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AGREEMENT NO. CE 65/2013 (EP) POST-CONSTRUCTION ECOLOGICAL MONITORING OF RIVER IMPROVEMENT WORKS IN UPPER LAM TSUEN RIVER SHE SHAN RIVER AND UPPER TAI PO RIVER – INVESTIGATION

POST-CONSTRUCTION ECOLOGICAL MONITORING REPORT (NO. 35)

Prepared By:

ALLIED ENVIRONMENTAL CONSULTANTS LTD.

For:

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Agreement No. CE65/2013(EP)
Post-Construction Ecological Monitoring of River Improvement Work in Upper Lam Tsuen River, She Shan River and Upper Tai Po River – Investigation

Post-Construction Ecological Monitoring Report (No. 35)
Upper Lam Tsuen River

November 2016

Prepared by: Mike pang		Deember 20, 2016
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Ecology Team: China-Hong Kong Ecology Consultants

Post-Construction Ecological Monitoring Report (No. 35)

Upper Lam Tsuen River

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1 Introduction

1.1 Agreement No. CE65/2013(EP) Post-Construction Ecological Monitoring of River Improvement Work in Upper Lam Tsuen River, She Shan River and Upper Tai Po River – Investigation required a post-construction ecological monitoring programme when the project completed. The collected data are mainly used to assess ecological recovery process and effectiveness of ecological migration proposed and enforced during the construction period.

1.2 The scope of the ecological monitoring was detailed in EM & A Manual of the project. In brief, the survey aimed to collect data on abiotic factors such as water quality, substratum characteristics, water flow as well as flora and fauna.

1.3 China Hong Kong Ecology Consultants Ltd. was committed by Allied Environmental Consultants Ltd (AEC) to undertake the ecological monitoring tasks for the project for December 2014.

1.4 This is the number 35 post-construction ecological monitoring report for the project conducted **on 22nd of November 2016**. It contains the following subsections:

- Summary of major points
- Monitoring Methods and Results
- Summary and Comments

2 Summary of Major Points

- Field ecological monitoring was undertaken **on 22nd of November 2016**.;
- Fauna and flora along the drainage project sections is in a process of re-establishing or restoration; Plants on river bed was experiencing seasonal changes in abundance and phonological appearance;
- The species richness of odonata was lower than the record of last month;
- Bird diversity and abundance was in natural fluctuation;
- *Paramesotriton hongkongensis* adult was recorded in the potential habitats along the Lam Tsuen River; and
- Fish abundance was similar to last month with slight increase.

3 Monitoring Methodology

3.1 Riparian Vegetation

Riparian vegetation, including aquatic and emergent, was sampled using line transects along the affected river channel and riparian habitat. Species, relative abundance and average heights were recorded. Vegetation surveys were conducted at four selected belt transects with two located at the lower portion (T3 and T4) of the river channel and another two at the upper section (T1 and T2) of the river respectively (**Figure 1**). The belt transects was run across the river channel in order to collect quantitative data of the vegetation, e.g., species inventory, height, percentage cover. Qualitative data of plants was collected by recording plant species, relative abundance along line transect. Nomenclature and protection status of the species followed those documented

in Lai *et al.* (2004) and Hong Kong Herbarium (2015).

3.2 Avifauna

Avifauna survey was conducted during post construction monitoring period. Special attention was given to the river channel and corridor area which birds used as feeding and foraging habitat. Avifauna surveys were undertaken in the early morning plus species recorded in the rest of the day when conducting other taxonomic groups (benthic, fish, insect) monitoring. Numerical abundance was recorded at fixed count points within a radius of 30-50m according to landscape feature and visual penetration extent. The duration of the point count of birds was standardized for 10 minutes at each location in order to collect comparable data. Transect count along accessible section of river channel were used in order to collect qualitative data. Binoculars and digital camera were the main items of equipment used. Nomenclature and protection status of the species follows the AFCD website (www.hkbiodiversity.net) and Carey *et al.* (2001).

The point count was conducted at four locations with two located at the lower portion of the river channel (T3&T4) and the other two located at the upper section of the river (T1&T2). The point count and survey transect locations for the bird survey and sampling sites for surveys of other faunal groups and flora were presented in **Figure 1.**

3.3 Adult Odonata Survey

Adult Odonata survey was conducted along transects (**Figure 1**). Binoculars, digital camera and hand net were utilized to aid identification. Numerical abundance, species identity and other notable behavior were recorded. Nomenclature and protection status of the species followed those documented in the AFCD website (www.hkbiodiversity.net), Wilson *et al.* (2004) and Tam *et al.* (2011). Adult Odonata survey was conducted along line transects in parallel with river channel within the works area where access was permitted.

3.4 Aquatic Macro-invertebrates

Macro-invertebrates in the river channel were surveyed. Sampling was conducted at five sampling locations including two sites located at the lower portion (T3 and T4) of the river channel and another two sites at the upper section (T1 and T2) of the river, as well as the reference site. Those sampling sites covered major type of river habitats, e.g. river pool and riffle (**Figure 1**) Five replicates were taken at each sampling point and pool together for further sample sorting and identification. Kick sampling and hand netting were the survey methodologies for river organisms. Dissection microscope and digital camera were used to aid identification and enumeration. Numerical abundance and species identity were recorded. Nomenclature and protection status of the species has followed those documented in the AFCD website (www.hkbiodiversity.net) and other literatures such as Dudgeon (1994).

3.5 Fish and Newt

Fish community and *Paramesotriton hongkongensis* at the specified river channel was monitored by live trapping, hand netting and direct observation methods.

Sampling was conducted at five sampling locations including two sites located at the lower portion (T3 and T4) of the river channel and another two sites at the upper section (T1 and T2) of the river, as well as reference site. Those sampling sites covered major type of river habitats, e.g. river pool and riffle (**Figure 1)**. The number of the observed fish and newt was estimated and recorded. Nomenclature and protection status of the species followed those documented in the AFCD website (www.hkbiodiversity.net) and Lee *et al.* (2004).

3.6 Abiotic Data Collection

3.6.1 Water Quality Monitoring

Dissolved oxygen level, pH value, conductivity, salinity, BOD and nutrient level (nitrate and ammonium) were measured and analyzed by conventional methods in situ or in laboratory. The instruments for measuring dissolved oxygen level, pH value, conductivity, salinity were model: DO-5510, AZ8685, AZ8361 and AZ8374 respectively. All the instruments were calculated every monitoring month according to the operation manuals in order to obtain the precise result. BOD test took 5 days to complete within darkness incubator with stable temperature at 20^{o}C and was performed using model: DO-5510 for measuring dissolved oxygen. Nutrient levels including nitrate and ammonia were performed in laboratory by applying the In-house method SOP056 (FIA) and SOP057 (FIA) respectively.

3.6.2 Sediment Characteristics

Sediment/substrate characteristics were recorded of sediment cover in percentage e.g. mud, sand, rock, boulder and cemented bottom in the river bed at sampling sites.

3.6.3 Water Flow

Water flow rates in river channel were measured by recording the time taken for a floating object (e.g. floating ball) to cover a measured distance.

The sampling locations for surveys were presented in **Figure 1.**

4 Monitoring Results

4.1 Vegetation

Vegetation has generally covered the gabion and river bed along Lam Tsuen River (Photos 1-3). In total, 75 flora species were recorded within the survey transects along the river course. Some of the vegetation at river bed has been washed out by flooding, especially vegetation in lower section of the river. The recorded floras were generally in good health, and the height of the

dominated riparian grass and herb species were in a range from 0.2m to 1.5m as observed along survey transect. Dominant flora species were shown in the **Table 4.1** marked with relative abundance sign "+++". Results of vegetation survey and belt transect survey were presented in **Table 4.1** and **Table 4.2**. **Figure 1** shows the transect line for the flora surveys.

4.2 Fauna

4.2.1 Avifauna

An avifauna survey was undertaken along survey transects and at four selected point count locations. In total, 19 species of birds were recorded during the bird survey and 5 of the total were wetland dependent species including *Ardeola bacchus, Egretta garzetta* (Photo 4), *Alcedo atthis, Motacilla alba* and *Motacilla cinerea*. They were commonly observed foraging in the river channel. *Pycnonotus jocosus* was a dominated species along the river. All the birds in Hong Kong are under protection of Wild Animals Protection Ordinance (Cap. 170). Among the recorded species, *Ardeola bacchus* and *Egretta garzetta* are both classified as Regional Concern by Fellowes *et al.* (2002). *Centropus sinensis* (Photo 5) was observed in the river, which is considered as Vulnerable in China Red Data Book. *Buteo buteo* (Photo 6), a raptor under protection by Cap.586, was recorded roosting on the electronic pole nearby Lam Tsuen River. Winter visitor such as *Phoenicurus auroreus* (Photo 7) was also recorded during the survey. Apart from mentioned species above, the others recorded in Lam Tsuen River were common species in Hong Kong. Transect and Point Count locations were shown on **Figure 1**. Result of bird survey was presented in the **Table 4.3**.

4.2.2 Adult Odonata Survey

Odonata survey was performed, and a list of recorded odonata species at Upper Lam Tsuen River is shown in **Table 4.4**. In total, 7 odonata species were recorded during the survey and the recorded species was common species and widely distributed in Hong Kong. The result obtained this month is similar to previous surveys conducted in approximate period of last year. Species richness in this month was lower than the record of last month. Most of the odoanta species in Hong Kong has the peak emergence from spring to late summer. The decrease in abundance of odoanta was due to seasonality. It is expected that number of odonata will be decreasing and keep in low abundance in the following months during dry season (Wilson *et al.*, 2004 & Tam *et al.*, 2011). Sampling location was shown in **Figure 1**.

4.2.3 Aquatic Macro-invertebrates

Upper Lam Tsuen River was flowing with constant water during survey (Photo 8). The river benthic fauna collected was mainly comprised of insects, molluscs and crustaceans. *Pomacea canaliculata* was found abundant along the river. Details of recorded of river benthic fauna refers to **Table 4.5.** Sampling location was shown on **Figure 1.**

4.2.4 Hong Kong Newt

Surveys of Hong Kong Newt were conducted (Photo 8) at Upper Lam Tsuen River. Adult *Paramesotriton hongkongensis* (Photo 9) were observed at the Lam Tsuen River where the habitat consisted of riparian vegetation during the survey. It is assumed that Hong Kong Newt would stay in river habitat during breeding period from September to March (Dudgeon, 2003). Riparian vegetation grown along the channel especially along water margin could provide shelter and breeding habitat for Hong Kong Newt. Hong Kong Newt is listed in Wild Animals Protection Ordinance (Cap. 170) and classified as "Near Threatened" under IUCN Red List Status and as "Potential Global Concern" by Fellowes *et al.* (2002). Record of Hong Kong Newts can be referred to **Table 4.6.**

4.2.5 River Fish Fauna

Fish surveys were performed at Upper Lam Tsuen River during field monitoring. In total, 17 species of freshwater fish, including species recorded from reference site, were recorded. *Oreochromis niloticus, Zacco platypus and Rhinogobius* spp were the dominated species in the river. *Acrossocheilus parallens* is a rare freshwater fish that only recorded in few of reservoir catchments and streams in Hong Kong (Lee *et al.*, 2004) and listed as Global Concern by Fellowes (2002). It was observed along the surveyed river with pool. Except *Acrossocheilus parallens, Parazacco spilurus* is classified as Vulnerable in China Red Data Book and observed along the river with low abundance. Fish counting at 2 x 2 meter area were performed and number of fish individuals was similar to the record of last month with slight increase. Details of recorded of fish fauna refers to **Table 4.6.** Sampling location was shown on **Figure 1**.

4.3 Abiotic Data

Data on water quality and major river hydrological feature (water flow and substratum) of the river were collected and are presented in the **Table 4.7.**

Generally, the water was not polluted and nutrient levels were generally low. Results of water test were presented in the **Table 4.7.**

The river substratum was comprised of over 75-93% stones or rocks in most of the river sections with moderate water flow (up to 0.2m/second at pool and 0.5m/second at riffle).

5 Summary and Commentary

Post construction ecological monitoring was carried out November 2016 and relevant biotic and abiotic data was collected according to project specification and EM & A Manual. Benthic fauna was temporally de-faunated in river sections due to river bed engineering works during construction period between 2008 and early 2013 and is under recovery process after that period. Adult amphibian *Paramesotriton hongkongensis* was recorded at river channel

where the river margin covered with riparian vegetation. *Acrossocheilus parallens*, a rare freshwater fish species in Hong Kong, was observed at a few locations in the river channel with pool. Except *Acrossocheilus parallens*, *Parazacco spilurus* recorded in the river is also considered with conservation interest and observed along the river with low abundance.

Aquatic and riparian vegetation along river channel was re-established. Vegetation has generally covered the gabion and covered the river bed along Upper Lam Tsuen River.

The water quality of the surveyed river was not polluted although the river receives low concentration of nutrients from the nearby agriculture lands and resident houses.

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FIGURES

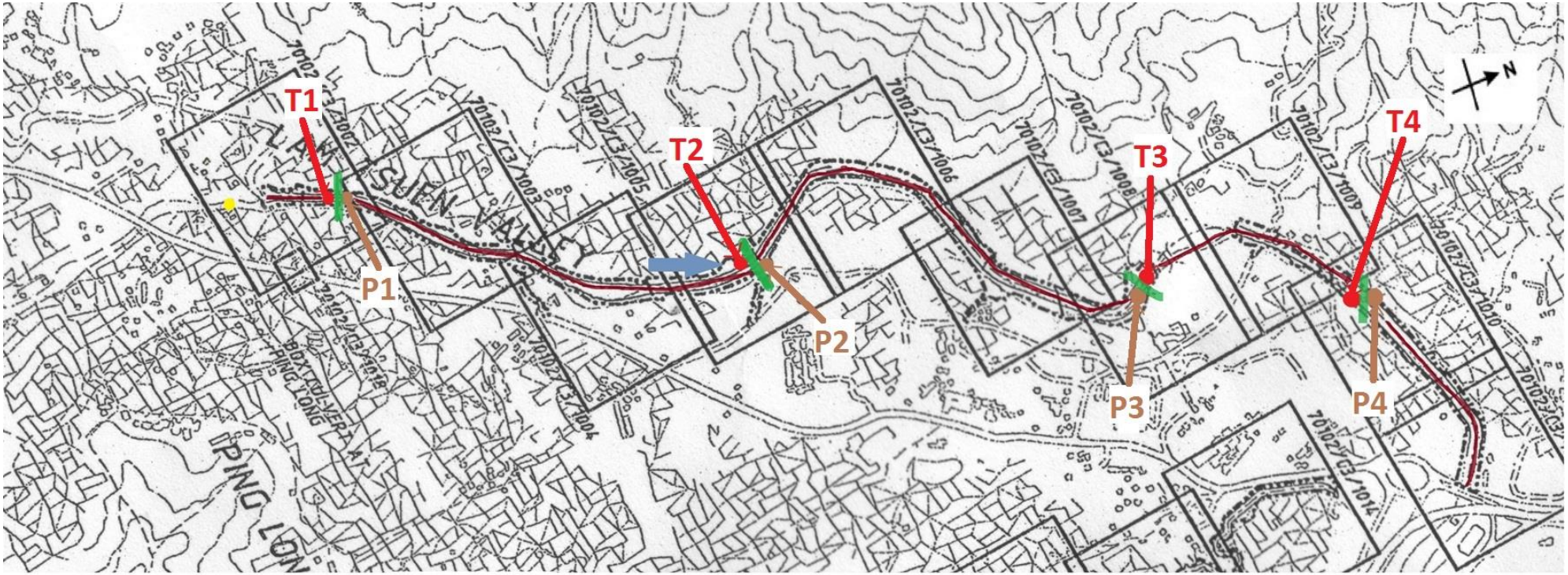

Figure1. Sampling Location of Ecological Survey and Monitoring at Upper Lam Tsuen River, Tai Po.

PHOTOS

	
Photo 1: General view of the river (Lower section)	Photo 2: General view of the river (Middle section)
	
Photo 3: General view of the river (Upper section)	Photo 4: Avifauna – *Egretta garzetta*
	
Photo 5: Avifauna – *Centropus sinensis*	Photo 6: Avifauna – *Buteo buteo*

	
Photo 7: Avifauna – *Phoenicurus auroreus*	Photo 8: Kick sampling
	
Photo 9: Hong Kong Newt	Photo 10: Aquatic sampling

TABLE

Table 4.1. Flora species recorded along the Lam Tsuen River including riparian habitat.

			Baseline monitoring	Impact monitoring						Impact monitoring				Post Construction monitoring			Post Construction monitoring							Post Construction monitoring						Post Construction monitoring				Post Construction monitoring			Post Construction monitoring											
Family	Species name	Species name in Chinese	Jul to Aug 08	Jan-09	Jul-09	Jan-10	Jul-10	Jan-11	Jul-11	Jan-12	Jul-12	Aug-13	Dec-13	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14	Aug-14	Sep-14	Oct-14	Nov-14	Dec-14	Jan-15	Feb-15	Mar-15	Apr-15	May-15	Jun-15	Jul-15	Aug-15	Sep-15	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16
Riparian Plant																																																
Acanthaceae	*Ruellia coerulea*	蘭花草											+	+	+	+	+	+	+	+	+	+	+	+	+																							
Acanthaceae	*Dicliptera chinensis*	狗肝菜																																	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Amaranthaceae	*Celosia argentea*	青葙	+	+	+	+	+	+	+	+			++	++	+	+	+	+	+	++	++	++	++	++	++	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Amaranthaceae	*Amaranthus viridis*	野莧		+	+	+	+	+	+	+	+	+	++	++	++	++	++	++	++	++	++	++	++	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Amaranthaceae	*Alternanthera philoxeroides*	空心蓮子草			+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	++	++	++	++	++	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Amaranthaceae	*Alternanthera sessilis*	蓮子草																							+	+	+	+	+																			
Anacardiaceae	*Rhus hypoleuca*	白背漆																								+	+	+	+																			
Annonaceae	*Uvaria macrophylla*	紫玉盤															+	+	+	+	+	+	+	+	+																							
Apiaceae	*Oenanthe javanica*	水芹															++	+	+	+	+	+	+			+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Apiaceae	*Centella asiatica*	崩大碗															+	+	+	+	+	+	+	+	+				+	+	+	+	+	+	+	+	+	+	+									
Araceae	*Alocasia odora*	海芋	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Araceae	*Colocasia esculenta*	芋	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Araceae	*Pistia stratiotes*	大薸		+		+	+	+							+	+				+	+	+	+	+	+		+	+	+																			
Arecaceae	*Rhapis excelsa*	棕竹			+	+	+									+	+	+	+	+	+	+	+	+	+																							
Asteraceae	*Bidens alba*	白花鬼針草	+	+	+	+	+	+	+	+	+	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++
Asteraceae	*Mikania micrantha*	薇甘菊	++	+	+	+	+	+	+	+	+	+	+	++	++	++	++	++	++	++	++	+++	++	+++	+++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++
Asteraceae	*Ageratum conyzoides*	勝紅薊		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Asteraceae	*Emilia sonchifolia*	一點紅		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Asteraceae	*Wedelia chinensis*	蟛蜞菊		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	++	++	++	++	++	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Asteraceae	*Erechtites hieracifolia*	革命菜		+	+	+	+	+	+					+	+	+	+	+	+	+	+	+	+	+	+															+	+	+	+	+	+	+	+	+
Asteraceae	*Conyza canadensis*	小蓬草							+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Asteraceae	*Youngia japonica*	黃鵪菜															+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Asteraceae	*Eclipta prostrata*	鱧腸															+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Asteraceae	*Spilanthes paniculata*	金鈕扣															+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Asteraceae	*Wedelia trilobata*	三裂葉蟛蜞菊																																						+	+	+	+	+	+	+	+	+
Asteraceae	*Sonchus arvensis*	苣蕒菜																																						+	+	+	+	+	+	+	+	+
Athyriaceae	*Callipteris esculenta*	菜蕨																	+	+	+	+	+	+	+	+	+	+	+											+	+	+	+	+	+	+	+	+
Blechnaceae	*Blechnum orientale*	烏毛蕨											+	+	+	+	+	+	+	+	+	+	+	+	+																							
Brassicaceae	*Cardamine flexuosa*	碎米薺		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Brassicaceae	*Nasturtium officinale*	西洋菜		+	+	+	+	+		+			+	+++	+++	+++	+	+	+	+	+	++	++	++	++	+	++	++	++	+	+	+	+	+	+	+	++	+	+	+	+	+	+	+	+	+	+	+
Brassicaceae	*Rorippa indica*	塘葛菜								+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+									
Brassicaceae	*Capsella bursa-pastoris*	薺菜															+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Buddlejaceae	*Buddleja asiatica*	白背楓															+	+	+	+	+	+	+	+	+															+	+	+	+	+	+	+	+	+
Caesalpiniaceae	*Cassia alata*	翅莢決明	+	+	+	+	+		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+									
Caryophyllaceae	*Drymaria cordata*	荷蓮豆															+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+									
Caryophyllaceae	*Myosoton aquaticum*	鵝腸菜															+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+									
Commelinaceae	*Commelina diffusa*	節節草	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	++	++	++	++	++	+++	+++	+++	+++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++
Convolvulaceae	*Ipomoea cairica*	五爪金龍		+	+	+	+	+	+	+	+	+	+	+	+	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++
Convolvulaceae	*Pharbitis nil*	牽牛				+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+																							
Convolvulaceae	*Ipomoea aquatica*	蕹菜											+	+	+	+	+	+	+	+	+	+	+	+	+																							
Cucurbitaceae	*Solena amplexicaulis*	茅瓜															+	+	+	+	+	+	+	+	+															+	+	+	+	+	+	+	+	+
Cuscutaceae	*Cuscuta australis*	南方菟絲子																								+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Cyperaceae	*Cyperus flabelliformis*	風車草														+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Cyperaceae	*Cyperus sp.*	莎草														+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Euphorbiaceae	*Macaranga tanarius*	血桐	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Euphorbiaceae	*Bischofia javanica*	秋楓															+	+	+	+	+	+	+	+	+				+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Fabaceae	*Pueraria lobata*	野葛	++	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Fabaceae	*Crotalaria pallida*	猪屎豆								+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+																							
Fabaceae	*Sesbania cannabina*	田菁										+	+	+	+	+	+	+	+	+	+	+	+	+	+																							
Fabaceae	*Dalbergia benthamii*	兩廣黃檀																																						+	+	+	+	+	+	+	+	+
Fabaceae	*Pueraria lobata var.thomsonii*	粉葛																							+	+	+	+	+	+	+	+	+	+	+	+	+	+	+									
Lauraceae	*Machilus breviflora*	短序潤楠																																						+	+	+	+	+	+	+	+	+
Lauraceae	*Machilus pauhoi*	刨花潤楠																																						+	+	+	+	+	+	+	+	+
Magnoliaceae	*Michelia alba*	白蘭	+	+	+	+	+	+							+	+	+	+	+	+	+	+	+	+	+																							
Malvaceae	*Hibiscus rosa-sinensia*	大紅花															+	+	+	+	+	+	+	+	+															+	+	+	+	+	+	+	+	+
Mimosaceae	*Acacia confusa*	台灣相思	+	+	+	+	+	+							+	+	+	+	+	+	+	+	+	+	+																					+	+	+
Mimosaceae	*Leucaena leucocephala*	銀合歡		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Mimosaceae	*Mimosa pudica*	含羞草								+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+																							
Mimosaceae	*Calliandra haematocephala*	紅絨球										+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Moraceae	*Ficus hispida*	對葉榕	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Moraceae	*Ficus variegata*	青果榕																								+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Moraceae	*Ficus subpisocarpa*	筆管榕																																						+	+	+	+	+	+	+	+	+
Moraceae	*Ficus microcarpa*	細葉榕																																						+	+	+	+	+	+	+	+	+
Musaceae	*Musa paradisiaca*	大蕉	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Myrtaceae	*Cleistocalyx nervosum*	水翁															+	+	+	+	+	+	+	+	+																							
Nyctaginaceae	*Bougainvillea spectabilis*	勒杜鵑	+	+	+	+	+	+								+	+	+	+	+	+	+	+	+	+																							
Oleaceae	*Ligustrum sinense*	山指甲																								+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Onagraceae	*Ludwigia erecta*	美洲水丁香											++	++	+	+	+	+	+	++	++	++	++	++	++	+	+	+	+	+	+	+	+	+	+	+	+	+	+									
Oxalidaceae	*Oxalis corniculata*	酢漿草											+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Plantaginaceae	*Plantago major*	車前草															+	+	+	+	+	+	+	+	+																							
Poaceae	*Panicum repens*	枯骨草	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+																							
Poaceae	*Pennisetum purpureum*	象草	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	++	++	++	++	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Poaceae	*Pennisetum alopecuroides*	狼尾草																														+	+	+	+	+	+	+	+									
Poaceae	*Rhynchelytrum repens*	紅毛草	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+																							
Poaceae	*Microstegium ciliatum*	剛秀竹	++	++	++	++	++	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Poaceae	*Brachiaria mutica*	巴拉草	++	+	++	++	++	++	+	++	++	++	++	++	++	++	++	++	++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	++	++	++	++	++	++	++	++	++	++	++
Poaceae	*Miscanthus floridulus*	五節芒		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Poaceae	*Arundinella nepalensis*	石珍芒		+	+	+	+	+		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+

Table 4.1. Flora species recorded along the Lam Tsuen River including riparian habitat.

			Baseline monitoring	Impact monitoring						Impact monitoring				Post Construction monitoring			Post Construction monitoring								Post Construction monitoring				Post Construction monitoring				Post Construction monitoring			Post Construction monitoring			Post Construction monitoring												
Family	Species name	Species name in Chinese	Jul to Aug 08	Jan-09	Jul-09	Jan-10	Jul-10	Jan-11	Jul-11	Jan-12	Jul-12	Aug-13	Dec-13	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14	Aug-14	Sep-14	Oct-14	Nov-14	Dec-14	Jan-15	Feb-15	Mar-15	Apr-15	May-15	Jun-15	Jul-15	Aug-15	Sep-15	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16
Poaceae	*Panicum maximum*	大黍		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+																							
Poaceae	*Coix lacryma-jobi*	薏苡				+	+	+						+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Poaceae	*Arundo donax*	蘆竹															+	+	+	+	+	+	+	+	+																							
Poaceae	*Chloris virgata*	虎尾草															+	+	+	+	+	+	+	+	+																							
Poaceae	*Setaria palmifolia*	棕葉狗尾草																																														
Polygonaceae	*Rumex trisetifer*	假蕨菜		+	+	+	+	+		+					+	+	++	++	++	++	++	++	++	++	++	+	++	++	++	++	++	++	++	++	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Polygonaceae	*Polygonum chinense*	火炭母															+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Polygonaceae	*Polygonum hydropiper*	水蓼															+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Polygonaceae	*Polygonum glabrum*	光蓼																													+	+	+	+	+	+	+												
Polygonaceae	*Polygonum perfoliatum*	杠板歸															+	+	+	+	+	+	+	+	+																							
Polygonaceae	*Polygonum lapathifolium*	大馬蓼															+	+	+	+	+	+	+	+	+																							
Portulacaceae	*Portulaca oleracea*	馬齒莧							+	+	+									+	+	+	+	+	+																							
Ranunculaceae	*Ranunculus sceleratus*	石龍芮														+	++	+	+			+	+			+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Rubiaceae	*Adina pilulifera*	水團花															+	+	+	+	+	+	+	+	+																							
Sapindaceae	*Dimocarpus longan*	龍眼		+	+	+	+	+							+	+	+	+	+	+	+	+	+	+	+																							
Scrophulariaceae	*Scoparia dulcis*	野甘草															+	+	+	+	+	+	+	+	+																							
Scrophulariaceae	*Lindernia anagallis*	長蕊母草															+	+	+	+	+	+	+	+	+																							
Solanaceae	*Solanum nigrum*	龍葵					+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+																							
Solanaceae	*Lycopersicon esculentum*	番茄											+	+	+	+	+																													
Solanaceae	*Solanum torvum*	水茄															+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Sterculiaceae	*Sterculia lanceolata*	假蘋婆															+	+	+	+	+	+	+	+	+																							
Sterculiaceae	*Byttneria aspera*	刺果藤															+	+	+	+	+	+	+	+	+																							
Thelypteridaceae	*Cyclosorus parasiticus*	華南毛蕨															+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Thelypteridaceae	*Macrothelypteris torresiana*	普通針毛蕨															+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Tiliaceae	*Microcos nervosa*	布渣葉																																														
Ulmaceae	*Celtis sinensis*	朴樹	+	+	+	+	+	+							+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Ulmaceae	*Trema orientalis*	異色山黃麻															+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Ulmaceae	*Trema tomentosa*	山黃麻										+	+	+	+	+	+	+	+	+	+	+	+	+	+																							
Urticaceae	*Pilea microphylla*	透明草			+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Verbenaceae	*Duranta erecta*	假連翹																								+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Urticaceae	*Boehmeria nivea*	苧麻				+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Verbenaceae	*Lantana camara*	馬纓丹	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Vitaceae	*Cayratia corniculata*	角花烏蘞莓	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Floating Plant																																																
Lemnaceae	*Lemna minor*	浮萍		+											+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Submerged Plant																																																
Hydrocharitaceae	*Hydrilla verticillata*	黑藻														+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
No. of species			22	38	40	44	44	42	34	40	37	39	47	49	56	62	91	92	93	94	94	94	94	94	96	63	64	64	66	64	64	63	63	63	65	65	65	65	74	74	74	74	74	74	75	75	75

Note:

+, occurred; ++, common; +++, Species abundant/dominant in the the study area

Table 4.2. Flora species recorded from belt transect survey at the Upper Lam Tsuen River

(T1- located at upper river channel sampling site to T4 - located at lower river Channel sampling site)

			Baseline monitoring								Impact monitoring				Impact monitoring				Impact monitoring								Impact monitoring								Impact monitoring								Impact monitoring							
		Stream	Jul-08				Aug-08				Jan-09				Jan-09				Jul-09								Jan-10								Jul-10				Jul-10				Jan-11							
		Transect	P1		P4		P1		P4		T1		T2		T3		T4		T1		T2		T3		T4		T1		T2		T3		T4		T1		T2		T3		T4		T1		T2		T3		T4	
Family	Species	Chinese name	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%
Poaceae	*Microstegium ciliatum*	刚秀竹	0.4	40			0.4	40			0.4	30	0.5	5	1.5	5	1	15																															0.8	5
Fabaceae	*Pueraria lobata*	野葛	0.5	30			0.5	30							0.2	5			0.5	50			0.5	20					0.5	5			0.5	2			0.5	5										
Poaceae	*Pennisetum purpureum*	象草	3	20			3	20																									2	5									1.2	10				
Araceae	*Alocasia odora*	海芋	1	10			1	10			0.5	2					0.3	<1															1	5			1	10							0.5	3
Caesalpiniaceae	*Cassia alata*	猪英决明			1.2	10			1.2	10																																						
Magnoliaceae	*Michelia alba*	白兰			6	10			6	10																																						
Poaceae	*Brachiaria mutica*	巴拉草			1.2	70			1.2	70	1.5	30							0.5	20			1.2	5	1	40	0.8	40	0.9	50	1	15			0.8	20	0.9	30	1	60	1.5	30	0.8	5			1	30	1	15
Moraceae	*Ficus hispida*	對葉榕									1.5	5							1.5	5	4	5																	4	5					4	5		
Asteraceae	*Mikania micrantha*	薇甘菊									0.4	20					0.5	1	0.5	5	0.3	15	0.5	30					0.5	30	0.3	25	0.5	30			0.5	20	0.3	5			0.4	10	0.5	5	0.3	5	0.4	8
Musaceae	*Musa paradisiaca*	大蕉													3	5							1.5	5									0.5	2														
Ulmaceae	*Celtis sinensis*	朴樹			6	10			6	10							4	10							6	50																						
Araceae	*Pistia stratiotes L.*	大漂																											0.05	5			2														
Urticaceae	*Boehmeria nivea*	苧麻																													0.3	5																
Asteraceae	*Bidens alba*	白花鬼針草											0.5	5													0.4	50			0.3	5			0.4	20					0.5	10	0.4	10	0.4	20	0.5	5		
Poaceae	*Coix lacryma-jobi*	薏苡																													1.5	2																
Solanaceae	*Solanum nigrum*	龍葵																																														
Cyperaceae	*Cyperus flabelliformis*	風車草																															1	30											1	5
Poaceae	*Miscanthus floridulus*	五節芒																					1.2	2																								
Euphorbiaceae	*Macaranga tanarius*	血桐											3	5																																		
Asteraceae	*Wedelia chinensis*	蜈蚣菊															0.2	10																													0.5	5
Commelinaceae	*Commelina diffusa*	節節草															0.2	<1																							0.5	20						
Asteraceae	*Erechtites hieracifolia*	革命菜															0.5	<1																														
Thelypteridaceae	*Cyclosorus parasiticus*	華南毛蕨																																												0.5	5
Convolvulaceae	*Pharbitis nil*	牽牛																																							0.5	10						
Verbenaceae	*Lantana camara*	馬纓丹																																													
Mimosaceae	*Leucaena leucocephala*	銀合歡																																													
Brassicaceae	*Nasturtium officinale*	西洋菜																																													
Onagraceae	*Ludwigia erecta*	美洲水丁香																																													
Poaceae	*Pennisetum alopecuroides*	狼尾草																																													
Amaranthaceae	*Celosia argentea*	青葙																																													
Bare Gound												13		85		85		64		20		80		38		10		50		10		43		24		60		45		20		30		75		65		45		54

P1 – Point count location 1; P4 – Point count location 4

Table 4.2. Flora species recorded from belt transect survey at the Upper Lam Tsuen River

(T1- located at upper river channel sampling site to T4 - located at lower river Channel sampling site)

			Impact monitoring								Impact monitoring								Impact monitoring								Impact monitoring								Impact monitoring								Post construction monitoring							
		Stream	Jul-11								Jan-12								Jul-12								Aug-13								Dec-13								Jan-14							
		Transect	T1		T2		T3		T4		T1		T2		T3		T4		T1		T2		T3		T4		T1		T2		T3		T4		T1		T2		T3		T4		T1		T2		T3		T4	
Family	Species	Chinese name	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%
Poaceae	*Microstegium ciliatum*	刚秀竹																											0.5	5																				
Fabaceae	*Pueraria lobata*	野葛	0.3	10							0.3	10							0.3	5							0.3	15	0.3	5			0.3	10							0.3	10							0.3	10
Poaceae	*Pennisetum purpureum*	象草			1.2	2	2.5	10					2.5	5	2.5	5					2	5																			1.5	5							1.5	5
Araceae	*Alocasia odora*	海芋																																															
Caesalpiniaceae	*Cassia alata*	翅荚决明																																														
Magnoliaceae	*Michelia alba*	白兰																																														
Poaceae	*Brachiaria mutica*	巴拉草	0.8	10	1	5					0.8	10	1	2	1.5	60			0.8	10	1	5	1.5	20			0.8	5	0.8	5	1	10	1	15	0.8	10	0.8	10					0.8	10	0.8	10				
Moraceae	*Ficus hispida*	對葉榕																																															
Asteraceae	*Mikania micrantha*	薇甘菊	0.4	5	0.5	3			0.4	2	0.4	5	0.5	3			0.4	2	0.4	5	0.5	3	0.5	15	0.4	1	0.5	25	0.5	10	0.5	10	0.4	3	0.5	10	0.5	5	0.5	10	0.4	10	0.5	10	0.5	5	0.5	10	0.4	10
Musaceae	*Musa paradisiaca*	大蕉																																														
Ulmaceae	*Celtis sinensis*	朴樹																																														
Araceae	*Pistia stratiotes L.*	大漂																																														
Urticaceae	*Boehmeria nivea*	苧麻					1.5	10																							0.8	2																		
Asteraceae	*Bidens alba*	白花鬼針草	0.4	2	0.4	5	0.5	2	0.5	10	0.4	2	0.4	5	0.5	2	0.5	10	0.4	5	0.4	5	0.5	5	0.5	2	0.4	5	0.4	20	0.5	10	0.5	2	0.4	5			0.5	10			0.4	5			0.5	10		
Poaceae	*Coix lacryma-jobi*	薏苡																																														
Solanaceae	*Solanum nigrum*	龍葵					2	3																																								
Cyperaceae	*Cyperus flabelliformis*	風車草																																														
Poaceae	*Miscanthus floridulus*	五節芒																																														
Euphorbiaceae	*Macaranga tanarius*	血桐																																														
Asteraceae	*Wedelia chinensis*	蜈蚣菊																																														
Commelinaceae	*Commelina diffusa*	節節草					0.4	10					0.3	3	0.4	5							0.4	2	0.3	5													0.3	5							0.3	5				
Asteraceae	*Erechtites hieracifolia*	革命菜																																														
Thelypteridaceae	*Cyclosorus parasiticus*	華南毛蕨																																														
Convolvulaceae	*Pharbitis nil*	牽牛																																														
Verbenaceae	*Lantana camara*	馬纓丹					0.5	2																																								
Mimosaceae	*Leucaena leucocephala*	銀合歡																															1.2	5														
Brassicaceae	*Nasturtium officinale*	西洋菜																																														
Onagraceae	*Ludwigia erecta*	美洲水丁香																																														
Poaceae	*Pennisetum alopecuroides*	狼尾草																																														
Amaranthaceae	*Celosia argentea*	青葙																																												1	2		
Bare Gound				73		85		65		88		73		82		28		88		75		82		58		92		50		55		68		70		75		85		73		75		75		85		73		75

P1 – Point count location 1; P4 – Point count location 4

Table 4.2. Flora species recorded from belt transect survey at the Upper Lam Tsuen River

(T1- located at upper river channel sampling site to T4 - located at lower river Channel sampling site)

			Post construction monitoring								Post construction monitoring								Post construction monitoring								Post construction monitoring								Post construction monitoring								Post construction monitoring							
		Stream	Feb-14								Mar-14								Apr-14								May-14								Jun-14								Jul-14							
		Transect	T1		T2		T3		T4		T1		T2		T3		T4		T1		T2		T3		T4		T1		T2		T3		T4		T1		T2		T3		T4		T1		T2		T3		T4	
Family	Species	Chinese name	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%
Poaceae	*Microstegium ciliatum*	刚秀竹																	0.3	2							0.3	2							0.3	2							0.5	4						
Fabaceae	*Pueraria lobata*	野葛							0.3	10							0.3	10					0.3	5	0.3	5					0.3	5	0.3	5					0.3	5	0.3	5						
Poaceae	*Pennisetum purpureum*	象草							1.5	5							1.5	5																																
Araceae	*Alocasia odora*	海芋																																															
Caesalpiniaceae	*Cassia alata*	翅荚决明																																															
Magnoliaceae	*Michelia alba*	白兰																																															
Poaceae	*Brachiaria mutica*	巴拉草	0.8	10	0.8	10					1	13	1	13					0.5	5	0.6	10			0.6	10	0.5	5	0.6	6			0.6	6	0.5	5	0.6	8			0.6	6	0.6	10	0.8	10			0.8	6
Moraceae	*Ficus hispida*	對葉榕																																															
Asteraceae	*Mikania micrantha*	薇甘菊	0.5	10	0.5	5	0.5	10	0.4	10	0.5	10	0.5	5	0.5	10	0.4	10			0.3	5	0.3	15	0.3	5			0.3	5	0.3	15	0.3	5			0.3	6	0.3	15	0.3	8			0.3	6	0.3	15	0.3	8
Musaceae	*Musa paradisiaca*	大蕉																																															
Ulmaceae	*Celtis sinensis*	朴樹																																															
Araceae	*Pistia stratiotes L.*	大漂																																															
Urticaceae	*Boehmeria nivea*	苧麻																																															
Asteraceae	*Bidens alba*	白花鬼針草	0.4	5			0.5	10			0.4	5			0.5	10			0.5	20	0.5	10	0.7	15	0.6	10	0.5	20	0.5	10	0.7	15	0.6	10	0.5	20	0.5	10	0.7	15	0.6	10	0.5	20	0.5	12	0.7	18	0.6	10
Poaceae	*Coix lacryma-jobi*	薏苡																																															
Solanaceae	*Solanum nigrum*	龍葵																																															
Cyperaceae	*Cyperus flabelliformis*	風車草																																															
Poaceae	*Miscanthus floridulus*	五節芒																																															
Euphorbiaceae	*Macaranga tanarius*	血桐																																															
Asteraceae	*Wedelia chinensis*	蟛蜞菊																																															
Commelinaceae	*Commelina diffusa*	節節草					0.3	5							0.3	5			0.2	10			0.3	3			0.2	8			0.3	3			0.2	8			0.3	3			0.2	8			0.3	3		
Asteraceae	*Erechtites hieracifolia*	革命菜																																															
Thelypteridaceae	*Cyclosorus parasiticus*	華南毛蕨																																															
Convolvulaceae	*Pharbitis nil*	牽牛																																															
Verbenaceae	*Lantana camara*	馬纓丹																																															
Mimosaceae	*Leucaena leucocephala*	銀合歡																																															
Brassicaceae	*Nasturtium officinale*	西洋菜																			0.2	5	0.2	50	0.2	5			0.2	2	0.2	2	0.2	1			0.2	2	0.2	2	0.2	1			0.3	1	0.3	1	0.3	1
Onagraceae	*Ludwigia erecta*	美洲水丁香																																															
Poaceae	*Pennisetum alopecuroides*	狼尾草																																															
Amaranthaceae	*Celosia argentea*	青葙					1	2							1	2																																		
Bare Gound				75		85		73		75		72		82		73		75		63		70		12		65		65		77		60		73		65		74		60		70		58		71		58		70

P1 – Point count location 1; P4 – Point count location 4

Table 4.2. Flora species recorded from belt transect survey at the Upper Lam Tsuen River

(T1- located at upper river channel sampling site to T4 - located at lower river Channel sampling site)

			Post construction monitoring								Post construction monitoring							
		Stream	Aug-14								Sep-14							
		Transect	T1		T2		T3		T4		T1		T2		T3		T4	
Family	Species	Chinese name	Height(m)	%	Height(m)	%	Height (m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height (m)	%	Height(m)	%
Poaceae	*Microstegium ciliatum*	剛秀竹	0.7	5							0.7	5						
Fabaceae	*Pueraria lobata*	野葛					0.3	5	0.3	5					0.3	5	0.3	5
Poaceae	*Pennisetum purpureum*	象草																
Araceae	*Alocasia odora*	海芋																
Caesalpiniaceae	*Cassia alata*	翅莢決明																
Magnoliaceae	*Michelia alba*	白蘭																
Poaceae	*Brachiaria mutica*	巴拉草	0.6	10	0.8	12			0.8	8	0.6	10	0.8	12			0.8	8
Moraceae	*Ficus hispida*	對葉榕																
Asteraceae	*Mikania micrantha*	薇甘菊			0.3	6	0.3	15	0.3	8			0.3	8	0.3	15	0.3	10
Musaceae	*Musa paradisiaca*	大蕉																
Ulmaceae	*Celtis sinensis*	朴樹																
Araceae	*Pistia stratiotes L.*	大漂																
Urticaceae	*Boehmeria nivea*	苧麻																
Asteraceae	*Bidens alba*	白花鬼針草	0.5	20	0.6	12	0.7	15	0.6	10	0.5	20	0.6	12	0.7	15	0.6	10
Poaceae	*Coix lacryma-jobi*	薏苡																
Solanaceae	*Solanum nigrum*	龍葵																
Cyperaceae	*Cyperus flabelliformis*	風車草																
Poaceae	*Miscanthus floridulus*	五節芒																
Euphorbiaceae	*Macaranga tanarius*	血桐																
Asteraceae	*Wedelia chinensis*	蟛蜞菊																
Commelinaceae	*Commelina diffusa*	節節草	0.3	10			0.3	5			0.3	10			0.3	5		
Asteraceae	*Erechtites hieracifolia*	革命菜																
Thelypteridaceae	*Cyclosorus parasiticus*	華南毛蕨																
Convolvulaceae	*Pharbitis nil*	牽牛																
Verbenaceae	*Lantana camara*	馬纓丹																
Mimosaceae	*Leucaena leucocephala*	銀合歡																
Brassicaceae	*Nasturtium officinale*	西洋菜			0.3	1	0.3	1	0.3	1			0.3	1	0.3	2	0.3	1
Onagraceae	*Ludwigia erecta*	美洲水丁香																
Poaceae	*Pennisetum alopecuroides*	狼尾草																
Amaranthaceae	*Celosia argentea*	青葙																
Bare Gound				55		69		59		68		55		67		58		66

			Post construction monitoring								Post construction monitoring							
		Stream	Oct-14								Nov-14							
		Transect	T1		T2		T3		T4		T1		T2		T3		T4	
Family	Species	Chinese name	Height(m)	%	Height(m)	%	Height(m)	%	Height (m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%
Poaceae	*Microstegium ciliatum*	剛秀竹																
Fabaceae	*Pueraria lobata*	野葛							0.6	10							0.6	10
Poaceae	*Pennisetum purpureum*	象草																
Araceae	*Alocasia odora*	海芋							1.8	1							1.8	1
Caesalpiniaceae	*Cassia alata*	翅莢決明																
Magnoliaceae	*Michelia alba*	白蘭																
Poaceae	*Brachiaria mutica*	巴拉草	1	10	1.5	15	1.3	30	1	5	1	10	1.5	15	1.3	30	1	5
Moraceae	*Ficus hispida*	對葉榕																
Asteraceae	*Mikania micrantha*	薇甘菊	0.3	15	0.3	15	0.3	15	0.3	15	0.3	18	0.3	18	0.3	18	0.3	18
Musaceae	*Musa paradisiaca*	大蕉																
Ulmaceae	*Celtis sinensis*	朴樹																
Araceae	*Pistia stratiotes L.*	大漂																
Urticaceae	*Boehmeria nivea*	苧麻																
Asteraceae	*Bidens alba*	白花鬼針草	0.5	5	0.8	12	0.7	10			0.5	5	0.8	12	0.7	10		
Poaceae	*Coix lacryma-jobi*	薏苡	2	5							2	5						
Solanaceae	*Solanum nigrum*	龍葵																
Cyperaceae	*Cyperus flabelliformis*	風車草																
Poaceae	*Miscanthus floridulus*	五節芒																
Euphorbiaceae	*Macaranga tanarius*	血桐																
Asteraceae	*Wedelia chinensis*	蟛蜞菊																
Commelinaceae	*Commelina diffusa*	節節草	0.3	10	0.8	20			0.3	20	0.3	12	0.8	22			0.3	20
Asteraceae	*Erechtites hieracifolia*	革命菜																
Thelypteridaceae	*Cyclosorus parasiticus*	華南毛蕨																
Convolvulaceae	*Pharbitis nil*	牽牛																
Verbenaceae	*Lantana camara*	馬纓丹																
Mimosaceae	*Leucaena leucocephala*	銀合歡																
Brassicaceae	*Nasturtium officinale*	西洋菜					0.3	2	0.1	1					0.3	2	0.1	1
Onagraceae	*Ludwigia erecta*	美洲水丁香	2	30	2	15	2	10	1.8	5	2	25	2	13	2	10	1.8	5
Poaceae	*Pennisetum alopecuroides*	狼尾草																
Amaranthaceae	*Celosia argentea*	青葙					1.5	15							1.5	15		
Bare Gound				25		23		18		43		25		20		15		40

			Post construction monitoring								Post construction monitoring							
		Stream	Dec-14								Jan-15							
		Transect	T1		T2		T3		T4		T1		T2		T3		T4	
Family	Species	Chinese name	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height (m)	%	Height (m)	%
Poaceae	*Microstegium ciliatum*	剛秀竹																
Fabaceae	*Pueraria lobata*	野葛							0.6	10							0.6	10
Poaceae	*Pennisetum purpureum*	象草													3	15		
Araceae	*Alocasia odora*	海芋							1.8	1							1.8	1
Caesalpiniaceae	*Cassia alata*	翅莢決明																
Magnoliaceae	*Michelia alba*	白蘭																
Poaceae	*Brachiaria mutica*	巴拉草	1	10	1.5	15	1.3	30	1	5	1	20	1	20	1.3	20	1	10
Moraceae	*Ficus hispida*	對葉榕																
Asteraceae	*Mikania micrantha*	薇甘菊	0.3	18	0.3	18	0.3	18	0.3	18	0.4	10	0.4	15	0.3	5	0.3	20
Musaceae	*Musa paradisiaca*	大蕉																
Ulmaceae	*Celtis sinensis*	朴樹																
Araceae	*Pistia stratiotes L.*	大漂																
Urticaceae	*Boehmeria nivea*	苧麻																
Asteraceae	*Bidens alba*	白花鬼針草	0.5	5	0.8	12	0.7	10			1	10	0.4	15	1	15		
Poaceae	*Coix lacryma-jobi*	薏苡	2	5														
Solanaceae	*Solanum nigrum*	龍葵																
Cyperaceae	*Cyperus flabelliformis*	風車草																
Poaceae	*Miscanthus floridulus*	五節芒																
Euphorbiaceae	*Macaranga tanarius*	血桐																
Asteraceae	*Wedelia chinensis*	蟛蜞菊																
Commelinaceae	*Commelina diffusa*	節節草	0.3	12	0.8	22			0.3	20	0.4	10	0.4	20			0.3	20
Asteraceae	*Erechtites hieracifolia*	革命菜																
Thelypteridaceae	*Cyclosorus parasiticus*	華南毛蕨																
Convolvulaceae	*Pharbitis nil*	牽牛																
Verbenaceae	*Lantana camara*	馬纓丹																
Mimosaceae	*Leucaena leucocephala*	銀合歡																
Brassicaceae	*Nasturtium officinale*	西洋菜					0.3	2	0.1	1					0.3	10	0.1	15
Onagraceae	*Ludwigia erecta*	美洲水丁香	2	25	2	13	2	10	1.8	5	2	30	2	10	2	5	1.8	5
Poaceae	*Pennisetum alopecuroides*	狼尾草																
Amaranthaceae	*Celosia argentea*	青葙					1.5	15										
Bare Gound				25		20		15		40		20		20		30		19

			Post construction monitoring								Post construction monitoring							
		Stream	Feb-15								Mar-15							
		Transect	T1		T2		T3		T4		T1		T2		T3		T4	
Family	Species	Chinese name	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%
Poaceae	*Microstegium ciliatum*	剛秀竹																
Fabaceae	*Pueraria lobata*	野葛							0.6	10							0.6	10
Poaceae	*Pennisetum purpureum*	象草					3	15							3	15		
Araceae	*Alocasia odora*	海芋							1.8	1							1.8	1
Caesalpiniaceae	*Cassia alata*	翅莢決明																
Magnoliaceae	*Michelia alba*	白蘭																
Poaceae	*Brachiaria mutica*	巴拉草	1	20	1	20	1.3	20	1	10	1	20	1.2	20	1.4	20	1	10
Moraceae	*Ficus hispida*	對葉榕																
Asteraceae	*Mikania micrantha*	薇甘菊	0.4	10	0.4	15	0.3	5	0.3	20	0.4	10	0.4	15	0.3	5	0.3	20
Musaceae	*Musa paradisiaca*	大蕉																
Ulmaceae	*Celtis sinensis*	朴樹																
Araceae	*Pistia stratiotes L.*	大漂																
Urticaceae	*Boehmeria nivea*	苧麻																
Asteraceae	*Bidens alba*	白花鬼針草	1	10	0.7	15	1	15			1	10	0.7	15	1	15		
Poaceae	*Coix lacryma-jobi*	薏苡																
Solanaceae	*Solanum nigrum*	龍葵																
Cyperaceae	*Cyperus flabelliformis*	風車草																
Poaceae	*Miscanthus floridulus*	五節芒																
Euphorbiaceae	*Macaranga tanarius*	血桐																
Asteraceae	*Wedelia chinensis*	蟛蜞菊																
Commelinaceae	*Commelina diffusa*	節節草	0.5	10	0.5	20			0.3	20	0.5	10	0.4	20			0.3	20
Asteraceae	*Erechtites hieracifolia*	革命菜																
Thelypteridaceae	*Cyclosorus parasiticus*	華南毛蕨																
Convolvulaceae	*Pharbitis nil*	牽牛																
Verbenaceae	*Lantana camara*	馬纓丹																
Mimosaceae	*Leucaena leucocephala*	銀合歡																
Brassicaceae	*Nasturtium officinale*	西洋菜					0.3	10	0.2	15					0.3	10	0.2	15
Onagraceae	*Ludwigia erecta*	美洲水丁香	2	30	2	10	2	5	2	5	2	30	2	10	2	5	2	5
Poaceae	*Pennisetum alopecuroides*	狼尾草																
Amaranthaceae	*Celosia argentea*	青葙																
Bare Gound				20		20		30		19		20		20		30		19

P1 – Point count location 1; P4 – Point count location 4

Table 4.2. Flora species recorded from belt transect survey at the Upper Lam Tsuen River

(T1- located at upper river channel sampling site to T4 - located at lower river Channel sampling site)

			Post construction monitoring								Post construction monitoring								Post construction monitoring								Post construction monitoring								Post construction monitoring							
		Stream	Apr-15								May-15								Jun-15								Jul-15								Aug-15							
		Transect	T1		T2		T3		T4		T1		T2		T3		T4		T1		T2		T3		T4		T1		T2		T3		T4		T1		T2		T3		T4	
Family	Species	Chinese name	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%
Poaceae	*Microstegium ciliatum*	刚秀竹																																									
Fabaceae	*Pueraria lobata*	野葛							0.6	10							0.3	5							0.3	5	0.5	10					0.4	5	0.5	10					0.4	5
Poaceae	*Pennisetum purpureum*	象草					3	15							2	15							2	15																		
Araceae	*Alocasia odora*	海芋							1.8	1							0.8	1							0.8	1																		
Caesalpiniaceae	*Cassia alata*	猪英决明																																									
Magnoliaceae	*Michelia alba*	白兰																																									
Poaceae	*Brachiaria mutica*	巴拉草	1.1	20	1.2	20	1.4	20	1	10	0.9	15	1	18	0.8	20	1	10	0.9	15	1	18	0.8	20	1	10	0.9	30	1.5	30	0.5	70	1	15	1	30	1.5	30	0.8	70	1	15
Moraceae	*Ficus hispida*	對葉榕																																								
Asteraceae	*Mikania micrantha*	薇甘菊	0.4	10	0.4	15	0.3	5	0.3	20	0.3	5	0.4	10	0.3	5	0.3	10	0.3	5	0.4	10	0.3	5	0.3	10	0.3	5	0.2	5	0.3	5	0.4	5	0.3	5	0.2	5	0.3	5	0.4	5
Musaceae	*Musa paradisiaca*	大蕉																																								
Ulmaceae	*Celtis sinensis*	朴樹																																								
Araceae	*Pistia stratiotes L.*	大漂																																								
Urticaceae	*Boehmeria nivea*	苧麻																																								
Asteraceae	*Bidens alba*	白花鬼針草	1	10	0.7	15	1	15			0.8	5	0.7	10	0.8	15			0.8	5	0.7	10	0.8	15							0.3	5							0.4	5		
Poaceae	*Coix lacryma-jobi*	薏苡																																								
Solanaceae	*Solanum nigrum*	龍葵																																								
Cyperaceae	*Cyperus flabelliformis*	風車草																													0.6	2							0.6	2		
Poaceae	*Miscanthus floridulus*	五節芒																																								
Euphorbiaceae	*Macaranga tanarius*	血桐																																								
Asteraceae	*Wedelia chinensis*	蜈蚣菊																									0.3	20	0.2	10					0.4	20	0.2	10				
Commelinaceae	*Commelina diffusa*	節節草	0.5	10	0.4	20			0.3	20	0.5	5	0.4	10			0.3	10	0.5	5	0.4	10			0.3	10	0.3	20	0.2	20	0.2	5	0.4	20	0.3	20	0.2	20	0.2	5	0.4	20
Asteraceae	*Erechtites hieracifolia*	革命菜																																								
Thelypteridaceae	*Cyclosorus parasiticus*	華南毛蕨																																								
Convolvulaceae	*Pharbitis nil*	牽牛																																								
Verbenaceae	*Lantana camara*	馬纓丹																																								
Mimosaceae	*Leucaena leucocephala*	銀合歡																																								
Brassicaceae	*Nasturtium officinale*	西洋菜					0.3	10	0.2	15																																		
Onagraceae	*Ludwigia erecta*	美洲水丁香	2	30	2	10	2	5	2	5	1.2	10	1.1	5	1.4	5	1.3	5	1.2	10	1.1	5	1.4	5	1.3	5																		
Poaceae	*Pennisetum alopecuroides*	狼尾草																													0.5	5	2	5					0.8	5	2	5
Amaranthaceae	*Celosia argentea*	青葙																																								
Bare Gound				20		20		30		19		60		47		40		59		60		47		40		59		15		35		13		55		15		35		13		55

P1 – Point count location 1; P4 – Point count location 4

(Contiuous) Table 4.2. Flora species recorded from belt transect survey at the Upper Lam Tsuen River

(T1- located at upper river channel sampling site to T4 - located at lower river Channel sampling site)

			Post construction monitoring								Post construction monitoring								Post construction monitoring								Post construction monitoring								Post construction monitoring							
		Stream	Sep-15								Oct-15								Nov-15								Dec-15								Jan-16							
		Transect	T1		T2		T3		T4		T1		T2		T3		T4		T1		T2		T3		T4		T1		T2		T3		T4		T1		T2		T3		T4	
Family	Species	Chinese name	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%
Poaceae	*Microstegium ciliatum*	蒭秀竹																																									
Fabaceae	*Pueraria lobata*	野葛	0.5	10					0.4	5	0.5	10					0.4	5	0.5	10					0.4	5	0.5	10					0.4	5	0.5	10					0.4	5
Poaceae	*Pennisetum purpureum*	象草																																									
Araceae	*Alocasia odora*	海芋																																									
Caesalpiniaceae	*Cassia alata*	翅荚決明																																									
Magnoliaceae	*Michelia alba*	白蘭																																									
Poaceae	*Brachiaria mutica*	巴拉草	1.1	30	1.5	35	1	70	1.2	15	0.7	5	1.5	30	1	60	1.2	15	0.7	5	1.5	35	1	60	1.2	20	0.8	5	1.5	35	1.2	60	1.2	20	0.3	5	0.3	20	0.3	30	0.3	10
Moraceae	*Ficus hispida*	對葉榕																																								
Asteraceae	*Mikania micrantha*	微甘菊	0.3	5	0.2	5	0.3	5	0.4	5	0.3	5	0.2	5	0.3	5	0.4	5	0.3	5	0.2	5	0.3	5	0.4	5	0.3	5	0.2	5	0.3	5	0.4	5	0.3	5	0.2	5	0.3	5	0.4	5
Musaceae	*Musa paradisiaca*	大蕉																																								
Ulmaceae	*Celtis sinensis*	朴樹																																									
Araceae	*Pistia stratiotes L.*	大漂																																									
Urticaceae	*Boehmeria nivea*	苧麻																																									
Asteraceae	*Bidens alba*	白花鬼針草					0.4	5							0.4	10							0.4	10					0.4	10									0.4	10		
Poaceae	*Coix lacryma-jobi*	薏苡									1	5							1	5							1	5							1	5						
Solanaceae	*Solanum nigrum*	龍葵																																								
Cyperaceae	*Cyperus flabelliformis*	風車草					0.6	2																																		
Poaceae	*Miscanthus floridulus*	五節芒									1	10							1	10							1	10							1	10						
Euphorbiaceae	*Macaranga tanarius*	血桐																																								
Asteraceae	*Wedelia chinensis*	蜈蚣菊	0.4	20	0.2	10					0.4	5							0.4	5							0.4	5							0.4	5						
Commelinaceae	*Commelina diffusa*	節節草	0.3	20	0.2	20	0.2	5	0.4	20	0.3	10	0.2	20	0.2	5	0.4	20	0.3	10	0.2	20	0.2	5	0.4	25	0.3	10	0.2	20	0.2	5	0.4	25	0.3	10	0.2	20	0.2	5	0.4	25
Asteraceae	*Erechtites hieracifolia*	革命菜																																								
Thelypteridaceae	*Cyclosorus parasiticus*	華南毛蕨																																								
Convolvulaceae	*Pharbitis nil*	牽牛																																								
Verbenaceae	*Lantana camara*	馬纓丹																																									
Mimosaceae	*Leucaena leucocephala*	銀合歡																																									
Brassicaceae	*Nasturtium officinale*	西洋菜																																									
Onagraceae	*Ludwigia erecta*	美洲水丁香																																									
Poaceae	*Pennisetum alopecuroides*	狼尾草					0.8	5	2	5					1.5	10	2	5					1.5	10	2	5					1.5	10	2	5					1.5	10	2	5
Amaranthaceae	*Celosia argentea*	青葙													0.4	5							0.4	5					0.4	5							0.4	5		
Acanthaceae	*Dicliptera chinensis*	狗肝菜									0.3	20							0.3	20							0.3	20							0.3	20						
Bare Gound				15		30		13		55		30		45		20		55		30		40		20		45		30		40		20		35		30		55		50		45

P1 – Point count location 1; P4 – Point count location 4

(Contiuous) Table 4.2. Flora species recorded from belt transect survey at the Upper Lam Tsuen River

(T1- located at upper river channel sampling site to T4 - located at lower river Channel sampling site)

			Post construction monitoring								Post construction monitoring								Post construction monitoring								Post construction monitoring								Post construction monitoring							
		Stream	Feb-16								Mar-16								Apr-16								May-16								Jun-16							
		Transect	T1		T2		T3		T4		T1		T2		T3		T4		T1		T2		T3		T4		T1		T2		T3		T4		T1		T2		T3		T4	
Family	Species	Chinese name	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%
Poaceae	*Microstegium ciliatum*	蒭秀竹																																									
Fabaceae	*Pueraria lobata*	野葛	0.5	10					0.4	5	0.5	10					0.4	5	0.5	8					0.4	5	0.5	5					0.4	5	0.5	5					0.4	5
Poaceae	*Pennisetum purpureum*	象草																																								
Araceae	*Alocasia odora*	海芋																																								
Caesalpiniaceae	*Cassia alata*	翅荚决明																																								
Magnoliaceae	*Michelia alba*	白蘭																																								
Poaceae	*Brachiaria mutica*	巴拉草	0.3	5	0.3	20	0.3	30	0.3	10	0.4	10	0.4	25	0.4	35	0.4	15	0.4	8	0.4	25	0.4	35	0.4	10	0.4	7	0.4	20	0.4	25	0.4	5	0.4	7	0.4	20	0.4	25	0.4	5
Moraceae	*Ficus hispida*	對葉榕																																								
Asteraceae	*Mikania micrantha*	微甘菊	0.3	5	0.2	5	0.3	5	0.4	5	0.3	5	0.2	5	0.3	5	0.4	5	0.3	5	0.2	5	0.3	5	0.4	5	0.3	5	0.2	5	0.3	5	0.4	5	0.3	5	0.2	5	0.3	5	0.4	5
Musaceae	*Musa paradisiaca*	大蕉																																								
Ulmaceae	*Celtis sinensis*	朴樹																																								
Araceae	*Pistia stratiotes L.*	大漂																																								
Urticaceae	*Boehmeria nivea*	苧麻																																								
Asteraceae	*Bidens alba*	白花鬼針草					0.4	10							0.4	10							0.4	10							0.4	5							0.4	5		
Poaceae	*Coix lacryma-jobi*	薏苡	1	5							1	5							1	5							1	5							1	5						
Solanaceae	*Solanum nigrum*	龍葵																																								
Cyperaceae	*Cyperus flabelliformis*	風車草																																								
Poaceae	*Miscanthus floridulus*	五節芒	1	10							1	10							1	8							1	7							1	7						
Euphorbiaceae	*Macaranga tanarius*	血桐																																								
Asteraceae	*Wedelia chinensis*	蜈蚣菊	0.4	5							0.4	5							0.4	5							0.4	5							0.4	5						
Commelinaceae	*Commelina diffusa*	節節草	0.3	10	0.2	20	0.2	5	0.4	25	0.3	10	0.2	20	0.2	5	0.4	25	0.3	8	0.2	20	0.2	5	0.4	20	0.3	7	0.2	15	0.2	5	0.4	15	0.3	7	0.2	15	0.2	5	0.4	15
Asteraceae	*Erechtites hieracifolia*	革命菜																																								
Thelypteridaceae	*Cyclosorus parasiticus*	華南毛蕨																																								
Convolvulaceae	*Pharbitis nil*	牽牛																																								
Verbenaceae	*Lantana camara*	馬纓丹																																								
Mimosaceae	*Leucaena leucocephala*	銀合歡																																								
Brassicaceae	*Nasturtium officinale*	西洋菜							0.2	10							0.2	5							0.2	5							0.2	5							0.2	5
Onagraceae	*Ludwigia erecta*	美洲水丁香																																								
Poaceae	*Pennisetum alopecuroides*	狼尾草					1.5	10	2	5					1.5	10							1.5	10							1.5	10							1.5	10		
Amaranthaceae	*Celosia argentea*	青葙					0.4	5							0.4	5							0.4	5							0.4	5							0.4	5		
Acanthaceae	*Dicliptera chinensis*	狗肝菜	0.3	20							0.3	20							0.3	15							0.3	5							0.3	5						
Bare Gound				30		55		50		45		25		50		45		45		38		50		45		55		54		60		60		65		54		60		60		65

P1 – Point count location 1; P4 – Point count location 4

(Contiuous) Table 4.2. Flora species recorded from belt transect survey at the Upper Lam Tsuen River

(T1- located at upper river channel sampling site to T4 - located at lower river Channel sampling site)

			Post construction monitoring								Post construction monitoring								Post construction monitoring								Post construction monitoring								Post construction monitoring							
		Stream	Jul-16								Aug-16								Sep-16								Oct-16								Nov-16							
		Transect	T1		T2		T3		T4		T1		T2		T3		T4		T1		T2		T3		T4		T1		T2		T3		T4		T1		T2		T3		T4	
Family	Species	Chinese name	Height(m	%	Height(m	%	Height(m	%	Height(m	%	Height(m	%	Height(m	%	Height(m	%	Height(m	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%
Poaceae	*Microstegium ciliatum*	蔄秀竹																																									
Fabaceae	*Pueraria lobata*	野葛	0.5	5					0.4	5	0.5	5					0.4	5	0.5	5					0.4	5	0.5	5					0.4	5	0.5	5					0.4	5
Poaceae	*Pennisetum purpureum*	象草																																									
Araceae	*Alocasia odora*	海芋																	0.3	5	0.2	5	0.3	5	0.3	5	0.3	5	0.2	5	0.3	5	0.3	5	0.4	5	0.2	5	0.3	5	0.4	5
Caesalpiniaceae	*Cassia alata*	翅荚决明																																									
Magnoliaceae	*Michelia alba*	白蘭																																									
Poaceae	*Brachiaria mutica*	巴拉草	0.4	7	0.4	15	0.4	20	0.4	5	0.4	7	0.4	15	0.4	20	0.4	5	0.5	10	0.5	20	0.5	25	0.5	5	0.5	10	0.5	20	0.5	25	0.5	5	0.5	10	0.5	20	0.5	25	0.5	5
Moraceae	*Ficus hispida*	對葉榕																																								
Asteraceae	*Mikania micrantha*	微甘菊	0.3	5	0.2	5	0.3	5	0.4	5	0.3	5	0.2	5	0.3	5	0.4	5	0.3	5	0.3	5	0.3	10	0.4	5	0.4	5	0.4	5	0.4	10	0.4	5	0.4	5	0.4	5	0.4	10	0.4	5
Musaceae	*Musa paradisiaca*	大蕉																																								
Ulmaceae	*Celtis sinensis*	朴樹																																								
Araceae	*Pistia stratiotes L.*	大漂																																								
Urticaceae	*Boehmeria nivea*	苧麻																																								
Asteraceae	*Bidens alba*	白花鬼針草					0.4	5							0.4	5					0.3	5	0.4	5					0.5	5	0.4	5					0.5	5	0.4	5		
Poaceae	*Coix lacryma-jobi*	薏苡	1	5							1	5							1	5							1	5							1.1	5						
Solanaceae	*Solanum nigrum*	龍葵																																								
Cyperaceae	*Cyperus flabelliformis*	風車草																																								
Poaceae	*Miscanthus floridulus*	五節芒	1	7							1	7							1	7							1	7							1.1	7						
Euphorbiaceae	*Macaranga tanarius*	血桐																																								
Asteraceae	*Wedelia chinensis*	蜈蚣菊	0.4	5							0.4	5							0.4	5							0.4	5							0.4	5						
Commelinaceae	*Commelina diffusa*	節節草	0.3	7	0.2	10	0.2	5	0.4	10	0.3	10	0.2	15	0.2	10	0.4	15	0.3	10	0.2	15	0.2	10	0.4	15	0.3	10	0.2	15	0.2	10	0.4	15	0.3	10	0.2	15	0.2	10	0.4	15
Asteraceae	*Erechtites hieracifolia*	革命菜																																								
Thelypteridaceae	*Cyclosorus parasiticus*	華南毛蕨																																								
Convolvulaceae	*Pharbitis nil*	牽牛																																								
Verbenaceae	*Lantana camara*	馬纓丹																																								
Mimosaceae	*Leucaena leucocephala*	銀合歡																																								
Brassicaceae	*Nasturtium officinale*	西洋菜							0.2	5							0.2	5							0.2	5																		
Onagraceae	*Ludwigia erecta*	美洲水丁香																																									
Poaceae	*Pennisetum alopecuroides*	狼尾草					1.5	10							1.5	10							1.5	10							1.5	10							1.5	10		
Amaranthaceae	*Celosia argentea*	青葙					0.4	5							0.4	5							0.4	5							0.4	5							0.4	5		
Acanthaceae	*Dicliptera chinensis*	狗肝菜	0.3	5							0.3	5							0.3	5							0.3	5							0.3	5						
Bare Gound				54		70		65		70		51		65		60		65		43		50		45		60		43		50		45		65		43		50		45		65

P1 – Point count location 1; P4 – Point count location 4

Table 4.3 Avifauna recorded along survey transects and at four selected point count locations of Lam Tsuen River.

(T1- located at upper river channel sampling site to T4 - located at lower river Channel sampling site)

					Baseline monitoring						Impact monitoring					Impact monitoring					Impact monitoring					Impact monitoring					Impact monitoring					Impact monitoring					Impact monitoring					Impact monitoring				
					Jul-08			Aug-08			Jan-09					Jul-09					Jan-10					Jul-10					Jan-11					Jul-11					Jan-12					Jul-12					Aug-13				
Common Name	**Species name**	**Chinese name**	**Status**	**Commonness**	Abundance			Abundance			Abundance					Abundance					Abundance					Abundance					Abundance					Abundance					Abundance					Abundance					Abundance				
					C	P1	P4	C	P1	P4	C	T1	T2	T3	T4	C	T1	T2	T3	T4	C	T1	T2	T3	T4	C	T1	T2	T3	T4	C	T1	T2	T3	T4	C	T1	T2	T3	T4	C	T1	T2	T3	T4	C	T1	T2	T3	T4	C	T1	T2	T3	T4
Barn Swallow	*Hirundo rustica*	家燕	PM	C	+	**1**	**1**									+			2	3																																		
Black Drongo	*Dicrurus macrocercus*	黑卷尾	Sv	C																																																	
Black Kite	*Milvus lineatus*	麻鷹	R, RC, Cap.586	C				+			+										+					+					+																						
Black-faced bunting	*Emberiza spodocephala*	灰眉鵐	WV&PM	C																																																	
Black-necked Starling	*Sturnus nigricollis*	黑領椋鳥	R	C	+++	**2**	**1**	++	**2**		+		1			+			2	1	+			2		+			2	1	+	2	1			+			1		+	1			2	++			3		++	1		2
Black-winged Cuckoo-shrike	*Coracina melaschistos*	暗灰鵙鷯	PM	C																																																
Blue Whistling Thrush	*Myophonus caeruleus*	紫嘯鶇	R	C																																																
Brown Shrike	*Lanius cristatus*	紅尾伯勞	PM	C																																																
Buzzard (Common Buzzard)	*Buteo buteo*	普通鵟	WV,Cap.586	C																										+																						
Chinese Bulbul	*Pycnonotus sinensis*	白頭鵐	R	C	++	**2**	**3**	+++	**4**	**5**	++	2		2	2	++	1	2	1	3	+++	20	2			+++	4	3	5	2	+	5	2	2	3	+		1	3	1	+	2		2	1	++	2	1	4	2	++	2	1		1
Chinese Pond Heron	*Ardeola bacchus*	池鷺	R,RC	C	+			++	**3**	**1**	+			1		+			1	1	+	1	2	1	1	+	2	1	1	2	+	1			+			1	1	+			1		+		1	1				1	1
Common Kingfisher	*Alcedo atthis*	普通翠鳥	R	C							+				1	+				1	+		1	1	2	+	1							+																	
Common Koel	*Eudynamys scolopacea*	噪鵑	R	C	++	**1**		+								+			2		+					+									+				4	+						+						
Common Sandpiper	*Actitis hypoleucos*	磯鷸	WV&PM	C							+					+			3		+					+	2		1						+												+					
Common Tailorbird	*Orthotomus sutorius*	長尾縫葉鶯	R	C	+	**1**	**1**	+	**1**		+		1	1		+			1		+	1		1	1	+	2		1	1	+	1		2	1	+				1	+	1	1	1		+				1
Crested bulbul	*Pycnonotus jocosus*	紅耳鵐	R	C	+++	**2**	**3**	++	**3**	**4**	++	3		3	4	+++	3	2	2	1	+++					+++	2	2	3	2	+	3	2	1	3	1	+	3	1	3	1	+	1		1	2	+++	5	2	4	2	+++	4	2	2	3
Crested Goshawk	*Accipiter trivirgatus*	鳳頭鷹	R, CR, Cap.586	U																										+																						
Crested Myna	*Acridotheres cristatellus*	八哥	R	C	++	**2**		++	**2**		+		2			++		2	3	2	++	2	3	5	1	++	3	4	2	3	+	3	2	1	+		1	2		+		2			++			5	2	++	1	3	3	
Crested Serpent Eagle	*Spilornis cheela*	蛇鵰	R, VU, LC	U																										+																						
Daurian redstart	*Phoenicurus auroreus*	北紅尾鴝	WV	C																																																
Domestic pigeon	*Columba sp.*	鴿	R	C	+			+	**3**	**2**	++					++		4			+	2		4		+	3	2																				+					
Dusky Warbler	*Phylloscopus fuscatus*	褐柳鶯	WV	C																																															
Eurasian tree sparrow	*Passer montanus*	麻鵐	R	C	++	**2**		+			+					++	3		1	2	+	4			3	++	6	4	3	5	+				+			3	2	+					+++	4	5	3	2	++			2	
Great Coucal	*Centropus sinensis*	褐翅鴉鵑	R,VU	C				+								+			1							+			1	+					+				3	+									+				
Great Tit	*Parus major(commixtus)*	大山雀	R	C																																															
Green Sandpiper	*Tringa ochropus*	白腰草鷸	PM&WV	C																																															
Grey Heron	*Ardea cinerea*	蒼鷺	WV,PRC	C	+																																														
Grey Wagtail	*Motacilla cinerea*	灰鶺鴒	WV	C																										+	2		1	1							+			1	2	1								
Japanese White Eye	*Zosterops japonica(simplex)*	暗綠繡眼鳥	R	C	+			+			++	1			4	++		2		3	++	15				++	6			4	+	4	2	1		+	5	2	3		+	1	1	2	1	+++	4		3		+++	4		3	2
Jungle Crow	*Corvus macrorhynchus*	大嘴烏鴉	R	C																																															
Large Hawk Cuckoo	*Cuculus sparverioides*	鷹鵑	SV	C																																															
Lesser Coucal	*Centropus bengalensis*	小鴉鵑	R, VU	C																																															
Little Egret	*Egretta garzetta*	小白鷺	R, RC	C				+			+			2		+		1	1		+	1	1	2		+	2	1	2	1	+	1	1		1	+			2	1				+			1	1	+	1	1		
Great Egret	*Ardea alba*	大白鷺	R,WV, RC	C																																															
Little Swift	*Apus affinis*	小白腰雨燕	R,SpM	C	++	**3**																																													
Magpie	*Pica pica*	喜鵲	R	C				+			+					+			1							+					+																				
Magpie Robin	*Copsychus saularis*	鵲鴝	R	C	++	**1**	**1**	+	**1**	**1**	+		1	1	1	+	1			1	+	1	1	2	2	+	2	1	1	2	+	1		1	2	+	2	1	2	1	+	2	3	1	2	++	3	2	3	2	++	1	1	1	
Mandarin Duck	*Aix galericulata*	鴛鴦	WV	U																																															
Masked Laughing Thrush	*Garrulax perspicillatus*	黑臉噪鹛	R	C																																															
Night Heron	*Nycticorax nycticorax*	夜鷺	R&WV, LC	C																																															
Northern Shoveler	*Anas clypeata*	琵嘴鴨	WV	C																																														
Olive Backed Pipit	*Anthus hodgsoni*	樹鷚	WV	C	+	**1**					++										+			2		+					+																				
Oriental Dollarbird	*Eurystomus orientalis*	三寶鳥	PM	U																																															
Plaintive Cuckoo	*Cacomantis merulinus*	八聲杜鵑	SV	U																																															
Red-billed Blue Magpie	*Urocissa erythrorhyncha*	紅嘴藍鵲	R	C																																															
Red-flanked Bluetail	*Tarsiger cyanurus*	紅脇藍尾鴝	PM&WV	C																																															
Rufous Turtle Dove	*Streptopelia orientalis*	山斑鳩	R	C												+		1																																		
Rufous-backed Shrike	*Lanius schach*	棕背伯勞	R	C				+			+			1		+	1	1			+		1			+			1		+					+					+	1				+							
Rufous-capped Babbler	*Stachyridopsis ruficeps*	紅頭穗鹛	R	C																																															
Scarlet Minivet	*Pericrocotus flammeus*	赤紅山椒鳥	R	C																																															
Siberian Stonechat	*Saxicola maurus*	黑喉石鵐	WV	C							+																														+											
Sooty-headed Bulbul	*Pycnonotus aurigaster*	白喉紅臀鵐	R	U																																+	1		1		+			1		+					
Spotted Dove	*Streptopelia chinensis*	珠頸斑鳩	R	C	+	**1**	**1**	+	**1**		+++			3	1	++	2		1	3	++	3	4	4	2	++	1	2	2	1	+	3	2	1	+	1	2	1	1	+			12		++	2	1	3		++	1	2	2	
Spotted Munia	*Lonchura punctulata*	斑文鳥	R	C										+			2				+			3						+					+					++					+					+				
Velvet-fronted Nuthatch	*Sitta frontalis*	絨額鳾	R	C																																															
White Wagtail	*Motacilla alba*	白鶺鴒	WV	C				+			+	1		1	1	+	1		1		+	1	2	2	1	+	1		1	1	+	1		1	1	+				2	+	1				++	1	2			+				
White-breasted Waterhen	*Amaurornis phoenicurus*	白胸苦惡鳥	R	C	+			+			+				1	+				1	+				1	+			1	2	+	1			+					+					+					+				
White-throated Kingfisher	*Halcyon smyrnensis*	白胸翡翠	R, LC	C							+					+			1		+			1		+																										
White-rumped Munia	*Lonchura striata*	白腰文鳥	R	C																																															
Yellow Bellid Prinia	*Prinia flaviventris*	黃腹鷦鶯	R	C	+		**1**	+			+			1	+				1	+	1		3	1	+			1	1	+	1		1		+			1		+	1		1		+								
Yellow Wagtail	*Motacilla flava*	黃鶺鴒	WV&PM	U				+						1	1						+	1		2						+																						
Zitting cisticola	*Cisticola juncidis*	棕扇尾鶯	WV&PM	C																																															
Number of birds						19	12		20	13		6	5	14	12		9	14	13	17		50	14	28	10		31	21	24	27		30	14	8	13		14	8	24	9		15	9	21	17		27	19	36	13		16	10	14	10
No. of species					18	12	8	19	9	5	24	3	4	8	5	23	5	7	9	11	23	9	6	10	5	25	10	10	12	13	28	13	9	7	7	19	7	6	12	8	26	8	6	7	9	23	10	9	13	7	37	9	6	7	6

Note: R – Resident; WV – Winter visitor; PM – Passage migrant; C – Common; U – Uncommon

SpM – Spring migrant; Sv–Summer Visitor ; C – transect survey;

P1 – Point count location 1; P4 – Point count location 4

+, occurred; ++, common; +++, abundant/dominant species in the the study area

Commonness and status were decided accroding to AFCD biodiversity website (www.hkbiodiversity.net)

All bird species are under protection of Wild Animals Protection Ordinance (Cap. 170)

Endangered Species of Animals and Plants Ordinance (Cap. 586)

RC : Regional concern Fellowes *et al* (2002)

LC : Local Concern Fellowes *et al* (2002)

PRC: Potential Regional onver Fellowes *et al* (2002)

CR: Rare in China Red Data Book Status

VU: Vulnerable in China Red Data Book Status

Table 4.3 Avifauna recorded along survey transects and at four selected point count locations of Lam Tsuen River.

(T1- located at upper river channel sampling site to T4 - located at lower river Channel sampling site)

Common Name	Species name	Chinese name	Status	Commonness	Impact monitoring					Post construction monitoring					Post construction monitoring					Post construction monitoring					Post construction monitoring					Post construction monitoring					Post construction monitoring					Post construction monitoring					Post construction monitoring					Post construction monitoring					Post construction monitoring					Post construction monitoring				
					Dec-13					Jan-14					Feb-14					Mar-14					Apr-14					May-14					Jun-14					Jul-14					Aug-14					Sep-14					Oct-14					Nov-14				
					Abundance					Abundance					Abundance					Abundance					Abundance					Abundance					Abundance					Abundance					Abundance					Abundance					Abundance					Abundance				
					C	T1	T2	T3	T4	C	T1	T2	T3	T4	C	T1	T2	T3	T4	C	T1	T2	T3	T4	C	T1	T2	T3	T4	C	T1	T2	T3	T4	C	T1	T2	T3	T4	C	T1	T2	T3	T4	C	T1	T2	T3	T4	C	T1	T2	T3	T4	C	T1	T2	T3	T4	C	T1	T2	T3	T4
Barn Swallow	*Hirundo rustica*	家燕	PM	C											+					+					+				1	++	2	1	4	2	+		1	2	1	+			2															+				
Black Drongo	*Dicrurus macrocercus*	黑卷尾	Sv	C																																																											
Black Kite	*Milvus lineatus*	麻鷹	R, RC, Cap.586	C											+					+																																				+					+				
Black-faced bunting	*Emberiza spodocephala*	灰眉鵐	WV&PM	C																																																													
Black-necked Starling	*Sturnus nigricollis*	黑領椋鳥	R	C	++		2	3	2	++		2	2	1	++		2		3	++	1		4	2	++		2	1		++	1	2	2	1	++	2		3	2	++	2	3	2	1	++	1		3		++		2	2	1	++	2		3		++		2	2	
Black-winged Cuckoo-shrike	*Coracina melaschistos*	暗灰鵑鵙	PM	C																																																											
Blue Whistling Thrush	*Myophonus caeruleus*	紫嘯鶇	R	C																																																												
Brown Shrike	*Lanius cristatus*	紅尾伯勞	PM	C																																																											
Buzzard (Common Buzzard)	*Buteo buteo*	普通鵟	WV,Cap.586	C																+																																									
Chinese Bulbul	*Pycnonotus sinensis*	白頭鵐	R	C	++	3	3	2	1	+	1		2	3	+	3	1	2	2	+	2	2	4	3	+	2		3	1	+		1	2		+	2		2		+	1				+	2		1		+	2	2	1		+	3		2	1	+	2			1
Chinese Pond Heron	*Ardeola bacchus*	池鷺	R,RC	C	++	2	3	2	1	++	1	2	4	3	++		1	2	2	++	2	3	3	1	++	3	2	2		++	1		2	1	++	2	1	1		++	4	2	3	2	++	2	1	2	2	++	3	2	3	1	++	4	1	1	2	++	3			1
Common Kingfisher	*Alcedo atthis*	普通翠鳥	R	C	+					+			1		+				1	+			1		+					+					+					+					+					+					+			1		+				1
Common Koel	*Eudynamys scolopacea*	噪鵑	R	C	+					+					+	1				+	1		1		+	2		1		+	1		1	1	+			1		+	1				+		1			+													
Common Sandpiper	*Actitis hypoleucos*	磯鷸	WV&PM	C	+		2	2		+		1	2		+		2	2	1	+		2	2	1	+		2	1		+					+					+					+					+					+					+				
Common Tailorbird	*Orthotomus sutorius*	長尾縫葉鶯	R	C	+	1	1		1	++	2	1	3	2	++	1	1	2	1	++	1	2	1	2	++	1	1		1	++	1		1	1	++	1	1	1	1	++	2		1		++	1	2	1	1	++	1	1	2	2	++	1	1		1	+		1	
Crested bulbul	*Pycnonotus jocosus*	紅耳鵐	R	C	+++	5	4	5	3	+++	6	5	4	5	+++	4	3	3	4	+++	3	2	6	5	+++	2	3	4	2	+++	3	2	3	3	+++	2	3	4	2	+++	4	3	6	3	+++	3		4	2	+++	2	2	3	2	+++	3	3	4	2	+++		2	2	3
Crested Goshawk	*Accipiter trivirgatus*	鳳頭鷹	R, CR, Cap.586	U																																																											
Crested Myna	*Acridotheres cristatellus*	八哥	R	C	++	1	2	3	2	++		3	2	3	++		2	4	2	++			6	3	++		1	3	2	+		2	1		++		3	5	2	++	1	2	5		++		2	3		++		4	3	2	++	1		2	3	++	3		4	
Crested Serpent Eagle	*Spilornis cheela*	蛇鵰	R, VU, LC	U	+															+																																											
Daurian redstart	*Phoenicurus auroreus*	北紅尾鴝	WV	C	+					+		1	1		+		1		1	+		1	1																																		+		1			+		1	1	
Domestic pigeon	*Columba sp.*	鴿	R	C	+					+					+					+																																				+					+				
Dusky Warbler	*Phylloscopus fuscatus*	褐柳鶯	WV	C	+					+	1				+	1		1		+		1	1		+			1		+			1	1	+					+		1	1		+					+			1		+		1	1		+			1	
Eurasian tree sparrow	*Passer montanus*	麻鵐	R	C	++					+					+					+					+	2				+					+					+	2		3	1	+		1	2	2	+		1			+		3		1	+	2	2		
Great Coucal	*Centropus sinensis*	褐翅鴉鵑	R,VU	C	+					+			1	1	+		1	1	1	+		1		1	+	1		1	1	+			1	1	+			1	1	+	1		1	1	+			1	1	+		1	1	1	+		1		1		
Great Tit	*Parus major(commixtus)*	大山雀	R	C	+					+					+	1			2	+	1				+					+			2																														
Green Sandpiper	*Tringa ochropus*	白腰草鷸	PM&WV	C	+					+		2			+			2		+		2	2		+		1	2		+					+																							+				
Grey Heron	*Ardea cinerea*	蒼鷺	WV,PRC	C	+					+					+					+																																				+									
Grey Wagtail	*Motacilla cinerea*	灰鶺鴒	WV	C	++	1	3	3	2	++	2	2	4	1	++	2	1	2	2	++	2	1	2	1	+		1			+					+		1	1		+			1	1	+	2	1	3	1	+	1	2	2	1	+	1	1	1	2
Japanese White Eye	*Zosterops japonica(simplex)*	暗綠繡眼鳥	R	C	+++	6	4	6	3	+++	4	3	3	5	+++	5		4		++	4		5	3	++	2		3		++	4	3	5	2	++	2	2	3		++	5	2		2	++	3		4	3	++	2				++	3				++	2		3	
Jungle Crow	*Corvus macrorhynchus*	大嘴烏鴉	R	C	+										+.					+					+					+																															
Large Hawk Cuckoo	*Cuculus sparverioides*	鷹鵑	SV	C																					+																																			
Lesser Coucal	*Centropus bengalensis*	小鴉鵑	R, VU	C																+.																																									
Little Egret	*Egretta garzetta*	小白鷺	R, RC	C	+	1	2	1	2	+	1	2	3	2	+	2	2	3	3	++	1	3	4	2	++	3	2	2	1	++	1	2	3	2	++	1	1	2	1	++	1	2	3	1	++	2	3	4	2	++	1	2	4	2	++	2	1	3	1	++	3	2	4	2
Great Egret	*Ardea alba*	大白鷺	R,WV, RC	C																																																											
Little Swift	*Apus affinis*	小白腰雨燕	R,SpM	C						+					+			2	1	+		2	2																																								
Magpie	*Pica pica*	喜鵲	R	C	+					+					+					+			1		+																																				
Magpie Robin	*Copsychus saularis*	鵲鴝	R	C	++	1	1	1	2	++	2	1	3	1	++	1	2	1	2	++	1	1	2	2	++	1		2	1	++	1	1	1		++	1	2			++	1	3	1		++	1	2	2	1	++	2	1	2	1	++	1	2	2		++	1	1	2	1
Mandarin Duck	*Aix galericulata*	鴛鴦	WV	U	+																																																											
Masked Laughing Thrush	*Garrulax perspicillatus*	黑臉噪鶇	R	C	+					+					+			3	2	+		2	4	2	+		2			+		2	4	2	+	2		3		+		2	1	+		3	2	3	+		2	4	2	+		2			+	3		3	
Night Heron	*Nycticorax nycticorax*	夜鷺	R&WV, LC	C																																																												
Northern Shoveler	*Anas clypeata*	琵嘴鴨	WV	C																																																													
Olive Backed Pipit	*Anthus hodgsoni*	樹鷚	WV	C	++		3	2	3	++	2	1		2	+			1		+		1	2		+			2		+																															
Oriental Dollarbird	*Eurystomus orientalis*	三寶鳥	PM	U																																																											
Plaintive Cuckoo	*Cacomantis merulinus*	八聲杜鵑	SV	U																					+								+																											
Red-billed Blue Magpie	*Urocissa erythrorhyncha*	紅嘴藍鵲	R	C						+										+																																									
Red-flanked Bluetail	*Tarsiger cyanurus*	紅脇藍尾鴝	PM&WV	C	+					+		1			+			1		+																																										
Rufous Turtle Dove	*Streptopelia orientalis*	山斑鳩	R	C																																																											
Rufous-backed Shrike	*Lanius schach*	棕背伯勞	R	C	+					+					+					+					+								+					+		1	1	+		1		1		+					+				1
Rufous-capped Babbler	*Stachyridopsis ruficeps*	紅頭穗鶇	R	C	+					+					+					+					+																																			
Scarlet Minivet	*Pericrocotus flammeus*	赤紅山椒鳥	R	C	+					+																																																					
Siberian Stonechat	*Saxicola maurus*	黑喉石鶇	WV	C	+					+		1			+					+			1																																							
Sooty-headed Bulbul	*Pycnonotus aurigaster*	白喉紅臀鵐	R	U																																																											
Spotted Dove	*Streptopelia chinensis*	珠頸斑鳩	R	C	++	1	3	1	2	++	3	2	3	4	++	3	4	3	2	++	2	3	4	3	++	3	2	2	1	++	2	3	5	2	++	3	1	3	2	++	2	3	5	1	++	1	2	4	2	++	3	2	4	3	++	4	2	3	2	++	3	3	5	3
Spotted Munia	*Lonchura punctulata*	斑文鳥	R	C	+					++					++					++					++			4		++					+										+			2		+			5		++	5		8		++		4	5	
Velvet-fronted Nuthatch	*Sitta frontalis*	絨額鳭	R	C	+																																																													
White Wagtail	*Motacilla alba*	白鶺鴒	WV	C	++	1	2	2	3	++		2	1	2	++	1	2	3	2	++	1	2	2	1	++	1	2	1	2	+							2		++	1	2	3	1	++	2	1	2	2	++	3	2	3	4	++	2	1	2	1	++	1	2	1	2
White-breasted Waterhen	*Amaurornis phoenicurus*	白胸苦惡鳥	R	C	+					+					+					+			2		+			1	1	+					+			1	1	+		1	1		+					+		1	2	1	+			1	1	+			1	1
White-throated Kingfisher	*Halcyon smyrnensis*	白胸翡翠	R, LC	C						+					+										+																																						
White-rumped Munia	*Lonchura striata*	白腰文鳥	R	C																																																															
Yellow Bellid Prinia	*Prinia flaviventris*	黃腹鱂鶯	R	C	+		1	1		+		1	2	1	+			1	2	+		1	2	1	+	1	1	1		+			1	1	+			1	1	+	1		1	2	2	1	+	1	1	2	2	+	1		1		+		1	1	1
Yellow Wagtail	*Motacilla flava*	黃鶺鴒	WV&PM	U																																																												
Zitting cisticola	*Cisticola juncidis*	棕扇尾鶯	WV&PM	C																																																											
Number of birds						23	36	34	27		25	33	41	37		25	25	42	35		22	32	66	33		23	23	36	14		18	19	41	21		19	16	32	16		28	24	44	18		19	21	43	24		22	28	46	25		34	21	39	17		25	23	39	19
No. of species					48	11	15	14	13	35	11	18	17	16	40	12	14	19	18	41	13	18	26	16		12	14	18	11		11	10	19	14		11	10	14	11		14	12	18	14		11	12	20	14		11	17	18	14		15	13	18	12		12	13	17	12

Note: R – Resident; WV – Winter visitor; PM – Passage migrant; C – Common; U – Uncommon

SpM – Spring migrant; Sv–Summer Visitor ; C – transect survey;

P1 – Point count location 1; P4 – Point count location 4

+, occurred; ++, common; +++, abundant/dominant species in the the study area

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CR: Rare in China Red Data Book Status

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Table 4.3 Avifauna recorded along survey transects and at four selected point count locations of Lam Tsuen River.

(T1- located at upper river channel sampling site to T4 - located at lower river Channel sampling site)

Common Name	Species name	Chinese name	Status	Commonness	Post construction monitoring					Post construction monitoring					Post construction monitoring					Post construction monitoring					Post construction monitoring					Post construction monitoring					Post construction monitoring					Post construction monitoring					Post construction monitoring					Post construction monitoring					Post construction monitoring					Post construction monitoring				
					Dec-14					Jan-15					Feb-15					Mar-15					Apr-15					May-15					Jun-15					Jul-15					Aug-15					Sep-15					Oct-15					Nov-15					Dec-15					Jan-16				
					Abundance					Abundance					Abundance					Abundance					Abundance					Abundance					Abundance					Abundance					Abundance					Abundance					Abundance					Abundance					Abundance				
					C	T1	T2	T3	T4	C	T1	T2	T3	T4	C	T1	T2	T3	T4	C	T1	T2	T3	T4	C	T1	T2	T3	T4	C	T1	T2	T3	T4	C	T1	T2	T3	T4	C	T1	T2	T3	T4	C	T1	T2	T3	T4	C	T1	T2	T3	T4	C	T1	T2	T3	T4	C	T1	T2	T3	T4	C	T1	T2	T3	T4
Barn Swallow	*Hirundo rustica*	家燕	PM	C																++	3	2	4	2	++	4	3	3	2	++	4	4	5	3	++	3	3	2	3	++			3	3	++	3	2	4		++		3	2		++			5		++				5										
Black Drongo	*Dicrurus macrocercus*	黑卷尾	Sv	C																									+										+			1																											
Black Kite	*Milvus lineatus*	黑鳶	R, RC, Cap.586	C	+					+					+					+					+			1																																									
Black-faced bunting	*Emberiza spodocephala*	灰頭鵐	WV&PM	C	+																				+			1																																								
Black-necked Starling	*Sturnus nigricollis*	黑領椋鳥	R	C	++	2		3	2	++	2		2		++			3	2	++	2		2		+		2		2	++			3	2	++	2		1	2	++	2	2		2	++	4	3	3		++		3	3		++		2	3		++	5	3			++		4	4	
Black-winged Cuckoo-shrike	*Coracina melaschistos*	暗灰鵙鶲	PM	C																																																																	
Blue Whistling Thrush	*Myophonus caeruleus*	紫嘯鶇	R	C																																																																
Brown Shrike	*Lanius cristatus*	紅尾伯勞	PM	C																																																																
Buzzard (Common Buzzard)	*Buteo buteo*	普通鵟	WV,Cap.586	C																											+			1																																	
Chinese Bulbul	*Pycnonotus sinensis*	白頭鵐	R	C	++	2	2	3		++	2		3	1	+	1		1		++	2		2		++	2		2		++	2	2	2		++		1	3	2	++		2	1	2	++	3		2	2	++	2	2	4	3	++			3	3	++			3	3	++			2	3	++	3	2	2	
Chinese Pond Heron	*Ardeola bacchus*	池鷺	R,RC	C	+	2	1	3		+	2	2		1	+	2	1	2		+	2	1	2	1	+				1	+				1	+	1				+	1				+			1		+			1		+				2	+		1			1	1	
Common Kingfisher	*Alcedo atthis*	普通翠鳥	R	C	+		1			+		1			+					+	1				+	1				+	1				+	1								+			1		+					+				2	+				1	+			1
Common Koel	*Eudynamys scolopacea*	噪鵑	R	C	+										+	1				+			1	1	+			1	1	+			1	1	+			1	1																						+	1				+	1			
Common Sandpiper	*Actitis hypoleucos*	磯鷸	WV&PM	C	+					+					+					+					+																																									
Common Tailorbird	*Orthotomus sutorius*	長尾縫葉鶯	R	C	++		1		1	++	1		1		+	1		1	1	+	1		2	1	+	2		1		+	2		2		+	1		2		++	2		2		++	1	2	2		++		1		1	++	2			2	++	2		2	2			
Crested bulbul	*Pycnonotus jocosus*	紅耳鵐	R	C	+++		4	3	2	+++	3	2	3		+++	2	2	4		+++	2	4			+++	4	3	5	2	+++	5	2	5	2	+++	5	3	5	4	+++	8	3	3	5	+++	7	5	5	5	+++	3	6	5	20	+++	3	5	5	10	+++	3	5	5	10	+++	8	5	5	12	+++	6	4	6	10
Crested Goshawk	*Accipiter trivirgatus*	鳳頭鷹	R, CR, Cap.586	U																																																																
Crested Myna	*Acridotheres cristatellus*	八哥	R	C	++	2	3	5		++		3	4	2	++		4	3		++		2	3	2	+++	3	4	2	3	+++	3	4	2	3	++	2	3	2	2	++	3	2	3	3	++	2	4		++		2		3	++			3		++			2		++	2		1	
Crested Serpent Eagle	*Spilornis cheela*	蛇鵰	R, VU, LC	U																																																													
Daurian redstart	*Phoenicurus auroreus*	北紅尾鴝	WV	C	++		1	1	1	+	1				+		1																																												+					+				
Domestic pigeon	*Columba sp.*	鴿	R	C	+					+					+																																																			
Dusky Warbler	*Phylloscopus fuscatus*	褐柳鶯	WV	C	+	1	1			+		1			+			1	1	+					+			1	1	+					+		1	1		+		1	1		+	1	1			+			1		+					+							
Eurasian tree sparrow	*Passer montanus*	麻鵐	R	C	++	3		2		+++		3	2	1	++		2		1	++	2			1	++	2	2	1	3	++	2	2	1	3	++	3	2	2	2	++	3		2	3	++	3	2	2	3	++	4	4	2	2	++				7	++				7	++		3		5	++			2	4
Great Coucal	*Centropus sinensis*	褐翅鴉鵑	R,VU	C	+		1		1	+					+			1	1	+		1	1		+		1			+	1																												+									
Great Tit	*Parus major(commixtus)*	大山雀	R	C						+															+	2				+	2																																		
Green Sandpiper	*Tringa ochropus*	白腰草鷸	PM&WV	C	+					+					+																																																				
Grey Heron	*Ardea cinerea*	蒼鷺	WV,PRC	C																																																																		
Grey Wagtail	*Motacilla cinerea*	灰鶺鴒	WV	C	+	1		2	1	+	1	1	1		++	1	2	2	2	++	1		1	2	+		1	1	2	++		1	1	2	++		1	1	1	+			1	1	+	1	1			+	1			+		1		1	+		1		1	+		1	1
Japanese White Eye	*Zosterops japonica(simplex)*	暗綠繡眼鳥	R	C	++	3	4	5		++	3		3		++	3		4		++			4	3	++			3	3	++		3	1	3	++	3	3	2	3	++	3	3	2	5	++	4	2	3	2	++	3	3	2	4	++			4	++		3		4	++			4	4	++		6		2
Jungle Crow	*Corvus macrorhynchus*	大嘴烏鴉	R	C																																																														
Large Hawk Cuckoo	*Cuculus sparverioides*	鷹鵑	SV	C																+					+			1	1	+			1	1	+																														
Lesser Coucal	*Centropus bengalensis*	小鴉鵑	R, VU	C																																																																
Little Egret	*Egretta garzetta*	小白鷺	R, RC	C	++	2	1	3	1	++	1	2	3	2	+	1	1	3	2	+	1	2	3	2	+		2	1		+		2	1		+	1	1	1		+	1	1	1		+		1		1	+		1		1	+	1		1	1	+		1		1	+		1		1	+		1	
Great Egret	*Ardea alba*	大白鷺	R,WV, RC	C											+			1							+	1								+		1																												
Little Swift	*Apus affinis*	小白腰雨燕	R,SpM	C											+	1		2		+			2																																													
Magpie	*Pica pica*	喜鵲	R	C	+																																																																
Magpie Robin	*Copsychus saularis*	鵲鴝	R	C	++	1	1	2	2	++	1	1	2	2	++	1	1	2	1	++	1	1	2		++	2		1	2	++	1	1	1	2	++	2			2	++	2	1	1	2	++		2	2		++		2	2		++			2	2	++		2		1	+		1		2	+		1	1
Mandarin Duck	*Aix galericulata*	鴛鴦	WV	U																																																														
Masked Laughing Thrush	*Garrulax perspicillatus*	黑臉噪鶥	R	C	++		2	2	++	2					+			3		++					++		2			++		2			++					++			3		++			4	++					+			4	+			2						
Night Heron	*Nycticorax nycticorax*	夜鷺	R&WV, LC	C																																																														
Northern Shoveler	*Anas clypeata*	琵嘴鴨	WV	C																																																																		
Olive Backed Pipit	*Anthus hodgsoni*	樹鷚	WV	C	+					+			1																																																								
Oriental Dollarbird	*Eurystomus orientalis*	三寶鳥	PM	U																																																																	
Plaintive Cuckoo	*Cacomantis merulinus*	八聲杜鵑	SV	U																+																																														
Red-billed Blue Magpie	*Urocissa erythrorhyncha*	紅嘴藍鵲	R	C																																																														
Red-flanked Bluetail	*Tarsiger cyanurus*	紅脇藍尾鴝	PM&WV	C																																																												
Rufous Turtle Dove	*Streptopelia orientalis*	山斑鳩	R	C																																																													
Rufous-backed Shrike	*Lanius schach*	棕背伯勞	R	C	+	1		1		+		1		+						+					+		1																		+		1	1		+					+					+				
Rufous-capped Babbler	*Stachyridopsis ruficeps*	紅頭穗鶥	R	C	+					++					++					+					+					+																																	
Scarlet Minivet	*Pericrocotus flammeus*	赤紅山椒鳥	R	C																+																					++			12																					
Siberian Stonechat	*Saxicola maurus*	黑喉石鵐	WV	C	++		1		1	++		1	1		+		1			++		1	1																																												
Sooty-headed Bulbul	*Pycnonotus aurigaster*	白喉紅臀鵐	R	U																																																															
Spotted Dove	*Streptopelia chinensis*	珠頸斑鳩	R	C	+++	2	3	3	2	+++	2	3	5	2	++	3	2	4	3	++	2	3	2	2	++	4	2	3	2	++	3	3	3	2	++	1	2	2	2	++	2	2	2	4	++	2	2	4	3	++	3	3	3	1	++	3	3		2	++	2		3	2
Spotted Munia	*Lonchura punctulata*	斑文鳥	R	C	+++	5		7		++	5		8		+										+			2		+																																			
Velvet-fronted Nuthatch	*Sitta frontalis*	絨額鳾	R	C																+					+	1																																						
White Wagtail	*Motacilla alba*	白鶺鴒	WV	C	++	1	1	2	1	++	1	2	3	2	+	1	1	2		++	2	1	2	2	+	1	2	1	2	++	1	2	2	2	++	2	2	2	4	+++				8	+			2				2	+				2	++		1		2	++	1	1	1	2
White-breasted Waterhen	*Amaurornis phoenicurus*	白胸苦惡鳥	R	C	+		1		+						+			1	1	+			1		+			1		+	1				+			1																										
White-throated Kingfisher	*Halcyon smyrnensis*	白胸翡翠	R, LC	C																																																															
White-rumped Munia	*Lonchura striata*	白腰文鳥	R	C																																																														
Yellow Bellid Prinia	*Prinia flaviventris*	黃腹鵐鶯	R	C	+	1		1							+			1	1	+		1	1		+		1	1		+		1	1		+			1		+			1		+					+					+					+				
Yellow Wagtail	*Motacilla flava*	黃鶺鴒	WV&PM	U																																																														
Zitting cisticola	*Cisticola juncidis*	棕扇尾鶯	WV&PM	C	+																																																														
Number of birds					29	26	49	17		27	23	42	14		18	18	39	15		21	21	36	20		28	29	32	27		28	30	35	28		32	21	25	27		27	19	38	34		14	27	36	26		16	36	25	38		13	13	25	41		9	25	30	40		17	21	17	35		15	23	23	24
No. of species					15	15	18	12	29	14	13	15	9	29	12	11	17	10	31	12	13	18	12	31	12	16	18	14	30	12	15	20	15	25	17	11	15	13	21	10	11	16	11	23	10	14	14	11	21	6	13	11	10	23	5	5	7	13	27	4	9	10	13	24	4	10	8	11	24	6	10	10	9

Note: R – Resident; WV – Winter visitor; PM – Passage migrant; C – Common; U – Uncommon

SpM – Spring migrant; Sv–Summer Visitor ; C – transect survey;

P1 – Point count location 1; P4 – Point count location 4

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Table 4.3 Avifauna recorded along survey transects and at four selected point count locations of Lam Tsuen River.

(T1- located at upper river channel sampling site to T4 - located at lower river Channel sampling site)

Common Name	Species name	Chinese name	Status	Commonness	Post construction monitoring					Post construction monitoring					Post construction monitoring					Post construction monitoring					Post construction monitoring					Post construction monitoring					Post construction monitoring					Post construction monitoring					Post construction monitoring					Post construction monitoring				
					Feb-16					Mar-16					Apr-16					May-16					Jun-16					Jul-16					Aug-16					Sep-16					Oct-16					Nov-16				
					Abundance					Abundance					Abundance					Abundance					Abundance					Abundance					Abundance					Abundance					Abundance					Abundance				
					C	T1	T2	T3	T4	C	T1	T2	T3	T4	C	T1	T2	T3	T4	C	T1	T2	T3	T4	C	T1	T2	T3	T4	C	T1	T2	T3	T4	C	T1	T2	T3	T4	C	T1	T2	T3	T4	C	T1	T2	T3	T4	C	T1	T2	T3	T4
Barn Swallow	*Hirundo rustica*	家燕	PM	C						+			7		+			3	6	+			1	7	+		4	5		++		3	3	6	++		5	5		++		5	2		++			6					
Black Drongo	*Dicrurus macrocercus*	黑卷尾	Sv	C																																																	
Black Kite	*Milvus lineatus*	麻鷹	R, RC, Cap.586	C																																																
Black-faced bunting	*Emberiza spodocephala*	灰頭鵐	WV&PM	C																																															
Black-necked Starling	*Sturnus nigricollis*	黑領椋鳥	R	C	++			2	3	++		3		3	++			3		++		2	2		++		3			+			4		+		3	2		+		4	2		+		3	3		+		3	2	
Black-winged Cuckoo-shrike	*Coracina melaschistos*	暗灰鵙鷯	PM	C																																																
Blue Whistling Thrush	*Myophonus caeruleus*	紫嘯鶇	R	C																+				1																													
Brown Shrike	*Lanius cristatus*	紅尾伯勞	PM	C																																															
Buzzard (Common Buzzard)	*Buteo buteo*	普通鵟	WV,Cap.586	C																																															
Chinese Bulbul	*Pycnonotus sinensis*	白頭鵐	R	C	++	3	2		3	++	2	2	5		++	2		3	2	++	2	3	3	2	++	3	3	3		++	2	2	5	4	++	3	3		2	++	4	2		2	++	3	2	2	2	++		3	4	
Chinese Pond Heron	*Ardeola bacchus*	池鷺	R,RC	C	+			1	1	+				1	+				1	+				1	+			1	1	+				1	1	+			1		+			1		+			1	1	
Common Kingfisher	*Alcedo atthis*	普通翠鳥	R	C	+				2	+				2	+																										+											
Common Koel	*Eudynamys scolopacea*	噪鵑	R	C	+	1				+					+					+					+					+																					
Common Sandpiper	*Actitis hypoleucos*	磯鷸	WV&PM	C										1																																					
Common Tailorbird	*Orthotomus sutorius*	長尾縫葉鶯	R	C	++	1	1			++		1	1	1	++				1	+				1	+		1	1		+		1	1		+	1	1	1	1	+		2	1		+		1	1		+		1	1	
Crested bulbul	*Pycnonotus jocosus*	紅耳鵐	R	C	+++	5	5	5	10	+++	2	5	2	10	+++	7	6	3	8	+++	5		2	10	+++	5	3	2	7	+++	7	5	5	7	+++	8	6	9	4	+++	10	3	2	7	+++	6	5	5		+++	7	8	2	2
Crested Goshawk	*Accipiter trivirgatus*	鳳頭鷹	R, CR, Cap.586	U						+								1																																	
Crested Myna	*Acridotheres cristatellus*	八哥	R	C	++	2	2			++		3	3	4	++		4	2		++		3			+			2		+			2		+		2	2		+		5			+		3	2		+		3	3	
Crested Serpent Eagle	*Spilornis cheela*	蛇鵰	R, VU, LC	U																																															
Daurian redstart	*Phoenicurus auroreus*	北紅尾鴝	WV	C	+																																														
Domestic pigeon	*Columba sp.*	鴿	R	C																																														
Dusky Warbler	*Phylloscopus fuscatus*	褐柳鶯	WV	C	+					+					+					+					+					+					+					+					+					+				
Eurasian tree sparrow	*Passer montanus*	麻鷯	R	C	++		3	2	4	++	3			5	++			3	2	++	4	1		3	++	3	2	2	3	++	4	3	2	5	++	5	3	4	5	++	4	4	4	3	++	3	3	2	3	++	4	3	3	3
Great Coucal	*Centropus sinensis*	褐翅鴉鵑	R,VU	C						+					+				1	+					+					+					+					+					+					+				
Great Tit	*Parus major(commixtus)*	大山雀	R	C						+																																									
Green Sandpiper	*Tringa ochropus*	白腰草鷸	PM&WV	C	+					+																																									
Grey Heron	*Ardea cinerea*	蒼鷺	WV,PRC	C																																														
Grey Wagtail	*Motacilla cinerea*	灰鶺鴒	WV	C	+	1		1	1	+	1	1	1	1	+	1		1	1	+	1			1	+		1		1	+				1	+				1	+		1		1	+	1			1	+	1	1	1	1
Japanese White Eye	*Zosterops japonica(simplex)*	暗綠繡眼鳥	R	C	++	2	1	5	5	++		3		4	++		3	3		++		2	3		++		3	3							+			3		+		3	2		+	4				+	3				
Jungle Crow	*Corvus macrorhynchus*	大嘴烏鴉	R	C																																															
Large Hawk Cuckoo	*Cuculus sparverioides*	鷹鵑	SV	C												+				+					+																											
Lesser Coucal	*Centropus bengalensis*	小鴉鵑	R, VU	C																																															
Little Egret	*Egretta garzetta*	小白鷺	R, RC	C	+		1		1	+			1	1	+				1	+				1	+				1	+			1	1	+		1	1	1	+		1	1		+	1	1	1		+		1	1	
Great Egret	*Ardea alba*	大白鷺	R,WV, RC	C																																															
Little Swift	*Apus affinis*	小白腰雨燕	R,SpM	C	++															++					+					+					+																
Magpie	*Pica pica*	喜鵲	R	C																																															
Magpie Robin	*Copsychus saularis*	鵲鴝	R	C	+	1	2		2	+	2			1	+	2			2	+	1	1		1	+		2			+		2	1	1	+		2	1	1	+	1	2	1	1	+	1		2	1	+	1	1	2	1
Mandarin Duck	*Aix galericulata*	鴛鴦	WV	U																																														
Masked Laughing Thrush	*Garrulax perspicillatus*	黑臉噪鹛	R	C																																														
Night Heron	*Nycticorax nycticorax*	夜鷺	R&WV, LC	C																																														
Northern Shoveler	*Anas clypeata*	琵嘴鴨	WV	C																																													
Olive Backed Pipit	*Anthus hodgsoni*	樹鷚	WV	C																																													
Oriental Dollarbird	*Eurystomus orientalis*	三寶鳥	PM	U																																													
Plaintive Cuckoo	*Cacomantis merulinus*	八聲杜鵑	SV	U											+					+					+					+																				
Red-billed Blue Magpie	*Urocissa erythrorhyncha*	紅嘴藍鵲	R	C																																													
Red-flanked Bluetail	*Tarsiger cyanurus*	紅脇藍尾鴝	PM&WV	C																																													
Rufous Turtle Dove	*Streptopelia orientalis*	山斑鳩	R	C																																													
Rufous-backed Shrike	*Lanius schach*	棕背伯勞	R	C	+			1	1	+			1							+			1		+			1						+					+											
Rufous-capped Babbler	*Stachyridopsis ruficeps*	紅頭穗鹛	R	C																																														
Scarlet Minivet	*Pericrocotus flammeus*	赤紅山椒鳥	R	C																																														
Siberian Stonechat	*Saxicola maurus*	黑喉石鵐	WV	C	+		1			+		1																																						
Sooty-headed Bulbul	*Pycnonotus aurigaster*	白喉紅臀鵐	R	U																																													
Spotted Dove	*Streptopelia chinensis*	珠頸斑鳩	R	C	++	1	2	1	6	++	1	2	1	6	++	2	3	3	4	++	3	3	3	4	++	2	1	1	2	++	3	2	3	3	++	4	5	2	4	++	5		4		++	3	3	3	2					
Spotted Munia	*Lonchura punctulata*	斑文鳥	R	C																																														
Velvet-fronted Nuthatch	*Sitta frontalis*	絨額鳭	R	C																																															
White Wagtail	*Motacilla alba*	白鶺鴒	WV	C	+	1	1	1		+	1	1	1		+		1	1	2	+		1	1		+		1	1	+				1	+		1		1	+	2	1			+	1	1	2	1					
White-breasted Waterhen	*Amaurornis phoenicurus*	白胸苦惡鳥	R	C						+				1																																					
White-throated Kingfisher	*Halcyon smyrnensis*	白胸翡翠	R, LC	C																																															
White-rumped Munia	*Lonchura striata*	白腰文鳥	R	C																+																															
Yellow Bellid Prinia	*Prinia flaviventris*	黃腹鷦鶯	R	C	+					+					+					+					+					+					+					+											
Yellow Wagtail	*Motacilla flava*	黃鶺鴒	WV&PM	U																																															
Zitting cisticola	*Cisticola juncidis*	棕扇尾鶯	WV&PM	C																																															
Number of birds						18	21	19	39		12	22	23	41		14	17	25	32		16	16	16	32		13	23	21	16		16	18	28	30		21	35	28	21		24	39	17	19		26	20	29	6		20	29	26	10
No. of species					22	10	11	9	12	24	7	10	10	14	21	6	5	10	13	24	6	8	8	11	22	4	10	10	7	19	4	7	11	10	19	5	12	10	10	20	6	14	9	7	19	9	9	11	3	19	7	12	13	6

Note: R – Resident; WV – Winter visitor; PM – Passage migrant; C – Common; U – Uncommon

SpM – Spring migrant; Sv–Summer Visitor ; C – transect survey;

P1 – Point count location 1; P4 – Point count location 4

+, occurred; ++, common; +++, abundant/dominant species in the the study area

Commonness and status were decided accroding to AFCD biodiversity website (www.hkbiodiversity.net)

All bird species are under protection of Wild Animals Protection Ordinance (Cap. 170)

Endangered Species of Animals and Plants Ordinance (Cap. 586)

RC : Regional concern Fellowes *et al* (2002)

LC : Local Concern Fellowes *et al* (2002)

PRC: Potential Regional onver Fellowes *et al* (2002)

CR: Rare in China Red Data Book Status

VU: Vulnerable in China Red Data Book Status

Table 4.4. Odonate species recorded at the Upper Lam Tsuen River

					Baseline monitoring		Impact monitoring								Impact monitoring		Post construction monitoring							Post construction monitoring						
Species name	Common name	Chinese name	Status	Commonness	Jul-08	Aug-08	Jan-09	Jul-09	Jan-10	Jul-10	Jan-11	Jul-11	Jan-12	Jul-12	Aug-13	Dec-13	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14	Aug-14	Sep-14	Oct-14	Nov-14	Dec-14	Jan-15	Feb-15
Acisoma panorpoides panorpoides	Asian Pintail	雜腹蜻	NP	VC																		+								
Brachythemis contaminata	Asian Amberwing	黃翅蜻	NP	VC										+	+															
Ceriagrion auranticum ryukyuanum	Orange-tailed Sprite	琉球橘黃蟌	NP	VC																+	+	+	+	+	+	+	+	+	+	
Coeliccia cyanomelas	Blue Forest Damsel	黃紋長腹蟌	NP	VC																+										
Copera marginipes	Yellow Featherlegs	黃狹扇蟌	NP	VC	+							+		+						+		+	+	+	+	+				
Crocothemis servilia servilia	Crimson Darter	紅蜻	NP	VC	+	+	+	+		++									+	+	+	+	+	+		+	+	+	+	+
Euphaea decorata	Black-banded Gossamerwing	方帶幽蟌	NP	VC																+		+								
Ictinogomphus pertinax	Common Flangetail	霸王葉春蜓	NP	C																			+							
Ischnura senegalensis	Common Blue Jewel	褐斑異痣蟌	NP	VC																+	+	+								
Mnais lacteola	Indochinese Copperwing	煙翅絲色蟌	P, LC	C																+										
Nannophya pygmaea	Scarlet Dwarf	侏紅小蜻	P, LC	C																+										
Neurobasis chinensis	Chinese Greenwing	華麗色蟌	NP	VC						+		+	+	+	+	+			+	+	+	+	+	+	+	+	+	+		
Neurothemis fulvia	Russet Percher	網脈蜻	NP	VC																			+	+	+	+				
Neurothemis tullia tullia	Pied Percher	戴斑脈蜻	NP	C																				+						
Orthetrum chrysis	Red-faced Skimmer	華麗灰蜻	NP	VC	+	+	+	+		+		+		++	++	+														
Orthetrum glaucum	Common blue skimmer	黑尾灰蜻	NP	VC			+					+		+	+									+						
Orthetrum luzonicum	Marsh Skimmer	呂宋灰蜻	NP	VC																										
Orthetrum pruinosum neglectum	Common Red Skimmer	赤褐灰蜻	NP	VC								+									+	+	+	+	+	+				
Orthetrum sabina sabina	Green Skimmer	狹腹灰蜻	NP	VC						+														+						
Pantala flavescens	Wandering Glider	黃蜻	NP	VC	+	+		+				++					+				+					+	+	+		
Paracercion calamorum duyeri	Dusky Lilysquatter	葦尾蟌	P, LC	C																+										
Prodasineura autumnalis	Black Threadtail	烏拉原蟌	NP	VC																+	+	+	+	+	+	+				
Pseudagrion rubriceps rubriceps	Orange-faced Sprite	丹頂斑蟌	NP	UC		+															+	+	+	+	+	+	+			
Rhinocypha perforata perforata	Common Blue Jewel	三斑鼻蟌	NP	VC		+				+										+			+	+	+	+	+			
Rhyothemis variegata arria	Variegated Flutterer	斑翅翠蜻	NP	C																		+	+	+	+	+	+			
Trithemis aurora	Crimson Dropwing	曉褐蜻	NP	VC										++	+	+	+	+	+		+	+	+	+	+	+	+	+	+	+
Trithemis festiva	Indigo Dropwing	應褐蜻	NP	VC				+		+		+		+								+	+	+	+	+	+			
Zygonyx iris insignis	Emerald Cascader	彩虹蜻	P,PGC	VC																		+								
No. of species					4	5	3	4	0	6	0	7	1	7	5	3	2	1	3	12	9	14	13	15	11	13	9	4	3	2

Note: NP – Not protected in Hong Kong; P-Protection in Hong Kong

"VC" – Very Common; "UC" – Uncommon; "C" - Common

"+" – Species exists in the study area

"++" – Species common in the study area

"+++" – Species abundant/dominant in study area

Commonness and status were decided accroding to AFCD biodiversity website (www.hkbiodiversity.net)

LC- Local Concern - Fellowes *et al* (2002)

PGC - Potential Global Concern - Fellowes *et al* (2002)

Table 4.4. Odonate species recorded at the Upper Lam Tsuen River

					Post construction monitoring							Post construction monitoring												
Species name	Common name	Chinese name	Status	Commonness	Mar-15	Apr-15	May-15	Jun-15	Jul-15	Aug-15	Sep-15	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16
Acisoma panorpoides panorpoides	Asian Pintail	雜腹蜻	NP	VC					+																
Brachythemis contaminata	Asian Amberwing	黃翅蜻	NP	VC																					
Ceriagrion auranticum ryukyuanum	Orange-tailed Sprite	琉球橘黃蟌	NP	VC		+	+	+	+	+	+							+	+	+	+	+	+	+	
Coeliccia cyanomelas	Blue Forest Damsel	黃紋長腹蟌	NP	VC																					
Copera marginipes	Yellow Featherlegs	黃狹扇蟌	NP	VC		+	+	+	+	+	+								+	+	+	+	+		
Crocothemis servilia servilia	Crimson Darter	紅蜻	NP	VC	+	+	+	+	+	+	+	+	+							+	+	+	+	+	+
Euphaea decorata	Black-banded Gossamerwing	方帶幽蟌	NP	VC						+									+	+	+				
Ictinogomphus pertinax	Common Flangetail	霸王葉春蜓	NP	C			+	+	+	+	+	+							+	+	+	+	+		
Ischnura senegalensis	Common Blue Jewel	褐斑異痣蟌	NP	VC																					
Mnais lacteola	Indochinese Copperwing	煙翅絲色蟌	P, LC	C																					
Nannophya pygmaea	Scarlet Dwarf	侏紅小蜻	P, LC	C																					
Neurobasis chinensis	Chinese Greenwing	華麗色蟌	NP	VC	+	+	+	+	+	+	+	+	+					+	+	+	+	+	+	+	+
Neurothemis fulvia	Russet Percher	網脈蜻	NP	VC		+		+	+	+	+									+	+	+	+	+	
Neurothemis tullia tullia	Pied Percher	戴斑脈蜻	NP	C																+	+	+	+		
Orthetrum chrysis	Red-faced Skimmer	華麗灰蜻	NP	VC						+	+	+	+				+	+	+	+	+	+	+	+	+
Orthetrum glaucum	Common blue skimmer	黑尾灰蜻	NP	VC		+																			
Orthetrum luzonicum	Marsh Skimmer	呂宋灰蜻	NP	VC					+	+	+	+								+	+	+	+	+	+
Orthetrum pruinosum neglectum	Common Red Skimmer	赤褐灰蜻	NP	VC			+	+	+	+					+			+	+						
Orthetrum sabina sabina	Green Skimmer	狹腹灰蜻	NP	VC									+												
Pantala flavescens	Wandering Glider	黃蜻	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Paracercion calamorum duyeri	Dusky Lilysquatter	葦尾蟌	P, LC	C																					
Prodasineura autumnalis	Black Threadtail	烏拉原蟌	NP	VC		+	+	+	+	+	+														
Pseudagrion rubriceps rubriceps	Orange-faced Sprite	丹頂斑蟌	NP	UC			+	+																	
Rhinocypha perforata perforata	Common Blue Jewel	三斑鼻蟌	NP	VC				+	+	+	+	+							+	+	+	+	+	+	
Rhyothemis variegata arria	Variegated Flutterer	斑翅蜻蜓	NP	C																					
Trithemis aurora	Crimson Dropwing	曉褐蜻	NP	VC	+	+	+	+	+	+	+	+	+					+	+	+	+	+	+	+	+
Trithemis festiva	Indigo Dropwing	膚褐蜻	NP	VC			+	+	+	+	+	+	+	+	+		+	+	+	+	+	+	+	+	+
Zygonyx iris insignis	Emerald Cascader	彩虹蜻	P,PGC	VC																					
No. of species					4	9	11	13	14	15	13	9	7	2	3	1	3	7	11	14	14	13	13	10	7

Note: NP – Not protected in Hong Kong; P-Protection in Hong Kong

"VC" – Very Common; "UC" – Uncommon; "C" - Common

"+" – Species exists in the study area

"++" – Species common in the study area

"+++" – Species abundant/dominant in study area

Commonness and status were decided accroding to AFCD biodiversity website (www.hkbiodiversity.net)

LC- Local Concern - Fellowes *et al* (2002)

PGC - Potential Global Concern - Fellowes *et al* (2002)

Table 4.5 Aquatic Macro invertebrates recorded at Lam Tsuen River

(T1- located at upper river channel sampling site to T4 - located at lower river Channel sampling site)

				Baseline monitoring				Impact monitoring					Impact monitoring					Impact monitoring					Impact monitoring					Impact monitoring					Impact monitoring					Impact monitoring					Impact monitoring					Impact monitoring					Impact monitoring					Post construction monitoring					Post construction monitoring					Post construction monitoring					Post construction monitoring				
				Jul-08		Aug-08		Jan-09					Jul-09					Jan-10					Jul-10					Jan-11					Jul-11					Jan-12					Jul-12					Aug-13					Dec-13					Jan-14					Feb-14					Mar-14					Apr-14				
		Sampling point		Upper stream	Lower stream	Upper stream	Lower stream	Reference point	T1	T2	T3	T4	Reference point	T1	T2	T3	T4	Reference point	T1	T2	T3	T4	Reference point	T1	T2	T3	T4	Reference point	T1	T2	T3	T4	Reference point	T1	T2	T3	T4	Reference point	T1	T2	T3	T4	Reference point	T1	T2	T3	T4	Reference point	T1	T2	T3	T4	Reference point	T1	T2	T3	T4	Reference point	T1	T2	T3	T4	Reference point	T1	T2	T3	T4	Reference point	T1	T2	T3	T4	Reference point	T1	T2	T3	T4
Species name	Chinese name	Status	Commonness																																																																										
Molluscs																																																																													
Biomphalaria sp.	--	NP	VC		+	+	+					+					+					+					+		+	+	+	+									+		+	+				+	+	+			+	+				+	+				+	+	+			+	+	+		+	+	+			+
Brotia hainanensis	--	NP	VC	+++	++	++	++	+	+	+	+	+	+		+	+	+	++	++			+	++	++			+	++	+	+	+	+	+					+	+				++					++	+	+			++	+	+			++	+	+	+		++	+	+	+		++	+	+	+	+	++	+	+	+	+
Melanoides tuberculata	瘤擬黑螺	NP	VC		+		+											+					+					+			+	+	+	+				+	+	+	+		+	+				+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Pomacea canaliculata	蘋果螺	NP	VC		+		+	+	+			+	+	+			+	+	+				+	+				+			+	+	+	+				+	+	+			+	+	+	+		+	+	+	+	+			+	+	+			+	+	+	+		+	+	+	+		+	+	+	+	+	+	+	+
Radix plicatulus	羅白螺	NP	VC		+	+	+	+	+			+	+	+			+	+				+	+				+	+	+	+	+	+	+					+	+		+		+	+	+			+	+	+			+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Sinotaia quadrata	田螺	NP	VC		+		+	+	+			+	+	+			+	+	+			+	+	+			+	+	+	+	+	+	+					+	+				+	+	+			+	+	+	+		+	+	+	+	+	+	+	+		+	+	+	+	+	+	+	+	+	+	+	+	+		+	+
Insects																																																																												
Baetis sp.	--	NP	VC	+	+	+	+	+	+		+	+	+			+	+	+		+	+	+	+		+	+	+	+	+	+	+	+	+					+					+					+					+					+			+		+		+	+		+		+	+		+		+		
Caenis sp.	--	NP	VC						+	+		+	+				+	+					+		+			+					+					+																																				+				
Chironomus sp.	蠓幼虫	NP	VC	+	+	+	+	+	+	+		+	+		+		+	+		+	+	+	+		+	+	+	+	+	+	+	+	+					+	+	+			+	+	+			+	+	+			+	+	+	+		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Electrogenas sp.	--	NP	VC																									+	+	+	+	+	+					+					+					+					+					+					+	+	+			+	+	+			+	+			
Hydropsyche sp.	--	NP	VC																									+	+	+	+	+	+					+					+					+					+	+				+	+				+	+				+	+				+	+	+		
Indobaetis sp.	--	NP	VC	+	+	+	+	+	+				+					+					+					+	+	+	+	+	+					+										+					+					+			+		+			+		+	+	+	+		+	+	+		+
Mnais sp.	--	NP	VC					+	+			+																+	+	+	+	+	+					+	+	+			+	+	+	+		+	+	+	+		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Orthetrum sp.	--	NP	VC	+	+										+		+	+		+		+	+		+		+	+	+	+	+	+	+					+	+	+	+		+	+	+	+		+	+	+	+		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Crustaceans																																																																												
Caridina cantanensis	廣東米蝦	NP	VC	+	+	+	+	+	+				+					+	+				+	+				+	+			+	+	+	+	+	+	+	+	+	+		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	++	++	++	+	+	++	++	++	++	+	++	++	++	++	+	++	++	++	++
Cryptopotamon anacoluthon	鰓刺溪蟹	NP	VC	+		+																											+					+					+	+	+	+		+	+	+	+		+	+				+	+				+	+				+	+				+	+	+		
Macrobrachium hainanense	海南沼蝦	NP	VC	+	+	+	+	+	+				+					+	+				+	+				+	+			+	+	+			+	+					+					+	+				+					+					+	+	+			+	+	+	+	+	+	+	+	+	+
Somanniathelphusa zanklon	束腰蟹	NP	VC	+		+																																+																																									
No. of species				9	12	10	11	10	11	3	2	9	10	3	3	2	9	12	5	3	2	7	12	5	4	2	7	15	13	11	13	15	16	4	1	1	2	17	9	6	5	0	15	10	8	5	1	16	12	11	7	3	15	11	9	8	7	15	11	9	10	8	16	13	13	11	8	16	14	14	12	11	17	15	16	13	12

Note: NP – Not protected in Hong Kong; P - Protected in Hong Kong
“VC” – Very Common; “UC” – Uncommon; “C” - Common; "R" - Rare
+, occurred; ++, common; +++, abundant/dominant Species in the the study area

Reference point was the sampling location outside the works area.

Table 4.5 Aquatic Macro invertebrates recorded at Lam Tsuen River

(T1- located at upper river channel sampling site to T4 - located at lower river Channel sampling site)

				Post construction monitoring					Post construction monitoring					Post construction monitoring					Post construction monitoring					Post construction monitoring				
				May-14					Jun-14					Jul-14					Aug-14					Sep-14				
		Sampling point		Reference point	T1	T2	T3	T4	Reference point	T1	T2	T3	T4	Reference point	T1	T2	T3	T4	Reference point	T1	T2	T3	T4	Reference point	T1	T2	T3	T4
Species name	Chinese name	Status	Commonness																									
Molluscs																												
Biomphalaria sp.	--	NP	VC	+	+				+	+				+	+		+	+	+	+		+	+	+	+	+	+	+
Brotia hainanensis	--	NP	VC	++	+	+	+	+	++	+	+	+	+	++	+	+	+	+	++	+	+	+		++	+	+	+	
Melanoides tuberculata	瘤擬黑螺	NP	VC	+	+	+	+	+				+	+				+	+			+	+	+			+		
Pomacea canaliculata	蘋果螺	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Radix plicatulus	羅白螺	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Sinotaia quadrata	田螺	NP	VC	+	+	+	+	+	+	+			+	+	+	+		+	+	+	+	+	+	+	+	+	+	+
Insects																												
Baetis sp.	--	NP	VC			+					+			+		+			+	+	+	+		+	+	+	+	+
Caenis sp.	--	NP	VC																						+			
Chironomus sp.	蠓幼虫	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Electrogenas sp.	--	NP	VC	+	+				+	+				+	+				+	+	+			+	+	+		
Hydropsyche sp.	--	NP	VC		+						+	+		+		+	+		+		+	+		+		+	+	+
Indobaetis sp.	--	NP	VC	+	+			+	+	+		+		+	+	+	+		+	+	+	+		+	+	+	+	+
Mnais sp.	--	NP	VC	+	+		+				+					+	+			+	+	+			+	+	+	+
Orthetrum sp.	--	NP	VC	+	+	+	+		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Crustaceans																												
Caridina cantanensis	廣東米蝦	NP	VC	+	++	++	++	++	+	++	++	++	++	+	++	++	++	++	+	++	++	++	++	+	++	++	++	++
Cryptopotamon anacoluthon	鰓刺溪蟹	NP	VC		+					+	+					+	+				+	+				+	+	
Macrobrachium hainanense	海南沼蝦	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Somanniathelphusa zanklon	束腰蟹	NP	VC																									
No. of species				13	15	10	10	10	11	12	11	10	9	13	11	13	13	10	13	13	15	15	9	13	14	16	14	12

				Post construction monitoring					Post construction monitoring					Post construction monitoring					Post construction monitoring					Post construction monitoring				
				Oct-14					Nov-14					Dec-14					Jan-15					Feb-15				
		Sampling point		Reference point	T1	T2	T3	T4	Reference point	T1	T2	T3	T4	Reference point	T1	T2	T3	T4	Reference point	T1	T2	T3	T4	Reference point	T1	T2	T3	T4
Species name	Chinese name	Status	Commonness																									
Molluscs																												
Biomphalaria sp.	--	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		+		+	
Brotia hainanensis	--	NP	VC	++	+	+	+		++	++	+	+	+	++	++	+	+	+	++	++	+	+	+	++	++	+	+	+
Melanoides tuberculata	瘤擬黑螺	NP	VC			+	+	+			+	+	+				+					+	+				+	+
Pomacea canaliculata	蘋果螺	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+		+	+	+	+	+	+	+	+	+	+	+	+
Radix plicatulus	羅白螺	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Sinotaia quadrata	田螺	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Insects																												
Baetis sp.	--	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+			+	+	+		+	+	+	+		+	+
Caenis sp.	--	NP	VC																									
Chironomus sp.	蠓幼虫	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Electrogenas sp.	--	NP	VC	+	+	+			+	+	+	+		+	+	+	+		+	+				+	+	+		
Hydropsyche sp.	--	NP	VC	+		+	+		+		+			+		+			+		+			+		+		
Indobaetis sp.	--	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		+	+	+	+			+
Mnais sp.	--	NP	VC		+	+	+	+		+	+	+				+	+				+	+				+		
Orthetrum sp.	--	NP	VC	+	+	+	+	+	+	+	+		+	+	+	+		+	+		+		+					+
Crustaceans																												
Caridina cantanensis	廣東米蝦	NP	VC	+	++	++	++	++	+	++	++	++	++	+	++	++	++	++	+	++	++	++	++	+	++	++	++	++
Cryptopotamon anacoluthon	鰓刺溪蟹	NP	VC		+	+	+			+		+					+					+				+	+	
Macrobrachium hainanense	海南沼蝦	NP	VC	+	+	+	+		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Somanniathelphusa zanklon	束腰蟹	NP	VC																									
No. of species				13	14	16	15	11	13	14	15	14	12	13	12	12	13	11	13	11	11	13	12	11	12	12	11	11

				Post construction monitoring										Post construction monitoring					Post construction monitoring				
				Mar-15					Apr-15					May-15					Jun-15				
		Sampling point		Reference point	T1	T2	T3	T4	Reference point	T1	T2	T3	T4	Reference point	T1	T2	T3	T4	Reference point	T1	T2	T3	T4
Species name	Chinese name	Status	Commonness																				
Molluscs																							
Biomphalaria sp.	--	NP	VC		+		+	+				+	+					+					+
Brotia hainanensis	--	NP	VC	++	++	+	+	+	++	++	+	+	+	++	++	+	+	+	++	++	+	+	+
Melanoides tuberculata	瘤擬黑螺	NP	VC				+	+				+	+				+	+				+	+
Pomacea canaliculata	蘋果螺	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	++	++	++	++	++
Radix plicatulus	羅白螺	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Sinotaia quadrata	田螺	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Insects																							
Baetis sp.	--	NP	VC	+	+	+	+	+	+		+	+	+	+			+	+	+			+	+
Caenis sp.	--	NP	VC																				
Chironomus sp.	蠓幼虫	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Electrogenas sp.	--	NP	VC	+	+	+			+	+	+	+		+	+	+	+		+	+	+	+	
Hydropsyche sp.	--	NP	VC	+	+	+			+	+	+			+	+	+			+	+	+		
Indobaetis sp.	--	NP	VC	+	+	+		+	+	+	+	+	+	+	+	+		+	+	+	+		+
Mnais sp.	--	NP	VC				+					+					+					+	
Orthetrum sp.	--	NP	VC			+	+	+			+	+	+			+	+	+			+	+	+
Crustaceans																							
Caridina cantanensis	廣東米蝦	NP	VC	+	++	++	++	++	+	++	++	++	++	++	++	++	++	++	++	++	++	++	++
Cryptopotamon anacoluthon	鰓刺溪蟹	NP	VC			+						+					+					+	
Macrobrachium hainanense	海南沼蝦	NP	VC	+	+	+	+	+	+		+	+	+	+		+	+	+	+		+	+	+
Somanniathelphusa zanklon	束腰蟹	NP	VC																				
No. of species				11	13	13	12	12	11	9	12	15	12	11	9	11	13	12	11	9	11	13	12

Note: NP – Not protected in Hong Kong; P - Protected in Hong Kong
“VC” – Very Common; “UC” – Uncommon; “C” - Common; "R" - Rare
+, occurred; ++, common; +++, abundant/dominant Species in the the study area

Reference point was the sampling location outside the works area.

Table 4.5 Aquatic Macro invertebrates recorded at Lam Tsuen River

(T1- located at upper river channel sampling site to T4 - located at lower river Channel sampling site)

				Post construction monitoring					Post construction monitoring					Post construction monitoring					Post construction monitoring					Post construction monitoring					Post construction monitoring					Post construction monitoring					Post construction monitoring					Post construction monitoring				
				Jul-15					Aug-15					Sep-15					Oct-15					Nov-15					Dec-15					Jan-16					Feb-16					Mar-16					Apr-16				
		Sampling point		Reference point	T1	T2	T3	T4	Reference point	T1	T2	T3	T4	Reference point	T1	T2	T3	T4	Reference point	T1	T2	T3	T4	Reference point	T1	T2	T3	T4	Reference point	T1	T2	T3	T4	Reference point	T1	T2	T3	T4	Reference point	T1	T2	T3	T4	Reference point	T1	T2	T3	T4	Reference point	T1	T2	T3	T4
Species name	Chinese name	Status	Commonness																																														
Molluscs																																																	
Biomphalaria sp.	--	NP	VC					+					+					+					+					+					+					+					+					+				+
Brotia hainanensis	--	NP	VC	++	++	++	+	++	++	++	++	+	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++
Melanoides tuberculata	瘤擬黑螺	NP	VC				+	+				+	+				+	+				+	+				+	+				+	+				+	+				+	+				+	+			+	++
Pomacea canaliculata	福壽螺	NP	VC	++	++	++	++	++	++	++	++	++	++	++	++	++	++	+++	++	++	++	++	+++	++	++	++	++	+++	++	++	++	++	+++	++	++	++	++	+++	++	++	++	++	+++	++	++	++	+++	++	++	++	++	+++
Radix plicatulus	褶白螺	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Sinotaia quadrata	田螺	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Insects																																																	
Baetis sp.	--	NP	VC	+			+	+	+			+	+	+			+	+	+			+	+	+			+	+	+			+	+	+			+	+	+			+	+				+	+			+	+
Caenis sp.	--	NP	VC																+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Chironomus sp.	搖幼虫	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
Electrogenas sp.	--	NP	VC	+	+	+	+		+	+	+	+		+	+	+	+		+	+	+	+		+	+	+	+		+	+	+	+		+	+	+			+	+	+			+	+	+			
Hydropsyche sp.	--	NP	VC	+	+	+			+	+	+			+	+	+			+	+	+			+	+	+			+	+	+		+	+	+	+			+	+	+			+	+	+			+
Indobaetis sp.	--	NP	VC	+	+	+		+	+	+	+		+	+	+	+		+	+	+	+		+	+	+	+					+					+					+									
Mnais sp.	--	NP	VC				+					+					+					+					+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Orthetrum sp.	--	NP	VC			+	+	+			+	+	+			+	+	+			+	+	+			+	+			+	+			+	+	+			+	+	+			+	+	+			+
Crustaceans																																																	
Caridina cantanensis	廣東米蝦	NP	VC	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++
Cryptopotamon anacoluthon	鰓刺溪蟹	NP	VC				+					+					+					+	+				+	+				+	+				+	+				+	+				+	+			+	+
Macrobrachium hainanense	海南沼蝦	NP	VC	+		+	+	+	+		+	+	+	+		+	+	+	+		+	+	+	+			+	+	+			+	+	+			+	+	+			+	+	+			+	+	+			+
Somanniathelphusa zanklon	束雕蟹	NP	VC																																														
No. of species				11	9	11	13	12	12	9	11	13	12	11	9	11	13	12	11	9	11	13	13	11	9	11	13	13	12	10	11	13	13	12	10	11	13	13	12	10	11	13	13	12	10	11	13	13	12	10	11	13	13

Note: NP – Not protected in Hong Kong; P - Protected in Hong Kong
"VC" – Very Common; "UC" – Uncommon; "C" - Common; "R" - Rare
+, occurred; ++, common; +++, abundant/dominant Species in the the study area
Reference point was the sampling location outside the works area.

Table 4.5 Aquatic Macro invertebrates recorded at Lam Tsuen River

(T1- located at upper river channel sampling site to T4 - located at lower river Channel sampling site)

				Post construction monitoring					Post construction monitoring					Post construction monitoring					Post construction monitoring					Post construction monitoring					Post construction monitoring					Post construction monitoring				
				May-16					Jun-16					Jul-16					Aug-16					Sep-16					Oct-16					Nov-16				
		Sampling point		Reference point	T1	T2	T3	T4	Reference point	T1	T2	T3	T4	Reference point	T1	T2	T3	T4	Reference point	T1	T2	T3	T4	Reference point	T1	T2	T3	T4	Reference point	T1	T2	T3	T4	Reference point	T1	T2	T3	T4
Species name	Chinese name	Status	Commonness																																			
Molluscs																																						
Biomphalaria sp.	--	NP	VC					+					+					+					+					+					+					+
Brotia hainanensis	--	NP	VC	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++
Melanoides tuberculata	瘤擬黑螺	NP	VC	+			+	++	+			+	++	+			+	++	++			+	++	+			+	++	+			+	++	+			+	++
Pomacea canaliculata	福壽螺	NP	VC	++	++	++	+++	+++	++	++	++	+++	+++	++	++	++	+++	+++	++	++	++	+++	+++	++	++	++	+++	+++	++	++	++	+++	+++	++	++	+++	+++	+++
Radix plicatulus	褶白螺	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Sinotaia quadrata	田螺	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Insects																																						
Baetis sp.	--	NP	VC	+			+	+	+			+	+	+			+	+	+			+	+	+			+	+	+			+	+	+			+	+
Caenis sp.	--	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Chironomus sp.	搖幼虫	NP	VC	+	+	+	+		+	+	+	+		+	+	+	+		+	+	+	+		+	+	+	+		+	+	+	+		+	+	+	+	
Electrogenas sp.	--	NP	VC	+	+	+		+	+	+			+	+	+			+	+	+			+	+	+			+	+	+			+	+	+			+	
Hydropsyche sp.	--	NP	VC	+	+	+		+	+	+		+	+	+	+		+	+	+	+		+	+	+	+		+	+	+		+	+	+	+		+	+	+
Indobaetis sp.	--	NP	VC				+				+					+					+					+					+					+		
Mnais sp.	--	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Orthetrum sp.	--	NP	VC			+	+	+			+	+	+			+	+	+			+	+	+			+	+			+	+	+			+	+	+
Crustaceans																																						
Caridina cantanensis	廣東米蝦	NP	VC	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++
Cryptopotamon anacoluthon	鰓刺溪蟹	NP	VC				+	+				+	+				+	+				+	+				+	+				+	+				+	+
Macrobrachium hainanense	海南沼蝦	NP	VC	+		+	+	+	+		+	+	+	+		+	+	+	+		+	+	+			+	+	+			+	+	+			+	+	+
Somanniathelphusa zanklon	束腹蟹	NP	VC																																			
No. of species				13	10	11	13	13	13	10	12	14	14	13	10	12	14	14	13	10	12	14	14	13	10	12	14	14	13	10	12	14	14	13	10	12	14	14

Note: NP – Not protected in Hong Kong; P - Protected in Hong Kong
"VC" – Very Common; "UC" – Uncommon; "C" - Common; "R" - Rare
+, occurred; ++, common; +++, abundant/dominant Species in the the study area
Reference point was the sampling location outside the works area.

Table 4.6 Fish species and amphibians at Upper Lam Tsuen River

(T1- located at upper river channel sampling site to T4 - located at lower river Channel sampling site)

				Baseline monitoring				Impact monitoring					Impact monitoring					Impact monitoring					Impact monitoring					Impact monitoring					Impact monitoring					Impact monitoring					Impact monitoring					Impact monitoring					Post construction monitoring				
				Jul-08		Aug-08		Jan-09					Jul-09					Jan-10					Jul-10					Jan-11					Jul-11					Jan-12					Jul-12					Aug-13					Dec-13					Jan-14				
			Sampling point	Upper stream	Lower stream	Upper stream	Lower stream	Reference	T1	T2	T3	T4	Reference	T1	T2	T3	T4	Reference	T1	T2	T3	T4	Reference	T1	T2	T3	T4	Reference	T1	T2	T3	T4	Reference	T1	T2	T3	T4	Reference	T1	T2	T3	T4	Reference	T1	T2	T3	T4	Reference	T1	T2	T3	T4	Reference	T1	T2	T3	T4
Species	Chinese name	Status	Commonnes																																																							
Fish																																																								
Acrossocheilus parallens	間絲光唇魚	P, PGC	R		+		+				+					+																																									
Channa maculate	斑鱧	NP	C				+																																																	
Cirrhina molitorella	鯪魚	NP	C																					+					+																											
Clarias fuscus	胡子鯰	NP	C																											+		+																								
Cyprinus carpio var. viridiviolaceus	鏡鯉	NP	C																			+																																		
Gambusia affinis	食蚊魚	NP	VC			+	+	+			+	++	+		+	+		+					+			++	++	+				+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Liniparhomaloptera disparis	凝平鰍	NP	C																																																						
Misgurnus anguillicaudatus	泥鰍	NP	C	+		+												+			+					+					+					+					+											+				
Oreochromis niloticus	尼羅口孵非鯽	NP	C		+		+									+					+	+	++				+	+	+				+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Parazacco spilurus	巖鱊	V and NP	C	+		+												+	+								+	+				+					+	+	+			+	+	+	+										
Poecilia reticulate	孔雀花魚鱂	NP	VC			+	+							+							+	+				+										+	+	+			+														
Pseudogastromyzon myersi	麥氏擬腹吸鰍	NP	C		+	+	+	++	++	++	+		++	++	+	+	+	++	++				++	+++	+	+		++	+				++	+				+					+					+					+				
Pterocryptis cochinchinensis	斑鮡	NP	C																																																				
Puntius semifasciolatus	七星魚	NP	C	++	+	++	+	+	+		++					+	++					+	+	+	+	+	+				+	+				+	+	+			+	+	+								+					+				
Rhinogobius spp.	鰕虎魚	NP	C/UN/R		+	+	+	+	+		+								+				+	+	+	+	+	+	+	+		+		+			+	+	+			+	+	+								+				
Schistura fasciolata	橫紋南鰍	NP	C		+	+	+	+	+	+	+		+					+	+				+	+	+			+	+				+	+				+	+	+			+	+	+								+				
Xiphophorus hellerii	劍尾魚	NP	C	+	+	+	+		+	+		++	+		++	+	+	+		+	++	+	+	+	++	++	+			+	+	+			+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Xiphophorus variatus	雜色劍尾魚	NP	C			+	+	+	+		+					+									+	+																															
Zacco platypus	寬鱎鱲	NP	C	+	++	+	++	+++	+++	+++	+++		++			++	++	++		++	++	+	++	+	++	++	++	+	+	+	+	+	+	++	++																						
2x2m fish counting		No. of fish		70	60	75	60	38	45	40	40	8	38	20	5	15	7	38	20	5	15	7	32	12	6	10	20	30	22	10	7	5	10	4	2	0	0	6	3	1	0	0	8	5	2	0	0	5	2	3	2	3	5	2	3	2	3	6	20	60	20	10
No. of species				5	8	11	12	7	7	4	8	2	5	3	3	5	6	5	3	2	2	2	9	8	10	13	9	9	7	4	4	8	10	8	9	5	3	12	8	6	4	3	14	10	10	4	3	14	11	11	6	4	14	9	12	8	6	14	10	13	11	6
Amphibian																																																									
Paramesotriton hongkongensis	香港瘰螈	P (Cap 170, NT, PGC)	R	+		+	+	+	+			+	+				+	+	+		+	+	+					+		+	+								+		+	+					+					+	+	+	+	+	+	+	+	+	+
Fejervarya limnocharis	澤蛙	NP	VC																																																				
No. of species				1	0	1	1	1	1	0	0	1	1	0	0	0	1	1	1	0	1	1	1	0	0	0	0	1	0	0	1	1	1	0	0	0	0	1	0	1	1	0	0	0	0	1	0	1	0	1	1	0	1	1	1	1	1	1	1	1	1

Note: NP – Not protected in Hong Kong

"VC" – Very Common; "UC" – Uncommon; "C" - Common; "R" - Rare

+, occurred; ++, common; +++, abundant/dominant Species in the the study area

-V – Listed as vulnerable in China Fish Red Data Book

-Reference point was the sampling location outside the works area used to compare the with the data within works area.

"Cap 170" - List in Wild Animials Protcetion Ordinance (Cap.170)

"NT" - Near Treatened in IUCN Red List Status

"PGC"-Potential Golal Concern by Fellowes *et al* (2002)

Table 4.6 Fish species and amphibians at Upper Lam Tsuen River

(T1- located at upper river channel sampling site to T4 - located at lower river Channel sampling site)

				Post construction monitoring					Post construction monitoring					Post construction monitoring					Post construction monitoring					Post construction monitoring					Post construction monitoring					Post construction monitoring					Post construction monitoring				
				Feb-14					Mar-14					Apr-14					May-14					Jun-14					Jul-14					Aug-14					Sep-14				
			Sampling point	Reference	T1	T2	T3	T4	Reference	T1	T2	T3	T4	Reference	T1	T2	T3	T4	Reference	T1	T2	T3	T4	Reference	T1	T2	T3	T4	Reference	T1	T2	T3	T4	Reference	T1	T2	T3	T4	Reference	T1	T2	T3	T4
Species	Chinese name	Status	Commonnes																																								
Fish																																											
Acrossocheilus parallens	側條光唇魚	P, PGC	R	+	+	++	+++	+	+	++	++	+++	++		++	++	+++	++		+	+	+	+		+	+	+	+		+	++	++	+		++	++	++	+		++	++	++	+
Channa maculate	斑鱧	NP	C																																							
Cirrhina molitorella	鯪魚	NP	C												+																												
Clarias fuscus	胡子鯰	NP	C	+		+			+			+	+				+	+					+					+															+
Cyprinus carpio var. viridiviolaceus	鏡鯉	NP	C			+					+				+																											
Gambusia affinis	食蚊魚	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Liniparhomaloptera disparis	薤平鰍	NP	C						+	+	+	+		+	+	+	+		+	+	+	+		+	+	+			+	+	+			+	+	+	+		+	+	+	+
Misgurnus anguillicaudatus	泥鰍	NP	C	+		+			+		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Oreochromis niloticus	尼羅口孵非鯽	NP	C	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+			+	+	+		+	+	+	+			+	+	+	+	+	+	+
Parazacco spilurus	巖鱊	V and NP	C	+	+	+	+		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Poecilia reticulate	孔雀花魚鱂	NP	VC			+	+				+	+	+			+	+	+				+	+			+	+	+				+	+	+					+	+	+	+
Pseudogastromyzon myersi	麥氏擬腹吸鰍	NP	C	+	+	+			+	+	+			+	+				+	+				+	+				+	+				+	+	+			+	+	+	+	
Pterocryptis cochinchinensis	斑鮠	NP	C	+			+		+			+		+			+		+					+			+		+			+						+	+	+	+	
Puntius semifasciolatus	七星魚	NP	C	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Rhinogobius spp.	鰕虎魚	NP	C/UN/R	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Schistura fasciolata	橫紋南鰍	NP	C	+	+	+			+	+	+			+	+				+	+	+			+	+	+	+		+	+	+	+		+	+	+	+		+	+	+	+	+
Xiphophorus hellerii	劍尾魚	NP	C	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		+	+	+	+		+	+	++	++	+		+	++	++	+			
Xiphophorus variatus	雜色劍尾魚	NP	C	+		+	+		+		+					+	+					+	+				+				+								+			
Zacco platypus	寬鱎鱲	NP	C	+	+	++	+++	++	+	+	++	+++	++	+	+	++	+++	++	+	+	++	++	++	+	+	+	+	+	+	+	+	+	+	+	+	++	++	+	+	+	+	++	+	+
2x2m fish counting		No. of fish		16	40	70	40	30	60	70	80	90	80	40	50	60	60	50	20	30	30	20	20	6	12	10	6	8	8	16	15	5	10	10	12	18	10	12	20	30	30	20	20
No. of species				14	10	15	11	7	15	11	16	14	11	11	12	16	14	12	13	13	13	12	11	10	12	13	11	11	11	12	13	12	11	10	12	13	13	11	11	13	14	15	13
Amphibian																																												
Paramesotriton hongkongensis	香港瘰螈	P (Cap 170, NT, PGC)	R	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Fejervarya limnocharis	澤蛙	NP	VC																																								
No. of species				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Note: NP – Not protected in Hong Kong

"VC" – Very Common; "UC" – Uncommon; "C" - Common; "R" - Rare

+, occurred; ++, common; +++, abundant/dominant Species in the the study area

-V – Listed as vulnerable in China Fish Red Data Book

-Reference point was the sampling location outside the works area used to compare the with the data within works area.

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"PGC"-Potential Golal Concern by Fellowes *et al* (2002)

Table 4.6 Fish species and amphibians at Upper Lam Tsuen River

(T1- located at upper river channel sampling site to T4 - located at lower river Channel sampling site)

				Post construction monitoring					Post construction monitoring					Post construction monitoring					Post construction monitoring					Post construction monitoring					Post construction monitoring					Post construction monitoring				
				Oct-14					Nov-14					Dec-14					Jan-15					Feb-15					Mar-15					Apr-15					May-15				
			Sampling point	Reference	T1	T2	T3	T4	Reference	T1	T2	T3	T4	Reference	T1	T2	T3	T4	Reference	T1	T2	T3	T4	Reference	T1	T2	T3	T4	Reference	T1	T2	T3	T4	Reference	T1	T2	T3	T4	Reference	T1	T2	T3	T4
Species	Chinese name	Status	Commonnes																																							
Fish																																										
Acrossocheilus parallens	側條光唇魚	P, PGC	R		++	++	++	+		++	++	++	++		++	++	++	++		++	++	++	++		++	++	++	++		++	++	++	++		+	+	++	++
Channa maculate	斑鱧	NP	C																																					+
Cirrhina molitorella	鯪魚	NP	C																																					
Clarias fuscus	胡子鯰	NP	C					+					+					+					+					+					+								+
Cyprinus carpio var. viridiviolaceus	鏡鯉	NP	C																																					
Gambusia affinis	食蚊魚	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Liniparhomaloptera disparis	薛平鰍	NP	C	+	+	+	+		+	+	+			+	+	+	+		+	+	+	+		+	+	+	+		+	+	+	+		+	+	+	+		
Misgurnus anguillicaudatus	泥鰍	NP	C	+	+	+	+	+	+	+	+	+	+	+			+	+	+				+	+				+	+		+	+	+	+	+	+	+	+	+
Oreochromis niloticus	尼羅口孵非鯽	NP	C		+	+	+	+		+	+	+	+		+	+	+	+		+	+	+	+		+	+	+	+		+	+	+	+	+	+	+	+	+
Parazacco spilurus	巖鱊	V and NP	C	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	++	+	+	+	+	+	+	+	+
Poecilia reticulate	孔雀花魚鱂	NP	VC			+	+	+			+	+					+					+								+	+				+	+		
Pseudogastromyzon myersi	麥氏擬腹吸鰍	NP	C	+	+	+	+		+	+	+	+		+	+	+	+		+	+	+	+		+	+	+	+		+	+	+	+		+	+			
Pterocryptis cochinchinensis	道鮠	NP	C	+	+	+	+		+	+	+			+	+	+			+		+	+		+	+	+	+		+	+	+	+		+				
Puntius semifasciolatus	七星魚	NP	C	+	+	++	++	+	+	+	++	++	+	+	+	++	++	+	+	+	++	++	+	+	+	++	++	+	+	+	++	++	+	+	+	++	++	++	+
Rhinogobius spp.	鰕虎魚	NP	C/UN/R	+	+	+	+	+	+	++	++	++	+	+	++	++	++	+	+	++	++	++	++	+	++	++	++	++	++	+	++	++	++	++	+	++	++	++	++
Schistura fasciolata	橫紋南鰍	NP	C	+	+	+	+		+	+	+	+		+	+	+			+	+	+	+		+	+	+	+		+	+	+	+		+	+	+		
Xiphophorus hellerii	劍尾魚	NP	C		+	++	++	+		+	++	++	+		+	++	++	+		+	++	++	+		+	++	++	+		+	++	++	+		+	+	++	+	+
Xiphophorus variatus	雜色劍尾魚	NP	C				+	+				+	+				+	+				+					+				+	+				+	+		
Zacco platypus	寬鱂鱲	NP	C	+	++	++	+	+	+	++	++	+	+	+	++	++	+	+	+	++	++	++	+	+	++	++	++	+	+	++	++	++	+	+	++	++	+	+	+
2x2m fish counting		No. of fish		30	40	40	30	30	50	70	70	60	60	60	60	60	50	50	50	50	60	60	60	40	50	60	60	60	40	40	50	55	50	40	20	30	30	20	20
No. of species				11	13	14	15	12	11	13	14	13	11	11	13	14	14	11	10	11	12	13	10	10	11	12	14	10	10	13	13	14	11	13	12	14	15	11	13	12	14	12	13
Amphibian																																										
Paramesotriton hongkongensis	香港瘰螈	P (Cap 170, NT, PGC)	R	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Fejervarya limnocharis	澤蛙	NP	VC																																					
No. of species				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Note: NP – Not protected in Hong Kong

"VC" – Very Common; "UC" – Uncommon; "C" - Common; "R" - Rare

+, occurred; ++, common; +++, abundant/dominant Species in the the study area

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Table 4.6 Fish species and amphibians at Upper Lam Tsuen River

(T1- located at upper river channel sampling site to T4 - located at lower river Channel sampling site)

				Post construction monitoring					Post construction monitoring					Post construction monitoring					Post construction monitoring					Post construction monitoring					Post construction monitoring					Post construction monitoring					Post construction monitoring					Post construction monitoring				
				Jun-15					Jul-15					Aug-15					Sep-15					Oct-15					Nov-15					Dec-15					Jan-16					Feb-16					Mar-16				
			Sampling point	Reference	T1	T2	T3	T4	Reference	T1	T2	T3	T4	Reference	T1	T2	T3	T4	Reference	T1	T2	T3	T4	Reference	T1	T2	T3	T4	Reference	T1	T2	T3	T4	Reference	T1	T2	T3	T4	Reference	T1	T2	T3	T4	Reference	T1	T2	T3	T4	Reference	T1	T2	T3	T4
Species	Chinese name	Status	Commonnes																																															
Fish																																																		
Acrossocheilus parallens	側條光唇魚	P, PGC	R		+	+	++	++		+	+	+	+		+	+	+	+			+	+	+			+	+	+				+	+	++			+	+	++			+	+	++						
Channa maculate	斑鱧	NP	C					+					+					+					+					+					+																
Cirrhina molitorella	鯪魚	NP	C																																															
Clarias fuscus	胡子鯰	NP	C					+					+					+					+					+					+																
Cyprinus carpio var. viridiviolaceus	鏡鯉	NP	C				+					+					+					+					+																						
Gambusia affinis	食蚊魚	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Liniparhomaloptera disparis	擬平鰍	NP	C	+	+	+	+		+	+	+	+		+	+	+	+		+	+	+	+		+	+	+	+		+	+	+	+		+	+	+	+		+	+	+	+		+	+	+	+	+
Misgurnus anguillicaudatus	泥鰍	NP	C	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Oreochromis niloticus	尼羅口孵非鯽	NP	C	+	+	++	+	+	+	++	++	++	++	+	++	++	++	++	+	+	++	++	++	+	+	++	++	++	+	+	++	++	++	+	+	++	++	++	+	+	++	++	++	+	+	++	++	++	+	+	++	++	++
Parazacco spilurus	巖鱊	V and NP	C	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		+	+	+	+			+	+	+	+			+	+	+	+			+	+	+	+			+	+	+	+	+	+	+
Poecilia reticulate	孔雀花魚鱂	NP	VC			+	+	+			+	+	+			+	+	+			+	+	+			+	+	+				+	+	+				+	+	+				+	+	+			+	+	+
Pseudogastromyzon myersi	麥氏擬腹吸鰍	NP	C	+	+				+	+				+	+				+	+				+	+				+	+				+	+				+	+				+	+						
Pterocryptis cochinchinensis	斑鮠	NP	C	+					+					+					+					+					+					+					+					+							
Puntius semifasciolatus	七星魚	NP	C	+	+	++	++	+	+	+	++	++	+	+	+	++	++	+	+	+	++	++	+	+	+	++	++	+	+	+	++	++	+	+	+	++	++	+	+	+	++	++	+	+	+	++	++	+	+	+	++	++	+
Rhinogobius spp.	鰕虎魚	NP	C/UN/R	+	++	++	++	++	+	++	++	++	++	+	++	++	++	++	+	++	++	++	++	+	++	++	++	++	+	++	++	++	++	+	++	++	++	++	+	++	++	++	++	+	++	++	++	++	+	++	++	++
Schistura fasciolata	橫紋南鰍	NP	C	+	+	+			+	++	++			+	++	++			+	++	++			+	++	++			+	++	++			+	++	++			+	++	++			+	++	++			+	++	++	
Xiphophorus hellerii	劍尾魚	NP	C	+	+	++	+	+	+	+	++	+	+	+	+	++	+	+	+	+	++	+	+	+	+	++	+	+	+	+	++	+	+	+	+	++	+	+	+	+	++	+	+	+	+	++	+	+	+	+	++	+
Xiphophorus variatus	雜色劍尾魚	NP	C			+	+				+	+				+	+				+	+				+	+				+	+				+	+				+	+				+	+			
Zacco platypus	寬鱂鰱	NP	C	+	++	++	+	+	+	++	++	+	+	+	++	++	+	+	+	+	++	++	+	+	+	++	++	+	+	+	++	++	+	+	+	++	++	+	+	+	++	++	+	+	+	++	++	+	+	+	++	++	+
2x2m fish counting		No. of fish		20	30	30	20	20	12	15	18	8	7	15	12	16	10	10	18	15	20	15	15	25	20	22	18	20	40	35	40	35	40	55	40	45	45	40	60	50	50	50	40	65	55	55	55	40	60	60	60	55	40
No. of species				12	13	13	13	12	12	12	13	13	12	12	12	13	13	12	12	10	13	13	12	12	10	13	13	12	12	10	13	13	12	12	10	13	12	12	12	10	14	13	10	12	10	14	13	10	12	10	14	13	10
Amphibian																																																		
Paramesotriton hongkongensis	香港瘰螈	P (Cap 170, NT, PGC)	R	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Fejervarya limnocharis	澤蛙	NP	VC																																															
No. of species				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Note: NP – Not protected in Hong Kong

"VC" – Very Common; "UC" – Uncommon; "C" - Common; "R" - Rare

+, occurred; ++, common; +++, abundant/dominant Species in the the study area

-V – Listed as vulnerable in China Fish Red Data Book

-Reference point was the sampling location outside the works area used to compare the with the data within works area.

"Cap 170" - List in Wild Animials Protcetion Ordinance (Cap.170)

"NT" - Near Treatened in IUCN Red List Status

"PGC"-Potential Golal Concern by Fellowes *et al* (2002)

Table 4.6 Fish species and amphibians at Upper Lam Tsuen River

(T1- located at upper river channel sampling site to T4 - located at lower river Channel sampling site)

				Post construction monitoring					Post construction monitoring					Post construction monitoring					Post construction monitoring					Post construction monitoring					Post construction monitoring					Post construction monitoring					Post construction monitoring				
				Apr-16					May-16					Jun-16					Jul-16					Aug-16					Sep-16					Oct-16					Nov-16				
			Sampling point	Reference	T1	T2	T3	T4	Reference	T1	T2	T3	T4	Reference	T1	T2	T3	T4	Reference	T1	T2	T3	T4	Reference	T1	T2	T3	T4	Reference	T1	T2	T3	T4	Reference	T1	T2	T3	T4	Reference	T1	T2	T3	T4
Species	Chinese name	Status	Commonnes																																								
Fish																																											
Acrossocheilus parallens	側條光唇魚	P, PGC	R			+	+	++			+	+	++			+	+	++			+	+	++			+	+	++			+	+	++			+	+	++			+	+	++
Channa maculate	斑鱧	NP	C																																								
Cirrhina molitorella	鯪魚	NP	C																																									
Clarias fuscus	胡子鯰	NP	C				+					+					+					+					+					+					+					+	
Cyprinus carpio var. viridiviolaceus	鏡鯉	NP	C			+					+					+					+					+					+					+					+	
Gambusia affinis	食蚊魚	NP	VC	+		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Liniparhomaloptera disparis	擬平鰍	NP	C	+		+	+	+	+	+	+	+		+	+	+	+		+	+	+	+		+	+	+	+		+	+	+	+		+	+	+	+		+	+	+	+	
Misgurnus anguillicaudatus	泥鰍	NP	C	+		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Oreochromis niloticus	尼羅口孵非鯽	NP	C	+		+	++	++	++	+	++	++	++	+	+	++	++	++	+	+	++	++	++	+	+	++	++	++	+	+	++	++	++	+	+	++	++	++	+	+	++	++	++	++
Parazacco spilurus	巢鱲	V and NP	C	+			+	+	+			+	+	+			+	+	+			+	+	+			+	+	+	+	+	+			+	+	+	+			+	+	+	+
Poecilia reticulate	孔雀花魚鱂	NP	VC				+	+	+			+	+	+			+	+	+			+	+	+			+	+	+	+	+	+			+	+	+	+			+	+	+	+
Pseudogastromyzon myersi	麥氏擬腹吸鰍	NP	C	+		+			+	+				+					+	+				+	+				+	+				+	+				+	+			
Pterocryptis cochinchinensis	斑鮠	NP	C	+					+					+					+					+					+					+					+				
Puntius semifasciolatus	七星魚	NP	C	+		+	++	++	+	+	++	++	+	+	+	++	++	+	+	+	++	++	+	+	+	++	++	++	+	+	+	++	++	++	+	+	+	++	++	++	+	+	++	++	+
Rhinogobius spp.	鰕虎魚	NP	C/UN/R	+		++	++	++	++	+	++	++	++	++	+	++	++	++	++	+	++	++	++	++	+	+	++	++	++	++	+	++	++	++	++	+	+	++	++	++	++	+	++	++	++
Schistura fasciolata	橫紋南鰍	NP	C	+		++	++			+	++	++			+	++	++			+	++	++			+	++	++			+	++	++			+	++	++			+	++	++		
Xiphophorus hellerii	劍尾魚	NP	C	+		+	++	+	+	+	++	+	+	+	+	++	+	+	+	+	++	+	+	+	+	++	+	+	+	+	+	++	+	+	+	+	++	+	+	+	+	++	+	+
Xiphophorus variatus	雜色劍尾魚	NP	C				+	+			+	+				+	+				+	+				+	+				+	+				+	+				+	+		
Zacco platypus	寬鱂鱲	NP	C	+		+	++	++	++	+	++	++	++	+	+	++	++	++	+	+	++	++	++	+	+	++	++	++	+	+	++	++	++	++	+	+	++	++	++	+	+	++	++	++
2x2m fish counting		No. of fish		45	45	45	40	30	45	25	25	20	15	40	30	25	25	20	30	20	15	20	25	20	15	15	15	25	25	20	20	25	20	25	20	20	30	30	30	30	25	
No. of species				12	10	14	13	10	12	10	14	13	10	12	10	14	13	10	12	10	14	13	10	12	10	14	13	10	12	10	14	13	10	12	10	14	13	10	12	10	14	13	10	
Amphibian																																												
Paramesotriton hongkongensis	香港瘰螈	P (Cap 170, NT, PGC)	R	+		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Fejervarya limnocharis	澤蛙	NP	VC																																								
No. of species				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Note: NP – Not protected in Hong Kong

"VC" – Very Common; "UC" – Uncommon; "C" - Common; "R" - Rare

+, occurred; ++, common; +++, abundant/dominant Species in the the study area

-V – Listed as vulnerable in China Fish Red Data Book

-Reference point was the sampling location outside the works area used to compare the with the data within works area.

"Cap 170" - List in Wild Animials Protcetion Ordinance (Cap.170)

"NT" - Near Treatened in IUCN Red List Status

"PGC"-Potential Golal Concern by Fellowes *et al* (2002)

Table 4.7 Abotic data for Upper Lam Tsuen River

(T1- located at upper river channel sampling site to T4 - located at lower river Channel sampling site)

	Baseline monitoring	Impact monitoring				Impact monitoring				Impact monitoring				Impact monitoring				Impact monitoring				Impact monitoring				Impact monitoring				Impact monitoring				Impact monitoring				Impact monitoring			
Parameter / date	8-Aug	Jan-09				Jul-09				Jan-10				Jul-10				Jan-11				Jul-11				Jan-12				Jul-12				Aug-13				Dec-13			
Replicate		T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4
DO (mg/L)	9.2	9.8	9.9	9.4	9.1	6.4	6.4	6.5	6.8	9.7	9.5	9.5	9.3	8.3	8.5	8.5	8.7	9.6	9.5	9.5	9.1	9.5	9.6	9.4	9.3	9.4	9.2	9.4	9.2	8.2	8	7.8	7.3	8.9	8.5	8.7	8.8	9.3	8.6	8.8	8.7
pH	7.49	7.24	7.36	7.53	7.44	7.1	7.25	7	7.05	7.9	8.1	8.1	8.2	7.4	7.5	7.3	7.4	7.1	7.2	7.2	7.1	7.3	7.1	7.1	7.1	7.2	6.9	6.8	6.7	6.8	7.1	7.3	7.6	6.5	6.8	6.8	7.1	6.2	6.9	7.1	7.1
Nitrate (mg N/L)	0.36	0.79	1.1	1.2	1.2	0.31	0.48	0.48	0.59	0.56	1.11	1.13	1.33	0.1	0.2	0.2	0.3	0.1	0.2	0.4	0.5	0.1	0.2	0.3	0.45	0.2	0.3	0.5	0.6	0.13	0.67	0.62	0.82	0.74	0.72	0.83	0.79	0.48	0.57	0.77	0.89
Ammonia (mg/L)	<0.01	PO4-P (µg P/L): <100				0.02	0.02	0.02	0.03	0.01	0.16	0.17	0.07	0.2	0.4	0.2	0.2	0.05	0.07	0.07	0.1	0.06	0.05	0.08	0.1	0.04	0.05	0.06	0.2	0.01	0.02	0.04	0.03	0.02	0.03	0.03	0.04	<0.01	<0.01	<0.01	<0.01
Salinity (ppt)	<0.1	<0.1	0.1	0.1	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Conductivity (µS/cm)	60	80	100	120	120	45	51	52	63	62	96	98	114	84	100	460	54	90	87	93	120	93	90	90	100	92	84	96	110	41	38	73	86	67	77	74	75	62	64	90	110
BOD (mg/L)	<2	<2	<2	<2	3	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Water flow at pool (m/s)	0.1-0.3	0.01-0.2				0.01-0.2				0.01-0.2				0.01-0.2				0.01-0.2				0.01-0.2				0.01-0.2				0.01-0.2				0.01-0.2				0.01-0.2			
Water flow at riffle (m/s)	0.4-0.7	0.2-0.5				0.2-0.5				0.2-0.6				0.2-0.6				0.2-0.6				0.2-0.6				0.2-0.6				0.2-0.6				0.2-0.6				0.2-0.6			
Sand (%)	15	15	10	10	10	10	10	10	15	8	8	8	15	8	8	8	15	8	8	8	15	8	8	8	15	10	15	10	10	10	10	10	10	10	10	10	10	5	5	5	5
Stone (%)	80	80	88	88	88	88	88	88	70	90	90	90	70	90	90	90	70	90	90	90	70	90	90	90	70	80	70	80	70	60	60	60	60	75	75	75	75	90	85	85	85
Mud (%)	5	5	2	2	2	2	2	2	5	2	2	2	5	2	2	2	5	2	2	2	5	2	2	2	5	10	15	10	20	30	30	30	30	15	15	15	15	5	10	10	10

Table 4.7 Abotic data for Upper Lam Tsuen River

(T1- located at upper river channel sampling site to T4 - located at lower river Channel sampling site)

	Post construction monitoring				Post construction monitoring				Post construction monitoring				Post construction monitoring				Post construction monitoring				Post construction monitoring				Post construction monitoring				Post construction monitoring				Post construction monitoring				Post construction monitoring				Post construction monitoring				Post construction monitoring			
Parameter / date	Jan-14				Feb-14				Mar-14				Apr-14				May-14				Jun-14				Jul-14				Aug-14				Sep-14				Oct-14				Nov-14							
Replicate	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4
DO (mg/L)	9.1	9.0	8.6	8.5	7.8	8.7	9.8	9.8	7.5	7.8	8.2	8.1	7.7	7.6	7.8	8.0	8.2	7.8	8.1	8.2	7.6	7.8	7.4	7.2	7.6	7.2	7.6	7.5	7.6	7.4	7.3	7.6	8.7	8.7	8.4	8.6	7.2	7.3	8.1	7.6	7.3	7.3	8.2	7.8				
pH	6.2	6.9	7.1	7.1	8.2	8.5	8	7.8	8.3	8.2	7.6	7.2	7.6	7.8	8.2	7.8	7.7	7.8	7.9	8.2	7.6	7.8	7.8	8.1	7.6	7.7	7.8	8	7.8	7.5	7.6	7.8	8.4	8.1	8.4	8.0	8.4	8.2	8.1	8.0	8.1	8.3	8.1	8.3				
Nitrate (mg N/L)	0.9	0.8	1.3	1.26	1.3	1.8	1.6	2.1	1.2	1.4	1.1	1.3	1.5	1.5	1.3	1.2	0.9	0.7	0.6	0.7	0.8	0.8	0.9	0.9	0.8	1.1	1.1	0.8	1.2	1.1	0.9	1.1	1.2	1.3	1.2	1.2	0.9	1	0.9	1	1	1	0.9	0.9				
Ammonia (mg/L)	0.04	0.1	0.12	0.15	0.05	0.04	0.1	0.12	0.06	0.04	0.04	0.1	0.1	0.1	0.1	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1				
Salinity (ppt)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.02	0.02	0.03	0.03	0.01	0.02	0.03	0.03	0	0	0	0	0	0	0	0	0	0	0	0	0.01	0.01	0.02	0.02	0.01	0.01	0.01	0.01				
Conductivity (µS/cm)	72	78	88	108	78	87	118	119	120	123	125	123	96	114	120	122	82	80	72	66	39	58	69	70	43	85	72	75	75	78	82	86	73	77	74	72	47	50	80	88	52	56	82	84				
BOD (mg/L)	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2				
Water flow at pool (m/s)	0.01-0.2				0.01-0.2				0.01-0.2				0.01-0.2				0.01-0.2				0.03-0.2				0.03-0.2				0.03-0.2				0.03-0.2				0.03-0.2				0.03-0.2							
Water flow at riffle (m/s)	0.2-0.6				0.2-0.6				0.2-0.6				0.2-0.6				0.2-0.6				0.2-0.6				0.2-0.6				0.2-0.6				0.2-0.6				0.2-0.6				0.2-0.6							
Sand (%)	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	10	5	5	5	10	5	5	5	10	5	5	5	10	5	5	8	10	5	5	8	10	5	5	8	10	5	5	8	10				
Stone (%)	90	85	85	85	90	85	85	85	90	85	85	80	90	85	85	75	90	85	85	75	93	90	90	75	93	90	90	75	93	90	90	75	93	90	90	75	93	90	90	75	93	90	90	75				
Mud (%)	5	10	10	10	5	10	10	10	5	10	10	15	5	10	10	15	5	10	10	15	2	5	5	15	2	5	5	15	2	5	2	15	2	5	2	15	2	5	2	15	2	5	2	15				

Table 4.7 Abotic data for Upper Lam Tsuen River

(T1- located at upper river channel sampling site to T4 - located at lower river Channel sampling site)

	Post construction monitoring				Post construction monitoring				Post construction monitoring				Post construction monitoring				Post construction monitoring				Post construction monitoring				Post construction monitoring				Post construction monitoring				Post construction monitoring				Post construction monitoring				Post construction monitoring				Post construction monitoring				Post construction monitoring			
Parameter / date	Dec-14				Jan-15				Mar-15				Apr-15				May-15				Jun-15				Jul-15				Aug-15				Sep-15				Oct-15				Nov-15				Dec-15				Jan-16			
Replicate	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4
DO (mg/L)	7.2	8.1	8.2	8.2	8.9	9.2	9.3	9.2	9.2	9.1	9	9.3	8.2	8.1	8.1	8.3	8.3	8.1	8.1	8.2	8.0	8.2	8.3	8.2	8.3	8.2	8.0	8.3	8.4	8.3	8.3	8.3	8.3	8.2	8.2	8.2	8.1.	8.2	8.2	8.2	7.9	8.0	8.0	8.1	8.0	8.1	7.9	8.1	7.9	7.8	8.2	8.1
pH	8.5	8.4	8.2	8.2	7.9	8.2	8.3	7.9	7.9	8.2	8.1	7.8	8.2	8.0	8.0	8.1	7.9	8.0	7.9	8.1	7.8	7.9	7.9	8.1	7.7	7.8	7.8	7.8	7.7	7.7	7.6	7.7	7.5	7.7	7.6	7.6	7.5	7.6	7.7	7.6	7.6	7.5	7.6	7.7	7.7	7.5	7.6	7.6	7.8	7.9	7.7	7.7
Nitrate (mg N/L)	0.9	1	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.8	0.8	0.9	0.8	0.8	0.8	0.9	0.8	0.8	0.8	0.9	0.8	0.8	0.8	0.9	0.8	0.8	0.8	0.9	0.8	0.8	0.8	0.9	0.8	0.8	0.8	0.9
Ammonia (mg/L)	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Salinity (ppt)	0.02	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.01	0.02	0.02	0.02	0.01	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.0	0.0	0.0	0.0	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01
Conductivity (µS/cm)	112	92	86	67	156	153	152	163	45	89	92	94	45	89	92	94	35	45	50	43	35	45	50	43	42	32	35	55	36	42	46	38	33.0	39.0	42.0	43.0	36.0	38.0	44.0	46.0	34.0	32.0	37.0	40.0	36.0	33.0	42.0	62.0	32.0	36.0	40.0	45.0
BOD (mg/L)	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Water flow at pool (m/s)	0.03-0.2				0.03-0.2				0.03-0.2				0.03-0.2				0.03-0.2				0.03-0.2				0.03-0.2				0.03-0.2				0.03-0.2				0.03-0.2				0.03-0.2				0.03-0.2				0.03-0.2			
Water flow at riffle (m/s)	0.2-0.5				0.2-0.5				0.2-0.5				0.2-0.5				0.2-0.5				0.2-0.5				0.2-0.5				0.2-0.5				0.2-0.5				0.2-0.5				0.2-0.5				0.2-0.5				0.2-0.5			
Sand (%)	5	5	8	10	5	5	8	10	5	5	8	10	5	5	8	10	5	5	8	10	5	5	8	10	5	5	8	10	5	5	8	10	5	5	8	10	5	5	8	10	5	5	8	10	5	5	8	10	5	5	8	10
Stone (%)	93	90	90	75	93	90	90	75	93	90	90	75	93	90	90	75	93	90	90	75	93	90	90	75	93	90	90	75	93	90	90	75	93	90	90	75	93	90	90	75	93	90	90	75	93	90	90	75	93	90	90	75
Mud (%)	2	5	2	15	2	5	2	15	2	5	2	15	2	5	2	15	2	5	2	15	2	5	2	15	2	5	2	15	2	5	2	15	2	5	2	15	2	5	2	15	2	5	2	15	2	5	2	15	2	5	2	15

Table 4.7 Abotic data for Upper Lam Tsuen River

(T1- located at upper river channel sampling site to T4 - located at lower river Channel sampling site)

	Post construction monitoring				Post construction monitoring				Post construction monitoring				Post construction monitoring				Post construction monitoring				Post construction monitoring				Post construction monitoring				Post construction monitoring				Post construction monitoring				Post construction monitoring			
Parameter / date	Feb-16				Mar-16				Apr-16				May-16				Jun-16				Jul-16				Aug-16				Sep-16				Oct-16				Nov-16			
Replicate	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4
DO (mg/L)	8.1	8.0	8.2	8.2	8.3	8.1	8.1	8.2	8.4	8.3	8.3	8.2	8.1	8.3	8.3	8.2	7.9	8.0	8.0	7.9	7.8	7.9	7.9	7.9	8.0	8.1	8.0	8.0	8.0	8.1	8.1	8.0	7.9	7.9	8.0	8.0	7.9	8.0	8.0	8.0
pH	7.7	7.8	7.7	7.6	7.8	7.7	7.7	7.7	7.6	7.7	7.6	7.7	7.7	7.7	7.5	7.6	7.6	7.7	7.6	7.7	7.7	7.6	7.6	7.7	7.7	7.7	7.6	7.7	7.7	7.6	7.6	7.7	7.7	7.7	7.6	7.7	7.6	7.7	7.6	7.7
Nitrate (mg N/L)	0.8	0.8	0.8	0.9	0.8	0.8	0.8	0.9	0.8	0.8	0.8	0.9	0.8	0.8	0.8	0.9	0.8	0.8	0.8	0.9	0.8	0.8	0.8	0.9	0.8	0.8	0.8	0.9	0.8	0.8	0.8	0.9	0.8	0.8	0.8	0.9	0.8	0.8	0.8	0.9
Ammonia (mg/L)	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Salinity (ppt)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01
Conductivity (µS/cm)	34.0	32.0	42.0	43.0	32.0	34.0	45.0	42.0	26.0	32.0	44.0	35.0	33.0	34.0	32.0	31.0	32.0	33.0	34.0	33.0	29.0	32.0	31.0	39.0	32.0	39.0	40.0	42.0	33.0	34.0	39.0	43.0	29.0	32.0	34.0	45.0	28.0	31.0	31.0	32.0
BOD (mg/L)	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Water flow at pool (m/s)	0.03-0.2				0.03-0.2				0.03-0.2				0.03-0.2				0.03-0.2				0.03-0.2				0.03-0.2				0.03-0.2				0.03-0.2				0.03-0.2			
Water flow at riffle (m/s)	0.2-0.5				0.2-0.5				0.2-0.5				0.2-0.5				0.2-0.5				0.2-0.5				0.2-0.5				0.2-0.5				0.2-0.5				0.2-0.5			
Sand (%)	5	5	8	10	5	5	8	10	5	5	8	10	5	5	8	10	5	5	8	10	5	5	8	10	5	5	8	10	5	5	8	10	5	5	8	10	5	5	8	10
Stone (%)	93	90	90	75	93	90	90	75	93	90	90	75	93	90	90	75	93	90	90	75	93	90	90	75	93	90	90	75	93	90	90	75	93	90	90	75	93	90	90	75
Mud (%)	2	5	2	15	2	5	2	15	2	5	2	15	2	5	2	15	2	5	2	15	2	5	2	15	2	5	2	15	2	5	2	15	2	5	2	15	2	5	2	15

Agreement No. CE65/2013(EP)
Post-Construction Ecological Monitoring of River Improvement Work in Upper Lam Tsuen River, She Shan River and Upper Tai Po River – Investigation
Post-Construction Ecological Monitoring Report (No.35)
She Shan River

November 2016

Prepared by:	Mike Pang		20 December, 2016
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Ecology Team: China Hong Kong Ecology Consultants

Post-Construction Ecological Monitoring of River Improvement Work in Upper Lam Tsuen River, She Shan River and Upper Tai Po River – Investigation

Agreement No. CE65/2013(EP

Post-Construction Ecological Monitoring Report (No.35) She Shan River

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1 Introduction

1.1 Agreement No. CE65/2013(EP) Post-Construction Ecological Monitoring of River Improvement Work in Upper Lam Tsuen River, She Shan River and Upper Tai Po River – Investigation required a post-construction ecological monitoring programme when the project completed. The collected data are mainly used to assess ecological recovery process and effectiveness of ecological migration proposed and enforced during the construction period.

1.2 The scope of the ecological monitoring was detailed in EM & A Manual of the project. In brief, the survey aimed to collect data on abiotic factors such as water quality, substratum characteristics, water flow as well as flora and fauna.

1.3 China Hong Kong Ecology Consultants Ltd. was committed by Allied Environmental Consultants Ltd (AEC) to undertake the ecological monitoring tasks for the project from December 2014.

1.4 This is the number 35 post-construction ecological monitoring report for the project conducted **on 20th of November 2016**. It contains the following subsections:

- Summary of major points
- Monitoring Methods and Results
- Summary and Comments

2 Summary of Major Points

- Field ecological monitoring was undertaken **on 20th of November 2016**;
- Fauna and flora along the drainage project sections is in a process of re-establishing or restoration;
- Fish abundance was similar to last month with slight increase;
- Bird diversity and abundance was in natural fluctuation;
- Odonata abundance was similar to the record of last month with slight decrease; and
- *Paramesotriton hongkongensis* was not found during the survey.

3 Monitoring Methodology

3.1 Riparian Vegetation

Riparian vegetation, including aquatic and emergent, was sampled using line transects along the affected river channel and riparian habitat. Species, relative abundance and average heights were recorded. Vegetation survey was conducted at three selected belt transects located at the upper (T1), middle (T2) and lower portion (T3) of the river channel respectively (**Figure 1**). The belt transects was run across the river channel in order to collect quantitative data of vegetation, e.g., species inventory, height, percentage cover. Qualitative data of plants was collected by recording plant species along line transect, e.g., species inventory, relative abundance. Nomenclature and protection status of the species has followed those documented in the Lai *et al.* (2004) and Hong

Kong Herbarium (2015).

3 Avifauna

Avifauna survey was conducted during the post construction monitoring period. Special attention was given to those stream channel area which birds used as feeding and foraging habitat. Avifauna surveys were undertaken in the early morning plus species recorded in the rest of the day when conducting other taxonomic groups (benthic, fish, insect) monitoring. Numerical abundance was recorded at fixed count points within a radius of 30 to 50m according to landscape feature and visual penetration extent. The duration of the point count of birds was standardized for 10 minutes at each location in order to collect comparable data. Transect count along accessible section of river channel were used in order to collect qualitative data. Binoculars and digital camera were the main items of equipment used. Nomenclature and protection status of the species has followed in the AFCD website (www.hkbiodiversity.net) and Carey *et al.* (2001).

The point count was conducted at three locations located at the lower (T3), middle (T2) and upper (T1) portion of the river channel respectively. The point count and survey transect locations for the bird survey and sampling sites for surveys of other faunal groups and flora were presented in **Figure 1.**

3.3 Adult Odonata Survey

Adult Odonata survey was conducted along transects (**Figure 1)**. Binoculars, digital camera and hand net were utilized to aid identification. Numerical abundance, species identity and other notable behavior were recorded. Nomenclature and protection status of the species has followed those documented in the AFCD website (www.hkbiodiversity.net), Wilson *et al.* (2004) and Tam *et al.* (2011). Adult Odonata survey was conducted along line transects in parallel with river channel within the works area where access was permitted.

3.4 Aquatic Macro-invertebrates

Macro-invertebrates in the riverbed were surveyed. Four sampling sites were selected to collect necessary macro-invertebrate fauna for ecological monitoring information, which covered upper (T1), middle (T2) and lower (T3) sections of the river respectively, as well as reference site (**Figure 1**). Five replicates were taken at each sampling point and pool together for further sample process. Kick sampling and hand netting were the survey methodologies for stream organisms. Dissection microscope and digital camera were used to aid identification and enumeration. Numerical abundance, species identity was recorded. Nomenclature and protection status of the species has followed those documented in the AFCD website (www.hkbiodiversity.net), and other literatures such as Dudgeon (1994).

3.5 Fish Population and Hong Kong Newt

Fish community at the specified river channel was monitored by live trapping, hand netting and direct observation methods. Hong Kong newt was surveyed

by direct observation and hand netting as well.

Sampling was conducted at four proposed sampling locations at upper (T1), middle (T2), lower (T3) sections and reference site respectively. Those sampling sites covered major type of stream habitats, e.g. river pool and riffle (**Figure 1**). The number of the observed fish was estimated and recorded. Nomenclature and protection status of the species has followed those documented in the AFCD website (www.hkbiodiversity.net) and Lee *et al.* (2004).

3.6 Abiotic Data Collection

3.6.1 Water Quality Monitoring

Dissolved oxygen level, pH value, conductivity, salinity, BOD and nutrient level (nitrate and ammonium) were sampled and analyzed by conventional methods in situ or in laboratory. The instruments for measuring dissolved oxygen level, pH value, conductivity, salinity were model: DO-5510, AZ8685, AZ8361 and AZ8374 respectively. All the instruments were calculated every monitoring month according to the operation manuals in order to obtain the precise result. BOD test took 5 days to complete within darkness incubator with stable temperature at 20^{o}C and was performed using model: DO-5510 for measuring dissolved oxygen. Nutrient levels including nitrate and ammonia were performed in laboratory by applying the In-house method SOP056 (FIA) and SOP057 (FIA) respectively.

3.6.2 Sediment Characteristics

Sediment/substrate characteristics were recorded of sediment cover in percentage e.g. mud, sand, rock, boulder and cemented bottom in the stream bed at sampling sites.

3.6.3 Water Flow

Water flow rates in river channel were measured by recording the time taken for a floating object (e.g. floating ball) in a measured distance. The sampling locations for surveys were presented in **Figure 1.**

4 Monitoring Results

4.1 Vegetation

In total, 80 flora species was recorded within the survey transects along the river course. The recorded floras were generally common wetland species. The height of the dominated riparian grass and herb species were in a range from 0.3m to 1.5m as observed along survey transect. Dominant flora species were shown in the **Table 4.1** marked with relative abundance sign "+++". Vegetation has partially covered the river bed in middle and lower sections (Photos 1-2) and generally covered the riverbed and riparian habitat in upper sections (Photo 3). Aquatic plants *Brachiaria mutica* was the most abundant plants found along the river channel. *Mucuna championii* and *Cibotium barometz* are classified as endangered and vulnerable in China respectively, were recorded in the woodland adjacent to She Shan River. *Cibotium barometz* is also classified as category II in wild plant under state protection.

Results of vegetation survey and belt transect survey were presented in **Table 4.1** and **Table 4.2**. **Figure 1** shows the transect line for the flora surveys.

4.2 Fauna

4.2.1 Avifauna

An avifauna survey was undertaken along survey transects and at three selected point count locations. In total, 21 species of birds were recorded during the bird surveys within project area. 5 recorded species were wetland dependant birds and observed foraging in the river channel including *Ardeola bacchus, Motacilla cinerea, Egretta garzetta, Tringa ochropus* (Photo 4) and *Motacilla alba* (Photo 5). The dominant species of the river was a common species *Pycnonotus jocosus.* All the birds in Hong Kong are under protection of Wild Animals Protection Ordinance (Cap. 170). Some of wetland dependent species with conservation interest including *Ardeola bacchus* and *Egretta garzetta* were observed foraging in the river. *Ardeola bacchus* and *Egretta garzetta* are considered as Regional Concern by Fellowes *et al.* (2002). Call of *Centropus sinensis* was heard from the adjacent habitat during the survey period, this species is considered as vulnerable in China Red Data Book Status. *Accipiter soloensis,* an uncommon passage migrant, was recorded standing on electronic line above She Shan River for the first time (Photo 6). Winter visitors were also recorded during the survey such as *Saxicola stejnegeri* (Photo 7). Except foraging and roosting behaviour of some birds were observed, no other remarkable behaviour was noticed. Transect and Point Count locations were shown on **Figure 1**. Result of bird survey was presented in the **Table 4.3**.

4.2.2 Adult Odonata Survey

Odonata survey was performed and a list of recorded odonata species at She Shan River is shown in **Table 4.4**. The number of odonata species was slightly decreased comparing with last month. Most of the odoanta species in Hong Kong has the peak emergence from spring to late summer. The decrease in abundance of odoanta was due to seasonality. It is expected that number of odonata will be decreasing and keep in low abundance in the following months during dry season (Wilson *et al.,* 2004 & Tam *et al.,* 2011). A total of 8 species was recorded, those recorded species were mostly common species in Hong Kong (Photos 8-9). The result of this month was similar to approximate period of last year. Mating behavior was noticed during the survey (Photo 9). Sampling location was shown on **Figure 1**.

4.2.3 Aquatic Macro-invertebrates

Survey of aquatic marco-invertebrates was carried out (Photo 10). The river benthic fauna collected was mainly comprised of insects, mollusks and crustaceans (Photo 11-12). Details of recorded benthic fauna refer to **Table 4.5**. Sampling location was shown on **Figure 1**.

4.2.4 Hong Kong Newt

Survey of Hong Kong Newt was performed (Photo 10). However, no newt was captured or seen during the survey. Hong Kong Newt is listed in Wild Animals Protection Ordinance (Cap. 170) and classified as "Near Threatened" under IUCN Red List Status and as "Potential Global Concern" by Fellowes *et al.* (2002). Record of Hong Kong Newts can be referred to **Table 4.6.**

4.2.5 Fish Fauna

Fish surveys were performed at She Shan River and total 12 species of freshwater fish were recorded. Native fish *Zacco platypus* and *Oreochromis niloticus* were abundant species dominating in the river channel. Among the recorded fish, *Parazacco spilurus* is classified as "Vulnerable" in Red China Data Book, it was commonly observed along the river with low abundance. The number of fish recorded is similar to the record of last month with slight increase. Details of recorded of fish fauna refers to **Table 4.6.** Sampling location was shown on **Figure 1**.

4.3 Abiotic Data

Data on water quality and major stream hydrological feature (water flow and substratum) of the stream were collected and are presented in the **Table 4.7.**

Generally, the water was not polluted and nutrient levels were low even though there were cultivation activities observed nearby the river. Results of water test are presented in the **Table 4.7.**

The river substratum was comprised of over 30-80% stones or rocks in large proportion of the river sections with slow water flow (up to 0.2m/second at pool and 0.5m/second at riffle).

5 Summary and Commentary

Ecological monitoring was carried out in current months and relevant biotic and abiotic data was collected according to project specification and EM & A Manual. *Paramesotriton hongkongensis* was not recorded during the survey. The rest of fauna was in a natural fluctuation.

Aquatic plants and riparian vegetation were generally established at new drainage channel. Vegetation has generally covered the riverbed and gabion in upper section and partially covered the rest portion of the river.

Water was not polluted and nutrient levels were low to moderate.

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FIGURE

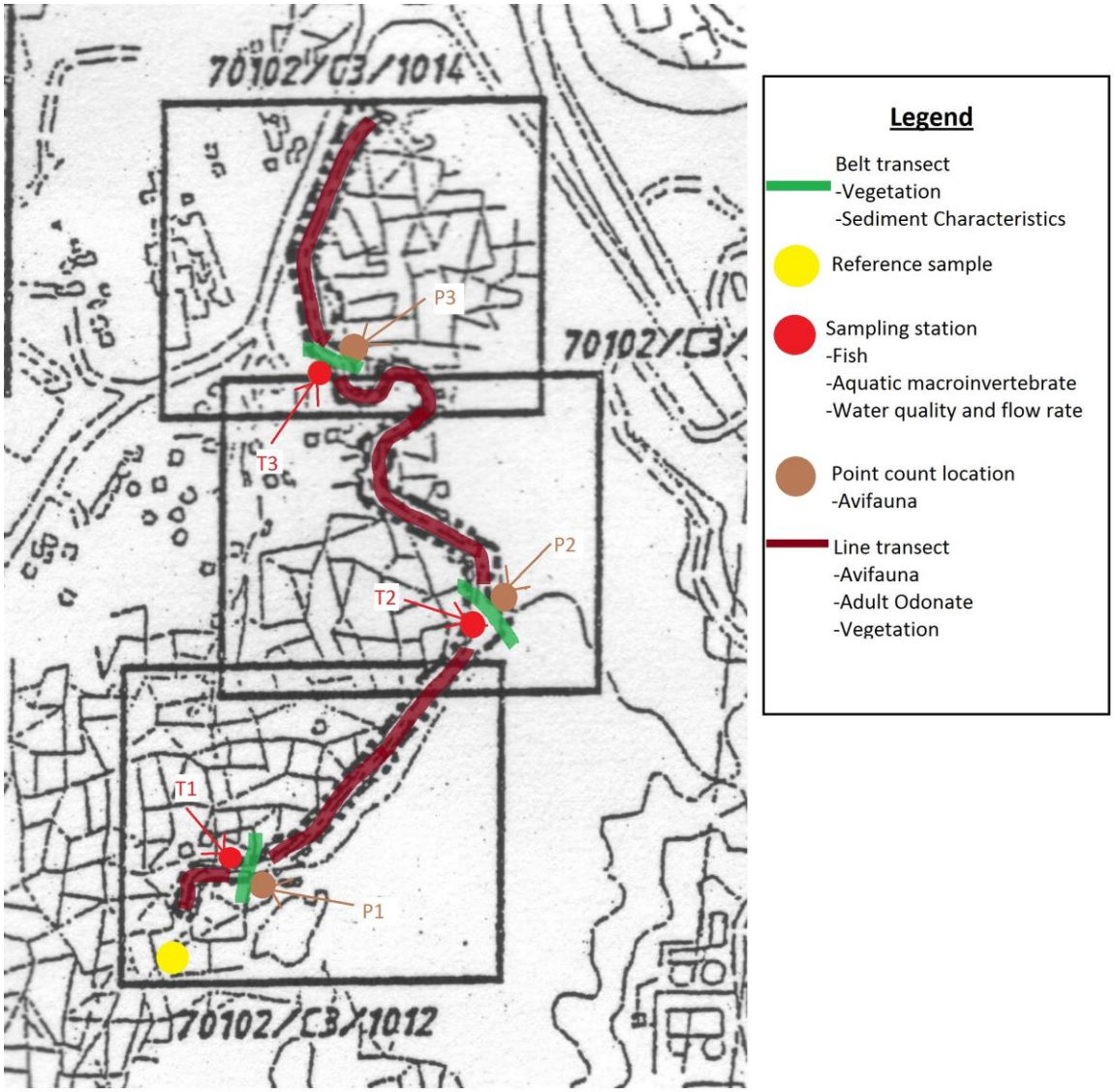


Figure 1. Sampling Location of Ecological Survey and Monitoring at She Shan River, Tai Po.

PHOTOS

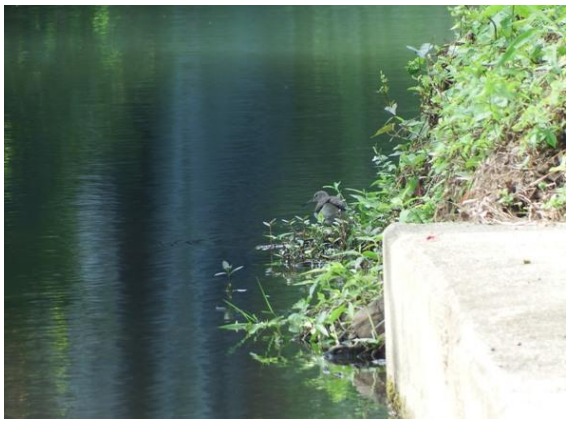
	
Photo 1: General view of the river habitat (Lower section)	Photo 2: General view of the river habitat (Middle section)
	
Photo 3 : General view of the river habitat (Upper section)	Photo 4 : Avifauna –*Tringa ochropus*
	
Photo 5 : Avifauna – *Motacilla alba*	Photo 6 : Avifauna –*Accipiter soloensis*

	
Photo 7 : Avifauna – *Saxicola stejnegeri*	Photo 8 : Odonata – *Orthetrum luzonicum*
	
Photo 9: Odonata – *Orthetrum chrysis*	Photo 10: Kick sampling
	
Photo 11: Aquatic sampling	Photo 12: Aquatic sampling

TABLE

Table 4.1. Flora species recorded along the She Shan River including riparian habitat.

				Baseline monitoring	Impact monitoring				Impact monitoring						Post construction monitoring					Post construction monitoring					Post construction monitoring					Post construction monitoring				Post construction monitoring				Post construction monitoring											
Family	Species name	Chinese name	Conservation Status	Jul to Aug 08	Jan-09	Jul-09	Jan-10	Jul-10	Jan-11	Jul-11	Jan-12	Jul-12	Jul-13	Dec-13	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14	Aug-14	Sep-14	Oct-14	Nov-14	Dec-14	Jan-15	Feb-15	Mar-15	Apr-15	May-15	Jun-15	Jul-15	Aug-15	Sep-15	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16
Riparian Plant																																																	
Acanthaceae	*Dicliptera chinensis*	狗肝菜																+	+	+	+	+	+	+	+	+																							
Acanthaceae	*Asystasia micrantha*	小花十萬錯																																							+	+	+	+	+	+	+	+	+
Actinidiaceae	*Saurauia tristyla*	水東哥																																							+	+	+	+	+	+	+	+	+
Acoraceae	*Acorus gramineus*	金錢蒲																+	+	+	+	+	+	+	+	+																							
Amaranthaceae	Alternanthera philoxeroides	空心蓮子草		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+															+	+	+	+	+	+	+	+	+
Amaranthaceae	*Celosia argentea L.*	青葙									+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+																							
Apiaceae	*Oenanthe javanica*	水芹																+	+	+	+	+	+	+																	+	+	+	+	+	+	+	+	+
Aquifoliaceae	*Ilex rotunda*	鐵冬青		+	+	+	+	+	+																																								
Araceae	*Alocasia odora*	海芋		+	+	+	+	+	+		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Araceae	*Colocasia esculenta*	芋		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Araceae	*Syngonium podophyllum*	合果芋		+	+	+	+	+	+												+	+	+	+	+	+																							
Araceae	*Pistia stratiotes*	大薸																									+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Araliaceae	*Schefflera heptaphylla*	鴨腳木																																							+	+	+	+	+	+	+	+	+
Asteraceae	*Bidens alba*	白花鬼針草		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	++	++	++	++	++	++	++	++	+	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++
Asteraceae	*Synedrella nodiflora*	金腰箭		+	+	+	+	+								+	+	+	+	+	+	+	+	+	+	+					+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Asteraceae	*Mikania micrantha*	薇甘菊		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++
Asteraceae	*Erigeron karvinskianus*	加勒比飛蓬		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+					+	+	+	+	+	+	+	+	+	+									
Asteraceae	*Eclipta prostrata*	鱧腸		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Asteraceae	*Gynura divaricata*	白子菜			+	+	+	+								+	+	+	+	+	+	+	+	+	+	+		+	+	+	+	+	+	+	+	+	+	+	+	+							+	+	+
Asteraceae	*Ageratum conyzoides*	勝紅薊									+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Asteraceae	*Emilia sonchifolia*	一點紅									+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Asteraceae	*E rechtites hieraciifolius*	梁子菜																+	+	+	+	+	+	+	+	+					+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Asteraceae	*Y oungia japonica*	黃鵪菜																+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Asteraceae	*S pilanthes paniculata*	金鈕扣																+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Asteraceae	*Gnaphalium pensylvanicum*	匙葉鼠麴草																																							+	+	+	+	+	+	+	+	+
Asteraceae	*Soliva anthemifolia*	裸柱菊																																							+	+	+	+	+	+	+	+	+
Asteraceae	*Conyza sumatrensis*	蘇門白酒草																																							+	+	+	+	+	+	+	+	+
Asteraceae	*Wedelia trilobata*	三裂葉蟛蜞菊																																							+	+	+	+	+	+	+	+	+
Athyriaceae	*Callipteris esculenta*	菜蕨		+	+	+	+	+	+					+	+	+	+	++	++	+	+	+	+	+	+	+	+	+	+	+	++	++	+	+	+	+	+	+	+	+	++	++	++	++	++	++	++	++	++
Begoniaceae	*Begonia cucullata var.hookeri*	四季秋海棠																+	+	+	+	+	+	+	+	+																							
Blechnaceae	*Blechnum orientale*	烏毛蕨											+	+	+	+	+	+	+	+	+	+	+	+	+	+																							
Brassicaceae	*Nasturtium officinale*	西洋菜		+	+	+	+	+	+					+	+++	+++	+++	+	+	+	+	+	+	+	+	+	+	++	++	++	+	+	+	+	+	+	+	++	++	++	+	+	+	+	+	+	+	+	+
Brassicaceae	*R orippa indica*	塘葛菜																+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Brassicaceae	*C apsella bursa-pastoris*	薺菜																+	+	+	+	+	+	+	+	+															+	+	+	+	+	+	+	+	+
Caesalpiniaceae	*Bauhinia championii*	缺葉藤																									+	+	+	+	+	+	+	+	+	+	+	+	+	+									
Caesalpiniaceae	*Bauhinia glauca*	羊蹄甲藤																																							+	+	+	+	+	+	+	+	+
Caryophyllaceae	*Drymaria diandra*	荷蓮豆		+	+	+	+	+	+							+	+	+	+	+	+	+	+	+			+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Caryophyllaceae	*Myosoton aquaticum*	鵝腸菜			+	+	+	+	+		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Chenopodiaceae	*Chenopodium ficifolium*	小藜																+	+	+	+	+	+	+	+	+				+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Commelinaceae	*Commelina diffusa*	節節草		+	+	+	+	++	+	+	+++	++	++	++	++ +	++ +	++ +	++ +	++	++	++	++ +	++ +	++ +	++ +	++ +	+++	+++	+++	+++	+++	+++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++
Convolvulaceae	*Pharbitis nil*	牽牛		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+																							
Convolvulaceae	*Ipomoea cairica*	五爪金龍		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Convolvulaceae	*Ipomoea aquatica*	蕹菜																																+	+	+	+	+	+	+	+	+	+	+	+	+	+
Cucurbitaceae	*Solena amplexicaulis*	茅瓜			+	+	+	+	+																																								
Cuscutaceae	*Cuscuta australis*	南方菟絲子																									+	+	+	+	+	+	+	+	+	+	+	+	+	+							+	+	+
Cyperaceae	*Cyperus sp.*	莎草						+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+									
Cyperaceae	*Cyperus involucratus*	風車草															+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Cyperaceae	*Mariscus cyperoides*	磚子苗																																							+	+	+	+	+	+	+	+	+
Cyperaceae	*Kyllinga polyphylla*	水蜈蚣																																							+	+	+	+	+	+	+	+	+
Dicksoniaceae	*Cibotium barometz*	金毛狗	Cap.567, VU, CII																																						+	+	+	+	+	+	+	+	+
Euphorbiaceae	*Macaranga tanarius*	血桐		+	+	+	+	+	+	+	+	+					+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Euphorbiaceae	*Aporusa dioica*	銀柴		+	+	+	+	+	+																																					+	+	+
Fabaceae	*Mucuna championii*	港油麻藤	EN																																			+	+	+	+	+	+	+	+	+	+	+
Fabaceae	*Pueraria lobata*	野葛		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	++	++	++	++	++	++	++	++	+	+	+	+	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++
Fabaceae	*Sesbania cannabina*	田菁									+	+	+	+	+	+	+				+	+	+	+	+	+																							
Lauraceae	*Cinnamomum burmannii*	陰香		+	+	+	+	+								+	+				+	+	+	+	+	+																							
Lauraceae	*Litsea monopetala*	假柿樹																																							+	+	+	+	+	+	+	+	+
Lauraceae	*Machilus pauhoi*	刨花潤楠																																							+	+	+	+	+	+	+	+	+
Lygodiaceae	*Lygodium japonicum*	海金沙			+	+	+	+	+									+	+	+	+	+	+	+	+	+																							
Magnoliaceae	*Michelia alba*	白蘭		+	+	+	+	+	+							+	+		+	+	+	+	+	+	+	+																							
Malvaceae	*Urena lobata*	肖梵天花																																							+	+	+	+	+	+	+	+	+
Malvaceae	*Hibiscus rosa-sinensia*	大紅花																									+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+

Table 4.1. Flora species recorded along the She Shan River including riparian habitat.

				Baseline monitoring	Impact monitoring				Impact monitoring						Post construction monitoring					Post construction monitoring					Post construction monitoring				Post construction monitoring				Post construction monitoring																	
Family	Species name	Chinese name	Conservation Status	Jul to Aug 08	Jan-09	Jul-09	Jan-10	Jul-10	Jan-11	Jul-11	Jan-12	Jul-12	Jul-13	Dec-13	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14	Aug-14	Sep-14	Oct-14	Nov-14	Dec-14	Jan-15	Feb-15	Mar-15	Apr-15	May-15	Jun-15	Jul-15	Aug-15	Sep-15	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16
Mimosaceae	*Mimosa pudica*	含羞草		+	+	+	+	+	+		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+																						
Mimosaceae	*Leucaena leucocephala*	銀合歡		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+					+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Mimosaceae	*Calliandra haematocephala*	紅絨球																+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Moraceae	*Broussonetia papyrifera*	構樹		+	+	+	+	+							+	+	+																															
Moraceae	*Ficus hispida*	對果榕		+	+	+	+	+	+		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Moraceae	*Ficus pumila*	薜荔		+	+	+	+	+	+												+	+	+	+	+																								
Moraceae	*Ficus variolosa*	變果榕		+	+	+	+	+	+																															+	+	+	+	+	+	+	+	+	+
Moraceae	*Ficus variegata*	青果榕																									+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Musaceae	*Musa paradisiaca*	大蕉		+	+	+	+	+								+	+	+	+	+	+	+	+	+	+	+				+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Myrsinaceae	*Maesa perlarius*	鯽魚胆		+	+	+	+	+																																								
Myrtaceae	*Cleistocalyx operculatus*	水翁		+	+	+	+	+	+							+	+	+	+	+	+	+	+	+	+	+			+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Onagraceae	*Ludwigia hyssopidolia*	草龍						+	+			+	+	+	+	+	+	+	+	+	+	+	+	+	+	+			+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Onagraceae	*Ludwigia erecta*	美洲水丁香											+	+	+	+	+	+	+	+	++	+++	+++	++	++	++	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Oxalidaceae	*Averrhoa carambola*	楊桃		+	+	+	+	+																																								
Oxalidaceae	*Oxalis corniculata*	酢醬草			+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+						+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Oxalidaceae	*Oxalis debilis*	紅花酢漿草																																					+	+	+	+	+	+	+	+	+	+	+
Plantaginaceae	*Plantago major*	車前草																				+	+	+	+	+														+	+	+	+	+	+	+	+	+	+	+
Poaceae	*Panicum maximum*	大黍		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Poaceae	*Panicum repens*	枯骨草		+	++	++	++	++	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Poaceae	*Brachiaria mutica*	巴拉草									++	++	++	++	++	++	++	++	++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++
Poaceae	*Pennisetum purpureum*	象草		++	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	++	++	++	++	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Poaceae	*Coix lacryma-jobi*	薏苡		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Poaceae	*Microstegium ciliatum*	刚秀竹		++	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	++	++	++	++	++	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Poaceae	*Miscanthus floridulus*	五節芒							+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Poaceae	*Pennisetum alopecuroides*	狼尾草																+	+	+	+	+	+	+	+	+																								
Poaceae	*Digitaria radicosa*	紅尾領																									+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Poaceae	*Imperata cylindrica*	大白茅																																																	
Portulacaceae	*Portulaca oleracea*	馬齒莧																																					+	+	+	+	+	+	+	+	+	+	+	+	+
Polygonaceae	*Polygonum hydropiper*	水蓼		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Polygonaceae	*Polygonum glabrum*	光蓼																																					+	+	+	+	+	+	+	+	+	+	+	+	+
Polygonaceae	*Polygonum chinense*	火炭母		+	+	+	+	+			+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+				+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Polygonaceae	*Rumex trisetifer*	假蕨菜																+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Polygonaceae	*Polygonum lapathifolium*	大馬蓼																+	+	+	+	+	+	+	+	+					+	+	+	+	+	+	+	+	+										
Polygonaceae	*Polygonum multiflorum*	何首烏																																					+	+	+	+	+	+	+	+	+	+	+	+	+
Rubiaceae	*Hedyotis corymbosa*	傘房花耳草																																					+	+	+	+	+	+	+	+	+	+	+	+	+
Rubiaceae	*Hedyotis hedyotidea*	牛白藤		+	+	+	+	+	+																																								
Sapindaceae	*Dimocarpus longan*	龍眼		+	+	+	+	+	+																																							
Solanaceae	*Solanum torvum*	水茄		+	+	+	+	+	+		+	+			+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Solanaceae	*Solanum americanum*	少花龍葵																+	+	+	+	+	+	+	+	+																								
Thelypteridaceae	*Cyclosorus parasiticus*	華南毛蕨																									+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Ulmaceae	*Celtis sinensis*	朴樹		+	+	+	+	+							+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Ulmaceae	*Celtis timorensis*	棒果朴		+	+	+	+	+	+																																							
Ulmaceae	*Trema orientalis*	異色山黃麻																+	+	+	+	+	+	+	+	+																								
Ulmaceae	*Trema tomentosa*	山黃麻									+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+																							
Urticaceae	*Boehmeria nivea*	苧麻		+	+	+	+	+						+	+	+	+	+	+	+	+	+	+	+	+	+														+	+	+	+	+	+	+	+	+	+	+
Urticaceae	*Pilea microphylla*	透明草		+	+	+	+	+	+							+	+	+	+	+	+	+	+	+	+	+																								
Urticaceae	*Pouzolzia zeylanica*	露水葛		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+																								
Verbenaceae	*Vitex quinata*	山牡荊		+	+	+	+	+																																								
Polygonaceae	*Polygonum perfoliatum*	杠板歸																+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Verbenaceae	*Lantana camara*	馬纓丹		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Floating Plant																																																		
Araceae	*Pistia stratiotes*	大漂																																																
Lemnaceae	*Lemna minor*	浮萍			+	+	+	+	+						+	+	+	+	+	+	+	+	+	+	+	+																								
Submerged Plant																																																	
Hydrocharitaceae	*Hydrilla verticillata*	黑藻																+	+	+	+	+	+	+	+	+				+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
No. of Species				48	54	54	54	57	46	23	36	36	36	40	41	51	54	67	69	69	73	74	74	74	74	74	42	46	46	51	57	57	59	59	59	61	61	61	62	62	77	77	77	77	77	77	80	80	80

Note:

"+" – Species exists in the study area

"++" – Species common in the study area

"+++" – Species abundant/dominant in study area

EN- Endanered in China

Table 4.2. Flora species recorded from belt transect survey at the She Shan River (T1- Upper stream section,T2 - middle stream section and T3 - Lower stream section)

			Baseline monitoring								Impact monitoring						Impact monitoring						Impact monitoring						Impact monitoring					
		Stream	Jul-08				Aug-08				Jan-09						Jul-09						Jan-10						Jul-10					
		Transect	P1		P3		P1		P3		T1		T2		T3		T1		T2		T3		T1		T2		T3		T1		T2		T3	
Family	Species	Chinese name	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(cm	%	Height(cm)	%	Height(cm)	%	Height(cm	%	Height(cm)	%	Height(cm)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%
Commelinaceae	*Commelina diffusa*	節節草			0.2	20			10	6	0.2	2	0.1	5	0.2	5					0.2	10	0.3	60							0.5	50	0.5	50
Poaceae	*Panicum repens*	枯骨草	0.3	5											0.2	5			0.6	5					0.6	25								
Asteraceae	*Mikania micrantha*	薇甘菊							0.2	7															0.2	5							1	20
Brassicaceae	*Nasturtium officinale*	西洋菜																																
Moraceae	*Ficus microcarpa*	細葉榕			0.7	5			0.6	7																								
Moraceae	*Ficus hispida*	對葉榕			3	10			3	10																								
Poaceae	*Microstegium ciliatum*	剛秀竹	0.5	5			0.5	3																							1.5	30		
Fabaceae	*Pueraria lobata*	野葛			0.3	5	0.5	3	0.3	5			0.2	5	0.2	5																		
Araceae	*Colocasia esculenta*	芋							0.2	5																								
Urticaceae	*Boehmeria nivea*	苧麻	1.5	30			2	7							3	10					2	5												
Asteraceae	*Bidens alba*	白花鬼針草																			0.3	5	1	5					0.5	5				
Poaceae	*Pennisetum purpureum*	象草	3	50	1	60	3	80	2	60					4	40					2	50												
Poaceae	*Coix lacryma-jobi*	薏苡																					1.5	20										
Amaranthaceae	*Alternanthera philoxeroides*	空心蓮子草	0.2	10			0.2	7													0.3	20												
Poaceae	*Panicum maximum*	大黍											0.5	5															0.4	5			1.5	5
Moraceae	*Broussonetia papyrifera*	構樹													6	5																		
Polygonaceae	*Polygonum chinense*	火炭母											0.1	10																				
Onagraceae	*Ludwigia hyssopidolia*	草龍																											0.4	5				
Cyperaceae	*Cyperus sp.*	莎草																											0.5	5				
Poaceae	*Miscanthus floridulus*	五節芒																													1.5	5		
Poaceae	*Brachiaria mutica*	巴拉草																																
Blechnaceae	*Blechnum orientale*	烏毛蕨																																
Poaceae	*Pennisetum alopecuroides*	狼尾草																																
Araceae	*Alocasia macrorrhizos*	海芋																																
Lemnaceae	*L emna minor*	浮萍																																
Polygonaceae	*Polygonum hydropiper*	水蓼																																
Cyperaceae	*Cyperus involucratus*	風車草																																
Onagraceae	*Ludwigia erecta*	美洲水丁香																																
Convolvulaceae	*Ipomoea cairica*	五爪金龍																																
Bare Gound											98		75		30		##		95		10		15		70		##		80		15		25	

P1 – Point count location 1; P3 – Point count location 3

Table 4.2. Flora species recorded from belt transect survey at the She Shan River (T1- Upper stream section,T2 - middle stream section and T3 - Lower stream section)

			Impact monitoring						Impact monitoring						Impact monitoring						Impact monitoring					
		Stream	Jan-11						Jul-11						Jan-12						Jul-12					
		Transect	T1		T2		T3		T1		T2		T3		T1		T2		T3		T1		T2		T3	
Family	Species	Chinese name	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%
Commelinaceae	*Commelina diffusa*	節節草	0.2	45	0.2	10			0.2	5	0.8	40			0.3	25	0.3	40			0.3	2	0.3	30	0.3	20
Poaceae	*Panicum repens*	枯骨草	0.3	30					0.5	20																
Asteraceae	*Mikania micrantha*	薇甘菊	0.3	5					0.3	30					0.2	15					0.2	2				
Brassicaceae	*Nasturtium officinale*	西洋菜	0.2	5																						
Moraceae	*Ficus microcarpa*	細葉榕																								
Moraceae	*Ficus hispida*	對葉榕																								
Poaceae	*Microstegium ciliatum*	剛秀竹			1.5	30					1.5	15			1	45	0.8	5					0.8	30		
Fabaceae	*Pueraria lobata*	野葛					0.3	2																		
Araceae	*Colocasia esculenta*	芋																								
Urticaceae	*Boehmeria nivea*	苧麻																								
Asteraceae	*Bidens alba*	白花鬼針草					0.5	2					Channelised		1	5			Channelised						0.3	10
Poaceae	*Pennisetum purpureum*	象草			1.5	20					1.5	15			2.5	5	2.5	25			2.5	1	2.5	5		
Poaceae	*Coix lacryma-jobi*	薏苡					1	1							2.5	2										
Amaranthaceae	*Alternanthera philoxeroides*	空心蓮子草																							0.1	5
Poaceae	*Panicum maximum*	大黍					0.4	2	1	15																
Moraceae	*Broussonetia papyrifera*	構樹																								
Polygonaceae	*Polygonum chinense*	火炭母																			0.2	2				
Onagraceae	*Ludwigia hyssopidolia*	草龍																								
Cyperaceae	*Cyperus sp.*	莎草																							1	5
Poaceae	*Miscanthus floridulus*	五節芒																								
Poaceae	*Brachiaria mutica*	巴拉草									1.5	20					1	15					1	15	1	10
Blechnaceae	*Blechnum orientale*	烏毛蕨																								
Poaceae	*Pennisetum alopecuroides*	狼尾草																								
Araceae	*Alocasia macrorrhizos*	海芋																								
Lemnaceae	*L emna minor*	浮萍																								
Polygonaceae	*Polygonum hydropiper*	水蓼																								
Cyperaceae	*Cyperus involucratus*	風車草																								
Onagraceae	*Ludwigia erecta*	美洲水丁香																								
Convolvulaceae	*Ipomoea cairica*	五爪金龍																								
Bare Gound				15		40		93		30		10		##		3		15		100		93		20		50

P1 – Point count location 1; P3 – Point count location 3

Table 4.2. Flora species recorded from belt transect survey at the She Shan River (T1- Upper stream section,T2 - middle stream section and T3 - Lower stream section)

			Impact monitoring						Impact monitoring						Post construction monitoring						Post construction monitoring					
		Stream	Jul-13						Dec-13						Jan-14						Feb-14					
		Transect	T1		T2		T3		T1		T2		T3		T1		T2		T3		T1		T2		T3	
Family	Species	Chinese name	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%
Commelinaceae	*Commelina diffusa*	節節草	0.3	15	0.3	5			0.1	10	0.5	30	0.1	1	0.2	15	0.5	30	0.2	1	0.2	20	0.5	30	0.2	5
Poaceae	*Panicum repens*	枯骨草											0.2	1					0.2	1					0.2	1
Asteraceae	*Mikania micrantha*	薇甘菊							0.1	10			0.2	1	0.1	10			0.2	1	0.1	10			0.2	1
Brassicaceae	*Nasturtium officinale*	西洋菜																								
Moraceae	*Ficus microcarpa*	細葉榕																								
Moraceae	*Ficus hispida*	對葉榕																								
Poaceae	*Microstegium ciliatum*	剛秀竹			0.8	35																				
Fabaceae	*Pueraria lobata*	野葛																								
Araceae	*Colocasia esculenta*	芋																								
Urticaceae	*Boehmeria nivea*	苧麻																								
Asteraceae	*Bidens alba*	白花鬼針草											0.3	1					0.3	1					0.4	1
Poaceae	*Pennisetum purpureum*	象草			2.5	5			1.5	10	1.5	10			1.5	10	1.5	10			1.5	10	1.5	10		
Poaceae	*Coix lacryma-jobi*	薏苡																								
Amaranthaceae	*Alternanthera philoxeroides*	空心蓮子草																								
Poaceae	*Panicum maximum*	大黍																								
Moraceae	*Broussonetia papyrifera*	構樹																								
Polygonaceae	*Polygonum chinense*	火炭母																								
Onagraceae	*Ludwigia hyssopidolia*	草龍											0.3	2					0.3	2					0.4	1
Cyperaceae	*Cyperus sp.*	莎草																								
Poaceae	*Miscanthus floridulus*	五節芒																								
Poaceae	*Brachiaria mutica*	巴拉草	1	20	1	50			1.5	60	0.8	20			1.5	60	0.8	20			1.5	55	0.8	25		
Blechnaceae	*Blechnum orientale*	烏毛蕨					0.3	1																		
Poaceae	*Pennisetum alopecuroides*	狼尾草																								
Araceae	*Alocasia macrorrhizos*	海芋																								
Lemnaceae	*L emna minor*	浮萍																								
Polygonaceae	*Polygonum hydropiper*	水蓼																								
Cyperaceae	*Cyperus involucratus*	風車草																								
Onagraceae	*Ludwigia erecta*	美洲水丁香	0.8	3			0.5	5			0.8	30					0.8	30					0.8	30		
Convolvulaceae	*Ipomoea cairica*	五爪金龍																								
Bare Gound				65		5		94		10		10		94		5		10		94		5		5		91

P1 – Point count location 1; P3 – Point count location 3

Table 4.2. Flora species recorded from belt transect survey at the She Shan River

(T1- Upper stream section,T2 - middle stream section and T3 - Lower stream section)

			Post construction monitoring						Post construction monitoring						Post construction monitoring						Post construction monitoring						Post construction monitoring					
		Stream	Mar-14						Apr-14						May-14						Jun-14						Jul-14					
		Transect	T1		T2		T3		T1		T2		T3		T1		T2		T3		T1		T2		T3		T1		T2		T3	
Family	Species	Chinese name	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m	%	Height(m	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%
Commelinaceae	*Commelina diffusa*	節節草	0.3	20	0.5	35	0.3	6			0.5	30					0.5	20					0.5	25					0.5	25		
Poaceae	*Panicum repens*	枯骨草					0.4	1																								
Asteraceae	*Mikania micrantha*	薇甘菊	0.1	10			0.2	1	0.3	10	0.3	10	0.3	1	0.3	10	0.3	10	0.3	1	0.3	10	0.3	10	0.3	1	0.3	10	0.3	10	0.3	2
Brassicaceae	*Nasturtium officinale*	西洋菜							0.3	20			0.3	5	0.3	5			0.3	5	0.3	5			0.3	5	0.3	2			0.3	2
Moraceae	*Ficus microcarpa*	細葉榕																														
Moraceae	*Ficus hispida*	對葉榕																														
Poaceae	*Microstegium ciliatum*	剛秀竹																														
Fabaceae	*Pueraria lobata*	野葛																														
Araceae	*Colocasia esculenta*	芋																														
Urticaceae	*Boehmeria nivea*	苧麻																														
Asteraceae	*Bidens alba*	白花鬼針草					0.4	1			0.3	5	0.8	1			0.3	5	0.8	1			0.3	5	0.8	1			0.3	5	0.8	2
Poaceae	*Pennisetum purpureum*	象草	1.5	5	1.5	5																										
Poaceae	*Coix lacryma-jobi*	薏苡											0.8	1					0.8	1					0.8	1					0.8	1
Amaranthaceae	*Alternanthera philoxeroides*	空心蓮子草																														
Poaceae	*Panicum maximum*	大黍																														
Moraceae	*Broussonetia papyrifera*	構樹																														
Polygonaceae	*Polygonum chinense*	火炭母																														
Onagraceae	*Ludwigia hyssopidolia*	草龍					0.4	1																								
Cyperaceae	*Cyperus sp.*	莎草																														
Poaceae	*Miscanthus floridulus*	五節芒																														
Poaceae	*Brachiaria mutica*	巴拉草	1.5	60	0.8	30			1.5	50	1	50			1.5	40	1	40			1.5	45	1	45			1.5	45	1	45		
Blechnaceae	*Blechnum orientale*	烏毛蕨																														
Poaceae	*Pennisetum alopecuroides*	狼尾草							2	20					2	15					2	15					2	12				
Araceae	*Alocasia macrorrhizos*	海芋											0.8	1					0.8	1					0.8	1					0.8	1
Lemnaceae	*L emna minor*	浮萍											N.A	5					N.A	5					N.A	5					N.A	1
Polygonaceae	*Polygonum hydropiper*	水蓼																														
Cyperaceae	*Cyperus involucratus*	風車草																														
Onagraceae	*Ludwigia erecta*	美洲水丁香			0.8	25							1	2					1	2					1	2					1	4
Convolvulaceae	*Ipomoea cairica*	五爪金龍																														
Bare Gound				5		5		90		0		5		84		30		25		84		25		15		84		31		15		87

P1 – Point count location 1; P3 – Point count location 3

Table 4.2. Flora species recorded from belt transect survey at the She Shan River (T1- Upper stream section,T2 - middle stream section and T3 - Lower stream section)

			Post construction monitoring						Post construction monitoring						Post construction monitoring						Post construction monitoring						Post construction monitoring					
		Stream	Aug-14						Sep-14						Oct-14						Nov-14						Dec-14					
		Transect	T1		T2		T3		T1		T2		T3		T1		T2		T3		T1		T2		T3		T1		T2		T3	
Family	Species	Chinese name	Height(m	%	Height(m	%	Height(m	%	Height(m	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m	%	Height(m	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%
Commelinaceae	*Commelina diffusa*	節節草			0.5	25					0.5	25			1	10	1	50	0.1	2	1	10	1	50	0.1	2	1	10	1	50	0.1	2
Poaceae	*Panicum repens*	枯骨草																														
Asteraceae	*Mikania micrantha*	薇甘菊	0.3	12	0.3	12	0.3	5	0.3	12	0.3	12	0.3	5	0.3	5	1	15	0.3	2	0.3	5	1	15	0.3	2	0.3	5	1	15	0.3	2
Brassicaceae	*Nasturtium officinale*	西洋菜	0.3	1			0.3	1	0.3	1			0.3	1																		
Moraceae	*Ficus microcarpa*	細葉榕																														
Moraceae	*Ficus hispida*	對葉榕																														
Poaceae	*Microstegium ciliatum*	剛秀竹																														
Fabaceae	*Pueraria lobata*	野葛																														
Araceae	*Colocasia esculenta*	芋																														
Urticaceae	*Boehmeria nivea*	苧麻																														
Asteraceae	*Bidens alba*	白花鬼針草			0.3	5	0.8	5			0.5	5	0.8	5	1	2	0.5	5	0.8	10	1	2	0.5	5	0.8	10	1	2	0.5	5	0.8	10
Poaceae	*Pennisetum purpureum*	象草																														
Poaceae	*Coix lacryma-jobi*	薏苡					1.2	1					1.5	1					1..5	1					1..5	1					1..5	1
Amaranthaceae	*Alternanthera philoxeroides*	空心蓮子草																														
Poaceae	*Panicum maximum*	大黍																														
Moraceae	*Broussonetia papyrifera*	構樹																														
Polygonaceae	*Polygonum chinense*	火炭母																														
Onagraceae	*Ludwigia hyssopidolia*	草龍																														
Cyperaceae	*Cyperus sp.*	莎草																														
Poaceae	*Miscanthus floridulus*	五節芒																														
Poaceae	*Brachiaria mutica*	巴拉草	1.5	50	1	50			1.5	50	1	50			1.8	65	1.8	20	1.5	5	1.8	70	1.8	25	1.5	8	1.8	70	1.8	25	1.5	8
Blechnaceae	*Blechnum orientale*	烏毛蕨																														
Poaceae	*Pennisetum alopecuroides*	狼尾草	2	10					2	10					2	15	3	5			2	10	3	2			2	10	3	2		
Araceae	*Alocasia macrorrhizos*	海芋					0.8	1					0.8	1																		
Lemnaceae	*L emna minor*	浮萍					N.A	1					N.A	1																		
Polygonaceae	*Polygonum hydropiper*	水蓼															1	3					1	1					1	1		
Cyperaceae	*Cyperus involucratus*	風車草															1.7	2					1.7	1					1.7	1		
Onagraceae	*Ludwigia erecta*	美洲水丁香					1	6					1	6	1.5	1			2	5	1.5	1			2	5	1.5	1			2	5
Convolvulaceae	*Ipomoea cairica*	五爪金龍																														
Bare Gound				27		8		80		27		8		80		2		0		75		2		1		72		2		1		72

P1 – Point count location 1; P3 – Point count location 3

Table 4.2. Flora species recorded from belt transect survey at the She Shan River

(T1- Upper stream section,T2 - middle stream section and T3 - Lower stream section)

			Post construction monitoring						Post construction monitoring						Post construction monitoring						Post construction monitoring						Post construction monitoring					
		Stream	Jan-15						Feb-15						Mar-15						Apr-15						May-15					
		Transect	T1		T2		T3		T1		T2		T3		T1		T2		T3		T1		T2		T3		T1		T2		T3	
Family	Species	Chinese name	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%
Commelinaceae	*Commelina diffusa*	節節草	0.5	10	0.8	70	0.3	40	0.6	10	1	70	0.4	40	0.6	10	1	70	0.5	40	0.6	10	1	70	0.5	40	0.3	5	0.7	50	0.5	25
Poaceae	*Panicum repens*	枯骨草																														
Asteraceae	*Mikania micrantha*	薇甘菊	0.4	10	0.5	15			0.4	10	0.5	15			0.4	10	0.5	15			0.4	10	0.5	15			0.3	5	0.5	10		
Brassicaceae	*Nasturtium officinale*	西洋菜																														
Moraceae	*Ficus microcarpa*	細葉榕																														
Moraceae	*Ficus hispida*	對葉榕																														
Poaceae	*Microstegium ciliatum*	剛秀竹																														
Fabaceae	*Pueraria lobata*	野葛																														
Araceae	*Colocasia esculenta*	芋																														
Urticaceae	*Boehmeria nivea*	苧麻																														
Asteraceae	*Bidens alba*	白花鬼針草																														
Poaceae	*Pennisetum purpureum*	象草																														
Poaceae	*Coix lacryma-jobi*	薏苡																														
Amaranthaceae	*Alternanthera philoxeroides*	空心蓮子草																														
Poaceae	*Panicum maximum*	大黍																														
Moraceae	*Broussonetia papyrifera*	構樹																														
Polygonaceae	*Polygonum chinense*	火炭母																														
Onagraceae	*Ludwigia hyssopidolia*	草龍																														
Cyperaceae	*Cyperus sp.*	莎草																														
Poaceae	*Miscanthus floridulus*	五節芒																														
Poaceae	*Brachiaria mutica*	巴拉草	1.5	80	1	5	1	25	1.5	80	1.3	5	1.3	25	1.5	80	1.3	5	1.3	25	1.5	80	1.4	5	1.4	25	1.5	40	1.2	5	1.2	15
Blechnaceae	*Blechnum orientale*	烏毛蕨																														
Poaceae	*Pennisetum alopecuroides*	狼尾草																														
Araceae	*Alocasia macrorrhizos*	海芋																														
Lemnaceae	*L emna minor*	浮萍																														
Polygonaceae	*Polygonum hydropiper*	水蓼																														
Cyperaceae	*Cyperus involucratus*	風車草			1.5	5					1.5	5					1.5	5					1.5	5					1.4	5		
Onagraceae	*Ludwigia erecta*	美洲水丁香					2	10					2	10					2	10					2	10					1.6	5
Convolvulaceae	*Ipomoea cairica*	五爪金龍																														
Bare Gound				0		5		25		0		5		25		0		5		25		0		5		25		50		30		55

P1 – Point count location 1; P3 – Point count location 3

Table 4.2. Flora species recorded from belt transect survey at the She Shan River

(T1- Upper stream section,T2 - middle stream section and T3 - Lower stream section)

			Post construction monitoring						Post construction monitoring						Post construction monitoring						Post construction monitoring						Post construction monitoring					
		Stream	Jun-15						Jul-15						Aug-15						Sep-15						Oct-15					
		Transect	T1		T2		T3		T1		T2		T3		T1		T2		T3		T1		T2		T3		T1		T2		T3	
Family	Species	Chinese name	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%
Commelinaceae	*Commelina diffusa*	節節草	0.3	5	0.7	50	0.5	25			0.3	25					0.3	15					0.3	17					0.3	17	0.2	10
Poaceae	*Panicum repens*	枯骨草																														
Asteraceae	*Mikania micrantha*	薇甘菊	0.3	5	0.5	10			0.4	10	0.4	10			0.5	10	0.4	5			0.5	10	0.4	5			0.5	10	0.4	20		
Brassicaceae	*Nasturtium officinale*	西洋菜																														
Moraceae	*Ficus microcarpa*	細葉榕																														
Moraceae	*Ficus hispida*	對葉榕																														
Poaceae	*Microstegium ciliatum*	剛秀竹																														
Fabaceae	*Pueraria lobata*	野葛																														
Araceae	*Colocasia esculenta*	芋																														
Urticaceae	*Boehmeria nivea*	苧麻																														
Asteraceae	*Bidens alba*	白花鬼針草							0.9	15			0.3	2	0.9	15			0.5	2	0.9	15			0.5	2	0.9	30				
Poaceae	*Pennisetum purpureum*	象草																														
Poaceae	*Coix lacryma-jobi*	薏苡							1	2					1	2					1	2					1	2				
Amaranthaceae	*Alternanthera philoxeroides*	空心蓮子草																														
Poaceae	*Panicum maximum*	大黍																														
Moraceae	*Broussonetia papyrifera*	構樹																														
Polygonaceae	*Polygonum chinense*	火炭母																														
Onagraceae	*Ludwigia hyssopidolia*	草龍																														
Cyperaceae	*Cyperus sp.*	莎草																														
Poaceae	*Miscanthus floridulus*	五節芒																														
Poaceae	*Brachiaria mutica*	巴拉草	1.5	45	1.2	10	1.2	20	0.8	60	1	50	0.8	10	0.9	60	1	35	0.9	10	0.9	60	1	38	0.9	10	0.3	30	1	15	0.9	1
Blechnaceae	*Blechnum orientale*	烏毛蕨																														
Poaceae	*Pennisetum alopecuroides*	狼尾草																														
Araceae	*Alocasia macrorrhizos*	海芋																														
Lemnaceae	*L emna minor*	浮萍																														
Polygonaceae	*Polygonum hydropiper*	水蓼																														
Cyperaceae	*Cyperus involucratus*	風車草			1.4	5					1.2	5					1.2	5					1.2	5					1.2	5	0.4	2
Onagraceae	*Ludwigia erecta*	美洲水丁香					1.6	5					1.5	50					1.5	50					1.5	50					0.3	15
Convolvulaceae	*Ipomoea cairica*	五爪金龍									0.3	5					0.3	5					0.3	5					0.3	5		
Bare Gound				45		25		50		13		10		38		13		40		38		13		35		38		28		43		72

P1 – Point count location 1; P3 – Point count location 3

Table 4.2. Flora species recorded from belt transect survey at the She Shan River (T1- Upper stream section,T2 - middle stream section and T3 - Lower stream section)

			Post construction monitoring																													
		Stream	Nov-15						Dec-15						Jan-16						Feb-16						Mar-16					
		Transect	T1		T2		T3		T1		T2		T3		T1		T2		T3		T1		T2		T3		T1		T2		T3	
Family	Species	Chinese name	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%
Commelinaceae	*Commelina diffusa*	節節草			0.3	17	0.2	10			0.3	10	0.2	5			0.3	5	0.2	5			0.3	5	0.2	5			0.3	5	0.2	5
Poaceae	*Panicum repens*	枯骨草																														
Asteraceae	*Mikania micrantha*	薇甘菊	0.5	10	0.4	20			0.5	10	0.5	10			0.5	10	0.5	5			0.5	10	0.5	5			0.5	10	0.5	5		
Brassicaceae	*Nasturtium officinale*	西洋菜															0.3	10					0.3	10					0.3	10		
Moraceae	*Ficus microcarpa*	細葉榕																														
Moraceae	*Ficus hispida*	對葉榕																														
Poaceae	*Microstegium ciliatum*	剛秀竹																														
Fabaceae	*Pueraria lobata*	野葛																														
Araceae	*Colocasia esculenta*	芋																														
Urticaceae	*Boehmeria nivea*	苧麻																														
Asteraceae	*Bidens alba*	白花鬼針草	0.9	30					1	30					1	30					1	30					1	35				
Poaceae	*Pennisetum purpureum*	象草																														
Poaceae	*Coix lacryma-jobi*	薏苡	1	2					1	2					1	2					1	2					1	2				
Amaranthaceae	*Alternanthera philoxeroides*	空心蓮子草																														
Poaceae	*Panicum maximum*	大黍																														
Moraceae	*Broussonetia papyrifera*	構樹																														
Polygonaceae	*Polygonum chinense*	火炭母																														
Onagraceae	*Ludwigia hyssopidolia*	草龍																														
Cyperaceae	*Cyperus sp.*	莎草																														
Poaceae	*Miscanthus floridulus*	五節芒																														
Poaceae	*Brachiaria mutica*	巴拉草	0.3	30	1	15	0.9	1	0.3	30	1	5	1	1	0.3	15	1	5	1	5	0.3	15	1	5	1	5	0.3	15	1	5	1	5
Blechnaceae	*Blechnum orientale*	烏毛蕨																														
Poaceae	*Pennisetum alopecuroides*	狼尾草																														
Araceae	*Alocasia macrorrhizos*	海芋																														
Lemnaceae	*L emna minor*	浮萍																														
Polygonaceae	*Polygonum hydropiper*	水蓼																														
Cyperaceae	*Cyperus involucratus*	風車草			1.2	5	0.4	2			1.2	5	0.4	2			1.2	5	0.4	2			1.2	5	0.4	2			1.2	5	0.4	2
Onagraceae	*Ludwigia erecta*	美洲水丁香					0.3	15					0.3	5					0.3	5					0.3	5					0.3	5
Convolvulaceae	*Ipomoea cairica*	五爪金龍			0.3	5					0.3	5					0.3	5					0.3	5					0.3	5		
Bare Gound				28		43		72		28		70		87		43		70		83		43		70		83		38		70		83

P1 – Point count location 1; P3 – Point count location 3

Table 4.2. Flora species recorded from belt transect survey at the She Shan River

(T1- Upper stream section,T2 - middle stream section and T3 - Lower stream section)

			Post construction monitoring						Post construction monitoring						Post construction monitoring					
		Stream	Apr-16						May-16						Jun-16					
		Transect	T1		T2		T3		T1		T2		T3		T1		T2		T3	
Family	Species	Chinese name	Height(m	%	Height(m)	%	Height(m	%	Height(m)	%	Height(m)	%	Height(m	%	Height(m)	%	Height(m)	%	Height(m)	%
Commelinaceae	*Commelina diffusa*	節節草			0.3	10	0.2	5			0.3	5	0.2	8			0.3	5	0.2	8
Poaceae	*Panicum repens*	枯骨草																		
Asteraceae	*Mikania micrantha*	薇甘菊	0.5	10	0.5	10			0.5	10	0.5	8			0.5	10	0.5	8		
Brassicaceae	*Nasturtium officinale*	西洋菜			0.3	10					0.3	8					0.3	8		
Moraceae	*Ficus microcarpa*	細葉榕																		
Moraceae	*Ficus hispida*	對葉榕																		
Poaceae	*Microstegium ciliatum*	剛秀竹																		
Fabaceae	*Pueraria lobata*	野葛																		
Araceae	*Colocasia esculenta*	芋																		
Urticaceae	*Boehmeria nivea*	苧麻																		
Asteraceae	*Bidens alba*	白花鬼針草	1	35					1	15					1	15				
Poaceae	*Pennisetum purpureum*	象草																		
Poaceae	*Coix lacryma-jobi*	薏苡	1	2					1	10					1	10				
Amaranthaceae	*Alternanthera philoxeroides*	空心蓮子草																		
Poaceae	*Panicum maximum*	大黍																		
Moraceae	*Broussonetia papyrifera*	構樹																		
Polygonaceae	*Polygonum chinense*	火炭母																		
Onagraceae	*Ludwigia hyssopidolia*	草龍																		
Cyperaceae	*Cyperus sp.*	莎草																		
Poaceae	*Miscanthus floridulus*	五節芒																		
Poaceae	*Brachiaria mutica*	巴拉草	0.3	15	1	5	1	5	0.3	15	1	5	1	10	0.3	15	1	5	1	10
Blechnaceae	*Blechnum orientale*	烏毛蕨																		
Poaceae	*Pennisetum alopecuroides*	狼尾草																		
Araceae	*Alocasia macrorrhizos*	海芋																		
Lemnaceae	*L emna minor*	浮萍																		
Polygonaceae	*Polygonum hydropiper*	水蓼																		
Cyperaceae	*Cyperus involucratus*	風車草			1.2	5	0.4	2			1.2	5	0.4	5			1.2	5	0.4	5
Onagraceae	*Ludwigia erecta*	美洲水丁香					0.3	5					0.3	5					0.3	5
Convolvulaceae	*Ipomoea cairica*	五爪金龍			0.3	5					0.3	5					0.3	5		
Bare Gound				38		60		83		50		69		72		50		69		72

P1 – Point count location 1; P3 – Point count location 3

Table 4.2 (Continuous). Flora species recorded from belt transect survey at the She Shan River

(T1- Upper stream section,T2 - middle stream section and T3 - Lower stream section)

		Stream	Post construction monitoring						Post construction monitoring						Post construction monitoring						Post construction monitoring						Post construction monitoring					
		Transect	Jul-16						Aug-16						Sep-16						Oct-16						Nov-16					
Family	Species	Chinese name	T1		T2		T3		T1		T2		T3		T1		T2		T3		T1		T2		T3		T1		T2		T3	
Commelinaceae	*Commelina diffusa*	節節草	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%
Poaceae	*Panicum repens*	枯骨草			0.3	5	0.2	8			0.3	5	0.2	8			0.5	15	0.3	8			0.5	15	0.5	8			0.6	15	0.6	8
Asteraceae	*Mikania micrantha*	薇甘菊																														
Brassicaceae	*Nasturtium officinale*	西洋菜							0.5	3	0.5	5																				
Moraceae	*Ficus microcarpa*	細葉榕			0.3	5					0.3	5																				
Moraceae	*Ficus hispida*	對葉榕																														
Poaceae	*Microstegium ciliatum*	蒯秀竹			0.3	5	0.3	15			0.3	5	0.3	15			0.4	10	0.4	15			0.5	10	0.5	15			0.6	10	0.5	15
Fabaceae	*Pueraria lobata*	野葛																														
Araceae	*Colocasia esculenta*	芋																														
Urticaceae	*Boehmeria nivea*	苧麻																														
Asteraceae	*Bidens alba*	白花鬼針草																														
Poaceae	*Pennisetum purpureum*	象草	1	15					1	15					1.3	15					1.4	15					1.5	15				
Poaceae	*Coix lacryma-jobi*	薏苡																														
Amaranthaceae	*Alternanthera philoxeroides*	空心蓮子草	1	10					1	10					1	10					1.1	10					1.1	10				
Poaceae	*Panicum maximum*	大黍																														
Moraceae	*Broussonetia papyrifera*	構樹																														
Polygonaceae	*Polygonum chinense*	火炭母																														
Onagraceae	*Ludwigia hyssopidolia*	草龍																														
Cyperaceae	*Cyperus sp.*	莎草																														
Poaceae	*Miscanthus floridulus*	五節芒																														
Poaceae	*Brachiaria mutica*	巴拉草			0.4	10	0.5	25			0.4	15	0.5	20			0.4	15	0.5	20			0.5	15	0.5	20			0.6	15	0.6	20
Blechnaceae	*Blechnum orientale*	烏毛蕨	0.3	15	1	5	1	10	0.3	15	1	10	1	10	0.3	15	1	10	1	10	0.4	15	1	10	1	10	0.5	15	1	10	1	10
Poaceae	*Pennisetum alopecuroides*	狼尾草																														
Araceae	*Alocasia macrorrhizos*	海芋																														
Lemnaceae	*L emna minor*	浮萍																														
Polygonaceae	*Polygonum hydropiper*	水蓼																														
Cyperaceae	*Cyperus involucratus*	風車草																														
Onagraceae	*Ludwigia erecta*	美洲水丁香																														
Convolvulaceae	*Ipomoea cairica*	五爪金龍			0.2	5	0.3	5			0.2	5	0.3	5			0.2	5	0.3	5			0.2	5	0.3	5			0.3	5	0.4	5
Bare Gound					0.3	5					0.3	5					0.3	5					0.3	5					0.4	5		
				60		65		37		57		50		42		60		45		42		60		45		42		60		45		42

P1 – Point count location 1; P3 – Point count location 3

Table 4.3 Avifauna recorded along survey transects and at three selected point count locations at She Shan River.

(T1- Upper stream section, T2 - middle stream section and T3 - Lower stream section)

Common Name	Species name	Chinese name	Status	Commonness	Baseline monitoring						Impact monitoring				Impact monitoring				Impact monitoring			
					Jul-08			Aug-08			Jan-09				Jul-09				Jan-10			
					Abundance			Abundance			Abundance				Abundance				Abundance			
					C	P1	P3	C	P1	P3	C	T1	T2	T3	C	T1	T2	T3	C	T1	T2	T3
Ashy Drongo	*Dicrurus leucophaeus*	灰卷尾	SWV, LC	U																		
Barn Swallow	*Hirundo rustica*	家燕	PM	C																		
Black Drongo	*Dicrurus macrocercus*	黑卷尾	Sv	C																		
Black Kite	*Milvus lineatus*	麻鷹	R, RC, Cap.586	C				+			+								+			
Black-necked Starling	*Sturnus nigricollis*	黑領椋鳥	R	C	+			+	2		+				+			2	+		1	
Black-throated Laughingthrush	*Garrulax chinensis*	黑喉噪鶥	R	C																		
Buzzard (Common Buzzard)	*Buteo buteo*	普通鵟	WV, Cap 586	U																		
Chestnut Bulbul	*Hemixos castanonotus*	栗背短腳鵯	R,WV	C																		
Chinese Bulbul	*Pycnonotus sinensis*	白頭鵯	R	C	+		2	+			++	1		3	++			2	++	3	4	2
Chinese Pond Heron	*Ardeola bacchus*	池鷺	R,RC	C	++		3	+	1	2	+			1	+	1		1	+		1	
Chinese Hwamei	*Garrulax canorus*	畫眉	R, Cap 586	U																		
Chinese Sparrowhawk	*Accipiter soloensis*	赤腹鷹	PM, Cap.586	U																		
Common Emerald Dove	*Chalcophaps indica*	綠翅金鳩	R,VU	U																		
Common Kingfisher	*Alcedo atthis*	普通翠鳥	R	C																		
Common Koel	*Eudynamys scolopacea*	噪鵑	R	C																		
Common Sandpiper	*Actitis hypoleucos*	磯鷸	WV&PM	C																		
Common Tailorbird	*Orthotomus sutorius*	長尾縫葉鶯	R	C	+	1		+	1		+		1		+			1	+			
Crested bulbul	*Pycnonotus jocosus*	紅耳鵯	R	C				++	3	2	++	2	1	3	++	3	2	3	++	4		2
Crested Goshawk	*Accipiter trivirgatus*	鳳頭鷹	R, CR, Cap.586	U																		
Crested Myna	*Acridotheres cristatellus*	八哥	R	C				+		2	+	2		1	++	2			+			
Crested Serpent Eagle	*Spilornis cheela*	蛇鵰	R, VU, LC, Cap 586	U																		
Domestic pigeon	*Columba sp.*	鴿	R	C	+	2		+	1	2	+				++			3	+			
Dusky Warbler	*Phylloscopus fuscatus*	褐柳鶯	WV	C																		
Eurasian tree sparrow	*Passer montanus*	麻鵲	R	C				+	2		+				+			1	+	2		
Fork-tailed Sunbird	*Aethopyga christinae*	叉尾太陽鳥	R	C																		
Great Coucal	*Centropus sinensis*	褐翅鴉鵑	R,VU	C	+	1	2	+	1	1	+				+			1	+			
Great Egret	*Ardea alba*	大白鷺	R,RC	C																		
Great Tit	*Parus major(commixtus)*	大山雀	R	C																		
Green Sandpiper	*Tringa ochropus*	白腰草鷸	PM&WV	C																		
Grey Heron	*Ardea cinerea*	蒼鷺	WV,PRC	C																		
Grey Wagtail	*Motacilla cinerea*	灰鶺鴒	WV	C							+			1								
Japanese White Eye	*Zosterops japonica(simplex)*	暗綠繡眼鳥	R	C																		
Large Hawk Cuckoo	*Cuculus sparverioides*	鷹鵑	SV	C																		
Little Egret	*Egretta garzetta*	小白鷺	R,RC	C	+			+			+		1		+		1	1	+		1	
Magpie Robin	*Copsychus saularis*	鵲鴝	R	C	+	1		+	1		+		1	1	+	1	1	2	+		1	1
Night Heron	*Nycticorax nycticorax*	夜鷺	R,LC	C																		
Olive Backed Pipit	*Anthus hodgsoni*	樹鷚	WV	C																		
Oriental Dollarbird	*Eurystomus orientalis*	三寶鳥	PM	U																		
Plaintive Cuckoo	*Cacomantis merulinus*	八聲杜鵑	SV	C																		
Plain Prinia	*Prinia inornata*	純色鷦鶯	R	C																		
Red-flanked Bluetail	*Tarsiger cyanurus*	红脇藍尾鴝	WV&PM	C																		
Rufous-backed Shrike	*Lanius schach*	棕背伯勞	R	C	+			+			+				+	1			+			
Rufous-capped Babbler	*Stachyridopsis ruficeps*	紅頭穗鶥	R, LC	U																		
Scarlet Minivet	*Pericrocotus speciosus*	赤紅山椒鳥	R	C																		
Sooty-headed Bulbul	*Pycnonotus aurigaster*	白喉紅臀鵯	R	C																		
Spotted Dove	*Streptopelia chinensis*	珠頸斑鳩	R	C	+		1	+	2	1	+++	1	3	4	+	1		2	+			1
Spotted Munia	*Lonchura punctulata*	斑文鳥	R	C																		
Stejneger's Stonechat	*Saxicola stejnegeri*	黑喉石䳭	PM,WV	C																		
White Wagtail	*Motacilla alba*	白鶺鴒	WV	C				+	1		+				+			1	+	1		
White-breasted Waterhen	*Amaurornis phoenicurus*	白胸苦惡鳥	R	C	+			+			+				+			1	+			
Yellow Bellid Prinia	*Prinia flaviventris*	黃腹鷦鶯	R	C							+				+			1	+			1
Number of birds						5	8		15	10		5	4	10	0	8	4	17	0	9	8	5
No. of species					11	4	4	16	10	6	18	3	4	6	0	5	3	10	17	3	5	3

Common Name	Impact monitoring				Impact monitoring				Impact monitoring				Impact monitoring				Impact monitoring			
	Jul-10				Jan-11				Jul-11				Jan-12				Jul-12			
	Abundance				Abundance				Abundance				Abundance				Abundance			
	C	T1	T2	T3	C	T1	T2	T3	C	T1	T2	T3	C	T1	T2	T3	C	T1	T2	T3
Ashy Drongo																				
Barn Swallow																				
Black Drongo																				
Black Kite	+				+				+											
Black-necked Starling	+			1	+				+			1	+	2	1		+			1
Black-throated Laughingthrush																				
Buzzard (Common Buzzard)																				
Chestnut Bulbul																				
Chinese Bulbul	++	5	3	1	+	3	3	5	+	2	3	1	+				++	2	5	1
Chinese Pond Heron	+	2	1	1	+	1	1	1	+	1	1		+	1		1	+	1		
Chinese Hwamei																				
Chinese Sparrowhawk																				
Common Emerald Dove																				
Common Kingfisher					+	1			+				+							
Common Koel					+												+			
Common Sandpiper					+								+							
Common Tailorbird	+				+		1	1	+		1		+				+			1
Crested bulbul	++	2	4	2	+	3	3	1	+	2	4	1	+		2		+++	4	5	3
Crested Goshawk																				
Crested Myna	+		1		+		1	2	+	3			+		3		+		2	
Crested Serpent Eagle																				
Domestic pigeon	+																			
Dusky Warbler																				
Eurasian tree sparrow	++	2	3	5	+				+			2	+	2			++	2		3
Fork-tailed Sunbird																				
Great Coucal	+		1		+				+								+			
Great Egret																				
Great Tit																				
Green Sandpiper																				
Grey Heron																				
Grey Wagtail					+	1	2	1					+	1	2	1				
Japanese White Eye																				
Large Hawk Cuckoo																				
Little Egret	+		1	1	+	1		1	+	1			+		1	1	+			
Magpie Robin	+			1	+	2	1	1	+	1		1	+	1			+	1		1
Night Heron					+															
Olive Backed Pipit					+								+				+			
Oriental Dollarbird																				
Plaintive Cuckoo																				
Plain Prinia																				
Red-flanked Bluetail																				
Rufous-backed Shrike	+								+								+	1		
Rufous-capped Babbler																	+		1	
Scarlet Minivet																				
Sooty-headed Bulbul									+	2			+				+			
Spotted Dove	+		1		+	2	2	3	+	1		1	+			1	+	1	2	
Spotted Munia					+				+				+				++		5	
Stejneger's Stonechat																				
White Wagtail	+				+	1	1	1	+		3	1	+		1		++	2	1	1
White-breasted Waterhen	+				+				+				+				+			
Yellow Bellid Prinia	+				+	1			+			1	+				+	1	1	
Number of birds	0	11	14	12	0	9	12	13	0	10	9	6	0	7	9	3	0	15	22	11
No. of species	17	4	7	7	21	6	7	8	18	8	5	7	18	5	6	4	20	9	8	7

Common Name	Impact monitoring				Impact monitoring				Post construction monitoring				Post construction monitoring			
	Jul-13				Dec-13				Jan-14				Feb-14			
	Abundance				Abundance				Abundance				Abundance			
	C	T1	T2	T3	C	T1	T2	T3	C	T1	T2	T3	C	T1	T2	T3
Ashy Drongo																
Barn Swallow	+								+				+		2	
Black Drongo																
Black Kite													+			
Black-necked Starling	+				+				+				+			
Black-throated Laughingthrush																
Buzzard (Common Buzzard)																
Chestnut Bulbul																
Chinese Bulbul	+		1	1	++		2	3	+	1		2	+	2	3	4
Chinese Pond Heron	+	1	2	1	+	1	2	2	+	1	3	2	+	1	2	3
Chinese Hwamei																
Chinese Sparrowhawk																
Common Emerald Dove																
Common Kingfisher					+			1	+				+			
Common Koel	+				+				+				+			
Common Sandpiper					+				+				+			
Common Tailorbird	+		1		+	1	1	1	+	1	1	1	+	1		1
Crested bulbul	+++	2	2	3	+++	3	2	5	++	2	4	6	++	2	2	8
Crested Goshawk																
Crested Myna	++				++			2	+		3	2	+			3
Crested Serpent Eagle					+											
Domestic pigeon	+		1	2	+		2									
Dusky Warbler					+		1		+		1	1	+		2	1
Eurasian tree sparrow	+	2			+				+				+			
Fork-tailed Sunbird																
Great Coucal	+				+				+				+			
Great Egret								1	+			1	+			1
Great Tit									+				+			
Green Sandpiper					+		2		+		2		+			
Grey Heron																
Grey Wagtail					++	2	3	3	++	2	3	3	++		2	2
Japanese White Eye					++			5	++			5	++			3
Large Hawk Cuckoo																
Little Egret	+	2	1	1	+	1	2	2	+		2	3	+	1	2	2
Magpie Robin	+		1	1	+	1	1	2	+		1	1	+		2	
Night Heron	+			2												
Olive Backed Pipit					++		3	2	+		1		+			
Oriental Dollarbird																
Plaintive Cuckoo	+															
Plain Prinia																
Red-flanked Bluetail																
Rufous-backed Shrike	+				+				+				+			
Rufous-capped Babbler	+				+				+				+			
Scarlet Minivet					+											
Sooty-headed Bulbul																
Spotted Dove	+	1	1	2	++	2	4	3	++	3	2	4	++	2	6	5
Spotted Munia	++				++				++				++		7	
Stejneger's Stonechat																
White Wagtail	+	2		1	++	2	4	2	+		2	1	+		1	2
White-breasted Waterhen	+				+		1		+				+			
Yellow Bellid Prinia	+				+				+	1	1		+	1	3	2
Number of birds		10	10	14		13	30	34		11	26	32		10	34	37
No. of species	22	6	8	9	31	9	14	16	32	11	16	17	33	11	18	18

Common Name	Post construction monitoring				Post construction monitoring				Post construction monitoring				Post construction monitoring			
	Mar-14				Apr-14				May-14				Jun-14			
	Abundance				Abundance				Abundance				Abundance			
	C	T1	T2	T3	C	T1	T2	T3	C	T1	T2	T3	C	T1	T2	T3
Ashy Drongo																
Barn Swallow	+	2	2	1	++	1	3	4	++	3	4	4	+	2		1
Black Drongo																
Black Kite	+															
Black-necked Starling	+		2		+			2	+		1	2	+	2		1
Black-throated Laughingthrush																
Buzzard (Common Buzzard)	+															
Chestnut Bulbul																
Chinese Bulbul	++		2	3	+			2	+				+			
Chinese Pond Heron	+	1	3	2	+	1	2	1	+	1	1		+	1	2	
Chinese Hwamei																
Chinese Sparrowhawk																
Common Emerald Dove																
Common Kingfisher	+				+				+				+			
Common Koel	+				+				+				+			
Common Sandpiper	+				+				+				+			
Common Tailorbird	+	1	2	1	+	1	1		+	1	2	1	+		1	
Crested bulbul	++	3	4	6	++	2	2	5	++	2		4	++	3	2	3
Crested Goshawk																
Crested Myna	+		2		+				+				+			2
Crested Serpent Eagle	+															
Domestic pigeon																
Dusky Warbler	+	1	1		+		1		+				+			
Eurasian tree sparrow	+		2		+				+	2			+		2	1
Fork-tailed Sunbird																
Great Coucal	+				+				+				+			
Great Egret	+			1	+											
Great Tit	+				+											
Green Sandpiper	+				+				+				+			
Grey Heron																
Grey Wagtail	++	1	3	2	+		1	1	+							
Japanese White Eye	++			6	+	3		4	+			6	++	4	2	3
Large Hawk Cuckoo									+							
Little Egret	+	1	1	2	+		1	1	+	1	2	1	+		2	2
Magpie Robin	+	1	2	1	+	1	1	2	+	1	1	1	+	1	2	2
Night Heron																
Olive Backed Pipit	+															
Oriental Dollarbird																
Plaintive Cuckoo	+				+				+				+			
Plain Prinia																
Red-flanked Bluetail																
Rufous-backed Shrike	+				+				+				+			
Rufous-capped Babbler	+				+				+							
Scarlet Minivet																
Sooty-headed Bulbul																
Spotted Dove	++	3	4	4	++	2	3	4	++	3	4	3	++	2	3	1
Spotted Munia	++		4		++		6		++		8					
Stejneger's Stonechat																
White Wagtail	+	1	2	1	+		1	1	+		2	1	+		1	
White-breasted Waterhen	+				+				+				+			
Yellow Bellid Prinia	+	1	2	1	+	1		1	+	1	1	1	+		1	1
Number of birds		16	38	31		12	22	28		15	26	24		15	18	17
No. of species	34	13	19	17	32	9	11	12	27	9	10	10	23	8	11	10

Note: R – Resident; WV – Winter visitor; PM – Passage migrant; C – Common; U – Uncommon

SpM – Spring migrant; Sv - Summer visitor

C – transect count; P1 – Point count location 1; P3 – Point count location 3

+, occurred; ++, common; +++, abundant/dominant species in the the study area

Commonness and status were decided accroding to AFCD biodiversity website (www.hkbiodiversity.net)

All bird species are under protection of Wild Animals Protection Ordinance (Cap. 170)

Endangered Species of Animals and Plants Ordinance (Cap. 586)

RC : Regional concern Fellowes *et al* (2002)

LC : Local Concern Fellowes *et al* (2002)

PRC: Potential Regional concern Fellowes *et al* (2002)

CR: Rare in China Red Data Book Status

VU: Vulnerable in China Red Data Book Status

Table 4.3 Avifauna recorded along survey transects and at three selected point count locations at She Shan River.

(T1- Upper stream section, T2 - middle stream section and T3 - Lower stream section)

Common Name	Species name	Chinese name	Status	Commonness	Post construction monitoring				Post construction monitoring				Post construction monitoring				Post construction monitoring				Post construction monitoring				Post construction monitoring				Post construction monitoring				Post construction monitoring				Post construction monitoring				Post construction monitoring				Post construction monitoring				Post construction monitoring				Post construction monitoring			
					Jul-14				Aug-14				Sep-14				Oct-14				Nov-14				Dec-14				Jan-15				Feb-15				Mar-15				Apr-15				May-15				Jun-15				Jul-15				Aug-15			
					Abundance				Abundance				Abundance				Abundance				Abundance				Abundance				Abundance				Abundance				Abundance				Abundance				Abundance				Abundance				Abundance			
					C	T1	T2	T3	C	T1	T2	T3	C	T1	T2	T3	C	T1	T2	T3	C	T1	T2	T3	C	T1	T2	T3	C	T1	T2	T3	C	T1	T2	T3	C	T1	T2	T3	C	T1	T2	T3	C	T1	T2	T3	C	T1	T2	T3	C	T1	T2	T3	C	T1	T2	T3
Ashy Drongo	*Dicrurus leucophaeus*	灰卷尾	SWV, LC	U																																																					
Barn Swallow	*Hirundo rustica*	家燕	PM	C																																	+	1	2		++		2	2	++	2		2	++	2		2	++		2	2	++	4					
Black Drongo	*Dicrurus macrocercus*	黑卷尾	Sv	C																																																				
Black Kite	*Milvus lineatus*	麻鷹	R, RC, Cap.586	C									+								+				+				+				+				+				+				+											
Black-necked Starling	*Sturnus nigricollis*	黑領椋鳥	R	C	+	2	1	2	+	2		2	+	1	2	2	+	2		1	+		2		+	2			+		2	2	+				++		2	2	++		2		++	2	2	2	++	1		2	++	2		2	++		3	
Black-throated Laughingthrush	*Garrulax chinensis*	黑喉噪鹛	R	C																																																												
Buzzard (Common Buzzard)	*Buteo buteo*	普通鵟	WV, Cap 586	U																									+				+																									
Chestnut Bulbul	*Hemixos castanonotus*	栗背短脚鵯	R,WV	C																																																									
Chinese Bulbul	*Pycnonotus sinensis*	白頭鵯	R	C	+			1	+			2	+	2		3	+			2	+	1		3	+		2	2	+	1		3	++	2		3	++	1		2	++	2		2	++	3	1	2	++	2	2	2	++		2	2	++	2	2	2
Chinese Pond Heron	*Ardeola bacchus*	池鷺	R,RC	C	+	2	2	1	++	1	2	2	++	2	1	1	++	2	2				1		+				++	1	2	2	++	1	1		++	1			+	1			+	1			+	1			+			1	+	1			
Chinese Hwamei	*Garrulax canorus*	畫眉	R, Cap 586	U																																																								
Chinese Sparrowhawk	*Accipiter soloensis*	赤腹鷹	PM, Cap.586	U																																																							
Common Emerald Dove	*Chalcophaps indica*	綠翅金鳩	R,VU	U																																																								
Common Kingfisher	*Alcedo atthis*	普通翠鳥	R	C									+				+				+																																+	1								
Common Koel	*Eudynamys scolopacea*	噪鵑	R	C	+				+				+				+				+																+		1		+				+				+		1	1							
Common Sandpiper	*Actitis hypoleucos*	磯鷸	WV&PM	C																																																					+				1	+		1	
Common Tailorbird	*Orthotomus sutorius*	長尾縫葉鶯	R	C	+	1	1	1	+	1	1		+	1	2	1	+			1	+		1		++	1	1		++	2	1	1	+	1	1		+	1	1		+	1		1	+	1		1	+	1	1		+	2	2		++	2	2	
Crested bulbul	*Pycnonotus jocosus*	紅耳鵯	R	C	++	2	4	5	++	3	2	4	++	2	4	3	++	3	1	4	++	2	1	3	+++	2	3	2	+++	3	2	4	+++	2	2	4	+++	3	1	4	+++	3	2	3	+++	4	3	3	+++	5	4	4	+++	5	5	7	+++	3	3	8
Crested Goshawk	*Accipiter trivirgatus*	鳳頭鷹	R, CR, Cap.586	U																									+				+								+			1														
Crested Myna	*Acridotheres cristatellus*	八哥	R	C	+		3	2	+	2	2	3	+		3	2	+		2	4	+	3	2		+	1			+			3	+			2	++		2	3	++		1	3	++		2	3	++	3	2	3	++	2	2	1	++			3
Crested Serpent Eagle	*Spilornis cheela*	蛇鵰	R, VU, LC, Cap 586	U																																	+				+														1		
Domestic pigeon	*Columba sp.*	鴿	R	C																					++				++				++																								
Dusky Warbler	*Phylloscopus fuscatus*	褐柳鶯	WV	C	+				+		1		+	1			+	1	1		+	1		1	++				++	1	2	1	++		1		+			1	+				+		1		+			1	+	1	1		+	1	1	
Eurasian tree sparrow	*Passer montanus*	麻鷯	R	C	+	2		1	+		3	2	+	3	2		+	2		3	+			2	+++		5	3	+++	2	4	3	+++		3	2	++	2		2	++	2	2	2	++	3	2	2	++	2	3	3	++	3	3	3	++		2	4
Fork-tailed Sunbird	*Aethopyga christinae*	叉尾太陽鳥	R	C																																					+		2												+		2	
Great Coucal	*Centropus sinensis*	褐翅鴉鵑	R,VU	C	+				+		1		+	1			+		1		+				+				+		1		+				+		1		+				+								+		1	
Great Egret	*Ardea alba*	大白鷺	R,RC	C																									+				+																								
Great Tit	*Parus major(commixtus)*	大山雀	R	C																																																								
Green Sandpiper	*Tringa ochropus*	白腰草鷸	PM&WV	C																																																								
Grey Heron	*Ardea cinerea*	蒼鷺	WV,PRC	C																																					+			1														
Grey Wagtail	*Motacilla cinerea*	灰鶺鴒	WV	C	+				+		1	1	+					1	1	+				1	+				++		1	2	+	1	2	1	+			1	+			1	+			1	+			1	+			1			1	
Japanese White Eye	*Zosterops japonica(simplex)*	暗綠繡眼鳥	R	C	++			4	++	2	2	5	+			3	+				+				+			3	+			4	+			3	+			4	+			3	+			2	3	+			3	3	+			3	3	+		3	3	
Large Hawk Cuckoo	*Cuculus sparverioides*	鷹鵑	SV	C																					+								+								+																
Little Egret	*Egretta garzetta*	小白鷺	R,RC	C	+	1	2	1	+	1	2	2	+	2	3	2	+	1	2	1	+	1	2	2	+	2	1	1	+	1	2	1	+	2	1	1	+	1	2	1	+	1		1	+	1		1	+			1	+			1
Magpie Robin	*Copsychus saularis*	鵲鴝	R	C	+	1	1	1	+	1	1	1	+	1	1	2	+	1		1	+	1	1	1	+			1	+	1	2	1	+	1	2	1	++	1	2	1	+	1	2	1	+	2	2	1	+	1	2	2	+	2		2	+		1	2
Night Heron	*Nycticorax nycticorax*	夜鷺	R,LC	C																																																							
Olive Backed Pipit	*Anthus hodgsoni*	樹鷚	WV	C																																																							
Oriental Dollarbird	*Eurystomus orientalis*	三寶鳥	PM	U																																																							
Plaintive Cuckoo	*Cacomantis merulinus*	八聲杜鵑	SV	C																																	++				+																
Plain Prinia	*Prinia inornata*	純色鷦鶯	R	C																																																						
Red-flanked Bluetail	*Tarsiger cyanurus*	紅脇藍尾鴝	WV&PM	C																																																						
Rufous-backed Shrike	*Lanius schach*	棕背伯勞	R	C	+		1		+		1		+		1		+		1		+	1			+				+				+		1		+			1	+			1	+			1	+	1			+	1		
Rufous-capped Babbler	*Stachyridopsis ruficeps*	紅頭穗鹛	R, LC	U									+				+				+				+				+				+				+				+				+				+				+		1	
Scarlet Minivet	*Pericrocotus speciosus*	赤紅山椒鳥	R	C																																	+																				
Sooty-headed Bulbul	*Pycnonotus aurigaster*	白喉紅臀鵯	R	C																																																							
Spotted Dove	*Streptopelia chinensis*	珠頸斑鳩	R	C	++	3	4	4	++	2	3	3	++	3	5	++	4	2	3	++	3	3	4	+	1	2	2	+	2	3	4	++	2	3	3	++	2	2	2	++	2	2	2	++	3	3	4	++	2	3	2				
Spotted Munia	*Lonchura punctulata*	斑文鳥	R	C	+		2		+		3		+		6		+		7		+	6	5		+	5			+		5		+																								
Stejneger's Stonechat	*Saxicola stejnegeri*	黑喉石鵖	PM,WV	C																																																							
White Wagtail	*Motacilla alba*	白鶺鴒	WV	C	+	1	2	2	+	2	2	1	+	2	3	2	+	2	2	1	+	1	2	2	++	1	2	2	++	1	2	2	+		1	2	+		1	1	+		1	1	+		1	1	+		1	1	+		1	
White-breasted Waterhen	*Amaurornis phoenicurus*	白胸苦惡鳥	R	C	+				+				+				+				+				+				+		1		+		1		+		1		+		1		+		1		+							
Yellow Bellid Prinia	*Prinia flaviventris*	黃腹鷦鶯	R	C	+	1	1	1	+	1	1		+	1	2	1	+	1	1	1	+		1	1									+	1	1		+		1	1	+		1	1	+		1	1	+		1	1	+		1	
Number of birds						16	24	26		18	28	28		23	35	28		19	24	23		21	20	20		15	19	15		15	16	17		12	19	21		12	21	29		20	24	25		24	24	34		21	24	33		17	31	23
No. of species					20	12	14	14	20	13	17	15	23	17	17	15	23	17	17	15	23	19	17	16	21	9	11	7	24	10	13	14	25	9	12	10	26	9	12	10	28	8	18	18	24	11	15	14	25	11	13	18	19	10	12	15	25	8	19	8

Note: R – Resident; WV – Winter visitor; PM – Passage migrant; C – Common; U – Uncommon

SpM – Spring migrant; Sv - Summer visitor

C – transect count; P1 – Point count location 1; P3 – Point count location 3

+, occurred; ++, common; +++, abundant/dominant species in the the study area

Commonness and status were decided accroding to AFCD biodiversity website (www.hkbiodiversity.net)

All bird species are under protection of Wild Animals Protection Ordinance (Cap. 170)

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LC : Local Concern Fellowes *et al* (2002)

PRC: Potential Regional concern Fellowes *et al* (2002)

CR: Rare in China Red Data Book Status

VU: Vulnerable in China Red Data Book Status

Table 4.3 Avifauna recorded along survey transects and at three selected point count locations at She Shan River.

(T1- Upper stream section, T2 - middle stream section and T3 - Lower stream section)

Common Name	Species name	Chinese name	Status	Commonness	Post construction monitoring				Post construction monitoring				Post construction monitoring				Post construction monitoring				Post construction monitoring				Post construction monitoring				Post construction monitoring				Post construction monitoring				Post construction monitoring				Post construction monitoring				Post construction monitoring				Post construction monitoring				Post construction monitoring			
					Sep-15				Oct-15				Nov-15				Dec-15				Jan-16				Feb-16				Mar-16				Apr-16				May-16				Jun-16				Jul-16				Aug-16				Sep-16				Oct-16				Nov-16			
					Abundance				Abundance				Abundance				Abundance				Abundance				Abundance				Abundance				Abundance				Abundance				Abundance				Abundance				Abundance				Abundance				Abundance			
					C	T1	T2	T3	C	T1	T2	T3	C	T1	T2	T3	C	T1	T2	T3	C	T1	T2	T3	C	T1	T2	T3	C	T1	T2	T3	C	T1	T2	T3	C	T1	T2	T3	C	T1	T2	T3	C	T1	T2	T3	C	T1	T2	T3	C	T1	T2	T3	C	T1	T2	T3
Ashy Drongo	*Dicrurus leucophaeus*	灰卷尾	SWV, LC	U													+		1						+		1																															
Barn Swallow	*Hirundo rustica*	家燕	PM	C	++			4																																																	
Black Drongo	*Dicrurus macrocercus*	黑卷尾	Sv	C													++			7																																					
Black Kite	*Milvus lineatus*	麻鷹	R, RC, Cap.586	C																	+		2																										+									
Black-necked Starling	*Sturnus nigricollis*	黑領椋鳥	R	C	++		2	2	++		3		+		1		+				+				+				+	2	2	2	+				++				++				++				++				++				++				++			
Black-throated Laughingthrush	*Garrulax chinensis*	黑喉噪鹛	R	C	+		1		+		1														+	3			+	2	2	2	+			2	+				++		2	2	++			3	++		2	1	++	2			++		3		++		2	2
Buzzard (Common Buzzard)	*Buteo buteo*	普通鵟	WV, Cap 586	U													+			1					+																															
Chestnut Bulbul	*Hemixos castanonotus*	栗背短腳鵯	R,WV	C																	++		6		++		5		++		5		++		7		++		6		++		5																			
Chinese Bulbul	*Pycnonotus sinensis*	白頭鵯	R	C	+		3		++	3	3		++		3	2	++		3	2	++	2	2	4	++	3	3	4	++	2	7		++	2	3	3	++	3	2	3	++	2	2	4	++	3	3	3	++	2	1	4	++	3	4		++	2	3	2	++	3		2
Chinese Pond Heron	*Ardeola bacchus*	池鷺	R,RC	C	+			1	+		1		+		1		+			1	+		1		+		1		+	1			+			1	+			1	+				+			1	+				+			1	+			1
Chinese Hwamei	*Garrulax canorus*	畫眉	R, Cap 586	U																					+																															
Chinese Sparrowhawk	*Accipiter soloensis*	赤腹鷹	PM, Cap.586	U																																																			
Common Emerald Dove	*Chalcophaps indica*	綠翅金鳩	R,VU	U																																																		
Common Kingfisher	*Alcedo atthis*	普通翠鳥	R	C													+		1		+		1																										+				+					
Common Koel	*Eudynamys scolopacea*	噪鵑	R	C																	+				+				+								+								+									
Common Sandpiper	*Actitis hypoleucos*	磯鷸	WV&PM	C																																																		
Common Tailorbird	*Orthotomus sutorius*	長尾縫葉鶯	R	C	++	1	2		++				++		1	1	+				+	1	2		+		2	1	+		1	1	+				+		1	1	+				+		1	1	+				+		1	1	+	1	1	1
Crested bulbul	*Pycnonotus jocosus*	紅耳鵯	R	C	+++	5	9	5	+++	5	5	7	+++	7	3	4	+++	7	6	7	+++	3	12	5	+++	2	15	3	+++	5	20	2	+++	7	15	3	+++	7	15	7	+++	5	10	8	+++	7	8	2	+++	9	8	6	+++	9	8	6	+++	7	6	2	+++	8	5	2
Crested Goshawk	*Accipiter trivirgatus*	鳳頭鷹	R, CR, Cap.586	U					+												+				+																															
Crested Myna	*Acridotheres cristatellus*	八哥	R	C	++			2	+		3		+		3						+				+				+	3			+			3	+		2		+			2	+		3	3	+	2		2	++	3	2		++	3		2	++		2	2
Crested Serpent Eagle	*Spilornis cheela*	蛇鵰	R, VU, LC, Cap 586	U	+		1		+				+		1						+			1					+		1																		+									
Domestic pigeon	*Columba sp.*	鴿	R	C																																																		
Dusky Warbler	*Phylloscopus fuscatus*	褐柳鶯	WV	C	+	1	1		+	1	1		+	1	1		+		1	1	+		1	1	+		3		+				+				+				+				+				+				+				+			
Eurasian tree sparrow	*Passer montanus*	麻雀	R	C	++		3	3	+++		6	3	++		3	4	++		6	5	++	3	4	6	++	4		5	++				++	3			++	3	4	2	++	3	3	3	++	5	2	3	++	3	3		++	3	3	2	++	4	4	3	++	3	3	4
Fork-tailed Sunbird	*Aethopyga christinae*	叉尾太陽鳥	R	C	+		1														+				+																															
Great Coucal	*Centropus sinensis*	褐翅鴉鵑	R,VU	C																	+		1		+			3	+																				+				+					
Great Egret	*Ardea alba*	大白鷺	R,RC	C	+	1																																																		
Great Tit	*Parus major(commixtus)*	大山雀	R	C																																																		
Green Sandpiper	*Tringa ochropus*	白腰草鷸	PM&WV	C	+		1		+			1	+			1	+			1									+								+							1	+			1					+			1								
Grey Heron	*Ardea cinerea*	蒼鷺	WV,PRC	C									+			1																																								
Grey Wagtail	*Motacilla cinerea*	灰鶺鴒	WV	C	+			1	+	1			+	1			+	1		1	+			1	+	1			+	1		1	+	1			+	1			+	1			+	2	1		+	1	1		+			1	+			1
Japanese White Eye	*Zosterops japonica(simplex)*	暗綠繡眼鳥	R	C	+	3	3										++		5	3	++		7	6	++	3		4	++		4	2	++	3	3		++	2		2	++		2	2	++		4		++		3	3	++			2	++		2	2
Large Hawk Cuckoo	*Cuculus sparverioides*	鷹鵑	SV	C																					+				+																									
Little Egret	*Egretta garzetta*	小白鷺	R,RC	C					+			1	+			1	+	1			+	1			+				+	1			+			1	+			1	+				+			1	+				+			1	+			1
Magpie Robin	*Copsychus saularis*	鵲鴝	R	C	+		2	2	+	1	2		+	1	2	1	+		2		+		2	2	+		2	2	+		1	1	+		2		+	1	1	1	+		2	1	+	2	2		+		2	1	+		1	1	+	1	1	1
Night Heron	*Nycticorax nycticorax*	夜鷺	R,LC	C																																																			
Olive Backed Pipit	*Anthus hodgsoni*	樹鷚	WV	C																					++				++																									
Oriental Dollarbird	*Eurystomus orientalis*	三寶鳥	PM	U	+		3																																															
Plaintive Cuckoo	*Cacomantis merulinus*	八聲杜鵑	SV	C																																																		
Plain Prinia	*Prinia inornata*	純色鵐鶯	R	C													++				+				+				+				+				+				+				+				+				+			
Red-flanked Bluetail	*Tarsiger cyanurus*	紅脇藍尾鴝	WV&PM	C																					+		1																											
Rufous-backed Shrike	*Lanius schach*	棕背伯勞	R	C	+			1	+	1		1	+			1	+				+			1	+			1					+								+				+				+							
Rufous-capped Babbler	*Stachyridopsis ruficeps*	紅頭穗鹛	R, LC	U	+		1														+				+																+				+											
Scarlet Minivet	*Pericrocotus speciosus*	赤紅山椒鳥	R	C																																																		
Sooty-headed Bulbul	*Pycnonotus aurigaster*	白喉紅臀鵯	R	C																																																	
Spotted Dove	*Streptopelia chinensis*	珠頸斑鳩	R	C	++	3	3	4	++	3	5	5	++		2	5	++		3	4	++	3	1	4	++	4	2	5	++	3	3	4	++	4	4	2	++	4	4	2	++	4		4	++	3	2	3	++	4	2	5	++	3	3	4	++	4	2	2
Spotted Munia	*Lonchura punctulata*	斑文鳥	R	C	+			3	+		4		++		5																																								
Stejneger's Stonechat	*Saxicola stejnegeri*	黑喉石鵖	PM,WV	C									+				+				+				+																												+			
White Wagtail	*Motacilla alba*	白鶺鴒	WV	C	+			1	+			3	+		1	1	+	1		1	+	1		1	+	1			+	1			+	1	1	1	+			1	+		1	1	+		1	1	+	1	1		+	1	1		+	1	1		+	1	1	
White-breasted Waterhen	*Amaurornis phoenicurus*	白胸苦惡鳥	R	C					+		1														+	1																															
Yellow Bellid Prinia	*Prinia flaviventris*	黃腹鵐鶯	R	C	+		1		+				+				+				+				+				+				+																		+							
Number of birds						14	37	29		15	35	21		10	25	24		10	27	34		14	42	32		22	34	28		19	44	12		22	36	18		21	31	24		14	28	31		26	26	25		26	26	21		26	27	19		21	23	19		21	21	21
No. of species					24	6	16	11	21	7	12	7	20	4	11	13	21	4	8	12	27	7	13	11	27	9	9	9	25	9	9	6	22	8	8	10	19	7	7	11	21	5	9	14	21	6	10	12	23	9	10	9	21	8	10	8	21	7	9	10	21	7	11	12

Note: R – Resident; WV – Winter visitor; PM – Passage migrant; C – Common; U – Uncommon

SpM – Spring migrant; Sv - Summer visitor

C – transect count; P1 – Point count location 1; P3 – Point count location 3

+, occurred; ++, common; +++, abundant/dominant species in the the study area

Commonness and status were decided accroding to AFCD biodiversity website (www.hkbiodiversity.net)

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PRC: Potential Regional concern Fellowes *et al* (2002)

CR: Rare in China Red Data Book Status

VU: Vulnerable in China Red Data Book Status

Table 4.4. Odonate species recorded at the She Shan River

					Baseline monitoring		Impact monitoring				Impact monitoring						Post construction monitoring								
Species name	Common name	Chinese name	Status	Commo--nness	Jul-08	Aug-08	Jan-09	Jul-09	Jan-10	Jul-10	Jan-11	Jul-11	Jan-12	Jul-12	Jul-13	Dec-13	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14	Aug-14	Sep-14
Agriocnemis pygmnalis	Wandering Midget	黃尾小蟌	NP	VC																+					
Brachythemis contaminata	Asian Amberwing	黃翅蜻	NP	VC										+											
Burmagomphus vermicularis	Dog-legged Clubtail	聯紋緬春蜓	P, LC	C																					
Ceriagrion auranticum ryukyuanum	Orange-tailed Sprite	琉球橘黃蟌	NP	VC																+	++	+		+	
Copera ciliata	Black-knees Featherlegs	白狹扇蟌	NP	VC																+					
Copera marginipes	Yellow Featherlegs	黃狹扇蟌	NP	VC										+						+		+		+	+
Crocothemis servilia servilia	Crimson Darter	红蜻	NP	VC	+	+		+		++		+			+		+				+	+	+	+	+
Diplacodes trivialis	Blue Percher	紋藍小蜻	NP	VC	+												+	+	+						
Ictinogomphus pertinax	Common Flangetail	霸王葉春蜓	NP	C								+			+	+	+	+	+			+	+	+	+
Ischnura senegalensis	Common Bluetail	褐斑異痣蟌	NP	VC								+			+					+	+	+			
Nannophya pygmaea	Scarlet Dwarf	侏紅小蜻	NP	C																					
Neurobasis chinensis chinensis	Chinese Greenwing	華艷色蟌	NP	VC								+							+						
Neurothemis fulvia	Russet Percher	網脈蜻	NP	VC						+												+	+		
Orthetrum chrysis	Red-faced Skimmer	華麗灰蜻	NP	VC	+	+	+	+		+						+									
Orthetrum glaucum	Common blue skimmer	黑尾灰蜻	NP	VC			+								+						+				
Orthetrum luzonicum	Marsh Skimmer	呂宋灰蜻	NP	VC								+									+	+			
Orthetrum pruinosum neglectum	Common Red Skimmer	赤褐灰蜻	NP	VC								++			+						++	++	+	+	+
Orthetrum Sabina sabina	Green Skimmer	狹腹灰蜻	NP	C	+	+															+				+
Pantala flavescens	Wandering Glider	黃蜻	NP	VC	+	+			+	+	+	+++	+	+	+	+	+								
Prodasineura autumnalis	Black Threadtail	烏齒原蟌	NP	VC								+			+					+	+				
Pseudagrion pruinosum fraseri	Ferruginous-faced Sprit	赤斑蟌	NP	C																					
Pseudagrion rubriceps rubriceps	Orange-faced Sprite	丹頂斑蟌	NP	UC	+		+	+		+		+		+		+				+	+	+	+	+	+
Rhinocypha perforata perforata	Common Blue Jewel	三斑鼻蟌	NP	VC																				+	+
Rhyothemis variegata arria	Variegated Flutterer	斑麗翅蜻	NP	C											+							+	+	+	
Trithemis aurora	Crimson Dropwing	曉褐蜻	NP	VC								++			+							+	+	+	+
Trithemis festiva	Indigo Dropwing	慶褐蜻	NP	VC				+		+		+			+				+			+	+	+	+
Zygonyx iris insignis	Emerald Cascader	彩虹蜻	P,PG	VC																		+	+	+	
No of Species					6	4	3	4	1	6	1	11	1	4	10	4	6	6	8	7	9	13	9	11	9

Note: NP – Not protected in Hong Kong ; P - Protected in Hong Kong
"VC" – Very Common; "UC" – Uncommon; "C" - Common
"+" – Species exists in the study area
"++" – Species common in the study area
"+++" – Species abundance in the study area
Commonness and status were decided accroding to AFCD biodiversity website
LC- Local Concern - Fellowes *et al* (2002)
PGC - Potential Global Concern - Fellowes *et al* (2002)

Table 4.4. Odonate species recorded at the She Shan River

					Post construction monitoring														
Species name	Common name	Chinese name	Status	Commo--nness	Oct-14	Nov-14	Dec-14	Jan-15	Feb-15	Mar-15	Apr-15	May-15	Jun-15	Jul-15	Aug-15	Sep-15	Oct-15	Nov-15	Dec-15
Agriocnemis pygmnalis	Wandering Midget	黃尾小蟌	NP	VC															
Brachythemis contaminata	Asian Amberwing	黃翅蜻	NP	VC															
Burmagomphus vermicularis	Dog-legged Clubtail	聯紋緬春蜓	P, LC	C															
Ceriagrion auranticum ryukyuanum	Orange-tailed Sprite	琉球橘黃蟌	NP	VC						+	+	+	+	+	+	+			
Copera ciliata	Black-knees Featherlegs	白狹扇蟌	NP	VC															
Copera marginipes	Yellow Featherlegs	黃狹扇蟌	NP	VC	+					+	+	+	+	+	+	+			
Crocothemis servilia servilia	Crimson Darter	紅蜻	NP	VC	+	+	+	+		+	+	+	+	+	+	+	+	+	
Diplacodes trivialis	Blue Percher	紋藍小蜻	NP	VC															
Ictinogomphus pertinax	Common Flangetail	霸王葉春蜓	NP	C	+							+	+	+	+	+	+		
Ischnura senegalensis	Common Bluetail	褐斑異痣蟌	NP	VC															
Nannophya pygmaea	Scarlet Dwarf	侏紅小蜻	NP	C															
Neurobasis chinensis chinensis	Chinese Greenwing	華艷色蟌	NP	VC	+	+				+	+	+			+	+	+	+	
Neurothemis fulvia	Russet Percher	網脈蜻	NP	VC						+	+	+	+	+	+	+			
Orthetrum chrysis	Red-faced Skimmer	華麗灰蜻	NP	VC											+	+	+	+	
Orthetrum glaucum	Common blue skimmer	黑尾灰蜻	NP	VC															
Orthetrum luzonicum	Marsh Skimmer	呂宋灰蜻	NP	VC									+	+					
Orthetrum pruinosum neglectum	Common Red Skimmer	赤褐灰蜻	NP	VC	+						+	+	+	+					
Orthetrum Sabina sabina	Green Skimmer	狹腹灰蜻	NP	C	+												+	+	
Pantala flavescens	Wandering Glider	黃蜻	NP	VC	+	+						+	+	+	+	+	+	+	+
Prodasineura autumnalis	Black Threadtail	烏齒原蟌	NP	VC							+	+	+	+	+				
Pseudagrion pruinosum fraseri	Ferruginous-faced Sprit	赤斑蟌	NP	C															
Pseudagrion rubriceps rubriceps	Orange-faced Sprite	丹頂斑蟌	NP	UC	+	+													
Rhinocypha perforata perforata	Common Blue Jewel	三斑鼻蟌	NP	VC	+	+					+	+	+	+	+	+	+		
Rhyothemis variegata arria	Variegated Flutterer	斑麗翅蜻	NP	C									+	+	+	+			
Trithemis aurora	Crimson Dropwing	曉褐蜻	NP	VC	+	+	+	+	+		+	+	+	+	+	+	+	+	
Trithemis festiva	Indigo Dropwing	慶褐蜻	NP	VC	+	+					+	+	+	+	+	+	+	+	+
Zygonyx iris insignis	Emerald Cascader	彩虹蜻	P,PG	VC															
No of Species					11	7	2	2	1	5	10	12	13	13	13	12	9	7	2

Note: NP – Not protected in Hong Kong ; P - Protected in Hong Kong
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"+" – Species exists in the study area
"++" – Species common in the study area
"+++" – Species abundance in the study area
Commonness and status were decided accroding to AFCD biodiversity website
LC- Local Concern - Fellowes *et al* (2002)
PGC - Potential Global Concern - Fellowes *et al* (2002)

Table 4.4. Odonate species recorded at the She Shan River

					Post construction monitoring										
Species name	Common name	Chinese name	Status	Commo--nness	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16
Agriocnemis pygmnalis	Wandering Midget	黃尾小蟌	NP	VC											
Brachythemis contaminata	Asian Amberwing	黃翅蜻	NP	VC											
Burmagomphus vermicularis	Dog-legged Clubtail	聯紋緬春蜓	P, LC	C						+					
Ceriagrion auranticum ryukyuanum	Orange-tailed Sprite	琉球橘黃蟌	NP	VC				+	+	+	+	+	+	+	+
Copera ciliata	Black-knees Featherlegs	白狹扇蟌	NP	VC				+	+	+	+	+	+		
Copera marginipes	Yellow Featherlegs	黃狹扇蟌	NP	VC						+	+	+	+		
Crocothemis servilia servilia	Crimson Darter	红蜻	NP	VC				+	+	+	+	+	+	+	+
Diplacodes trivialis	Blue Percher	紋藍小蜻	NP	VC											
Ictinogomphus pertinax	Common Flangetail	霸王葉春蜓	NP	C					+	+	+	+	+	+	
Ischnura senegalensis	Common Bluetail	褐斑異痣蟌	NP	VC								+	+		
Nannophya pygmaea	Scarlet Dwarf	侏紅小蜻	NP	C											
Neurobasis chinensis chinensis	Chinese Greenwing	華艷色蟌	NP	VC				+	+	+	+	+	+	+	+
Neurothemis fulvia	Russet Percher	網脈蜻	NP	VC				+	+	+	+	+	+	+	
Orthetrum chrysis	Red-faced Skimmer	華麗灰蜻	NP	VC	+			+	+	+	+	+	+	+	+
Orthetrum glaucum	Common blue skimmer	黑尾灰蜻	NP	VC											
Orthetrum luzonicum	Marsh Skimmer	呂宋灰蜻	NP	VC				+	+	+	+	+		+	+
Orthetrum pruinosum neglectum	Common Red Skimmer	赤褐灰蜻	NP	VC											
Orthetrum Sabina sabina	Green Skimmer	狹腹灰蜻	NP	C											
Pantala flavescens	Wandering Glider	黃蜻	NP	VC	+	+	+	+	+	+	+	+	+	+	+
Prodasineura autumnalis	Black Threadtail	烏齒原蟌	NP	VC											
Pseudagrion pruinosum fraseri	Ferruginous-faced Sprit	赤斑蟌	NP	C											
Pseudagrion rubriceps rubriceps	Orange-faced Sprite	丹頂斑蟌	NP	UC										+	
Rhinocypha perforata perforata	Common Blue Jewel	三斑鼻蟌	NP	VC					+	+	+				
Rhyothemis variegata arria	Variegated Flutterer	斑麗翅蜻	NP	C						+	+	+	+		
Trithemis aurora	Crimson Dropwing	曉褐蜻	NP	VC			+	+	+	+	+	+	+	+	+
Trithemis festiva	Indigo Dropwing	慶褐蜻	NP	VC	+		+	+	+	+	+	+	+	+	+
Zygonyx iris insignis	Emerald Cascader	彩虹蜻	P,PG	VC											
No of Species					3	1	3	10	12	15	14	14	13	11	8

Note: NP – Not protected in Hong Kong ; P - Protected in Hong Kong
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"++" – Species common in the study area
"+++" – Species abundance in the study area
Commonness and status were decided accroding to AFCD biodiversity website
LC- Local Concern - Fellowes *et al* (2002)
PGC - Potential Global Concern - Fellowes *et al* (2002)

Table 4.5 Aquatic Macro invertebrates recorded at She Shan River.

(T1- Upper stream section, T2 - middle stream section, T3 - Lower stream section)

				Baseline monitoring				Impact monitoring				Impact monitoring				Impact monitoring				Impact monitoring				Impact monitoring				Impact monitoring				Impact monitoring				Impact monitoring			
Species	Chinese name	Sampling location		Jul-08		Aug-08		Jan-09				Jul-09				Jan-10				Jul-10				Jan-11				Jul-11				Jan-12				Jul-12			
		Status	Common - ness	Upper stream	Lower stream	Upper stream	Lower stream	Referen	T1	T2	T3	Referen	T1	T2	T3	Reference	T1	T2	T3	Reference	T1	T2	T3	Referenc	T1	T2	T3	Reference	T1	T2	T3	Reference	T1	T2	T3	Reference	T1	T2	T3
Mollusks																																							
Anodonta woodiana	背角無齒蚌	NP	VC																			+																	
Biomphalaria sp.	--	NP	VC	+	+	+	+	+		+	+	+			+	+		+		+		+		+		+	+	+		+	+	+	+	+	+			+	+	+	
Brotia hainanensis	--	NP	VC	+	+	+	+	+		+		+				+		+		+	+	+		+				+	+			+	+			+			
Corbicula fluminea	河蜆	NP	VC																			+										+							
Melanoides tuberculata	瘤擬黑螺	NP	VC	+	+	+	++				+				+	+		+		+		+	+	+	++	++	+	+	+	+	+		+	+	+	+	+	+	+	+
Pomacea canaliculata	蘋果螺	NP	VC	+	++	+	+	+		+	+	+			+	+		++		+	+	++	++	+	+++	+++	+++	+	++	++	+++	+	+	+	+	+	+	+	+
Radix plicatulus	--	NP	VC	+	+	+	+	+			+	+			+	+		+		+	+	+		+	+	+	+	+	+	+	++	+	+	+	+	+	+	+	+
Sinotaia quadrata	田螺	NP	VC	+	+	+	++	+			+	+			+	+		++		+	+	++	++	+	+++	++	++	+	+++	++	+	+	+	+	+	+	+	+	+
Insects																																							
Baetis sp.		NP	VC	+	+	+	+	+		+	+	+			+	+		+		+	+	+		+	+	+	+	+	+	+		+				+	+		
Caenis sp.	--	NP	VC	+	+	+	+	+			+	+			+	+		+		+		+		+															
Chironomus sp.	蠓幼虫	NP	VC	+	+	++	++	+		+	+	+			+	+		+		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Euphaea sp.		NP	VC																																				
Indobaetis sp.	--	NP	VC	+	+	+	+	+		+	+	+			+	+		+		+	+	+		+	+	+	+	+	+	+		+							
Odonate larvae		NP	VC																																				
Orthetrum spp.	--	NP	VC							+	+				+						+	+			+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
Pseudagrion spp.	--	NP	UC												+																									
Pseudocloeon sp.	--	NP	VC	+	+	+	+				+				+																									
Serratella sp.		NP	VC	+	+	+	+											+				+																			
Crustaceans																																							
Caridina cantanensis	廣東米蝦	NP	VC																																				
Cryptopotamon anacoluthon	鰓刺溪蟹	NP	VC																																				
No of Species				12	12	12	12	9	0	7	11	9	0	0	12	10	0	11	0	10	8	14	4	10	9	9	8	10	10	9	7	11	7	6	5	9	8	7	5

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"+" – Species exists in the study area
"++" – Species common in the study area
"+++" – Species abundance in the study area
- Reference point was the sampling location outside the works area used to compare the with the data within works area.

Table 4.5 Aquatic Macro invertebrates recorded at She Shan River.

(T1- Upper stream section, T2 - middle stream section, T3 - Lower stream section)

				Impact monitoring				Impact monitoring				Post construction monitoring				Post construction monitoring				Post construction monitoring				Post construction monitoring				Post construction monitoring				Post construction monitoring				Post construction monitoring			
Species	Chinese name	Sampling location		Jul-13				Dec-13				Jan-14				Feb-14				Mar-14				Apr-14				May-14				Jun-14				Jul-14			
		Status	Common - ness	Reference	T1	T2	T3	Reference	T1	T2	T3	Reference	T1	T2	T3	Reference	T1	T2	T3	Reference	T1	T2	T3	Reference	T1	T2	T3	Reference	T1	T2	T3	Reference	T1	T2	T3	Reference	T1	T2	T3
Mollusks																																							
Anodonta woodiana	背角無齒蚌	NP	VC																										+										
Biomphalaria sp.	--	NP	VC	+				+								+				+	+	+		+	+	+		+	+	+		+	+	+		+	+	+	
Brotia hainanensis	--	NP	VC	+	+			+	+	+		+	+	+		+	+	+	+	+	+	+	+	+	+	+		+	+	+		+	+	+		+	+	+	
Corbicula fluminea	河蜆	NP	VC	+				+				+				+				+						+				+						+			+	+
Melanoides tuberculata	瘤擬黑螺	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		+	+	+	+	+
Pomacea canaliculata	蘋果螺	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		+	+	+	+	+
Radix plicatulus	--	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		+	+	+	+	+
Sinotaia quadrata	田螺	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	++	+	+	+	++	+	+	+	++	+	+	+	+	+	+	+	+	+	+		+	+	+	+	+
Insects																																							
Baetis sp.		NP	VC	+				+				+				+	+			+	+	+		+		+		+		+			+				+	+	
Caenis sp.	--	NP	VC																					+															
Chironomus sp.	蠓幼虫	NP	VC	+	+	+		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		+	+	+	+	+
Euphaea sp.		NP	VC																														+					+		
Indobaetis sp.	--	NP	VC									+				+	+	+		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		+	+	+	+	+
Odonate larvae		NP	VC																																					
Orthetrum spp.	--	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		+	+	+	+	
Pseudagrion spp.	--	NP	UC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		+	+	+	+	
Pseudocloeon sp.	--	NP	VC																	+				+	+															
Serratella sp.		NP	VC													+				+	+	+		+	+	+			+				+	+				+		
Crustaceans																																							
Caridina cantanensis	廣東米蝦	NP	VC																																					
Cryptopotamon anacoluthon	鰓刺溪蟹	NP	VC																																					
No of Species				11	8	7	6	11	8	8	7	11	8	8	7	13	10	9	8	14	12	12	9	14	12	13	9	11	11	13	8	10	12	13	8	10	11	14	7

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"+++" – Species abundance in the study area
- Reference point was the sampling location outside the works area used to compare the with the data within works area.

Table 4.5 Aquatic Macro invertebrates recorded at She Shan River.

(T1- Upper stream section, T2 - middle stream section, T3 - Lower stream section)

				Post construction monitoring				Post construction monitoring				Post construction monitoring				Post construction monitoring				Post construction monitoring				Post construction monitoring				Post construction monitoring				Post construction monitoring				Post construction monitoring			
Species	Chinese name	Sampling location		Aug-14				Sep-14				Oct-14				Nov-14				Dec-14				Jan-15				Feb-15				Mar-15				Apr-15			
		Status	Common - ness	Reference	T1	T2	T3	Reference	T1	T2	T3	Reference	T1	T2	T3	Reference	T1	T2	T3	Reference	T1	T2	T3	Reference	T1	T2	T3	Reference	T1	T2	T3	Referer	T1	T2	T3	Referenc	T1	T2	T3
Mollusks																																									
Anodonta woodiana	背角無齒蚌	NP	VC																																						
Biomphalaria sp.	--	NP	VC	+	+	+		+	+	+		+	+	+		+	+				+				+	+				+		+	+	+		+	+	+	
Brotia hainanensis	--	NP	VC	+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+	+	+	
Corbicula fluminea	河蜆	NP	VC			+	+			+	+			+				+				+												+					+	
Melanoides tuberculata	瘤擬黑螺	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Pomacea canaliculata	蘋果螺	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Radix plicatulus	--	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Sinotaia quadrata	田螺	NP	VC	+	+	++	+	+	+	++	+	+	+	++	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	++	+	+	+	++	+
Insects																																									
Baetis sp.		NP	VC		+	+		+	+	+		+	+	+		+	+	+				+				+				+				+				+		
Caenis sp.	--	NP	VC																																						
Chironomus sp.	蠓幼虫	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Euphaea sp.		NP	VC			+				+								+				+				+								+				+	+	+	
Indobaetis sp.	--	NP	VC	+	+	+		+	+	+		+	+	+		+	+	+		+		+		+	+	+			+	+		+	+	+					
Odonate larvae		NP	VC																																		+			
Orthetrum spp.	--	NP	VC	+	+	+		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+					
Pseudagrion spp.	--	NP	UC	+	+	+		+	+	+	+	+	+	+	+	+	+	+	+	+		+		+	+	+			+	+			+	+			+	+	
Pseudocloeon sp.	--	NP	VC			+		+	+	+		+	+	+		+		+		+		+		+		+									+	+	+	+	
Serratella sp.		NP	VC		+	+																			+	+			+				+				+	+		
Crustaceans																																									
Caridina cantanensis	廣東米蝦	NP	VC																																					
Cryptopotamon anacoluthon	鰓刺溪蟹	NP	VC																																					
No of Species				10	12	15	6	12	12	14	8	12	12	13	7	12	11	13	7	10	8	13	6	10	11	14	6	7	10	12	6	9	12	13	6	9	12	13	6

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"+" – Species exists in the study area
"++" – Species common in the study area
"+++" – Species abundance in the study area
- Reference point was the sampling location outside the works area used to compare the with the data within works area.

Table 4.5 Aquatic Macro invertebrates recorded at She Shan River.

(T1- Upper stream section, T2 - middle stream section, T3 - Lower stream section)

Species	Chinese name	Sampling location		Post construction monitoring				Post construction monitoring				Post construction monitoring				Post construction monitoring				Post construction monitoring				Post construction monitoring				Post construction monitoring				Post construction monitoring			
				May-15				Jun-15				Jul-15				Aug-15				Sep-15				Oct-15				Nov-15				Dec-15			
		Status	Common - ness	Reference	T1	T2	T3	Reference	T1	T2	T3	Reference	T1	T2	T3	Reference	T1	T2	T3	Reference	T1	T2	T3	Reference	T1	T2	T3	Reference	T1	T2	T3	Reference	T1	T2	T3
Mollusks																																			
Anodonta woodiana	背角無齒蚌	NP	VC																																
Biomphalaria sp.	--	NP	VC	+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+	+	+	
Brotia hainanensis	--	NP	VC	+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+	+	+	
Corbicula fluminea	河蜆	NP	VC			+				+				+				+				+				+				+				+	
Melanoides tuberculata	瘤擬黑螺	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	++	+	+	+	++	+	+	+	++	+	+	+	++	+	+	+
Pomacea canaliculata	蘋果螺	NP	VC	+	+	+	+	+	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	+	++	++	+	+	++	++	+	+	++	++	+	+	+
Radix plicatulus	--	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Sinotaia quadrata	田螺	NP	VC	+	+	+	++	+	+	+	++	+	+	+	++	+	+	+	++	+	+	+	++	+	+	++	++	+	+	++	++	+	+	++	++	+	+	++	++
Insects																																			
Baetis sp.		NP	VC			+				+				+				+				+				+				+				+	
Caenis sp.	--	NP	VC																																
Chironomus sp.	蠓幼虫	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Euphaea sp.		NP	VC		+	+			+	+			+	+			+	+			+	+			+	+			+	+			+	+	
Indobaetis sp.	--	NP	VC	+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+	+	+	
Odonate larvae		NP	VC															+			+	+			+	+			+	+			+	+	
Orthetrum spp.	--	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Pseudagrion spp.	--	NP	UC		+	+			+	+			+	+			+	+			+	+			+	+			+	+			+	+	
Pseudocloeon sp.	--	NP	VC																																
Serratella sp.		NP	VC		+				+				+				+				+				+				+				+		
Crustaceans																																			
Caridina cantanensis	廣東米蝦	NP	VC											+				+				+				+				+				+	
Cryptopotamon anacoluthon	鰓刺溪蟹	NP	VC																			+				+				+				+	
No of Species				9	12	13	6	9	12	13	6	9	12	14	6	9	12	15	6	9	13	15	6	9	13	15	6	9	13	15	6	9	14	15	6

Note: NP – Not protected in Hong Kong;
P - protected species in Hong Kong
"VC" – Very Common; "UC" – Uncommon; "C" - Common
"+" – Species exists in the study area
"++" – Species common in the study area
"+++" – Species abundance in the study area
- Reference point was the sampling location outside the works area used to compare the with the data within works area.

Table 4.5 Aquatic Macro invertebrates recorded at She Shan River.

(T1- Upper stream section, T2 - middle stream section, T3 - Lower stream section)

Species	Chinese name	Sampling location		Post construction monitoring				Post construction monitoring				Post construction monitoring				ost construction monitorin				Post construction monitoring				Post construction monitoring				Post construction monitoring			
				Jan-16				Feb-16				Mar-16				Apr-16				May-16				Jun-16				Jul-16			
		Status	Common - ness	Reference	T1	T2	T3	Reference	T1	T2	T3	Reference	T1	T2	T3	Reference	T1	T2	T3	Reference	T1	T2	T3	Reference	T1	T2	T3	Reference	T1	T2	T3
Mollusks																															
Anodonta woodiana	背角無齒蚌	NP	VC																												
Biomphalaria sp.	--	NP	VC	+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+	+	+	
Brotia hainanensis	--	NP	VC	+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+	+	+	
Corbicula fluminea	河蜆	NP	VC			+				+				+				+				+				+				+	
Melanoides tuberculata	瘤擬黑螺	NP	VC	+	+	++	+	+	+	++	+	+	+	++	+	+	+	++	+	+	++	++	+	+	++	++	+	+	++	++	+
Pomacea canaliculata	蘋果螺	NP	VC	+	++	++	+	+	++	++	+	+	++	++	+	+	++	++	+	+	++	++	+	+	++	++	+	+	++	++	+
Radix plicatulus	--	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Sinotaia quadrata	田螺	NP	VC	+	+	++	++	+	+	++	++	+	+	++	++	+	+	++	++	+	+	++	++	+	+	++	++	+	+	++	++
Insects																															
Baetis sp.		NP	VC			+				+				+				+				+				+				+	
Caenis sp.	--	NP	VC																												
Chironomus sp.	蠓幼虫	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Euphaea sp.		NP	VC		+	+			+	+			+	+			+	+			+	+			+	+			+	+	
Indobaetis sp.	--	NP	VC	+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+	+	+	
Odonate larvae		NP	VC		+	+			+	+			+	+			+	+			+	+			+	+			+	+	
Orthetrum spp.	--	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Pseudagrion spp.	--	NP	UC		+	+			+	+			+	+			+	+			+	+			+	+			+	+	
Pseudocloeon sp.	--	NP	VC																												
Serratella sp.		NP	VC		+				+				+				+				+				+				+		
Crustaceans																															
Caridina cantanensis	廣東米蝦	NP	VC		+	+			+	+			+	+			+	+			+	+			+	+			+	+	
Cryptopotamon anacoluthon	鰓刺溪蟹	NP	VC			+				+				+				+				+				+				+	
No of Species				9	14	15	6	9	14	15	6	9	14	15	6	9	14	15	6	9	14	15	6	9	14	16	6	9	14	16	6

Note: NP – Not protected in Hong Kong;
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"VC" – Very Common; "UC" – Uncommon; "C" - Common
"+" – Species exists in the study area
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- Reference point was the sampling location outside the works area used to compare the with the data within works area.

Table 4.5 Aquatic Macro invertebrates recorded at She Shan River.

(T1- Upper stream section, T2 - middle stream section, T3 - Lower stream section)

				Post construction monitoring				Post construction monitoring				Post construction monitoring			
Species	Chinese name	Sampling location		Aug-16				Sep-16				Oct-16			
		Status	Common - ness	Reference	T1	T2	T3	Reference	T1	T2	T3	Reference	T1	T2	T3
Mollusks															
Anodonta woodiana	背角無齒蚌	NP	VC												
Biomphalaria sp.	--	NP	VC	+	+	+		+	+	+		+	+	+	
Brotia hainanensis	--	NP	VC	+	+	+		+	+	+		+	+	+	
Corbicula fluminea	河蜆	NP	VC			+				+				+	
Melanoides tuberculata	瘤擬黑螺	NP	VC	+	++	++	+	+	++	++	+	+	++	++	+
Pomacea canaliculata	蘋果螺	NP	VC	+	++	++	+	+	++	++	+	+	++	++	+
Radix plicatulus	--	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+
Sinotaia quadrata	田螺	NP	VC	+	+	++	++	+	+	++	++	+	+	++	++
Insects															
Baetis sp.		NP	VC			+				+				+	
Caenis sp.	--	NP	VC												
Chironomus sp.	蠓幼虫	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+
Euphaea sp.		NP	VC		+	+			+	+			+	+	
Indobaetis sp.	--	NP	VC	+	+	+		+	+	+		+	+	+	
Odonate larvae		NP	VC		+	+			+	+			+	+	
Orthetrum spp.	--	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+
Pseudagrion spp.	--	NP	UC		+	+			+	+			+	+	
Pseudocloeon sp.	--	NP	VC												
Serratella sp.		NP	VC		+				+				+		
Crustaceans															
Caridina cantanensis	廣東米蝦	NP	VC		+	+			+	+			+	+	
Cryptopotamon anacoluthon	鰓刺溪蟹	NP	VC			+				+				+	
No of Species				9	14	16	6	9	14	16	6	9	14	16	6

Note: NP – Not protected in Hong Kong;
P - protected species in Hong Kong
"VC" – Very Common; "UC" – Uncommon; "C" - Common
"+" – Species exists in the study area
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"+++" – Species abundance in the study area
- Reference point was the sampling location outside the works area used to compare the with the data within works area.

Table 4.6 Fish species and Hong Kong Newt recorded at She Shan River
(T1- Upper stream section, T2 - middle stream section and T3 - Lower stream section)

				Baseline monitoring				Impact monitoring				Impact monitoring				Impact monitoring				Impact monitoring				Impact monitoring				Impact monitoring			
				Jul-08		Aug-08		Jan-09				Jul-09				Jan-10				Jul-10				Jan-11				Jul-11			
Species		Status	Commonness	Upper stream	Lower stream	Upper stream	Lower stream	Reference	T1	T2	T3	Reference	T1	T2	T3	Reference	T1	T2	T3	Reference	T1	T2	T3	Reference	T1	T2	T3	Referenc	T1	T2	T3
Channa maculata	斑鱧	NP	C																												
Clarias gariepinus	革胡子鯰	NP	VC																												
Gambusia affinis	食蚊魚	NP	VC			++	++	+		+	+	+				+		+		+		+	+	+	+	+		+		+	+
Misgurnus anguillicaudatus	泥鰍	NP	C															+				+									
Oreochromis niloticus	尼羅口孵非鯽	NP	C			+	++				+	+			+	+				+		+	++	+				+			
Parazacco spilurus	異鱲	NP, V	C	+	++	+	++	+	+	+	++	+	+			+	+			+	+			+				+			
Poecilia reticulata	孔雀花魚將	NP	VC			++	++				+	+			+	+				+		+	+	+	+			+			
Pterocryptis cochinchinensis	越南隱鰭鯰	NP	C																												
Puntius semifasciolatus	七星魚	NP	C	+++	++	+++	+++	++		+	+	+			+	+		+		+	+	+	+	+	+			+			
Rhinogobius spp.	鰕虎魚	NP	C			+	+	+		+	+							+			+	+	+	+				+			
Xiphophorus hellerii	劍尾魚	NP	C	+	+	++	++	+		+	+	+			+++	+		+		+		+	+	+	+			+			
Xiphophorus variatus	雜色劍尾魚	NP	C			+	+				+											+	+								
Zacco platypus	寬鰭鱲	NP	C	++	+	+	+	+		+	+	+			+	+		+		+		+	+	+	+			+		+	
		2x2m fish number		80	60	80	60	30		15	45	30	0	0	300	30	0	13		20	5	20	200	22	16	3	0	6	4	2	3
		No of Species		4	4	9	9	6	1	6	9	7	1	0	5	7	1	6	0	7	3	9	8	8	6	1	0	8	0	2	1
Amphibian																															
Paramesotriton hongkongensis	香港瘰螈	P, Cap 170, NT, PGC	R																												

Note: NP – Not protected in Hong Kong

"VC" – Very Common; "UC" – Uncommon; "C" - Common

"+" – Species exists in the study area

"++" – Species common in the study area

"+++" – Species abundance in the study area

- Reference point was the sampling location outside the works area used to compare the with the data within works area.

"Cap 170" - List in Wild Animials Protcetion Ordinance (Cap.170)

"NT" - Near Treatened in IUCN Red List Status

"PGC"-Potential Golal Concern by Fellowes *et al* (2002)

'V" - Vulerable - in Red China Data Book

Table 4.6 Fish species and Hong Kong Newt recorded at She Shan River
(T1- Upper stream section, T2 - middle stream section and T3 - Lower stream section)

				Impact monitoring				Impact monitoring				Impact monitoring				Impact monitoring				Post construction monitoring				Post construction monitoring				Post construction monitoring			
				Jan-12				Jul-12				Jul-13				Dec-13				Jan-14				Feb-14				Mar-14			
Species		Status	Commonness	Reference	T1	T2	T3	Reference	T1	T2	T3	Referenc	T1	T2	T3	Reference	T1	T2	T3	Reference	T1	T2	T3	Reference	T1	T2	T3	Reference	T1	T2	T3
Channa maculata	斑鱧	NP	C																					+				+	+	+	
Clarias gariepinus	革胡子鯰	NP	VC																					+				+			
Gambusia affinis	食蚊魚	NP	VC	+	+	+		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Misgurnus anguillicaudatus	泥鰍	NP	C					+				+				+				+				+				+	+	+	
Oreochromis niloticus	尼羅口孵非鯽	NP	C	+				+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Parazacco spilurus	異鱲	NP, V	C	+				+	+	+		+	+	+		+	+	+		+	+	++	++	+	+	+	+	+	+	+	+
Poecilia reticulata	孔雀花魚將	NP	VC	+	+			+				+	+	+										+				+	+	+	
Pterocryptis cochinchinensis	越南隱鰭鯰	NP	C																					+				+			
Puntius semifasciolatus	七星魚	NP	C	+	+			+	+	+		+	+	+		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Rhinogobius spp.	鰕虎魚	NP	C	+	+			+	+	+		+	+	+		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Xiphophorus hellerii	劍尾魚	NP	C	+	+			+	+	+	+	+	+	+	+	+	+	+	+	+	+	++	++	+	+	+	+	+	+	+	+
Xiphophorus variatus	雜色劍尾魚	NP	C														+				+				+				+	+	
Zacco platypus	寬鰭鱲	NP	C	+	+			+	+	+		+	+	+		+	+	+	+	+	+	++	+	+	+	++	++	+	+	++	++
		2x2m fish number		8	2	4	0	4	2	2	0	5	3	4	2	5	3	4	2	12	16	30	40	30	40	50	60	60	60	70	70
		No of Species		8	6	1	0	9	7	7	3	9	8	8	3	8	8	7	6	8	8	7	7	12	8	7	7	12	11	11	8
Amphibian																															
Paramesotriton hongkongensis	香港瘰螈	P, Cap 170, NT, PGC	R																	+				+		+		+	+	+	

Note: NP – Not protected in Hong Kong

“VC” – Very Common; “UC” – Uncommon; “C” - Common

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'V" - Vulerable - in Red China Data Book

Table 4.6 Fish species and Hong Kong Newt recorded at She Shan River
(T1- Upper stream section, T2 - middle stream section and T3 - Lower stream section)

				Post construction monitoring				Post construction monitoring				Post construction monitoring				Post construction monitoring				Post construction monitoring				Post construction monitoring				Post construction monitoring			
				Apr-14				May-14				Jun-14				Jul-14				Aug-14				Sep-14				Oct-14			
Species		Status	Commonness	Reference	T1	T2	T3	Reference	T1	T2	T3	Reference	T1	T2	T3	Reference	T1	T2	T3	Reference	T1	T2	T3	Reference	T1	T2	T3	Reference	T1	T2	T3
Channa maculata	斑鱧	NP	C	+	+	+		+	+	+		+	+			+	+			+	+	+		+	+	+			+	+	
Clarias gariepinus	革胡子鯰	NP	VC	+						+				+				+	+			+	+					+	+		+	+
Gambusia affinis	食蚊魚	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Misgurnus anguillicaudatus	泥鰍	NP	C	+	+	+		+	+	+		+		+	+	+		+		+	+	+	+	+	+	+	+	+	+	+	+	+	+
Oreochromis niloticus	尼羅口孵非鯽	NP	C	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Parazacco spilurus	異鱲	NP, V	C	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Poecilia reticulata	孔雀花魚將	NP	VC	+	+	+	+	+	+	+	+	+			+				+				+				+						+
Pterocryptis cochinchinensis	越南隱鰭鮠	NP	C	+		+				+				+				+				+						+			+		
Puntius semifasciolatus	七星魚	NP	C	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Rhinogobius spp.	鰕虎魚	NP	C	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Xiphophorus hellerii	劍尾魚	NP	C	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Xiphophorus variatus	雜色劍尾魚	NP	C		+	+	+			+	+			+				+				+				+							
Zacco platypus	寬鰭鱲	NP	C	+	+	++	++	+	+	+	+	+	+	+	+	+	+	+	+	+	+	++	+	+	++	++	+	+	++	++	+	+	+
		2x2m fish number		40	40	50	40	20	10	20	10	12	5	8	6	16	8	10	10	12	10	16	12	20	20	30	16	40	30	40	30
		No of Species		12	11	12	9	10	10	13	9	10	9	11	9	9	8	11	10	9	9	12	10	9	9	12	10	8	9	11	10
Amphibian																																	
Paramesotriton hongkongensis	香港瘰螈	P, Cap 170, NT, PGC	R			+				+				+				+				+				+				+			

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'V" - Vulerable - in Red China Data Book

Table 4.6 Fish species and Hong Kong Newt recorded at She Shan River
(T1- Upper stream section, T2 - middle stream section and T3 - Lower stream section)

				Post construction monitoring				Post construction monitoring				Post construction monitoring				Post construction monitoring				Post construction monitoring				Post construction monitoring			
				Nov-14				Dec-14				Jan-15				Feb-15				Mar-15				Apr-15			
Species		Status	Commonness	Reference	T1	T2	T3	Reference	T1	T2	T3	Reference	T1	T2	T3	Reference	T1	T2	T3	Reference	T1	T2	T3	Reference	T1	T2	T3
Channa maculata	斑鱧	NP	C		+	+							+				+				+				+		
Clarias gariepinus	革胡子鯰	NP	VC			+				+				+				+				+	+				+	+
Gambusia affinis	食蚊魚	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Misgurnus anguillicaudatus	泥鰍	NP	C	+	+	+				+			+	+			+	+		+	+	+		+	+	+			
Oreochromis niloticus	尼羅口孵非鯽	NP	C	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	++	+	+	+	++	+	+	+
Parazacco spilurus	異鱲	NP, V	C	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Poecilia reticulata	孔雀花魚將	NP	VC				+				+				+			+	+			+	+				+	+	+
Pterocryptis cochinchinensis	越南隱鰭鯰	NP	C			+				+				+				+				+					+		
Puntius semifasciolatus	七星魚	NP	C	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Rhinogobius spp.	鰕虎魚	NP	C	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Xiphophorus hellerii	劍尾魚	NP	C	+	+	+	+	+		+	+	+		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Xiphophorus variatus	雜色劍尾魚	NP	C			+				+				+				+			+	+				+	+		
Zacco platypus	寬鰭鱲	NP	C	+	++	++	+	+	++	++	+	+	++	++	+	+	++	++	+	+	++	++	+	+	++	++	+		
		2x2m fish number		50	50	60	50	60	50	50	40	50	40	40	50	40	30	40	40	40	40	50	50	30	35	55	45		
		No of Species		8	9	12	8	7	6	11	9	7	8	11	8	7	9	12	8	8	10	12	9	8	10	12	9		
Amphibian																													
Paramesotriton hongkongensis	香港瘰螈	P, Cap 170, NT, PGC	R			+				+				+				+				+				+			

Note: NP – Not protected in Hong Kong

“VC” – Very Common; “UC” – Uncommon; “C” - Common

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'V" - Vulerable - in Red China Data Book

Table 4.6 Fish species and Hong Kong Newt recorded at She Shan River
(T1- Upper stream section, T2 - middle stream section and T3 - Lower stream section)

				Post construction monitoring				Post construction monitoring				Post construction monitoring				Post construction monitoring				Post construction monitoring				Post construction monitoring				Post construction monitoring			
				May-15				Jun-15				Jul-15				Aug-15				Sep-15				Oct-15				Nov-15			
Species		Status	Commonness	Reference	T1	T2	T3	Reference	T1	T2	T3	Reference	T1	T2	T3	Reference	T1	T2	T3	Reference	T1	T2	T3	Reference	T1	T2	T3	Reference	T1	T2	T3
Channa maculata	斑鱧	NP	C		+	+				+				+				+				+				+				+	
Clarias gariepinus	革胡子鯰	NP	VC			+	+			+	+			+	+			+	+			+	+			+	+			+	+
Gambusia affinis	食蚊魚	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Misgurnus anguillicaudatus	泥鰍	NP	C	+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+	+	+	
Oreochromis niloticus	尼羅口孵非鯽	NP	C	+	+	++	++	+	+	++	++	+	+	++	++	+	++	++		+	++	++		+	++	++		+	++	++	
Parazacco spilurus	異鱲	NP, V	C	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		+	+	+		+	+	+	
Poecilia reticulata	孔雀花魚將	NP	VC			+	+			+	+			+	+			+	+			+	+			+	+			+	+
Pterocryptis cochinchinensis	越南隱鱨鯰	NP	C			+				+				+				+				+				+				+	
Puntius semifasciolatus	七星魚	NP	C	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		+	+	+		+	+	+		+	+	+	
Rhinogobius spp.	鰕虎魚	NP	C	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Xiphophorus hellerii	劍尾魚	NP	C	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		+	+	+		+	+	+		+	+	+	
Xiphophorus variatus	雜色劍尾魚	NP	C			+	+			+	+			+	+			+	+			+	+			+	+			+	+
Zacco platypus	寬鰭鱲	NP	C	+	+	++	+	+	+	++	+	+	+	++	+	+	+	++	+	+	+	++	+	+	++	++	+	+	++	++	+
		2x2m fish number		20	10	20	10	20	10	20	10	15	8	15	8	20	10	20	10	20	12	23	12	35	35	25	20	45	45	35	30
		No of Species		8	9	13	10	8	8	13	10	8	8	13	10	8	8	13	7	8	8	13	6	8	8	13	6	8	8	13	6
Amphibian																															
Paramesotriton hongkongensis	香港瘰螈	P, Cap 170, NT, PGC	R			+				+																					

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Table 4.6 Fish species and Hong Kong Newt recorded at She Shan River
(T1- Upper stream section, T2 - middle stream section and T3 - Lower stream section)

				Post construction monitoring				Post construction monitoring				Post construction monitoring				Post construction monitoring				Post construction monitoring				Post construction monitoring			
				Dec-15				Jan-16				Feb-16				Mar-16				Apr-16				May-16			
Species		Status	Commonness	Reference	T1	T2	T3	Reference	T1	T2	T3	Reference	T1	T2	T3	Reference	T1	T2	T3	Reference	T1	T2	T3	Reference	T1	T2	T3
Channa maculata	斑鱧	NP	C			+				+				+				+				+				+			
Clarias gariepinus	革胡子鯰	NP	VC			+	+			+	+			+	+			+	+			+	+			+			+
Gambusia affinis	食蚊魚	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Misgurnus anguillicaudatus	泥鰍	NP	C	+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+	+	+	
Oreochromis niloticus	尼羅口孵非鯽	NP	C	+	++	++		+	++	++	+	+	++	++	+	+	++	++	+	+	++	++	+	+	++	++	+		
Parazacco spilurus	異鱲	NP, V	C	+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+	+	+			
Poecilia reticulata	孔雀花魚將	NP	VC			+	+			+	+			+	+			+	+			+	+			+			+
Pterocryptis cochinchinensis	越南隱鰭鯰	NP	C			+																							
Puntius semifasciolatus	七星魚	NP	C	+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+	+	+			
Rhinogobius spp.	鰕虎魚	NP	C	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Xiphophorus hellerii	劍尾魚	NP	C	+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+	+	+			
Xiphophorus variatus	雜色劍尾魚	NP	C			+	+			+	+			+	+			+	+			+	+			+			+
Zacco platypus	寬鰭鱲	NP	C	+	++	++	+	+	++	++	+	+	++	++	+	+	++	++	+	+	++	++	+	+	++	++	+		
		2x2m fish number		55	50	40	35	55	45	35	25	60	45	40	30	60	50	35	25	40	40	30	20	30	20	20	10		
		No of Species		8	8	13	6	8	8	12	7	8	8	12	7	8	8	12	7	8	8	12	7	8	8	12	7		
Amphibian																													
Paramesotriton hongkongensis	香港瘰螈	P, Cap 170, NT, PGC	R			+				+				+				+				+							

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'V" - Vulerable - in Red China Data Book

Table 4.6 Fish species and Hong Kong Newt recorded at She Shan River
(T1- Upper stream section, T2 - middle stream section and T3 - Lower stream section)

				Post construction monitoring				Post construction monitoring				Post construction monitoring				Post construction monitoring				Post construction monitoring				Post construction monitoring			
				Jun-16				Jul-16				Aug-16				Sep-16				Oct-16				Oct-16			
Species		Status	Commonness	Reference	T1	T2	T3	Reference	T1	T2	T3	Reference	T1	T2	T3	Reference	T1	T2	T3	Reference	T1	T2	T3	Reference	T1	T2	T3
Channa maculata	斑鱧	NP	C			+				+				+				+				+				+	
Clarias gariepinus	革胡子鯰	NP	VC			+	+			+	+			+				+				+				+	
Gambusia affinis	食蚊魚	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Misgurnus anguillicaudatus	泥鰍	NP	C	+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+	+	+	
Oreochromis niloticus	尼羅口孵非鯽	NP	C	+	++	++	+	+	++	++	+	+	++	++	+	+	++	++	+	+	++	++	+	+	++	++	+
Parazacco spilurus	異鱲	NP, V	C	+	+	+		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Poecilia reticulata	孔雀花魚將	NP	VC			+	+			+	+			+				+				+				+	
Pterocryptis cochinchinensis	越南隱鰭鯰	NP	C																								
Puntius semifasciolatus	七星魚	NP	C	+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+	+	+	
Rhinogobius spp.	鰕虎魚	NP	C	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Xiphophorus hellerii	劍尾魚	NP	C	+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+	+	+	
Xiphophorus variatus	雜色劍尾魚	NP	C			+	+			+	+			+				+				+				+	
Zacco platypus	寬鰭鱲	NP	C	+	++	++	+	+	++	++	+	+	++	++	+	+	++	++	+	+	++	++	+	+	++	++	+
		2x2m fish number		30	20	25	8	20	15	20	3	20	10	15	5	20	12	15	8	25	20	20	10	35	35	30	20
		No of Species		8	8	12	7	8	8	12	8	8	8	12	5	8	8	12	5	8	8	12	5	8	8	12	5
Amphibian																											
Paramesotriton hongkongensis	香港瘰螈	P, Cap 170, NT, PGC	R															+				+					

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Table 4.7 Abotic data for the Upper She Shan River

(T1- Upper stream section, T2 - middle stream section and T3 - Lower stream section)

	Baseline monitoring	Impact monitoring			Impact monitoring			Impact monitoring			Impact monitoring			Impact monitoring			Impact monitoring			Impact monitoring		
Parameter / date	Aug-08	Jan-09			Jul-09			Jan-10			Jul-10			Jan-11			Jul-11			Jan-12		
Replicate		T1	T2	T3	T1	T2	T3	T1	T2	T3	T1	T2	T3	T1	T2	T3	T1	T2	T3	T1	T2	T3
DO (mg/L)	8.9	--	9.1	8.3	6	5.8	6.5	--	8.9	--	8.2	8.3	8.3	8	8.5	8.8	8	8.5	9	8.6	8.2	8.8
pH	7.29	--	7.51	7.42	7.22	7.16	7.35	--	7.5	--	7.5	7.5	7.5	6.9	7	7.2	7	7.2	7.5	6.9	6.6	7.1
Nitrate (mg N/L)	0.5	--	1.6	1.5	0.22	0.3	0.4	--	0.75	--	0.1	0.14	0.2	0.1	0.2	0.7	0.1	0.3	0.4	0.2	0.2	0.4
Ammonia (mg N/L)	0.1	--	PO4-P (µg P/L) :<100	PO4-P (µg P/L) :110	0.83	0.97	0.99	--	0.03	--	0.25	0.2	0.12	0.1	0.1	0.12	0.1	0.1	0.15	0.2	0.2	0.3
Salinity (ppt)	<0.1	--	0.1	0.1	0	0	0	--	0	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0	0	0
Conductivity (µS/cm)	90	--	140	170	116	114	116	--	105	--	410	410	390	110	111	115	120	115	130	122	118	126
BOD (mg/L)	<2	--	<2	4	<2	<2	<2	--	2	--	<2	3.2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Water flow at pool (m/s)	0.1-0.3	--	<0.01-0.1		<0.01	N.A	<0.01-0.1	--	<0.01-0.1	--	0.1	0	0	0.1	0	0	0.2	0.05	0.1	0.2	0.05	0.1
Water flow at riffle (m/s)	0.4-0.5	--	0.2-0.3		<0.01	N.A	0.2-0.3	--	0.01	--	0.1	0	0	0.1	0	0	0.2	0.1	0.1	0.2	0.1	0.1
Sand (%)	55	65	23	65	23	23	65	5	23	--	5	30	5	5	30	2	5	30	2	10	25	5
Stone (%)	25	30	75	30	75	75	30	40	75	--	40	65	80	40	65	2	40	65	2	45	65	5
Mud (%)	30	5	2	5	2	2	5	5	2	--	5	5	5	5	5	1	5	5	1	5	10	10
Concrete (%)	0	0	0	0	0	0	0	50	0	100	50	0	10	50	0	95	50	0	95	40	0	80

Table 4.7 Abotic data for the Upper She Shan River

(T1- Upper stream section, T2 - middle stream section and T3 - Lower stream section)

	Impact monitoring			Impact monitoring			Impact monitoring			Post construction monitoring			Post construction monitorin			Post construction monitorin			Post construction monitoring			Post construction monitoring			Post construction monitoring			Post construction monitoring			Post construction monitoring		
Parameter / date	Jul-12			Jul-13			Dec-13			Jan-14			Feb-14			Mar-14			Apr-14			May-14			Jun-14			Jul-14					
Replicate	T1	T2	T3	T1	T2	T3	T1	T2	T3	T1	T2	T3	T1	T2	T3	T1	T2	T3	T1	T2	T3	T1	T2	T3	T1	T2	T3	T1	T2	T3			
DO (mg/L)	7.7	7.7	6.3	7.8	7.8	7.7	8.7	8.6	9.2	8.3	8.2	8.6	7.2	7.6	7.8	7.1	7.2	7.2	7.3	7.5	7.6	7.8	7.6	7.7	7.6	7.8	7.4	7.7	7.7	7.4			
pH	6.7	6.6	6.6	6.8	7.2	7.6	6.6	6.9	7.1	6.8	7.3	7.4	7.8	6.7	7.6	7.2	6.8	7.5	6.6	7.3	7.2	7.5	7.5	7.4	7.5	7.5	7.4	7.4	7.5	7.3			
Nitrate (mg N/L)	0.84	0.86	1.14	0.6	0.61	0.7	0.78	0.63	0.53	1.2	1.12	1.02	1.5	1.2	1.6	1.2	1.1	0.77	0.6	0.8	1.2	1.1	1.0	1.1	0.5	0.6	0.6	0.8	0.6	0.5			
Ammonia (mg N/L)	0.05	0.02	1.08	0.14	0.06	0.05	0.08	<0.01	0.42	1.9	1.8	1.73	0.8	1.2	1.4	0.4	0.6	0.01	0.6	0.5	0.8	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1			
Salinity (ppt)	0.03	0.04	0.07	0.03	0.03	0.04	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.04	0.04	0.06	0.04	0.05	0.05	0.04	0.05	0.05			
Conductivity (µS/cm)	121	120	160	94	97	97	116	116	134	124	118	132	128	113	132	123	136	140	112	116	120	124	121	123	118	115	119	110	113	111			
BOD (mg/L)	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2			
Water flow at pool (m/s)	0.2	0.05	0.1	0.2	0.05	0.1	0.1	0.05	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2			
Water flow at riffle (m/s)	0.2	0.1	0.1	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2-0.4	0.2-0.3	0.2-0.4	0.2-0.5	0.2-0.4	0.2-0.5	0.2-0.5	0.2-0.5	0.2-0.5	0.2-0.5	0.2-0.5	0.2-0.5			
Sand (%)	10	25	5	15	25	5	15	10	5	15	10	5	15	10	5	15	10	5	10	10	5	5	5	5	5	5	5	5	5	5			
Stone (%)	45	65	5	65	65	15	65	80	20	65	80	20	65	80	20	65	80	20	70	80	30	80	80	30	80	80	30	80	80	30			
Mud (%)	5	10	10	10	10	10	10	10	5	10	10	5	10	10	5	10	10	5	10	10	5	5	5	2	5	5	2	5	5	2			
Concrete (%)	40	0	80	10	0	70	10	0	70	10	0	70	10	0	70	10	0	70	10	0	60	10	10	63	10	10	63	10	10	63			

Table 4.7 Abotic data for the Upper She Shan River

(T1- Upper stream section, T2 - middle stream section and T3 - Lower stream section)

	Post construction monitoring			Post construction monitoring			Post construction monitoring			Post construction monitoring			Post construction monitoring			Post construction monitoring			Post construction monitoring		
Parameter / date	Aug-14			Sep-14			Oct-14			Nov-14			Dec-14			Jan-15			Feb-15		
Replicate	T1	T2	T3	T1	T2	T3	T1	T2	T3	T1	T2	T3	T1	T2	T3	T1	T2	T3	T1	T2	T3
DO (mg/L)	7.2	7.2	7.4	7.8	7.0	8.1	7.8	8.0	7.5	7.6	8.1	7.6	8.5	8.6	8.6	8.6	8.6	8.7	8.5	8.6	8.4
pH	7.2	7.3	7.1	8.2	8.2	8.2	8.4	8.3	8.1	7.9	8	7.8	8.2	8.5	8.4	9.0	8.8	8.8	9.1	8.9	8.7
Nitrate (mg N/L)	0.5	0.4	0.5	0.5	0.4	0.5	0.3	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.5	0.5
Ammonia (mg N/L)	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Salinity (ppt)	0	0	0	0.03	0.04	0.03	0.03	0.03	0.04	0.01	0.03	0.02	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.03	0.03
Conductivity (µS/cm)	120	116	108	125	125	123	113	114	116	110	96	106	127	132	121	156	162	147	152	153	155
BOD (mg/L)	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Water flow at pool (m/s)	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2
Water flow at riffle (m/s)	0.2-0.5	0.2-0.5	0.2-0.5	0.2-0.5	0.2-0.5	0.2-0.5	0.2-0.5	0.2-0.5	0.2-0.5	0.2-0.5	0.2-0.5	0.2-0.5	0.2-0.5	0.2-0.5	0.2-0.5	0.2-0.5	0.2-0.5	0.2-0.5	0.2-0.5	0.2-0.5	0.2-0.5
Sand (%)	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Stone (%)	80	80	30	80	80	30	80	80	30	80	80	30	80	80	30	80	80	30	80	80	30
Mud (%)	5	5	2	5	5	2	5	5	2	5	5	2	5	5	2	5	5	2	5	5	2
Concrete (%)	10	10	63	10	10	63	10	10	63	10	10	63	10	10	63	10	10	63	10	10	63

Table 4.7 Abotic data for the Upper She Shan River

(T1- Upper stream section, T2 - middle stream section and T3 - Lower stream section)

	Post construction monitoring			Post construction monitoring			Post construction monitoring			Post construction monitoring			Post construction monitoring			Post construction monitoring			Post construction monitoring		
Parameter / date	Mar-15			Apr-15			May-15			Jun-15			Jul-15			Aug-15			Sep-15		
Replicate	T1	T2	T3	T1	T2	T3	T1	T2	T3	T1	T2	T3	T1	T2	T3	T1	T2	T3	T1	T2	T3
DO (mg/L)	8.6	8.5	8.4	8.3	8.4	8.1	8.3	8.1	8.2	8.3	8.1	8.2	8.2	8.0	8.2	8.1	8.0	8.1	8	8.1	8.2
pH	8.6	8.5	8.5	8.6	8.5	8.5	8.1	8.2	8.1	7.8	7.7	7.8	7.8	7.7	7.9	7.6	7.7	7.6	7.7	7.7	7.5
Nitrate (mg N/L)	0.4	0.5	0.5	0.4	0.5	0.5	0.4	0.5	0.5	0.4	0.5	0.5	0.4	0.5	0.5	0.4	0.5	0.5	0.4	0.5	0.5
Ammonia (mg N/L)	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Salinity (ppt)	0.03	0.03	0.03	0.03	0.03	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.02	0.01	0.01	0.01
Conductivity (µS/cm)	142	138	137	142	138	137	36	39	45	36	39	45	39	45	28	32	38	46	29	31	32
BOD (mg/L)	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Water flow at pool (m/s)	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2
Water flow at riffle (m/s)	0.2-0.5	0.2-0.5	0.2-0.5	0.2-0.5	0.2-0.5	0.2-0.5	0.2-0.5	0.2-0.5	0.2-0.5	0.2-0.5	0.2-0.5	0.2-0.5	0.2-0.5	0.2-0.5	0.2-0.5	0.2-0.5	0.2-0.5	0.2-0.5	0.2-0.5	0.2-0.5	0.2-0.5
Sand (%)	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Stone (%)	80	80	30	80	80	30	80	80	30	80	80	30	80	80	30	80	80	30	80	80	30
Mud (%)	5	5	2	5	5	2	5	5	2	5	5	2	5	5	2	5	5	2	5	5	2
Concrete (%)	10	10	63	10	10	63	10	10	63	10	10	63	10	10	63	10	10	63	10	10	63

Table 4.7 Abotic data for the Upper She Shan River

(T1- Upper stream section, T2 - middle stream section and T3 - Lower stream section)

	Post construction monitoring			Post construction monitoring			Post construction monitoring			Post construction monitoring			Post construction monitoring			Post construction monitoring			Post construction monitoring		
Parameter / date	Oct-15			Nov-15			Dec-15			Jan-16			Feb-16			Mar-16			Apr-16		
Replicate	T1	T2	T3	T1	T2	T3	T1	T2	T3	T1	T2	T3	T1	T2	T3	T1	T2	T3	T1	T2	T3
DO (mg/L)	8.1	7.9	8	7.9	7.8	7.9	8	7.8	8	7.8	7.7	7.8	8.0	8.0	8.0	7.9	8.0	8.0	8.0	8.2	8.2
pH	7.5	7.5	7.6	7.6	7.5	7.5	7.6	7.6	7.5	7.9	7.8	7.8	7.7	7.7	7.8	7.7	7.6	7.6	7.5	7.6	7.6
Nitrate (mg N/L)	0.4	0.5	0.5	0.4	0.5	0.5	0.4	0.5	0.5	0.4	0.5	0.5	0.4	0.5	0.5	0.4	0.5	0.5	0.4	0.5	0.5
Ammonia (mg N/L)	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Salinity (ppt)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.02	0.01	0.01	0.02	0.01	0.01
Conductivity (µS/cm)	33	32	39	30	29	36	32	29	42	29	35	32	56	32	33	59	33	28	22	31	25
BOD (mg/L)	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Water flow at pool (m/s)	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2
Water flow at riffle (m/s)	0.2-0.5	0.2-0.5	0.2-0.5	0.2-0.5	0.2-0.5	0.2-0.5	0.2-0.5	0.2-0.5	0.2-0.5	0.2-0.5	0.2-0.5	0.2-0.5	0.2-0.5	0.2-0.5	0.2-0.5	0.2-0.5	0.2-0.5	0.2-0.5	0.2-0.5	0.2-0.5	0.2-0.5
Sand (%)	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Stone (%)	80	80	30	80	80	30	80	80	30	80	80	30	80	80	30	80	80	30	80	80	30
Mud (%)	5	5	2	5	5	2	5	5	2	5	5	2	5	5	2	5	5	2	5	5	2
Concrete (%)	10	10	63	10	10	63	10	10	63	10	10	63	10	10	63	10	10	63	10	10	63

Table 4.7 Abotic data for the Upper She Shan River

(T1- Upper stream section, T2 - middle stream section and T3 - Lower stream section)

	Post construction monitoring			Post construction monitoring			Post construction monitoring			Post construction monitoring			Post construction monitoring			Post construction monitoring			Post construction monitoring		
Parameter / date	May-16			Jun-16			Jul-16			Aug-16			Sep-16			Oct-16			Nov-16		
Replicate	T1	T2	T3	T1	T2	T3	T1	T2	T3	T1	T2	T3	T1	T2	T3	T1	T2	T3	T1	T2	T3
DO (mg/L)	8.1	8.2	8.1	8.0	8.2	8.1	8.1	8.0	8.0	8.0	8.1	8.0	8.1	8.1	8.0	8.0	8.1	8.0	8.0	8.0	8.0
pH	7.5	7.5	7.5	7.6	7.6	7.5	7.6	7.6	7.6	7.5	7.7	7.7	7.6	7.7	7.6	7.7	7.7	7.6	7.6	7.6	7.6
Nitrate (mg N/L)	0.4	0.5	0.5	0.4	0.5	0.5	0.4	0.5	0.5	0.4	0.5	0.5	0.4	0.5	0.5	0.4	0.5	0.5	0.4	0.5	0.5
Ammonia (mg N/L)	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Salinity (ppt)	0.01	0.01	0.02	0.01	0.01	0.02	0.01	0.01	0.02	0.01	0.01	0.02	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01
Conductivity (µS/cm)	32	35	46	35	34	37	33	33	34	29	36	37	34	35	35	29	36	39	32	31	35
BOD (mg/L)	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Water flow at pool (m/s)	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2
Water flow at riffle (m/s)	0.2-0.5	0.2-0.5	0.2-0.5	0.2-0.5	0.2-0.5	0.2-0.5	0.2-0.5	0.2-0.5	0.2-0.5	0.2-0.5	0.2-0.5	0.2-0.5	0.2-0.5	0.2-0.5	0.2-0.5	0.2-0.5	0.2-0.5	0.2-0.5	0.2-0.5	0.2-0.5	0.2-0.5
Sand (%)	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Stone (%)	80	80	30	80	80	30	80	80	30	80	80	30	80	80	30	80	80	30	80	80	30
Mud (%)	5	5	2	5	5	2	5	5	2	5	5	2	5	5	2	5	5	2	5	5	2
Concrete (%)	10	10	63	10	10	63	10	10	63	10	10	63	10	10	63	10	10	63	10	10	63

Agreement No. CE65/2013(EP) Post-Construction Ecological Monitoring of River Improvement Work in Upper Lam Tsuen River, She Shan River and Upper Tai Po River – Investigation
Post-Construction Ecological Monitoring Report (No. 35) Upper Tai Po River

November 2016

Prepared by : Mike Pang		December 20, 2016
Validated by:Mark Shea		December 20, 2016
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Post-Construction Ecological Monitoring of River Improvement Work in Upper Lam Tsuen River, She Shan River and Upper Tai Po River – Investigation Agreement No. CE65/2013(EP)

Post-Construction Ecological Monitoring Report (No.35) Upper Tai Po River

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1 Introduction

1.1 The current post-construction ecological monitoring programme is under Agreement No. CE65/2013(EP) Post-Construction Ecological Monitoring of River Improvement Work in Upper Lam Tsuen River, She Shan River and Upper Tai Po River. The collected data are mainly used to assess ecological recovery process and effectiveness of ecological migration proposed and enforced during the construction period.

1.2 The scope of the ecological monitoring was detailed in EM & A Manual of the project. In brief, the survey aimed to collect data on abiotic factors such as water quality, substratum characteristics, water flow as well as flora and fauna.

1.3 China Hong Kong Ecology Consultants Ltd. was committed by Allied Environmental Consultants Ltd (AEC) to undertake the ecological monitoring tasks for the project from December 2014.

1.4 This is the number 35 post-construction ecological monitoring report for the project conducted **on 21st November 2016**. It contains the following subsections:

- Summary of major points
- Monitoring Methods and Results
- Summary and Comments

2 Summary of Major Points

- Fauna and flora along the drainage project sections is in a process of re-establishing or restoration;
- Bird abundance was similar to those recorded during baseline survey;
- The abundance of target river fauna, i.e., fish *Parazacco spilurus* recorded was lower than those recorded during baseline monitoring (before fish capture/relocation took place). The reason for low fish population of *Parazacco spilurus* was due to river bed modification. The rare fish *Pseudobagrus trilineatus* was consistently recorded in the river during recent monitoring. The other target species, Hong Kong Newt *Paramesotriton hongkongensis*, was not found within works area during baseline, impact monitoring and it was recorded in the river during post construction monitoring. Apart from fauna species, 52 flora species was recorded within the survey transects along the river course. Some common herbs were observed generating on the embankment, which indicating that vegetation was recovering. Flora species of *Tibouchina semidecandra* and *Ipomoea pes-caprae* were planted on the gabion along the river for landscape purpose;
- The abundance of fish was similar to last month with slight increase;
- The abundance of odonata was lower than the record of last month; and
- Newt was not recorded during the survey.

3 Monitoring Methodology

3.1 Riparian Vegetation

Riparian vegetation including aquatic and emergent was sampled by line transects along the affected river channel and riparian habitat. Species, relative abundance and average heights were recorded. Vegetation surveys were conducted at three selected belt transects with one located at the upper portion of the river channel (T1) and another one at the middle section of the river (T2), as well as reference site (**Figure 1**). The belt transects was run across the river channel in order to collect quantitative data of the vegetation, e.g., species inventory, height, percentage cover. Qualitative data of plants was collected by recording plant species along line transect, e.g., species inventory, relative abundance. Nomenclature and protection status of the species has followed those documented in Lai *et al.* (2004) and Hong Kong Herbarium (2015).

3.2 Avifauna

Avifauna survey was conducted during post construction monitoring period. Special attention was given to the river channel and corridor area which birds used as feeding and foraging habitat. Avifauna survey was undertaken in the early morning plus species recorded in the rest of the day when conducting other taxonomic groups (benthic, fish, insect) monitoring. Numerical abundance was recorded at fixed count points within a radius of 30 to 50m according to landscape feature and visual penetration extent. The duration of the point count of birds was standardized for 10 minutes at each location in order to collect comparable data. Transect count along accessible sections of river channel were used in order to collect qualitative data. Binoculars and digital camera were the main items of equipment used. Nomenclature and protection status of the species has followed in the AFCD website (www.hkbiodiversity.net) and Carey *et al.* (2001).

The point count was conducted at two locations with one located at the lower portion of the river channel (T2) and the other located at the upper section of the river (T1). The point count locations, survey transect for bird survey and sampling sites for surveys of other faunal groups and flora was given in **Figure 1**.

3.3 Adult Odonata Survey

Adult Odonata surveys were conducted along transects (**Figure 1**). Binoculars, digital camera and hand net were utilized to aid identification. Numerical abundance, species identity and other notable behavior were recorded. Nomenclature and protection status of the species has followed those documented in the AFCD website (www.hkbiodiversity.net), Wilson *et al.* (2004) and Tam *et al.* (2011). Adult Odonata survey was conducted along line transects in parallel with river channel within the works area where access was permitted.

3.4 Aquatic Macro-invertebrates

Macro-invertebrates in the river channel were surveyed in three sampling sites with two located at upper (T1) and middle (T2) proportion of the river respectively and one reference site. It aims to collect necessary macro-invertebrate fauna for ecological monitoring programme (**Figure 1**). Five replicates were taken at each sampling point and pool together for further sample sorting and identification. Kick sampling and hand netting were the survey methodologies for river organisms. Dissection microscope and digital camera were used to aid identification and enumeration. Numerical abundance and species identity were recorded. Nomenclature and protection status of the species has followed those documented in the AFCD website (www.hkbiodiversity.net) and other literatures such as Dudgeon (1994).

3.5 Fish and Newt

Fish community including target species *Parazacco spilurus* and *Paramesotriton hongkongensis* at the specified river channel was monitored by live trapping, hand netting and direct observation methods.

Sampling was conducted at three sampling locations with one located at upper section (T1) and one located at middle section (T2), as well as reference site. The selected sampling site covered major type of river habitats, e.g. river pool and riffle (**Figure 1**). The number of the observed fish and newt was estimated and recorded. Nomenclature and protection status of the species has followed those documented in the AFCD website (www.hkbiodiversity.net) and Lee *et al.* (2004).

3.6 Abiotic Data Collection

3.6.1 Water Quality Monitoring

Dissolved oxygen level, pH value, conductivity, salinity, BOD and nutrient level (nitrate and ammonium) were measured and analyzed by conventional methods in situ or in laboratory. The instruments for measuring dissolved oxygen level, pH value, conductivity, salinity were model: DO-5510, AZ8685, AZ8361 and AZ8374 respectively. All the instruments were calculated every monitoring month according to the operation manuals in order to obtain the precise result. BOD test took 5 days to complete within darkness incubator with stable temperature at 20^{o}C and was performed using model: DO-5510 for measuring dissolved oxygen. Nutrient levels including nitrate and ammonia were performed in laboratory by applying the In-house method SOP056 (FIA) and SOP057 (FIA) respectively.

3.6.2 Sediment Characteristics

Sediment/substrate characteristics were recorded of sediment cover in percentage e.g. mud, sand, rock, boulder and cemented bottom in the river bed at sampling sites.

3.6.3 Water Flow

Water flow rates in river channel were measured by recording the time taken for a floating object (e.g. floating ball) in a measured distance. The sampling sites for surveys were given in **Figure 1.**

4 Monitoring Results

4.1 Vegetation

Major proportion of river bed and bank was concrete and without plant colonizing (Photos 1-4). Vegetation has sparely covered the gabion wall along the upper Tai Po River and the river bed with some common plants (Photo 4) including invasive species *Mikania micrantha,* and native species *Commelina diffusa*. Most of the plants on the river bed along the river have been removed from the clearance work. In total, 52 flora species was recorded within the survey transects along the river course. Abundant native species *Commelina diffusa* was the dominant species established in the river bed. After strong flooding event in previous months, vegetation has gradually recovered and established in some parts of the river. However, vegetation coverage in upper section was still low. The flora were generally in good health, and the height of the dominated riparian grass and herb species were in a range from 0.1m to 1.6m as observed along survey transect. Dominant flora species were shown in the **Table 4.1** marked with relative abundance sign "+++". Results of vegetation survey and belt transect survey were presented in **Table 4.1** and **Table 4.2**. **Figure 1** shows the transect line for the flora surveys.

4.2 Fauna

4.2.1 Avifauna

An avifauna survey was undertaken along survey transects and at two defined point count locations. In total, 16 species of birds were recorded during bird survey. Among them, 4 species were wetland dependant birds observed feeding and roosting in the river channel including *Ardeola bacchus, Motacilla cinerea* (Photo 5), *Motacilla alba* (Photo 6) and *Egretta garzetta.* A common species *Pycnonotus jocosus* was the dominant species of most of the proportion of the river. All the birds in Hong Kong are under protection of Wild Animals Protection Ordinance (Cap. 170). Some of the wetland dependent species recorded are classified as Regional Concern by Fellowes *et al.* (2002) including *Egretta garzetta* and *Ardeola bacchus*, which were usually observed feeding in the river. *Centropus sinensis* was found in the river, which is considered as Vulnerable in China Red Data Book. Only foraging and roosting behaviour of some wetland dependent birds were noticed. Transect and Point Count locations were shown on **Figure 1**. Result of bird survey was presented in the **Table 4.3**.

4.2.2 Adult Odonata Survey

Odonata surveys were performed and a list of recorded odonata species at Upper Tai Po River is shown in **Table 4.4**. Number of odonata species recorded was slightly decreased comparing with last month and similar to the previous surveys conducted in approximate period of last year. In total, 5 species odonata were found, the recorded odonata species was common species in Hong Kong. Most of the odoanta species in Hong Kong has the peak emergence from spring to late summer. The decrease in abundance of odoanta was due to seasonality. It is expected that number of odonata will be decreasing and keep in low abundance in the following months during dry season (Wilson *et al.*, 2004 & Tam *et al.*, 2011). Sampling location was shown in **Figure 1**.

4.2.3 Aquatic Macro-invertebrates

Aquatic-net and kick sampling were performed at the river. The river benthic fauna collected was mainly comprised of insects, molluscs and crustaceans (Photos 7-8). Details of recorded of river benthic fauna refers to **Table 4.5.** Sampling location was shown on **Figure 1**.

4.2.4 Hong Kong Newt

Survey of Hong Kong Newt was conducted at Upper Tai Po River. Adult Newt was not captured in this month at reference site. Hong Kong Newt is listed in Wild Animals Protection Ordinance (Cap. 170) and classified as "Near Threatened" under IUCN Red List Status and as "Potential Global Concern" by Fellowes *et al.* (2002). Record of Hong Kong Newts can be referred to **Table 4.6.**

4.2.5 River Fish Fauna

Fish surveys were performed at Upper Tai Po River during surveys. In total, 12 species freshwater fish were recorded within project area. Fish abundance was low along the modified river channel. The *Parazacco spilurus, Glyptothorax pallozonum* and *Pseudobagrus trilineatus,* which have conservation interest, were restricted in the upper section of the surveyed river outside the works boundary where the habitat was not affected by construction works, while *Parazacco spilurus* is listed in China Red Data Book Status as Vulnerable and *Pseudobagrus trilineatus* is classified as Global Concern by Fellowes *et al*. (2002). The data showed that fish abundance was similar to the record of last month with slight increase. Details of records of fish fauna refers to **Table 4.6.** Sampling location was shown on **Figure 1**.

4.3 Abiotic Data

Data on water quality and major river hydrological feature (water flow and substratum) of the river were collected and are presented in the **Table 4.7.**

Generally, the water was not polluted and nutrient levels were generally low. Results of water test were presented in the **Table 4.7.**

The river substratums of upper and lower sections were comprised of 40% stone and 60% concrete, 20% stone and 80% concrete respectively. Moderate water flow up to 0.3m/second at pool and 0.6m/second at riffle was measured.

5 Summary and Commentary

Post construction ecological monitoring was carried out in current month and relevant biotic and abiotic data was collected according to project specification and EM & A Manual. An adult Newt was recorded during the survey. Fish's abundance appears to be similar to last month. Bird abundance was similar to those recorded during baseline survey. Species richness of odonata was lower than the record of last month.

Aquatic and riparian vegetation along river channel was re-established compared to those recorded during baseline surveys. However, vegetation clearance work has removed most of the plant out of the river bed. Vegetation has sparsely covered gabion wall and river bed along to the Upper Tai Po River.

The water quality of the surveyed river was not polluted as indicated by low nutrient concentration level of ammonium and nitrate although the river channel may receive discharge and runoff from the village areas.

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FIGURE

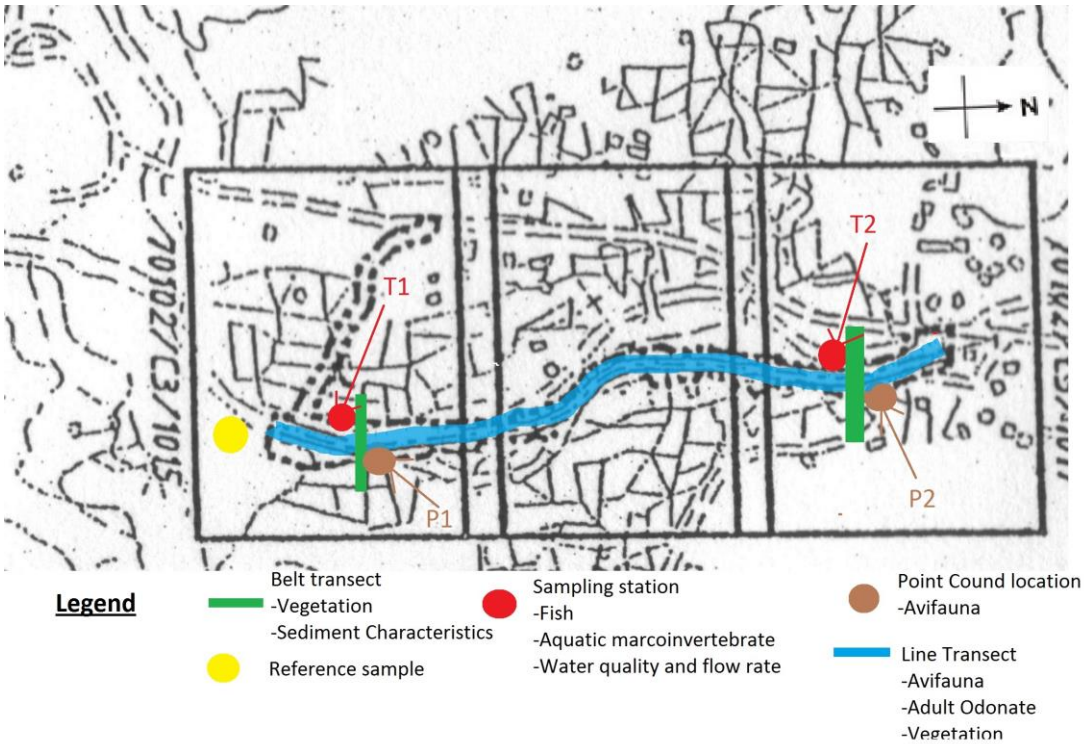

Figure 1. Sampling Location of Ecological Survey and Monitoring at Upper Tai Po River,Tai Po.

PHOTOS

	
Photo 1: General view of the river channel (Reference site)	Photo 2: General view of the river channel (Upper section)
	
Photo 3: General view of the river channel (Middle section)	Photo 4: Vegetation sparsely growing on gabion (Middle section)
	
Photo 5: Avifauna – *Motacilla cinerea*	Photo 6: Avifauna – *Motacilla alba*

	
Photo 7: Aquatic sample	Photo 8: Aquatic sample

TABLE

Table 4.1. Flora species recorded at the transect along the Upper Tai Po River including riparian habitat.

			Baseline	Impact Monitoring							Impact Monitoring			Post Construction Monitoring					Post Construction Monitoring								Post Construction Monitoring					Post Construction Monitoring								Post Construction Monitoring											
Family	Species name	Species name in Chinese	Oct-07	Jan-09	Jul-09	Jan-10	Jul-10	Jan-11	Jul-11	Jan-12	Jul-12	Mar-13	Jul-13	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14	Aug-14	Sep-14	Oct-14	Nov-14	Dec-14	Jan-15	Feb-15	Mar-15	Apr-15	May-15	Jun-15	Jul-15	Aug-15	Sep-15	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16
Acoraceae	*Acorus gramineus*	金錢蒲															+	+	+	+	+	+	+	+					+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Amaranthaceae	*Alternanthera philoxeroides*	空心蓮子草	+	+	+	+	+	+				+	+	+	+	+	++	++	++	++	++	++	++	++	++	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Amaranthaceae	*Amaranthus viridis*	野莧										+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Amaranthaceae	*Celosia argentea*	青葙															+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Araceae	*Alocasia macrorrhizos*	海芋	+	+	+	+	+	+						+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Araceae	*Colocasia esculenta*	芋	+	+	+	+	+	+							+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Asteraceae	*Bidens alba*	白花鬼針草	+	+	+	+	+	+	++	+	+	+	+	+	+	+	++	++	++	++	+++	+++	+++	+++	+++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++
Asteraceae	*Ageratum conyzoides*	勝紅薊	+	+	+	+	+	+	+	+		+	+	+	+	+	+	+	+	+	++	++	++	++	++	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Asteraceae	*Mikania micrantha*	薇甘菊	++	+	+	+	+	+	+	+	+	+	+	++	++	++	++	+++	+++	+++	+++	+++	+++	+++	+++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++
Asteraceae	*Synedrella nodiflora*	金腰箭	+	+	+	+	+	+				+	+	+	+	+		+	+	+	+	+	+	+	+					+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Asteraceae	*Wedelia chinensis*	蜜腺菊	+	+	+	+	+	+	+	+				+	+	+	+	+	+	+	+	+	+	+	+					+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Asteraceae	*Eclipta prostrata*	鱧腸										+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Asteraceae	*Erechtites hieraciifolius*	革命菜											+	+	+	+	+	+	+	+	+	+	+	+	+				+	+	+	+	+	+	+														
Asteraceae	*Youngia japonica*	黃鵌菜															+	+	+	+	+	+			+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Asteraceae	*Conyza canadensis*	小蓬草															+	+	+	+	+	+	+	+																									
Athyriaceae	*Callipteris esculenta*	菜蕨	+	+	+	+	+	+							+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Bombacaceae	*Bombax ceiba*	木棉	+	+	+	+	+	+																																								
Brassicaceae	*Nasturtium officinale*	西洋菜															+	+	+	+	+	+	+	+																									
Caesalpiniaceae	*Bauhinia championii*	洗葉藤															+	+	+	+	+	+	+	+																									
Caprifoliaceae	*Viburnum odoratissimum*	珊瑚樹	+	+	+	+	+																																									
Caryophyllaceae	*Drymaria cordata*	荷蓮豆															+	+	+	+	+	+	+		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Caryophyllaceae	*Myosoton aquaticum*	鵝腸菜															+	+	+	+	+	+	+	+																									
Commelinaceae	*Commelina diffusa*	節節草	+	+	+	+	+	+	+	+	+	+	+	+	++	++	++	++	++	++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++
Commelinaceae	*Floscopa scandens*	聚花草															+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Convolvulaceae	*Ipomoea aquatica*	通菜	+	+	+	+	+																																									
Convolvulaceae	*Ipomoea cairica*	五爪金龍	+	+	+	+	+	+	+	+				+	+	+	+	+	+	++	++	++	++	++	++	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Convolvulaceae	*Ipomoea pes-caprae*	海灘牽牛										+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Convolvulaceae	*Merremia hederacea*	魚黃草															+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Cucurbitaceae	*Benincasa hispida*	冬瓜						+					+	+	+	+																															
Equisetaceae	*Equisetum debile*	筆管草	+	+	+	+	+									+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+													
Euphorbiaceae	*Macaranga tanarius*	血桐	+	+	+	+	+	+								+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Euphorbiaceae	*Glochidion zeylanicum*	香港算盤子	+	+	+	+	+																																									
Euphorbiaceae	*Phyllanthus reticulatus*	小果葉下珠															+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Fabaceae	*Pueraria lobata*	野葛	+	+	+	+	+	+				+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Lauraceae	*Cinnamomum camphora*	樟樹	+	+	+	+	+	+																																								
Lauraceae	*Litsea glutinosa*	潺槁樹	+	+	+	+	+																																									
Malvaceae	*Hibiscus rosa-sinensis*	大紅花											+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Melastomataceae	*Melastoma sanguineum*	毛稔										+	+	+	+	+	+	+	+	+	+	+	+	+	+																								
Melastomataceae	*Tibouchina semidecandra*	巴西野牡丹										+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Mimosaceae	*Calliandra haematocephala*	紅絨球											+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Mimosaceae	*Mimosa pudica*	含羞草															+	+	+	+	+	+	+	+	+																									
Mimosaceae	*Leucaena leucocephala*	銀合歡															+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Moraceae	*Ficus hispida*	對葉榕	+	+	+	+	+	+					+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Moraceae	*Ficus variegata*	青果榕															+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Musaceae	*Musa paradisiaca*	大蕉	+	+	+	+	+								+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Myrtaceae	*Psidium guajava*	番石榴	+	+	+	+	+	+																																								
Myrtaceae	*Cleistocalyx operculatus*	水翁	+	+	+	+	+	+	+	+						+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Oleaceae	*Ligustrum sinense*	山指甲															+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Onagraceae	*Ludwigia erecta*	美洲水丁香																			+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Oxalidaceae	*Oxalis corniculata*	酢漿草															+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Plantaginaceae	*Plantago major*	車前草															+	+	+	+	+	+	+	+	+																									
Poaceae	*Panicum repens*	枯骨草	+	+	+	+	+	+	+	+					+	+	+	+	+	+	+	+	+	+	+		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Poaceae	*Microstegium ciliatum*	刚秀竹	++	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	++	++	++	++	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Poaceae	*Pennisetum purpureum*	象草	+	+	+	+	+	+							+	+	+	+	+	+	+	+	+	++	++	++	++	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Poaceae	*Coix lacryma-jobi*	薏苡	+	+	+	+	+	+		+					+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Poaceae	*Phragmites karka*	卡開蘆	+	+	+	+	+	+		+					+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Poaceae	*Miscanthus floridulus*	五節芒															+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Poaceae	*Brachiaria mutica*	巴拉草															+	+	+	++	++	++	++	++	++	+++	+++	+++	+++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++
Poaceae	*Digitaria radicosa*	紅尾翎																	+	+	+	+	+	+	++	++	++	++	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Poaceae	*Pennisetum alopecuroides*	狼尾草																					+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Polygonaceae	*Polygonum barbatum*	毛蓼	+	+	+	+	+	+			+	+	+	+	+	+	+	+	+	+	+	+	+	+	+																								
Polygonaceae	*Polygonum chinense*	火炭母															+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Polygonaceae	*Rumex trisetifer*	假酸葉																							+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Rutaceae	*Clausena lansium*	黃皮	+	+	+	+	+	+																																								
Sapindaceae	*Dimocarpus longan*	龍眼	+	+	+	+	+	+																																								
Sapindaceae	*Litchi chinensis*	荔枝	+	+	+	+	+	+																																								
Scrophulariaceae	*Scoparia dulcis*	冰糖草															+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Solanaceae	*Solanum torvum*	水茄	+	+	+	+	+	+			+	+	+	+	+	+	+	+	+	+	+	+	+	+	+																								
Solanaceae	*Solanum nigrum*	龍葵				+	+	+	+	+		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Thelypteridaceae	*Cyclosorus parasiticus*	華南毛蕨	+	+	+	+	+	+							+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Ulmaceae	*Celtis sinensis*	朴樹	+	+	+	+	+	+				+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Urticaceae	*Boehmeria nivea*	苧麻	+	+	+	+	+	+	+						+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Urticaceae	*Pouzolzia zeylanica*	霧水葛											+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Verbenaceae	*Lantana camara*	馬纓丹	+	+	+	+	+	+						+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Poaceae	*Eleusine indica*	牛筋草															+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Brassicaceae	*Rorippa indica*	塘葛菜															+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Poaceae	*Isachne globosa*	柳葉箬															+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Poaceae	*Paspalum distichum*	雙穗雀稗															+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Cyperaceae	*Cyperus involucratus*	風車草															+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Dioscoreaceae	*Dioscorea alata*	參薯															+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Menispermaceae	*Stephania longa*	廣箕篤															+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Polygonaceae	*Polygonum hydropiper*	水蓼															+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Balsaminaceae	*Impatiens walleriana*	非洲鳳仙															+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Rubiaceae	*Paederia scandens*	雞矢藤															+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Ulmaceae	*Trema tomentosa*	山黃麻															+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Verbenaceae	*Duranta erecta*	假連翹															+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Floating plant																																																		
Lemnaceae	*Lemna minor*	浮萍																	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+				
No of Species			38	38	38	39	39	34	11	12	4	17	23	27	36	39	59	60	61	61	61	62	63	63	63	61	63	63	66	67	67	67	67	67	67	67	67	67	65	65	66	66	52	52	52	52	52	52	52

Note:

+, occurred; ++, common; +++, abundant/dominant species recorded in study area

Table 4.2. Flora species recorded from belt transect survey at the Upper Tai Po stream (T1- Upper stream sampling site and T2 - Lower stream sampling site)

			Baseline survey				Impact monitoring					Impact monitoring					Impact monitoring					Impact monitoring					Impact monitoring					Impact monitoring					Impact monitoring					Impact monitoring				
		Stream	Oct-07				Jan-09					Jul-09					Jan-10					Jul-10					Jan-11					Jul-11					Jan-12					Jul-12				
		Transect	P1		P2		Reference		T1		T2	Reference		T1		T2	Reference		T1		T2	Reference		T1		T2	Reference		T1		T2	Reference		T1		T2	Reference		T1		T2	Reference		T1		T2	
Family	Species	Chinese name	Height (m)	%	Height (m)	%	Height (m)	%	Height(m)	%	Height (m)	%	Height(m)	%	Height (m)	%	Height(m)	%	Height (m)	%	Height (m)	%	Height(m)	%	Height (m)	%	Height(m)	%	Height (m)	%	Height(m)	%	Height (m)	%	Height(m)	%	Height (m)	%	Height(m)	%	Height (m)	%	Height(m)	%	Height (m)	%
Asteraceae	*Mikania micrantha*	薇甘菊	0.4	15	1	40	0.5	5	0.5	5		0.5	5				0.5	3	0.2	5	0.2	2	0.5	20	0.5	60			0.5	10					0.5	10					0.4	20					0.4	10			
Moraceae	*Ficus hispida*	對葉榕	1	2			5	5			2	10	5	5			2	10	5	5					5	5																						
Ulmaceae	*Celtis sinensis*	朴樹	5	2							6	15					6	15									4m	5																				
Poaceae	*Microstegium ciliatum*	刚秀竹	1.2	45	1.2	30			0.8	10	0.5	12					0.7	30					1	35	1	5	0.5	10	1	15	1	5	0.5	2	1	2					1	55				
Euphorbiaceae	*Macaranga tanarius*	血桐	2	2			5	5	3	5	1.5	4	5	5	3	5	1.5	5	5	5					5	5					4m	5																
Araceae	*Alocasia odora*	海芋	1.5	23							1.5	25					2	30									2	10					0.4	3												
Araceae	*Colocasia esculenta*	芋	0.3	<1	0.4	<1	0.3	2					0.3	2	0.8	5			0.3	1																												
Myrtaceae	*Cleistocalyx operculatus*	水翁					0.4	10	7	5			0.4	10	7	5			0.4	10	7	5	0.4	10					0.4	5	5m	5																
Athyriaceae	*Callipteris esculenta*	菜蕨			0.6	1	0.8	10			0.4	10	0.8	10			0.4	2	0.8	6			0.8	6																								
Poaceae	*Phragmites karka*	卡開蘆					1.5	51					1.5	51					1.5	53			1.5	10					1.5	2					1.5	2										
Thelypteridaceae	*Cyclosorus parasiticus*	華南毛蕨	0.4	10							0.4	10					0.4	2																												
Equisetaceae	*Equisetum debile*	笪竹草			0.6	<1	0.3	2					0.3	2					0.3	2																												
Asteraceae	*Ageratum conyzoides*	勝紅薊							0.4	2					0.4	2					0.2	2													1.2	10					0.4	20				
Commelinaceae	*Commelina diffusa*	節節草																	0.2	5	0.2	5	0.2	5			0.5	20													0.4	10			0.4	5
Solanaceae	*Solanum nigrum*	龍葵																			0.4	5																								
Euphorbiaceae	*Mallotus paniculatus*	白楸																			0.3	5																								
Poaceae	*Eleusine indica*	牛筋草													0.5	5					5																									
Poaceae	*Pennisetum purpureum*	象草									3	4																																		
Asteraceae	*Wedelia chinensis*	蟛蜞菊																																											
Asteraceae	*Bidens alba*	白花鬼針草																											0.5	5		3														
Poaceae	*Panicum repens*	枯骨草																																	1.5	5					1.5	5				
Poaceae	*Coix lacryma-jobi*	薏苡																																							1.5	5				
Convolvulaceae	*Ipomoea cairica*	五爪金龍																																							0.2	5				
Cucurbitaceae	*Benincasa hispida*	冬瓜																													0.2	5														
Fabaceae	*Pueraria lobata*	野葛																																											
Convolvulaceae	*Merremia hederacea*	魚黃草																																											
Poaceae	*Pennisetum alopecuroides*	狼尾草																																											
Poaceae	*Brachiaria mutica*	巴拉草																																											
Onagraceae	*Ludwigia erecta*	美洲水丁香																																											
Malvaceae	*Hibiscus rosa-sinensis*	大紅花																																											
Cyperaceae	*Cyperus sp.*	莎草																																											
Balsaminaceae	*Impatiens walleriana*	非洲鳳仙																																											
Amaranthaceae	*C elosia argentea*	青箱																																											
Bare Gound								10		73		10		10		78		6		10		73		88		9		15		65		68		80		89		71		100		89		35		100		100		20		100		100

- Reference point was the sampling location outside the works area used to compare with the data within works area.

P1 – Point count location 1; P2 – Point count location 2

Table 4.2. Flora species recorded from belt transect survey at the Upper Tai Po stream (T1- Upper stream sampling site and T2 - Lower stream sampling site)

			Impact monitoring						Impact monitoring						Post construction monitoring						Post construction monitoring						Post construction monitoring						Post construction monitoring						Post construction monitoring						Post construction monitoring						Post construction monitoring					
		Stream	Mar-13						Jul-13						Jan-14						Feb-14						Mar-14						Apr-14						May-14						Jun-14						Jul-14					
		Transect	Reference		T1		T2		Reference		T1		T2		Reference		T1		T2		Reference		T1		T2		Reference		T1		T2		Reference		T1		T2		Reference		T1		T2		Reference		T1		T2		Reference		T1		T2	
Family	Species	Chinese name	Height (m)	%	Height(m)	%	Height (m)	%	Height (m)	%	Height(m)	%	Height (m)	%	Height (m)	%	Height(m)	%	Height (m)	%	Height (m)	%	Height(m)	%	Height (m)	%	Height (m)	%	Height(m)	%	Height (m)	%	Height (m)	%	Height(m)	%	Height (m)	%	Height (m)	%	Height(m)	%	Height (m)	%	Height (m)	%	Height (m)	%	Height (m)	%	Height (m)	%
Asteraceae	*Mikania micrantha*	薇甘菊	0.4	60					0.4	40	0.4	3			0.4	40	0.4	5			0.4	40	0.4	8			0.4	40	0.4	8			0.3	5	0.3	20			0.3	5	0.3	25			0.3	5	0.3	25			0.4	8	0.4	25		
Moraceae	*Ficus hispida*	對葉榕																																																			
Ulmaceae	*Celtis sinensis*	朴樹																																																		
Poaceae	*Microstegium ciliatum*	刚秀竹									0.6	3					0.6	3					0.6	5					0.6	5			0.4	5					0.4	5					0.4	5			0.6	5				
Euphorbiaceae	*Macaranga tanarius*	血桐																																	0.5	1					0.5	1					0.5	1			0.6	1		
Araceae	*Alocasia odora*	海芋																																																		
Araceae	*Colocasia esculenta*	芋	0.3	2					0.3	5					0.3	3					0.3	3					0.3	3																										
Myrtaceae	*Cleistocalyx operculatus*	水翁																																																		
Athyriaceae	*Callipteris esculenta*	菜蕨																																																		
Poaceae	*Phragmites karka*	卡開蘆							1.2	5					1.2	2					1.2	2					1.2	2					1.5	5					1.5	5					1.5	5					1.5	5				
Thelypteridaceae	*Cyclosorus parasiticus*	華南毛蕨																																																		
Equisetaceae	*Equisetum debile*	笪笞草																																																	
Asteraceae	*Ageratum conyzoides*	勝紅薊			(concret section)		(concret section)						(concret section)						(concret section)						(concret section)						(concret section)						(concret section)						(concret section)						(concret section)					
Commelinaceae	*Commelina diffusa*	節節草	0.4	5					0.4	5					0.4	6					0.4	6					0.4	6							0.1	5					0.1	3					0.1	3			0.2	4		
Solanaceae	*Solanum nigrum*	龍葵																																																		
Euphorbiaceae	*Mallotus paniculatus*	白楸																																																	
Poaceae	*Eleusine indica*	牛筋草									0.3	3					0.3	3					0.3	3					0.3	3																										
Poaceae	*Pennisetum purpureum*	象草																																																		
Asteraceae	*Wedelia chinensis*	蟛蜞菊																																																		
Asteraceae	*Bidens alba*	白花鬼針草	0.3	10					0.3	10	0.3	10			0.3	15	0.3	10			0.3	15	0.3	10			0.3	15	0.3	10																										
Poaceae	*Panicum repens*	枯骨草							0.6	5					0.6	5					0.6	5					0.6	5	0.6	2			0.3	5					0.3	3					0.3	3			0.4	3				
Poaceae	*Coix lacryma-jobi*	薏苡	1.5	3																																																	
Convolvulaceae	*Ipomoea cairica*	五爪金龍																																																		
Cucurbitaceae	*Benincasa hispida*	冬瓜																																																	
Fabaceae	*Pueraria lobata*	野葛	0.2	5					0.2	10					0.2	10					0.2	10					0.2	10					0.4	10					0.4	15					0.4	15			0.4	15				
Convolvulaceae	*Merremia hederacea*	魚黃草	0.2	5																																																
Poaceae	*Pennisetum alopecuroides*	狼尾草																															1.5	5					1.5	5					1.5	5			1.5	5		
Poaceae	*Brachiaria mutica*	巴拉草																																																		
Onagraceae	*Ludwigia erecta*	美洲水丁香																																																		
Malvaceae	*Hibiscus rosa-sinensis*	大紅花									0.6	5					0.6	5					0.6	5					0.6	5																										
Cyperaceae	*Cyperus sp.*	莎草																																																		
Balsaminaceae	*Impatiens walleriana*	非洲鳳仙																																																		
Amaranthaceae	*C elosia argentea*	青箱																																																		
Bare Gound				10						20		76				19		74				19		69				19		67				70		69				67		66				67		66				64		65		

- Reference point was the sampling location outside the works area used to compare with the data within works area.

P1 – Point count location 1; P2 – Point count location 2

Table 4.2. Flora species recorded from belt transect survey at the Upper Tai Po stream (T1- Upper stream sampling site and T2 - Lower stream sampling site)

			Post construction monitoring						Post construction monitoring						Post construction monitoring						Post construction monitoring						Post construction monitoring						Post construction monitoring						Post construction monitoring						Post construction monitoring						Post construction monitoring						Post construction monitoring					
		Stream	Aug-14						Sep-14						Oct-14						Nov-14						Dec-14						Jan-15						Feb-14						Mar-14						Apr-14						May-15					
		Transect	Reference		T1		T2		Reference		T1		T2		Reference		T1		T2		Reference		T1		T2		Reference		T1		T2		Reference		T1		T2		Reference		T1		T2		Reference		T1		T2		Reference		T1		T2		Reference		T1		T2	
Family	Species	Chinese name	Height (m)	%	Height (m)	%	Height (m)	%	Height (m)	%	Height (m)	%	Height (m)	%	Height (m)	%	Height (m)	%	Height (m)	%	Height (m)	%	Height (m)	%	Height (m)	%	Height (m)	%	Height (m)	%	Height (m)	%	Height (m)	%	Height (m)	%	Height (m)	%	Height (m)	%	Height (m)	%	Height (m)	%	Height (m)	%	Height (m)	%	Height (m)	%	Height (m)	%	Height (m)	%	Height (m)	%	Height (m)	%	Height (m)	%
Asteraceae	*Mikania micrantha*	薇甘菊	0.4	10	0.4	28			0.4	10	0.4	28			0.4	10	0.4	30			0.4	12	0.4	30			0.4	12	0.4	30			0.8	15			0.3	10	0.8	15			0.3	10	0.8	15			0.3	10	0.8	15			0.3	10	0.5	10			0.3	3
Moraceae	*Ficus hispida*	對葉榕																																																												
Ulmaceae	*Celtis sinensis*	朴樹																																																										
Poaceae	*Microstegium ciliatum*	刚秀竹	0.6	5					0.6	5					0.6	10					0.6	15					0.6	15					1.3	5			1	5	1.3	5			1	5	1.3	5			1	5	1.3	5			1	5	1	5			1	3
Euphorbiaceae	*Macaranga tanarius*	血桐			0.6	1					0.6	1					0.6	1					0.6	1					0.6	1					0.6	1					0.6	1					0.6	1					0.6	1					0.5	1
Araceae	*Alocasia odora*	海芋																																																											
Araceae	*Colocasia esculenta*	芋													0.5	5					0.5	5					0.5	5					0.8	5					0.8	5					0.8	5					0.8	5					0.5	5				
Myrtaceae	*Cleistocalyx operculatus*	水翁																																																										
Athyriaceae	*Callipteris esculenta*	菜蕨																																																											
Poaceae	*Phragmites karka*	卡開蘆	1.8	5					1.8	5					2	5					2	5					2	5					1.7	10					1.7	10					1.7	10					1.7	10					1.5	10				
Thelypteridaceae	*Cyclosorus parasiticus*	華南毛蕨																																																										
Equisetaceae	*Equisetum debile*	笪笞草													0.3	5					0.3	5					0.3	5					0.3	5					0.3	5					0.3	5					0.3	5					0.3	5				
Asteraceae	*Ageratum conyzoides*	勝紅薊					(concret section)						(concret section)						(concret section)						(concret section)								0.3	2					0.3	2					0.3	2							0.3	2				
Commelinaceae	*Commelina diffusa*	節節草			0.3	5					0.3	5					0.3	10					0.3	10					0.3	10			0.2	10			0.4	60	0.3	10			0.5	60	0.3	10			0.5	60	0.3	10			0.5	60	0.3	10			0.5	35
Solanaceae	*Solanum nigrum*	龍葵																																																										
Euphorbiaceae	*Mallotus paniculatus*	白楸																																																										
Poaceae	*Eleusine indica*	牛筋草																																																										
Poaceae	*Pennisetum purpureum*	象草																																																									
Asteraceae	*Wedelia chinensis*	蜈蚣菊																																																									
Asteraceae	*Bidens alba*	白花鬼針草															1	10					1	10					1	10			1	5			0.8	2	1	5			0.8	2	1	5			0.8	2	1	5			0.8	2	0.7	5			0.6	2
Poaceae	*Panicum repens*	枯骨草	0.6	3					0.6	4					0.6	4					0.6	4					0.6	4					0.6	5					0.6	5					0.6	5					0.6	5					0.4	5				
Poaceae	*Coix lacryma-jobi*	薏苡																																																									
Convolvulaceae	*Ipomoea cairica*	五爪金龍																																																									
Cucurbitaceae	*Benincasa hispida*	冬瓜																																																									
Fabaceae	*Pueraria lobata*	野葛	0.4	15					0.4	18					0.4	18					0.4	20					0.4	20																																		
Convolvulaceae	*Merremia hederacea*	魚黃草																																																								
Poaceae	*Pennisetum alopecuroides*	狼尾草			1.5	5					1.5	5					2	20					2	20					2	20							4	10					4	10					4	10					4	10			2	7
Poaceae	*Brachiaria mutica*	巴拉草															1.5	25					1.5	25					1.5	25																																
Onagraceae	*Ludwigia erecta*	美洲水丁香																																	0.2	4							0.3	4							0.3	4					0.3	2				
Malvaceae	*Hibiscus rosa-sinensis*	大紅花																																																									
Cyperaceae	*Cyperus sp.*	莎草																																	0.2	6					0.2	6					0.2	6							0.2	6			0.2	3				
Balsaminaceae	*Impatiens walleriana*	非洲鳳仙																																																										
Amaranthaceae	*Celosia argentea*	青箱																															1.7	5			1	5	1.7	5			1	5	1.7	5			1	5	1.7	5			1	5	1.7	5			1	3
Bare Gound				62		61				58		61				43		4				34		4				34		4				35		88		7		35		88		7		35		88		7		35		88		7		40		93		46

- Reference point was the sampling location outside the works area used to compare with the data within works area.

P1 – Point count location 1; P2 – Point count location 2

Table 4.2. Flora species recorded from belt transect survey at the Upper Tai Po stream (T1- Upper stream sampling site and T2 - Lower stream sampling site)

			Post construction monitoring						Post construction monitoring						Post construction monitoring						Post construction monitoring						Post construction monitoring						Post construction monitoring						Post construction monitoring						Post construction monitoring						Post construction monitoring						Post construction monitoring					
		Stream	Jun-15						Jul-15						Aug-15						Sep-15						Oct-15						Nov-15						Dec-15						Jan-16						Feb-16					
		Transect	Reference		T1		T2		Reference		T1		T2		Reference		T1		T2		Reference		T1		T2		Reference		T1		T2		Reference		T1		T2		Reference		T1		T2		Reference		T1		T2		Reference		T1		T2		Reference		T1		T2	
Family	Species	Chinese name	Height (m)	%	Height (m)	%	Height (m)	%	Height (m)	%	Height (m)	%	Height (m)	%	Height (m)	%	Height (m)	%	Height (m)	%	Height (m)	%	Height (m)	%	Height (m)	%	Height (m)	%	Height (m)	%	Height (m)	%	Height (m)	%	Height (m)	%	Height (m)	%	Height (m)	%	Height (m)	%	Height (m)	%	Height (m)	%	Height (m)	%	Height (m)	%	Height (m)	%	Height (m)	%	Height (m)	%	Height (m)	%
Asteraceae	*Mikania micrantha*	薇甘菊	0.5	10			0.3	3	0.5	10					0.5	10					0.5	10					0.5	10					0.5	10					0.5	5					0.5	5					0.5	5					0.5	5				
Moraceae	*Ficus hispida*	對葉榕																																																										
Ulmaceae	*Celtis sinensis*	朴樹																																																									
Poaceae	*Microstegium ciliatum*	刚秀竹	1	5			1	3	1	5	1	1			1	5	1	1			1	5	1	1			1	5	1	3			1	5	1	3			1	5	1	3			1	5	1	3			1	5	1	3			1	5	1	3		
Euphorbiaceae	*Macaranga tanarius*	血桐					0.5	1					1.5	5					1.5	5					1.5	5					1.5	5																															1.5	5		
Araceae	*Alocasia odora*	海芋																																																										
Araceae	*Colocasia esculenta*	芋	0.5	5					0.5	5	1.2	10			0.5	5	1.2	5			0.5	5	1.2	2			0.5	5	1.2	5			0.5	5	1.2	5			0.5	5	1.2	5			0.5	5	1.2	5			0.5	5	1.2	5			0.5	5	1.2	5		
Myrtaceae	*Cleistocalyx operculatus*	水翁																																																										
Athyriaceae	*Callipteris esculenta*	菜蕨																																																										
Poaceae	*Phragmites karka*	卡開蘆	1.5	10					1.5	10					1.5	10					1.5	10					1.5	10					1.5	10					1.5	7					1.5	7					1.5	7					1.5	7				
Thelypteridaceae	*Cyclosorus parasiticus*	華南毛蕨																																																										
Equisetaceae	*Equisetum debile*	笪笞草	0.3	5					0.3	5					0.3	5					0.3	5					0.3	5					0.3	5					0.3	5					0.3	5					0.3	5					0.3	5				
Asteraceae	*Ageratum conyzoides*	勝紅薊			0.3	5																																																							
Commelinaceae	*Commelina diffusa*	節節草	0.3	10			0.5	35	0.3	10			0.4	40	0.4	10	0.2	20	0.4	30	0.4	10	0.2	5	0.4	30	0.4	10	0.2	15	0.4	30	0.4	10	0.2	20	0.4	30	0.4	7	0.2	20	0.4	30	0.4	10	0.2	25	0.4	35	0.4	10	0.2	25	0.4	35
Solanaceae	*Solanum nigrum*	龍葵																																																										
Euphorbiaceae	*Mallotus paniculatus*	白楸																																																										
Poaceae	*Eleusine indica*	牛筋草																																																										
Poaceae	*Pennisetum purpureum*	象草																																																									
Asteraceae	*Wedelia chinensis*	蟛蜞菊																																																									
Asteraceae	*Bidens alba*	白花鬼針草	0.7	5			0.6	2	0.7	5			0.5	5	0.7	5			0.5	5	0.7	5			0.5	5	0.7	5			0.5	5	0.7	5			0.5	5	0.7	5			0.5	5	0.7	5			0.5	5	0.7	5			0.5	5	0.7	5		
Poaceae	*Panicum repens*	枯骨草	0.4	5					0.4	5					0.4	5					0.4	5					0.4	5					0.4	5					0.4	5					0.4	5					0.4	5					0.4	5				
Poaceae	*Coix lacryma-jobi*	薏苡																																																										
Convolvulaceae	*Ipomoea cairica*	五爪金龍																																																										
Cucurbitaceae	*Benincasa hispida*	冬瓜																																																										
Fabaceae	*Pueraria lobata*	野葛																																																										
Convolvulaceae	*Merremia hederacea*	魚黃草																																																										
Poaceae	*Pennisetum alopecuroides*	狼尾草					2	7			2.5	20	2	30			2.5	5	2	20			2.5	5	2	20			2	7	2	20			2	10	2	20			2	10	2	20			2	10	2	20			2	10	2	20		
Poaceae	*Brachiaria mutica*	巴拉草									1.2	50	0.5	15			1.2	30	0.5	15			1.2	2	0.5	15			1.2	2	0.5	15			1.2	2	0.5	15			1.2	2	0.5	15			1.2	2	0.5	15			1.2	2	0.5	15		
Onagraceae	*Ludwigia erecta*	美洲水丁香			0.3	5																																																						
Malvaceae	*Hibiscus rosa-sinensis*	大紅花																																																									
Cyperaceae	*Cyperus sp.*	莎草			0.2	5					0.2	5					0.2	5					0.2	2					0.2	2					0.2	2					0.2	2					0.2	2					0.2	2				
Balsaminaceae	*Impatiens walleriana*	非洲鳳仙					1	3																																																				
Amaranthaceae	*C elosia argentea*	青箱	1.7	5					1.7	5					1.7	5					1.7	5					1.7	5					1.7	5					1.7	5					1.7	5					1.7	5					1.7	5				
Bare Gound				40		85		46		40		14		5		40		34		25		40		83		25		40		66		25		40		58		25		51		58		25		48		53		20		48		53		20	

- Reference point was the sampling location outside the works area used to compare with the data within works area.

P1 – Point count location 1; P2 – Point count location 2

Table 4.2. Flora species recorded from belt transect survey at the Upper Tai Po stream (T1- Upper stream sampling site and T2 - Lower stream sampling site)

			Post construction monitoring						Post construction monitoring						Post construction monitoring						Post construction monitoring						Post construction monitoring					
		Stream	Mar-16						Apr-16						May-16						Jun-16						Jul-16					
		Transect	Reference		T1		T2		Reference		T1		T2		Reference		T1		T2		Reference		T1		T2		Reference		T1		T2	
Family	Species	Chinese name	Height (m)	%	Height (m)	%	Height (m)	%	Height (m)	%	Height (m)	%	Height (m)	%	Height (m)	%	Height (m)	%	Height (m)	%	Height (m)	%	Height (m)	%	Height (m)	%	Height (m)	%	Height (m)	%	Height (m)	%	Height (m)	%
Asteraceae	*Mikania micrantha*	薇甘菊	0.6	5					0.6	5					0.6	5					0.6	5					0.6	5				
Moraceae	*Ficus hispida*	對葉榕																														
Ulmaceae	*Celtis sinensis*	朴樹																														
Poaceae	*Microstegium ciliatum*	刚秀竹	1.2	5	1	3			1.2	5	1	3			1.2	5					1.2	5					1.2	5				
Euphorbiaceae	*Macaranga tanarius*	血桐					1.5	5					1.5	5					1.5	5					1.5	5					1.5	10
Araceae	*Alocasia odora*	海芋																														
Araceae	*Colocasia esculenta*	芋	0.5	5	1.2	5			0.5	5	1.2	5			0.5	5					0.5	5					0.5	5				
Myrtaceae	*Cleistocalyx operculatus*	水翁																														
Athyriaceae	*Callipteris esculenta*	菜蕨																														
Poaceae	*Phragmites karka*	卡開蘆	1.5	7					1.5	7					1.5	5					1.5	5					1.5	5				
Thelypteridaceae	*Cyclosorus parasiticus*	華南毛蕨																														
Equisetaceae	*Equisetum debile*	笪竹草	0.3	5					0.3	5					0.3	5					0.3	5					0.3	5				
Asteraceae	*Ageratum conyzoides*	勝紅薊																														
Commelinaceae	*Commelina diffusa*	節節草	0.4	10	0.3	25	40	0	0.4	8	0.3	20	40	0	0.4	5	0.3	5	0.4	2	0.4	5	0.3	5	0.4	2	0.4	5	0.3	5	0.4	5
Solanaceae	*Solanum nigrum*	龍葵																														
Euphorbiaceae	*Mallotus paniculatus*	白楸																														
Poaceae	*Eleusine indica*	牛筋草																														
Poaceae	*Pennisetum purpureum*	象草																														
Asteraceae	*Wedelia chinensis*	蟛蜞菊																														
Asteraceae	*Bidens alba*	白花鬼針草	0.7	5			0.5	5	0.7	5			0.5	5	0.7	5			0.5	5	0.7	5			0.5	5	0.7	5			0.5	8
Poaceae	*Panicum repens*	枯骨草	0.4	5					0.4	5					0.4	5					0.4	5					0.4	5				
Poaceae	*Coix lacryma-jobi*	薏苡																														
Convolvulaceae	*Ipomoea cairica*	五爪金龍																														
Cucurbitaceae	*Benincasa hispida*	冬瓜																														
Fabaceae	*Pueraria lobata*	野葛																														
Convolvulaceae	*Merremia hederacea*	魚黃草																														
Poaceae	*Pennisetum alopecuroides*	狼尾草			2	10	2	20			2	8	2	10					2	3					2	3					2	5
Poaceae	*Brachiaria mutica*	巴拉草			1.2	2	0.5	15			1.2	2	0.5	10			1.2	2					1.2	2					1.2	2		
Onagraceae	*Ludwigia erecta*	美洲水丁香																														
Malvaceae	*Hibiscus rosa-sinensis*	大紅花																														
Cyperaceae	*Cyperus sp.*	莎草			0.2	2					0.2	2																				
Balsaminaceae	*Impatiens walleriana*	非洲鳳仙																														
Amaranthaceae	*C elosia argentea*	青箱	1.7	5					1.7	5					1.7	5					1.7	5					1.7	5				
Bare Gound				48		53		55		50		60		70		55		93		85		55		93		85		55		93		72

- Reference point was the sampling location outside the works area used to compare with the data within works area.

P1 – Point count location 1; P2 – Point count location 2

Table 4.2. Flora species recorded from belt transect survey at the Upper Tai Po stream (T1- Upper stream sampling site and T2 - Lower stream sampling site)

			Post construction monitoring						Post construction monitoring						Post construction monitoring						Post construction monitoring					
		Stream	Aug-16						Sep-16						Oct-16						Nov-16					
		Transect	Reference		T1		T2		Reference		T1		T2		Reference		T1		T2		Reference		T1		T2	
Family	Species	Chinese name	Height (m)	%	Height (m)	%	Height (m)	%	Height (m)	%	Height (m)	%	Height (m)	%	Height (m)	%	Height (m)	%	Height (m)	%	Height (m)	%	Height (m)	%	Height (m)	%
Asteraceae	*Mikania micrantha*	薇甘菊	0.6	5					0.5	10					0.5	10					0.5	10				
Moraceae	*Ficus hispida*	對葉榕																								
Ulmaceae	*Celtis sinensis*	朴樹																								
Poaceae	*Microstegium ciliatum*	剛秀竹	1.2	5					1.5	10					1.5	10					1.5	10				
Euphorbiaceae	*Macaranga tanarius*	血桐					1.5	10					1.5	10					1.6	10					0.1	10
Araceae	*Alocasia odora*	海芋							0.4	5					0.4	5					0.4	5				
Araceae	*Colocasia esculenta*	芋	0.5	5					0.5	5					0.5	5					0.5	5				
Myrtaceae	*Cleistocalyx operculatus*	水翁																								
Athyriaceae	*Callipteris esculenta*	菜蕨																								
Poaceae	*Phragmites karka*	卡開蘆	1.5	5					1.6	5					1.6	5					1.6	5				
Thelypteridaceae	*Cyclosorus parasiticus*	華南毛蕨																								
Equisetaceae	*Equisetum debile*	筆管草	0.3	5					0.5	5					0.5	5					0.5	5				
Asteraceae	*Ageratum conyzoides*	勝紅薊																								
Commelinaceae	*Commelina diffusa*	節節草	0.4	5	0.3	5	0.4	5	0.4	10	0.4	10	0.4	10	0.5	10	0.3	10	0.3	10	0.5	10	0.1	10	0.1	10
Solanaceae	*Solanum nigrum*	龍葵																								
Euphorbiaceae	*Mallotus paniculatus*	白楸																								
Poaceae	*Eleusine indica*	牛筋草																								
Poaceae	*Pennisetum purpureum*	象草																								
Asteraceae	*Wedelia chinensis*	蟛蜞菊																								
Asteraceae	*Bidens alba*	白花鬼針草	0.7	5			0.5	8	0.7	5			0.5	8	0.8	5			0.5	8	0.8	5			0.1	8
Poaceae	*Panicum repens*	枯骨草	0.4	5					0.4	5					0.4	5					0.4	5				
Poaceae	*Coix lacryma-jobi*	薏苡																								
Convolvulaceae	*Ipomoea cairica*	五爪金龍																								
Cucurbitaceae	*Benincasa hispida*	冬瓜																								
Fabaceae	*Pueraria lobata*	野葛																								
Convolvulaceae	*Merremia hederacea*	魚黃草																								
Poaceae	*Pennisetum alopecuroides*	狼尾草					2	5					1.6	5					1.6	5					0.1	5
Poaceae	*Brachiaria mutica*	巴拉草			1.2	2					1.2	5	1.3	5			1.2	5	1.3	5			0.1	5	0.1	5
Onagraceae	*Ludwigia erecta*	美洲水丁香																								
Malvaceae	*Hibiscus rosa-sinensis*	大紅花																								
Cyperaceae	*Cyperus sp.*	莎草																								
Balsaminaceae	*Impatiens walleriana*	非洲鳳仙																								
Amaranthaceae	*Celosia argentea*	青葙	1.7	5					1.5	5					1.5	5					1.5	5				
Bare Gound				55		93		72		35		85		62		35		85		62		35		85		62

- Reference point was the sampling location outside the works area used to compare with the data within works area.

P1 – Point count location 1; P2 – Point count location 2

Table 4.3 Avifauna recorded along survey transects and at two selected point count locations for Upper Tai Po River. (T1- Upper stream section and T2- Lower stream section)

					Baseline survey			Impact monitoring						Impact monitoring												Impact monitoring												Post construction monitoring									Post construction monitoring									Post construction monitoring									Post construction monitoring									Post construction monitoring								
					Oct-07			Jan-09			Jul-09			Jan-10			Jul-10			Jan-11			Jul-11			Jan-12			Jul-12			Mar-13			Jul-13			Jan-14			Feb-14			Mar-14			Apr-14			May-14			Jun-14			Jul-14			Aug-14			Sep-14			Oct-14			Oct-14			Dec-14			Jan-15			Feb-15			Mar-15		
					Abundance			Abundance			Abundance			Abundance			Abundance			Abundance			Abundance			Abundance			Abundance			Abundance			Abundance			Abundance			Abundance			Abundance			Abundance			Abundance			Abundance			Abundance			Abundance			Abundance			Abundance			Abundance			Abundance			Abundance			Abundance			Abundance		
Common Name	**Species name**	**Chinese name**	**Status**	**Rarity**	C	P1	P2	C	T1	T2	C	T1	T2	C	T1	T2	C	T1	T2	C	T1	T2	C	T1	T2	C	T1	T2	C	T1	T2	C	T1	T2	C	T1	T2	C	T1	T2	C	T1	T2	C	T1	T2	C	T1	T2	C	T1	T2	C	T1	T2	C	T1	T2	C	T1	T2	C	T1	T2	C	T1	T2	C	T1	T2	C	T1	T2	C	T1	T2	C	T1	T2	C	T1	T2
Barn Swallow	*Hirundo rustica*	家燕	SV, SpM	C																			+						+++	3	2	+++	4	1	+			+			+	1		+	1	2	++	2	3	++	3	2	+	2	1																											++	2	3
Black -crown Night Heron	*Nycticorax nyxticorax*	夜鷺	R,WV, P	C													+			+																																																													
Black Kite	*Milvus lineatus*	麻鷹	R, RC, Cap.586	C	+									+						+						+									+						+																											+			+						+			+			+		
Black-collared Starling	*Sturnus nigricollis*	黑領椋鳥	R	C	+	1	1							+			+		1	+			+		1	+		1	+			+			+			+			+	1		+	1	2	+		1	+			+			+			+		2	+	2	2	+		3	+		2	+		2	+		3	++		2	++		2
Chinese Bulbul	*Pycnonotus sinensis*	白頭鵯	R	C	+	3	2	++	5	6	++	4	7	+++	7	6	+++	6	3	+	4	2	+	1		+	1		++	2	1	++	2	3	++	2	1	+	2	2	+	5	2	+		3	+	2	1	+	2	2	+		1	+	1		+			+			+		1	+	1	2	+	2	2	+	1	2	+	1		++	2	4
Chinese Hwamei	*Garrulax canorus*	畫眉	R	C																																																																													
Chinese Pond Heron	*Ardeola bacchus*	池鷺	R,RC	C	+			++	6	3	+	2	3	++	3	3	++	2	2	+	1	1	+	1					+			+		1	+			+		1	+	1	2	+		3	+		1	+		2	+		1	+		1	+		1	+	2	2	+	1		+	1	1	+		1	+		2	+	1	1	+		1
Common Blackbird	*Turdus merula*	烏鶇	WV, PM	C																+																																																												
Common Kingfisher	*Alcedo atthis*	普通翠鳥	PM, WV	C	+												+			+																		+			+			+																																	+					
Common Koel	*Eudynamys scolopacea*	噪鵑	R	C	+											2				+			+						+			+			+			+			+			+			+			+			+			+			+																					+		
Common Sandpiper	*Actitis hypoleucos*	磯鷸	WV&PM	C	+															+			+												+			+						+		+	+		+	+																														
Common Snipe	*Gallinago gallinago*	扇尾沙錐	WV&PM	C																																																																											
Common Tailorbird	*Orthotomus sutorius*	長尾縫葉鶯	R	C	+		1	+	1	1	+		1	++		10	+	1		+		1	+			+			+			+			+	1		+	1		+	1		+	1		+	1	1	+	1		+			+	1	1	+	1	1	+	1	1	+	1	1	+		1	+		1	+	1	1	+		1	+		1
Crested bulbul	*Pycnonotus jocosus*	紅耳鵯	R	C	+	2		+++	6	7	++	2	6	+++	4	5	++	3	2	+	2	1	+	1	2	+	2		+++	5	3	+++	2	1	++	3	2	++	5	4	++	4	6	++	2	5	++	1	4	++	2	6	++	3	2	++	2	4	++	3	2	++	3	5	++	3	2	++	2	4	+	2	4	+++	3	4	+++	2	3	+++	3	4
Crested Myna	*Acridotheres cristatellus*	八哥	R	C		1											+			+	2		+		2	+			+			+			+			+			+			+			+			+			+	2		+	2	2	+		3	+		2	+		2	+		3	+			+	2		++	2	2	++		3
Daurian redstart	*Phoenicurus auroreus*	北紅尾鴝	WV	U																																																																+		1	+								
Domestic pigeon	*Columba sp.*	鴿	R	C		3											+						+												+		2	+																											+			+			+			+			+					
Eurasian Tree Sparrow	*Passer montanus*	麻鵲	R	C	+	3	2							+			+	4	3	+			+		1	+			+			+			+			+			+			+		2	+			+			+			+			+			+		2	+		3	+	2	1	0			++		3	++	3		++		2
Great Coucal	*Centropus sinensis*	褐翅鴉鵑	R,VU	C	+	1											+	1		+			+												+			+			+			+			+			+			+			+			+						+	1		+			+			+			+		1			
Great Tit	*Parus major (commixtus)*	大山雀	R	C										+	2	1	+	1								+												+			+			+			+			+																								+		1						
Green Sandpiper	*Tringa ochropus*	白腰草鷸	WV	U																+																								+			+																																			
Grey Wagtail	*Motacilla cinerea*	灰鶺鴒	WV	C																+	2	1				+	1	2										+	1	2	+	1	1	+	1	2	+		1							+			+		1	++	1	3	+	2	2	+	1	1	++	2	2	++	1	2	+	1	1	++	2	2
Japanese White Eye	*Zosterops japonica*	暗綠繡眼鳥	R	C		2		++	2	3	+	1	4	+++	4	6	++	3	2	+	5	2	+			+			+	2		+	3		+	2		+	3		+	5		+	3		+	4		+	2	4	+		3	+		5	+	3	6	+		3	+			+	3		+			+		4	+		3	+		5
Large-billed Crow	*Corvus macrorhynchos*	大嘴烏鴉	R	C																																																																												
Little Egret	*Egretta garzetta*	小白鷺	R, RC	C	+			+	1		+		1	+		1	+	1	1		1	1	+												+			+		1	+		2	+		1	+			+									+			+		1	+	1	2	+	1	1	+			+	1	1	+	1	2	+		1
Little Swift	*Apus affinis*	小白腰雨燕	R, SpM	C																												+						++			++	3	5	+	2	1																													++					
Magpie	*Pica pica*	喜鵲	R	C		1																				+															+			+																		+			+			+												+		
Magpie Robin	*Copsychus saularis*	鵲鴝	R	C	+	1	1				+	1	3	+	2	1	+	2	2	+	1	1	+	1		+		2	+	1	1	+	1		+		1	+	1	1	+	1	1	+	1	1	+	1		+	1	1	+	1	2	+	1	1	+	1	1	+	1	1	+	1	1	+	1	1	+		1	+	2	1	++	1	1	+	1	1
Olive Backed pipit	*Anthus hodgsoni*	樹鷚	WV	C	+			+	1	3										+																								+																																						
Plaintive Cuckoo	*Cacomantis merulinus*	八聲杜鵑	SV	U																																																																												
Red-billed blud magpie	*Urocissa erythrorhyncha*	紅咀藍鵲	R	C										+		2																																																																	
Rufous-backed Shrike	*Lanius schach*	棕背伯勞	R	C										+	1		+	1					+												+						+			+												+			+			+			+		1	+														
Scaly-breasted Munia	*Lonchura punctulata*	斑文鳥	R	C																																																															+			++			++			++					
Scarlet Minivet	*Pericrocotus flammeus*	赤紅山椒鳥	R	C										+																																																																				
Scarlet-backed Flowerpecker	*Dicaeum cruentatum*	朱背啄花鳥	R	C										+																																																																					
Siberian Stonechat	*Saxicola maurus*	黑喉石䳭	WV	C																																																																			+			+			+					
Silver-eared Mesia	*Leiothrix argentauris*	銀耳相思鳥	R	C																+																																																														
Sooty-headed Bulbul	*Pycnonotus aurigaster*	白喉紅臀鵯	R	C																			+		1																																																										
Spotted Dove	*Streptopelia chinensis*	珠頸斑鳩	R	C	+		2	+	1		+	1	3	+	1	2	+	1	1	+	1	1	+	1		++	4	3	++	1	2	++		1	++	1	1	++	2	1	++	2	3	++	1	4	++	2	3	++	3	5	++	2	3	++	1	2	++	2	4	++	1	3	++	2	3	++	3	4	+	2	3	++	2	3	+++	2	2	++	2	3
Violet Whistling Thrush	*Myiophoneus caeruleus*	紫嘯鶇	R	C	+																																										1					+			+															+														
White Wagtail	*Motacilla alba*	白鶺鴒	WV, R	C	+		1							++	2	3	+	1	1	+	2	2	+			++	2	1	+	1	1	+		1	+			+			+	1	2	+	2	1	+		1				+		1	+	1	2	+	1	1	+	3	4	+	2	2	+	2	1	+			+	1	1	+		1	+		1
White-breasted Waterhen	*Amaurornis phoenicurus*	白胸苦惡鳥	R	C	+									+		1	+		1							+												1		1	+			+			+			+			+			+			+			+			+			+		1				+		1						
White-rumped Munia	*Lonchura striata*	白腰文鳥	R	C																																																																												
Yellow Bellid Prinia	*Prinia flaviventris*	灰頭鷦鶯	R	C	+															+			+			+			+			+			+			+			+			+			+			+			+			+			+			+			+		1	+			+			+								
Yellow Wagtail	*Motacilla flava*	黃鶺鴒	WV&PM	C		1																																																																										
Number of birds						19	10		22	23		10	25		24	39		26	17		21	13		5	7		10	9		15	10		12	8	0	9	7		15	12		26	24		15	28		13	16		14	22		10	14		9	18		11	22		14	29		14	23		17	22		8	17		8	17		14	20		12	31
No. of species					19	11	7	8	8	6	8	6	8	18	9	13	19	13	11	23	10	10	20	5	5	16	5	5	14	7	6	15	5	6	21	5	5	25	7	8	26	12	9	27	10	13	24	7	9	24	7	7	17	5	8	17	7	8	18	6	10	19	8	12	21	9	13	23	10	13	19	4	9	22	4	9	20	9	12	17	6	14

Note: R – Resident; WV – Winter visitor; Sv–Summer Visitor; PM – Passage migrant; C – Common; U – Uncommon; SpM – Spring migrant; C – transect count; P1 – Point count location 1; P2 – Point count location 2

Abundance indication: +, No. of indiv. 1 ~ 3; ++, No. of indiv. 4 ~ 10; +++, No. of indiv. >10;

Commonness and status were decided accroding to AFCD biodiversity website (www.hkbiodiversity.net)

All bird species are under protection of Wild Animals Protection Ordinance (Cap. 170)

Endangered Species of Animals and Plants Ordinance (Cap. 586)

RC : Regional concern Fellowes *et al* (2002)

LC : Local Concern Fellowes *et al* (2002)

PRC: Potential Regional onver Fellowes *et al* (2002)

CR: Rare in China Red Data Book Status

VU: Vulnerable in China Red Data Book Status

Table 4.3 Avifauna recorded along survey transects and at two selected point count locations for Upper Tai Po River. (T1- Upper stream section and T2- Lower stream section)

					Post construction monitoring									Post construction monitoring									Post construction monitoring									Post construction monitoring																																
					Apr-15			May-15			Jun-15			Jul-15			Aug-15			Sep-15			Oct-15			Nov-15			Dec-15			Jan-16			Feb-16			Mar-16			Apr-16			May-16			Jun-16			Jul-16			Aug-16			Sep-16			Oct-16			Nov-16		
					Abundance			Abundance			Abundance			Abundance			Abundance			Abundance			Abundance			Abundance			Abundance			Abundance			Abundance			Abundance			Abundance			Abundance			Abundance			Abundance			Abundance			Abundance			Abundance			Abundance		
Common Name	**Species name**	**Chinese name**	**Status**	**Rarity**	C	T1	T2	C	T1	T2	C	T1	T2	C	T1	T2	C	T1	T2	C	T1	T2	C	T1	T2	C	T1	T2	C	T1	T2	C	T1	T2	C	T1	T2	C	T1	T2	C	T1	T2	C	T1	T2	C	T1	T2	C	T1	T2	C	T1	T2	C	T1	T2	C	T1	T2	C	T1	T2
Barn Swallow	*Hirundo rustica*	家燕	SV, SpM	C	+	2	3	+		3	+	2	2	+	2	3	++	2	4	++	3	3	++	5														+			++		7	++		5	++		6	++		5	++		6	++		7	++		5			
Black -crown Night Heron	*Nycticorax nyxticorax*	夜鷺	R,WV, P	C																																																										
Black Kite	*Milvus lineatus*	麻鷹	R, RC, Cap.586	C																																																									
Black-collared Starling	*Sturnus nigricollis*	黑領椋鳥	R	C	+	1	2	++	2	2	++	3	3	++	1	2	++	2	2	++	3	3	++	4	2	++	2	1	++	2	2	++	3	3	++	2	1	++	4	3	+	4		+		3	+		4	+		2	+	2	2	+		2	+	2	3	+	2	2
Chinese Bulbul	*Pycnonotus sinensis*	白頭鵯	R	C	+	2	2	++	2	3	++	1	2	++	3	3	++	2	2	++		2	++	3	2	++	3	2	++	1	3	++	4	2	++	3	5	++	5	2	++		5	++	3	4	++	3	2	++		5	++	3	3	++		7	++		5	++	3	2
Chinese Hwamei	*Garrulax canorus*	畫眉	R	C	+																																																							
Chinese Pond Heron	*Ardeola bacchus*	池鷺	R,RC	C			1	+		1	+	1		+		1	+		1	+		1	+	1		+		1	+		1	+		1	+		1	+	1		+	1		+	1		+	1		+	1		+	1		+	1		+	1		+	1	
Common Blackbird	*Turdus merula*	烏鶇	WV, PM	C																																																								
Common Kingfisher	*Alcedo atthis*	普通翠鳥	PM, WV	C																+	1								+																																
Common Koel	*Eudynamys scolopacea*	噪鵑	R	C	+			+			+																								+			+			+			+			+			+														
Common Sandpiper	*Actitis hypoleucos*	磯鷸	WV&PM	C																+																																											
Common Snipe	*Gallinago gallinago*	扇尾沙錐	WV&PM	C													+		1																																											
Common Tailorbird	*Orthotomus sutorius*	長尾縫葉鶯	R	C	+	1	1	+	1	1	+	1	1	+	1	1	+	1	1	+		1	+	1	1	+	1	1	+		1	+		1	+			+			+			+			+			+			+			+		1	+	1	1	+	1	1
Crested bulbul	*Pycnonotus jocosus*	紅耳鵯	R	C	+++	3	4	+++	4	4	+++	5	5	+++	7	6	+++	5	5	+++	7	3	+++	7	5	+++	5	7	+++	3	6	+++	6	4	+++	8	5	+++	8	7	+++	5	9	+++	9	8	+++	7	7	+++	5	3	+++	2	7	+++	6	2	+++	7	6	+++	5	7
Crested Myna	*Acridotheres cristatellus*	八哥	R	C	++	2	3	++	2	3	++	4	2	++	3	2	++		2	++	2	2	++	2	1	+	2								+			+	2	2	+			+			+	2		+			+		2	+			+		2	+	2	2
Daurian redstart	*Phoenicurus auroreus*	北紅尾鴝	WV	U																																																								
Domestic pigeon	*Columba sp.*	鴿	R	C																																																									
Eurasian Tree Sparrow	*Passer montanus*	麻雀	R	C	++		2	++	3	2	++	3	3	++	5	7	++	5	2	++	4	3	++	4	4	++	3	6	++	6	2	++	4	4	++	2	3	++	4	5	++	3	2	++	2	3	++	2	3	++		5	++	4	6	++	5	6	++	4	3	++	3	3
Great Coucal	*Centropus sinensis*	褐翅鴉鵑	R,VU	C	+			+															+						+			+									+			+			+			+			+			+			+			+		
Great Tit	*Parus major (commixtus)*	大山雀	R	C	+		2	+		2	+		2	+	2		+	2		+	2																																											
Green Sandpiper	*Tringa ochropus*	白腰草鷸	WV	U													+		1	+						+						+		1																														
Grey Wagtail	*Motacilla cinerea*	灰鶺鴒	WV	C	++	2	1	++	2	2	+		1	+	1	1	+		3	+	1		+	1	1	++	2	1	+	1	1	+	2	1	+	1	1	+		1	+	1	1	+	1	1	+		1	+		1	+		1	+	1		+		1	+	1	1
Japanese White Eye	*Zosterops japonica*	暗綠繡眼鳥	R	C	++		4	++	2	4	++	4	4	++	5	3	++	5	2	++	4	3	++	3	3	++	3	4	++	4	4	++	3	4	+	2	2	+		2	+	4	3	+		2	+		3	+		2	+		2	+		2	+		4	+	2	3
Large-billed Crow	*Corvus macrorhynchos*	大嘴烏鴉	R	C																+																		+									+																	
Little Egret	*Egretta garzetta*	小白鷺	R, RC	C	+	1		+	1		+	1		+		1	+	1		+	1		+	1		+			+			+			+			+			+			+	1		+	1		+	1		+	1		+	1		+	1		+	1	
Little Swift	*Apus affinis*	小白腰雨燕	R, SpM	C	+												+		2	+		5	+		6	+		5	++		6	++		7	++		7				+																					+		
Magpie	*Pica pica*	喜鵲	R	C																																																								
Magpie Robin	*Copsychus saularis*	鵲鴝	R	C	+	1	1	++	2	2	++	2	2	++	2	2	++		2	++		2	+	1	1	+	1		+	1	1	+	1		+	1	1	+	1	1	+	2	1	+	1	1	+	2	2	+	2	1	+	2	2	+	1	2	+	1	1	+	2	2
Olive Backed pipit	*Anthus hodgsoni*	樹鷚	WV	C																																		+																										
Plaintive Cuckoo	*Cacomantis merulinus*	八聲杜鵑	SV	U																																								+			+																	
Red-billed blud magpie	*Urocissa erythrorhyncha*	紅咀藍鵲	R	C																																																								
Rufous-backed Shrike	*Lanius schach*	棕背伯勞	R	C																													+																									+		
Scaly-breasted Munia	*Lonchura punctulata*	斑文鳥	R	C							++	3		+++		7	+++		5	++		3	++		3	++		3																																				
Scarlet Minivet	*Pericrocotus flammeus*	赤紅山椒鳥	R	C																																								+			+						+											
Scarlet-backed Flowerpecker	*Dicaeum cruentatum*	朱背啄花鳥	R	C																																																								
Siberian Stonechat	*Saxicola maurus*	黑喉石鵖	WV	C																																																								
Silver-eared Mesia	*Leiothrix argentauris*	銀耳相思鳥	R	C																																																								
Sooty-headed Bulbul	*Pycnonotus aurigaster*	白喉紅臀鵯	R	C																																																								
Spotted Dove	*Streptopelia chinensis*	珠頸斑鳩	R	C	++	2	3	++	2	3	++	2	3	++	3	3	++	3	1	++	1	3	++	3	3	++	4	2	++	1	3	++	2	3	++	1	3	++	3	3	++	5	3	++	2	3	++	4	5	++	3	4	++	4	5	++	3	4	++	4	5	++	4	2
Violet Whistling Thrush	*Myiophoneus caeruleus*	紫嘯鶇	R	C																																																								
White Wagtail	*Motacilla alba*	白鶺鴒	WV, R	C	++		3	++		2	++		3	++		3	++	1	2	++		2	+	1	1	+	1	1	+		2	+	1	2	+	1	1	+	1	2	+	2	1	+	1	1	+		1	+		1	+		1	+	1	1	+	1	1	+	1	1
White-breasted Waterhen	*Amaurornis phoenicurus*	白胸苦惡鳥	R	C	+	1		+	1		+	1					+	1																							+																							
White-rumped Munia	*Lonchura striata*	白腰文鳥	R	C													+	1																																														
Yellow Bellid Prinia	*Prinia flaviventris*	灰頭鷦鶯	R	C																																																								
Yellow Wagtail	*Motacilla flava*	黃鶺鴒	WV&PM	C																																																								
Number of birds						18	32		24	34		31	33		42	38		31	38		29	36		37	33		27	34		19	32		26	33		21	30		29	28		27	32		21	31		22	34		12	29		19	37		19	34		22	37		28	26
No. of species					19	11	14	18	15	14	18	14	13	17	14	13	21	13	17	22	11	14	17	14	13	16	11	12	15	8	12	15	9	12	16	9	11	17	9	10	18	9	9	18	9	10	19	8	10	16	5	10	16	8	11	15	8	10	15	9	12	16	13	11

Note: R – Resident; WV – Winter visitor; Sv–Summer Visitor; PM – Passage migrant; C – Common; U – Uncommon; SpM – Spring migrant; C – transect count; P1 – Point count location 1; P2 – Point count location 2

Abundance indication: +, No. of indiv. 1 ~ 3; ++, No. of indiv. 4 ~ 10; +++, No. of indiv. >10;

Commonness and status were decided accroding to AFCD biodiversity website (www.hkbiodiversity.net)

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CR: Rare in China Red Data Book Status

VU: Vulnerable in China Red Data Book Status

Table 4.4. Odonate species recorded at the UpperTai Po River

					Baseline survey	Impact monitoring				Impact monitoring						Post construction monitoring										Post construction monitoring						
Species	Common name	Chinese name	Status	Commonness	Oct-07	Jan-09	Jul-09	Jan-10	Jul-10	Jan-11	Jul-11	Jan-12	Jul-12	Mar-13	Jul-13	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14	Aug-14	Sep-14	Oct-14	Nov-14	Dec-14	Jan-15	Feb-15	Mar-15	Apr-15	May-15
Aethriamanta brevipennis brevipennis	Elusive Adjutant	短腹異蜻	NP	U																												
Macrodiplax cora	Coastal Glider	高翔灌蜻	NP	C																												
Ceriagrion auranticum ryukyuanum	Orange-tailed Sprite	琉球橘黃蟌	NP	VC															+	+						+					+	+
Copera marginipes	Yellow Featherlegs	黃�purple腿蟌	NP	VC																		+	+	+	+						+	+
Crocothemis servilia servilia	Crimson Darter	紅蜻	NP	VC	+		+		+											+												
Euphaea decorata	Black-banded Gossamerwing	方帶幽蟌	NP	VC							+											+	+									
Neurobasis chinensis	Chinese Greenwing	華艷色蟌	NP	C					+									+	+	+		+	+	+	+	+				+	+	
Neurothemis fulvia	Russet Percher	網脈蜻	NP	VC																												
Orthetrum chrysis	Red-faced Skimmer	華麗灰蜻	NP	VC		+	+		+				+		+	+																
Orthetrum glaucum	Common blue skimmer	黑尾灰蜻	NP	VC	+	+	+								+									+	+							
Orthetrum luzonicum	Marsh Skimmer	呂宋灰蜻	NP	VC									+									+	+	+	+					+	+	+
Orthetrum pruinosum neglectum	Common Red Skimmer	赤褐灰蜻	NP	VC																												+
Palpopleura sexmaculata sexmaculata	Asian Widow	六斑曲緣蜻	NP	C									+																			
Pantala flavescens	Wandering Glider	黃蜻	NP	VC	+		+	+	+	+	++	+	+	+	+										+	+						
Paracercion calamorum dyeri	Dusky Lilysquatter	暮尾蟌	P, LC	C															+													
Prodasineura autumnalis	Black Threadtail	烏幽原蟌	NP	VC																												
Pseudagrion rubriceps rubriceps	Orange-faced Sprite	丹頂斑蟌	NP	C							+										+											+
Rhinocypha perforata	Common Blue Jewel	三斑鼻蟌	NP	VC					+															+	+						+	+
Trithemis Aurora	Crimson dropwing	曉褐蜻	NP	VC	+				+									+				+	+	+	+	+	+	+				
Trithemis festiva	Indigo Dropwing	櫻褐蜻	NP	VC							+		+		+	+	+	+	+	+	+		+	+	+	+	+	+	+	+	+	+
Urothemis signata signata	Scarlet Basket	赤斑曲鈎蜓蜻	NP	C							+																					
Zygonyx iris insignis	Emerald Cascader	彩虹蜻	P	P,PGC																			+	+	+	+						
No of Species					4	2	4	1	6	1	5	1	5	1	4	2	1	3	4	4	2	5	7	8	9	6	2	2	1	3	6	7

Note: NP – Not protected in Hong Kong P- Protected in Hong Kong

"VC" – Very Common; "UC" – Uncommon; "C" - Common

"+" – Species exists in the study area

"++" – Species common in the study area

"+++" – Species abundance in the study area

Commonness and status were decided accroding to AFCD biodiversity website (www.hkbiodiversity.net)
LC- Local Concern - Fellowes *et al* (2002)
PGC - Potential Global Concern - Fellowes *et al* (2002)

Table 4.4. Odonate species recorded at the UpperTai Po River

					Post construction monitoring																
Species	Common name	Chinese name	Status	Commonness	Jun-15	Jul-15	Aug-15	Sep-15	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16
Aethriamanta brevipennis brevipennis	Elusive Adjutant	短腹異蜻	NP	U												+	+	+				
Macrodiplax cora	Coastal Glider	高翔滑蜻	NP	C	+	+																
Ceriagrion auranticum ryukyuanum	Orange-tailed Sprite	琉球橘黃蟌	NP	VC	+	+	+	+								+	+	+	+			
Copera marginipes	Yellow Featherlegs	黃裔扇蟌	NP	VC	+	+	+	+														
Crocothemis servilia servilia	Crimson Darter	紅蜻	NP	VC		+	+	+	+	+							+	+	+	+	+	
Euphaea decorata	Black-banded Gossamerwing	方帶幽蟌	NP	VC																		
Neurobasis chinensis	Chinese Greenwing	華艷色蟌	NP	C			+	+	+						+	+	+	+	+	+	+	
Neurothemis fulvia	Russet Percher	網脈蜻	NP	VC		+	+	+														
Orthetrum chrysis	Red-faced Skimmer	華麗灰蜻	NP	VC			+	+	+	+				+	+	+	+	+	+	+	+	+
Orthetrum glaucum	Common blue skimmer	黑尾灰蜻	NP	VC					+	+												
Orthetrum luzonicum	Marsh Skimmer	呂宋灰蜻	NP	VC	+	+	+								+	+	+	+	+	+	+	+
Orthetrum pruinosum neglectum	Common Red Skimmer	赤褐灰蜻	NP	VC	+	+									+	+	+	+	+			
Palpopleura sexmaculata sexmaculata	Asian Widow	六斑曲緣蜻	NP	C	+	+																
Pantala flavescens	Wandering Glider	黃蜻	NP	VC					+	+	+	+	+	+	+	+	+	+	+	+	+	+
Paracercion calamorum dyeri	Dusky Lilysquatter	暮尾蟌	P, LC	C																		
Prodasineura autumnalis	Black Threadtail	烏幽原蟌	NP	VC			+															
Pseudagrion rubriceps rubriceps	Orange-faced Sprite	丹頂斑蟌	NP	C	+	+																
Rhinocypha perforata	Common Blue Jewel	三斑鼻蟌	NP	VC	+	+	+	+	+							+	+	+	+	+		
Trithemis Aurora	Crimson dropwing	曉褐蜻	NP	VC					+	+					+	+	+	+	+	+	+	+
Trithemis festiva	Indigo Dropwing	褐蜻	NP	VC	+	+	+	+	+			+			+	+	+	+	+	+	+	+
Urothemis signata signata	Scarlet Basket	赤斑曲鈎蜻	NP	C																		
Zygonyx iris insignis	Emerald Cascader	彩虹蜻	P	P,PGC																		
No of Species					9	11	10	8	8	5	1	2	1	2	7	10	11	11	10	8	7	5

Note: NP – Not protected in Hong Kong P- Protected in Hong Kong

"VC" – Very Common; "UC" – Uncommon; "C" - Common

"+" – Species exists in the study area

"++" – Species common in the study area

"+++" – Species abundance in the study area

Commonness and status were decided accroding to AFCD biodiversity website (www.hkbiodiversity.net)
LC- Local Concern - Fellowes *et al* (2002)
PGC - Potential Global Concern - Fellowes *et al* (2002)

Table 4.5 Aquatic Macro invertebrates recorded at Upper Tai Po River (T1- Upper stream sampling site and T2- Lower stream sampling site)

				Baseline survey		Impact monitoring			Impact monitoring			Impact monitoring			Impact monitoring			Impact monitoring			Impact monitoring			Impact monitoring			Impact monitoring			Impact monitoring			Impact monitoring			Post construction monitoring					
Species	Chinese name			Oct-07		Jan-09			Jul-09			Jan-10			Jul-10			Jan-11			Jul-11			Jan-12			Jul-12			Mar-13			Jul-13			Jan-14			Feb-14		
Mollusca		Sampling point		T1	T2	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2
Biomphalaria sp.	--	NP	VC		+			+			+		+	+		+	+				+			+												+		
Brotia hainanensis	--	NP	VC	++	+	++			++			++	+		++	+		+			+	+		+			+			+			+			+	+		+	+	
Melanoides tuberculata	瘤騷黑螺	NP	VC					+	+	+	+	+		+	+		++	+			+		+		+	+	+	+	+		+	+		+	+		+	+	+	+	+	+
Physella acuta	尖膀胱螺	NP	VC															+	+	++				+			+			+											
Pomacea canaliculata	蘋果螺	NP	VC					+	+		++	+		+	+		++			+	+		+	+	+	+	+			+			+	+	+	+	+	+	+	+	+
Radix plicatulus	羅白螺	NP	VC		++			+			+		+	+		+	+				+		+	+	+	+	+			+			+			+		+	+	+	+
Sinotaia quadrata	田螺	NP	VC					++		+	++			++		+++					+			+			+	+		+			+			+			+		+
Insects																																									
Anisocentropus sp.	--	NP	VC													+																									
Arctopora sp.	--	NP	VC													+																									
Aulocodes sp.	--	NP	VC										+			+																									
Baetis sp.	--	NP	VC	+		+			+			+	+		+	+		+									+			+			+			+			+		
Chironomus sp.	蠓幼虫	NP	VC	+	+	+			+			+		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+			+	+		+	+		+	+	+
Ephemera sp.		NP	VC																																					
Indobaetis sp.	--	NP	VC	+		+			+			+	+		+	+		+															+			+			+	+	
Mnais sp.	--	NP	VC		+	+			+			+	+		+	+		+	+	+	+	+		+	+		+	+		+			+			+	+		+	+	+
Odonate Larvae	--	NP	VC																																					
Orthetrum sp.	--	NP	VC	+	+	+			+			+	+		+	+		+	+		+			+	+		+	+		+			+			+	+		+	+	+
Perla sp	--	NP	VC										+			+																									
Rhaphium sp.	--	NP	VC																								+	+		+											
Tipulidae spp.	--	NP	VC										+			+																									
Crustacea																																									
Caridina cantonensis	廣東米蝦	NP	VC			+			+			+	++		+	++	+	+	+	+	+	+		+			+	+		+			+			+	+	+	+	+	+
Cryptopotamon anacoluthon	鰓刺溪蟹	NP	C			+			+			+			+	+					+						+			+			+			+					
Macrobrachium hainanense	海南沼蝦	NP	VC			+			+			+	+		+	+	+	+	+		+						+			+			+			+			+	+	
No of Species				5	6	9	0	5	11	2	5	11	12	6	11	16	8	10	6	5	12	4	4	10	6	4	14	7	1	14	2	0	13	4	1	13	7	4	14	10	8

Note:

"NP" – Not protected in Hong Kong

P - Listed in Wild Animals Protection Ordinance (Cap. 170) and Listed as "Near Threatened" in IUCN Red List Status

"VC" – Very Common; "UC" – Uncommon; "C" - Common

"+" – Species exists in the study area

"++" – Species common in the study area

"+++" – Species abundance in the study area

- Reference point was the sampling location outside the works area used to compare the with the data within works area.

Table 4.5 Aquatic Macro invertebrates recorded at Upper Tai Po River (T1- Upper stream sampling site and T2- Lower stream sampling site)

				Post construction monitoring																																		
				Mar-14			Apr-14			May-14			Jun-14			Jul-14			Aug-14			Sep-14			Oct-14			Nov-14			Dec-14			Jan-15			Feb-15		
Species	Chinese name																																					
Mollusca		Sampling point		Reference	T1	T2	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2
Biomphalaria sp.	--	NP	VC	+			+			+			+			+			+			+			+									+			+		
Brotia hainanensis	--	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		+	+		+	+		+	+		+	+	
Melanoides tuberculata	瘤擬黑螺	NP	VC	+	+	+	+	+	+	+	+	+		+		+	+		+			+			+			+			+			+			+		
Physella acuta	尖膀胱螺	NP	VC																			+			+			+			+			+			+		
Pomacea canaliculata	蘋果螺	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Radix plicatulus	羅白螺	NP	VC	+	+	+	+	+	+	+	+	+	+	+		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		
Sinotaia quadrata	田螺	NP	VC	+	+	+	+	+	+	+	+		+	+		+	+		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Insects																																							
Anisocentropus sp.	--	NP	VC	+			+			+			+			+			+			+			+			+			+			+			+		
Arctopora sp.	--	NP	VC	+			+			+									+			+			+												+		
Aulocodes sp.	--	NP	VC																									+			+			+					
Baetis sp.	--	NP	VC	+			+	+					+			+			+			+	+		+	+		+	+		+			+			+		
Chironomus sp.	蠕幼虫	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Ephemera sp.		NP	VC										+			+			+			+	+		+	+		+						+			+		
Indobaetis sp.	--	NP	VC	+	+		+	+		+			+			+			+			+	+		+	+		+			+			+			+		
Mnais sp.	--	NP	VC	+	+	+	+	+	+	+	+		+	+		+	+		+	+	+	+	+	+	+	+	+	+	+		+	+		+			+		
Odonate Larvae	--	NP	VC																																				
Orthetrum sp.	--	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
Perla sp	--	NP	VC				+	+		+						+												+						+					
Rhaphium sp.	--	NP	VC	+			+									+			+			+			+														
Tipulidae spp.	--	NP	VC																																				
Crustacea																																						
Caridina cantonensis	廣東米蝦	NP	VC	+	+	+	++	++	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	++	+	+	++	+	+	++	+	+	++	+	+	++	+
Cryptopotamon anacoluthon	鰓刺溪蟹	NP	C	+			+						+			+			+			+			+			+			+			+			+		
Macrobrachium hainanense	海南沼蝦	NP	VC	+	+		+	+		+			+			+	+		+	+		+			+	+		+			+			+			+		
No of Species				17	11	9	18	13	9	15	9	7	15	9	5	18	10	6	18	9	8	19	12	8	19	13	7	19	11	6	16	10	5	19	10	5	18	7	4

Note:

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"P" - Listed in Wild Animals Protection Ordinance (Cap. 170) and Listed as "Near Threatened" in IUCN Red List Status

"VC" – Very Common; "UC" – Uncommon; "C" - Common

"+" – Species exists in the study area

"++" – Species common in the study area

"+++" – Species abundance in the study area

- Reference point was the sampling location outside the works area used to compare the with the data within works area.

Table 4.5 Aquatic Macro invertebrates recorded at Upper Tai Po River (T1- Upper stream sampling site and T2- Lower stream sampling site)

				Post construction monitoring																	Post construction monitoring								
Species	Chinese name			Mar-15			Apr-15			May-15			Jun-15			Jul-15			Aug-15			Sep-15			Oct-15			Nov-15		
Mollusca		Sampling point		Reference	T1	T2	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2
Biomphalaria sp.	--	NP	VC	+	+	+	+			+			+			+			+			+			+			+		
Brotia hainanensis	--	NP	VC	+			+	+		+	+		+	+		+	+		+	+		+	+		+	+		+	+	
Melanoides tuberculata	瘤擬黑螺	NP	VC	+			+			+		+	+		+	+		+	+		+	+		+	+		+	+		+
Physella acuta	尖膀胱螺	NP	VC	+			+																								
Pomacea canaliculata	蘋果螺	NP	VC	+			+	+	+	+	+	+	+	++	+	++	++	+	++	+	+	++	+	+	++	+	+	++	+	+	++	+	+
Radix plicatulus	耳台螺	NP	VC	+	+		+			+			+			+			+			+			+			+		
Sinotaia quadrata	田螺	NP	VC	+	+	+	+	+	+	+	+		+	+		+	+		+	+		+	+		+	+		+	+	
Insects																															
Anisocentropus sp.	--	NP	VC	+			+			+			+			+			+			+			+			+		
Arctopora sp.	--	NP	VC	+			+			+			+			+			+			+			+			+		
Aulocodes sp.	--	NP	VC	+																											
Baetis sp.	--	NP	VC	+	+	+	+																								
Chironomus sp.	蠕幼虫	NP	VC	+			+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Ephemera sp.		NP	VC	+	+		+																								
Indobaetis sp.	--	NP	VC	+			+			+			+			+			+			+			+			+		
Mnais sp.	--	NP	VC				+			+			+			+			+			+			+			+		
Odonate Larvae	--	NP	VC																+			+			+			+		
Orthetrum sp.	--	NP	VC				+	+		+	+		+	+		+	+		+	+		+	+		+	+		+	+	
Perla sp	--	NP	VC	+			+			+			+			+			+			+			+			+		
Rhaphium sp.	--	NP	VC	+																											
Tipulidae spp.	--	NP	VC																												
Crustacea																															
Caridina cantonensis	廣東米蝦	NP	VC	+	+		++	++		++	++	+	++	++	+	++	++	+	++	+	+	++	+		++	+		++	+		++	+	
Cryptopotamon anacoluthon	鰓刺溪蟹	NP	C	++	++	+	+		+		+			+			+														
Macrobrachium hainanense	海南沼蝦	NP	VC	+			+	+		+			+			+			+			+			+			+			
No of Species				19	7	5	20	7	4	15	7	4	15	7	4	15	7	4	16	6	4	16	6	3	16	6	3	16	6	3

Note:

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"+++" – Species abundance in the study area

- Reference point was the sampling location outside the works area used to compare the with the data within works area.

Table 4.5 Aquatic Macro invertebrates recorded at Upper Tai Po River (T1- Upper stream sampling site and T2- Lower stream sampling site)

				Post construction monitoring																																		
Species	Chinese name			Dec-15			Jan-16			Feb-16			Mar-16			Apr-16			May-16			Jun-16			Jul-16			Aug-16			Sep-16			Oct-16			Nov-16		
Mollusca		Sampling point		Reference	T1	T2	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2
Biomphalaria sp.	--	NP	VC	+			+			+			+			+			+			+			+			+			+			+			+		
Brotia hainanensis	--	NP	VC	+	+		+	+		+	+		+	+		+	+		+	+		+	+		+	+		+	+		+	+		+	+		+	+	
Melanoides tuberculata	瘤擬黑螺	NP	VC	+		+	+		+	+		+	+		+	+		+	+		+	+		+	+		+	+		+	+		+	+		+	+		+	
Physella acuta	尖膀胱螺	NP	VC																																					
Pomacea canaliculata	蘋果螺	NP	VC	++	+	+	++	+	+	++	+	+	++	+	+	++	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Radix plicatulus	羅白螺	NP	VC	+			+			+			+			+			+			+			+			+			+			+			+		
Sinotaia quadrata	田螺	NP	VC	+	+		+	+		+	+		+	+		+	+		+	+		+	+		+	+		+	+		+	+		+	+		+	+	
Insects																																								
Anisocentropus sp.	--	NP	VC	+			+			+			+			+			+			+			+			+			+			+			+		
Arctopora sp.	--	NP	VC	+			+			+			+			+			+			+			+			+			+			+			+		
Aulocodes sp.	--	NP	VC																																					
Baetis sp.	--	NP	VC																																					
Chironomus sp.	蠕幼虫	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Ephemera sp.		NP	VC																																					
Indobaetis sp.	--	NP	VC	+			+			+			+			+			+			+			+			+			+			+			+		
Mnais sp.	--	NP	VC	+			+			+			+			+			+			+			+			+			+			+			+		
Odonate Larvae	--	NP	VC	+			+			+			+			+			+			+			+			+			+			+			+		
Orthetrum sp.	--	NP	VC	+	+		+	+		+	+		+	+		+	+		+	+		+	+		+	+		+	+		+	+		+	+		+	+	
Perla sp	--	NP	VC	+			+			+			+			+			+			+			+			+			+			+			+		
Rhaphium sp.	--	NP	VC																																					
Tipulidae spp.	--	NP	VC																																					
Crustacea																																							
Caridina cantonensis	廣東米蝦	NP	VC	++	+		++	+		++	+		++	+		++	+		+	+		+	+		+	+		+	+		+	+		+	+		+	+	
Cryptopotamon anacoluthon	鰓刺溪蟹	NP	C																																					
Macrobrachium hainanense	海南沼蝦	NP	VC	+			+			+			+			+															+			+			+		
No of Species				16	6	3	16	6	3	16	6	3	16	6	3	16	6	3	15	6	3	15	6	3	15	6	3	15	6	3	17	6	3	17	6	3	17	6	3

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"++" – Species common in the study area

"+++" – Species abundance in the study area

- Reference point was the sampling location outside the works area used to compare the with the data within works area.

Table 4.6 Fish species and Hong Kong Newt recorded at Upper Tai Po River (T1- Upper stream sampling site and T2 - Lower stream sampling

				Baseline survey		Impact monitoring			Impact monitoring			Impact monitoring			Impact monitoring			Impact monitoring		
				Oct-07		Jan-09			Jul-09			Jan-10			Jul-10			Jan-11		
Species		Status	Commonness	T1	T2	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2
Cyprinus carpio var. viridiviolaceus	錦鯉	NP	C													+				
Gambusia affinis	食蚊魚	NP	VC	+	++			+		+	+		+	++		+	+++	+	+	+
Glyptothorax pallozonum	白線紋胸鮡	NP	R																	
Liniparhomaloptera disparis	擬平鰍	NP	C																	
Misgurnus anguillicaudatus	泥鰍	NP	C			+			+			+			+			+		
Oreochromis niloticus	尼羅口孵非鯽	NP	C	+													+			+
Parazacco spilurus	異鱲	V and	C	++		+	+		+			+			+	+		+	+	
Poecilia reticulata	孔雀花魚將	NP	C	++	+			++			+		+	+++		+	++			+
Pseudobagrus trilineatus	三線擬鱨	NP,GC	R																	
Pseudogastromyzon myersi	麥氏擬腹吸鰍	NP	C	+		+			+			+			+	+		++	++	
Pterocryptis cochinchinensis	越南隱鰭鯰	NP	C																	
Puntius semifasciolatus	七星魚	NP	C	+		+	+		+	+	+	+	+	++	+	+	++	+		
Rhinogobius spp.	鰕虎魚	NP	C	+		+	+		+			+	++	+	+	++	+	+		
Schistura fasciolata	橫紋南鰍	NP	C	+		+			+	+		+			+	+		+	+	
Xiphophorus hellerii	劍尾魚	NP	C	++		+			+	+	++	+	+	++	+	+	+++	+	+	
Xiphophorus variatus	雜色劍尾魚	NP	C	+													++			
		2x2m fish		70	60	15	8	25	10	20	100	10	2	8	10	7	100	10	5	20
		No of Speices		10	2	7	3	2	7	4	4	7	5	5	7	9	7	8	5	3
Amphibian																				
Paramesotriton hongkongensis	香港瘰螈	P	UC																	

				Impact monitoring			Impact monitoring			Impact monitoring			Impact monitoring			Impact monitoring		
				Jul-11			Jan-12			Jul-12			Mar-13			Jul-13		
Species		Status	Commonness	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2
Cyprinus carpio var. viridiviolaceus	錦鯉	NP	C															
Gambusia affinis	食蚊魚	NP	VC	+	+	+	+		++	+	+	+	+	+	+	+	+	+
Glyptothorax pallozonum	白線紋胸鮡	NP	R															
Liniparhomaloptera disparis	擬平鰍	NP	C															
Misgurnus anguillicaudatus	泥鰍	NP	C	+						+			+			+		
Oreochromis niloticus	尼羅口孵非鯽	NP	C	+		+	+					+						
Parazacco spilurus	異鱲	V and	C	+			+	+		+			+			+	+	
Poecilia reticulata	孔雀花魚將	NP	C	+		+	+		+									
Pseudobagrus trilineatus	三線擬鱨	NP,GC	R										+			+		
Pseudogastromyzon myersi	麥氏擬腹吸鰍	NP	C	+	+		+			+			+			+		
Pterocryptis cochinchinensis	越南隱鰭鯰	NP	C															
Puntius semifasciolatus	七星魚	NP	C	+		+	+	+	+	+			+			+		
Rhinogobius spp.	鰕虎魚	NP	C	+			+	+		+	+		+			+	+	
Schistura fasciolata	橫紋南鰍	NP	C	+		+	+			+			+	+		+	+	
Xiphophorus hellerii	劍尾魚	NP	C	+		+	+		++	+			+			+		
Xiphophorus variatus	雜色劍尾魚	NP	C	+		+	+		++									
		2x2m fish		6	2	4	6	2	5	5	2	2	5	2	1	5	2	1
		No of Speices		11	2	7	10	3	5	8	2	2	9	2	1	9	4	1
Amphibian																		
Paramesotriton hongkongensis	香港瘰螈	P	UC															

				Post construction monitoring						Post construction monitoring																				
				Jan-14			Feb-14			Mar-14			Apr-14			May-14			Jun-14			Jul-14			Aug-14			Sep-14		
Species		Status	Commonness	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2
Cyprinus carpio var. viridiviolaceus	錦鯉	NP	C																											
Gambusia affinis	食蚊魚	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+			+			+			+		+	+		+
Glyptothorax pallozonum	白線紋胸鮡	NP	R										+			+			+			+			+			+		
Liniparhomaloptera disparis	擬平鰍	NP	C							+			+			+			+			+			+			+		
Misgurnus anguillicaudatus	泥鰍	NP	C										+			+			+			+			+			+		
Oreochromis niloticus	尼羅口孵非鯽	NP	C	+			+			+			+								+			+			+			+
Parazacco spilurus	異鱲	V and	C	+	+		+	+	+	+	+	+	+	+	+	+	+		+	+		+	+		+	+		+	+	
Poecilia reticulata	孔雀花魚將	NP	C	+							+			+			+													
Pseudobagrus trilineatus	三線擬鱨	NP,GC	R										+			+			+			+			+			+		
Pseudogastromyzon myersi	麥氏擬腹吸鰍	NP	C	+			+	+		+	+		+	+		+			+			+			+			+		
Pterocryptis cochinchinensis	越南隱鰭鯰	NP	C													+			+			+			+			+		
Puntius semifasciolatus	七星魚	NP	C	+		+	+		+	+		+	+		+	+			+			+			+	+	+	+	+	+
Rhinogobius spp.	鰕虎魚	NP	C	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Schistura fasciolata	橫紋南鰍	NP	C	+	+		+	+		+	+		+	+		+			+			+			+			+		
Xiphophorus hellerii	劍尾魚	NP	C	+			+			+			+			+			+			+			+			+		
Xiphophorus variatus	雜色劍尾魚	NP	C							+			+			+														
		2x2m fish		12	8	6	10	12	10	16	10	8	16	10	8	12	4	2	12	4	2	15	5	4	20	8	5	30	10	10
		No of Speices		9	4	3	8	5	4	10	6	4	13	6	4	13	3	1	12	2	2	12	2	2	12	3	4	12	3	4
Amphibian																														
Paramesotriton hongkongensis	香港瘰螈	P	UC				+			+			+			+			+			+			+			+		

Note: NP – Not protected in Hong Kong; P - Protected in Hong Kong

"VC" – Very Common; "UC" – Uncommon; "C" - Common

"+" – Species exists in the study area

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V – Listed as vulnerable in China Fish Red Data Book

GC- Global Concern - Fellowes *et al* (2002)

- Reference point was the sampling location outside the works area used to compare with the data within works area.

Table 4.6 Fish species and Hong Kong Newt recorded at Upper Tai Po River (T1- Upper stream sampling site and T2 - Lower stream sampling

				Post construction monitoring																	
				Oct-14			Nov-14			Dec-14			Jan-15			Feb-15			Mar-15		
Species		Status	Commonness	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2
Cyprinus carpio var. viridiviolaceus	錦鯉	NP	C																		
Gambusia affinis	食蚊魚	NP	VC	+		+	+		+	+		+	+	+	+	+	+	+	+	+	+
Glyptothorax pallozonum	白線紋胸鮡	NP	R	+			+			+			+			+			+		
Liniparhomaloptera disparis	擬平鰍	NP	C	+			+			+			+			+			+		
Misgurnus anguillicaudatus	泥鰍	NP	C	+			+			+			+			+			+		
Oreochromis niloticus	尼羅口孵非鯽	NP	C			+			+			+			+			+			+
Parazacco spilurus	異鱲	V and	C	+	+		+	+		+	+		+	+		+	+		+	+	
Poecilia reticulata	孔雀花魚將	NP	C																		
Pseudobagrus trilineatus	三線擬鱨	NP,GC	R	+			+			+			+			+			+		
Pseudogastromyzon myersi	麥氏擬腹吸鰍	NP	C	+			+			+			+			+			+		
Pterocryptis cochinchinensis	越南隱鰭鯰	NP	C	+			+			+			+			+			+		
Puntius semifasciolatus	七星魚	NP	C	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Rhinogobius spp.	鰕虎魚	NP	C	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Schistura fasciolata	橫紋南鰍	NP	C	+			+			+			+			+			+		
Xiphophorus hellerii	劍尾魚	NP	C	+			+			+			+			+			+		
Xiphophorus variatus	雜色劍尾魚	NP	C																		
		2x2m fish		40	15	20	50	20	30	60	30	30	50	20	20	40	20	20	50	20	20
		No of Speices		12	3	4	12	3	4	12	3	4	12	4	4	12	4	4	12	4	4
Amphibian																					
Paramesotriton hongkongensis	香港瘰螈	P	UC	+			+			+			+			+			+		

				Post construction monitoring																	
				Apr-15			May-15			Jun-15			Jul-15			Aug-15			Sep-15		
Species		Status	Commonness	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2
Cyprinus carpio var. viridiviolaceus	錦鯉	NP	C																		
Gambusia affinis	食蚊魚	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Glyptothorax pallozonum	白線紋胸鮡	NP	R	+			+			+			+			+					
Liniparhomaloptera disparis	擬平鰍	NP	C	+			+			+			+			+			+		
Misgurnus anguillicaudatus	泥鰍	NP	C	+																	
Oreochromis niloticus	尼羅口孵非鯽	NP	C			+			+			+			+			+			+
Parazacco spilurus	異鱲	V and	C	+	+		+	+		+	+		+	+		+	+		+	+	
Poecilia reticulata	孔雀花魚將	NP	C																		
Pseudobagrus trilineatus	三線擬鱨	NP,GC	R	+			+			+			+			+			+		
Pseudogastromyzon myersi	麥氏擬腹吸鰍	NP	C	+			+			+			+			+			+		
Pterocryptis cochinchinensis	越南隱鰭鯰	NP	C	+			+			+			+			+			+		
Puntius semifasciolatus	七星魚	NP	C	+	+	+	+	+	+	+	+	+	+	+	+	+	+		+	+	
Rhinogobius spp.	鰕虎魚	NP	C	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Schistura fasciolata	橫紋南鰍	NP	C	+			+			+			+			+			+		
Xiphophorus hellerii	劍尾魚	NP	C	+			+			+			+			+			+		
Xiphophorus variatus	雜色劍尾魚	NP	C																		
		2x2m fish		40	15	20	12	4	2	10	4	2	8	4	2	10	5	2	15	7	6
		No of Speices		12	4	4	11	4	4	11	4	4	11	4	4	11	4	3	11	4	3
Amphibian																					
Paramesotriton hongkongensis	香港瘰螈	P	UC	+			+			+			+			+			+		

				Post construction monitoring															
				Oct-15			Nov-15			Dec-15			Jan-16			Feb-16			
Species		Status	Commonness	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2	Reference
Cyprinus carpio var. viridiviolaceus	錦鯉	NP	C																
Gambusia affinis	食蚊魚	NP	VC	+	+		+	+		+	+		+	+		+	+		+
Glyptothorax pallozonum	白線紋胸鮡	NP	R																
Liniparhomaloptera disparis	擬平鰍	NP	C	+			+			+			+			+			+
Misgurnus anguillicaudatus	泥鰍	NP	C																
Oreochromis niloticus	尼羅口孵非鯽	NP	C	+			+			+			+			+			+
Parazacco spilurus	異鱲	V and	C	+	+		+	+		+	+		+	+		+	+		+
Poecilia reticulata	孔雀花魚將	NP	C																
Pseudobagrus trilineatus	三線擬鱨	NP,GC	R	+			+			+									
Pseudogastromyzon myersi	麥氏擬腹吸鰍	NP	C	+			+			+			+			+			+
Pterocryptis cochinchinensis	越南隱鰭鯰	NP	C	+			+			+			+			+			+
Puntius semifasciolatus	七星魚	NP	C	+	+		+	+		+	+		+	+		+	+		+
Rhinogobius spp.	鰕虎魚	NP	C	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Schistura fasciolata	橫紋南鰍	NP	C	+			+			+			+			+			+
Xiphophorus hellerii	劍尾魚	NP	C	+			+			+			+			+			+
Xiphophorus variatus	雜色劍尾魚	NP	C																
		2x2m fish		20	10	5	35	15	10	45	20	5	50	15	5	45	20	5	45
		No of Speices		12	4	1	12	4	1	12	4	1	11	4	1	11	4	1	11
Amphibian																			
Paramesotriton hongkongensis	香港瘰螈	P	UC	+			+			+			+			+			+

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Table 4.6 Fish species and Hong Kong Newt recorded at Upper Tai Po River (T1- Upper stream sampling site and T2 - Lower stream sampling

				Post construction monitoring												Post construction monitoring									Post construction monitoring			Post construction monitoring		
				Mar-16		Apr-16			May-16			Jun-16			Jul-16			Aug-16			Sep-16			Oct-16			Nov-16		
Species		Status	Commonness	T1	T2	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2
Cyprinus carpio var. viridiviolaceus	鏡鯉	NP	C																										
Gambusia affinis	食蚊魚	NP	VC	+		+	+		+			+			+			+			+			+			+			
Glyptothorax pallozonum	白線紋胸鮡	NP	R												+			+			+			+			+			
Liniparhomaloptera disparis	擬平鰍	NP	C			+			+			+			+			+			+			+			+			
Misgurnus anguillicaudatus	泥鰍	NP	C																											
Oreochromis niloticus	尼羅口孵非鯽	NP	C			+			+			+			+			+			+			+			+			
Parazacco spilurus	異鱗	V and	C	+		+	+		+	+		+	+		+	+		+	+		+			+			+			
Poecilia reticulata	孔雀花魚將	NP	C																											
Pseudobagrus trilineatus	三線擬鯰	NP,GC	R						+			+			+			+			+			+			+			
Pseudogastromyzon myersi	麥氏擬腹吸鰍	NP	C			+			+			+			+			+			+			+			+			
Pterocryptis cochinchinensis	越南隱鯰鮫	NP	C			+			+			+			+			+			+			+			+			
Puntius semifasciolatus	十星魚	NP	C	+		+	+		+			+			+			+			+			+			+			
Rhinogobius spp.	鰕虎魚	NP	C	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Schistura fasciolata	橫紋南鰍	NP	C			+			+			+			+			+			+			+			+			
Xiphophorus hellerii	劍尾魚	NP	C			+			+			+			+			+			+			+			+			
Xiphophorus variatus	雜色劍尾魚	NP	C																											
		2x2m fish		20	5	40	15	5	25	10	5	25	10	5	20	7	2	22	5	2	22	2	2	25	2	2	30	2	2
		No of Speices		4	1	11	4	1	12	2	1	11	2	1	12	2	1	12	2	1	12	1	1	12	1	1	12	1	1
Amphibian																														
Paramesotriton hongkongensis	香港瘰螈	P	UC			+			+												+			+						

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Table 4.7 Abotic data for Upper Tai Po River (T1- Upper stream sampling site and T2- Lower stream sampling site)

	Baseline survey	Impact monitoring														Impact monitoring						Post construction monitoring							
Parameters/ Date	Oct-07	Jan-09		Jul-09		Jan-10		Jul-10		Jan-11		Jul-11		Jan-12		Jul-12		Mar-13		Jul-13		Jan-14		Feb-14		Mar-14		Apr-14	
Replicate	T1	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
DO (mg/L)	8.2	9	4	6.3	6	9.4	8.8	9	6.5	10.5	9.8	9	8.2	8.8	8.4	7.6	7.8	7.9	8.1	8	7.8	8.3	8.1	7.8	8.2	7.6	8	7.4	7.6
pH	6.9	7.18	6.86	7.28	6.96	8.2	8.5	7.3	7.2	6.9	7.1	7.1	7.3	6.8	7.6	6.9	7.8	6.8	7.5	7.2	7.6	7.1	7.4	6.7	7.6	7.7	7.3	7.5	7.4
Nitrate (mg N/L)	0.39	0.1	1.3	0.07	1.32	0.12	0.71	0.1	0.5	0.1	0.5	0.1	0.5	<0.1	0.5	0.29	0.26	0.15	0.22	0.21	0.29	0.62	0.73	0.3	0.5	0.3	0.5	0.3	0.4
Ammonia (mg/L)	<0.01	PO4-P (μ g P/L): <100		0.01	0.22	<0.01	0.2	0.1	0.2	0.01	0.3	0.01	0.2	<0.01	0.3	<0.01	0.03	<0.01	0.02	<0.01	0.04	0.04	0.06	0.05	0.06	0.06	0.07	0.04	0.05
Salinity (ppt)	<0.1	<0.1	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Conductivity (mS/cm)	40	40	190	34	118	42	72	49	43	50	60	50	60	65	74	52	54	54	58	44	42	52	56	113	112	48	43	42	40
BOD (mg/L)	< 2	< 2	12	< 2	< 2	< 2	2	< 2	2	2	< 2	< 2	2	< 2	3	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Water flow at pool (m/s)	0.01-0.2	0.01-0.2		0.01-0.2		0.01-0.2		0.01-0.2		0.01-0.2		0.01-0.2		0.01-0.2		0.01-0.2		0.01-0.2		0.01-0.2		0.01-0.2		0.01-0.2		0.01-0.2		0.01-0.3	
Water flow at riffle (m/s)	0.2-0.5	0.2-0.5		0.2-0.5		0.2-0.5		0.2-0.5		0.2-0.5		0.2-0.5		0.2-0.5		0.2-0.5		0.2-0.5		0.2-0.5		0.2-0.5		0.2-0.5		0.2-0.5		0.3-0.6	
Sand (%)	15	15		15	25	15	25	15	25	15	25	15	15	15	15	15	15	0	0	0	0	0	0	0	0	0	0	0	0
Stone (%)	80	80		80	70	80	70	80	70	80	70	80	70	80	70	80	70	40	20	40	20	40	20	40	20	40	20	40	20
Mud (%)	5	5		5	5	5	5	5	5	5	5	5	5	5	5	5	5	0	0	0	0	0	0	0	0	0	0	0	0
Concrete(%)	0	0	0	0	0	0	0	0	0	0	0	0	10	0	10	0	10	60	80	60	80	60	80	60	80	60	80	60	80

Table 4.7 Abotic data for Upper Tai Po River (T1- Upper stream sampling site and T2- Lower stream sampling site)

	Post construction monitoring												Post construction monitoring															
Parameters/ Date	May-14		Jun-14		Jul-14		Aug-14		Sep-14		Oct-14		Nov-14		Dec-14		Jan-15		Feb-15		Mar-15		Apr-15		May-15		Jun-15		Jun-15	
Replicate	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
DO (mg/L)	7.8	7.5	7.3	7.2	7.6	7.4	7.4	7.5	8.3	8.4	8.2	8.0	8.4	8.2	8.4	8.3	8.9	9.0	8.5	8.4	8.3	8.2	8.1	8.3	8.8	9.0	8.7	8.8	8.6	8.6
pH	7.8	8.2	8	7.7	7.9	7.8	7.1	7.2	8.2	8.4	8.2	8.1	7.8	8	8.5	8.2	8.6	8.4	8.6	8.3	8.5	8.5	8.4	8.4	8.1	8	7.9	8	7.8	7.9
Nitrate (mg N/L)	0.1	0.1	0.3	0.4	0.5	0.5	0.3	0.4	0.4	0.5	0.5	0.5	0.4	0.5	0.5	0.5	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Ammonia (mg/L)	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Salinity (ppt)	< 0.1	< 0.1	0.02	0.01	0.02	0.01	0	0	0	0	0	0.01	0.01	0.01	0	0	0	0.02	0.02	0.01	0.02	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Conductivity (mS/cm)	35	55	53	32	51	30	54	40	34	49	26	43	36	48	38	42	23	84	82	50	79	46	79	46	39	46	39	46	36	42
BOD (mg/L)	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Water flow at pool (m/s)	0.01-0.3		0.01-0.3		0.01-0.3		0.01-0.3		0.01-0.3		0.01-0.3		0.01-0.3		0.01-0.3		0.01-0.3		0.01-0.3		0.01-0.3		0.01-0.3		0.01-0.3		0.01-0.3		0.01-0.3	
Water flow at riffle (m/s)	0.3-0.6		0.3-0.6		0.3-0.6		0.3-0.6		0.3-0.6		0.3-0.6		0.3-0.6		0.3-0.6		0.3-0.6		0.3-0.6		0.3-0.6		0.3-0.6		0.3-0.6		0.3-0.6		0.3-0.6	
Sand (%)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Stone (%)	40	20	40	20	40	20	40	20	40	20	40	20	40	20	40	20	40	20	40	20	40	20	40	20	40	20	40	20	40	20
Mud (%)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Concrete(%)	60	80	60	80	60	80	60	80	60	80	60	80	60	80	60	80	60	80	60	80	60	80	60	80	60	80	60	80	60	80

Table 4.7 Abotic data for Upper Tai Po River (T1- Upper stream sampling site and T2- Lower stream sampling site)

	Post construction monitoring								Post construction monitoring													
Parameters/ Date	Aug-15		Sep-15		Oct-15		Nov-15		Dec-15		Jan-16		Feb-16		Mar-16		Apr-16		May-16		Jun-16	
Replicate	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
DO (mg/L)	8.5	8.5	8.4	8.3	8.2	8.0	8.1	8.1	7.8	7.8	7.9	7.8	7.7	7.9	7.8	7.9	8.1	8.1	8.2	8.1	8.1	8.1
pH	7.8	7.6	7.7	7.8	7.9	7.7	7.8	7.9	7.9	7.8	7.8	7.6	7.6	7.5	7.7	7.6	7.5	7.6	7.4	7.5	7.5	7.5
Nitrate (mg N/L)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Ammonia (mg/L)	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Salinity (ppt)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Conductivity (mS/cm)	28	36	33	42	28	33	34	36	33	32	42	45	33	35	34	36	23	26	25	27	32	33
BOD (mg/L)	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Water flow at pool (m/s)	0.01-0.3		0.01-0.3		0.01-0.3		0.01-0.3		0.01-0.3		0.01-0.3		0.01-0.3		0.01-0.3		0.01-0.3		0.01-0.3		0.01-0.3	
Water flow at riffle (m/s)	0.3-0.6		0.3-0.6		0.3-0.6		0.3-0.6		0.3-0.6		0.3-0.6		0.3-0.6		0.3-0.6		0.3-0.6		0.3-0.6		0.3-0.6	
Sand (%)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Stone (%)	40	20	40	20	40	20	40	20	40	20	40	20	40	20	40	20	40	20	40	20	40	20
Mud (%)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Concrete(%)	60	80	60	80	60	80	60	80	60	80	60	80	60	80	60	80	60	80	60	80	60	80

Table 4.7 Abotic data for Upper Tai Po River (T1- Upper stream sampling site and T2- Lower stream sampling site)

Parameters/ Date	Jul-16		Aug-16		Sep-16		Oct-16		Nov-16	
Replicate	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
DO (mg/L)	7.9	8.0	8.1	8.0	8	8.0	7.9	8.0	8	8.0
pH	7.6	7.5	7.5	7.5	7.6	7.5	7.6	7.6	7.6	7.6
Nitrate (mg N/L)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Ammonia (mg/L)	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Salinity (ppt)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Conductivity (mS/cm)	29	28	35	38	34	32	29	32	33	34
BOD (mg/L)	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Water flow at pool (m/s)	0.01-0.3		0.01-0.3		0.01-0.3		0.01-0.3		0.01-0.3	
Water flow at riffle (m/s)	0.3-0.6		0.3-0.6		0.3-0.6		0.3-0.6		0.3-0.6	
Sand (%)	0	0	0	0	0	0	0	0	0	0
Stone (%)	40	20	40	20	40	20	40	20	40	20
Mud (%)	0	0	0	0	0	0	0	0	0	0
Concrete(%)	60	80	60	80	60	80	60	80	60	80