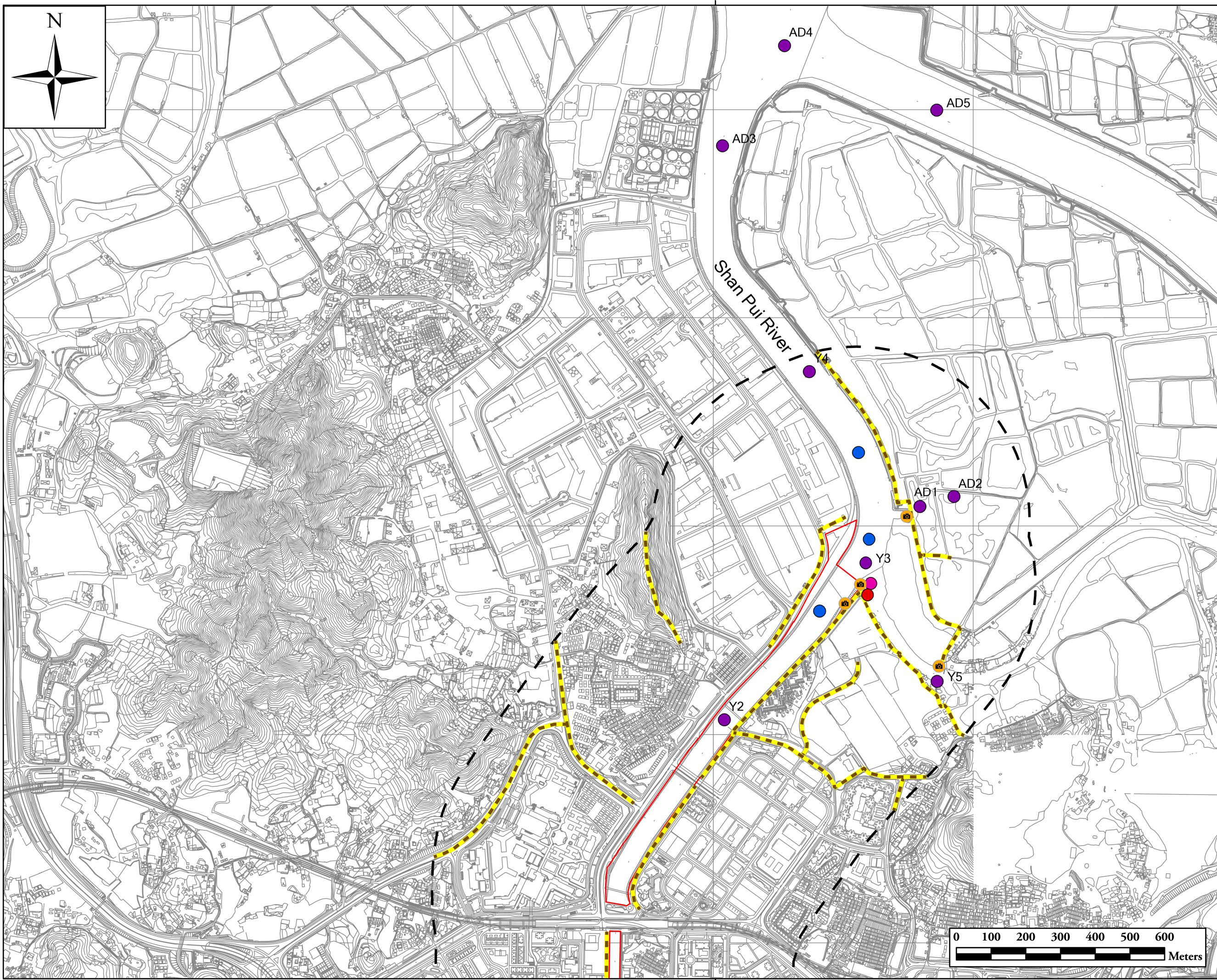
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Legend

- Project Site
- 500m Assessment Area
- Survey Transects
- Freshwater Sampling Locations
- Automatic Infra-red Camera
- Vantage Points for Breeding Ardeids of TSL Egret
- Vantage Points for Great Cormorants Flight Path
- Intertidal Benthic Sampling Locations

Revision	Date	Description	Initial
	Designed	Checked	Drawn
Initial			
Date			
Approved			

Agreement No.

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Contract Title

YUEN LONG BARRAGE SCHEME - INVESTIGATION, DESIGN AND CONSTRUCTION


Drawing Title

Surveys Transects and Sampling Locations (1 of 2 Yuen Long)


Drawing No.	Revision
Figure A2b	-

Scale

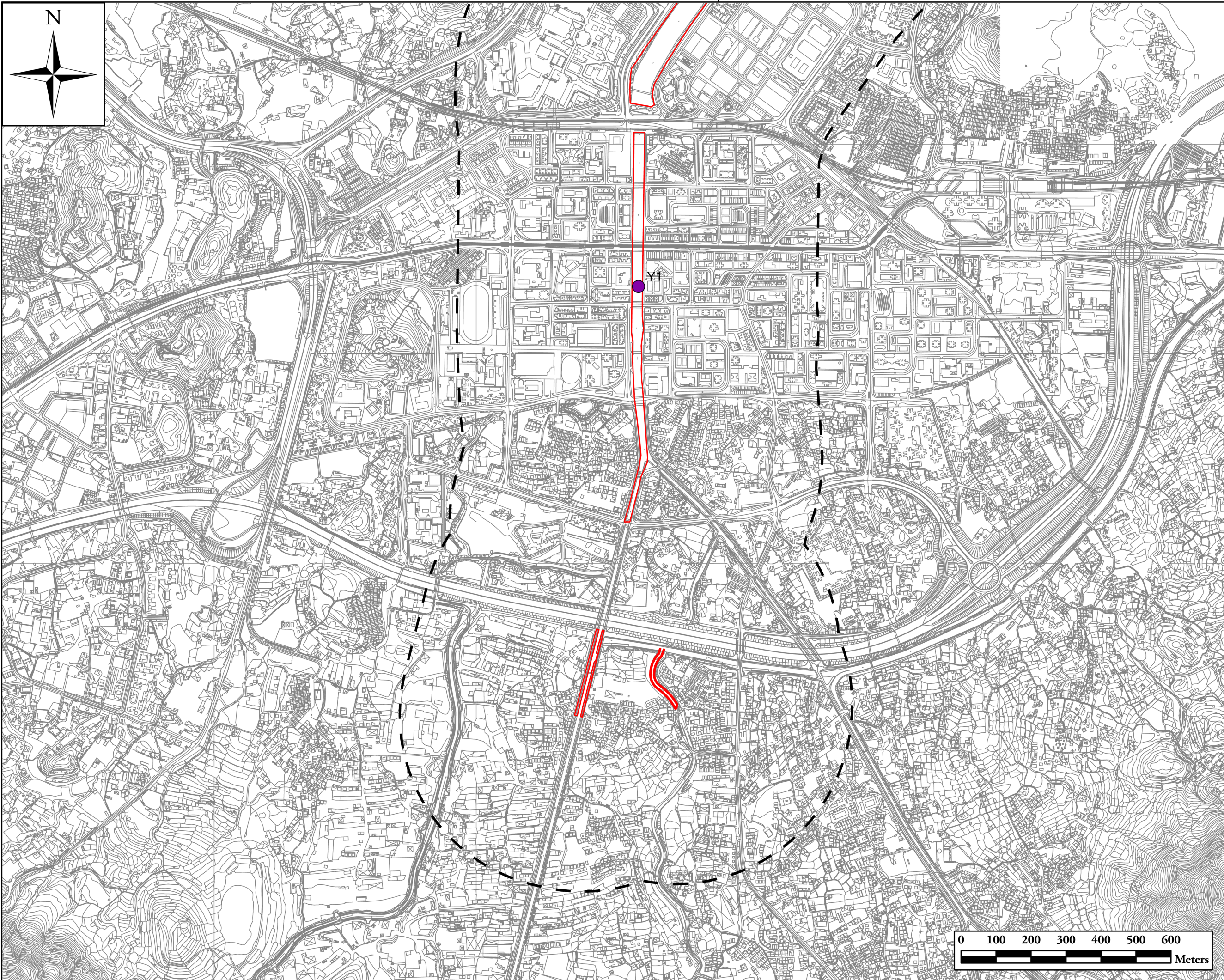
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- Legend**
- Project Site
 - 500m Assessment Area
 - Freshwater Sampling Locations

Revision	Date	Description	Initial
	Designed	Checked	Drawn
Initial			
Date			

Approved

Agreement No.
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Contract Title
YUEN LONG BARRAGE SCHEME -
INVESTIGATION, DESIGN AND
CONSTRUCTION

Drawing Title

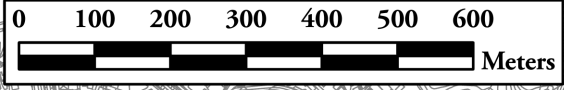
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Sampling Locations
(2 of 2 Yuen Long)

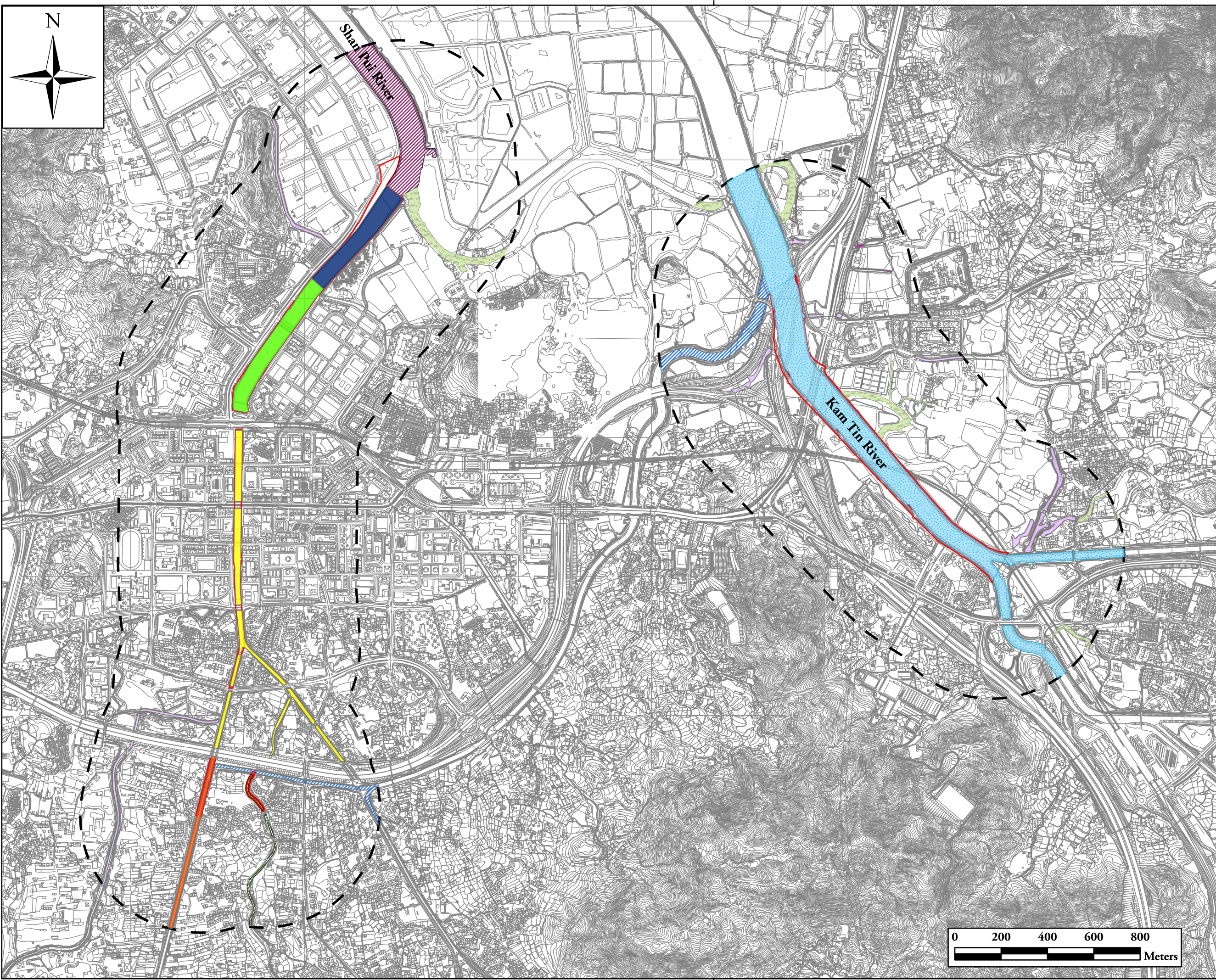
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Legend

- Project Site
- 500m Assessment Area
- Kam Tin River (KTR) - Channelised Sections
- Kam Tin River (KTR) - Old Meanders and Tributaries
- Minor Channelised Watercourse
- Minor Semi-natural Watercourse
- Sham Chung River (SCR)
- Shan Pui River (SPR)
- Yuen Long Bypass Floodway (YLBFB)
- Yuen Long Town Nullah (YLTN) - Section 1
- Yuen Long Town Nullah (YLTN) - Section 2
- Yuen Long Town Nullah (YLTN) - Section 3
- Yuen Long Town Nullah (YLTN) - Section 4

Revision	Date	Description	Initial
	Designed	Checked	Drawn
Initial			
Date			
Approved			

Agreement No.

CE 93/2017 (DS)

Contract Title

YUEN LONG BARRAGE SCHEME - INVESTIGATION, DESIGN AND CONSTRUCTION

Drawing Title

Major Watercourses within the 500m assessment area

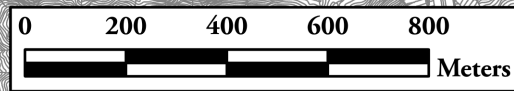
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Figure A3	-

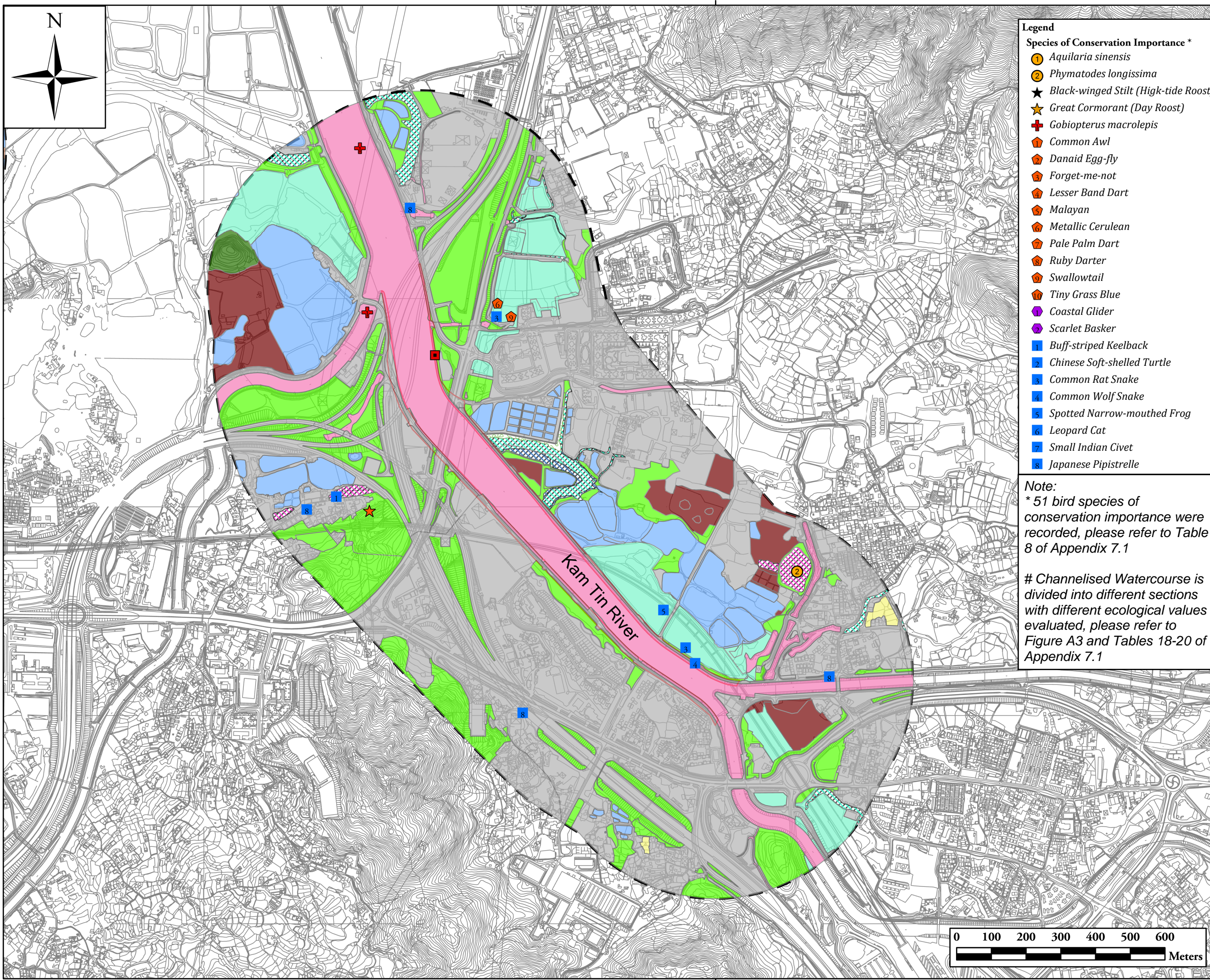
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- Legend**
- Species of Conservation Importance ***
- ① *Aquilaria sinensis*
 - ② *Phymatodes longissima*
 - ★ *Black-winged Stilt (High-tide Roost)*
 - ★ *Great Cormorant (Day Roost)*
 - ✚ *Gobiopterus macrolepis*
 - ⑥ *Common Awl*
 - ⑦ *Danaid Egg-fly*
 - ⑧ *Forget-me-not*
 - ⑨ *Lesser Band Dart*
 - ⑩ *Malayan*
 - ⑪ *Metallic Cerulean*
 - ⑫ *Pale Palm Dart*
 - ⑬ *Ruby Darter*
 - ⑭ *Swallowtail*
 - ⑮ *Tiny Grass Blue*
 - ⑯ *Coastal Glider*
 - ⑰ *Scarlet Basker*
 - ⑱ *Buff-striped Keelback*
 - ⑲ *Chinese Soft-shelled Turtle*
 - ⑳ *Common Rat Snake*
 - ㉑ *Common Wolf Snake*
 - ㉒ *Spotted Narrow-mouthed Frog*
 - ㉓ *Leopard Cat*
 - ㉔ *Small Indian Civet*
 - ㉕ *Japanese Pipistrelle*

Note:
* 51 bird species of conservation importance were recorded, please refer to Table 8 of Appendix 7.1

Channelised Watercourse is divided into different sections with different ecological values evaluated, please refer to Figure A3 and Tables 18-20 of Appendix 7.1

- Legend**
- Project Site
 - ┌ ┐ 500m Assessment Area
 - Ardeid Night Roost (Indicative)
 - ★ Tung Shing Lane Egrettry
- Habitat**
- Agricultural Land
 - Channelised Watercourse #
 - Developed Area
 - Abandoned Wet
 - Agricultural Land/Freshwater Marsh
 - Grassland/Shrubland
 - Mangrove
 - Mitigation Wetland
 - Mixed Woodland
 - Plantation
 - Pond
 - Reedbed
 - Semi-natural Watercourse
 - Tidal Marsh
 - Waste Ground

Revision	Date	Description	Initial
	Designed	Checked	Drawn
Initial			
Date			

Approved

Agreement No. CE 93/2017 (DS)

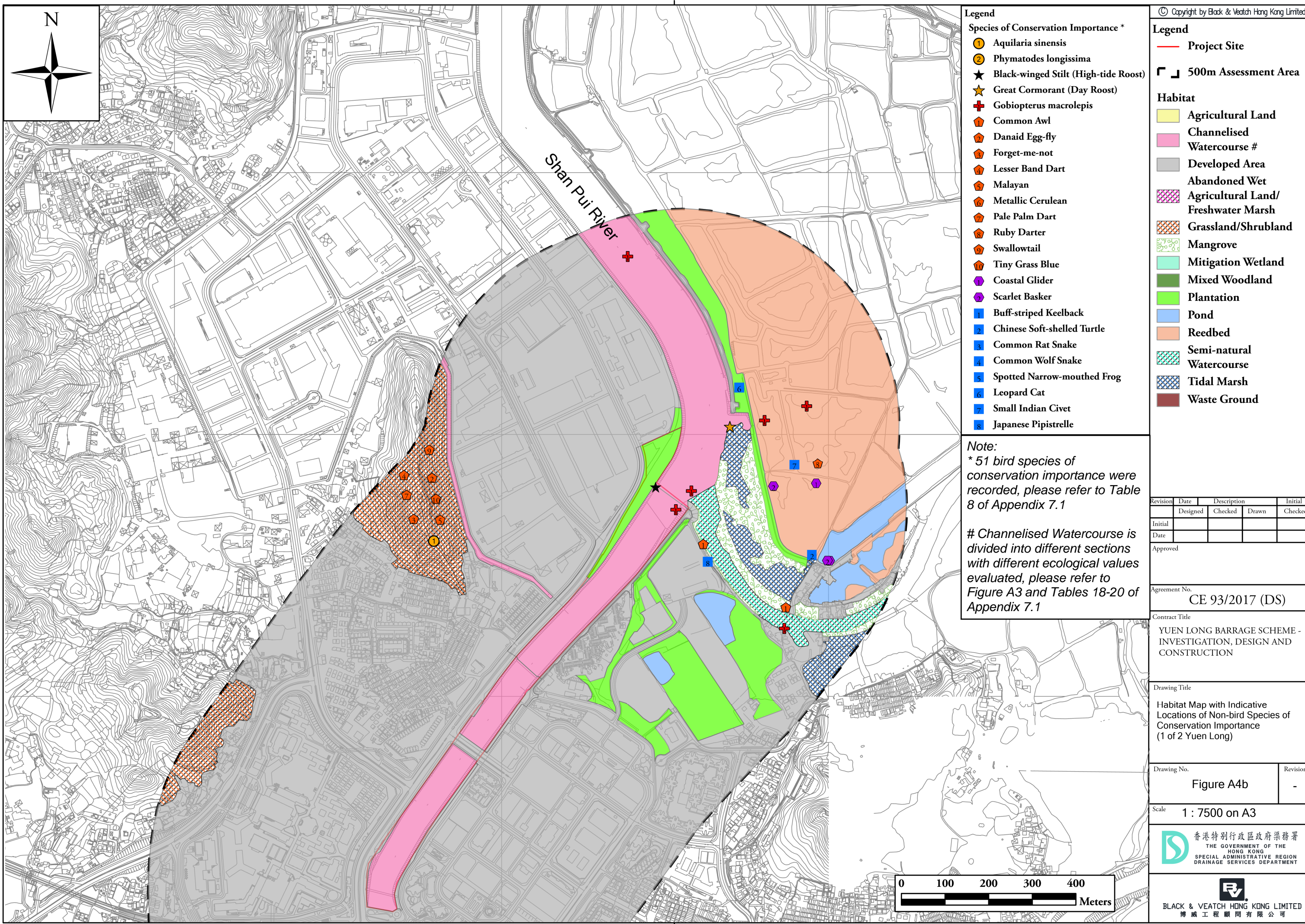
Contract Title
YUEN LONG BARRAGE SCHEME - INVESTIGATION, DESIGN AND CONSTRUCTION

Drawing Title
Habitat Map with Indicative Locations of Non-bird Species of Conservation Importance (Kam Tin)

Drawing No.	Revision
Figure A4a	-

Scale 1 : 10000 on A3





- Legend**
- Species of Conservation Importance ***
- ① Aquilaria sinensis
 - ② Phymatodes longissima
 - ★ Black-winged Stilt (High-tide Roost)
 - ★ Great Cormorant (Day Roost)
 - ✚ Gobiopterus macrolepis
 - ⑥ Common Awl
 - ⑦ Danaid Egg-fly
 - ⑧ Forget-me-not
 - ⑨ Lesser Band Dart
 - ⑩ Malayan
 - ⑪ Metallic Cerulean
 - ⑫ Pale Palm Dart
 - ⑬ Ruby Darter
 - ⑭ Swallowtail
 - ⑮ Tiny Grass Blue
 - ⑯ Coastal Glider
 - ⑰ Scarlet Basker
 - ⑱ Buff-striped Keelback
 - ⑲ Chinese Soft-shelled Turtle
 - ⑳ Common Rat Snake
 - ㉑ Common Wolf Snake
 - ㉒ Spotted Narrow-mouthed Frog
 - ㉓ Leopard Cat
 - ㉔ Small Indian Civet
 - ㉕ Japanese Pipistrelle

Note:
* 51 bird species of conservation importance were recorded, please refer to Table 8 of Appendix 7.1

Channelised Watercourse is divided into different sections with different ecological values evaluated, please refer to Figure A3 and Tables 18-20 of Appendix 7.1

- Legend**
- Project Site
- ┌ 500m Assessment Area
- Habitat**
- Yellow Agricultural Land
 - Pink Channelised Watercourse #
 - Grey Developed Area
 - Light Green Abandoned Wet
 - Orange Agricultural Land/Freshwater Marsh
 - Orange with dots Grassland/Shrubland
 - Green with wavy lines Mangrove
 - Light blue Mitigation Wetland
 - Dark green Mixed Woodland
 - Bright green Plantation
 - Blue Pond
 - Orange Reedbed
 - Green with dots Semi-natural Watercourse
 - Blue with dots Tidal Marsh
 - Brown Waste Ground

Revision	Date	Description	Initial
	Designed	Checked	Drawn
Initial			
Date			

Approved

Agreement No. CE 93/2017 (DS)

Contract Title
YUEN LONG BARRAGE SCHEME - INVESTIGATION, DESIGN AND CONSTRUCTION

Drawing Title
Habitat Map with Indicative Locations of Non-bird Species of Conservation Importance (1 of 2 Yuen Long)

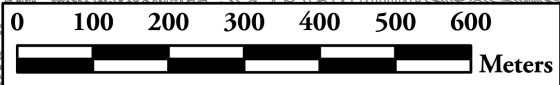
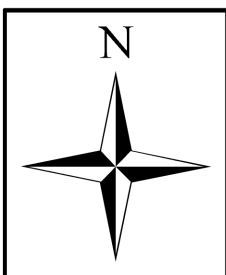
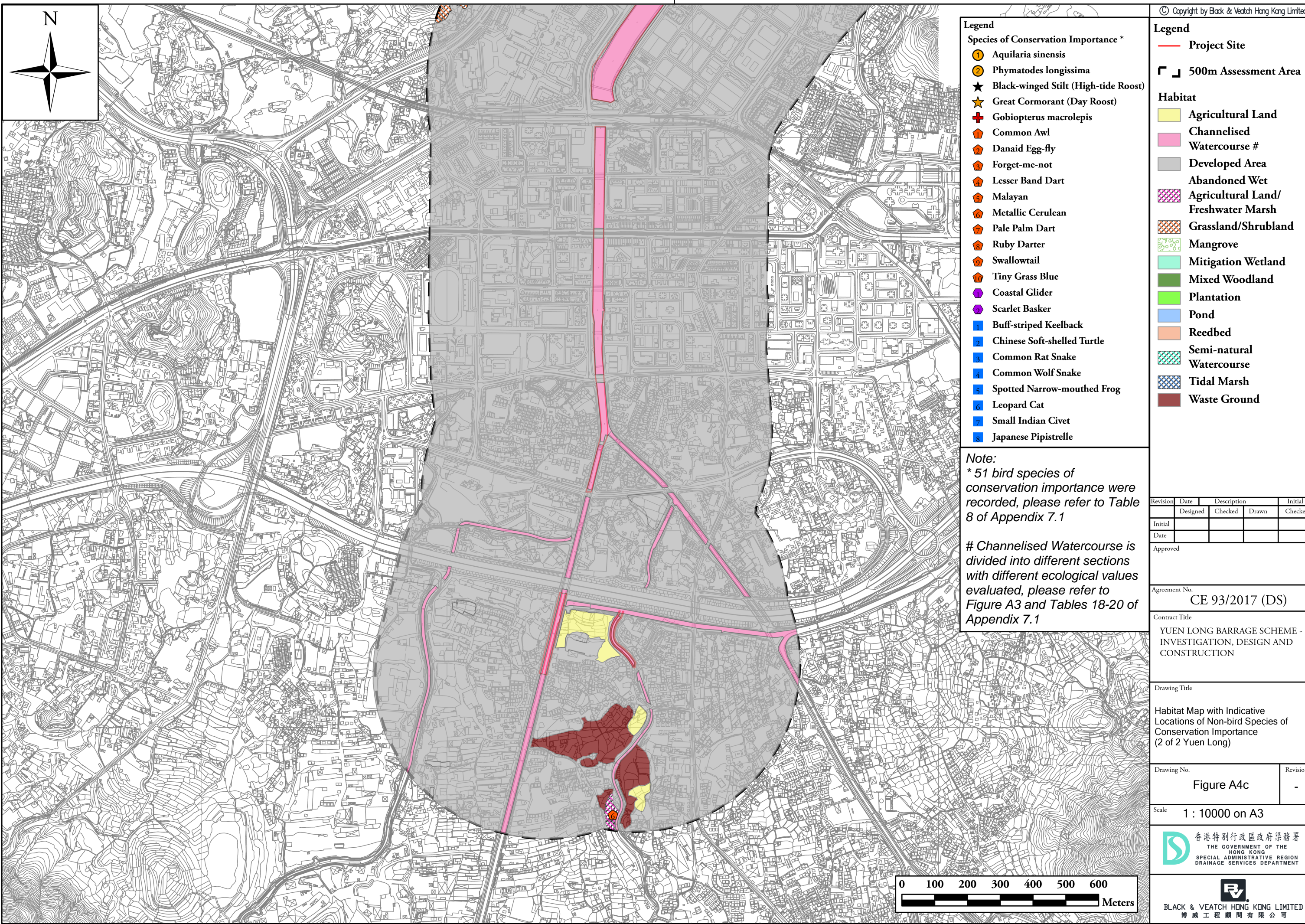
Drawing No. Figure A4b

Revision -

Scale 1 : 7500 on A3

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- Legend**
- Species of Conservation Importance ***
- ① *Aquilaria sinensis*
 - ② *Phymatodes longissima*
 - ★ Black-winged Stilt (High-tide Roost)
 - ★ Great Cormorant (Day Roost)
 - ✚ *Gobiopterus macrolepis*
 - Common Awl
 - Danaid Egg-fly
 - Forget-me-not
 - Lesser Band Dart
 - Malayan
 - Metallic Cerulean
 - Pale Palm Dart
 - Ruby Darter
 - Swallowtail
 - Tiny Grass Blue
 - Coastal Glider
 - Scarlet Basker
 - 1 Buff-striped Keelback
 - 2 Chinese Soft-shelled Turtle
 - 3 Common Rat Snake
 - 4 Common Wolf Snake
 - 5 Spotted Narrow-mouthed Frog
 - 6 Leopard Cat
 - 7 Small Indian Civet
 - 8 Japanese Pipistrelle

Note:

* 51 bird species of conservation importance were recorded, please refer to Table 8 of Appendix 7.1

Channelised Watercourse is divided into different sections with different ecological values evaluated, please refer to Figure A3 and Tables 18-20 of Appendix 7.1

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- Legend**
- Project Site
- ┌ ┐ 500m Assessment Area
- Habitat**
- Agricultural Land
 - Channelised Watercourse #
 - Developed Area
 - Abandoned Wet
 - Agricultural Land/Freshwater Marsh
 - Grassland/Shrubland
 - Mangrove
 - Mitigation Wetland
 - Mixed Woodland
 - Plantation
 - Pond
 - Reedbed
 - Semi-natural Watercourse
 - Tidal Marsh
 - Waste Ground

Revision	Date	Description	Initial
	Designed	Checked	Drawn

Initial	Date	Approved

Agreement No. CE 93/2017 (DS)

Contract Title
YUEN LONG BARRAGE SCHEME - INVESTIGATION, DESIGN AND CONSTRUCTION

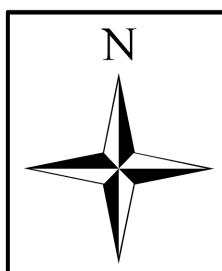
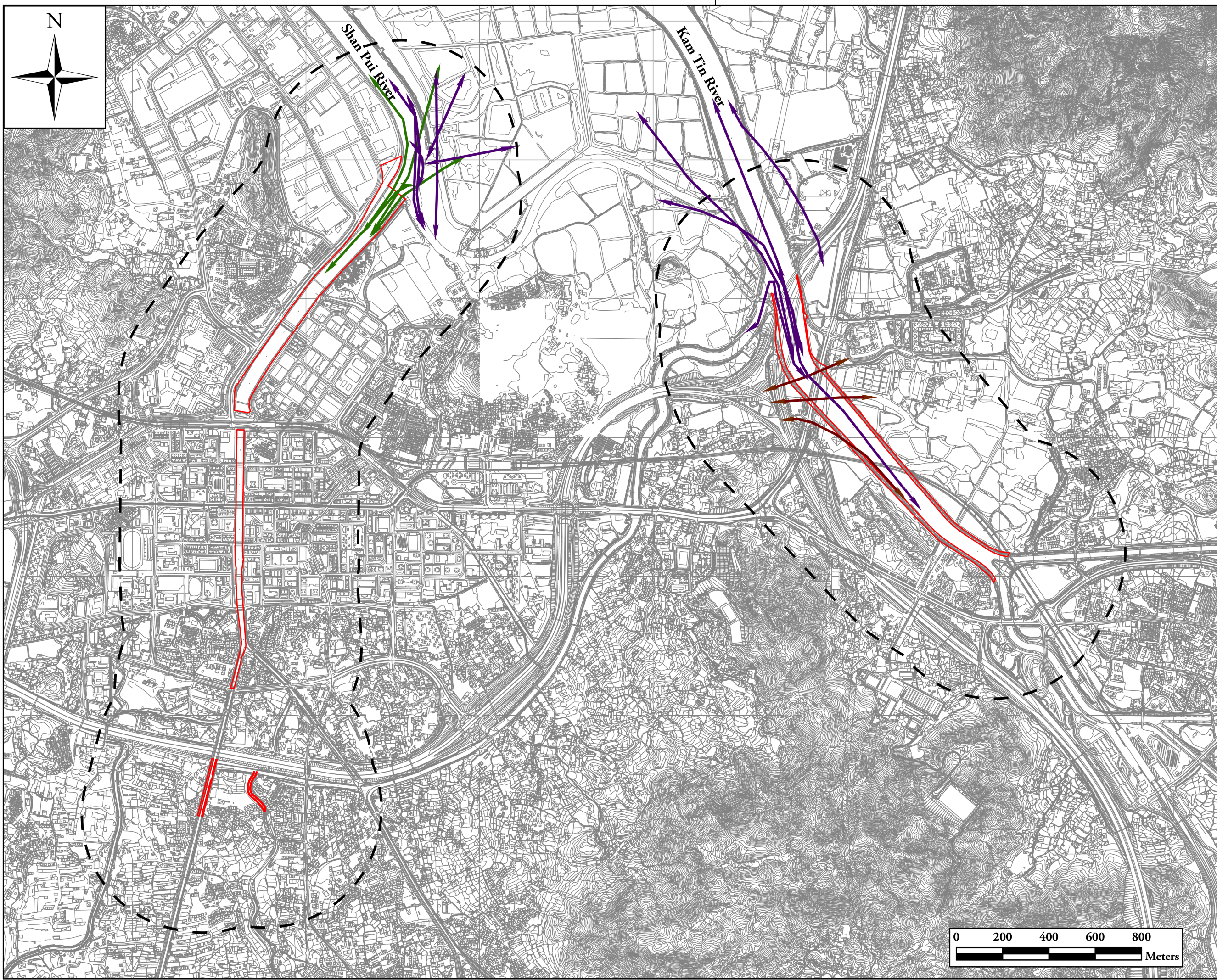
Drawing Title
Habitat Map with Indicative Locations of Non-bird Species of Conservation Importance (2 of 2 Yuen Long)

Drawing No. Figure A4c

Scale 1 : 10000 on A3

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Legend

- Project Site
- 500m Assessment Area
- Flight Line**
 - Parapet wall
 - Tidal barrier
 - Other

Revision	Date	Description	Initial
	Designed	Checked	Drawn
Initial			
Date			

Approved

Agreement No. CE 93/2017 (DS)


Contract Title
YUEN LONG BARRAGE SCHEME -
INVESTIGATION, DESIGN AND
CONSTRUCTION


Drawing Title

Flight-lines of Waterbirds

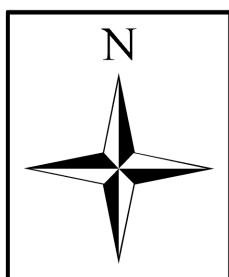
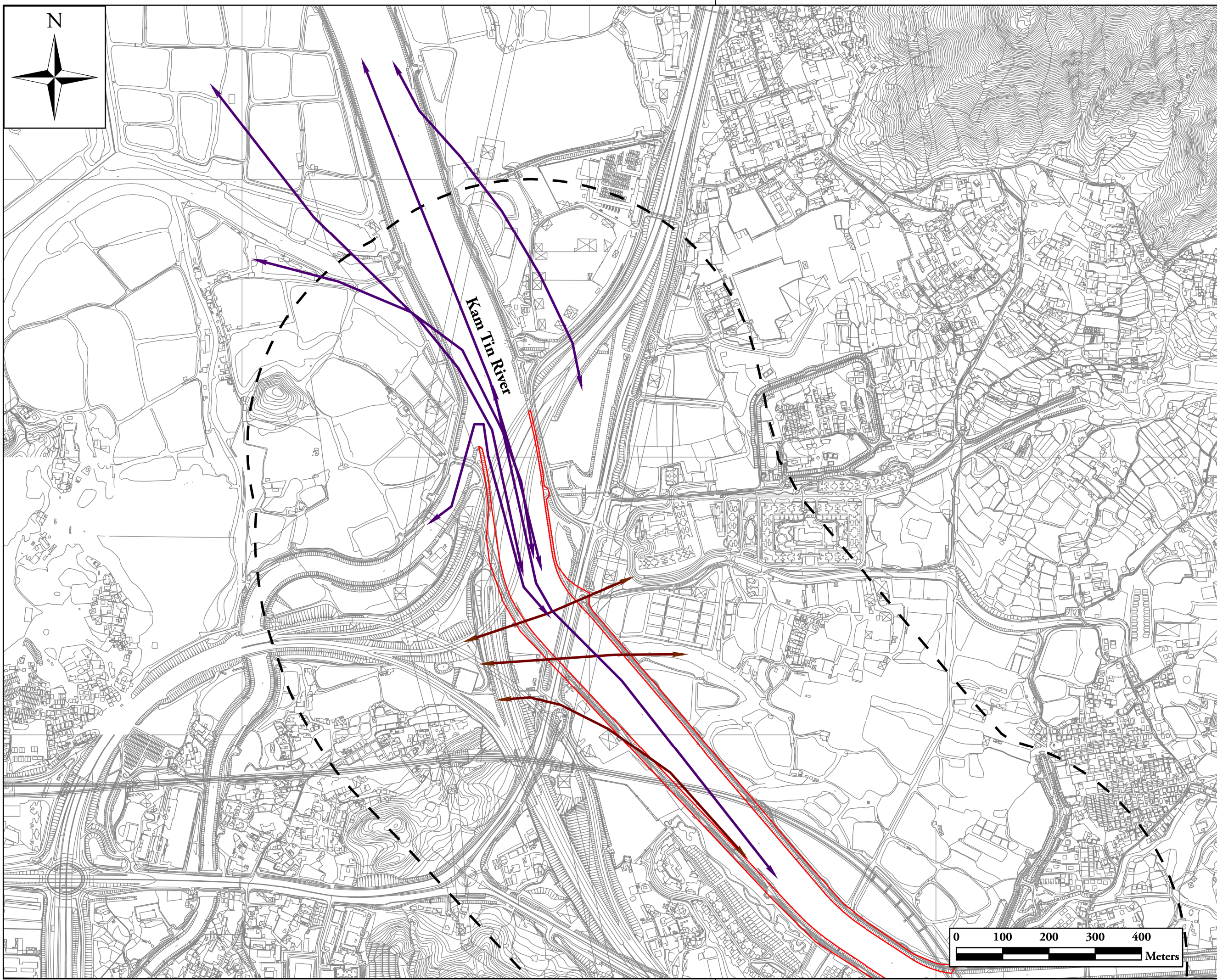
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Figure A5a	-

Scale 1 : 15000 on A3

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Legend

— Project Site

500m Assessment Area

Flight Line

— Parapet wall

— Tidal barrier

— Other

Revision	Date	Description	Initial
	Designed	Checked	Drawn
Initial			
Date			
Approved			

Agreement No.

CE 93/2017 (DS)

Contract Title

YUEN LONG BARRAGE SCHEME -
INVESTIGATION, DESIGN AND
CONSTRUCTION


Drawing Title

Flight-lines of Waterbirds
(Kam Tin)


Drawing No.	Revision
Figure A5b	-

Scale

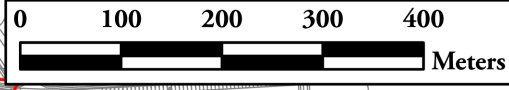
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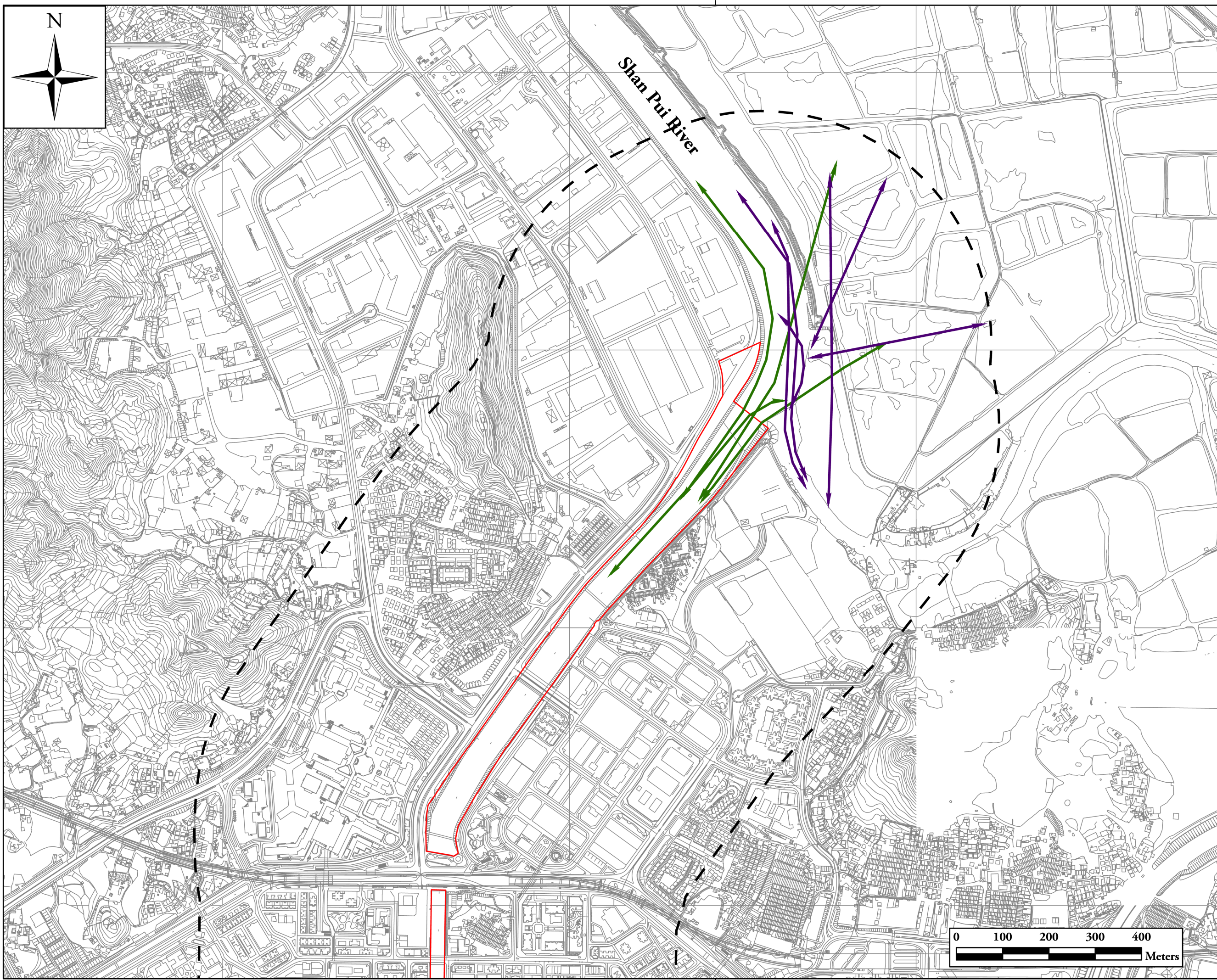
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0 100 200 300 400 Meters



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Legend

— Project Site

 500m Assessment Area

Flight Line

→ Parapet wall

→ Tidal barrier

→ Other

Revision	Date	Description	Initial
	Designed	Checked	Drawn
Initial			
Date			
Approved			

Agreement No.

CE 93/2017 (DS)

Contract Title

YUEN LONG BARRAGE SCHEME -
INVESTIGATION, DESIGN AND
CONSTRUCTION


Drawing Title

Flight-lines of Waterbirds
(Yuen Long)


Drawing No.	Revision
Figure A5c	-

Scale

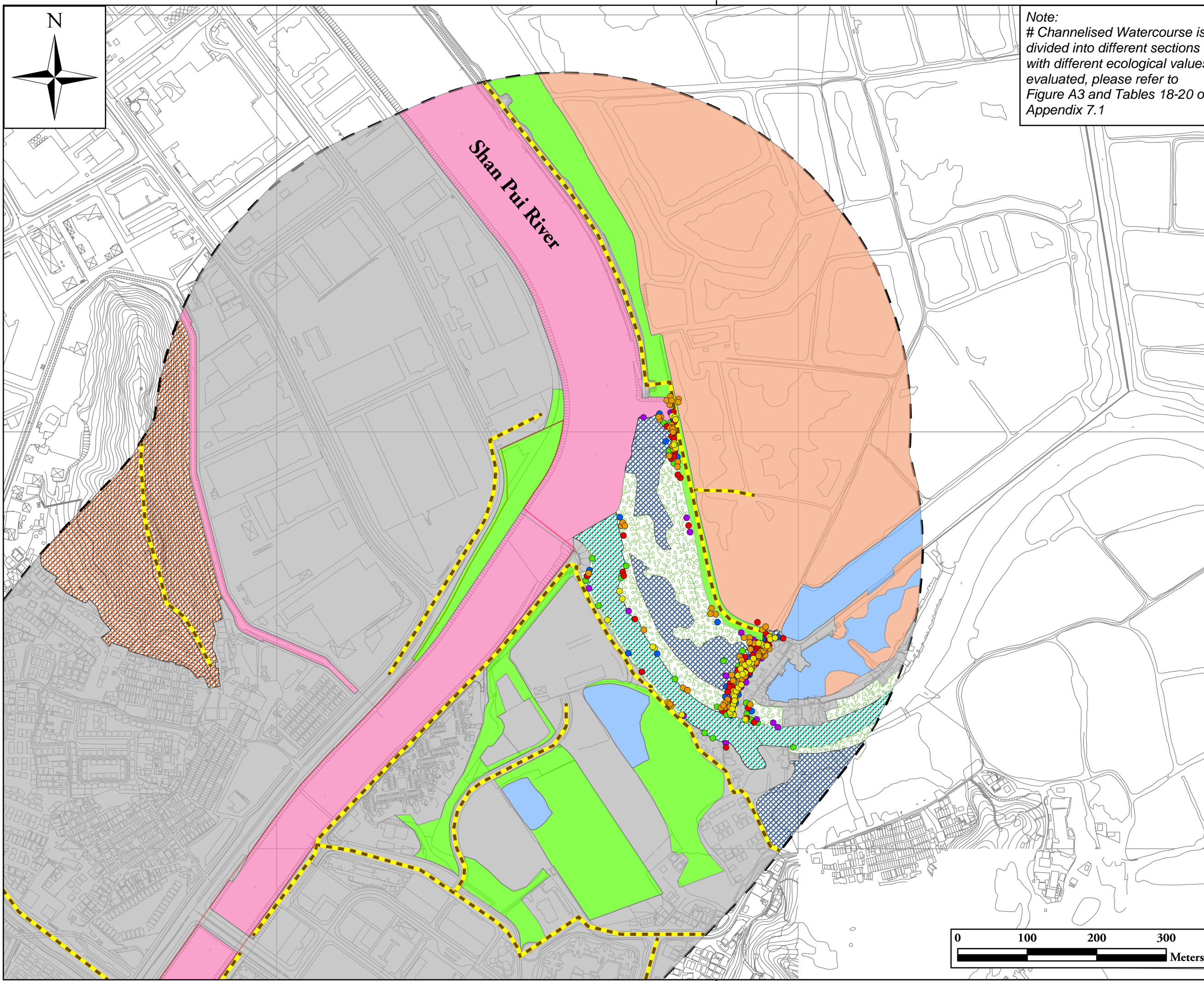
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Note:
Channelised Watercourse is divided into different sections with different ecological values evaluated, please refer to Figure A3 and Tables 18-20 of Appendix 7.1

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- Legend**
- Project Site
 - 500m Assessment Area
 - Survey Transects
- Habitat**
- Channelised Watercourse #
 - Developed Area
 - Grassland/Shrubland
 - Mangrove
 - Plantation
 - Pond
 - Reedbed
 - Semi-natural Watercourse
 - Tidal Marsh
- Date**
- April 2019
 - May 2019
 - Jun 2019
 - Jul 2019
 - Aug 2019
 - Sept 2019

Revision	Date	Description	Initial
	Designed	Checked	Drawn
Initial			
Date			
Approved			

Agreement No.
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Contract Title
YUEN LONG BARRAGE SCHEME - INVESTIGATION, DESIGN AND CONSTRUCTION

Drawing Title
Indicative Distribution of Mai Po Bent-winged Firefly

Drawing No.	Revision
Figure A6	-

Scale 1 : 5000 on A3

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Annex 1

Floral species recorded within the Project Site and the Assessment Area

Table 1. List of plant species recorded within the Project Site of Kam Tin River and 500m Assessment Area

Species	Chinese Name	Origin ¹	Growth Form ¹	Status in HK ¹	Project Site ²			500m Assessment Area ²											
					CH	PL	DA	CH	WC	PO	FM	TM	MG	MW	AG	WD	PL	WG	DA
<i>Acacia auriculiformis</i>	耳果相思	Exotic	Tree	Widely cultivated				*		*				*			**		
<i>Acacia confusa</i>	台灣相思	Exotic	Tree	Widely cultivated				*									***		**
<i>Acacia mangium</i>	大葉相思	Exotic	Tree	Widely cultivated													*		*
<i>Acanthus ilicifolius</i>	老鼠簕	Native	Shrub	Common	**			***	**				***	**					
<i>Achyranthes aspera</i>	土牛膝	Native	Herb	Common						**				**			*	**	*
<i>Acrostichum aureum</i>	鹵蕨	Native	Herb	Restricted					*										
<i>Aegiceras corniculatum</i>	桐花樹	Native	Shrub/Tree	Common					*										
<i>Ageratum conyzoides</i>	藿香薷	Exotic	Herb	Common						**									
<i>Aglaia odorata</i>	米仔蘭	Exotic	Shrub/Tree	Cultivated (IUCN: Near Threatened); the recorded specimen is planted													*		*
<i>Albizia lebbek</i>	大葉合歡	Exotic	Tree	Cultivated				*								*	*		*
<i>Aleurites moluccana</i>	石栗	Exotic	Tree	Widely cultivated													*		
<i>Allamanda schottii</i>	硬枝黃蟬	Exotic	Shrub	Commonly cultivated															**
<i>Alocasia macrorrhizos</i>	海芋	Native	Herb	Very common	*	*	*	*	*	*	*					*	*		*
<i>Alpinia zerumbet</i>	豔山薑	Native	Herb	Very common										*					*
<i>Alternanthera philoxeroides</i>	空心莧	Exotic	Herb	Common				**											
<i>Alternanthera sessilis</i>	蝦鉗菜	Native	Herb	Common	***			***				****		**					
<i>Alysicarpus vaginalis</i>	鏈莢豆	Native	Herb	Very common															*
<i>Amaranthus viridis</i>	野莧	Native	Herb	Very common															*
<i>Aporusa dioica</i>	銀柴	Native	Tree	Very common												**			
<i>Araucaria heterophylla</i>	異葉南洋杉	Exotic	Tree	Cultivated (IUCN: Vulnerable); the recorded specimen is planted										*					*
<i>Archontophoenix alexandrae</i>	假檳榔	Exotic	Tree	Commonly cultivated				*	*										
<i>Artocarpus heterophyllus</i>	菠蘿蜜	Exotic	Tree	Cultivated						*						*	*		
<i>Aster subulatus</i>	鑲形紫菀	Exotic	Herb	Naturalized										*					
<i>Asystasia micrantha</i>	小花十萬錯	Exotic	Herb	Cultivated or naturalized					**										
<i>Averrhoa carambola</i>	楊桃	Exotic	Tree	Planted															*
<i>Bambusa</i> sp.	竹屬	-	Bamboo	-													*		*
<i>Bambusa tuldoidea</i>	青稈竹	Native	Bamboo	Restricted										**					*
<i>Bauhinia variegata</i>	宮粉羊蹄甲	Exotic	Tree	Cultivated						**				*			**	**	
<i>Bauhinia variegata</i> var. <i>candida</i>	白花洋紫荊	Exotic	Tree	Cultivated															*
<i>Bidens alba</i>	白花鬼針草	Exotic	Herb	Very common	***	**	**	***	***	**	***			**		**	**	***	**
<i>Bischofia javanica</i>	秋楓	Native	Tree	Common													*		*
<i>Bischofia polycarpa</i>	重陽木	Exotic	Tree	Cultivated										*					
<i>Bombax ceiba</i>	木棉	Exotic	Tree	Cultivated	*			*	*					*			*	*	*
<i>Bothriochloa bladhii</i>	臭根子草	Native	Herb	Very common				**									**	**	
<i>Bothriochloa ischaemum</i>	白羊草	Native	Herb	Common	*			*						**			**		*
<i>Bougainvillea spectabilis</i>	簕杜鵑	Exotic	Climber/Shrub	Cultivated					*					*			*		*
<i>Brachiaria mutica</i>	巴拉草	Exotic	Herb	Very common	***			**	***	***		***		***			**	***	
<i>Bridelia tomentosa</i>	土蜜樹	Native	Shrub/Tree	Very common						*				*		**	*		*
<i>Broussonetia papyrifera</i>	構樹	Native	Tree	Very common				*									*		*
<i>Caesalpinia pulcherrima</i>	洋金鳳, 金鳳花	Exotic	Shrub/Tree	Cultivated										*					
<i>Cajanus scarabaeoides</i>	蔓草蟲豆	Native	Climber	Common	*														
<i>Calliandra haematocephala</i>	紅絨球	Exotic	Shrub	Cultivated															**
<i>Callistemon viminalis</i>	串錢柳	Exotic	Tree	Cultivated													*		*
<i>Carica papaya</i>	番木瓜	Exotic	Tree	Cultivated				*	*						*				*
<i>Caryota maxima</i>	魚尾葵	Exotic	Tree	Cultivated															*
<i>Caryota mitis</i>	短穗魚尾葵	Exotic	Shrub	Cultivated													*		

Species	Chinese Name	Origin ¹	Growth Form ¹	Status in HK ¹	Project Site ²			500m Assessment Area ²											
					CH	PL	DA	CH	WC	PO	FM	TM	MG	MW	AG	WD	PL	WG	DA
<i>Cassia fistula</i>	豬腸豆	Exotic	Tree	Cultivated															*
<i>Casuarina equisetifolia</i>	木麻黃	Exotic	Tree	Cultivated													*	*	*
<i>Catharanthus roseus</i>	長春花	Exotic	Herb/Shrub	Common										*					
<i>Celosia argentea</i>	青葙	Native	Herb	Very common				*											*
<i>Celtis sinensis</i>	朴	Native	Tree	Common and widely planted	*			*	*	*		*	*	*		**	*	*	*
<i>Cerbera manghas</i>	海芒果	Native	Tree	Common													*		
<i>Chloris barbata</i>	孟仁草	Native	Herb	Very common	*			*											*
<i>Cinnamomum burmannii</i>	陰香	Native	Tree	Common, also cultivated										*			*		
<i>Cinnamomum camphora</i>	樟	Native	Tree	Common, also cultivated					*					*		*	*		*
<i>Citrus maxima</i>	柚	Exotic	Tree	Cultivated															*
<i>Citrus reticulata</i>	桔	Exotic	Tree	Cultivated					*										
<i>Clausena lansium</i>	黃皮	Exotic	Tree	Cultivated													*		
<i>Cleistocalyx nervosum</i>	水翁	Native	Tree	Common				*									*		*
<i>Clerodendrum inerme</i>	苦郎樹	Native	Climber/Shrub	Common					*										
<i>Cocculus orbiculatus</i>	木防己	Native	Climber	Common	*					*				*		*	*		*
<i>Codiaeum variegatum</i>	變葉木	Exotic	Shrub	Cultivated															*
<i>Colocasia esculenta</i>	芋	Native	Herb	Cultivated					*										
<i>Commelina diffusa</i>	節節草	Native	Herb	Common	***			***	**		***	****		**					
<i>Cordyline fruticosa</i>	朱蕉	Exotic	Shrub	Cultivated										*			*		*
<i>Corymbia citriodora</i>	檸檬桉	Exotic	Tree	Cultivated													***		***
<i>Curcuma aromatica</i>	郁金	Exotic	Herb	Restricted										*					
<i>Cuscuta australis</i>	南方菟絲子	Native	Herb	Common				*		*				*					*
<i>Cycas revoluta</i>	蘇鐵	Exotic	Tree	Cultivated										*					
<i>Cyclosorus interruptus</i>	間斷毛蕨	Native	Herb	Common				*	*					*					
<i>Cynodon dactylon</i>	狗牙根	Native	Herb	Very common						**				**			**	**	**
<i>Cyperus diffusus</i>	多脈莎草	Native	Herb	Restricted				*											
<i>Cyperus imbricatus</i>	疊穗莎草	Native	Herb	Common							*								
<i>Cyperus involucratus</i>	風車草	Exotic	Herb	Cultivated or naturalized				*		*				*				*	
<i>Cyperus iria</i>	碎米莎草	Native	Herb	Common				*		*									
<i>Cyperus malaccensis</i>	茳茳	Native	Herb	Common	***			***	*			**	**	***					
<i>Cyperus malaccensis</i> var. <i>brevifolius</i>	短葉茳茳	Native	Herb	Common	**														
<i>Cyperus odoratus</i>	斷節莎	Exotic	Herb	Naturalised				*											
<i>Cyperus papyrus</i>	紙莎草	Exotic	Herb	Cultivated										*					
<i>Cyperus surinamensis</i>	蘇里南莎草	Exotic	Herb	-				*						*					
<i>Delonix regia</i>	鳳凰木	Exotic	Tree	Cultivated													*		
<i>Derris trifoliata</i>	魚藤	Native	Climber/Shrub	Common	*														
<i>Desmodium gangeticum</i>	大葉山螞蝗	Native	Shrub	Common													*		
<i>Desmodium heterocarpon</i>	假地豆	Native	Shrub	Very common				*											*
<i>Desmodium tortuosum</i>	南美山螞蝗	Exotic	Herb	Common				*											*
<i>Desmos chinensis</i>	假鷹爪	Native	Climber/Shrub	Common													*		
<i>Digitaria ciliaris</i>	升馬唐	Native	Herb	Very common										*			*		*
<i>Dimocarpus longan</i>	龍眼	Exotic	Tree	Cultivated (IUCN: Near Threatened); the recorded specimen is planted					*	*						*	*		*
<i>Dioscorea alata</i>	大薯	Exotic	Climber	Cultivated											*				
<i>Dracaena marginata</i>	紅邊鐵樹	Exotic	Shrub	Planted															*
<i>Dracaena sanderiana</i>	富貴竹	Exotic	Shrub	Planted or naturalized															*
<i>Drymaria cordata</i>	荷蓮豆	Native	Herb	Common				*											
<i>Duranta erecta</i>	假連翹	Exotic	Climber/Shrub	Cultivated															**

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<i>Duranta erecta</i> 'Variegata'	花葉假連翹	Exotic	Shrub	Cultivated										*			**		**
<i>Dypsis lutescens</i>	散尾葵	Exotic	Shrub	Cultivated (IUCN: Near Threatened); the recorded specimen is planted															*
<i>Echinochloa crusgalli</i>	稗	Native	Herb	Common				*											
<i>Eclipta prostrata</i>	鰓腸	Native	Herb	Common				*											
<i>Eichhornia crassipes</i>	鳳眼藍	Exotic	Herb	Common	*			*			**		*						
<i>Elaeocarpus hainanensis</i>	水石榕	Exotic	Tree	Cultivated										*					
<i>Eleocharis spiralis</i>	螺旋鱗荸薺	Native	Herb	Restricted										*					
<i>Eleusine indica</i>	牛筋草	Native	Herb	Very common													*		
<i>Emilia sonchifolia</i>	一點紅	Native	Herb	Very common															*
<i>Epipremnum aureum</i>	綠蘿	Exotic	Climber	Cultivated															*
<i>Eragrostis tenella</i>	鯽魚草	Native	Herb	Very common															*
<i>Eucalyptus robusta</i>	大葉桉	Exotic	Tree	Cultivated													**		
<i>Eucalyptus tereticornis</i>	細葉桉	Exotic	Tree	Cultivated													***		
<i>Euphorbia cotinifolia</i>	紫錦木	Exotic	Tree	Cultivated										*					
<i>Euphorbia hirta</i>	大飛揚草	Exotic	Herb	Very common		*								*			*		*
<i>Euphorbia thymifolia</i>	小飛揚	Native	Herb	Very common		*													*
<i>Excoecaria cochinchinensis</i>	紅背桂	Exotic	Shrub	Cultivated															*
<i>Fagraea ceilanica</i>	灰莉	Exotic	Tree	Cultivated															*
<i>Ficus benjamina</i>	垂葉榕	Exotic	Tree	Cultivated										*					*
<i>Ficus elastica</i>	印度榕	Exotic	Tree	Cultivated															*
<i>Ficus hirta</i>	粗葉榕	Native	Shrub/Tree	Common												*			
<i>Ficus hispida</i>	對葉榕	Native	Shrub/Tree	Very common	*		*	*	*	*				*		**	**	*	*
<i>Ficus microcarpa</i>	細葉榕	Native	Tree	Common and widely cultivated						*				*			*		*
<i>Ficus microcarpa</i> 'Golden Leaf'	黃金榕	Exotic	Shrub	Cultivated										*					**
<i>Ficus microcarpa</i> var. <i>crassifolia</i>	圓葉榕	-	Shrub	Cultivated															*
<i>Ficus pumila</i>	薜荔	Native	Climber	Very common													*		*
<i>Ficus religiosa</i>	菩提樹	Exotic	Tree	Restricted but widely planted and locally naturalized															*
<i>Ficus subpisocarpa</i>	筆管榕	Native	Tree	Common				*											
<i>Ficus tinctoria</i> subsp. <i>gibbosa</i>	斜葉榕	Native	Tree	Restricted														*	*
<i>Ficus variegata</i>	青果榕	Native	Tree	Common												*			*
<i>Fimbristylis?littoralis</i>	日照飄拂草	Native	Herb	Very common										*					
<i>Flueggea virosa</i>	白飯樹	Native	Shrub	Common	*			*	*					*			*	*	*
<i>Gardenia jasminoides</i>	梔子	Native	Shrub	Common										**					
<i>Gardenia jasminoides</i> var. <i>fortuniana</i>	白蟾	Exotic	Shrub	Cultivated										**					
<i>Hedychium coronarium</i>	薑花	Exotic	Herb	Common										*					*
<i>Hedyotis auricularia</i>	耳草	Native	Herb	Common				*											
<i>Hedyotis corymbosa</i>	傘房花耳草	Native	Herb	Very common															*
<i>Hibiscus rosa-sinensis</i>	大紅花	Exotic	Shrub	Commonly cultivated										*			**		*
<i>Hibiscus tiliaceus</i>	黃槿	Native	Tree	Very common	*			*					*	*			**		*
<i>Hylocereus undatus</i>	量天尺	Exotic	Herb	Cultivated											*				*
<i>Hyophorbe lagenicaulis</i>	酒瓶椰子	Exotic	Tree	Cultivated															*
<i>Ilex asprella</i>	梅葉冬青	Native	Shrub	Very common												**			
<i>Ilex rotunda</i>	鐵冬青	Exotic	Tree	Common										**					
<i>Imperata cylindrica</i> var. <i>major</i>	絲茅	Native	Herb	Very common	***			***						**			*	***	**
<i>Ipomoea aquatica</i>	通菜	Exotic	Herb	Very common	*				**		*			**					

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<i>Ipomoea batatas</i>	番薯	Exotic	Herb	Cultivated				*												
<i>Ipomoea cairica</i>	五爪金龍	Exotic	Herb	Very common			*	**	**	**	**	**		*		**	*	***	**	
<i>Ipomoea triloba</i>	三裂葉薯	Exotic	Herb	Common				*									*	**		
<i>Iris</i> sp.	鳶尾屬植物	Exotic	Herb	Cultivated										*						
<i>Ixora chinensis</i>	龍船花	Native	Shrub	Restricted, also widely cultivated										*					**	
<i>Ixora coccinea</i>	橙紅龍船花	Exotic	Shrub	Often planted															**	
<i>Ixora coccinea</i> f. <i>lutea</i>	黃龍船花	Exotic	Shrub	-															*	
<i>Juniperus chinensis</i>	圓柏	Exotic	Tree	Cultivated															*	
<i>Juniperus chinensis</i> 'Kaizuca'	龍柏	Exotic	Tree	Cultivated										*						
<i>Kandelia obovata</i>	水筆仔	Native	Tree	Very common	*			*	**				**	*						
<i>Koelreuteria bipinnata</i>	複羽葉欒樹	Exotic	Tree	Cultivated															*	
<i>Kyllinga nemoralis</i>	單穗水蜈蚣	Native	Herb	Very common															*	
<i>Kyllinga polyphylla</i>	香根水蜈蚣	Exotic	Herb	Common				**	**	**				**			*	**		
<i>Lagerstroemia speciosa</i>	大花紫薇	Exotic	Tree	Cultivated										*			*			
<i>Lantana camara</i>	馬纓丹	Exotic	Shrub	Very common	*	*			*	*						*	*	**	*	
<i>Lemna minor</i>	浮萍	Native	Herb	Restricted										*						
<i>Leonurus japonicus</i>	益母草	Native	Herb	Restricted															*	
<i>Leucaena leucocephala</i>	銀合歡	Exotic	Shrub/Tree	Cultivated or naturalized	**	*	*	**	**	**	*	*		**		**	***	***	**	
<i>Ligustrum sinense</i>	山指甲	Exotic	Shrub/Tree	Common, also widely cultivated				*						*		*	**		*	
<i>Lindernia rotundifolia</i>	圓葉母草	Exotic	Herb	Restricted				*												
<i>Liquidambar formosana</i>	楓香	Native	Tree	Common, also widely planted										*						
<i>Litchi chinensis</i>	荔枝	Exotic	Tree	Cultivated				*	*								*	*	*	
<i>Litsea cubeba</i>	木薑子	Native	Shrub/Tree	Common												*				
<i>Litsea glutinosa</i>	潺槁	Native	Tree	Very common										*		*	*			
<i>Litsea rotundifolia</i> var. <i>oblongifolia</i>	豺皮樟	Native	Shrub/Tree	Very common												*				
<i>Livistona chinensis</i>	蒲葵	Exotic	Tree	Cultivated													*		*	
<i>Loropetalum chinense</i> f. <i>rubrum</i>	紅花檵木	Exotic	Shrub	Cultivated															*	
<i>Ludwigia erecta</i>	美洲水丁香	Exotic	Herb	-				*		*										
<i>Ludwigia hyssopifolia</i>	草龍	Native	Herb	Restricted						**	*	**								
<i>Ludwigia octovalvis</i>	毛草龍	Native	Herb	Common	*				*		*			*						
<i>Ludwigia perennis</i>	細花丁香蓼	Native	Herb	Restricted				*	*											
<i>Ludwigia x taiwanensis</i>	台灣水龍	Exotic	Herb	-										*						
<i>Lygodium japonicum</i>	海金沙	Native	Climber/Herb	Very common					*		**			*		*	*		*	
<i>Macaranga tanarius</i> var. <i>tomentosa</i>	血桐	Native	Tree	Common			**	*	*	*	*			*		**	**	*	**	
<i>Macroptilium lathyroides</i>	大翼豆	Exotic	Herb	Common				**		**								**		
<i>Malvastrum coromandelianum</i>	賽葵	Native	Herb/Shrub	Common			**										*		*	
<i>Mangifera indica</i>	杧果	Exotic	Tree	Cultivated				*	*	*						*			*	
<i>Maranta arundinacea</i>	竹芋	Exotic	Herb	Cultivated										*						
<i>Markhamia stipulata</i> var. <i>kerrii</i>	貓尾木	Exotic	Tree	Cultivated										*						
<i>Melaleuca bracteata</i>	黃金香柳	Exotic	Tree	Cultivated										*					*	
<i>Melaleuca cajuputi</i> subsp. <i>cumingiana</i>	白千層	Exotic	Tree	Cultivated													**		**	
<i>Melastoma malabathricum</i>	野牡丹	Native	Shrub	Common							*									
<i>Melia azedarach</i>	苦楝	Exotic	Tree	Cultivated or naturalized				**	**	*			*	**		**	**	*	**	
<i>Melinis repens</i>	紅毛草	Exotic	Herb	Very common	**			**									*		*	
<i>Merremia hederacea</i>	魚黃草	Native	Herb	Restricted											*					

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<i>Michelia x alba</i>	白蘭	Exotic	Tree	Widely cultivated															*
<i>Microcos nervosa</i>	布渣葉	Native	Shrub/Tree	Common												*			*
<i>Microstegium ciliatum</i>	剛莠竹	Native	Herb	Very common					**								**		
<i>Mikania micrantha</i>	薇甘菊	Exotic	Climber/Herb	Very common		*	*	**	**	**	**	**	*	**		*	**	**	*
<i>Mimosa pudica</i>	含羞草	Exotic	Herb	Very common						*				*			*	*	*
<i>Miscanthus floridulus</i>	五節芒	Native	Herb	Common							***			*					
<i>Morus alba</i>	桑	Native	Shrub/Tree	Common and cultivated	*			*	*								*		*
<i>Murraya paniculata</i>	九里香	Exotic	Tree	Cultivated or naturalized													*		*
<i>Musa x paradisiaca</i>	大蕉	Exotic	Herb	Cultivated					*	*	*			*		*	*		*
<i>Nandina domestica</i>	南天竺	Exotic	Shrub	Cultivated										*					*
<i>Nephrolepis auriculata</i>	腎蕨	Native	Herb	Common															*
<i>Nerium oleander</i>	夾竹桃	Exotic	Shrub	Cultivated										*					*
<i>Neyraudia reynaudiana</i>	類蘆	Native	Herb	Very common				**						*			*	*	*
<i>Nymphaea</i> sp.	睡蓮	Exotic	Herb	Cultivated										*					
<i>Oxalis corniculata</i>	酢醬草	Native	Herb	Very common										*					*
<i>Oxalis debilis</i> subsp. <i>corymbosa</i>	紅花酢醬草	Exotic	Herb	Common															*
<i>Paederia scandens</i>	雞矢藤	Native	Herb	Very common	*					*				*		*	*	*	
<i>Panicum brevifolium</i>	短葉黍	Native	Herb	Very common								***							
<i>Panicum maximum</i>	大黍	Exotic	Herb	Very common	***	**	**	***	**	***	***			***			**	***	
<i>Panicum repens</i>	鋪地黍	Native	Herb	Very common							**			**					
<i>Paspalum distichum</i>	雙穗雀稗	Native	Herb	Common				**				****							
<i>Passiflora foetida</i>	龍珠果	Exotic	Climber	Very common													*		
<i>Pennisetum purpureum</i>	象草	Exotic	Herb	Very common					**	**	*			*				**	
<i>Persicaria barbata</i>	毛蓼	Native	Herb	Common					*					*					
<i>Persicaria chinensis</i>	火炭母	Native	Herb	Very common					*							*			
<i>Persicaria lapathifolia</i>	大馬蓼	Native	Herb	Common				*											
<i>Phragmites australis</i>	蘆葦	Native	Herb	Very common	**				*	*				***				*	
<i>Phyllanthus reticulatus</i>	小果葉下珠	Native	Shrub	Common													*		
<i>Phymatodes longissima</i>	多羽瘤蕨	Native	Herb	Rare, only found in limited localities							***								
<i>Pluchea indica</i>	闊苞菊, 煙茜	Native	Shrub	Common				*											
<i>Portulaca oleracea</i>	馬齒莧	Native	Herb	Very common				*											
<i>Psidium guajava</i>	番石榴	Exotic	Tree	Common and often planted											*		*		
<i>Psychotria asiatica</i>	山大刀	Native	Shrub/Tree	Very common												**			
<i>Pueraria lobata</i> var. <i>thomsonii</i>	粉葛	Exotic	Climber	Cultivated						*									
<i>Pycreus polystachyos</i>	多枝扁莎	Native	Herb	Very common				*											
<i>Rhaphiolepis indica</i>	車輪梅	Native	Shrub/Tree	Very common										*			*		
<i>Ruellia coerulea</i>	蘭花草	Exotic	Herb	Cultivated										**					
<i>Saccharum officinarum</i>	甘蔗	Exotic	Herb	Cultivated											*				
<i>Sagittaria sagittifolia</i> subsp. <i>leucopetala</i>	慈菇	Exotic	Herb	Restricted				*											
<i>Sapium sebiferum</i>	烏桕	Native	Tree	Common					*					*			*		
<i>Schefflera arboricola</i>	鵝掌藤	Exotic	Climber/Shrub	Often planted										*			**		
<i>Schefflera arboricola</i> 'Variegata'	花葉鵝掌藤	Exotic	Climbing Shrub	Cultivated													**		
<i>Schefflera heptaphylla</i>	鴨腳木	Native	Shrub/Tree	Very common						*				*			*		
<i>Scoparia dulcis</i>	野甘草	Exotic	Herb/Shrub	Common													*	*	
<i>Senna surattensis</i>	黃槐	Exotic	Shrub/Tree	Often planted										*					
<i>Sesbania cannabina</i>	田菁	Exotic	Herb	Common				*									*		
<i>Sida acuta</i>	黃花稔	Native	Herb	Common						*							*		
<i>Smilax china</i>	金剛藤	Native	Climber	Very common												*			

Species	Chinese Name	Origin ¹	Growth Form ¹	Status in HK ¹	Project Site ²			500m Assessment Area ²												
					CH	PL	DA	CH	WC	PO	FM	TM	MG	MW	AG	WD	PL	WG	DA	
<i>Solanum torvum</i>	水茄	Exotic	Shrub	Common					*	*							*	*		
<i>Sonneratia apetala</i>	無瓣海桑	Exotic	Tree	Restricted	*															
<i>Sonneratia caseolaris</i>	海桑	Exotic	Tree	Naturalized	**				*	*			*	*						
<i>Spathodea campanulata</i>	火焰木	Exotic	Tree	Cultivated										*						
Species from Family CUCURBITACEAE	葫蘆科植物	-	Herb	-											*					
<i>Sterculia lanceolata</i>	假蘋婆	Native	Tree	Very common													*			
<i>Sterculia monosperma</i>	蘋婆	Exotic	Tree	Restricted but also cultivated													*			
<i>Strelitzia reginae</i>	鶴望蘭, 天堂鳥蕉	Exotic	Herb	Cultivated										*						
<i>Syngonium podophyllum</i>	合果芋	Exotic	Herb	Often planted													*			
<i>Syzygium jambos</i>	蒲桃	Exotic	Tree	Cultivated and naturalized												*	**			
<i>Terminalia catappa</i>	欖仁樹	Exotic	Tree	Cultivated										*						
<i>Tinospora sinensis</i>	中華青牛膽	Native	Climber	Common													*			
<i>Tridax procumbens</i>	羽芒菊	Exotic	Herb	Very common			*	*									*	*		
<i>Typha angustifolia</i>	水燭	Exotic	Herb	Cultivated and widely established				*		*				*						
<i>Vernonia cinerea</i>	夜香牛	Native	Herb	Very common				*									*			
<i>Wedelia trilobata</i>	三裂葉蟛蜞菊	Exotic	Herb	Common, also widely cultivated	**			**	*					**			**	**		
<i>Zanthoxylum nitidum</i>	兩面針	Native	Climber/Shrub	Very common													*			
Total no. of species recorded				248	33	8	10	71	48	41	20	11	9	100	7	33	96	34	109	

Notes:

1. Origin and Status in HK refer to:

a. Cap. 96 = Chapter 96 Forests and Countryside Ordinance , including the associated Chapter 96A Forestry Regulation

b. Cap. 586 = Chapter 586 Protection of Endangered Species of Animal and Plants Ordinance

c. Wu and Lee (2000);

d. Xing *et al.* (2000);

e. AFCD (2003);

f. AFCD (2007);

g. AFCD (2008);

h. AFCD (2009);

i. AFCD (2011);

j. AFCD (2012);

k. IUCN (2020);

l. Status in China Red Data Book is retrieved from AFCD (2003).

In this study, plant species is regarded as floral species of conservation importance if it is protected under Cap. 96A, Cap. 586, documented as rare/protected species in AFCD (2003), or its wild population (i.e. not cultivated specimens) has conservation status under international or regional conservation inventory (e.g. IUCN Red List of Threatened Species, China Red Data Book).
2. CH=Channelised Watercourse; WC=Semi-natural Watercourse; PO=Pond; FM= Abandoned Wet Agricultural Land/Freshwater Marsh; TM=Tidal Marsh; MG=Mangrove; MW=Mitigation Wetland; AG=Agricultural Land; WD=Mixed Woodland; PL=Plantation; WG=Waste Ground; DA=Developed Area.

Code for abundance: ****= Abundant, *** = Frequent, ** = Occasional, * = Scarce

Table 1. List of plant species recorded within the Project Site of Yuen Long Town Nullah and Proposed Barrage and the 500m Assessment Area

Species	Chinese Name	Origin ¹	Growth Form ¹	Status in HK ¹	Project Site ²		500m Assessment Area ²								
					CW	DA	CW	WC	PO	TM	MG	RB	SH	PL	DA
<i>Acacia auriculiformis</i>	耳果相思	Exotic	Tree	Widely cultivated									***		
<i>Acacia confusa</i>	台灣相思	Exotic	Tree	Widely cultivated		**								**	**
<i>Acalypha wilkesiana</i> `Hoffmannii`	銀邊旋葉鐵莧	Exotic	Shrub	Cultivated											*
<i>Acanthus ilicifolius</i>	老鼠簕	Native	Shrub	Common				***			***				
<i>Achyranthes aspera</i>	土牛膝	Native	Herb	Common				**							
<i>Acrostichum aureum</i>	鹵蕨	Native	Herb	Restricted				*			**	*			
<i>Ageratum houstonianum</i>	熊耳草	Exotic	Herb	Common			*							**	
<i>Albizia lebbek</i>	大葉合歡	Exotic	Tree	Cultivated	*	*								*	*
<i>Aleurites moluccana</i>	石栗	Exotic	Tree	Widely cultivated											**
<i>Allamanda schottii</i>	硬枝黃蟬	Exotic	Shrub	Commonly cultivated											**
<i>Alocasia macrorrhizos</i>	海芋	Native	Herb	Very common		*							*	*	*
<i>Aloe vera</i>	蘆薈	Exotic	Herb	Cultivated											*
<i>Alpinia zerumbet</i> `Variegata`	花葉豔山薑	Exotic	Herb	Cultivated											*
<i>Alternanthera philoxeroides</i>	空心莧	Exotic	Herb	Common	**					**		**			
<i>Alternanthera sessilis</i>	蝦鉗菜	Native	Herb	Common	**	*	**				**	**			
<i>Amaranthus viridis</i>	野莧	Native	Herb	Very common	*		*								*
<i>Ampelopsis heterophylla</i> var. <i>kulingensis</i>	牯嶺蛇葡萄	Native	Climber	Common									*		
<i>Aporosa dioica</i>	銀柴	Native	Tree	Very common									**		
<i>Aquilaria sinensis</i>	土沉香	Native	Tree	Common, Protected under Cap. 586, listed as "Vulnerable" in China Plant Red Data Book, under State protection (Category II) in China (AFCD 2003), classified as "Vulnerable" on the IUCN Red List									*		
<i>Araucaria heterophylla</i>	異葉南洋杉	Exotic	Tree	Cultivated (IUCN: Vulnerable)											*
<i>Archontophoenix alexandrae</i>	假檳榔	Exotic	Tree	Commonly cultivated											*
<i>Artocarpus heterophyllus</i>	菠蘿蜜	Exotic	Tree	Cultivated									*		*
<i>Aster subulatus</i>	鑲形紫菀	Exotic	Herb	Naturalized	*										
<i>Bambusa multiplex</i> var. <i>riviereorum</i>	觀音竹	Exotic	Bamboo	Cultivated											**
<i>Bambusa</i> sp.	竹屬	-	Bamboo	-										*	*
<i>Bambusa vulgaris</i> `Vittata`	黃金間碧竹	Exotic	Bamboo	Widely cultivated											*
<i>Bauhinia variegata</i>	宮粉羊蹄甲	Exotic	Tree	Cultivated		*								*	*
<i>Bauhinia x blakeana</i>	洋紫荊	Native	Tree	Cultivated											**
<i>Bidens alba</i>	白花鬼針草	Exotic	Herb	Very common	**	**							**	**	**
<i>Bischofia javanica</i>	秋楓	Native	Tree	Common											*
<i>Blechnum orientale</i>	烏毛蕨	Native	Herb	Very common									**		
<i>Bombax ceiba</i>	木棉	Exotic	Tree	Cultivated	*	*								*	*
<i>Bothriochloa bladhii</i>	臭根子草	Native	Herb	Very common	**		**								
<i>Bothriochloa ischaemum</i>	白羊草	Native	Herb	Common	**	*	**							**	
<i>Bougainvillea spectabilis</i>	簕杜鵑	Exotic	Climber/Shrub	Cultivated											**
<i>Brachiaria mutica</i>	巴拉草	Exotic	Herb	Very common					***	**		**		**	
<i>Breynia fruticosa</i>	黑面神	Native	Shrub	Very common									*		
<i>Bridelia tomentosa</i>	土蜜樹	Native	Shrub/Tree	Very common								*	*		*
<i>Broussonetia papyrifera</i>	構樹	Native	Tree	Very common											*
<i>Calliandra haematocephala</i>	紅絨球	Exotic	Shrub	Cultivated		**									
<i>Callistemon viminalis</i>	串錢柳	Exotic	Tree	Cultivated		*									*
<i>Camellia japonica</i>	山茶	Exotic	Shrub/Tree	Cultivated											*
<i>Carica papaya</i>	番木瓜	Exotic	Tree	Cultivated										*	*
<i>Caryota mitis</i>	短穗魚尾葵	Exotic	Shrub	Cultivated											*
<i>Cassia fistula</i>	豬腸豆	Exotic	Tree	Cultivated		*									
<i>Cassytha filiformis</i>	無根藤	Native	Climber	Very common									*		
<i>Casuarina equisetifolia</i>	木麻黃	Exotic	Tree	Cultivated											*
<i>Catharanthus roseus</i>	長春花	Exotic	Herb/Shrub	Common											*
<i>Celosia argentea</i>	青葙	Native	Herb	Very common											*
<i>Celtis sinensis</i>	朴	Native	Tree	Common and widely planted	*							*	*	*	*
<i>Chloris barbata</i>	孟仁草	Native	Herb	Very common		*	*							*	**

Species	Chinese Name	Origin ¹	Growth Form ¹	Status in HK ¹	Project Site ²		500m Assessment Area ²								
					CW	DA	CW	WC	PO	TM	MG	RB	SH	PL	DA
<i>Cinnamomum burmannii</i>	陰香	Native	Tree	Common, also cultivated		*									*
<i>Cinnamomum camphora</i>	樟	Native	Tree	Common, also cultivated									*		*
<i>Citrus reticulata</i>	桔	Exotic	Tree	Cultivated									*		*
<i>Clausena lansium</i>	黃皮	Exotic	Tree	Cultivated											*
<i>Cleome rutidosperma</i>	皺子白花菜	Exotic	Herb	Restricted	*	*									
<i>Clerodendrum fortuneatum</i>	鬼燈籠	Native	Shrub	Common									*		
<i>Clerodendrum inerme</i>	苦郎樹	Native	Climber/Shrub	Common				*			**				
<i>Cocculus orbiculatus</i>	木防己	Native	Climber	Common		*							*	*	
<i>Codiaeum variegatum</i>	變葉木	Exotic	Shrub	Cultivated											*
<i>Commelina diffusa</i>	節節草	Native	Herb	Common	*										
<i>Conyza sumatrensis</i>	蘇門白酒草	Exotic	Herb	Common									*		
<i>Cordyline fruticosa</i>	朱蕉	Exotic	Shrub	Cultivated											**
<i>Cratoxylum cochinchinense</i>	黃牛木	Native	Shrub/Tree	Very common									**		
<i>Cuscuta australis</i>	南方菟絲子	Native	Herb	Common									*		
<i>Cyclosorus interruptus</i>	間斷毛蕨	Native	Herb	Common								**			
<i>Cymbopogon tortilis</i>	扭鞘香茅	Native	Herb	Very common									**		
<i>Cynodon dactylon</i>	狗牙根	Native	Herb	Very common	**	**									**
<i>Cyperus difformis</i>	異型莎草	Native	Herb	Very common	**		**								
<i>Cyperus iria</i>	碎米莎草	Native	Herb	Common	*		*								
<i>Cyperus malaccensis</i>	茳芩	Native	Herb	Common			***	***		***	**				
<i>Cyperus odoratus</i>	斷節莎	Exotic	Herb	Naturalised				*							
<i>Cyperus surinamensis</i>	蘇里南莎草	Exotic	Herb	-	***		**								
<i>Cyrtococcum patens</i>	弓果黍	Native	Herb	Very common										**	
<i>Dalbergia benthamii</i>	兩廣黃檀	Native	Climber	Common									*		
<i>Delonix regia</i>	鳳凰木	Exotic	Tree	Cultivated		*									*
<i>Derris trifoliata</i>	魚藤	Native	Climber/Shrub	Common			*	*			**	*			
<i>Desmos chinensis</i>	假鷹爪	Native	Climber/Shrub	Common									*		
<i>Dianella ensifolia</i>	山菅蘭	Native	Herb	Very common									**		
<i>Dicranopteris pedata</i>	芒萁	Native	Herb	Very common									**		
<i>Dimocarpus longan</i>	龍眼	Exotic	Tree	Cultivated (IUCN: Lower Risk/ Near Threatened)									*	*	*
<i>Dracaena marginata</i>	紅邊鐵樹	Exotic	Shrub	Planted											*
<i>Dracaena reflexa</i>	百合竹	Exotic	Shrub	Cultivated											*
<i>Dracaena sanderiana</i>	富貴竹	Exotic	Shrub	Cultivated											*
<i>Duranta erecta</i>	假連翹	Exotic	Climber/Shrub	Cultivated		**									**
<i>Dyopsis lutescens</i>	散尾葵	Exotic	Shrub	Cultivated (IUCN: Near Threatened)											*
<i>Echinochloa colona</i>	光頭稗	Native	Herb	Very common	*		*								
<i>Eclipta prostrata</i>	鱧腸	Native	Herb	Common	*		*								
<i>Elephantopus tomentosus</i>	白花地膽草	Native	Herb	Common									**		
<i>Eleusine indica</i>	牛筋草	Native	Herb	Very common	*										
<i>Emilia sonchifolia</i>	一點紅	Native	Herb	Very common	*	*	*								
<i>Epipremnum aureum</i>	綠蘿	Exotic	Climber	Cultivated		*									*
<i>Eragrostis atrovirens</i>	鼠婦草	Native	Herb	Common	*										
<i>Eragrostis tenella</i>	鯽魚草	Native	Herb	Very common		*									**
<i>Eriobotrya japonica</i>	枇杷	Exotic	Tree	Cultivated											*
<i>Eucalyptus sp.</i>	桉屬	Exotic	Tree	-		**						**		***	
<i>Euphorbia antiquorum</i>	火殃籐	Exotic	Tree	Cultivated											*
<i>Euphorbia hirta</i>	大飛揚草	Exotic	Herb	Very common											*
<i>Excoecaria cochinchinensis</i>	紅背桂	Exotic	Shrub	Cultivated		*									
<i>Ficus benjamina</i>	垂葉榕	Exotic	Tree	Cultivated									*	**	**
<i>Ficus elastica</i>	印度榕	Exotic	Tree	Cultivated											*
<i>Ficus hirta</i>	粗葉榕	Native	Shrub/Tree	Common									*		
<i>Ficus hispida</i>	對葉榕	Native	Shrub/Tree	Very common					*				*	*	*
<i>Ficus microcarpa</i>	細葉榕	Native	Tree	Common and widely cultivated	*	**						*		**	**
<i>Ficus microcarpa 'Golden Leaf'</i>	黃金榕	Exotic	Shrub	Cultivated		**									**
<i>Ficus religiosa</i>	菩提樹	Exotic	Tree	Restricted but widely planted and locally naturalized	*	*									*

Species	Chinese Name	Origin ¹	Growth Form ¹	Status in HK ¹	Project Site ²		500m Assessment Area ²								
					CW	DA	CW	WC	PO	TM	MG	RB	SH	PL	DA
<i>Ficus subpisocarpa</i>	筆管榕	Native	Tree	Common	*										*
<i>Ficus variegata</i>	青果榕	Native	Tree	Common									*		
<i>Ficus virens</i>	大葉榕	Native	Tree	Common	*										*
<i>Flueggea virosa</i>	白飯樹	Native	Shrub	Common									*		
<i>Garcinia subelliptica</i>	菲島福木	Exotic	Tree	-											*
<i>Grevillea robusta</i>	銀樺	Exotic	Tree	Cultivated											*
<i>Hedyotis corymbosa</i>	傘房花耳草	Native	Herb	Very common			*								
<i>Helicteres angustifolia</i>	山芝麻	Native	Shrub	Very common									**		
<i>Hibiscus rosa-sinensis</i>	大紅花	Exotic	Shrub	Commonly cultivated		**							*		**
<i>Hibiscus tiliaceus</i>	黃槿	Native	Tree	Very common		**									**
<i>Hymenocallis littoralis</i>	水鬼蕉	Exotic	Herb	Cultivated											**
<i>Ilex asprella</i>	梅葉冬青	Native	Shrub	Very common									**		
<i>Ilex rotunda</i>	鐵冬青	Exotic	Tree	Common		*									
<i>Imperata cylindrica</i> var. <i>major</i>	絲茅	Native	Herb	Very common	**								***		**
<i>Ipomoea batatas</i>	番薯	Exotic	Herb	Cultivated											*
<i>Ipomoea cairica</i>	五爪金龍	Exotic	Herb	Very common					**			**		***	**
<i>Ixora chinensis</i>	龍船花	Native	Shrub	Restricted, also widely cultivated											**
<i>Juniperus chinensis</i>	圓柏	Exotic	Tree	Cultivated									*		
<i>Juniperus chinensis</i> 'Kaizuca'	龍柏	Exotic	Tree	Cultivated											*
<i>Kandelia obovata</i>	水筆仔	Native	Tree	Very common				**			***	*			
<i>Lagerstroemia speciosa</i>	大花紫薇	Exotic	Tree	Cultivated		*									**
<i>Lantana camara</i>	馬纓丹	Exotic	Shrub	Very common	*	*						*	**	**	
<i>Leucaena leucocephala</i>	銀合歡	Exotic	Shrub/Tree	Cultivated or naturalized	*	**			**			*		****	**
<i>Ligustrum sinense</i>	山指甲	Exotic	Shrub/Tree	Common, also widely cultivated											*
<i>Lindernia procumbens</i>	陌上菜	Native	Herb	Common	*										
<i>Lindernia rotundifolia</i>	圓葉母草	Exotic	Herb	Restricted	**										
<i>Litsea cubeba</i>	木薑子	Native	Shrub/Tree	Common									*		
<i>Litsea glutinosa</i>	潺槁	Native	Tree	Very common									*		*
<i>Litsea rotundifolia</i> var. <i>oblongifolia</i>	豺皮樟	Native	Shrub/Tree	Very common									**		
<i>Livistona chinensis</i>	蒲葵	Exotic	Tree	Cultivated											*
<i>Loropetalum chinense</i> f. <i>rubrum</i>	紅花檵木	Exotic	Shrub	Cultivated											*
<i>Ludwigia hyssopifolia</i>	草龍	Native	Herb	Restricted	*		*								
<i>Ludwigia octovalvis</i>	毛草龍	Native	Herb	Common	*	*	*					*			
<i>Ludwigia perennis</i>	細花丁香蓼	Native	Herb	Restricted	*										
<i>Macaranga tanarius</i> var. <i>tomentosa</i>	血桐	Native	Tree	Common	*	*		*					*	**	*
<i>Mallotus paniculatus</i>	白楸	Native	Shrub/Tree	Very common									**		
<i>Malvastrum coromandelianum</i>	賽葵	Native	Herb/Shrub	Common	*										
<i>Mangifera indica</i>	芒果	Exotic	Tree	Cultivated									*		*
<i>Markhamia stipulata</i> var. <i>kerrii</i>	貓尾木	Exotic	Tree	Cultivated										*	
<i>Melaleuca cajuputi</i> subsp. <i>cumingiana</i>	白千層	Exotic	Tree	Cultivated		**						*		**	**
<i>Melastoma malabathricum</i>	野牡丹	Native	Shrub	Common									**		
<i>Melia azedarach</i>	苦楝	Exotic	Tree	Cultivated or naturalized	*	*			**			*		**	
<i>Melicope pteleifolia</i>	三桠苦	Native	Shrub/Tree	Common									**		
<i>Melinis repens</i>	紅毛草	Exotic	Herb	Very common		*									*
<i>Michelia x alba</i>	白蘭	Exotic	Tree	Widely cultivated									*		*
<i>Microcos nervosa</i>	布渣葉	Native	Shrub/Tree	Common									*		
<i>Mikania micrantha</i>	薇甘菊	Exotic	Climber/Herb	Very common					***			***	**	***	**
<i>Miscanthus floridulus</i>	五節芒	Native	Herb	Common									***		
<i>Miscanthus sinensis</i>	芒	Native	Herb	Very common									***		
<i>Monstera deliciosa</i>	龜背竹	Exotic	Climber/Shrub	Often planted											*
<i>Morus alba</i>	桑	Native	Shrub/Tree	Common and cultivated									*	*	*
<i>Murraya paniculata</i>	九里香	Exotic	Tree	Cultivated or naturalized											*
<i>Nageia nagi</i>	竹柏	Exotic	Tree	Cultivated (IUCN: Near Threatened)											*
<i>Nephrolepis auriculata</i>	腎蕨	Native	Herb	Common											*
<i>Neyraudia reynaudiana</i>	類蘆	Native	Herb	Very common									***		*

Species	Chinese Name	Origin ¹	Growth Form ¹	Status in HK ¹	Project Site ²		500m Assessment Area ²								
					CW	DA	CW	WC	PO	TM	MG	RB	SH	PL	DA
<i>Osmanthus fragrans</i>	桂花, 木犀	Exotic	Shrub/Tree	Cultivated											*
<i>Oxalis corniculata</i>	酢醬草	Native	Herb	Very common											*
<i>Pachira aquatica</i>	瓜栗	Exotic	Tree	Planted for ornamental purpose											*
<i>Paederia scandens</i>	雞矢藤	Native	Herb	Very common					**			*	*	*	*
<i>Panicum brevifolium</i>	短葉黍	Native	Herb	Very common									*		
<i>Panicum maximum</i>	大黍	Exotic	Herb	Very common	**	**	*	*	***			**	**	**	
<i>Paspalum notatum</i>	百喜草	Exotic	Herb	Common											**
<i>Passiflora foetida</i>	龍珠果	Exotic	Climber	Very common		*							*	*	*
<i>Peltophorum tonkinense</i>	銀珠	Exotic	Tree	Cultivated											*
<i>Pennisetum alopecuroides</i>	狼尾草	Native	Herb	Common									**		
<i>Pennisetum polystachion</i>	牧地狼尾草	Exotic	Herb	Restricted									**		
<i>Pennisetum purpureum</i>	象草	Exotic	Herb	Very common										*	
<i>Persicaria hydropiper</i>	水蓼	Native	Herb	Common			*								
<i>Persicaria lapathifolia</i>	大馬蓼	Native	Herb	Common	*		*								
<i>Phragmites australis</i>	蘆葦	Native	Herb	Very common				**		***		****			
<i>Phyllanthus cochinchinensis</i>	越南葉下珠	Native	Shrub	Very common									*		
<i>Phyllanthus emblica</i>	油甘子	Native	Shrub/Tree	Very common									*		
<i>Pinus elliotii</i>	濕地松	Exotic	Tree	Widely planted									*		
<i>Platycladus orientalis</i>	側柏	Exotic	Tree	Often planted (IUCN: Near Threatened)									*		*
<i>Plumeria rubra</i>	雞蛋花	Exotic	Tree	Commonly cultivated											*
<i>Podocarpus macrophyllus</i> var. <i>maki</i>	短葉羅漢松	Exotic	Tree	Classified as "Near Threatened" in IUCN Red List, widely planted as ornamentals											*
<i>Praxelis clematidea</i>	假臭草	Exotic	Herb	Very common									**		
<i>Prunus persica</i>	桃	Exotic	Tree	Cultivated											*
<i>Psychotria asiatica</i>	山大刀	Native	Shrub/Tree	Very common									*		
<i>Pterocarpus indicus</i>	紫檀	Exotic	Tree	Common (IUCN: Vulnerable)											*
<i>Pueraria phaseoloides</i>	野葛	Native	Climber	Very common											*
<i>Punica granatum</i>	安石榴	Exotic	Shrub/Tree	Cultivated											*
<i>Ravenala madagascariensis</i>	旅人蕉	Exotic	Tree	Cultivated											*
<i>Rhaphiolepis indica</i>	車輪梅	Native	Shrub/Tree	Very common									*		
<i>Rhapis excelsa</i>	棕竹	Native	Shrub	Common		*									*
<i>Rhododendron simsii</i>	紅杜鵑	Native	Shrub	Protected under Cap. 96, but is very common in Hong Kong									*		
<i>Rhododendron</i> sp.	杜鵑屬	-	Shrub	All wild population of <i>Rhododendron</i> spp. are protected under Cap. 96; specimens recorded in this survey are planted for ornamental use											*
<i>Rhodomyrtus tomentosa</i>	桃金娘	Native	Shrub	Very common									**		
<i>Rhus chinensis</i>	鹽膚木	Native	Shrub/Tree	Common									*		
<i>Rhus succedanea</i>	野漆樹	Native	Shrub/Tree	Common									*		
<i>Ricinus communis</i>	蓖麻	Exotic	Shrub	Restricted but often planted and naturalized											*
<i>Roystonea regia</i>	王棕	Exotic	Tree	Often planted										*	*
<i>Ruellia coerulea</i>	蘭花草	Exotic	Herb	Cultivated											*
<i>Rumex trisetifer</i>	長刺酸模	Native	Herb	Common	*										
<i>Saccharum officinarum</i>	甘蔗	Exotic	Herb	Cultivated											*
<i>Sansevieria trifasciata</i>	虎尾蘭	Exotic	Herb	Cultivated											*
<i>Sapium sebiferum</i>	烏柏	Native	Tree	Common								*	*		*
<i>Schefflera actinophylla</i>	傘樹	Exotic	Tree	Commonly planted											*
<i>Schefflera arboricola</i>	鵝掌藤	Exotic	Climber/Shrub	Often planted											**
<i>Schefflera arboricola</i> 'Variegata'	花葉鵝掌藤	Exotic	Climbing Shrub	Cultivated		**									**
<i>Scleria levis</i>	毛果珍珠茅, 珍珠茅	Native	Herb	Common									**		
<i>Scoparia dulcis</i>	野甘草	Exotic	Herb/Shrub	Common	*	*									
<i>Senna siamea</i>	鐵刀木	Exotic	Tree	Cultivated											*
<i>Setaria pumila</i>	金色狗尾草	Native	Herb	Very common									**		
<i>Sida rhombifolia</i>	白背黃花稔	Native	Shrub	Common	*										
<i>Smilax china</i>	金剛藤	Native	Climber	Very common									*		
<i>Smilax glabra</i>	土茯苓	Native	Climber	Very common									*		

Species	Chinese Name	Origin ¹	Growth Form ¹	Status in HK ¹	Project Site ²		500m Assessment Area ²								
					CW	DA	CW	WC	PO	TM	MG	RB	SH	PL	DA
<i>Solanum americanum</i>	少花龍葵	Exotic	Herb	Very common											*
<i>Solanum torvum</i>	水茄	Exotic	Shrub	Common										*	*
<i>Sonneratia apetala</i>	無瓣海桑	Exotic	Tree	Restricted				**			***				
<i>Sonneratia caseolaris</i>	海桑	Exotic	Tree	Naturalized				**			***				
<i>Spermacoce remota</i>	光葉豐花草	Exotic	Herb	-									*		
<i>Spilanthes paniculata</i>	金鈕扣	Native	Herb	Common			*								
<i>Stephania longa</i>	蕢箕篤	Native	Climber	Common									*		
<i>Sterculia lanceolata</i>	假蘋婆	Native	Tree	Very common											*
<i>Sterculia monosperma</i>	蘋婆	Exotic	Tree	Restricted but also cultivated											*
<i>Strophanthus divaricatus</i>	羊角拗	Native	Climber/Shrub	Common									**		
<i>Syagrus romanzoffiana</i>	皇后葵	Exotic	Tree	Cultivated											*
<i>Syngonium podophyllum</i>	合果芋	Exotic	Herb	Often planted											*
<i>Syngonium sp.</i>	白蝴蝶	Exotic	Herb	Cultivated											*
<i>Syzygium jambos</i>	蒲桃	Exotic	Tree	Cultivated and naturalized											*
<i>Tabernaemontana divaricata</i>	狗牙花	Exotic	Shrub/Tree	Commonly cultivated											*
<i>Taxodium distichum</i>	落羽杉	Exotic	Tree	Cultivated											*
<i>Terminalia catappa</i>	欖仁樹	Exotic	Tree	Regarded as Very Rare in Xing et al. (2000) but also widely cultivated											*
<i>Terminalia mantaly</i>	小葉欖仁	Exotic	Tree	Cultivated											*
<i>Thevetia peruviana</i>	黃花夾竹桃	Exotic	Tree	Commonly cultivated		*									*
<i>Tradescantia spathacea</i>	蚌花	Exotic	Herb	Cultivated		*									
<i>Tridax procumbens</i>	羽芒菊	Exotic	Herb	Very common	*		*							*	*
<i>Typha angustifolia</i>	水燭	Exotic	Herb	Regarded as Rare in Xing et al. (2000), widely established in HK in recent years								**			
<i>Wedelia trilobata</i>	三裂葉蟛蜞菊	Exotic	Herb	Common, also widely cultivated									*	***	**
<i>Wikstroemia indica</i>	了哥王	Native	Shrub	Common									*		
<i>Youngia japonica</i>	黃鶉菜	Native	Herb	Very common											*
<i>Zanthoxylum nitidum</i>	兩面針	Native	Climber/Shrub	Very common									*		
<i>Zanthoxylum piperitum</i>	胡椒木	Exotic	Shrub	Cultivated											*
Total No. of species recorded				240	42	44	22	13	8	4	9	23	80	37	131

Notes:

1. Origin and Status in HK refer to:
- a. Cap. 96 = Chapter 96 Forests and Countryside Ordinance , including the associated Chapter 96A Forestry Regulation

b. Cap. 586 = Chapter 586 Protection of Endangered Species of Animal and Plants Ordinance

c. Xing *et al.* (2000);

d. AFCD (2003);

e. AFCD (2007);

f. AFCD (2008);

g. AFCD (2009);

h. AFCD (2011);

i. AFCD (2012);

j. IUCN (2020);

k. Status in China Red Data Book is retrieved from AFCD (2003).

In this study, plant species is regarded as floral species of conservation importance if it is protected under Cap. 96A, Cap. 586, documented as rare/protected species in AFCD (2003), or its wild population (i.e. not cultivated specimens) has conservation status under international or regional conservation inventory (e.g. IUCN Red List of Threatened Species, China Red Data Book).

2. CH=Channelised Watercourse; DA=Developed Area; WC=Semi-natural Watercourse; PO=Pond; TM=Tidal Marsh; MG=Mangrove; RB=Reedbed; SH=Shrubland; PL=Plantation.

Code for abundance: ****= Abundant, *** = Frequent, ** = Occasional, * = Scarce

Appendix 2

Faunal species recorded within the Project Site and the Assessment Area

Table 1. Maximum abundance and distribution of mammal species of conservation importance recorded from July 2019 to June 2020

Species	Conservation and Protection Status ¹	Status in HK ²	Project Site	500m Assessment Area		
				Freshwater Marsh	Plantation	Reedbed
Unidentified Rat <i>Rattus</i> sp.	-	-			1	
Small Indian Civet <i>Viverricula indica</i>	RLCV(VU); CSMPS(II); CITES(III); Cap.170; Cap.586	Very Common				1
Domestic Dog <i>Canis lupus familiaris</i>	-	Common			3	
Leopard Cat <i>Prionailurus bengalensis</i>	RLCV(VU); CITES(II); Cap.170; Cap.586	Uncommon			1	
Domestic Ox <i>Bos taurus</i>	-	Common			1	
Domestic Water Buffalo <i>Bubalus bubalis</i>	-	Uncommon		1		
Total no. of species recorded			0	1	4	1

- Notes:**
- Conservation and protection status refers to Fellowes *et al.* (2002), Red List of China’s Vertebrates (Jiang *et al.* 2016), IUCN (2020), China State Major Protection Status, CITES (2020), Cap. 170 and Cap. 586.
 - Conservation status by Fellowes *et al.* (2002): LC = Local Concern; PRC = Potential Regional Concern; RC = Regional Concern; PGC = Potential Global 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.
 - Conservation status by Red List of China’s Vertebrates (RLCV) (Jiang *et al.* 2016): NT = Near Threatened; VU = Vulnerable; EN = Endangered; CR = Critically Endangered.
 - Conservation status by IUCN (2019): NT = Near Threatened; VU = Vulnerable; EN = Endangered; CR = Critically Endangered.
 - Protection status by China State Major Protection Status (CSMPS): II = Class II Protected Species in China.
 - Protection status by CITES (2019): II = Listed in CITES Appendix II.
 - Cap. 170 = Wild Animals Protection Ordinance. All wild birds in Hong Kong are protected under Cap. 170.
 - Cap. 586 = Protection of Endangered Species of Animals and Plants Ordinance.
 - Status in HK follows AFCD (2020).

Table 2. Maximum abundance of all bird species recorded from July 2019 to June 2020

Species	Conservation and Protection Status ¹	Principal Status ²	Wetland-dependant?	Project Site ³	500m Assessment Area ³														
					CW	AG	CW	DA	FM	IF	MA	MW	WL	PL	PO	RB	WC	SH	TM
Northern Shoveler <i>Spatula clypeata</i>	RC	W	Y	2		98										8			
Northern Pintail <i>Anas acuta</i>	RC	W	Y			2													
Eurasian Teal <i>Anas crecca</i>	RC	W	Y			56				2	12					12			
Tufted Duck <i>Aythya fuligula</i>	LC	W	Y			20								12					
Little Grebe <i>Tachybaptus ruficollis</i>	LC	P	Y								1			2					
Eurasian Spoonbill <i>Platalea leucorodia</i>	LC; RLCV(NT); CITES(II); CSMPS(II); Cap.586	W	Y								1								
Black-faced Spoonbill <i>Platalea minor</i>	PGC; RLCV(EN); IUCN(EN); CSMPS(II)	W	Y			10													
Yellow Bittern <i>Ixobrychus sinensis</i>	(LC)	M,Su	Y			1					1				2				
Black-crowned Night Heron <i>Nycticorax nycticorax</i>	(LC)	P	Y			2					13			1	2	1			
Striated Heron <i>Butorides striata</i>	(LC)	Su	Y							1									
Chinese Pond Heron <i>Ardeola bacchus</i>	PRC (RC)	P	Y	9		29				1	11			9	2	6		1	
Eastern Cattle Egret <i>Bubulcus coromandus</i>	(LC)	P	Y								16								
Grey Heron <i>Ardea cinerea</i>	PRC	W	Y	8		38					18			5	3	3			
Purple Heron <i>Ardea purpurea</i>	RC	AM,P	Y											1	2				
Great Egret <i>Ardea alba</i>	PRC (RC)	P	Y	6		42				3	1	32		2	2	6		1	
Intermediate Egret <i>Ardea intermedia</i>	RC	M,P	Y								1								
Little Egret <i>Egretta garzetta</i>	PRC (RC)	P	Y	22		37				1	1	26		23	3	5		2	
Great Cormorant <i>Phalacrocorax carbo</i>	PRC	W	Y	3		12					2			2		3			
Crested Serpent Eagle <i>Spilornis cheela</i>	(LC); RLCV(NT); CITES(II); CSMPS(II); Cap.586	R,M	N							1									
Black Kite <i>Milvus migrans</i>	(RC); CITES(II); CSMPS(II); Cap.586	W,R	N							2		1			3				
Eastern Buzzard <i>Buteo japonicus</i>	CSMPS(II); CITES(II); Cap.586	W	N							1		2							
White-breasted Waterhen <i>Amaurornis phoenicurus</i>	-	R	Y	2		3		2			1	6		2	3	1			
Common Moorhen <i>Gallinula chloropus</i>	-	R	Y			2						5			3				
Black-winged Stilt <i>Himantopus himantopus</i>	RC	W	Y	16		65						5				3			
Pied Avocet <i>Recurvirostra avosetta</i>	RC	W	Y	3		133										12			
Grey-headed Lapwing <i>Vanellus cinereus</i>	LC	W	Y			14										2			
Pacific Golden Plover <i>Pluvialis fulva</i>	LC	M,W	Y			1													
Little Ringed Plover <i>Charadrius dubius</i>	(LC)	W,R	Y	2		16													
Pheasant-tailed Jacana <i>Hydrophasianus chirurgus</i>	LC; RLCV(NT)	M	Y	2		3													

Species	Conservation and Protection Status ¹	Principal Status ²	Wetland-dependant?	Project Site ³	500m Assessment Area ³														
					CW	AG	CW	DA	FM	IF	MA	MW	WL	PL	PO	RB	WC	SH	TM
Common Snipe <i>Gallinago gallinago</i>	-	W	Y			16				1	1					1		2	
Common Sandpiper <i>Actitis hypoleucos</i>	-	M,W	Y	2		11					5			2					
Green Sandpiper <i>Tringa ochropus</i>	-	W	Y	2		14					5								
Common Redshank <i>Tringa totanus</i>	RC	W	Y	2		15													
Marsh Sandpiper <i>Tringa stagnatilis</i>	RC	M,W	Y	2		11													
Wood Sandpiper <i>Tringa glareola</i>	LC	M,W	Y			12													
Spotted Redshank <i>Tringa erythropus</i>	RC	W/M	Y			16													
Common Greenshank <i>Tringa nebularia</i>	RC	M,W	Y	3		21										1			
Black-headed Gull <i>Chroicocephalus ridibundus</i>	PRC	W	Y	6		32													
Rock Dove <i>Columba livia</i>	-	R	N	112		117	50						8						
Eurasian Collared Dove <i>Streptopelia decaocto</i>	-	(Not included)	N								1				2				
Spotted Dove <i>Spilopelia chinensis</i>	-	R	N	24	1	23	17				10	3	11		3		2		
Common Emerald Dove <i>Chalcophaps indica</i>	-	R	N									1							
Greater Coucal <i>Centropus sinensis</i>	CSMPS(II)	R	N					1		1	1	1	1		1		1	1	
Asian Koel <i>Eudynamys scolopaceus</i>	-	Su,R	N				2				2		2						
Plaintive Cuckoo <i>Cacomantis merulinus</i>	-	Su	N								2								
Large Hawk-Cuckoo <i>Hierococcyx sparverioides</i>	-	Su	N				1						1						
Collared Scops Owl <i>Otus lettia</i>	CITES(II); CSMPS(II); Cap.586	R	N										1						
Asian Barred Owlet <i>Glaucidium cuculoides</i>	CITES(II); CSMPS(II); Cap.586	R	N										1						
House Swift <i>Apus nipalensis</i>	-	R,SpM	N						24		2								
White-throated Kingfisher <i>Halcyon smyrnensis</i>	(LC)	AM,P	Y			2					3			1	1				
Common Kingfisher <i>Alcedo atthis</i>	-	AM,P	Y	1		1				1	3			3					
Pied Kingfisher <i>Ceryle rudis</i>	(LC)	R	Y			2					1								
Eurasian Hoopoe <i>Upupa epops</i>	-	OV	N								1								
Eurasian Wryneck <i>Jynx torquilla</i>	-	W,M	N												1				
Peregrine Falcon <i>Falco peregrinus</i>	(LC); RLCV(NT); CITES(I); CSMPS(II); Cap.586	R,W	N						1										
Scarlet Minivet <i>Pericrocotus speciosus</i>	-	R	N								2								
Brown Shrike <i>Lanius cristatus</i>	-	SpM	N										1						
Long-tailed Shrike <i>Lanius schach</i>	-	R	N	1		1	1		1		2		1		1		1		1

Species	Conservation and Protection Status ¹	Principal Status ²	Wetland-dependant?	Project Site ³	500m Assessment Area ³														
					CW	AG	CW	DA	FM	IF	MA	MW	WL	PL	PO	RB	WC	SH	TM
Black-naped Oriole <i>Oriolus chinensis</i>	LC	AM	N														1		
Black Drongo <i>Dicrurus macrocercus</i>	-	M,Su	N							2	3		1		2	1			
Hair-crested Drongo <i>Dicrurus hottentottus</i>	-	M,Su,W	N				2				2				1				
Red-billed Blue Magpie <i>Urocissa erythroryncha</i>	-	R	N				1				5		2						
Oriental Magpie <i>Pica serica</i>	-	R	N				2				2		2						
Collared Crow <i>Corvus torquatus</i>	LC; RLCV(NT); IUCN(VU)	R	Y								5					2		1	
Large-billed Crow <i>Corvus macrorhynchos</i>	-	R	N				1		2			1	2				1		
Cinereous Tit <i>Parus cinereus</i>	-	R	N				12			1	5		8		1				
Chinese Penduline Tit <i>Remiz consobrinus</i>	RC	M,W	N								4				8				
Red-whiskered Bulbul <i>Pycnonotus jocosus</i>	-	R	N	2	2		34	4		2	39	5	13		7		6	2	
Chinese Bulbul <i>Pycnonotus sinensis</i>	-	R	N	1			8				41	2	11		5			1	
Sooty-headed Bulbul <i>Pycnonotus aurigaster</i>	-	R	N				3				3				2		3		2
Barn Swallow <i>Hirundo rustica</i>	-	SpM,Su	N			1	8		3		4			1	6			5	
Manchurian Bush Warbler <i>Horornis canturians</i>	-	W	N												1				
Yellow-browed Warbler <i>Phylloscopus inornatus</i>	-	W	N				2				5		2		1				
Pallas's Leaf Warbler <i>Phylloscopus proregulus</i>	-	W	N								4		3		1		1		
Dusky Warbler <i>Phylloscopus fuscatus</i>	-	W	N	1		3	1			3	11		3	2	7	5		2	
Sakhalin Leaf Warbler <i>Phylloscopus borealoides</i>	-	AM	N										1						
Pale-legged Leaf Warbler <i>Phylloscopus tenellipes</i>	-	AM	N										3						
Arctic Warbler <i>Phylloscopus borealis</i>	-	AM	N												1				
Oriental Reed Warbler <i>Acrocephalus orientalis</i>	-	M	Y							1	1				13	4			
Black-browed Reed Warbler <i>Acrocephalus bistrigiceps</i>	-	M	Y								9				28	28			
Thick-billed Warbler <i>Arundinax aedon</i>	LC	AM	N												1				
Pallas's Grasshopper Warbler <i>Helopsaltes certhiola</i>	LC	AM	Y								1				3	1			
Lanceolated Warbler <i>Locustella lanceolata</i>	RLCV(NT)	AM	N								1				1				
Zitting Cisticola <i>Cisticola juncidis</i>	LC	W	N								1								
Yellow-bellied Prinia <i>Prinia flaviventris</i>	-	R	N	1		3		1		2	13			1	15	6	1	1	
Plain Prinia <i>Prinia inornata</i>	-	R	N	2		3		2			13			1	7	5	1	3	2
Common Tailorbird <i>Orthotomus sutorius</i>	-	R	N	1			3	1			13	1	2				3		

Species	Conservation and Protection Status ¹	Principal Status ²	Wetland-dependant?	Project Site ³	500m Assessment Area ³														
				CW	AG	CW	DA	FM	IF	MA	MW	WL	PL	PO	RB	WC	SH	TM	WL
Masked Laughingthrush <i>Pterorhinus perspicillatus</i>	-	R	N		3		18				17	5	8		16	2	4		
Swinhoe's White-eye <i>Zosterops simplex</i>	-	R,?W	N	4			12				25		23	2	12				
Crested Myna <i>Acridotheres cristatellus</i>	-	R	N	3	2	5	28				21		12	18	2				3
Common Myna <i>Acridotheres tristis</i>	-	R	N	4		3	12				2		4						
Red-billed Starling <i>Spodiopsar sericeus</i>	GC	W	N								2	3							
White-cheeked Starling <i>Spodiopsar cineraceus</i>	PRC	W	N								17				8				
Black-collared Starling <i>Gracupica nigricollis</i>	-	R	N	14		34	21				19		6	4	1		2		2
White-shouldered Starling <i>Sturnia sinensis</i>	(LC)	M,W,Su	N								10								
Chinese Blackbird <i>Turdus mandarinus</i>	-	W,M	N								6	1	1						
Oriental Magpie Robin <i>Copsychus saularis</i>	-	R	N	1		3	8	3		2	6		6		1	2	2	2	2
Asian Brown Flycatcher <i>Muscicapa dauurica</i>	-	M,W	N				1				1		4		1	1			
Siberian Rubythroat <i>Calliope calliope</i>	-	W	N										2		2	1			
Blue Whistling Thrush <i>Myophonus caeruleus</i>	-	R	N								1								
Red-throated Flycatcher <i>Ficedula albicilla</i>	-	AM,W	N							2	3		2		1				
Daurian Redstart <i>Phoenicurus aureus</i>	-	W	N				12			1	11		15	1	3				
Stejneger's Stonechat <i>Saxicola stejnegeri</i>	-	W,M	N								6				4	4			
Fork-tailed Sunbird <i>Aethopyga christinae</i>	-	R	N								1	1					1		
Eurasian Tree Sparrow <i>Passer montanus</i>	-	R	N	9	15	65	79				30		35				4		4
White-rumped Munia <i>Lonchura striata</i>	-	R	N				1				2		1						
Scaly-breasted Munia <i>Lonchura punctulata</i>	-	R	N		3			15			31		9		18	12	6		12
Eastern Yellow Wagtail <i>Motacilla tschutschensis</i>	-	M,W	N	2		7		3			1				2				
Grey Wagtail <i>Motacilla cinerea</i>	-	W	N	3		4					6								
White Wagtail <i>Motacilla alba</i>	-	W,R	N	9		8	4			1	15			2	2	5		1	
Richard's Pipit <i>Anthus richardi</i>	-	W,R	N								6				4				1
Olive-backed Pipit <i>Anthus hodgsoni</i>	-	W	N		1		2				12	2	5						
Chestnut-eared Bunting <i>Emberiza fucata</i>	LC	M	N											1	1				
Little Bunting <i>Emberiza pusilla</i>	-	W	N												3		4		
Yellow-breasted Bunting <i>Emberiza aureola</i>	RC; RLCV(EN); IUCN(CR)	M	N											3					
Black-faced Bunting <i>Emberiza spodocephala</i>	-	M,W	N								2								
Total no. of species recorded				36	7	47	29	9	10	19	79	12	37	24	53	29	18	14	9

Notes:

1. Conservation and protection status refers to Fellowes *et al.* (2002), Red List of China’s Vertebrates (Jiang *et al.* 2016), IUCN (2020), China State Major Protection Status, CITES (2020), Cap. 170 and Cap. 586.
 - a. Conservation status by Fellowes *et al.* (2002): LC = Local Concern; PRC = Potential Regional Concern; RC = Regional Concern; PGC = Potential Global 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.
 - b. Conservation status by Red List of China’s Vertebrates (RLCV) (Jiang *et al.* 2016): NT = Near Threatened; VU = Vulnerable; EN = Endangered; CR = Critically Endangered.
 - c. Conservation status by IUCN (2019): NT = Near Threatened; VU = Vulnerable; EN = Endangered; CR = Critically Endangered.
 - d. Protection status by China State Major Protection Status (CSMPS): II = Class II Protected Species in China.
 - e. Protection status by CITES (2019): II = Listed in CITES Appendix II.
 - f. Cap. 170 = Wild Animals Protection Ordinance. All wild birds in Hong Kong are protected under Cap. 170.
 - g. Cap. 586 = Protection of Endangered Species of Animals and Plants Ordinance.
2. Principal status refers to Carey et al. (2001): R = Resident; W = Winter Visitor; Su = Summer Visitor; M = Migrant; A = Autumn; Sp = Spring; P = Present all year, exact composition unknown.
3. Habitats: AG = Agricultural Land; CW = Channelised Watercourse; DA = Developed Area; FM = Freshwater Marsh; IF = In Flight; MG = Mangrove; MW = Mitigation Wetland; WL = Mixed Woodland; PL = Plantation; PO = Pond; RB = Reedbed; WC = Semi-natural Watercourse; SH = Shrubland; TM = Tidal Marsh; WG = Wasteland.

Table 3. Distribution of bird species of conservation importance recorded from July 2019 to June 2020 and their maximum abundance recorded

Species	Project Site ¹					500m Assessment Area ¹																										
	CW					CW										FM	IF	MA		MW		WL	PL	PO				RB	WC	SH	TM	
	KTR	SCR	YLTN S1	YLTN S3	YLTN S4	KTR (D)	KTR (U)	KTR (A)	MCW	SCR	SPR	YLBP (D)	YLBF (U)	YLTN S1	STST	NSW		Old KTR	SP	WR	-	NSW	ATFO	WR	NSW	TSL	NSW	Old KTR	CWL	NSW	Old KTR	
Northern Shoveler <i>Spatula clypeata</i>					2	39		98			15																8					
Northern Pintail <i>Anas acuta</i>						2																										
Eurasian Teal <i>Anas crecca</i>						56		28			3							2		12							12					
Tufted Duck <i>Aythya fuligula</i>						20																		12								
Little Grebe <i>Tachybaptus ruficollis</i>																				1				2	2	1						
Eurasian Spoonbill <i>Platalea leucorodia</i>																				1												
Black-faced Spoonbill <i>Platalea minor</i>						10					2	4																				
Yellow Bittern <i>Ixobrychus sinensis</i>								1			1								1	1						2						
Black-crowned Night Heron <i>Nycticorax nycticorax</i>								2				1	1					2	13					1		2	1					
Striated Heron <i>Butorides striata</i>																	1															
Chinese Pond Heron <i>Ardeola bacchus</i>	3	3	1	3	9	24	1	29	4	3	15	3	2	1			1	1	2	11			9	1	3	5	2	6			1	
Eastern Cattle Egret <i>Bubulcus coromandus</i>																			2	16												
Grey Heron <i>Ardea cinerea</i>	1			4	8	13		38			12	5	1						2	18			3		5		3	3				
Purple Heron <i>Ardea purpurea</i>																								1		2						
Great Egret <i>Ardea alba</i>	3			1	6	23		42			6	3	2			3		1	1	32			1		2	1	2	6			1	
Intermediate Egret <i>Ardea intermedia</i>																			1													
Little Egret <i>Egretta garzetta</i>	4	1	1	7	22	37	1	31	3	2	27	7	3	1		1	1	1	3	26			23	2	2	1	3	5			2	
Great Cormorant <i>Phalacrocorax carbo</i>					3	7		4			12									2					2			3				
Crested Serpent Eagle <i>Spilornis cheela</i>																1																
Black Kite <i>Milvus migrans</i>																2				1							3					
Eastern Buzzard <i>Buteo japonicus</i>																1			1	2												
Black-winged Stilt <i>Himantopus himantopus</i>				3	16	59		52			65	8								5								3				
Pied Avocet <i>Recurvirostra avosetta</i>					3	133		21			71	3																12				
Grey-headed Lapwing <i>Vanellus cinereus</i>						4		14																				2				
Pacific Golden Plover <i>Pluvialis fulva</i>						1																										
Little Ringed Plover <i>Charadrius dubius</i>					2			16			2																					
Pheasant-tailed Jacana <i>Hydrophasianus chirurgus</i>					2						3																					
Common Redshank <i>Tringa totanus</i>					2	13		15			4																					

Species	Project Site ¹					500m Assessment Area ¹																										
	CW					CW										FM	IF	MA		MW		WL	PL	PO				RB	WC	SH	TM	
	KTR	SCR	YLTN S1	YLTN S3	YLTN S4	KTR (D)	KTR (U)	KTR (A)	MCW	SCR	SPR	YLBP (D)	YLBF (U)	YLTN S1	STST	NSW		Old KTR	SP	WR	-	NSW	ATFO	WR	NSW	TSL	NSW	Old KTR	CWL	NSW	Old KTR	
Marsh Sandpiper <i>Tringa stagnatilis</i>					2	6		11			7																					
Wood Sandpiper <i>Tringa glareola</i>						2		12	1		5																					
Spotted Redshank <i>Tringa erythropus</i>						16																										
Common Greenshank <i>Tringa nebularia</i>					3	21		4			3																1					
Black-headed Gull <i>Chroicocephalus ridibundus</i>				6		29					32																					
Greater Coucal <i>Centropus sinensis</i>															1		1		1	1	1	1					1		1	1		
Collared Scops Owl <i>Otus lettia</i>																					1											
Asian Barred Owlet <i>Glaucidium cuculoides</i>																					1											
White-throated Kingfisher <i>Halcyon smyrnensis</i>						2		1			1	1						2	3					1		1						
Pied Kingfisher <i>Ceryle rudis</i>											2							1	1													
Peregrine Falcon <i>Falco peregrinus</i>																1																
Black-naped Oriole <i>Oriolus chinensis</i>																												1				
Collared Crow <i>Corvus torquatus</i>																		1	5								2		1			
Chinese Penduline Tit <i>Remiz consobrinus</i>																		4	1							8						
Thick-billed Warbler <i>Arundinax aedon</i>																										1						
Pallas's Grasshopper Warbler <i>Helopsaltes certhiola</i>																			1							3	1					
Lanceolated Warbler <i>Locustella lanceolata</i>																			1							1						
Zitting Cisticola <i>Cisticola juncidis</i>																		1														
Red-billed Starling <i>Spodiopsar sericeus</i>																			2	3												
White-cheeked Starling <i>Spodiopsar cineraceus</i>																			17							8						
White-shouldered Starling <i>Sturnia sinensis</i>																			10													
Chestnut-eared Bunting <i>Emberiza fucata</i>																							1			1						
Yellow-breasted Bunting <i>Emberiza aureola</i>																								3								
Total no. of species of conservation importance	4	2	2	6	13	21	2	18	3	2	20	9	5	2	1	6	4	4	15	24	2	3	4	5	10	4	16	14	2	2	3	

Notes:

1. Habitats: CW = Channelised Watercourse; FM = Freshwater Marsh; IF = In Flight; MG = Mangrove; MW = Mitigation Wetland; WL = Mixed Woodland; PL = Plantation; PO = Pond; RB = Reedbed; WC = Semi-natural Watercourse; SH = Shrubland; TM = Tidal Marsh. Locations: KTR = Kam Tin River; KTR (U) = Kam Tin River upstream of Project Site; KTR (D) = Kam Tin River downstream of Project Site; KTR (A) = Kam Tin River adjacent to the works area at parapet wall; SCR = Sham Chung River; YLTN = Yuen Long Town Nullah; MCW = Minor channelised watercourses; SPR = Shan Pui River; STST = Shui Tsiu San Tseun; NSW = Nam Sang Wai; WR = West Rail; TSL = Tung Shing Lei area; ATFO = Au Tau Fisheries Office.

Table 4. Maximum abundance of amphibian species recorded from July 2019 to June 2020

Species	Conservation and Protection Status ¹	Status in HK	Project Site	500m Study Area										
			-	Agricultural Land	Developed Area	Freshwater Marsh	Grassland	Mitigation Wetland	Plantation	Pond	Reedbed	Semi-natural Watercourse	Shrubland	Waste Ground
Asian Common Toad <i>Duttaphrynus melanostictus</i>	-	Widely distributed in Hong Kong.		1	7	50		2	4	20			3	2
Spotted Narrow-mouthed Frog <i>Kalophrynus interlineatus</i>	RLCV(NT)	Widely distributed from low to moderate altitudes in northern and central New Territories.						1						
Asiatic Painted Frog <i>Kaloula pulchra</i>	-	Widely distributed in Hong Kong.		1	8	1		1	2				1	
Butler's Pigmy Frog <i>Microhyla butleri</i>	-	Widely distributed in Hong Kong.				20		10						
Ornate Pigmy Frog <i>Microhyla fissipes</i>	-	Widely distributed in Hong Kong.				20	2	30	1	2	1			
Marbled Pigmy Frog <i>Microhyla pulchra</i>	-	Widely distributed in Hong Kong.				20		10						
Paddy Frog <i>Fejervarya multistriata</i>	-	Widely distributed in Hong Kong.		1	3	5		1	3	5	1		2	1
Günther's Frog <i>Sylvirana guentheri</i>	-	Widely distributed throughout Hong Kong.				50		15		20	6	1		
Brown Tree Frog <i>Polypedates megacephalus</i>	-	Widely distributed throughout Hong Kong.		2	6	2		2	3				2	
Greenhouse Frog <i>Eleutherodactylus planirostris</i>	-	(Introduced species)			12			10	7					2
Total no. of species recorded			0	4	5	8	1	10	6	4	3	1	4	3

- Notes:
- Conservation and protection status refers to Fellowes *et al.* (2002), Red List of China’s Vertebrates (Jiang *et al.* 2016), IUCN (2020), China State Major Protection Status, CITES (2020), Cap. 170 and Cap. 586.
 - Conservation status by Fellowes *et al.* (2002): LC = Local Concern; PRC = Potential Regional Concern; RC = Regional Concern; PGC = Potential Global 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.
 - Conservation status by Red List of China’s Vertebrates (RLCV) (Jiang *et al.* 2016): NT = Near Threatened; VU = Vulnerable; EN = Endangered; CR = Critically Endangered.
 - Conservation status by IUCN (2019): NT = Near Threatened; VU = Vulnerable; EN = Endangered; CR = Critically Endangered.
 - Protection status by China State Major Protection Status (CSMPS): II = Class II Protected Species in China.
 - Protection status by CITES (2019): II = Listed in CITES Appendix II.
 - Cap. 170 = Wild Animals Protection Ordinance. All wild birds in Hong Kong are protected under Cap. 170.
 - Cap. 586 = Protection of Endangered Species of Animals and Plants Ordinance.
 - Status in HK follows AFCD (2020).

Table 5. Maximum abundance of reptile species recorded from July 2019 to June 2020

Species	Conservation and Protection Status ¹	Status in HK	Project Site	500m Study Area								
			Channelised Watercourse	Developed Area	Freshwater Marsh	Mitigation Wetland	Plantation	Pond	Reedbed	Shrubland	Tidal Marsh	Waste Ground
Red-eared Slider <i>Trachemys scripta</i>	-	Widely distributed and commonly found in reservoirs or ponds in urban parks.	1			3			2			
Chinese Soft-shelled Turtle <i>Pelodiscus sinensis</i>	GC; RLCV(EN); IUCN(VU); Cap.170	Locally found in reservoirs and fishponds in Deep Bay area.							1			
Changeable Lizard <i>Calotes versicolor</i>	-	Widely distributed throughout Hong Kong.		2		1	1	1		1		
Long-tailed Skink <i>Eutropis longicaudata</i>	-	Widely distributed throughout Hong Kong.		1		1		1		1		1
Bowring's Gecko <i>Hemidactylus bowringii</i>	-	Distributed throughout Hong Kong.	2	12			6	3		1		1
Common Wolf Snake <i>Lycodon aulicus</i>	RLCV(NT)	Widely distributed at low elevations throughout Hong Kong.		1								
Common Rat Snake <i>Ptyas mucosus</i>	PRC; RLCV(EN); CITES(II); Cap.586	Widely distributed throughout Hong Kong.				1						
Buff-striped Keelback <i>Amphiesma stolatum</i>	LC	Distributed in lowland in central and northern New Territories and Lantau Island.			1							
Checkered Keelback <i>Fowlea flavipunctatus</i>	-	Widely distributed in streams in the New Territories and Lantau Island.	1								1	
Bamboo Snake <i>Cryptelytrops albolabris</i>	-	Distributed in shrubland, grassland throughout Hong Kong.								1		
Total no. of species recorded			3	4	1	4	2	3	2	4	1	2

- Notes:
- Conservation and protection status refers to Fellowes *et al.* (2002), Red List of China’s Vertebrates (Jiang *et al.* 2016), IUCN (2020), China State Major Protection Status, CITES (2020), Cap. 170 and Cap. 586.
 - Conservation status by Fellowes *et al.* (2002): LC = Local Concern; PRC = Potential Regional Concern; RC = Regional Concern; PGC = Potential Global 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.
 - Conservation status by Red List of China’s Vertebrates (RLCV) (Jiang *et al.* 2016): NT = Near Threatened; VU = Vulnerable; EN = Endangered; CR = Critically Endangered.
 - Conservation status by IUCN (2019): NT = Near Threatened; VU = Vulnerable; EN = Endangered; CR = Critically Endangered.
 - Protection status by China State Major Protection Status (CSMPS): II = Class II Protected Species in China.
 - Protection status by CITES (2019): II = Listed in CITES Appendix II.
 - Cap. 170 = Wild Animals Protection Ordinance. All wild birds in Hong Kong are protected under Cap. 170.
 - Cap. 586 = Protection of Endangered Species of Animals and Plants Ordinance.
 - Status in HK follows AFCD (2020).

Table 6. Maximum abundance of butterfly species recorded from July 2019 to June 2020

Species	Conservation and Protection Status ¹	Status in HK ²	Project Site ³	500m Study Area ³												
			CW	AG	CW	DA	FM	MG	MW	PL	PO	RB	WC	SH	TM	WG
Common Awl <i>Hasora badra</i>	LC	Very Rare						2								
Formosan Swift <i>Borbo cinnara</i>	-	Common	1			1	1		1	2				3	1	1
Banana Skipper <i>Erionota torus</i>	-	Uncommon				1										
Common Straight Swift <i>Parnara guttata</i>	-	Common													1	
Contiguous Swift <i>Polytremis lubricans</i>	-	Common					1									
Chinese Dart <i>Potanthus confucius</i>	-	Uncommon				1										
Lesser Band Dart <i>Potanthus trachala</i>	-	Rare												1		
Indian Palm Bob <i>Suastus gremius</i>	-	Uncommon												6		
Greenish Palm Dart <i>Telicota ancilla</i>	-	Uncommon												1		
Pale Palm Dart <i>Telicota colon</i>	LC	Rare												1		
Purple Sapphire <i>Heliophorus epicles</i>	-	Common					2						2			
Common Hedge Blue <i>Acytolepis puspa</i>	-	Common				1			1							
Forget-me-not <i>Catochrysops strabo</i>	-	Very Rare; Species of Conservation Concern												12		
Lime Blue <i>Chilades lajus</i>	-	Common				3								2		
Plains Cupid <i>Chilades pandava</i>	-	Uncommon				3			3							
Metallic Cerulean <i>Jamides alecto</i>	-	Very Rare					1		1							
Dark Cerulean <i>Jamides bochus</i>	-	Common				1								5		
Malayan <i>Megisba malaya</i>	LC	Very Rare; Species of Conservation Concern												5		
Quaker <i>Neopithecops zalmora</i>	-	Uncommon				1								1		
Tailless Line Blue <i>Prosotas dubiosa</i>	-	Vagrant							1					12		12
Pale Grass Blue <i>Pseudozizeeria maha</i>	-	Very Common	2	1		12			4				1	3		4
Lesser Grass Blue <i>Zizina otis</i>	-	Common				3								4		
Tiny Grass Blue <i>Zizula hylax</i>	-	Very Rare; Species of Conservation Concern												8		
Silver Streak Blue <i>Iraota timoleon</i>	-	Uncommon												1		
Chocolate Royal <i>Remelana jangala</i>	-	Common						3								
Club Silverline <i>Spindasis syama</i>	-	Uncommon												3		
Plum Judy <i>Abisara echerius</i>	-	Very Common				2								6		
Tawny Rajah <i>Charaxes bernardus</i>	-	Common							1					1		
Plain Tiger <i>Danaus chrysippus</i>	-	Uncommon							2							

Species	Conservation and Protection Status ¹	Status in HK ²	Project Site ³	500m Study Area ³												
			CW	AG	CW	DA	FM	MG	MW	PL	PO	RB	WC	SH	TM	WG
Common Tiger <i>Danaus genutia</i>	-	Common				3			1	1				2		
Common Indian Crow <i>Euploea core</i>	-	Common				2	2			2				3		
Blue-spotted Crow <i>Euploea midamus</i>	-	Very Common				2			1	2		1		3		
Ceylon Blue Glassy Tiger <i>Ideopsis similis</i>	-	Very Common							1							
Blue Tiger <i>Tirumala limniace</i>	-	Common				1										
Angled Castor <i>Ariadne ariadne</i>	-	Common				3			1	2						2
Staff Sergeant <i>Athyma selenophora</i>	-	Common												1		
White-edged Blue Baron <i>Euthalia phemius</i>	-	Common				1								1		
Red-ring Skirt <i>Hestina assimilis</i>	-	Common							1					2		
Great Egg-fly <i>Hypolimnias bolina</i>	-	Common				1			3	1				5		
Danaid Egg-fly <i>Hypolimnias misippus</i>	LC	Uncommon												3		
Peacock Pansy <i>Junonia almana</i>	-	Common					3									
Grey Pansy <i>Junonia atlites</i>	-	Common											2			
Lemon Pansy <i>Junonia lemonias</i>	-	Common				1				1			2			
Common Sailer <i>Neptis hylas</i>	-	Very Common							1							
Short-banded Sailer <i>Phaedyma columella</i>	-	Common												2		
Common Palmfly <i>Elymnias hypermnestra</i>	-	Common				2			2					3		
Common Evening Brown <i>Melanitis leda</i>	-	Common							3							
Dark Evening Brown <i>Melanitis phedima</i>	-	Uncommon				2				1						
Dark-brand Bush Brown <i>Mycalesis mineus</i>	-	Very Common				2			4	2				3		1
South China Bush Brown <i>Mycalesis zonata</i>	-	Common								2				2		
Common Five-ring <i>Ypthima baldus</i>	-	Very Common				1			3	2				3		
Common Mime <i>Chilasa clytia</i>	-	Common							1					4		
Tailed Jay <i>Graphium agamemnon</i>	-	Common							1					5		
Common Bluebottle <i>Graphium sarpedon</i>	-	Very Common												6		
Chinese Peacock <i>Papilio bianor</i>	-	Common												1		
Lime Butterfly <i>Papilio demoleus</i>	-	Common							2							
Red Helen <i>Papilio helenus</i>	-	Very Common												4		4
Great Mormon <i>Papilio memnon</i>	-	Very Common				3	2		1	2				2		
Paris Peacock <i>Papilio paris</i>	-	Very Common				3	1							3		

Species	Conservation and Protection Status ¹	Status in HK ²	Project Site ³	500m Study Area ³												
			CW	AG	CW	DA	FM	MG	MW	PL	PO	RB	WC	SH	TM	WG
Common Mormon <i>Papilio polytes</i>	-	Very Common		2	1	3			1	5				8		2
Spangle <i>Papilio protenor</i>	-	Very Common				2	2		1					3		
Swallowtail <i>Papilio xuthus</i>	-	Rare							2					1		
Lemon Emigrant <i>Catopsilia pomona</i>	-	Common		1	1	2	1		2	3						3
Mottled Emigrant <i>Catopsilia pyranthe</i>	-	Very Common				1										
Three-spot Grass Yellow <i>Eurema blanda</i>	-	Common				2	1			3				5		
Common Grass Yellow <i>Eurema hecabe</i>	-	Very Common	1	1	1	3			2	3				5		3
Red-base Jezebel <i>Delias pasithoe</i>	-	Very Common				2		1						1		
Great Orange Tip <i>Hebomoia glaucippe</i>	-	Common				2			1							
Indian Cabbage White <i>Pieris canidia</i>	-	Very Common	2			5	1		2	2	1					
Total no. of species recorded			4	4	3	34	12	3	30	17	1	1	4	44	2	9

- Notes:
- Conservation and protection status refers to Fellowes *et al.* (2002), IUCN (2020), China State Major Protection Status, CITES (2020), Cap. 170 and Cap. 586.
 - Conservation status by Fellowes *et al.* (2002): LC = Local Concern.
 - Status in HK follows AFCD (2020).
 - Habitats: CW = Channelised Watercourse; FM = Freshwater Marsh; MG = Mangrove; MW = Mitigation Wetland; WL = Mixed Woodland; PL = Plantation; PO = Pond; RB = Reedbed; WC = Semi-natural Watercourse; SH = Shrubland; TM = Tidal Marsh.

Table 7. Maximum abundance of odonate species recorded from July 2019 to June 2020

Species	Conservation and Protection Status ¹	Status in HK ²	Project Site ³	500m Study Area ³											
			CW	CW	DA	FM	MG	MW	PL	PO	RB	WC	SH	TM	WG
Orange-tailed Sprite <i>Ceriagrion auranticum</i>	-	Abundant			2	5		1			1	2			
Common Bluetail <i>Ischnura senegalensis</i>	-	Abundant	2					2							
Marsh Dancer <i>Onychargia atrocyana</i>	-	Common				2									
Yellow Featherlegs <i>Copera marginipes</i>	-	Abundant				2						1			
Common Evening Hawker <i>Anaciaeschna jaspidea</i>	-	Common						1							
Pale-spotted Emperor <i>Anax guttatus</i>	-	Common		1				1				2			
Lesser Emperor <i>Anax parthenope</i>	-	Common						1		1		1			
Common Flangetail <i>Ictinogomphus pertinax</i>	-	Common						10		5		2			
Golden Flangetail <i>Sinictinogomphus clavatus</i>	-	Common						1		1					
Regal Pond Cruiser <i>Epoptalmia elegans</i>	-	Common								1			1		
Asian Pintail <i>Acisoma panorpoides</i>	-	Common						1			1				
Blue Dasher <i>Brachydiplax chalybea</i>	-	Common					1	2		3	3				
Asian Amberwing <i>Brachythemis contaminata</i>	-	Abundant	4	5	6	1	2	6		12	5	3		5	1
Crimson Darter <i>Crocothemis servilia</i>	-	Abundant				2		1							
Blue Percher <i>Diplacodes trivialis</i>	-	Abundant						1							
Amber-winged Glider <i>Hydrobasileus croceus</i>	-	Common						2							
Russet Percher <i>Neurothemis fulvia</i>	-	Common			2	3	1	8		2		1			
Pied Percher <i>Neurothemis tullia</i>	-	Common						4		1					
Red-faced Skimmer <i>Orthetrum chrysis</i>	-	Abundant		1								1			
Common Blue Skimmer <i>Orthetrum glaucum</i>	-	Abundant		3	2	4						2			
Marsh Skimmer <i>Orthetrum luzonicum</i>	-	Abundant				1		1			1				
Common Red Skimmer <i>Orthetrum pruinosum</i>	-	Abundant	2	3	3	5		3		1		3			
Green Skimmer <i>Orthetrum sabina</i>	-	Abundant	3	3	3	1	2	5		2	1	2		2	
Wandering Glider <i>Pantala flavescens</i>	-	Abundant	1	4	15			30	2	14				2	25
Pied Skimmer <i>Pseudothemis zonata</i>	-	Common						2		1	1	2			
Ruby Darter <i>Rhodothemis rufa</i>	LC	Common									1				
Variegated Flutterer <i>Rhyothemis variegata</i>	-	Common	3	12	5		3	15		23	3	1		15	
Evening Skimmer <i>Tholymis tillarga</i>	-	Common		1	1	1		1		1	1	2		1	
Saddlebag Glider <i>Tamea virginia</i>	-	Abundant						2			1				

Species	Conservation and Protection Status ¹	Status in HK ²	Project Site ³	500m Study Area ³											
			CW	CW	DA	FM	MG	MW	PL	PO	RB	WC	SH	TM	WG
Crimson Dropwing <i>Trithemis aurora</i>	-	Abundant						1		1					
Dingy Dusk-Darter <i>Zyxomma petiolatum</i>	-	Common										1			
Total no. of species recorded			6	9	9	11	5	24	1	15	11	15	1	5	2

- Notes:**
- Conservation and protection status refers to Fellowes *et al.* (2002), IUCN (2020), China State Major Protection Status, CITES (2020), Cap. 170 and Cap. 586.
 - Status in HK follows AFCD (2020).
 - Habitats: CW = Channelised Watercourse; FM = Freshwater Marsh; MG = Mangrove; MW = Mitigation Wetland; WL = Mixed Woodland; PL = Plantation; PO = Pond; RB = Reedbed; WC = Semi-natural Watercourse; SH = Shrubland; TM = Tidal Marsh.

Table 8. Abundance of Mai Po Bent-winged Firefly recorded from 2019 and 2020

Habitat	2019			2020		
	July	August	September	April	May	June
Channelised Watercourse	2	1	1		2	1
Developed Area	4	2	3	3	4	2
Mangrove	16	11	12	24	31	18
Tidal Marsh	13	10	6	31	27	21
Plantation				2	3	2
Reedbed				1	3	
Total count in each survey	35	24	22	61	70	44

Table 9. Relative abundance of freshwater fish species recorded from July 2019 to June 2020

Species	Conservation and Protection Status ¹	Status in HK ²	Additional 1	Additional 2	Additional 3	Additional 4	Additional 5	K1	K2	K3	K4	Y1	Y2	Y3	Y4	Y5
			Reedbed		Channelised Watercourse					Semi-natural Watercourse	Channelised Watercourse					Semi-natural Watercourse
Tenpounder <i>Elops machnata</i>	-	-				*										
Indo-Pacific Tarpon <i>Megalops cyprinoides</i>	-	-	*												*	
North African Catfish <i>Clarias gariepinus</i>	-	-					*	*	*		*		*			
Suckermouth Catfish <i>Pterygoplichthys</i> sp.	-	-						*	*		*					
Grey Mullet <i>Mugil cephalus</i>	-	Common			*	*	*		**		**			*	*	*
Greenback Mullet <i>Planiliza subviridis</i>	-	-	**						**		**					
Mosquito Fish <i>Gambusia affinis</i>	-	Common	**	**				**	***	***						
Unidentified Glass Perchlet <i>Ambassis</i> sp.	-	-	***											***	***	***
Climbing perch <i>Anabas testudineus</i>	-	-	**	*												
Redbelly Tilapia <i>Coptodon zillii</i>	-	Common	**	**					**							
Mozambique Tilapia <i>Oreochromis mossambicus</i>	IUCN(NT)*	Common	***	***	**		**		**		****					
Nile Tilapia <i>Oreochromis niloticus</i>	-	Common	**	**	**	**	**	****	***	**	****		***	****	****	
Sharphead Sleeper <i>Eleotris oxycephala</i>	-	Common								*						
Bluespotted Mudskipper <i>Boleophthalmus pectinirostris</i>	-	-			****	****	****	***			****			**	***	*
Fork Tongue Goby <i>Glossogobius giuris</i>	-	Common					*		*		*					
Glass Goby <i>Gobiopterus macrolepis</i>	RLCV(VU)	-	****	****		***			***		***			***	***	**
Giant-fin Mudskipper <i>Periophthalmus magnuspinnatus</i>	-	-				*										
Javanese Fat-nose Goby <i>Pseudogobius javanicus</i>	-	Common					*									*
Taijiang Fat-nose Goby <i>Pseudogobius taijiangensis</i>	-	-	**			*			*		*				**	*
Spotted Scat <i>Scatophagus argus</i>	-	Common	*													
Spotted Snakehead <i>Channa maculata</i>	-	Uncommon													*	
Snakehead Murrel <i>Channa striata</i>	-	Uncommon						*	*		*					
Total no. of species recorded			11	6	4	7	7	6	12	3	11	0	2	5	8	6

Notes:

- Conservation and protection status refers to Fellowes *et al.* (2002), Red List of China's Vertebrates (Jiang *et al.* 2016), IUCN (2020), China State Major Protection Status, CITES (2020), Cap. 170 and Cap. 586.
 - Conservation status by IUCN (2020): NT = Near Threatened; * = the assessment is only valid for native population(s).
 - Conservation status by Red List of China's Vertebrates (RLCV) (Jiang *et al.* 2016): VU = Vulnerable.
- Status in HK follows AFCD (2020).
- Relatively abundance: * = 1-10; ** = 11-50; *** = 51-100; **** = over 100.

Table 10. Relative abundance of aquatic invertebrate species recorded from July 2019 to June 2020

Species	Conservation and Protection Status ¹	Status in HK ²	Additional 1	Additional 2	Additional 3	Additional 4	Additional 5	K1	K3	K4	Y1	Y2	Y3	Y4	Y5
			Reedbed		Channelised Watercourse				Semi-natural Watercourse	Channelised Watercourse					Semi-natural Watercourse
Lesser Emperor (Larva) <i>Anax parthenope</i>	-	Common							*						
Crimson Dropwing (Larva) <i>Trithemis aurora</i>	-	Abundant							*						
Freshwater Shrimp <i>Caridina gracilipes</i>	-	-	**	**		**				*				**	
Freshwater Shrimp <i>Coutierella tonkinensis</i>	-	-	***			***	***			**			***	**	***
Freshwater Prawn <i>Macrobrachium nipponense</i>	-	-						*	***	**				*	*
Chinese White Shrimp <i>Fenneropenaeus cf. chinensis</i>	-	-	*												
Greasyback Shrimp <i>Metapenaeus ensis</i>	CSRL(VU)	-	*			*		*		**				***	***
Mitten Crab <i>Eriocheir japonica</i>	-	-													*
Crab <i>Varuna litterata</i>	-	-		*				*		*			*		*
Mud Crab <i>Scylla serrata</i>	-	-			*					*				*	
Apple Snail <i>Pomacea canaliculata</i>	-	-						****	**	**			***	**	
Freshwater Snail <i>Melanoides tuberculata</i>	-	-	**	**	**	**	**	*	***	**			***	**	*
Freshwater Snail <i>Mieniplotia scabra</i>	-	-							***	**					
Freshwater Snail <i>Sermyla riqueti</i>	-	-	**	**	**		**		***	**			***	**	
Freshwater Snail <i>Tarebia granifera</i>	-	-	**	**		**			***	**					
Total no. of species recorded			7	5	3	5	3	5	8	11	0	0	5	8	6

- Notes:
- Conservation and protection status refers to Fellowes *et al.* (2002), China Species Red List, IUCN (2020), China State Major Protection Status, CITES (2020), Cap. 170 and Cap. 586.
 - Conservation status by China Species Red List (CSRL): VU = Vulnerable.
 - Status in HK follows AFCD (2020).
 - Relatively abundance: * = 1-10; ** = 11-50; *** = 51-100; **** = over 100.

Table 11. Comprehensive list of intertidal/benthic fauna recorded from the walk-over surveys and benthic grab surveys

Phylum	Class	Family	Species
Chordata	Actinopterygii	Oxudercidae	<i>Boleophthalmus pectinirostris</i>
Annelida	Clitellata	Naididae	<i>Thalassodrilides</i> sp.
Annelida	Polychaeta	Sabellidae	<i>Laonome triangularis</i>
Annelida	Polychaeta	Nephtyidae	<i>Micronephthys oligobranchia</i>
Arthropoda	Malacostraca	Machophthalmidae	<i>Macrophthalmus banzai</i>
Mollusca	Gastropoda	Thiaridae	<i>Melanoides tuberculata</i>
Mollusca	Gastropoda	Thiaridae	<i>Tarebia granifera</i>
Arthropoda	Malacostraca	Corophiidae	<i>Corophiinae</i> sp.
Arthropoda	Malacostraca	Ocypodidae	<i>Tubuca arcuata</i>
Arthropoda	Malacostraca	Penaeidae	<i>Fenneropenaeus chinensis</i>
Arthropoda	Malacostraca	Penaeidae	<i>Metapenaeus ensis</i>
Arthropoda	Malacostraca	Varunidae	<i>Varuna litterata</i>

Table 12. Results of Van Veen grab surveys carried out in Shan Pui River in Wet Season and Dry Season

Phylum	Class	Family	Species	Wet Season			Dry Season		
				Upper	Middle	Lower	Upper	Middle	Lower
Annelida	Clitellata	Naididae	<i>Thalassodrilides</i> sp.	5	9	11		21	11
Annelida	Polychaeta	Nephtyidae	<i>Micronephthys oligobranchia</i>		4			11	8
Annelida	Polychaeta	Sabellidae	<i>Laonome triangularis</i>	2	4	3	2	8	6
Arthropoda	Malacostraca	Corophiidae	<i>Corophiinae</i> sp.	1	1	1	3	1	2
Arthropoda	Malacostraca	Machophthalmidae	<i>Macrophthalmus banzai</i>			4	1		1
Arthropoda	Malacostraca	Penaeidae	<i>Fenneropenaeus chinensis</i>		2		1		1
Arthropoda	Malacostraca	Penaeidae	<i>Metapenaeus ensis</i>			1			
Arthropoda	Malacostraca	Varunidae	<i>Varuna litterata</i>		1				
Mollusca	Gastropoda	Thiaridae	<i>Melanoides tuberculata</i>					1	3
Mollusca	Gastropoda	Thiaridae	<i>Tarebia granifera</i>	9	5	5	12	16	13
Total no. of species recorded per sampling station				4	7	6	5	6	8
Density (No. of individuals recorded per sampling location)				17	26	25	19	58	45
Shannon-Weaver Diversity Index (H')				1.12	1.71	1.49	1.13	1.45	1.77
Pielou's Species Evenness (J)				0.81	0.88	0.83	0.7	0.81	0.85

Table 13. Results of Van Veen grab surveys carried out in Kam Tin River in Wet Season and Dry Season

Phylum	Class	Family	Species	Wet Season		Dry Season	
				Upper	Lower	Upper	Lower
Annelida	Clitellata	Naididae	<i>Thalassodrilides</i> sp.	3	11	1	18
Annelida	Polychaeta	Nephtyidae	<i>Micronephthys oligobranchia</i>		8	2	1
Annelida	Polychaeta	Sabellidae	<i>Laonome triangularis</i>	1	2	5	9
Arthropoda	Malacostraca	Corophiidae	<i>Corophiinae</i> sp.				1
Arthropoda	Malacostraca	Penaeidae	<i>Metapenaeus ensis</i>		1		
Arthropoda	Malacostraca	Varunidae	<i>Varuna litterata</i>				2
Mollusca	Gastropoda	Thiaridae	<i>Melanoides tuberculata</i>	5	16	8	18
Mollusca	Gastropoda	Thiaridae	<i>Tarebia granifera</i>	2	3	11	7
Total no. of species recorded per sampling station				4	6	5	7
Density (No. of individuals recorded per sampling location)				11	41	27	56
Shannon-Weaver Diversity Index (H')				1.24	1.47	1.35	1.29
Pielou's Species Evenness (J)				0.89	0.83	0.84	0.66

Annex 2

Faunal species recorded within the Project Site and the Assessment Area

Table 1. Maximum abundance and distribution of mammal species of conservation importance recorded from July 2019 to June 2020

Species	Conservation and Protection Status ¹	Status in HK ²	Project Site	500m Assessment Area		
				Freshwater Marsh	Plantation	Reedbed
Unidentified Rat <i>Rattus</i> sp.	-	-			1	
Small Indian Civet <i>Viverricula indica</i>	RLCV(VU); CSMPS(II); CITES(III); Cap.170; Cap.586	Very Common				1
Domestic Dog <i>Canis lupus familiaris</i>	-	Common			3	
Leopard Cat <i>Prionailurus bengalensis</i>	RLCV(VU); CITES(II); Cap.170; Cap.586	Uncommon			1	
Domestic Ox <i>Bos taurus</i>	-	Common			1	
Domestic Water Buffalo <i>Bubalus bubalis</i>	-	Uncommon		1		
Total no. of species recorded			0	1	4	1

- Notes:**
- Conservation and protection status refers to Fellowes *et al.* (2002), Red List of China’s Vertebrates (Jiang *et al.* 2016), IUCN (2020), China State Major Protection Status, CITES (2020), Cap. 170 and Cap. 586.
 - Conservation status by Fellowes *et al.* (2002): LC = Local Concern; PRC = Potential Regional Concern; RC = Regional Concern; PGC = Potential Global 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.
 - Conservation status by Red List of China’s Vertebrates (RLCV) (Jiang *et al.* 2016): NT = Near Threatened; VU = Vulnerable; EN = Endangered; CR = Critically Endangered.
 - Conservation status by IUCN (2019): NT = Near Threatened; VU = Vulnerable; EN = Endangered; CR = Critically Endangered.
 - Protection status by China State Major Protection Status (CSMPS): II = Class II Protected Species in China.
 - Protection status by CITES (2019): II = Listed in CITES Appendix II.
 - Cap. 170 = Wild Animals Protection Ordinance. All wild birds in Hong Kong are protected under Cap. 170.
 - Cap. 586 = Protection of Endangered Species of Animals and Plants Ordinance.
 - Status in HK follows AFCD (2020).

Table 2. Maximum abundance of all bird species recorded from July 2019 to June 2020

Species	Conservation and Protection Status ¹	Principal Status ²	Wetland-dependant?	Project Site ³	500m Assessment Area ³														
					CW	AG	CW	DA	FM	IF	MA	MW	WL	PL	PO	RB	WC	SH	TM
Northern Shoveler <i>Spatula clypeata</i>	RC	W	Y	2		98										8			
Northern Pintail <i>Anas acuta</i>	RC	W	Y			2													
Eurasian Teal <i>Anas crecca</i>	RC	W	Y			56				2	12					12			
Tufted Duck <i>Aythya fuligula</i>	LC	W	Y			20								12					
Little Grebe <i>Tachybaptus ruficollis</i>	LC	P	Y								1			2					
Eurasian Spoonbill <i>Platalea leucorodia</i>	LC; RLCV(NT); CITES(II); CSMPS(II); Cap.586	W	Y								1								
Black-faced Spoonbill <i>Platalea minor</i>	PGC; RLCV(EN); IUCN(EN); CSMPS(II)	W	Y			10													
Yellow Bittern <i>Ixobrychus sinensis</i>	(LC)	M,Su	Y			1					1				2				
Black-crowned Night Heron <i>Nycticorax nycticorax</i>	(LC)	P	Y			2					13			1	2	1			
Striated Heron <i>Butorides striata</i>	(LC)	Su	Y							1									
Chinese Pond Heron <i>Ardeola bacchus</i>	PRC (RC)	P	Y	9		29				1	11			9	2	6		1	
Eastern Cattle Egret <i>Bubulcus coromandus</i>	(LC)	P	Y								16								
Grey Heron <i>Ardea cinerea</i>	PRC	W	Y	8		38					18			5	3	3			
Purple Heron <i>Ardea purpurea</i>	RC	AM,P	Y											1	2				
Great Egret <i>Ardea alba</i>	PRC (RC)	P	Y	6		42				3	1	32		2	2	6		1	
Intermediate Egret <i>Ardea intermedia</i>	RC	M,P	Y								1								
Little Egret <i>Egretta garzetta</i>	PRC (RC)	P	Y	22		37				1	1	26		23	3	5		2	
Great Cormorant <i>Phalacrocorax carbo</i>	PRC	W	Y	3		12					2			2		3			
Crested Serpent Eagle <i>Spilornis cheela</i>	(LC); RLCV(NT); CITES(II); CSMPS(II); Cap.586	R,M	N							1									
Black Kite <i>Milvus migrans</i>	(RC); CITES(II); CSMPS(II); Cap.586	W,R	N							2		1			3				
Eastern Buzzard <i>Buteo japonicus</i>	CSMPS(II); CITES(II); Cap.586	W	N							1		2							
White-breasted Waterhen <i>Amaurornis phoenicurus</i>	-	R	Y	2		3		2			1	6		2	3	1			
Common Moorhen <i>Gallinula chloropus</i>	-	R	Y			2						5			3				
Black-winged Stilt <i>Himantopus himantopus</i>	RC	W	Y	16		65						5				3			
Pied Avocet <i>Recurvirostra avosetta</i>	RC	W	Y	3		133										12			
Grey-headed Lapwing <i>Vanellus cinereus</i>	LC	W	Y			14										2			
Pacific Golden Plover <i>Pluvialis fulva</i>	LC	M,W	Y			1													
Little Ringed Plover <i>Charadrius dubius</i>	(LC)	W,R	Y	2		16													
Pheasant-tailed Jacana <i>Hydrophasianus chirurgus</i>	LC; RLCV(NT)	M	Y	2		3													

Species	Conservation and Protection Status ¹	Principal Status ²	Wetland-dependant?	Project Site ³	500m Assessment Area ³														
					CW	AG	CW	DA	FM	IF	MA	MW	WL	PL	PO	RB	WC	SH	TM
Common Snipe <i>Gallinago gallinago</i>	-	W	Y			16				1	1					1		2	
Common Sandpiper <i>Actitis hypoleucos</i>	-	M,W	Y	2		11					5			2					
Green Sandpiper <i>Tringa ochropus</i>	-	W	Y	2		14					5								
Common Redshank <i>Tringa totanus</i>	RC	W	Y	2		15													
Marsh Sandpiper <i>Tringa stagnatilis</i>	RC	M,W	Y	2		11													
Wood Sandpiper <i>Tringa glareola</i>	LC	M,W	Y			12													
Spotted Redshank <i>Tringa erythropus</i>	RC	W/M	Y			16													
Common Greenshank <i>Tringa nebularia</i>	RC	M,W	Y	3		21										1			
Black-headed Gull <i>Chroicocephalus ridibundus</i>	PRC	W	Y	6		32													
Rock Dove <i>Columba livia</i>	-	R	N	112		117	50						8						
Eurasian Collared Dove <i>Streptopelia decaocto</i>	-	(Not included)	N								1					2			
Spotted Dove <i>Spilopelia chinensis</i>	-	R	N	24	1	23	17				10	3	11		3		2		
Common Emerald Dove <i>Chalcophaps indica</i>	-	R	N									1							
Greater Coucal <i>Centropus sinensis</i>	CSMPS(II)	R	N					1		1	1	1	1		1		1	1	
Asian Koel <i>Eudynamys scolopaceus</i>	-	Su,R	N				2				2		2						
Plaintive Cuckoo <i>Cacomantis merulinus</i>	-	Su	N								2								
Large Hawk-Cuckoo <i>Hierococcyx sparverioides</i>	-	Su	N				1						1						
Collared Scops Owl <i>Otus lettia</i>	CITES(II); CSMPS(II); Cap.586	R	N										1						
Asian Barred Owlet <i>Glaucidium cuculoides</i>	CITES(II); CSMPS(II); Cap.586	R	N										1						
House Swift <i>Apus nipalensis</i>	-	R,SpM	N						24		2								
White-throated Kingfisher <i>Halcyon smyrnensis</i>	(LC)	AM,P	Y			2					3			1	1				
Common Kingfisher <i>Alcedo atthis</i>	-	AM,P	Y	1		1				1	3			3					
Pied Kingfisher <i>Ceryle rudis</i>	(LC)	R	Y			2					1								
Eurasian Hoopoe <i>Upupa epops</i>	-	OV	N								1								
Eurasian Wryneck <i>Jynx torquilla</i>	-	W,M	N												1				
Peregrine Falcon <i>Falco peregrinus</i>	(LC); RLCV(NT); CITES(I); CSMPS(II); Cap.586	R,W	N						1										
Scarlet Minivet <i>Pericrocotus speciosus</i>	-	R	N								2								
Brown Shrike <i>Lanius cristatus</i>	-	SpM	N										1						
Long-tailed Shrike <i>Lanius schach</i>	-	R	N	1		1	1		1		2		1		1		1		1

Species	Conservation and Protection Status ¹	Principal Status ²	Wetland-dependant?	Project Site ³	500m Assessment Area ³														
				CW	AG	CW	DA	FM	IF	MA	MW	WL	PL	PO	RB	WC	SH	TM	WL
Black-naped Oriole <i>Oriolus chinensis</i>	LC	AM	N														1		
Black Drongo <i>Dicrurus macrocercus</i>	-	M,Su	N							2	3		1		2	1			
Hair-crested Drongo <i>Dicrurus hottentottus</i>	-	M,Su,W	N				2				2				1				
Red-billed Blue Magpie <i>Urocissa erythroryncha</i>	-	R	N				1				5		2						
Oriental Magpie <i>Pica serica</i>	-	R	N				2				2		2						
Collared Crow <i>Corvus torquatus</i>	LC; RLCV(NT); IUCN(VU)	R	Y								5					2		1	
Large-billed Crow <i>Corvus macrorhynchos</i>	-	R	N				1		2			1	2				1		
Cinereous Tit <i>Parus cinereus</i>	-	R	N				12			1	5		8		1				
Chinese Penduline Tit <i>Remiz consobrinus</i>	RC	M,W	N								4				8				
Red-whiskered Bulbul <i>Pycnonotus jocosus</i>	-	R	N	2	2		34	4		2	39	5	13		7		6	2	
Chinese Bulbul <i>Pycnonotus sinensis</i>	-	R	N	1			8				41	2	11		5			1	
Sooty-headed Bulbul <i>Pycnonotus aurigaster</i>	-	R	N				3				3				2		3		2
Barn Swallow <i>Hirundo rustica</i>	-	SpM,Su	N			1	8		3		4			1	6			5	
Manchurian Bush Warbler <i>Horornis canturians</i>	-	W	N												1				
Yellow-browed Warbler <i>Phylloscopus inornatus</i>	-	W	N				2				5		2		1				
Pallas's Leaf Warbler <i>Phylloscopus proregulus</i>	-	W	N								4		3		1		1		
Dusky Warbler <i>Phylloscopus fuscatus</i>	-	W	N	1		3	1			3	11		3	2	7	5		2	
Sakhalin Leaf Warbler <i>Phylloscopus borealoides</i>	-	AM	N										1						
Pale-legged Leaf Warbler <i>Phylloscopus tenellipes</i>	-	AM	N										3						
Arctic Warbler <i>Phylloscopus borealis</i>	-	AM	N												1				
Oriental Reed Warbler <i>Acrocephalus orientalis</i>	-	M	Y							1	1				13	4			
Black-browed Reed Warbler <i>Acrocephalus bistrigiceps</i>	-	M	Y								9				28	28			
Thick-billed Warbler <i>Arundinax aedon</i>	LC	AM	N												1				
Pallas's Grasshopper Warbler <i>Helopsaltes certhiola</i>	LC	AM	Y								1				3	1			
Lanceolated Warbler <i>Locustella lanceolata</i>	RLCV(NT)	AM	N								1				1				
Zitting Cisticola <i>Cisticola juncidis</i>	LC	W	N								1								
Yellow-bellied Prinia <i>Prinia flaviventris</i>	-	R	N	1		3		1		2	13			1	15	6	1	1	
Plain Prinia <i>Prinia inornata</i>	-	R	N	2		3		2			13			1	7	5	1	3	2
Common Tailorbird <i>Orthotomus sutorius</i>	-	R	N	1			3	1			13	1	2				3		

Species	Conservation and Protection Status ¹	Principal Status ²	Wetland-dependant?	Project Site ³	500m Assessment Area ³														
				CW	AG	CW	DA	FM	IF	MA	MW	WL	PL	PO	RB	WC	SH	TM	WL
Masked Laughingthrush <i>Pterorhinus perspicillatus</i>	-	R	N		3		18				17	5	8		16	2	4		
Swinhoe's White-eye <i>Zosterops simplex</i>	-	R,?W	N	4			12				25		23	2	12				
Crested Myna <i>Acridotheres cristatellus</i>	-	R	N	3	2	5	28				21		12	18	2				3
Common Myna <i>Acridotheres tristis</i>	-	R	N	4		3	12				2		4						
Red-billed Starling <i>Spodiopsar sericeus</i>	GC	W	N								2	3							
White-cheeked Starling <i>Spodiopsar cineraceus</i>	PRC	W	N								17				8				
Black-collared Starling <i>Gracupica nigricollis</i>	-	R	N	14		34	21				19		6	4	1		2		2
White-shouldered Starling <i>Sturnia sinensis</i>	(LC)	M,W,Su	N								10								
Chinese Blackbird <i>Turdus mandarinus</i>	-	W,M	N								6	1	1						
Oriental Magpie Robin <i>Copsychus saularis</i>	-	R	N	1		3	8	3		2	6		6		1	2	2	2	2
Asian Brown Flycatcher <i>Muscicapa dauurica</i>	-	M,W	N				1				1		4		1	1			
Siberian Rubythroat <i>Calliope calliope</i>	-	W	N										2		2	1			
Blue Whistling Thrush <i>Myophonus caeruleus</i>	-	R	N								1								
Red-throated Flycatcher <i>Ficedula albicilla</i>	-	AM,W	N							2	3		2		1				
Daurian Redstart <i>Phoenicurus aureus</i>	-	W	N				12			1	11		15	1	3				
Stejneger's Stonechat <i>Saxicola stejnegeri</i>	-	W,M	N								6				4	4			
Fork-tailed Sunbird <i>Aethopyga christinae</i>	-	R	N								1	1					1		
Eurasian Tree Sparrow <i>Passer montanus</i>	-	R	N	9	15	65	79				30		35				4		4
White-rumped Munia <i>Lonchura striata</i>	-	R	N				1				2		1						
Scaly-breasted Munia <i>Lonchura punctulata</i>	-	R	N		3			15			31		9		18	12	6		12
Eastern Yellow Wagtail <i>Motacilla tschutschensis</i>	-	M,W	N	2		7		3			1				2				
Grey Wagtail <i>Motacilla cinerea</i>	-	W	N	3		4					6								
White Wagtail <i>Motacilla alba</i>	-	W,R	N	9		8	4			1	15			2	2	5		1	
Richard's Pipit <i>Anthus richardi</i>	-	W,R	N								6				4				1
Olive-backed Pipit <i>Anthus hodgsoni</i>	-	W	N		1		2				12	2	5						
Chestnut-eared Bunting <i>Emberiza fucata</i>	LC	M	N											1	1				
Little Bunting <i>Emberiza pusilla</i>	-	W	N												3		4		
Yellow-breasted Bunting <i>Emberiza aureola</i>	RC; RLCV(EN); IUCN(CR)	M	N											3					
Black-faced Bunting <i>Emberiza spodocephala</i>	-	M,W	N								2								
Total no. of species recorded				36	7	47	29	9	10	19	79	12	37	24	53	29	18	14	9

Notes:

1. Conservation and protection status refers to Fellowes *et al.* (2002), Red List of China’s Vertebrates (Jiang *et al.* 2016), IUCN (2020), China State Major Protection Status, CITES (2020), Cap. 170 and Cap. 586.
 - a. Conservation status by Fellowes *et al.* (2002): LC = Local Concern; PRC = Potential Regional Concern; RC = Regional Concern; PGC = Potential Global 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.
 - b. Conservation status by Red List of China’s Vertebrates (RLCV) (Jiang *et al.* 2016): NT = Near Threatened; VU = Vulnerable; EN = Endangered; CR = Critically Endangered.
 - c. Conservation status by IUCN (2019): NT = Near Threatened; VU = Vulnerable; EN = Endangered; CR = Critically Endangered.
 - d. Protection status by China State Major Protection Status (CSMPS): II = Class II Protected Species in China.
 - e. Protection status by CITES (2019): II = Listed in CITES Appendix II.
 - f. Cap. 170 = Wild Animals Protection Ordinance. All wild birds in Hong Kong are protected under Cap. 170.
 - g. Cap. 586 = Protection of Endangered Species of Animals and Plants Ordinance.
2. Principal status refers to Carey et al. (2001): R = Resident; W = Winter Visitor; Su = Summer Visitor; M = Migrant; A = Autumn; Sp = Spring; P = Present all year, exact composition unknown.
3. Habitats: AG = Agricultural Land; CW = Channelised Watercourse; DA = Developed Area; FM = Freshwater Marsh; IF = In Flight; MG = Mangrove; MW = Mitigation Wetland; WL = Mixed Woodland; PL = Plantation; PO = Pond; RB = Reedbed; WC = Semi-natural Watercourse; SH = Shrubland; TM = Tidal Marsh; WG = Wasteland.

Table 3. Distribution of bird species of conservation importance recorded from July 2019 to June 2020 and their maximum abundance recorded

Species	Project Site ¹					500m Assessment Area ¹																										
	CW					CW										FM	IF	MA		MW		WL	PL	PO				RB	WC	SH	TM	
	KTR	SCR	YLTN S1	YLTN S3	YLTN S4	KTR (D)	KTR (U)	KTR (A)	MCW	SCR	SPR	YLBP (D)	YLBF (U)	YLTN S1	STST	NSW		Old KTR	SP	WR	-	NSW	ATFO	WR	NSW	TSL	NSW	Old KTR	CWL	NSW	Old KTR	
Northern Shoveler <i>Spatula clypeata</i>					2	39		98			15																8					
Northern Pintail <i>Anas acuta</i>						2																										
Eurasian Teal <i>Anas crecca</i>						56		28			3							2		12							12					
Tufted Duck <i>Aythya fuligula</i>						20																		12								
Little Grebe <i>Tachybaptus ruficollis</i>																				1				2	2	1						
Eurasian Spoonbill <i>Platalea leucorodia</i>																				1												
Black-faced Spoonbill <i>Platalea minor</i>						10					2	4																				
Yellow Bittern <i>Ixobrychus sinensis</i>								1			1								1	1							2					
Black-crowned Night Heron <i>Nycticorax nycticorax</i>								2				1	1						2	13					1		2	1				
Striated Heron <i>Butorides striata</i>																	1															
Chinese Pond Heron <i>Ardeola bacchus</i>	3	3	1	3	9	24	1	29	4	3	15	3	2	1			1	1	2	11			9	1	3	5	2	6			1	
Eastern Cattle Egret <i>Bubulcus coromandus</i>																			2	16												
Grey Heron <i>Ardea cinerea</i>	1			4	8	13		38			12	5	1						2	18			3		5		3	3				
Purple Heron <i>Ardea purpurea</i>																									1		2					
Great Egret <i>Ardea alba</i>	3			1	6	23		42			6	3	2			3		1	1	32			1		2	1	2	6			1	
Intermediate Egret <i>Ardea intermedia</i>																			1													
Little Egret <i>Egretta garzetta</i>	4	1	1	7	22	37	1	31	3	2	27	7	3	1		1	1	1	3	26			23	2	2	1	3	5			2	
Great Cormorant <i>Phalacrocorax carbo</i>					3	7		4			12									2					2			3				
Crested Serpent Eagle <i>Spilornis cheela</i>																1																
Black Kite <i>Milvus migrans</i>																2				1							3					
Eastern Buzzard <i>Buteo japonicus</i>																1			1	2												
Black-winged Stilt <i>Himantopus himantopus</i>				3	16	59		52			65	8								5								3				
Pied Avocet <i>Recurvirostra avosetta</i>					3	133		21			71	3																12				
Grey-headed Lapwing <i>Vanellus cinereus</i>						4		14																				2				
Pacific Golden Plover <i>Pluvialis fulva</i>						1																										
Little Ringed Plover <i>Charadrius dubius</i>					2			16			2																					
Pheasant-tailed Jacana <i>Hydrophasianus chirurgus</i>					2						3																					
Common Redshank <i>Tringa totanus</i>					2	13		15			4																					

Species	Project Site ¹					500m Assessment Area ¹																										
	CW					CW										FM	IF	MA		MW		WL	PL	PO				RB	WC	SH	TM	
	KTR	SCR	YLTN S1	YLTN S3	YLTN S4	KTR (D)	KTR (U)	KTR (A)	MCW	SCR	SPR	YLBP (D)	YLBF (U)	YLTN S1	STST	NSW		Old KTR	SP	WR	-	NSW	ATFO	WR	NSW	TSL	NSW	Old KTR	CWL	NSW	Old KTR	
Marsh Sandpiper <i>Tringa stagnatilis</i>					2	6		11			7																					
Wood Sandpiper <i>Tringa glareola</i>						2		12	1		5																					
Spotted Redshank <i>Tringa erythropus</i>						16																										
Common Greenshank <i>Tringa nebularia</i>					3	21		4			3																	1				
Black-headed Gull <i>Chroicocephalus ridibundus</i>				6		29					32																					
Greater Coucal <i>Centropus sinensis</i>															1		1		1	1	1	1						1		1	1	
Collared Scops Owl <i>Otus lettia</i>																						1										
Asian Barred Owlet <i>Glaucidium cuculoides</i>																						1										
White-throated Kingfisher <i>Halcyon smyrnensis</i>						2		1			1	1						2	3					1			1					
Pied Kingfisher <i>Ceryle rudis</i>											2							1	1													
Peregrine Falcon <i>Falco peregrinus</i>																1																
Black-naped Oriole <i>Oriolus chinensis</i>																													1			
Collared Crow <i>Corvus torquatus</i>																		1	5									2		1		
Chinese Penduline Tit <i>Remiz consobrinus</i>																		4	1								8					
Thick-billed Warbler <i>Arundinax aedon</i>																											1					
Pallas's Grasshopper Warbler <i>Helopsaltes certhiola</i>																			1								3	1				
Lanceolated Warbler <i>Locustella lanceolata</i>																			1								1					
Zitting Cisticola <i>Cisticola juncidis</i>																		1														
Red-billed Starling <i>Spodiopsar sericeus</i>																			2	3												
White-cheeked Starling <i>Spodiopsar cineraceus</i>																			17								8					
White-shouldered Starling <i>Sturnia sinensis</i>																			10													
Chestnut-eared Bunting <i>Emberiza fucata</i>																							1			1						
Yellow-breasted Bunting <i>Emberiza aureola</i>																								3								
Total no. of species of conservation importance	4	2	2	6	13	21	2	18	3	2	20	9	5	2	1	6	4	4	15	24	2	3	4	5	10	4	16	14	2	2	3	

Notes:

1. Habitats: CW = Channelised Watercourse; FM = Freshwater Marsh; IF = In Flight; MG = Mangrove; MW = Mitigation Wetland; WL = Mixed Woodland; PL = Plantation; PO = Pond; RB = Reedbed; WC = Semi-natural Watercourse; SH = Shrubland; TM = Tidal Marsh. Locations: KTR = Kam Tin River; KTR (U) = Kam Tin River upstream of Project Site; KTR (D) = Kam Tin River downstream of Project Site; KTR (A) = Kam Tin River adjacent to the works area at parapet wall; SCR = Sham Chung River; YLTN = Yuen Long Town Nullah; MCW = Minor channelised watercourses; SPR = Shan Pui River; STST = Shui Tsiu San Tseun; NSW = Nam Sang Wai; WR = West Rail; TSL = Tung Shing Lei area; ATFO = Au Tau Fisheries Office.

Table 4. Maximum abundance of amphibian species recorded from July 2019 to June 2020

Species	Conservation and Protection Status ¹	Status in HK	Project Site	500m Study Area										
			-	Agricultural Land	Developed Area	Freshwater Marsh	Grassland	Mitigation Wetland	Plantation	Pond	Reedbed	Semi-natural Watercourse	Shrubland	Waste Ground
Asian Common Toad <i>Duttaphrynus melanostictus</i>	-	Widely distributed in Hong Kong.		1	7	50		2	4	20			3	2
Spotted Narrow-mouthed Frog <i>Kalophrynus interlineatus</i>	RLCV(NT)	Widely distributed from low to moderate altitudes in northern and central New Territories.						1						
Asiatic Painted Frog <i>Kaloula pulchra</i>	-	Widely distributed in Hong Kong.		1	8	1		1	2				1	
Butler's Pigmy Frog <i>Microhyla butleri</i>	-	Widely distributed in Hong Kong.				20		10						
Ornate Pigmy Frog <i>Microhyla fissipes</i>	-	Widely distributed in Hong Kong.				20	2	30	1	2	1			
Marbled Pigmy Frog <i>Microhyla pulchra</i>	-	Widely distributed in Hong Kong.				20		10						
Paddy Frog <i>Fejervarya multistriata</i>	-	Widely distributed in Hong Kong.		1	3	5		1	3	5	1		2	1
Günther's Frog <i>Sylvirana guentheri</i>	-	Widely distributed throughout Hong Kong.				50		15		20	6	1		
Brown Tree Frog <i>Polypedates megacephalus</i>	-	Widely distributed throughout Hong Kong.		2	6	2		2	3				2	
Greenhouse Frog <i>Eleutherodactylus planirostris</i>	-	(Introduced species)			12			10	7					2
Total no. of species recorded			0	4	5	8	1	10	6	4	3	1	4	3

- Notes:
- Conservation and protection status refers to Fellowes *et al.* (2002), Red List of China’s Vertebrates (Jiang *et al.* 2016), IUCN (2020), China State Major Protection Status, CITES (2020), Cap. 170 and Cap. 586.
 - Conservation status by Fellowes *et al.* (2002): LC = Local Concern; PRC = Potential Regional Concern; RC = Regional Concern; PGC = Potential Global 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.
 - Conservation status by Red List of China’s Vertebrates (RLCV) (Jiang *et al.* 2016): NT = Near Threatened; VU = Vulnerable; EN = Endangered; CR = Critically Endangered.
 - Conservation status by IUCN (2019): NT = Near Threatened; VU = Vulnerable; EN = Endangered; CR = Critically Endangered.
 - Protection status by China State Major Protection Status (CSMPS): II = Class II Protected Species in China.
 - Protection status by CITES (2019): II = Listed in CITES Appendix II.
 - Cap. 170 = Wild Animals Protection Ordinance. All wild birds in Hong Kong are protected under Cap. 170.
 - Cap. 586 = Protection of Endangered Species of Animals and Plants Ordinance.
 - Status in HK follows AFCD (2020).

Table 5. Maximum abundance of reptile species recorded from July 2019 to June 2020

Species	Conservation and Protection Status ¹	Status in HK	Project Site	500m Study Area								
			Channelised Watercourse	Developed Area	Freshwater Marsh	Mitigation Wetland	Plantation	Pond	Reedbed	Shrubland	Tidal Marsh	Waste Ground
Red-eared Slider <i>Trachemys scripta</i>	-	Widely distributed and commonly found in reservoirs or ponds in urban parks.	1			3			2			
Chinese Soft-shelled Turtle <i>Pelodiscus sinensis</i>	GC; RLCV(EN); IUCN(VU); Cap.170	Locally found in reservoirs and fishponds in Deep Bay area.							1			
Changeable Lizard <i>Calotes versicolor</i>	-	Widely distributed throughout Hong Kong.		2		1	1	1		1		
Long-tailed Skink <i>Eutropis longicaudata</i>	-	Widely distributed throughout Hong Kong.		1		1		1		1		1
Bowring's Gecko <i>Hemidactylus bowringii</i>	-	Distributed throughout Hong Kong.	2	12			6	3		1		1
Common Wolf Snake <i>Lycodon aulicus</i>	RLCV(NT)	Widely distributed at low elevations throughout Hong Kong.		1								
Common Rat Snake <i>Ptyas mucosus</i>	PRC; RLCV(EN); CITES(II); Cap.586	Widely distributed throughout Hong Kong.				1						
Buff-striped Keelback <i>Amphiesma stolatum</i>	LC	Distributed in lowland in central and northern New Territories and Lantau Island.			1							
Checkered Keelback <i>Fowlea flavipunctatus</i>	-	Widely distributed in streams in the New Territories and Lantau Island.	1								1	
Bamboo Snake <i>Cryptelytrops albolabris</i>	-	Distributed in shrubland, grassland throughout Hong Kong.								1		
Total no. of species recorded			3	4	1	4	2	3	2	4	1	2

- Notes:
1.

Conservation and protection status refers to Fellowes *et al.* (2002), Red List of China’s Vertebrates (Jiang *et al.* 2016), IUCN (2020), China State Major Protection Status, CITES (2020), Cap. 170 and Cap. 586.

a.

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

b.

Conservation status by Red List of China’s Vertebrates (RLCV) (Jiang *et al.* 2016): NT = Near Threatened; VU = Vulnerable; EN = Endangered; CR = Critically Endangered.

c.

Conservation status by IUCN (2019): NT = Near Threatened; VU = Vulnerable; EN = Endangered; CR = Critically Endangered.

d.

Protection status by China State Major Protection Status (CSMPS): II = Class II Protected Species in China.

e.

Protection status by CITES (2019): II = Listed in CITES Appendix II.

f.

Cap. 170 = Wild Animals Protection Ordinance. All wild birds in Hong Kong are protected under Cap. 170.

g.

Cap. 586 = Protection of Endangered Species of Animals and Plants Ordinance.
2.

Status in HK follows AFCD (2020).

Table 6. Maximum abundance of butterfly species recorded from July 2019 to June 2020

Species	Conservation and Protection Status ¹	Status in HK ²	Project Site ³	500m Study Area ³												
			CW	AG	CW	DA	FM	MG	MW	PL	PO	RB	WC	SH	TM	WG
Common Awl <i>Hasora badra</i>	LC	Very Rare						2								
Formosan Swift <i>Borbo cinnara</i>	-	Common	1			1	1		1	2				3	1	1
Banana Skipper <i>Erionota torus</i>	-	Uncommon				1										
Common Straight Swift <i>Parnara guttata</i>	-	Common													1	
Contiguous Swift <i>Polytremis lubricans</i>	-	Common					1									
Chinese Dart <i>Potanthus confucius</i>	-	Uncommon				1										
Lesser Band Dart <i>Potanthus trachala</i>	-	Rare												1		
Indian Palm Bob <i>Suastus gremius</i>	-	Uncommon												6		
Greenish Palm Dart <i>Telicota ancilla</i>	-	Uncommon												1		
Pale Palm Dart <i>Telicota colon</i>	LC	Rare												1		
Purple Sapphire <i>Heliophorus epicles</i>	-	Common					2						2			
Common Hedge Blue <i>Acytolepis puspa</i>	-	Common				1			1							
Forget-me-not <i>Catochrysops strabo</i>	-	Very Rare; Species of Conservation Concern												12		
Lime Blue <i>Chilades lajus</i>	-	Common				3								2		
Plains Cupid <i>Chilades pandava</i>	-	Uncommon				3			3							
Metallic Cerulean <i>Jamides alecto</i>	-	Very Rare					1		1							
Dark Cerulean <i>Jamides bochus</i>	-	Common				1								5		
Malayan <i>Megisba malaya</i>	LC	Very Rare; Species of Conservation Concern												5		
Quaker <i>Neopithecops zalmora</i>	-	Uncommon				1								1		
Tailless Line Blue <i>Prosotas dubiosa</i>	-	Vagrant							1					12		12
Pale Grass Blue <i>Pseudozizeeria maha</i>	-	Very Common	2	1		12			4				1	3		4
Lesser Grass Blue <i>Zizina otis</i>	-	Common				3								4		
Tiny Grass Blue <i>Zizula hylax</i>	-	Very Rare; Species of Conservation Concern												8		
Silver Streak Blue <i>Iraota timoleon</i>	-	Uncommon												1		
Chocolate Royal <i>Remelana jangala</i>	-	Common						3								
Club Silverline <i>Spindasis syama</i>	-	Uncommon												3		
Plum Judy <i>Abisara echerius</i>	-	Very Common				2								6		
Tawny Rajah <i>Charaxes bernardus</i>	-	Common							1					1		
Plain Tiger <i>Danaus chrysippus</i>	-	Uncommon							2							

Species	Conservation and Protection Status ¹	Status in HK ²	Project Site ³	500m Study Area ³												
			CW	AG	CW	DA	FM	MG	MW	PL	PO	RB	WC	SH	TM	WG
Common Tiger <i>Danaus genutia</i>	-	Common				3			1	1				2		
Common Indian Crow <i>Euploea core</i>	-	Common				2	2			2				3		
Blue-spotted Crow <i>Euploea midamus</i>	-	Very Common				2			1	2		1		3		
Ceylon Blue Glassy Tiger <i>Ideopsis similis</i>	-	Very Common							1							
Blue Tiger <i>Tirumala limniace</i>	-	Common				1										
Angled Castor <i>Ariadne ariadne</i>	-	Common				3			1	2						2
Staff Sergeant <i>Athyma selenophora</i>	-	Common												1		
White-edged Blue Baron <i>Euthalia phemius</i>	-	Common				1								1		
Red-ring Skirt <i>Hestina assimilis</i>	-	Common							1					2		
Great Egg-fly <i>Hypolimnias bolina</i>	-	Common				1			3	1				5		
Danaid Egg-fly <i>Hypolimnias misippus</i>	LC	Uncommon												3		
Peacock Pansy <i>Junonia almana</i>	-	Common					3									
Grey Pansy <i>Junonia atlites</i>	-	Common											2			
Lemon Pansy <i>Junonia lemonias</i>	-	Common				1				1			2			
Common Sailer <i>Neptis hylas</i>	-	Very Common							1							
Short-banded Sailer <i>Phaedyma columella</i>	-	Common												2		
Common Palmfly <i>Elymnias hypermnestra</i>	-	Common				2			2					3		
Common Evening Brown <i>Melanitis leda</i>	-	Common							3							
Dark Evening Brown <i>Melanitis phedima</i>	-	Uncommon				2				1						
Dark-brand Bush Brown <i>Mycalesis mineus</i>	-	Very Common				2			4	2				3		1
South China Bush Brown <i>Mycalesis zonata</i>	-	Common								2				2		
Common Five-ring <i>Ypthima baldus</i>	-	Very Common				1			3	2				3		
Common Mime <i>Chilasa clytia</i>	-	Common							1					4		
Tailed Jay <i>Graphium agamemnon</i>	-	Common							1					5		
Common Bluebottle <i>Graphium sarpedon</i>	-	Very Common												6		
Chinese Peacock <i>Papilio bianor</i>	-	Common												1		
Lime Butterfly <i>Papilio demoleus</i>	-	Common							2							
Red Helen <i>Papilio helenus</i>	-	Very Common												4		4
Great Mormon <i>Papilio memnon</i>	-	Very Common				3	2		1	2				2		
Paris Peacock <i>Papilio paris</i>	-	Very Common				3	1							3		

Species	Conservation and Protection Status ¹	Status in HK ²	Project Site ³	500m Study Area ³												
			CW	AG	CW	DA	FM	MG	MW	PL	PO	RB	WC	SH	TM	WG
Common Mormon <i>Papilio polytes</i>	-	Very Common		2	1	3			1	5				8		2
Spangle <i>Papilio protenor</i>	-	Very Common				2	2		1					3		
Swallowtail <i>Papilio xuthus</i>	-	Rare							2					1		
Lemon Emigrant <i>Catopsilia pomona</i>	-	Common		1	1	2	1		2	3						3
Mottled Emigrant <i>Catopsilia pyranthe</i>	-	Very Common				1										
Three-spot Grass Yellow <i>Eurema blanda</i>	-	Common				2	1			3				5		
Common Grass Yellow <i>Eurema hecabe</i>	-	Very Common	1	1	1	3			2	3				5		3
Red-base Jezebel <i>Delias pasithoe</i>	-	Very Common				2		1						1		
Great Orange Tip <i>Hebomoia glaucippe</i>	-	Common				2			1							
Indian Cabbage White <i>Pieris canidia</i>	-	Very Common	2			5	1		2	2	1					
Total no. of species recorded			4	4	3	34	12	3	30	17	1	1	4	44	2	9

- Notes:
- Conservation and protection status refers to Fellowes *et al.* (2002), IUCN (2020), China State Major Protection Status, CITES (2020), Cap. 170 and Cap. 586.
 - Conservation status by Fellowes et al. (2002): LC = Local Concern.
 - Status in HK follows AFCD (2020).
 - Habitats: CW = Channelised Watercourse; FM = Freshwater Marsh; MG = Mangrove; MW = Mitigation Wetland; WL = Mixed Woodland; PL = Plantation; PO = Pond; RB = Reedbed; WC = Semi-natural Watercourse; SH = Shrubland; TM = Tidal Marsh.

Table 7. Maximum abundance of odonate species recorded from July 2019 to June 2020

Species	Conservation and Protection Status ¹	Status in HK ²	Project Site ³	500m Study Area ³											
			CW	CW	DA	FM	MG	MW	PL	PO	RB	WC	SH	TM	WG
Orange-tailed Sprite <i>Ceriagrion auranticum</i>	-	Abundant			2	5		1			1	2			
Common Bluetail <i>Ischnura senegalensis</i>	-	Abundant	2					2							
Marsh Dancer <i>Onychargia atrocyana</i>	-	Common				2									
Yellow Featherlegs <i>Copera marginipes</i>	-	Abundant				2						1			
Common Evening Hawker <i>Anaciaeschna jaspidea</i>	-	Common						1							
Pale-spotted Emperor <i>Anax guttatus</i>	-	Common		1				1				2			
Lesser Emperor <i>Anax parthenope</i>	-	Common						1		1		1			
Common Flangetail <i>Ictinogomphus pertinax</i>	-	Common						10		5		2			
Golden Flangetail <i>Sinictinogomphus clavatus</i>	-	Common						1		1					
Regal Pond Cruiser <i>Epoptalmia elegans</i>	-	Common								1			1		
Asian Pintail <i>Acisoma panorpoides</i>	-	Common						1			1				
Blue Dasher <i>Brachydiplax chalybea</i>	-	Common					1	2		3	3				
Asian Amberwing <i>Brachythemis contaminata</i>	-	Abundant	4	5	6	1	2	6		12	5	3		5	1
Crimson Darter <i>Crocothemis servilia</i>	-	Abundant				2		1							
Blue Percher <i>Diplacodes trivialis</i>	-	Abundant						1							
Amber-winged Glider <i>Hydrobasileus croceus</i>	-	Common						2							
Russet Percher <i>Neurothemis fulvia</i>	-	Common			2	3	1	8		2		1			
Pied Percher <i>Neurothemis tullia</i>	-	Common						4		1					
Red-faced Skimmer <i>Orthetrum chrysis</i>	-	Abundant		1								1			
Common Blue Skimmer <i>Orthetrum glaucum</i>	-	Abundant		3	2	4						2			
Marsh Skimmer <i>Orthetrum luzonicum</i>	-	Abundant				1		1			1				
Common Red Skimmer <i>Orthetrum prunosum</i>	-	Abundant	2	3	3	5		3		1		3			
Green Skimmer <i>Orthetrum sabina</i>	-	Abundant	3	3	3	1	2	5		2	1	2		2	
Wandering Glider <i>Pantala flavescens</i>	-	Abundant	1	4	15			30	2	14				2	25
Pied Skimmer <i>Pseudothemis zonata</i>	-	Common						2		1	1	2			
Ruby Darter <i>Rhodothemis rufa</i>	LC	Common									1				
Variegated Flutterer <i>Rhyothemis variegata</i>	-	Common	3	12	5		3	15		23	3	1		15	
Evening Skimmer <i>Tholymis tillarga</i>	-	Common		1	1	1		1		1	1	2		1	
Saddlebag Glider <i>Tamea virginia</i>	-	Abundant						2			1				

Species	Conservation and Protection Status ¹	Status in HK ²	Project Site ³	500m Study Area ³											
			CW	CW	DA	FM	MG	MW	PL	PO	RB	WC	SH	TM	WG
Crimson Dropwing <i>Trithemis aurora</i>	-	Abundant						1		1					
Dingy Dusk-Darter <i>Zyxomma petiolatum</i>	-	Common										1			
Total no. of species recorded			6	9	9	11	5	24	1	15	11	15	1	5	2

- Notes:**
1. Conservation and protection status refers to Fellowes *et al.* (2002), IUCN (2020), China State Major Protection Status, CITES (2020), Cap. 170 and Cap. 586.
 2. Status in HK follows AFCD (2020).
 3. Habitats: CW = Channelised Watercourse; FM = Freshwater Marsh; MG = Mangrove; MW = Mitigation Wetland; WL = Mixed Woodland; PL = Plantation; PO = Pond; RB = Reedbed; WC = Semi-natural Watercourse; SH = Shrubland; TM = Tidal Marsh.

Table 8. Abundance of Mai Po Bent-winged Firefly recorded from 2019 and 2020

Habitat	2019			2020		
	July	August	September	April	May	June
Channelised Watercourse	2	1	1		2	1
Developed Area	4	2	3	3	4	2
Mangrove	16	11	12	24	31	18
Tidal Marsh	13	10	6	31	27	21
Plantation				2	3	2
Reedbed				1	3	
Total count in each survey	35	24	22	61	70	44

Table 9. Relative abundance of freshwater fish species recorded from July 2019 to June 2020

Species	Conservation and Protection Status ¹	Status in HK ²	Additional 1	Additional 2	Additional 3	Additional 4	Additional 5	K1	K2	K3	K4	Y1	Y2	Y3	Y4	Y5
			Reedbed		Channelised Watercourse					Semi-natural Watercourse	Channelised Watercourse					Semi-natural Watercourse
Tenpounder <i>Elops machnata</i>	-	-				*										
Indo-Pacific Tarpon <i>Megalops cyprinoides</i>	-	-	*												*	
North African Catfish <i>Clarias gariepinus</i>	-	-					*	*	*		*		*			
Suckermouth Catfish <i>Pterygoplichthys</i> sp.	-	-						*	*		*					
Grey Mullet <i>Mugil cephalus</i>	-	Common			*	*	*		**		**			*	*	*
Greenback Mullet <i>Planiliza subviridis</i>	-	-	**						**		**					
Mosquito Fish <i>Gambusia affinis</i>	-	Common	**	**				**	***	***						
Unidentified Glass Perchlet <i>Ambassis</i> sp.	-	-	***											***	***	***
Climbing perch <i>Anabas testudineus</i>	-	-	**	*												
Redbelly Tilapia <i>Coptodon zillii</i>	-	Common	**	**					**							
Mozambique Tilapia <i>Oreochromis mossambicus</i>	IUCN(NT)*	Common	***	***	**		**		**		****					
Nile Tilapia <i>Oreochromis niloticus</i>	-	Common	**	**	**	**	**	****	***	**	****		***	****	****	
Sharphead Sleeper <i>Eleotris oxycephala</i>	-	Common								*						
Bluespotted Mudskipper <i>Boleophthalmus pectinirostris</i>	-	-			****	****	****	***			****			**	***	*
Fork Tongue Goby <i>Glossogobius giuris</i>	-	Common					*		*		*					
Glass Goby <i>Gobioplerus macrolepis</i>	RLCV(VU)	-	****	****		***			***		***			***	***	**
Giant-fin Mudskipper <i>Periophthalmus magnuspinnatus</i>	-	-				*										
Javanese Fat-nose Goby <i>Pseudogobius javanicus</i>	-	Common					*									*
Taijiang Fat-nose Goby <i>Pseudogobius taijiangensis</i>	-	-	**			*			*		*				**	*
Spotted Scat <i>Scatophagus argus</i>	-	Common	*													
Spotted Snakehead <i>Channa maculata</i>	-	Uncommon													*	
Snakehead Murrel <i>Channa striata</i>	-	Uncommon						*	*		*					
Total no. of species recorded			11	6	4	7	7	6	12	3	11	0	2	5	8	6

Notes:

- Conservation and protection status refers to Fellowes *et al.* (2002), Red List of China's Vertebrates (Jiang *et al.* 2016), IUCN (2020), China State Major Protection Status, CITES (2020), Cap. 170 and Cap. 586.
 - Conservation status by IUCN (2020): NT = Near Threatened; * = the assessment is only valid for native population(s).
 - Conservation status by Red List of China's Vertebrates (RLCV) (Jiang *et al.* 2016): VU = Vulnerable.
- Status in HK follows AFCD (2020).
- Relatively abundance: * = 1-10; ** = 11-50; *** = 51-100; **** = over 100.

Table 10. Relative abundance of aquatic invertebrate species recorded from July 2019 to June 2020

Species	Conservation and Protection Status ¹	Status in HK ²	Additional 1	Additional 2	Additional 3	Additional 4	Additional 5	K1	K3	K4	Y1	Y2	Y3	Y4	Y5
			Reedbed		Channelised Watercourse				Semi-natural Watercourse	Channelised Watercourse					Semi-natural Watercourse
Lesser Emperor (Larva) <i>Anax parthenope</i>	-	Common							*						
Crimson Dropwing (Larva) <i>Trithemis aurora</i>	-	Abundant							*						
Freshwater Shrimp <i>Caridina gracilipes</i>	-	-	**	**		**				*				**	
Freshwater Shrimp <i>Coutierella tonkinensis</i>	-	-	***			***	***			**			***	**	***
Freshwater Prawn <i>Macrobrachium nipponense</i>	-	-						*	***	**				*	*
Chinese White Shrimp <i>Fenneropenaeus cf. chinensis</i>	-	-	*												
Greasyback Shrimp <i>Metapenaeus ensis</i>	CSRL(VU)	-	*			*		*		**				***	***
Mitten Crab <i>Eriocheir japonica</i>	-	-													*
Crab <i>Varuna litterata</i>	-	-		*				*		*			*		*
Mud Crab <i>Scylla serrata</i>	-	-			*					*				*	
Apple Snail <i>Pomacea canaliculata</i>	-	-						****	**	**			***	**	
Freshwater Snail <i>Melanoides tuberculata</i>	-	-	**	**	**	**	**	*	***	**			***	**	*
Freshwater Snail <i>Mieniplotia scabra</i>	-	-							***	**					
Freshwater Snail <i>Sermyla riqueti</i>	-	-	**	**	**		**		***	**			***	**	
Freshwater Snail <i>Tarebia granifera</i>	-	-	**	**		**			***	**					
Total no. of species recorded			7	5	3	5	3	5	8	11	0	0	5	8	6

- Notes:
- Conservation and protection status refers to Fellowes *et al.* (2002), China Species Red List, IUCN (2020), China State Major Protection Status, CITES (2020), Cap. 170 and Cap. 586.
 - Conservation status by China Species Red List (CSRL): VU = Vulnerable.
 - Status in HK follows AFCD (2020).
 - Relatively abundance: * = 1-10; ** = 11-50; *** = 51-100; **** = over 100.

Table 11. Comprehensive list of intertidal/benthic fauna recorded from the walk-over surveys and benthic grab surveys

Phylum	Class	Family	Species
Chordata	Actinopterygii	Oxudercidae	<i>Boleophthalmus pectinirostris</i>
Annelida	Clitellata	Naididae	<i>Thalassodrilides</i> sp.
Annelida	Polychaeta	Sabellidae	<i>Laonome triangularis</i>
Annelida	Polychaeta	Nephtyidae	<i>Micronephthys oligobranchia</i>
Arthropoda	Malacostraca	Machophthalmidae	<i>Macrophthalmus banzai</i>
Mollusca	Gastropoda	Thiaridae	<i>Melanoides tuberculata</i>
Mollusca	Gastropoda	Thiaridae	<i>Tarebia granifera</i>
Arthropoda	Malacostraca	Corophiidae	<i>Corophiinae</i> sp.
Arthropoda	Malacostraca	Ocypodidae	<i>Tubuca arcuata</i>
Arthropoda	Malacostraca	Penaeidae	<i>Fenneropenaeus chinensis</i>
Arthropoda	Malacostraca	Penaeidae	<i>Metapenaeus ensis</i>
Arthropoda	Malacostraca	Varunidae	<i>Varuna litterata</i>

Table 12. Results of Van Veen grab surveys carried out in Shan Pui River in Wet Season and Dry Season

Phylum	Class	Family	Species	Wet Season			Dry Season		
				Upper	Middle	Lower	Upper	Middle	Lower
Annelida	Clitellata	Naididae	<i>Thalassodrilides</i> sp.	5	9	11		21	11
Annelida	Polychaeta	Nephtyidae	<i>Micronephthys oligobranchia</i>		4			11	8
Annelida	Polychaeta	Sabellidae	<i>Laonome triangularis</i>	2	4	3	2	8	6
Arthropoda	Malacostraca	Corophiidae	<i>Corophiinae</i> sp.	1	1	1	3	1	2
Arthropoda	Malacostraca	Machophthalmidae	<i>Macrophthalmus banzai</i>			4	1		1
Arthropoda	Malacostraca	Penaeidae	<i>Fenneropenaeus chinensis</i>		2		1		1
Arthropoda	Malacostraca	Penaeidae	<i>Metapenaeus ensis</i>			1			
Arthropoda	Malacostraca	Varunidae	<i>Varuna litterata</i>		1				
Mollusca	Gastropoda	Thiaridae	<i>Melanoides tuberculata</i>					1	3
Mollusca	Gastropoda	Thiaridae	<i>Tarebia granifera</i>	9	5	5	12	16	13
Total no. of species recorded per sampling station				4	7	6	5	6	8
Density (No. of individuals recorded per sampling location)				17	26	25	19	58	45
Shannon-Weaver Diversity Index (H')				1.12	1.71	1.49	1.13	1.45	1.77
Pielou's Species Evenness (J)				0.81	0.88	0.83	0.7	0.81	0.85

Table 13. Results of Van Veen grab surveys carried out in Kam Tin River in Wet Season and Dry Season

Phylum	Class	Family	Species	Wet Season		Dry Season	
				Upper	Lower	Upper	Lower
Annelida	Clitellata	Naididae	<i>Thalassodrilides</i> sp.	3	11	1	18
Annelida	Polychaeta	Nephtyidae	<i>Micronephthys oligobranchia</i>		8	2	1
Annelida	Polychaeta	Sabellidae	<i>Laonome triangularis</i>	1	2	5	9
Arthropoda	Malacostraca	Corophiidae	<i>Corophiinae</i> sp.				1
Arthropoda	Malacostraca	Penaeidae	<i>Metapenaeus ensis</i>		1		
Arthropoda	Malacostraca	Varunidae	<i>Varuna litterata</i>				2
Mollusca	Gastropoda	Thiaridae	<i>Melanoides tuberculata</i>	5	16	8	18
Mollusca	Gastropoda	Thiaridae	<i>Tarebia granifera</i>	2	3	11	7
Total no. of species recorded per sampling station				4	6	5	7
Density (No. of individuals recorded per sampling location)				11	41	27	56
Shannon-Weaver Diversity Index (H')				1.24	1.47	1.35	1.29
Pielou's Species Evenness (J)				0.89	0.83	0.84	0.66

Annex 3

Representative photographs of habitats and species of conservation importance recorded within the Assessment Area

Plate 1. Photographs of habitats identified within the Assessment Area**Yuen Long Town Nullah (Section 1)****Yuen Long Town Nullah (Section 2)****Yuen Long Town Nullah (Section 3)****Yuen Long Town Nullah (Section 4)**

Shan Pui River



Old Kam Tin River



Pond



Reedbed



Tidal Marsh and Mangrove



Shrubland



Mitigation Wetland



Abandoned Wet Agricultural Land/Freshwater Marsh



Agricultural Land



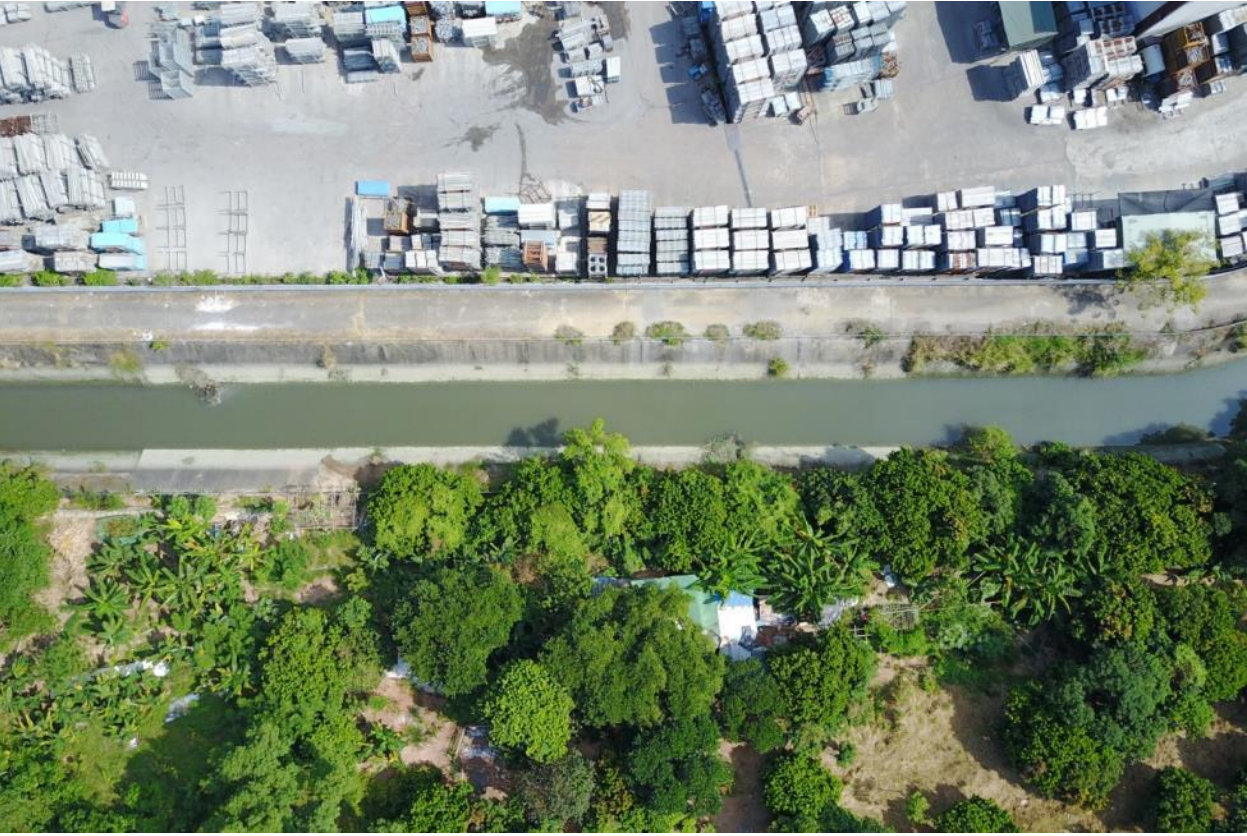
Plantation



Mixed Woodland



Minor Channelised Watercourse



Wasteland



Developed Area



Plate 2. Photographs of species of conservation importance identified within the Assessment Area (non-exhaustive)***Aquilaria sinensis*****Leopard Cat****Eurasian Teal****Black-faced Spoonbill**

Chinese Pond Heron



Grey Heron



Great Egret



Little Egret



Great Cormorant



Black-winged Stilt



Chinese Soft-shelled Turtle



Common Awl



Pied Avocet



Wood Sandpiper



Collared Crow



Danaid Egg-fly



Forget-me-not



Tiny Grass Blue



Malayan



Gobiopterus macrolepis

