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Issue Date : December 2017
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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. 38)**

Prepared By:

ALLIED ENVIRONMENTAL CONSULTANTS LTD.

For:

Drainage Services Department

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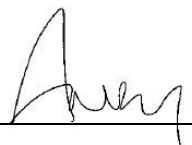
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**Agreement No. CE65/2013(EP)
Post-Construction Ecological Monitoring of River
Improvement Work in Upper Lam Tsuen River, She Shan
River and Upper Tai Po River – Investigation**

**Post-Construction Ecological Monitoring Report (No. 38)
Upper Lam Tsuen River**

February 2017



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March 23, 2017

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March 23, 2017

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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. 38)

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 38 post-construction ecological monitoring report for the project conducted **on 17th of February 2017**. 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 **17th of February 2017**;
- Fauna and flora along the drainage project sections are in a process of re-establishing or restoration; Plants on river bed was experiencing seasonal changes in abundance and phenological appearance;
- The species richness of odonata was similar to 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 calibrated 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°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 in

previous month. 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, 22 species of birds were recorded during the bird survey and 6 of the total were wetland dependent species including *Egretta garzetta* (Photo 4), *Ardeola bacchus* (Photo 5), *Alcedo atthis*, *Ardea alba* (Photo 6), *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, *Ardea alba*, *Ardeola bacchus* and *Egretta garzetta* are classified as Regional Concern by Fellowes *et al.* (2002). *Centropus sinensis* was observed in the river, which is considered as Vulnerable in China Red Data Book. Apart from species mentioned 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, 2 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 the same to the record of last month. Most of the odonata species in Hong Kong has the peak emergence from spring to late summer. The decrease in abundance of odonata was due to seasonality. It is expected that number of odonata will keep in low abundance 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 7). The river benthic fauna collected was mainly comprised of insects, molluscs and crustaceans (Photo 9). *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 7) at Upper Lam Tsuen River. Adult *Paramesotriton hongkongensis* (Photo 8) 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 February 2017 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. In addition to *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.

6 REFERENCES

Carey, G.J., Chalmers, M.L., Diskin, D.A., Kennerley, P.R., Leader, P.J., Leven, M.R., Lewthwaite, R.W., Melville, D.S., Turnbull, M. and Yung, L.(2001). *The Avifauna of Hong Kong*. Hong Kong Bird Watching Society.

Dudgeon, D. (2003). *Hillstreams*. The Department of Ecology & Biodiversity of The University of Hong Kong and Wan Li Book Co, Lte. Hong Kong.

Dudgeon, D. and Corlett, R. (1994). *Hills and Streams - An Ecology of Hong Kong*. Hong Kong University Press, Hong Kong.

Fellowes, J.R., Lau, M.W.N., Dudgeon, D., Reels, G., Ades, G.W.J., Carey, G.J., Chan, B.P.L., Kendrick, R.C., Lee, K.S., Leven, M.R., Wilson, K.D.P. & Yu, Y.T. (2002). Wild animals to watch: Terrestrial and freshwater fauna of conservation concern in Hong Kong. *Memoirs of the Hong Kong Natural History Society* 25: 123-159.

Hong Kong Biodiversity Website (2015) :

<http://www.afcd.gov.hk/english/conservation/hkbiodiversity/hkbiodiversity.html>

Hong Kong Herbarium (2015) :

<http://herbarium.gov.hk/>

Lai, P.C.C., Lam, Y.W., So, P.S., Tam, K.Y., Wan, P.Y.M. and Yip, K.L. (2004). *Check List of Hong Kong Plants*, Agriculture, Fisheries and Conservation Department. Hong Kong.

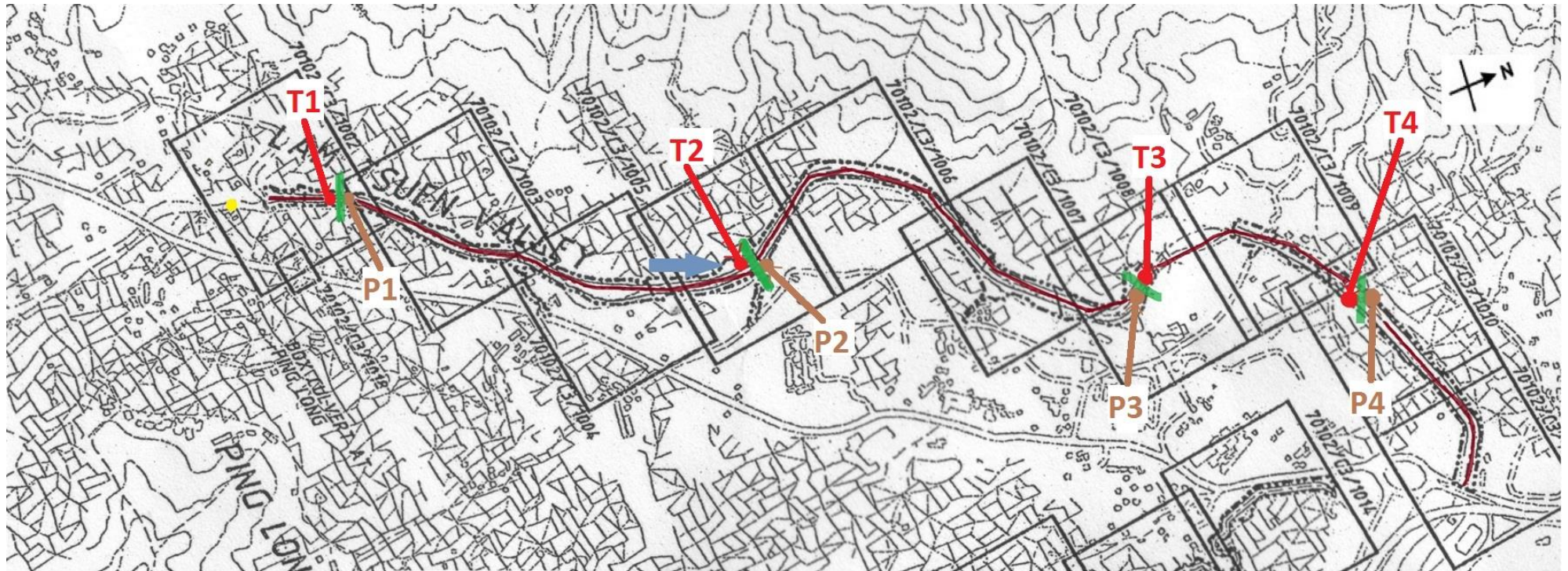
Lee, V.L.F., Lam, S.K.S., NG, F.K.Y., Chan, T.K.T. and Young, M.L.C. (2004). *Field Guide to the Freshwater Fish of Hong Kong*, Friends of the Country Parks and Cosmos Books Ltd, Hong Kong.

Tam, T.W., Leung, K.K., Kwan, B.P. S., Wu, K. K. Y., Tang, S. S. H., So, I.W.Y., Cheng, J.C.Y., Yuen, E.F.M., Tsang, Y.M and Leung, H.W. (2011). *The Dragonflies of Hong Kong*. Agriculture, Fisheries and Conservation Department, Friends of the Country Parks and Cosmos Books Ltd., Hong Kong.

Wilson, K.D.P., Tam, K.W., Kwan, B.S.P., Wu, K.K.Y., Wong, B.S.F. and Wong, J.K. (2004). *Field guide to the dragonflies of Hong Kong (2nd Edition)*. Agriculture,

Fisheries and Conservation Department, Friends of the Country Parks and Cosmos Books Ltd., Hong Kong.

FIGURES



Legend

- | | | |
|--|--|--|
| <ul style="list-style-type: none"> — Belt transect -Vegetation -Sediment characteristics ● Reference sample | <ul style="list-style-type: none"> ● Sampling station -Fish -Aquatic macroinvertebrate -Water quality and flow rate | <ul style="list-style-type: none"> ● Point count location -Avifauna — Line transect -Avifauna -Adult Odonate -Vegetation |
|--|--|--|

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 – *Ardeola bacchus*



Photo 6: Avifauna – *Ardea alba*



Photo 7: Kick sampling



Photo 8: Hong Kong Newt



Photo 9: Aquatic sampling

TABLE

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)

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

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)

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

Family	Species	Chinese name	Impact monitoring								Impact monitoring								Impact monitoring							
			Stream				Stream				Stream				Stream				Stream							
			Jul-11		Jul-11		Jul-11		Jul-11		Jan-12		Jan-12		Jan-12		Jan-12		Jul-12		Jul-12		Jul-12		Jul-12	
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		
	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	<i>Microstegium ciliatum</i>	剛秀竹																								
Fabaceae	<i>Pueraria lobata</i>	野葛	0.3	10						0.3	10						0.3	5								
Poaceae	<i>Pennisetum purpureum</i>	象草			1.2	2	2.5	10					2.5	5	2.5	5			2	5						
Araceae	<i>Alocasia odora</i>	海芋																								
Caesalpiniaceae	<i>Cassia alata</i>	翅莢決明																								
Magnoliaceae	<i>Michelia alba</i>	白蘭																								
Poaceae	<i>Brachiaria mutica</i>	巴拉草	0.8	10	1	5				0.8	10	1	2	1.5	60			0.8	10	1	5	1.5	20			
Moraceae	<i>Ficus hispida</i>	對葉榕																								
Asteraceae	<i>Mikania micrantha</i>	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	
Musaceae	<i>Musa paradisiaca</i>	大蕉																								
Ulmaceae	<i>Celtis sinensis</i>	朴樹																								
Araceae	<i>Pistia stratiotes L.</i>	大漂																								
Urticaceae	<i>Boehmeria nivea</i>	苧麻					1.5	10																		
Asteraceae	<i>Bidens alba</i>	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
Poaceae	<i>Coix lacryma-jobi</i>	薏苡																								
Solanaceae	<i>Solanum nigrum</i>	龍葵					2	3																		
Cyperaceae	<i>Cyperus flabelliformis</i>	風車草																								
Poaceae	<i>Miscanthus floridulus</i>	五節芒																								
Euphorbiaceae	<i>Macaranga tanarius</i>	血桐																								
Asteraceae	<i>Wedelia chinensis</i>	蟛蜞菊																								
Commelinaceae	<i>Commelina diffusa</i>	節節草				0.4	10						0.3	3	0.4	5					0.4	2	0.3	5		
Asteraceae	<i>Erechtites hieracifolia</i>	革命菜																								
Thelypteridaceae	<i>Cyclosorus parasiticus</i>	華南毛蕨																								
Convolvulaceae	<i>Pharbitis nil</i>	牽牛																								
Verbenaceae	<i>Lantana camara</i>	馬纓丹				0.5	2																			
Mimosaceae	<i>Leucaena leucocephala</i>	銀合歡																								
Brassicaceae	<i>Nasturtium officinale</i>	西洋菜																								
Onagraceae	<i>Ludwigia erecta</i>	美洲水丁香																								
Poaceae	<i>Pennisetum alopecuroides</i>	狼尾草																								
Amaranthaceae	<i>Celosia argentea</i>	青葙																								
Bare Gound				73		85		65		88		73		82		28		88		75		82		58		92

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)

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

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)

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

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)

Family	Species	Chinese name	Post construction monitoring								Post construction monitoring								Post construction monitoring							
			May-14				Jun-14				Jul-14															
			T1		T2		T3		T4		T1		T2		T3		T4		T1		T2		T3		T4	
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	<i>Microstegium ciliatum</i>	剛秀竹	0.3	2						0.3	2							0.5	4							
Fabaceae	<i>Pueraria lobata</i>	野葛			0.3	5	0.3	5					0.3	5	0.3	5					0.3	5	0.3	5		
Poaceae	<i>Pennisetum purpureum</i>	象草																								
Araceae	<i>Alocasia odora</i>	海芋																								
Caesalpiniaceae	<i>Cassia alata</i>	翅莢決明																								
Magnoliaceae	<i>Michelia alba</i>	白蘭																								
Poaceae	<i>Brachiaria mutica</i>	巴拉草	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	<i>Ficus hispida</i>	對葉榕																								
Asteraceae	<i>Mikania micrantha</i>	薇甘菊		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	15	0.3	8	
Musaceae	<i>Musa paradisiaca</i>	大蕉																								
Ulmaceae	<i>Celtis sinensis</i>	朴樹																								
Araceae	<i>Pistia stratiotes L.</i>	大漂																								
Urticaceae	<i>Boehmeria nivea</i>	芋麻																								
Asteraceae	<i>Bidens alba</i>	白花鬼針草	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	<i>Coix lacryma-jobi</i>	薏苡																								
Solanaceae	<i>Solanum nigrum</i>	龍葵																								
Cyperaceae	<i>Cyperus flabelliformis</i>	風車草																								
Poaceae	<i>Miscanthus floridulus</i>	五節芒																								
Euphorbiaceae	<i>Macaranga tanarius</i>	血桐																								
Asteraceae	<i>Wedelia chinensis</i>	蟛蜞菊																								
Commelinaceae	<i>Commelina diffusa</i>	節節草	0.2	8			0.3	3		0.2	8			0.3	3		0.2	8			0.3	3				
Asteraceae	<i>Erechtites hieracifolia</i>	革命菜																								
Thelypteridaceae	<i>Cyclosorus parasiticus</i>	華南毛蕨																								
Convolvulaceae	<i>Pharbitis nil</i>	牽牛																								
Verbenaceae	<i>Lantana camara</i>	馬纓丹																								
Mimosaceae	<i>Leucaena leucocephala</i>	銀合歡																								
Brassicaceae	<i>Nasturtium officinale</i>	西洋菜		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	0.3	1	
Onagraceae	<i>Ludwigia erecta</i>	美洲水丁香																								
Poaceae	<i>Pennisetum alopecuroides</i>	狼尾草																								
Amaranthaceae	<i>Celosia argentea</i>	青葙																								
Bare Gound				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)

Family	Species	Chinese name	Post construction monitoring								Post construction monitoring								Post construction monitoring								Post construction monitoring								Post construction monitoring							
			Aug-14								Sep-14								Oct-14								Nov-14								Dec-14							
			T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4																
Poaceae	<i>Microstegium ciliatum</i>	剛秀竹	0.7	5					0.7	5																																
Fabaceae	<i>Pueraria lobata</i>	野葛			0.3	5	0.3	5					0.3	5	0.3	5									0.6	10											0.6	10				
Poaceae	<i>Pennisetum purpureum</i>	象草																																								
Araceae	<i>Alocasia odora</i>	海芋																							1.8	1											1.8	1				
Caesalpiniaceae	<i>Cassia alata</i>	翅莢決明																																								
Magnoliaceae	<i>Michelia alba</i>	白蘭																																								
Poaceae	<i>Brachiaria mutica</i>	巴拉草	0.6	10	0.8	12		0.8	8	0.6	10	0.8	12		0.8	8	1	10	1.5	15	1.3	30	1	5	1	10	1.5	15	1.3	30	1	5	1	10	1.5	15	1.3	30	1	5		
Moraceae	<i>Ficus hispida</i>	對葉榕																																								
Asteraceae	<i>Mikania micrantha</i>	薇甘菊		0.3	6	0.3	15	0.3	8		0.3	8	0.3	15	0.3	10	0.3	15	0.3	15	0.3	15	0.3	15	0.3	18	0.3	18	0.3	18	0.3	18	0.3	18	0.3	18	0.3	18	0.3	18		
Musaceae	<i>Musa paradisiaca</i>	大蕉																																								
Ulmaceae	<i>Celtis sinensis</i>	朴樹																																								
Araceae	<i>Pistia stratiotes L.</i>	大漂																																								
Urticaceae	<i>Boehmeria nivea</i>	芋麻																																								
Asteraceae	<i>Bidens alba</i>	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	0.5	5	0.8	12	0.7	10		0.5	5	0.8	12	0.7	10		0.5	5	0.8	12	0.7	10				
Poaceae	<i>Coix lacryma-jobi</i>	薏苡																	2	5						2	5															
Solanaceae	<i>Solanum nigrum</i>	龍葵																																								
Cyperaceae	<i>Cyperus flabelliformis</i>	風車草																																								
Poaceae	<i>Miscanthus floridulus</i>	五節芒																																								
Euphorbiaceae	<i>Macaranga tanarius</i>	血桐																																								
Asteraceae	<i>Wedelia chinensis</i>	蟛蜞菊																																								
Commelinaceae	<i>Commelina diffusa</i>	節節草	0.3	10			0.3	5		0.3	10			0.3	5		0.3	10	0.8	20			0.3	20	0.3	12	0.8	22			0.3	20	0.3	12	0.8	22			0.3	20		
Asteraceae	<i>Erechtites hieracifolia</i>	革命菜																																								
Thelypteridaceae	<i>Cyclosorus parasiticus</i>	華南毛蕨																																								
Convolvulaceae	<i>Pharbitis nil</i>	牽牛																																								
Verbenaceae	<i>Lantana camara</i>	馬纓丹																																								
Mimosaceae	<i>Leucaena leucocephala</i>	銀合歡																																								
Brassicaceae	<i>Nasturtium officinale</i>	西洋菜		0.3	1	0.3	1	0.3	1		0.3	1	0.3	2	0.3	1				0.3	2	0.1	1				0.3	2	0.1	1				0.3	2	0.1	1					
Onagraceae	<i>Ludwigia erecta</i>	美洲水丁香															2	30	2	15	2	10	1.8	5	2	25	2	13	2	10	1.8	5	2	25	2	13	2	10	1.8	5		
Poaceae	<i>Pennisetum alopecuroides</i>	狼尾草																																								
Amaranthaceae	<i>Celosia argentea</i>	青葙																		1.5	15								1.5	15							1.5	15				
Bare Gound				55		69		59		68		55		67		58		66		25		23		18		43		25		20		15		40		25		20		15		40

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)

Family	Species	Chinese name	Post construction monitoring								Post construction monitoring								Post construction monitoring								Post construction monitoring							
			Jan-15				Feb-15				Mar-15				Apr-15																			
			T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4																
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	<i>Microstegium ciliatum</i>	剛秀竹																																
Fabaceae	<i>Pueraria lobata</i>	野葛					0.6	10						0.6	10					0.6	10						0.6	10						
Poaceae	<i>Pennisetum purpureum</i>	象草				3	15						3	15					3	15						3	15							
Araceae	<i>Alocasia odora</i>	海芋					1.8	1					1.8	1					1.8	1						1.8	1							
Caesalpinaceae	<i>Cassia alata</i>	翅莢決明																																
Magnoliaceae	<i>Michelia alba</i>	白蘭																																
Poaceae	<i>Brachiaria mutica</i>	巴拉草	1	20	1	20	1.3	20	1	10	1	20	1	20	1.3	20	1	10	1	20	1.2	20	1.4	20	1	10	1.1	20	1.2	20	1.4	20	1	10
Moraceae	<i>Ficus hispida</i>	對葉榕																																
Asteraceae	<i>Mikania micrantha</i>	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	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	<i>Musa paradisiaca</i>	大蕉																																
Ulmaceae	<i>Celtis sinensis</i>	朴樹																																
Araceae	<i>Pistia stratiotes L.</i>	大漂																																
Urticaceae	<i>Boehmeria nivea</i>	苧麻																																
Asteraceae	<i>Bidens alba</i>	白花鬼針草	1	10	0.4	15	1	15			1	10	0.7	15	1	15			1	10	0.7	15	1	15			1	10	0.7	15	1	15		
Poaceae	<i>Coix lacryma-jobi</i>	薏苡																																
Solanaceae	<i>Solanum nigrum</i>	龍葵																																
Cyperaceae	<i>Cyperus flabelliformis</i>	風車草																																
Poaceae	<i>Miscanthus floridulus</i>	五節芒																																
Euphorbiaceae	<i>Macaranga tanarius</i>	血桐																																
Asteraceae	<i>Wedelia chinensis</i>	蟛蜞菊																																
Commelinaceae	<i>Commelina diffusa</i>	節節草	0.4	10	0.4	20		0.3	20	0.5	10	0.5	20		0.3	20	0.5	10	0.4	20		0.3	20	0.5	10	0.4	20		0.3	20	0.5	10		
Asteraceae	<i>Erechtites hieracifolia</i>	革命菜																																
Thelypteridaceae	<i>Cyclosorus parasiticus</i>	華南毛蕨																																
Convolvulaceae	<i>Pharbitis nil</i>	牽牛																																
Verbenaceae	<i>Lantana camara</i>	馬纓丹																																
Mimosaceae	<i>Leucaena leucocephala</i>	銀合歡																																
Brassicaceae	<i>Nasturtium officinale</i>	西洋菜				0.3	10	0.1	15					0.3	10	0.2	15					0.3	10	0.2	15					0.3	10	0.2	15	
Onagraceae	<i>Ludwigia erecta</i>	美洲水丁香	2	30	2	10	2	5	1.8	5	2	30	2	10	2	5	2	5	2	30	2	10	2	5	2	5	2	30	2	10	2	5		
Poaceae	<i>Pennisetum alopecuroides</i>	狼尾草																																
Amaranthaceae	<i>Celosia argentea</i>	青葙																																
Bare Gound				20		20		30		19		20		20		30		19		20		20		30		19		20		20		30		19

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

(Continous) 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)

Family	Species	Chinese name	Post construction monitoring								Post construction monitoring				Post construction monitoring				Post construction monitoring							
			Nov-16								Dec-16				Jan-17				Feb-17							
			T1		T2		T3		T4		T1		T2		T3		T4		T1		T2		T3		T4	
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	<i>Microstegium ciliatum</i>	剛秀竹																								
Fabaceae	<i>Pueraria lobata</i>	野葛	0.5	5				0.4	5	0.5	5					0.4	5	0.5	5					0.4	5	
Poaceae	<i>Pennisetum purpureum</i>	象草																								
Araceae	<i>Alocasia odora</i>	海芋	0.4	5	0.2	5	0.3	5	0.4	5	0.4	5	0.2	5	0.3	5	0.4	5	0.4	5	0.2	5	0.3	5	0.4	5
Caesalpiniaceae	<i>Cassia alata</i>	翅莢決明																								
Magnoliaceae	<i>Michelia alba</i>	白蘭																								
Poaceae	<i>Brachiaria mutica</i>	巴拉草	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	<i>Ficus hispida</i>	對葉榕																								
Asteraceae	<i>Mikania micrantha</i>	微甘菊	0.4	5	0.4	5	0.4	10	0.4	5	0.4	5	0.4	10	0.4	5	0.4	5	0.4	5	0.4	10	0.4	5	0.4	5
Musaceae	<i>Musa paradisiaca</i>	大蕉																								
Ulmaceae	<i>Celtis sinensis</i>	朴樹																								
Araceae	<i>Pistia stratiotes L.</i>	大漂																								
Urticaceae	<i>Boehmeria nivea</i>	苧麻																								
Asteraceae	<i>Bidens alba</i>	白花鬼針草			0.5	5	0.4	5					0.5	5	0.4	5					0.5	5	0.4	5		
Poaceae	<i>Coix lacryma-jobi</i>	薏苡	1.1	5						1.1	5															
Solanaceae	<i>Solanum nigrum</i>	龍葵																								
Cyperaceae	<i>Cyperus flabelliformis</i>	風車草																								
Poaceae	<i>Miscanthus floridulus</i>	五節芒	1.1	7						1.1	7															
Euphorbiaceae	<i>Macaranga tanarius</i>	血桐																								
Asteraceae	<i>Wedelia chinensis</i>	蟛蜞菊	0.4	5						0.4	5															
Commelinaceae	<i>Commelina diffusa</i>	節節草	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	<i>Erechtites hieracifolia</i>	革命菜																								
Thelypteridaceae	<i>Cyclosorus parasiticus</i>	華南毛蕨																								
Convolvulaceae	<i>Pharbitis nil</i>	牽牛																								
Verbenaceae	<i>Lantana camara</i>	馬纓丹																								
Mimosaceae	<i>Leucaena leucocephala</i>	銀合歡																								
Brassicaceae	<i>Nasturtium officinale</i>	西洋菜																								
Onagraceae	<i>Ludwigia erecta</i>	美洲水丁香																								
Poaceae	<i>Pennisetum alopecuroides</i>	狼尾草				1.5	10							1.5	10									1.5	10	
Amaranthaceae	<i>Celosia argentea</i>	青葙				0.4	5							0.4	5									0.4	5	
Acanthaceae	<i>Dicliptera chinensis</i>	狗肝菜	0.3	5						0.3	5												0.3	5		
Bare Gound				43		50		45		65		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)

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																																
					Mar-16				Apr-16				May-16				Jun-16				Jul-16				Aug-16				Sep-16				Oct-16				Nov-16				Dec-16				Jan-17				Feb-17																				
					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															
Barn Swallow	<i>Hirundo rustica</i>	家燕	PM	C	+			7		+			3	6	+			1	7	+		4	5		++		3	3	6	++	5	5			++	5	2			++			6																										
Black Drongo	<i>Dicrurus macrocoerus</i>	黑卷尾	Sv	C																																																																	
Black Kite	<i>Milvus lineatus</i>	黑鷹	R, RC, Cap.586	C																																																																	
Black-faced bunting	<i>Emberiza spodocephala</i>	灰頭鵲	WV&PM	C																																																																	
Black-necked Starling	<i>Sturnus nigricollis</i>	黑頸椋鳥	R	C	++		3		3	++			3		++		2	2		++		3			+			4		+	3	2			+	4	2			+	3	3			+	3	2			+	2	2	2	+	+	2	3	2	+	+	2	3	2	+	+	3	2		
Black-winged Cuckoo-shrike	<i>Coracina melaschistos</i>	暗灰鶇鶇	PM	C																																																																	
Blue Whistling Thrush	<i>Myophonus caeruleus</i>	紫嘯鶇	R	C															1																																																		
Brown Shrike	<i>Lanius cristatus</i>	紅尾伯勞	PM	C																																																																	
Buzzard (Common Buzzard)	<i>Buteo buteo</i>	普通鵟	WV, Cap.586	C																																																																	
Chinese Bulbul	<i>Pycnonotus sinensis</i>	白頭鵲	R	C	++	2	2	5		++	2		3	2	++	2	3	3	3	++	3	3	3		++	2	2	5	4	++	3	3			++	2	++	4	2	++	3	2	2	2	++	3	4			++	2	3	3	++	++	4	2	3	++	++	2	2	3	3					
Chinese Pond Heron	<i>Ardeola bacchus</i>	池鷺	R, RC	C	+					+					+					+					+					+					+					+					+					+					+														
Common Kingfisher	<i>Alcedo atthis</i>	普通翠鳥	R	C	+				2	+					+					+					+					+					+					+					+					+																			
Common Koel	<i>Eudynamis scolopacea</i>	雉鴉	R	C	+					+					+					+					+					+					+					+					+																								
Common Sandpiper	<i>Actitis hypoleucos</i>	磯鶇	WV&PM	C					1																																																												
Common Tailorbird	<i>Orthotomus sutorius</i>	長尾縫紉鶇	R	C	++		1	1	1	++					+					+					+					+					+					+					+																								
Crested bulbul	<i>Pycnonotus jocosus</i>	紅耳鵲	R	C	+++	2	5	2	10	+++	7	6	3	8	+++	5				+					+					+					+					+					+					+																			
Crested Goshawk	<i>Accipiter trivirgatus</i>	鳳頭鷹	R, CR, Cap.586	U						+					+					+					+					+					+					+					+																								
Crested Myna	<i>Acridotheres cristatellus</i>	八哥	R	C	++		3	3	4	++		4	2		++					+					+					+					+					+					+					+																			
Crested Serpent Eagle	<i>Sphoropsis cheela</i>	蛇鵟	R, VU, LC	U																																																																	
Daurian redstart	<i>Phoenicurus auroreus</i>	北紅尾鴉	WV	C																																																																	
Domestic pigeon	<i>Columba sp.</i>	鴿	R	C																																																																	
Dusky Warbler	<i>Phylloscopus fuscatus</i>	褐柳鶇	WV	C	+					+					+					+					+					+					+					+					+																								
Eurasian tree sparrow	<i>Passer montanus</i>	麻雀	R	C	++	3			5	++	3	2	++	4	1					+					+					+					+					+					+																								
Great Coucal	<i>Centropus sinensis</i>	褐翅鵲鶇	R, VU	C	+					+					+					+					+					+					+					+					+																								
Great Tit	<i>Parus major(commixtus)</i>	大山雀	R	C	+					+					+					+					+					+					+					+																													
Green Sandpiper	<i>Tringa ochropus</i>	白腰濱鶇	PM&WV	C	+																																																																
Grey Heron	<i>Ardea cinerea</i>	蒼鷺	WV, PRC	C																																																																	
Grey Wagtail	<i>Motacilla cinerea</i>	灰鶇鶇	WV	C	+	1	1	1	1	+	1				+	1				+	1				+	1				+	1				+	1				+	1				+	1																							
Japanese White Eye	<i>Zosterops japonica(simples)</i>	暗綠繡眼鳥	R	C	++		3		4	++		3	3		++		2	3		++		3	3		++		3	3		++		3	3		++		3	3		++		3	3		++		3	3																					
Jungle Crow	<i>Corvus macrorhynchos</i>	大嘴烏鶇	R	C																																																																	
Large Hawk Cuckoo	<i>Cuculus sparveriaoides</i>	鷹鵟	SV	C						+					+					+					+					+					+					+																													
Lesser Coucal	<i>Centropus bengalensis</i>	小鵲鶇	R, VU	C																																																																	
Little Egret	<i>Egretta garzetta</i>	小白鷺	R, RC	C	+			1	1	+					+				1	+					+				1	+	1	1	1	+	+	1	1	1	+	+	1	1	1	+	+	1	1	1	+	+	5	2			+	6	3												
Great Egret	<i>Ardea alba</i>	大白鷺	R, WV, RC	C																																																																	
Little Swift	<i>Apus affinis</i>	小白腰雨燕	R, SpM	C						++					+					+					+					+					+					+																													
Magpie	<i>Pica pica</i>	喜鵲	R	C																																																																	
Magpie Robin	<i>Copsychus saularis</i>	鶇鶇	R	C	+	2			1	+	2				+	1	1			+	2	1	1	+	+	1	2	1	1	+	1	2	1	1	+	2	1	1	1	+	2	2	1	1	+	2	2	1	1	+	1	2	2	1															
Mandarin Duck	<i>Aix galericulata</i>	鸚鵡	WV	U																																																																	
Masked Laughing Thrush	<i>Garrulus perspicillatus</i>	黑臉鵲	R	C																																																																	
Night Heron	<i>Nycticorax nycticorax</i>	夜鷺	R&WV, LC	C																																																																	
Northern Shoveler	<i>Anas clypeata</i>	琵鷺	WV	C																																																																	
Olive Backed Pipit	<i>Anthus hodgsoni</i>	樹鶇	WV	C																																																																	
Oriental Dollarbird	<i>Eurystomus orientalis</i>	三寶鳥	PM	U																																																																	
Plaintive Cuckoo	<i>Cacomantis merulinus</i>	八聲杜鵑	SV	U						+					+																																																						

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

Species name	Common name	Chinese name	Status	Commonness	Post construction monitoring						Post construction monitoring									
					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	
<i>Acisoma panorpoides panorpoides</i>	Asian Pintail	錐腹蜻	NP	VC																
<i>Brachythemis contaminata</i>	Asian Amberwing	黃翅蜻	NP	VC																
<i>Ceriagrion auranticum ryukyuanum</i>	Orange-tailed Sprite	琉球橘黃蟳	NP	VC	+	+	+		+				+	+	+	+	+	+		
<i>Coeliccia cyanomelas</i>	Blue Forest Damsel	黃紋長腹蟳	NP	VC																
<i>Copera marginipes</i>	Yellow Featherlegs	黃狹扇蟳	NP	VC	+	+							+	+	+	+	+	+		
<i>Crocothemis servilia servilia</i>	Crimson Darter	紅蜻	NP	VC		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Euphaea decorata</i>	Black-banded Gossamerwing	方帶幽蟳	NP	VC													+			
<i>Ictinogomphus pertinax</i>	Common Flangetail	霸王葉春蜓	NP	C										+	+	+	+	+	+	
<i>Ischnura senegalensis</i>	Common Blue Jewel	褐斑異痣蟳	NP	VC																+
<i>Mnais lacteola</i>	Indochinese Copperwing	煙翅綠色蟳	P, LC	C																
<i>Nannophya pygmaea</i>	Scarlet Dwarf	侏紅小蜻	P, LC	C																
<i>Neurobasis chinensis</i>	Chinese Greenwing	華艷色蟳	NP	VC	+	+	+	+			+	+	+	+	+	+	+	+	+	+
<i>Neurothemis fulvia</i>	Russet Percher	網脈蜻	NP	VC	+	+							+		+	+	+	+		
<i>Neurothemis tullia tullia</i>	Pied Percher	截斑脈蜻	NP	C																
<i>Orthetrum chrysis</i>	Red-faced Skimmer	華麗灰蜻	NP	VC													+	+	+	+
<i>Orthetrum glaucum</i>	Common blue skimmer	黑尾灰蜻	NP	VC									+							
<i>Orthetrum luzonicum</i>	Marsh Skimmer	呂宋灰蜻	NP	VC													+	+	+	+
<i>Orthetrum pruinosum neglectum</i>	Common Red Skimmer	赤褐灰蜻	NP	VC	+	+								+	+	+	+	+		
<i>Orthetrum sabina sabina</i>	Green Skimmer	狹腹灰蜻	NP	VC																+
<i>Pantala flavescens</i>	Wandering Glider	黃蜻	NP	VC		+	+	+			+	+	+	+	+	+	+	+	+	+
<i>Paracercion calamorum duyeri</i>	Dusky Lilysquatter	葦尾蟳	P, LC	C																
<i>Prodasineura autumnalis</i>	Black Threadtail	烏齒原蟳	NP	VC	+	+							+	+	+	+	+	+	+	
<i>Pseudagrion rubriceps rubriceps</i>	Orange-faced Sprite	丹頂斑蟳	NP	UC	+	+	+							+	+					
<i>Rhinocypha perforata perforata</i>	Common Blue Jewel	三斑鼻蟳	NP	VC	+	+	+							+	+	+	+	+	+	
<i>Rhyothemis variegata arria</i>	Variegated Flutterer	斑麗翅蜻	NP	C	+	+	+													
<i>Trithemis aurora</i>	Crimson Dropwing	曉褐蜻	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Trithemis festiva</i>	Indigo Dropwing	慶褐蜻	NP	VC	+	+	+							+	+	+	+	+	+	+
<i>Zygonyx iris insignis</i>	Emerald Cascader	彩虹蜻	P,PGC	VC																
No. of species					11	13	9	4	3	2	4	9	11	13	14	15	13	9	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 according 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																			
Species name	Common name	Chinese name	Status	Commonness	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Jan-17	Feb-17
<i>Acisoma panorpoides panorpoides</i>	Asian Pintail	錐腹蜻	NP	VC															
<i>Brachythemis contaminata</i>	Asian Amberwing	黃翅蜻	NP	VC															
<i>Ceriagrion auranticum ryukyuanum</i>	Orange-tailed Sprite	琉球橘黃蟴	NP	VC					+	+	+	+	+	+	+				
<i>Coeliccia cyanomelas</i>	Blue Forest Damsel	黃紋長腹蟴	NP	VC															
<i>Copera marginipes</i>	Yellow Featherlegs	黃狹扇蟴	NP	VC						+	+	+	+	+					
<i>Crocothemis servilia servilia</i>	Crimson Darter	紅蜻	NP	VC							+	+	+	+	+	+			
<i>Euphaea decorata</i>	Black-banded Gossamerwing	方帶幽蟴	NP	VC						+	+	+							
<i>Ictinogomphus pertinax</i>	Common Flangetail	霸王葉春蜓	NP	C						+	+	+							
<i>Ischnura senegalensis</i>	Common Blue Jewel	褐斑異痣蟴	NP	VC															
<i>Mnais lacteola</i>	Indochinese Copperwing	煙翅綠色蟴	P, LC	C															
<i>Nannophya pygmaea</i>	Scarlet Dwarf	侏紅小蜻	P, LC	C															
<i>Neurobasis chinensis</i>	Chinese Greenwing	華艷色蟴	NP	VC					+	+	+	+	+	+	+	+			
<i>Neurothemis fulvia</i>	Russet Percher	網脈蜻	NP	VC							+	+	+	+	+				
<i>Neurothemis tullia tullia</i>	Pied Percher	截斑脈蜻	NP	C							+	+	+	+					
<i>Orthetrum chrysis</i>	Red-faced Skimmer	華麗灰蜻	NP	VC				+	+	+	+	+	+	+	+	+			
<i>Orthetrum glaucum</i>	Common blue skimmer	黑尾灰蜻	NP	VC															
<i>Orthetrum luzonicum</i>	Marsh Skimmer	呂宋灰蜻	NP	VC							+	+	+	+	+	+			
<i>Orthetrum pruinosum neglectum</i>	Common Red Skimmer	赤褐灰蜻	NP	VC		+			+	+									
<i>Orthetrum sabina sabina</i>	Green Skimmer	狹腹灰蜻	NP	VC															
<i>Pantala flavescens</i>	Wandering Glider	黃蜻	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Paracercion calamorum duyeri</i>	Dusky Lilysquatter	葦尾蟴	P, LC	C															
<i>Prodasineura autumnalis</i>	Black Threadtail	烏齒原蟴	NP	VC															
<i>Pseudagrion rubriceps rubriceps</i>	Orange-faced Sprite	丹頂斑蟴	NP	UC															
<i>Rhinocypha perforata perforata</i>	Common Blue Jewel	三斑鼻蟴	NP	VC						+	+	+	+	+	+				
<i>Rhyothemis variegata arria</i>	Variegated Flutterer	斑麗翅蜻	NP	C															
<i>Trithemis aurora</i>	Crimson Dropwing	曉褐蜻	NP	VC						+	+	+	+	+	+	+			
<i>Trithemis festiva</i>	Indigo Dropwing	慶褐蜻	NP	VC	+	+		+	+	+	+	+	+	+	+	+	+	+	+
<i>Zygonyx iris insignis</i>	Emerald Cascader	彩虹蜻	P,PGC	VC															
No. of species					2	3	1	3	7	11	14	14	13	13	10	7	2	2	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 according 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)

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										
				Jun-14				Jul-14				Aug-14				Sep-14				Oct-14				Nov-14				Dec-14				Jan-15						
				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
Molluscs																																						
<i>Biomphalaria sp.</i>	--	NP	VC	+	+					+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		
<i>Brotia hainanensis</i>	--	NP	VC	++	+	+	+	+	+	++	+	+	+	+	++	+	+	+	+	++	+	+	+	+	++	++	+	+	+	++	++	+	+	+	++	++	+	
<i>Melanoides tuberculata</i>	瘤擬黑螺	NP	VC				+	+								+	+																					
<i>Pomacea canaliculata</i>	蘋果螺	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
<i>Radix plicatulus</i>	羅白螺	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
<i>Sinotaia quadrata</i>	田螺	NP	VC	+	+			+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
Insects																																						
<i>Baetis sp.</i>	--	NP	VC			+				+					+	+	+	+	+																			
<i>Caenis sp.</i>	--	NP	VC																																			
<i>Chironomus sp.</i>	蠓幼虫	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
<i>Electrogenus sp.</i>	--	NP	VC	+	+					+	+				+	+				+	+				+	+	+											
<i>Hydropsyche sp.</i>	--	NP	VC			+	+			+	+				+	+				+	+				+	+												
<i>Indobaetis sp.</i>	--	NP	VC	+	+		+			+	+				+	+				+	+				+	+	+											
<i>Mnais sp.</i>	--	NP	VC			+				+	+				+	+				+	+				+	+												
<i>Orthetrum sp.</i>	--	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
Crustaceans																																						
<i>Caridina cantanensis</i>	廣東米蝦	NP	VC	+	++	++	++	++	+	++	++	++	++	+	++	++	++	++	+	++	++	++	++	+	++	++	++	++	+	++	++	++	++	+	++	++	++	
<i>Cryptopotamon anacoluthon</i>	鯉刺溪蟹	NP	VC		+	+				+	+				+	+				+	+				+	+												
<i>Macrobrachium hainanense</i>	海南沼蝦	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
<i>Somanniathelphusa zanklon</i>	束腰蟹	NP	VC																																			
No. of species				11	12	11	10	9	13	11	13	13	10	13	13	15	15	9	13	14	16	14	12	13	14	16	15	11	13	14	15	14	12	13	12	12	13	11

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												
				Sep-15					Oct-15					Nov-15					Dec-15					Jan-16					Feb-16							
Species name		Chinese name	Status	Commonness	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		
Molluscs																																				
<i>Biomphalaria sp.</i>	--		NP	VC					+					+					+					+										+		
<i>Brotia hainanensis</i>	--		NP	VC	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	
<i>Melanoides tuberculata</i>	瘤擬黑螺		NP	VC				+	+				+	+				+	+				+	++									+	++		
<i>Pomacea canaliculata</i>	蘋果螺		NP	VC	++	++	++	++	+++	++	++	++	+++	++	++	++	++	+++	++	++	++	++	+++	++	++	++	++	+++	++	++	++	+++	++	++	++	+++
<i>Radix plicatulus</i>	羅白螺		NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		
<i>Sinotaia quadrata</i>	田螺		NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		
Insects																																				
<i>Baetis sp.</i>	--		NP	VC	+			+	+	+			+	+	+			+	+	+	+	+			+	+	+	+	+			+	+			
<i>Caenis sp.</i>	--		NP	VC															+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		
<i>Chironomus sp.</i>	蠓幼虫		NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		
<i>Electrogenus sp.</i>	--		NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		
<i>Hydropsyche sp.</i>	--		NP	VC	+	+	+		+	+	+		+	+	+	+	+		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		
<i>Indobaetis sp.</i>	--		NP	VC	+	+	+		+	+	+		+	+	+	+	+		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		
<i>Mnais sp.</i>	--		NP	VC				+					+					+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		
<i>Orithetrum sp.</i>	--		NP	VC			+	+	+				+	+	+			+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		
Crustaceans																																				
<i>Caridina cantanensis</i>	廣東米蝦		NP	VC	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	
<i>Cryptopotamon anacoluthon</i>	鯉刺溪蟹		NP	VC				+					+	+				+	+				+	+									+	+		
<i>Macrobrachium hainanense</i>	海南沼蝦		NP	VC	+		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		
<i>Somanniathelphusa zanklon</i>	束腰蟹		NP	VC																																
No. of species					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		

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)

Species	Chinese name	Status	Sampling point	Post construction monitoring					Post construction monitoring					Post construction monitoring					Post construction monitoring					Post construction monitoring									
				Mar-14					Apr-14					May-14					Jun-14					Jul-14									
				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					
Fish			Commonnes																														
<i>Acrossocheilus parallens</i>	側條光唇魚	P, PGC	R	+	++	++	+++	++		++	++	+++	++		+	+	+	+		+	+	+	+		+	++	++	+					
<i>Channa maculate</i>	斑鱧	NP	C																														
<i>Cirrhina molitorella</i>	鯪魚	NP	C								+																						
<i>Clarias fuscus</i>	胡子鯪	NP	C	+			+	+				+	+					+					+										+
<i>Cyprinus carpio var. viridiviolaceus</i>	錦鯉	NP	C			+					+																						
<i>Gambusia affinis</i>	食蚊魚	NP	VC	+	+	+	+	+		+	+	+	+		+	+	+	+		+	+	+	+		+	+	+	+		+	+	+	+
<i>Liniparhomaloptera disparis</i>	擬平鰾	NP	C	+	+	+	+	+		+	+	+	+		+	+	+	+		+	+	+	+		+	+	+	+		+	+	+	+
<i>Misgurnus anguillicaudatus</i>	泥鰾	NP	C	+	+	+	+	+		+	+	+	+		+	+	+	+		+	+	+	+		+	+	+	+		+	+	+	+
<i>Oreochromis niloticus</i>	尼羅口孵非鯽	NP	C	+	+	+	+	+		+	+	+	+		+	+	+	+		+	+	+	+		+	+	+	+		+	+	+	+
<i>Parazacco spilurus</i>	異鱧	V and	C	+	+	+	+	+		+	+	+	+		+	+	+	+		+	+	+	+		+	+	+	+		+	+	+	+
<i>Poecilia reticulata</i>	孔雀花魚將	NP	VC			+	+	+			+	+	+			+	+	+			+	+	+			+	+	+			+	+	+
<i>Pseudogastromyzon myersi</i>	麥氏擬腹吸鰾	NP	C	+	+	+				+	+				+					+					+					+			
<i>Pterocryptis cochinchinensis</i>	黃鰲	NP	C	+			+			+		+			+					+					+					+			
<i>Puntius semifasciolatus</i>	七星魚	NP	C	+	+	+	+	+		+	+	+	+		+	+	+	+		+	+	+	+		+	+	+	+		+	+	+	+
<i>Rhinogobius spp.</i>	鰕虎魚	NP	C/UN/R	+	+	+	+	+		+	+	+	+		+	+	+	+		+	+	+	+		+	+	+	+		+	+	+	+
<i>Schistura fasciolata</i>	橫紋南鰾	NP	C	+	+	+	+			+	+	+			+	+	+			+	+	+			+	+	+			+	+	+	
<i>Xiphophorus hellerii</i>	劍尾魚	NP	C	+	+	+	+	+		+	+	+	+		+	+	+	+		+	+	+	+		+	+	+	+		+	+	+	+
<i>Xiphophorus variatus</i>	雜色劍尾魚	NP	C	+		+	+				+	+	+			+	+				+	+				+	+				+	+	
<i>Zacco platypus</i>	寬鰭鱈	NP	C	+	+	++	+++	++		+	++	+++	++		+	++	++	++		+	+	+	+		+	+	+	+		+	+	+	+
2x2m fish counting			No. of fish	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					
No. of species				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					
Amphibian																																	
<i>Paramesotriton hongkongensis</i>	香港瘰螈	P (Cap 170, NT, PGC)	R	+	+	+	+	+		+	+	+	+		+	+	+	+		+	+	+	+		+	+	+	+		+	+	+	+
<i>Fejervarya limnocharis</i>	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					

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 arc

-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 Animals Protction Ordinance (Cap.170)

"NT" - Near Treated in IUCN Red List Status

"PGC"-Potential Gola 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)

Species	Chinese name	Status	Sampling point	Post construction monitoring					Post construction monitoring					Post construction monitoring					Post construction monitoring					Post construction monitoring				
				Aug-14					Sep-14					Oct-14					Nov-14					Dec-14				
				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
Fish																												
<i>Acrossocheilus parallens</i>	側條光唇魚	P, PGC	R		++	++	++	+		++	++	++	+		++	++	++	+		++	++	++	++		++	++	++	++
<i>Channa maculate</i>	斑鱧	NP	C																									
<i>Cirrhina molitorella</i>	鯪魚	NP	C																									
<i>Clarias fuscus</i>	胡子鯪	NP	C					+					+														+	
<i>Cyprinus carpio var. viridiviolaceus</i>	錦鯉	NP	C																									
<i>Gambusia affinis</i>	食蚊魚	NP	VC		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Liniparhomaloptera disparis</i>	擬平鰾	NP	C		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
<i>Misgurnus anguillicaudatus</i>	泥鰾	NP	C		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
<i>Oreochromis niloticus</i>	尼羅口孵非鯽	NP	C		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
<i>Parazacco spilurus</i>	異鱧	V and	C		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
<i>Poecilia reticulata</i>	孔雀花魚將	NP	VC					+					+														+	
<i>Pseudogastromyzon myersi</i>	麥氏擬腹吸鰾	NP	C		+	+	+			+	+	+	+		+	+	+	+		+	+	+	+		+	+	+	
<i>Pterocryptis cochinchinensis</i>	黃鯪	NP	C		+			+		+	+	+	+		+	+	+	+		+	+	+	+		+	+	+	
<i>Puntius semifasciolatus</i>	七星魚	NP	C		+	+	++	++	+	+	+	++	++	+	+	+	++	++	+	+	+	++	++	+	+	+	+	
<i>Rhinogobius spp.</i>	鰕虎魚	NP	C/UN/R		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
<i>Schistura fasciolata</i>	橫紋南鰕	NP	C		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
<i>Xiphophorus hellerii</i>	劍尾魚	NP	C		+	++	++	+		+	++	++	+		+	++	++	+		+	++	++	+		+	++	++	
<i>Xiphophorus variatus</i>	雜色劍尾魚	NP	C					+					+					+					+				+	
<i>Zacco platypus</i>	寬鰭鱈	NP	C		+	++	++	+	+	+	++	++	+	+	+	++	++	+	+	+	++	++	+	+	+	+	+	
2x2m fish counting		No. of fish		10	12	18	10	12	20	30	30	20	20	30	40	40	30	30	50	70	70	60	60	60	60	60	50	
No. of species				10	12	13	13	11	11	13	14	15	13	11	13	14	15	12	11	13	14	13	11	11	13	14	14	
Amphibian																												
<i>Paramesotriton hongkongensis</i>	香港瘰螈	P (Cap 170, NT, PGC)	R		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
<i>Fejervarya limnocharis</i>	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	

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 arc

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

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"NT" - Near Treatedened in IUCN Red List Status

"PGC"-Potential Golar 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)

Species	Chinese name	Status	Commonness	Post construction monitoring					Post construction monitoring					Post construction monitoring					Post construction monitoring					Post construction monitoring					
				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	
<i>Acrossocheilus parallens</i>	側條光唇魚	P, PGC	R		++	++	++	++		++	++	++	++		++	++	++	++		++	++	++	++		+	+	++	++	
<i>Channa maculate</i>	斑鱧	NP	C																									+	
<i>Cirrhina molitorella</i>	鯪魚	NP	C																										
<i>Clarias fuscus</i>	胡子鯪	NP	C					+					+																+
<i>Cyprinus carpio var. viridiviolaceus</i>	錦鯉	NP	C																										+
<i>Gambusia affinis</i>	食蚊魚	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Liniparhomaloptera disparis</i>	擬平鰾	NP	C	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Misgurnus anguillicaudatus</i>	泥鰍	NP	C	+			+	+	+	+			+	+	+			+	+	+	+	+	+	+	+	+	+	+	+
<i>Oreochromis niloticus</i>	尼羅口孵非鯽	NP	C	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Parazacco spilurus</i>	異鱧	V and	C	+	+	+	+	+	+	+	+	+	+	+	++	+	+	+	+	+	++	+	+	+	+	+	+	+	+
<i>Poecilia reticulata</i>	孔雀花魚將	NP	VC				+					+			+	+				+	+				+	+		+	
<i>Pseudogastromyzon myersi</i>	麥氏擬腹吸鰍	NP	C	+	+	+	+		+	+	+	+		+	+	+		+	+	+	+		+	+		+	+		
<i>Pterocryptis cochinchinensis</i>	黃鰷	NP	C	+		+			+	+	+	+		+	+	+		+	+	+	+		+	+		+	+		
<i>Puntius semifasciolatus</i>	七星魚	NP	C	+	+	++	++	+	+	+	++	++	+	+	+	++	++	+	+	+	++	++	+	+	+	++	++	+	+
<i>Rhinogobius spp.</i>	鰕虎魚	NP	C/UN/R	+	++	++	++	++	+	+	++	++	++	+	+	++	++	++	+	+	++	++	++	++	+	++	++	++	++
<i>Schistura fasciolata</i>	橫紋南鰾	NP	C	+	+	+	+		+	+	+	+		+	+	+	+		+	+	+	+		+	+	+	+	+	
<i>Xiphophorus hellerii</i>	劍尾魚	NP	C		+	++	++	+		+	++	++	+		+	++	++	+		+	++	++	+	+	+	++	++	+	+
<i>Xiphophorus variatus</i>	雜色劍尾魚	NP	C				+					+				+	+					+	+		+	+		+	
<i>Zacco platypus</i>	寬鰭鱈	NP	C	+	++	++	++	+	+	+	++	++	+	+	++	++	++	+	+	++	++	++	++	+	+	++	++	+	+
2x2m fish counting		No. of fish		50	50	60	60	60	50	60	60	60	40	50	60	60	60	40	40	50	55	50	40	20	30	30	20	20	
No. of species				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																													
<i>Paramesotriton hongkongensis</i>	香港瘰螈	P (Cap 170, NT, PGC)	R	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Fejervarya limnocharis</i>	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	

Note: NP – Not protected in Hong Kong

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

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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)

Species	Chinese name	Status	Sampling point	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					
				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	
Fish																													
<i>Acrossocheilus parallens</i>	側條光唇魚	P, PGC	R		+	+	++	++		+	+	+	+		+	+	+	+			+	+	+			+	+	+	
<i>Channa maculate</i>	斑鱧	NP	C					+					+															+	
<i>Cirrhina molitorella</i>	鯪魚	NP	C																										
<i>Clarias fuscus</i>	胡子鯪	NP	C					+					+															+	
<i>Cyprinus carpio var. viridiviolaceus</i>	錦鯉	NP	C					+					+															+	
<i>Gambusia affinis</i>	食蚊魚	NP	VC		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
<i>Liniparhomaloptera disparis</i>	擬平鰾	NP	C		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
<i>Misgurnus anguillicaudatus</i>	泥鰾	NP	C		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
<i>Oreochromis niloticus</i>	尼羅口孵非鯽	NP	C		+	+	++	+	+	+	++	++	++	++	+	++	++	++	++	+	+	++	++	++	+	+	++	++	++
<i>Parazacco spilurus</i>	異鱧	V and	C		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
<i>Poecilia reticulata</i>	孔雀花魚將	NP	VC				+	+				+	+			+	+				+	+	+			+	+	+	
<i>Pseudogastromyzon myersi</i>	麥氏擬腹吸鰾	NP	C		+	+				+	+				+	+					+	+				+	+		
<i>Pterocryptis cochinchinensis</i>	黃鰷	NP	C		+					+					+						+					+			
<i>Puntius semifasciolatus</i>	七星魚	NP	C		+	+	++	++	+	+	+	++	++	+	+	+	++	++	+	+	+	++	++	+	+	+	++	++	+
<i>Rhinogobius spp.</i>	鰕虎魚	NP	C/UN/R		+	++	++	++	++	+	++	++	++	++	+	++	++	++	++	+	++	++	++	++	+	++	++	++	++
<i>Schistura fasciolata</i>	橫紋南鰾	NP	C		+	+	+			+	++	++			+	++	++				+	++	++			+	++	++	
<i>Xiphophorus hellerii</i>	劍尾魚	NP	C		+	+	++	+	+	+	+	++	+	+	+	+	++	+	+	+	+	+	++	+	+	+	+	+	
<i>Xiphophorus variatus</i>	雜色劍尾魚	NP	C				+	+				+	+			+	+				+	+				+	+		
<i>Zacco platypus</i>	寬鰭鱈	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	
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	
Amphibian																													
<i>Paramesotriton hongkongensis</i>	香港瘰螈	P (Cap 170, NT, PGC)	R		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
<i>Fejervarya limnocharis</i>	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	

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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)

Species	Chinese name	Status	Sampling point	Post construction monitoring					Post construction monitoring					Post construction monitoring					Post construction monitoring					
				Nov-16					Dec-16					Jan-17					Feb-17					
				Reference	T1	T2	T3	T4	Reference	T1	T2	T3	T4	Reference	T1	T2	T3	T4	Reference	T1	T2	T3	T4	
Fish																								
<i>Acrossocheilus parallens</i>	側條光唇魚	P, PGC	R			+	+	++			+	+	++			+	+	++			+	+	++	
<i>Channa maculate</i>	斑鱧	NP	C																					
<i>Cirrhina molitorella</i>	鯪魚	NP	C																					
<i>Clarias fuscus</i>	胡子鯪	NP	C				+					+					+					+		
<i>Cyprinus carpio var. viridiviolaceus</i>	錦鯉	NP	C				+					+					+					+		
<i>Gambusia affinis</i>	食蚊魚	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
<i>Liniparhomaloptera disparis</i>	擬平鰕	NP	C	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
<i>Misgurnus anguillicaudatus</i>	泥鰕	NP	C	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
<i>Oreochromis niloticus</i>	尼羅口孵非鯽	NP	C	+	+	++	++	++	+	+	+	++	++	++	+	+	++	++	++	+	+	++	++	++
<i>Parazacco spilurus</i>	異鱧	V and	C	+		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
<i>Poecilia reticulata</i>	孔雀花魚將	NP	VC			+	+	+			+	+	+			+	+	+			+	+	+	
<i>Pseudogastromyzon myersi</i>	麥氏擬腹吸鰕	NP	C	+	+				+	+					+	+				+	+			
<i>Pterocryptis cochinchinensis</i>	黃鰔	NP	C	+					+						+					+				
<i>Puntius semifasciolatus</i>	七星魚	NP	C	+	+	++	++	+	+	+	++	++	+	+	+	++	++	+	+	+	++	++	+	
<i>Rhinogobius spp.</i>	鰕虎魚	NP	C/UN/R	+	++	++	++	++	+	++	++	++	++	+	++	++	++	++	+	++	++	++	++	
<i>Schistura fasciolata</i>	橫紋南鰕	NP	C	+	++	++			+	++	++			+	++	++			+	++	++			
<i>Xiphophorus hellerii</i>	劍尾魚	NP	C	+	+	++	+	+	+	+	++	+	+	+	+	++	+	+	+	+	++	+	+	
<i>Xiphophorus variatus</i>	雜色劍尾魚	NP	C			+	+				+	+			+	+				+	+			
<i>Zacco platypus</i>	寬鰭鱈	NP	C	+	+	++	++	++	+	+	++	++	++	+	+	++	++	++	+	+	++	++	++	
2x2m fish counting		No. of fish		30	30	30	30	25	45	40	40	35	35	50	45	45	35	35	55	50	50	40	40	
No. of species				12	10	14	13	10	12	10	14	13	10	12	10	14	13	10	12	10	14	13	10	
Amphibian																								
<i>Paramesotriton hongkongensis</i>	香港瘰螈	P (Cap 170, NT, PGC)	R	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
<i>Fejervarya limnocharis</i>	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	

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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)

Parameter / date	Baseline monitoring	Impact monitoring				Impact monitoring				Impact monitoring				Impact monitoring				Impact monitoring				Impact monitoring			
	8-Aug	Jan-09				Jul-09				Jan-10				Jul-10				Jan-11				Jul-11			
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
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
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
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
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
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
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
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
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			
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			
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
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
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

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)

Parameter / date	Impact monitoring				Impact monitoring				Impact monitoring				Impact monitoring				Post construction monitoring			
	Jan-12				Jul-12				Aug-13				Dec-13				Jan-14			
Replicate	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4
DO (mg/L)	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	9.1	9.0	8.6	8.5
pH	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	6.2	6.9	7.1	7.1
Nitrate (mg N/L)	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	0.9	0.8	1.3	1.26
Ammonia (mg/L)	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	0.04	0.1	0.12	0.15
Salinity (ppt)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Conductivity (µS/cm)	92	84	96	110	41	38	73	86	67	77	74	75	62	64	90	110	72	78	88	108
BOD (mg/L)	<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			
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			
Sand (%)	10	15	10	10	10	10	10	10	10	10	10	10	5	5	5	5	5	5	5	5
Stone (%)	80	70	80	70	60	60	60	60	75	75	75	75	90	85	85	85	90	85	85	85
Mud (%)	10	15	10	20	30	30	30	30	15	15	15	15	5	10	10	10	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)

Parameter / date	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							
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
DO (mg/L)	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	7.6	7.4	7.3	7.6
pH	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	7.8	7.5	7.6	7.8
Nitrate (mg N/L)	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	1.1	0.9	1.1
Ammonia (mg/L)	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
Salinity (ppt)	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
Conductivity (µS/cm)	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	75	78	82	86
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
Water flow at pool (m/s)	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							
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							
Sand (%)	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
Stone (%)	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
Mud (%)	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

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)

Parameter / date	Post construction monitoring				Post construction monitoring				Post construction monitoring				Post construction monitoring				Post construction monitoring			
	Aug-16				Sep-16				Oct-16				Nov-16				Dec-16			
Replicate	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4
DO (mg/L)	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	8.0	8.0	8.0	8.0
pH	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	7.6	7.7	7.6	7.6
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
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
Salinity (ppt)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Conductivity (µS/cm)	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	32.0	32.0	34.0	36.0
BOD (mg/L)	<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			
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			
Sand (%)	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
Mud (%)	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)

Parameter / date	Post construction monitoring				Post construction monitoring			
	Jan-17				Feb-17			
Replicate	T1	T2	T3	T4	T1	T2	T3	T4
DO (mg/L)	7.9	7.9	8.0	8.0	7.9	8.0	8.0	8.0
pH	7.6	7.6	7.6	7.6	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
Ammonia (mg/L)	< 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
Conductivity (µS/cm)	33.0	32.0	35.0	36.0	29.0	29.0	32.0	35.0
BOD (mg/L)	<2	<2	<2	<2	<2	<2	<2	<2
Water flow at pool (m/s)	0.03-0.2				0.03-0.2			
Water flow at riffle (m/s)	0.2-0.5				0.2-0.5			
Sand (%)	5	5	8	10	5	5	8	10
Stone (%)	93	90	90	75	93	90	90	75
Mud (%)	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.38)
She Shan River

February 2017



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20 March, 2017

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20 March, 2017

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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.38) 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 38 post-construction ecological monitoring report for the project conducted **on 14th of February 2017**. 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 14th of February 2017**;
- Fauna and flora along the drainage project sections are 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 is low; 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°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, 78 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 0.2m to 0.5m as observed along survey transect. The vegetation cleared were generally recovered. 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, and 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, 22 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 *Egretta garzetta* (Photo 4), *Ardeola bacchus* (Photo 5), *Motacilla cinerea*, *Alcedo atthis* and *Motacilla alba*. 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*, *Ardea alb* and *Egretta garzetta* are considered as Regional Concern by Fellowes *et al.* (2002). *Myophonus caeruleus* (Photo 6), was recorded roosting in the lower section of the river. It is the first time of recording this species in She Shan River. 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. 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 low and similar to last month. Most of the odoanta species in Hong Kong has the peak emergence from spring to late summer. Low abundance of odoanta was due to seasonality. It is expected that number of odonata will keep in low abundance during dry season (Wilson *et al.*, 2004 & Tam *et al.*, 2011). A total of 3 species was recorded, those recorded species were mostly common species in Hong Kong (Photo 7). The result of this month was similar to approximate period of last year. Mating behavior was not noticed during the survey. Sampling location was shown on **Figure 1**.

4.2.3 Aquatic Macro-invertebrates

Survey of aquatic marco-invertebrates was carried out (Photo 8). The river benthic fauna collected was mainly comprised of insects, mollusks and crustaceans (Photos 9&10). 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 8). However, Hong Kong New was not 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 were collected according to project specification and EM & A Manual. Hong Kong New was not recorded during the survey. The rest of fauna was in a natural fluctuation. Low abundance and diversity of odonata was recorded due to seasonality.

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.

6 REFERENCES

Carey, G.J., Chalmers, M.L., Diskin, D.A., Kennerley, P.R., Leader, P.J., Leven, M.R., Lewthwaite, R.W., Melville, D.S., Turnbull, M. and Yung, L.(2001). *The Avifauna of Hong Kong*. Hong Kong Bird Watching Society.

Dudgeon, D. and Corlett, R. (1994). *Hills and Streams - An Ecology of Hong Kong*. Hong Kong University Press, Hong Kong.

Dudgeon, D. (2003). *Hillstreams*. The Department of Ecology & Biodiversity of The University of Hong Kong and Wan Li Book Co, Ltd. Hong Kong.

Fellowes, J.R., Lau, M.W.N., Dudgeon, D., Reels, G., Ades, G.W.J., Carey, G.J., Chan, B.P.L., Kendrick, R.C., Lee, K.S., Leven, M.R., Wilson, K.D.P. & Yu, Y.T. (2002). Wild animals to watch: Terrestrial and freshwater fauna of conservation concern in Hong Kong. *Memoirs of the Hong Kong Natural History Society* 25: 123-159.

Hong Kong Herbarium (2015) :
<http://herbarium.gov.hk/>

Hong Kong Biodiversity Website (2015) :
<http://www.afcd.gov.hk/english/conservation/hkbiodiversity/hkbiodiversity.html>

Lai, P.C.C., Lam, Y.W., So, P.S., Tam, K.Y., Wan, P.Y.M. and Yip, K.L. (2004). *Check List of Hong Kong Plants*, Agriculture, Fisheries and Conservation Department. Hong Kong.

Lee, V.L.F., Lam, S.K.S., NG, F.K.Y., Chan, T.K.T. and Young, M.L.C. (2004). *Field Guide to the Freshwater Fish of Hong Kong*, Friends of the Country Parks and Cosmos Books Ltd, Hong Kong.

Tam, T.W., Leung, K.K., Kwan, B.P. S., Wu, K. K. Y., Tang, S. S. H., So, I.W.Y., Cheng, J.C.Y., Yuen, E.F.M., Tsang, Y.M and Leung, H.W. (2011). *The Dragonflies of Hong Kong*. Agriculture, Fisheries and Conservation Department, Friends of the Country Parks and Cosmos Books Ltd., Hong Kong.

Wilson, K.D.P., Tam, K.W., Kwan, B.S.P., Wu, K.K.Y., Wong, B.S.F. and Wong, J.K. (2004). *Field guide to the dragonflies of Hong Kong (2nd Edition)*. Agriculture, Fisheries and Conservation Department, Friends of the Country Parks and Cosmos Books Ltd., Hong Kong.

FIGURE

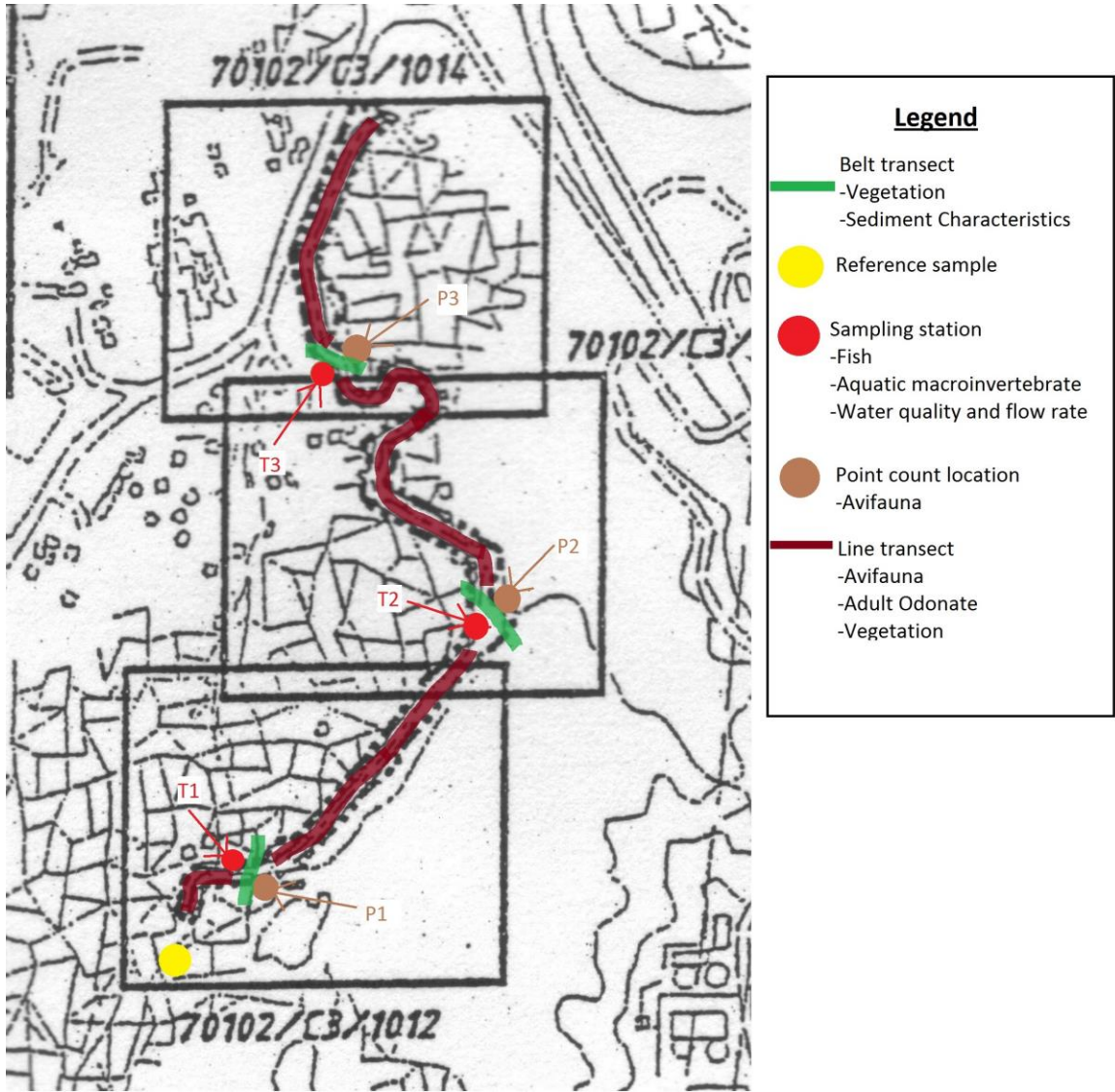


Figure 1. Sampling Location of Ecological Survey and Monitoring at She Shan River, Tai Po.

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 –*Egretta garzetta*



Photo 5 : Avifauna – *Ardeola bacchus*



Photo 6 : Avifauna –*Myophonus caeruleus*



Photo 7: Odonata - *Neurobasis chinensis chinensis*



Photo 8: Kick Sampling



Photo 9: Aquatic sample



Photo 10: Aquatic sample

TABLE

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)

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

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

Family	Species	Chinese name	Impact monitoring									Post construction monitoring																					
			Jul-13			Dec-13			Jan-14			Feb-14			Mar-14																		
			T1	T2	T3	T1	T2	T3	T1	T2	T3	T1	T2	T3	T1	T2	T3																
Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%	Height(m)	%												
Commelinaceae	<i>Commelina diffusa</i>	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	0.3	20	0.5	35	0.3	6	
Poaceae	<i>Panicum repens</i>	枯骨草											0.2	1					0.2	1					0.2	1					0.4	1	
Asteraceae	<i>Mikania micrantha</i>	薇甘菊						0.1	10				0.2	1	0.1	10			0.2	1	0.1	10			0.2	1	0.1	10			0.2	1	
Brassicaceae	<i>Nasturtium officinale</i>	西洋菜																															
Moraceae	<i>Ficus microcarpa</i>	細葉榕																															
Moraceae	<i>Ficus hispida</i>	對葉榕																															
Poaceae	<i>Microstegium ciliatum</i>	剛秀竹			0.8	35																											
Fabaceae	<i>Pueraria lobata</i>	野葛																															
Araceae	<i>Colocasia esculenta</i>	芋																															
Urticaceae	<i>Boehmeria nivea</i>	苧麻																															
Asteraceae	<i>Bidens alba</i>	白花鬼針草											0.3	1					0.3	1					0.4	1					0.4	1	
Poaceae	<i>Pennisetum purpureum</i>	象草			2.5	5		1.5	10	1.5	10			1.5	10	1.5	10			1.5	10	1.5	10			1.5	5	1.5	5				
Poaceae	<i>Coix lacryma-jobi</i>	薏苡																															
Amaranthaceae	<i>Alternanthera philoxeroides</i>	空心蓮子草																															
Poaceae	<i>Panicum maximum</i>	大黍																															
Moraceae	<i>Broussonetia papyrifera</i>	構樹																															
Polygonaceae	<i>Polygonum chinense</i>	火炭母																															
Onagraceae	<i>Ludwigia hyssopifolia</i>	草龍											0.3	2					0.3	2					0.4	1					0.4	1	
Cyperaceae	<i>Cyperus sp.</i>	莎草																															
Poaceae	<i>Miscanthus floridulus</i>	五節芒																															
Poaceae	<i>Brachiaria mutica</i>	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			1.5	60	0.8	30				
Blechnaceae	<i>Blechnum orientale</i>	烏毛蕨				0.3	1																										
Poaceae	<i>Pennisetum alopecuroides</i>	狼尾草																															
Araceae	<i>Alocasia macrorrhizos</i>	海芋																															
Lemnaceae	<i>Lemna minor</i>	浮萍																															
Polygonaceae	<i>Polygonum hydropiper</i>	水蓼																															
Cyperaceae	<i>Cyperus involucratus</i>	風車草																															
Onagraceae	<i>Ludwigia erecta</i>	美洲水丁香	0.8	3			0.5	5		0.8	30					0.8	30					0.8	30					0.8	25				
Convolvulaceae	<i>Ipomoea cairica</i>	五爪金龍																															
Bare Gound				65		5		94	10		10			94		5		10			94		5		5		91		5		5		90

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																		
		Apr-14						May-14						Jun-14						Jul-14						Aug-14						
Stream		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)	%		
Commelinaceae	<i>Commelina diffusa</i>	節節草			0.5	30					0.5	20				0.5	25					0.5	25					0.5	25			
Poaceae	<i>Panicum repens</i>	枯骨草																														
Asteraceae	<i>Mikania micrantha</i>	薇甘菊	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	0.3	12	0.3	12	0.3	5
Brassicaceae	<i>Nasturtium officinale</i>	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	0.3	1			0.3	1
Moraceae	<i>Ficus microcarpa</i>	細葉榕																														
Moraceae	<i>Ficus hispida</i>	對葉榕																														
Poaceae	<i>Microstegium ciliatum</i>	剛秀竹																														
Fabaceae	<i>Pueraria lobata</i>	野葛																														
Araceae	<i>Colocasia esculenta</i>	芋																														
Urticaceae	<i>Boehmeria nivea</i>	苧麻																														
Asteraceae	<i>Bidens alba</i>	白花鬼針草			0.3	5	0.8	1			0.3	5	0.8	1			0.3	5	0.8	1			0.3	5	0.8	2		0.3	5	0.8	5	
Poaceae	<i>Pennisetum purpureum</i>	象草																														
Poaceae	<i>Coix lacryma-jobi</i>	薏苡				0.8	1				0.8	1				0.8	1					0.8	1						1.2	1		
Amaranthaceae	<i>Alternanthera philoxeroides</i>	空心蓮子草																														
Poaceae	<i>Panicum maximum</i>	大黍																														
Moraceae	<i>Broussonetia papyrifera</i>	構樹																														
Polygonaceae	<i>Polygonum chinense</i>	火炭母																														
Onagraceae	<i>Ludwigia hyssopifolia</i>	草龍																														
Cyperaceae	<i>Cyperus sp.</i>	莎草																														
Poaceae	<i>Miscanthus floridulus</i>	五節芒																														
Poaceae	<i>Brachiaria mutica</i>	巴拉草	1.5	50	1	50			1.5	40	1	40			1.5	45	1	45			1.5	45	1	45			1.5	50	1	50		
Blechnaceae	<i>Blechnum orientale</i>	烏毛蕨																														
Poaceae	<i>Pennisetum alopecuroides</i>	狼尾草	2	20					2	15					2	15					2	12					2	10				
Araceae	<i>Alocasia macrorrhizos</i>	海芋				0.8	1				0.8	1				0.8	1					0.8	1					0.8	1			
Lemnaceae	<i>Lemna minor</i>	浮萍				N.A	5				N.A	5				N.A	5					N.A	1					N.A	1			
Polygonaceae	<i>Polygonum hydropiper</i>	水蓼																														
Cyperaceae	<i>Cyperus involucratus</i>	風車草																														
Onagraceae	<i>Ludwigia erecta</i>	美洲水丁香				1	2				1	2				1	2					1	4					1	6			
Convolvulaceae	<i>Ipomoea cairica</i>	五爪金龍																														
Bare Gound				0		5		84		30		25		84		25		15		84		31		15		87		27		8	80	

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)

Family	Species	Chinese name	Post construction monitoring						Post construction monitoring						Post construction monitoring						Post construction monitoring						Post construction monitoring					
			Stream		Sep-14		Oct-14		Nov-14		Dec-14		Jan-15		T1		T2		T3		T1		T2		T3		T1		T2		T3	
			Transect	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	<i>Commelina diffusa</i>	節節草			0.5	25			1	10	1	50	0.1	2	1	10	1	50	0.1	2	1	10	1	50	0.1	2	0.5	10	0.8	70	0.3	40
Poaceae	<i>Panicum repens</i>	枯骨草																														
Asteraceae	<i>Mikania micrantha</i>	薇甘菊	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	0.4	10	0.5	15		
Brassicaceae	<i>Nasturtium officinale</i>	西洋菜	0.3	1			0.3	1																								
Moraceae	<i>Ficus microcarpa</i>	細葉榕																														
Moraceae	<i>Ficus hispida</i>	對葉榕																														
Poaceae	<i>Microstegium ciliatum</i>	剛秀竹																														
Fabaceae	<i>Pueraria lobata</i>	野葛																														
Araceae	<i>Colocasia esculenta</i>	芋																														
Urticaceae	<i>Boehmeria nivea</i>	苧麻																														
Asteraceae	<i>Bidens alba</i>	白花鬼針草			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	<i>Pennisetum purpureum</i>	象草																														
Poaceae	<i>Coix lacryma-jobi</i>	薏苡					1.5	1				1.5	1					1.5	1				1.5	1								
Amaranthaceae	<i>Alternanthera philoxeroides</i>	空心蓮子草																														
Poaceae	<i>Panicum maximum</i>	大黍																														
Moraceae	<i>Broussonetia papyrifera</i>	構樹																														
Polygonaceae	<i>Polygonum chinense</i>	火炭母																														
Onagraceae	<i>Ludwigia hyssopifolia</i>	草龍																														
Cyperaceae	<i>Cyperus sp.</i>	莎草																														
Poaceae	<i>Miscanthus floridulus</i>	五節芒																														
Poaceae	<i>Brachiaria mutica</i>	巴拉草	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	1.5	80	1	5	1	25
Blechnaceae	<i>Blechnum orientale</i>	烏毛蕨																														
Poaceae	<i>Pennisetum alopecuroides</i>	狼尾草	2	10					2	15	3	5			2	10	3	2			2	10	3	2								
Araceae	<i>Alocasia macrorrhizos</i>	海芋				0.8	1																									
Lemnaceae	<i>Lemna minor</i>	浮萍					N.A	1																								
Polygonaceae	<i>Polygonum hydropiper</i>	水蓼						1	3					1	1					1	1											
Cyperaceae	<i>Cyperus involucratus</i>	風車草							1.7	2				1.7	1					1.7	1						1.5	5				
Onagraceae	<i>Ludwigia erecta</i>	美洲水丁香				1	6	1.5	1			2	5	1.5	1			2	5	1.5	1			2	5					2	10	
Convolvulaceae	<i>Ipomoea cairica</i>	五爪金龍																														
Bare Gound				27		8		80		2		0		75		2		1		72		2		1		72		0		5		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)

Family	Species	Chinese name	Post construction monitoring									Post construction monitoring									Post construction monitoring									Post construction monitoring									Post construction monitoring								
			Stream			Feb-15			Mar-15			Apr-15			May-15			Jun-15			T1			T2			T3			T1			T2			T3											
			Transect	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	<i>Commelina diffusa</i>	節節草	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	0.3	5	0.7	50	0.5	25															
Poaceae	<i>Panicum repens</i>	枯骨草																																													
Asteraceae	<i>Mikania micrantha</i>	薇甘菊	0.4	10	0.5	15			0.4	10	0.5	15			0.4	10	0.5	15			0.3	5	0.5	10			0.3	5	0.5	10																	
Brassicaceae	<i>Nasturtium officinale</i>	西洋菜																																													
Moraceae	<i>Ficus microcarpa</i>	細葉榕																																													
Moraceae	<i>Ficus hispida</i>	對葉榕																																													
Poaceae	<i>Microstegium ciliatum</i>	剛秀竹																																													
Fabaceae	<i>Pueraria lobata</i>	野葛																																													
Araceae	<i>Colocasia esculenta</i>	芋																																													
Urticaceae	<i>Boehmeria nivea</i>	苧麻																																													
Asteraceae	<i>Bidens alba</i>	白花鬼針草																																													
Poaceae	<i>Pennisetum purpureum</i>	象草																																													
Poaceae	<i>Coix lacryma-jobi</i>	薏苡																																													
Amaranthaceae	<i>Alternanthera philoxeroides</i>	空心蓮子草																																													
Poaceae	<i>Panicum maximum</i>	大黍																																													
Moraceae	<i>Broussonetia papyrifera</i>	構樹																																													
Polygonaceae	<i>Polygonum chinense</i>	火炭母																																													
Onagraceae	<i>Ludwigia hyssopifolia</i>	草龍																																													
Cyperaceae	<i>Cyperus sp.</i>	莎草																																													
Poaceae	<i>Miscanthus floridulus</i>	五節芒																																													
Poaceae	<i>Brachiaria mutica</i>	巴拉草	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	1.5	45	1.2	10	1.2	20															
Blechnaceae	<i>Blechnum orientale</i>	烏毛蕨																																													
Poaceae	<i>Pennisetum alopecuroides</i>	狼尾草																																													
Araceae	<i>Alocasia macrorrhizos</i>	海芋																																													
Lemnaceae	<i>Lemna minor</i>	浮萍																																													
Polygonaceae	<i>Polygonum hydropiper</i>	水蓼																																													
Cyperaceae	<i>Cyperus involucratus</i>	風車草			1.5	5					1.5	5					1.5	5					1.4	5				1.4	5																		
Onagraceae	<i>Ludwigia erecta</i>	美洲水丁香					2	10					2	10											1.6	5				1.6	5																
Convolvulaceae	<i>Ipomoea cairica</i>	五爪金龍																																													
Bare Gound				0		5		25		0		5		25		0		5		25		50		30		55		45		25	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)

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

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

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

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

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					
		Transect	Nov-16						Dec-16						Jan-17						Feb-17					
Family	Species	Chinese name	T1		T2		T3		T1		T2		T3		T1		T2		T3		T1		T2		T3	
			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	<i>Commelina diffusa</i>	節節草																								
Poaceae	<i>Panicum repens</i>	枯骨草			0.6	15	0.6	8																		
Asteraceae	<i>Mikania micrantha</i>	薇甘菊																								
Brassicaceae	<i>Nasturtium officinale</i>	西洋菜																								
Moraceae	<i>Ficus microcarpa</i>	細葉榕																								
Moraceae	<i>Ficus hispida</i>	對葉榕																								
Poaceae	<i>Microstegium ciliatum</i>	剛秀竹			0.6	10	0.5	15			0.1	10					0.2	10					0.3	10		
Fabaceae	<i>Pueraria lobata</i>	野葛																								
Araceae	<i>Colocasia esculenta</i>	芋																								
Urticaceae	<i>Boehmeria nivea</i>	苧麻																								
Asteraceae	<i>Bidens alba</i>	白花鬼針草																						0.2	2	
Poaceae	<i>Pennisetum purpureum</i>	象草	1.5	15																						
Poaceae	<i>Coix lacryma-jobi</i>	薏苡																								
Amaranthaceae	<i>Alternanthera philoxeroides</i>	空心蓮子草	1.1	10					0.1	10					0.2	10					0.3	10				
Poaceae	<i>Panicum maximum</i>	大黍																								
Moraceae	<i>Broussonetia papyrifera</i>	構樹																								
Polygonaceae	<i>Polygonum chinense</i>	火炭母																								
Onagraceae	<i>Ludwigia hyssopifolia</i>	草龍																								
Cyperaceae	<i>Cyperus sp.</i>	莎草																								
Poaceae	<i>Miscanthus floridulus</i>	五節芒																								
Poaceae	<i>Brachiaria mutica</i>	巴拉草			0.6	15	0.6	20			0.1	15	0.1	20			0.2	15	0.2	20			0.3	20	0.3	20
Blechnaceae	<i>Blechnum orientale</i>	烏毛蕨	0.5	15	1	10	1	10	0.1	15	0.1	10	0.1	10	0.2	15	0.2	10	0.2	10	0.3	15	0.2	10	0.2	10
Poaceae	<i>Pennisetum alopecuroides</i>	狼尾草																								
Araceae	<i>Alocasia macrorrhizos</i>	海芋																					0.2	5	0.2	5
Lemnaceae	<i>Lemna minor</i>	浮萍																								
Polygonaceae	<i>Polygonum hydropiper</i>	水蓼																								
Cyperaceae	<i>Cyperus involucratus</i>	風車草																					0.3	5	0.3	5
Onagraceae	<i>Ludwigia erecta</i>	美洲水丁香																								
Convolvulaceae	<i>Ipomoea cairica</i>	五爪金龍			0.3	5	0.4	5			0.1	5	0.1	5			0.2	5	0.2	5			0.2	5	0.2	5
Bare Gound					0.4	5					0.4	5					0.5	5					0.5	5		
					60		45		42		75		60		65		75		60		65		75		43	55

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	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-16			Aug-16			Sep-16			Oct-16			Nov-16			Dec-16			Jan-17			Feb-17		
					Abundance	Abundance	Abundance	Abundance	Abundance	Abundance	Abundance	Abundance	Abundance	Abundance	Abundance	Abundance	Abundance	Abundance	Abundance	Abundance	Abundance	Abundance	Abundance	Abundance	Abundance	Abundance		
Ashy Drongo	<i>Dicrurus leucophaeus</i>	灰卷尾	SWV, LC	U																								
Barn Swallow	<i>Hirundo rustica</i>	家燕	PM	C	++	5		++	2				+															
Black Drongo	<i>Dicrurus macrocoerces</i>	黑卷尾	Sv	C																+								
Black Kite	<i>Milvus lineatus</i>	黑鷹	R, RC, Cap. 586	C						+																		
Black-necked Starling	<i>Sturnus nigricollis</i>	黑頸椋鳥	R	C	++		3	++	2	1	++	2	C	++	3	++	2	2	++	3	++	2	2	++	3	2		
Black-throated Laughingthrush	<i>Garrulax chinensis</i>	黑喉噪鶇	R	C																								
Blue Whistling Thrush	<i>Myiophonus caeruleus</i>	紫嘯鶇	R	C																				+	1			
Buzzard (Common Buzzard)	<i>Buteo buteo</i>	普通鵟	WV, Cap. 586	U																								
Chestnut Bulbul	<i>Hemixos castanonotus</i>	栗背短腳鶇	R, WV	C																								
Chinese Blackbird	<i>Turdus mandarinus</i>	烏鶇	WV	C																+								
Chinese Bulbul	<i>Pycnonotus sinensis</i>	白頸鶇	R, RC	C	++	3	3	3	++	2	1	4	++	3	4	++	2	3	2	++	3	2	++	2	3	2		
Chinese Pond Heron	<i>Ardeola bacchus</i>	池鶇	R, RC	C	+		1	+		1	+		1	+		1	+		1	+		1	+		1	+		
Chinese Hwamei	<i>Garrulax canorus</i>	畫眉	R, Cap. 586	U																								
Chinese Sparrowhawk	<i>Accipiter soloensis</i>	赤腹鷹	PM, Cap. 586	U										+														
Common Emerald Dove	<i>Chalcophaps indica</i>	綠翅金鳩	R, VU	U																								
Common Kingfisher	<i>Alcedo atthis</i>	普通翠鳥	R	C				+				+							+				+					
Common Koel	<i>Eudynamis scolopacea</i>	喙鹇	R	C	+																			+				
Common Sandpiper	<i>Actitis hypoleucos</i>	磯鶇	WV&P, M	C																								
Common Tailorbird	<i>Orthotomus sutorius</i>	長尾縫紉鶇	R	C	+		1	1	+		1	1	+	1	1	+	1	1	+	1	1	+	1	1	+	1		
Crested bulbul	<i>Pycnonotus jocosus</i>	紅耳鶇	R	C	+++	7	8	2	+++	9	8	6	+++	9	8	6	+++	7	6	2	+++	8	5	2	+++	12		
Crested Goshawk	<i>Accipiter trivirgatus</i>	鳳頭鷹	R, CR, Cap. 586	U																								
Crested Myna	<i>Acridotheres cristatellus</i>	八哥	R	C	+		3	3	+	2		2	++	3	2		++	3	2	++	2	2	++	4	++			
Crested Serpent Eagle	<i>Spilornis cheela</i>	蛇鶇	R, VU, LC, Cap. 586	U					+																			
Domestic pigeon	<i>Columba sp.</i>	鴿	R	C																								
Dusky Warbler	<i>Phylloscopus fuscatus</i>	褐柳鶇	WV	C	+				+				+						+						+			
Eurasian tree sparrow	<i>Passer montanus</i>	麻雀	R	C	++	5	2	3	++	3	3	++	3	3	2	++	4	4	3	++	3	3	4	++	3			
Fork-tailed Sunbird	<i>Aethopyga christinae</i>	叉尾太陽鳥	R	C																								
Great Coucal	<i>Centropus sinensis</i>	褐翅鴉鶇	R, VU	C					+				+						+				+					
Great Egret	<i>Ardea alba</i>	大白鶇	R, RC	C																				+	1			
Great Tit	<i>Parus major/commixtus</i>	大山雀	R	C																								
Green Sandpiper	<i>Tringa ochropus</i>	白腹草鶇	PM&W, V	C	+		1	+		1						+	1											
Grey Heron	<i>Ardea cinerea</i>	蒼鶇	WV, PRC	C																								
Grey Wagtail	<i>Motacilla cinerea</i>	灰鶇鶇	WV	C	+		1	1	+	2	1		+	1	1	+	1	1	+	1	1	+	1	1	+	1		
Japanese White Eye	<i>Zosterops japonica (simplex)</i>	暗綠繡眼鳥	R	C	++		3	++		4	++		++		3	3	++		2	++		2	2	++	3			
Large Hawk Cuckoo	<i>Cuculus sparveroides</i>	鷹鴉	SV	C																								
Little Egret	<i>Egretta garzetta</i>	小白鶇	R, RC	C	+		1	+		1	+		1	+		1	+		1	+	1	+		1	+			
Maggie Robin	<i>Copsychus saularis</i>	鶇鶇	R	C	+	2	2		+	2	2		+	2	1	+	1	1	+	1	1	1	+	2	2			
Night Heron	<i>Nycticorax nycticorax</i>	夜鶇	R, LC	C																								
Olive Backed Pipit	<i>Anthus hodgsoni</i>	樹鶇	WV	C																								
Oriental Dollarbird	<i>Eurystomus orientalis</i>	三寶鳥	PM	U																								
Plaintive Cuckoo	<i>Cacomantis merulinus</i>	八聲杜鵑	SV	C																								
Plain Prinia	<i>Prinia inornata</i>	纯色鶇鶇	R	C	+				+				+						+					+				
Red-flanked Bluetail	<i>Tarsiger cyanurus</i>	紅扇藍尾鶇	WV&P, M	C																								
Rufous-backed Shrike	<i>Lanius schach</i>	棕背伯勞	R	C	+				+				+						+					+				
Rufous-capped Babbler	<i>Stachyridopsis ruficeps</i>	紅頭穗鶇	R, LC	U	+				+																+			
Scarlet Minivet	<i>Pericrocotus speciosus</i>	赤紅山椒鳥	R	C																								
Sooty-headed Bulbul	<i>Pycnonotus aurigaster</i>	白喉紅臀鶇	R	C																								
Spotted Dove	<i>Streptopelia chinensis</i>	珠頸斑斑鶇	R	C	++	4	2	5	++	3	3	4	++	4	2	4	++	3	3	4	++	4	2	2	++			
Spotted Mania	<i>Lanchara punctulata</i>	斑文鳥	R	C																								
Stejneger's Stonechat	<i>Saxicola stejnegeri</i>	黑喉石鶇	PM, WV	C																								
White Wagtail	<i>Motacilla alba</i>	白鶇鶇	WV	C	+		1	1	+	1	1		+	1	1		+	1	1		+	2	1		+			
White-breasted Waterhen	<i>Amaurornis phoeniceus</i>	白胸苦惡鳥	R	C					+																			
Yellow Bellid Prinia	<i>Prinia flaviventris</i>	黃腹鶇鶇	R	C	+				+				+					+					+		+			
Yellow Bittern	<i>Isohyachus sinensis</i>	黃葦鶇	WV, PM, LC	U																								
Number of birds						26	26	25		26	26	21		26	27	19		21	23	19		21	21	21				
No. of species						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 study area

Commonness and status were decided according 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 4.4. Odonate species recorded at the She Shan River

Species name	Common name	Chinese name	Status	Commonness	Baseline 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	Jul-13	Dec-13	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14	Aug-14	Sep-14				
<i>Agriocnemis pygmalis</i>	Wandering Midget	黃尾小蠅	NP	VC																+									
<i>Brachythemis contaminata</i>	Asian Amberwing	黃翅蜻	NP	VC																									
<i>Burmagomphus vermicularis</i>	Dog-legged Clubtail	聯紋緬春蜓	P, LC	C																									
<i>Ceriagrion auranticum ryukyuanum</i>	Orange-tailed Sprite	琉球橘黃蠅	NP	VC																	+	++	+			+			
<i>Copera ciliata</i>	Black-knees Featherlegs	白狹扇蠅	NP	VC																									
<i>Copera marginipes</i>	Yellow Featherlegs	黃狹扇蠅	NP	VC																	+				+		+	+	
<i>Crocothemis servilia servilia</i>	Crimson Darter	紅蜻	NP	VC	+	+		+		++		+											+		+	+	+	+	
<i>Diplacodes trivialis</i>	Blue Percher	紋藍小蜻	NP	VC	+																								
<i>Ictinogomphus pertinax</i>	Common Flangetail	霸王葉春蜓	NP	C												+													
<i>Ischnura senegalensis</i>	Common Bluetail	褐斑異痣蠅	NP	VC																									
<i>Nannophya pygmaea</i>	Scarlet Dwarf	侏紅小蜻	NP	C																									
<i>Neurobasis chinensis chinensis</i>	Chinese Greenwing	華艷色蠅	NP	VC																									
<i>Neurothemis fulvia</i>	Russet Percher	網脈蜻	NP	VC																						+	+		
<i>Orthetrum chrysis</i>	Red-faced Skimmer	華麗灰蜻	NP	VC	+	+		+	+																				
<i>Orthetrum glaucum</i>	Common blue skimmer	黑尾灰蜻	NP	VC																									
<i>Orthetrum luzonicum</i>	Marsh Skimmer	呂宋灰蜻	NP	VC																									
<i>Orthetrum pruinosum neglectum</i>	Common Red Skimmer	赤褐灰蜻	NP	VC																									
<i>Orthetrum Sabina sabina</i>	Green Skimmer	狹腹灰蜻	NP	C	+	+																							
<i>Pantala flavescens</i>	Wandering Glider	黃蜻	NP	VC	+	+			+	+	+	+	+++	+	+	+	+	+	+	+									
<i>Prodasineura autumnalis</i>	Black Threadtail	烏齒原蠅	NP	VC																									
<i>Pseudagrion pruinosum fraseri</i>	Ferruginous-faced Sprite	赤斑蠅	NP	C																									
<i>Pseudagrion rubriceps rubriceps</i>	Orange-faced Sprite	丹頂斑蠅	NP	UC	+			+	+																				
<i>Rhinocypha perforata perforata</i>	Common Blue Jewel	三斑鼻蠅	NP	VC																									
<i>Rhyothemis variegata arria</i>	Variiegated Flutterer	斑麗翅蜻	NP	C																									
<i>Trithemis aurora</i>	Crimson Dropwing	曉褐蜻	NP	VC																									
<i>Trithemis festiva</i>	Indigo Dropwing	慶褐蜻	NP	VC					+																				
<i>Zygonyx iris insignis</i>	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 according 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

Species name	Common name	Chinese name	Status	Commonness	Post construction monitoring														
					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
<i>Agriocnemis pygmalis</i>	Wandering Midget	黃尾小蠓	NP	VC															
<i>Brachythemis contaminata</i>	Asian Amberwing	黃翅蜻	NP	VC															
<i>Burmagomphus vermicularis</i>	Dog-legged Clubtail	聯紋緬春蜓	P, LC	C															
<i>Ceriagrion auranticum ryukyuanum</i>	Orange-tailed Sprite	琉球橘黃蠓	NP	VC						+	+	+	+	+	+	+			
<i>Copera ciliata</i>	Black-knees Featherlegs	白狹扇蠓	NP	VC															
<i>Copera marginipes</i>	Yellow Featherlegs	黃狹扇蠓	NP	VC	+					+	+	+	+	+	+	+			
<i>Crocothemis servilia servilia</i>	Crimson Darter	紅蜻	NP	VC	+	+	+	+		+	+	+	+	+	+	+	+	+	
<i>Diplacodes trivialis</i>	Blue Percher	紋藍小蜻	NP	VC															
<i>Ictinogomphus pertinax</i>	Common Flangetail	霸王葉春蜓	NP	C	+							+	+	+	+	+	+	+	
<i>Ischnura senegalensis</i>	Common Bluetail	褐斑異痣蠓	NP	VC															
<i>Nannophya pygmaea</i>	Scarlet Dwarf	侏紅小蜻	NP	C															
<i>Neurobasis chinensis chinensis</i>	Chinese Greenwing	華艷色蠓	NP	VC	+	+				+	+	+			+	+	+	+	
<i>Neurothemis fulvia</i>	Russet Percher	網脈蜻	NP	VC						+	+	+	+	+	+	+	+	+	
<i>Orthemtrum chrysis</i>	Red-faced Skimmer	華麗灰蜻	NP	VC											+	+	+	+	
<i>Orthemtrum glaucum</i>	Common blue skimmer	黑尾灰蜻	NP	VC															
<i>Orthemtrum luzonicum</i>	Marsh Skimmer	呂宋灰蜻	NP	VC									+	+					
<i>Orthemtrum pruinosum neglectum</i>	Common Red Skimmer	赤褐灰蜻	NP	VC	+						+	+	+	+					
<i>Orthemtrum Sabina sabina</i>	Green Skimmer	狹腹灰蜻	NP	C	+												+	+	
<i>Pantala flavescens</i>	Wandering Glider	黃蜻	NP	VC	+	+						+	+	+	+	+	+	+	+
<i>Prodasineura autumnalis</i>	Black Threadtail	烏齒原蠓	NP	VC							+	+	+	+	+				
<i>Pseudagrion pruinosum fraseri</i>	Ferruginous-faced Sprite	赤斑蠓	NP	C															
<i>Pseudagrion rubriceps rubriceps</i>	Orange-faced Sprite	丹頂斑蠓	NP	UC	+	+													
<i>Rhinocypha perforata perforata</i>	Common Blue Jewel	三斑鼻蠓	NP	VC	+	+					+	+	+	+	+	+	+	+	
<i>Rhyothemis variegata arria</i>	Variiegated Flutterer	斑麗翅蜻	NP	C									+	+	+	+	+	+	
<i>Trithemis aurora</i>	Crimson Dropwing	曉褐蜻	NP	VC	+	+	+	+			+	+	+	+	+	+	+	+	+
<i>Trithemis festiva</i>	Indigo Dropwing	慶褐蜻	NP	VC	+	+					+	+	+	+	+	+	+	+	+
<i>Zygonyx iris insignis</i>	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

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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 according 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	Commonness	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Jan-17	Feb-17
<i>Agriocnemis pygmalis</i>	Wandering Midget	黃尾小蠓	NP	VC														
<i>Brachythemis contaminata</i>	Asian Amberwing	黃翅蜻	NP	VC														
<i>Burmagomphus vermicularis</i>	Dog-legged Clubtail	聯紋緬春蜓	P, LC	C						+								
<i>Ceriagrion auranticum ryukyuanum</i>	Orange-tailed Sprite	琉球橘黃蠓	NP	VC				+	+	+	+	+	+	+	+			
<i>Copera ciliata</i>	Black-knees Featherlegs	白狹扇蠓	NP	VC				+	+	+	+	+	+					
<i>Copera marginipes</i>	Yellow Featherlegs	黃狹扇蠓	NP	VC						+	+	+	+					
<i>Crocothemis servilia servilia</i>	Crimson Darter	紅蜻	NP	VC				+	+	+	+	+	+	+	+			
<i>Diplacodes trivialis</i>	Blue Percher	紋藍小蜻	NP	VC														
<i>Ictinogomphus pertinax</i>	Common Flangetail	霸王葉春蜓	NP	C					+	+	+	+	+	+				
<i>Ischnura senegalensis</i>	Common Bluetail	褐斑異痣蠓	NP	VC								+	+					
<i>Nannophya pygmaea</i>	Scarlet Dwarf	侏紅小蜻	NP	C														
<i>Neurobasis chinensis chinensis</i>	Chinese Greenwing	華艷色蠓	NP	VC				+	+	+	+	+	+	+	+			+
<i>Neurothemis fulvia</i>	Russet Percher	網脈蜻	NP	VC				+	+	+	+	+	+	+				
<i>Orthetrum chrysis</i>	Red-faced Skimmer	華麗灰蜻	NP	VC	+			+	+	+	+	+	+	+	+			
<i>Orthetrum glaucum</i>	Common blue skimmer	黑尾灰蜻	NP	VC														
<i>Orthetrum luzonicum</i>	Marsh Skimmer	呂宋灰蜻	NP	VC				+	+	+	+	+		+	+			
<i>Orthetrum pruinosum neglectum</i>	Common Red Skimmer	赤褐灰蜻	NP	VC														
<i>Orthetrum Sabina sabina</i>	Green Skimmer	狹腹灰蜻	NP	C														
<i>Pantala flavescens</i>	Wandering Glider	黃蜻	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Prodasineura autumnalis</i>	Black Threadtail	烏齒原蠓	NP	VC														
<i>Pseudagrion pruinosum fraseri</i>	Ferruginous-faced Sprite	赤斑蠓	NP	C														
<i>Pseudagrion rubriceps rubriceps</i>	Orange-faced Sprite	丹頂斑蠓	NP	UC										+				
<i>Rhinocypha perforata perforata</i>	Common Blue Jewel	三斑鼻蠓	NP	VC					+	+	+							
<i>Rhyothemis variegata arria</i>	Variiegated Flutterer	斑麗翅蜻	NP	C						+	+	+	+					
<i>Trithemis aurora</i>	Crimson Dropwing	曉褐蜻	NP	VC			+	+	+	+	+	+	+	+	+			
<i>Trithemis festiva</i>	Indigo Dropwing	慶褐蜻	NP	VC	+		+	+	+	+	+	+	+	+	+	+	+	+
<i>Zygonyx iris insignis</i>	Emerald Cascader	彩虹蜻	P,PG	VC														
No of Species					3	1	3	10	12	15	14	14	13	11	8	2	2	3

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“++” – Species common in the study area

“+++” – Species abundance in the study area

Commonness and status were decided according to AFCD biodiversity website

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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		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				Jan-12																				
				Status	Common-ness	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	Reference	T1	T2	T3	Reference	T1	T2	T3															
Mollusks																																																				
<i>Anodonta woodiana</i>	背角無齒蚌	NP	VC																																																	
<i>Biomphalaria sp.</i>	--	NP	VC	+	+	+	+	+																																												
<i>Brotia hainanensis</i>	--	NP	VC	+	+	+	+	+																																												
<i>Corbicula fluminea</i>	河蚬	NP	VC																																																	
<i>Melanoides tuberculata</i>	瘤擬黑螺	NP	VC	+	+	+	++																																													
<i>Pomacea canaliculata</i>	蘋果螺	NP	VC	+	++	+	+	+																																												
<i>Radix plicatulus</i>	--	NP	VC	+	+	+	+	+																																												
<i>Sinotaia quadrata</i>	田螺	NP	VC	+	+	+	++	+																																												
Insects																																																				
<i>Baetis sp.</i>		NP	VC	+	+	+	+	+																																												
<i>Caenis sp.</i>	--	NP	VC	+	+	+	+	+																																												
<i>Chironomus sp.</i>	蠓幼虫	NP	VC	+	+	++	++	+																																												
<i>Euphaea sp.</i>		NP	VC																																																	
<i>Indobaetis sp.</i>	--	NP	VC	+	+	+	+	+																																												
<i>Odonate larvae</i>		NP	VC																																																	
<i>Orthetrum spp.</i>	--	NP	VC																																																	
<i>Pseudagrion spp.</i>	--	NP	UC																																																	
<i>Pseudocloeon sp.</i>	--	NP	VC	+	+	+	+																																													
<i>Serratella sp.</i>		NP	VC	+	+	+	+																																													
Crustaceans																																																				
<i>Caridina cantanensis</i>	廣東米蝦	NP	VC																																																	
<i>Cryptopotamon anacoluthon</i>	鯉刺溪蟹	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																	

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

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											
				Jul-14				Aug-14				Sep-14				Oct-14				Nov-14				Dec-14				Jan-15				Feb-15				Mar-15							
				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																																											
<i>Anodonta woodiana</i>	背角無齒蚌	NP	VC																																								
<i>Biomphalaria sp.</i>	--	NP	VC	+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+	+	+	
<i>Brotia hainanensis</i>	--	NP	VC	+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+	+	+	
<i>Corbicula fluminea</i>	河蚬	NP	VC			+	+			+	+			+	+			+	+			+	+			+	+			+	+			+	+			+	+			+	+
<i>Melanoides tuberculata</i>	瘤擬黑螺	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Pomacea canaliculata</i>	蘋果螺	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Radix plicatulus</i>	--	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Sinotaia quadrata</i>	田螺	NP	VC	+	+	+	+	+	+	++	+	+	+	++	+	+	+	++	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	++	+
Insects																																											
<i>Baetis sp.</i>		NP	VC		+	+			+	+			+	+			+	+			+	+			+	+			+	+			+	+			+	+			+	+	
<i>Caenis sp.</i>	--	NP	VC																																								
<i>Chironomus sp.</i>	螻幼虫	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Euphaea sp.</i>		NP	VC			+				+				+				+				+				+				+				+				+				+	
<i>Indobaetis sp.</i>	--	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Odonate larvae</i>		NP	VC																																								
<i>Orthetrum spp.</i>	--	NP	VC	+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+	+	+	
<i>Pseudagrion spp.</i>	--	NP	UC	+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+	+	+	
<i>Pseudocloeon sp.</i>	--	NP	VC							+				+				+				+				+				+				+				+				+	
<i>Serratella sp.</i>		NP	VC			+				+				+				+				+				+				+				+				+				+	
Crustaceans																																											
<i>Caridina cantanensis</i>	廣東米蝦	NP	VC																																								
<i>Cryptopotamon anacoluthon</i>	鯉刺溪蟹	NP	VC																																								
No of Species				10	11	14	7	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				

Note: NP – Not protected in Hong Kong;
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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											
				Apr-15				May-15				Jun-15				Jul-15				Aug-15				Sep-15				Oct-15				Nov-15				Dec-15							
				Referend	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																																											
<i>Anodonta woodiana</i>	背角無齒蚌	NP	VC																																								
<i>Biomphalaria sp.</i>	--	NP	VC	+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+	+	+	
<i>Brotia hainanensis</i>	--	NP	VC	+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+	+	+	
<i>Corbicula fluminea</i>	河蜆	NP	VC			+				+				+				+				+				+				+				+				+				+	
<i>Melanoides tuberculata</i>	瘤擬黑螺	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	++	+	+	+	++	+	+	+	++	+	+	+	++	+	+	+	++	+
<i>Pomacea canaliculata</i>	蘋果螺	NP	VC	+	+	+	+	+	+	+	+	+	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	+	++	++	+	+	++	++	+	+	++	++	+	+	++	++	+
<i>Radix plicatulus</i>	--	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Sinotaia quadrata</i>	田螺	NP	VC	+	+	++	+	+	+	+	++	+	+	+	++	+	+	+	++	+	+	+	++	+	+	+	++	+	+	+	++	+	+	+	++	+	+	+	++	+	+	+	++
Insects																																											
<i>Baetis sp.</i>		NP	VC			+				+				+				+				+				+				+				+				+				+	
<i>Caenis sp.</i>	--	NP	VC																																								
<i>Chironomus sp.</i>	蠓幼虫	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Euphaea sp.</i>		NP	VC	+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+	+	+	
<i>Indobaetis sp.</i>	--	NP	VC					+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+	+	+	
<i>Odonate larvae</i>		NP	VC		+																																						
<i>Orthetrum spp.</i>	--	NP	VC					+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Pseudagrion spp.</i>	--	NP	UC		+	+			+	+			+	+			+	+			+	+			+	+			+	+			+	+			+	+			+	+	
<i>Pseudocloeon sp.</i>	--	NP	VC	+	+	+	+																																				
<i>Serratella sp.</i>		NP	VC		+	+			+	+			+	+			+	+			+	+			+	+			+	+			+	+			+	+			+	+	
Crustaceans																																											
<i>Caridina cantanensis</i>	廣東米蝦	NP	VC														+				+				+				+				+				+				+		
<i>Cryptopotamon anacoluthon</i>	鯉刺溪蟹	NP	VC																																								
No of Species				9	12	13	6	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				

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 - Reference point was the sampling location outside the works

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							
		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																																			
<i>Anodonta woodiana</i>	背角無齒蚌	NP	VC																																
<i>Biomphalaria sp.</i>	--	NP	VC	+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+	+	+	
<i>Brotia hainanensis</i>	--	NP	VC	+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+	+	+	
<i>Corbicula fluminea</i>	河蚌	NP	VC			+				+				+				+				+				+				+				+	
<i>Melanoides tuberculata</i>	瘤擬黑螺	NP	VC	+	+	++	+	+	+	++	+	+	+	++	+	+	+	++	+	+	+	++	+	+	+	++	+	+	+	++	+	+	+	++	+
<i>Pomacea canaliculata</i>	蘋果螺	NP	VC	+	++	++	+	+	++	++	+	+	++	++	+	+	++	++	+	+	++	++	+	+	++	++	+	+	++	++	+	+	++	++	+
<i>Radix plicatulus</i>	--	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Sinotaia quadrata</i>	田螺	NP	VC	+	+	++	++	+	+	++	++	+	+	++	++	+	+	++	++	+	+	++	++	+	+	++	++	+	+	++	++	+	+	++	++
Insects																																			
<i>Baetis sp.</i>		NP	VC			+				+				+				+				+				+				+				+	
<i>Caenis sp.</i>	--	NP	VC																																
<i>Chironomus sp.</i>	螻蛄幼虫	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Euphaea sp.</i>		NP	VC		+	+			+	+			+	+			+	+			+	+			+	+			+	+			+	+	
<i>Indobaetis sp.</i>	--	NP	VC	+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+	+	+	
<i>Odonate larvae</i>		NP	VC		+	+			+	+			+	+			+	+			+	+			+	+			+	+			+	+	
<i>Orithrum spp.</i>	--	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Pseudagrion spp.</i>	--	NP	UC		+	+			+	+			+	+			+	+			+	+			+	+			+	+			+	+	
<i>Pseudocloeon sp.</i>	--	NP	VC																																
<i>Serratella sp.</i>		NP	VC		+				+				+				+				+				+				+				+		
Crustaceans																																			
<i>Caridina cantanensis</i>	廣東米蝦	NP	VC		+	+			+	+			+	+			+	+			+	+			+	+			+	+			+	+	
<i>Cryptopotamon anacoluthon</i>	鯉刺溪蟹	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	9	14	16	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

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				
		Status	Common-ness	Sep-16				Oct-16				Nov-16				Dec-16				Jan-17				Feb-17				
				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																												
<i>Anodonta woodiana</i>	背角無齒蚌	NP	VC																									
<i>Biomphalaria sp.</i>	--	NP	VC	+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		
<i>Brotia hainanensis</i>	--	NP	VC	+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		
<i>Corbicula fluminea</i>	河蜆	NP	VC			+				+				+				+			+					+		
<i>Melanoides tuberculata</i>	瘤擬黑螺	NP	VC	+	++	++	+	+	++	++	+	+	++	++	+	+	++	++	+	+	++	++	+	+	++	++	+	
<i>Pomacea canaliculata</i>	蘋果螺	NP	VC	+	++	++	+	+	++	++	+	+	++	++	+	+	++	++	+	+	++	++	+	+	++	++	+	
<i>Radix plicatulus</i>	--	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
<i>Sinotaia quadrata</i>	田螺	NP	VC	+	+	++	++	+	+	++	++	+	+	++	++	+	+	++	++	+	+	++	++	+	+	++	++	
Insects																												
<i>Baetis sp.</i>		NP	VC			+				+				+				+					+				+	
<i>Caenis sp.</i>	--	NP	VC																									
<i>Chironomus sp.</i>	蠓幼虫	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
<i>Euphaea sp.</i>		NP	VC		+	+			+	+			+	+			+	+			+	+			+	+		
<i>Indobaetis sp.</i>	--	NP	VC	+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		
<i>Odonate larvae</i>		NP	VC		+	+			+	+			+	+			+	+			+	+			+	+		
<i>Orthetrum spp.</i>	--	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
<i>Pseudagrion spp.</i>	--	NP	UC		+	+			+	+			+	+			+	+			+	+			+	+		
<i>Pseudocloeon sp.</i>	--	NP	VC																									
<i>Serratella sp.</i>		NP	VC		+				+				+				+				+				+			
Crustaceans																												
<i>Caridina cantanensis</i>	廣東米蝦	NP	VC		+	+			+	+			+	+			+	+			+	+			+	+		
<i>Cryptopotamon anacoluthon</i>	鯉刺溪蟹	NP	VC			+				+				+				+				+				+		
No of Species				9	14	16	6	9	14	16	6	9	14	16	6	9	14	16	6	9	14	16	6	9	14	16	6	

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- Reference point was the sampling location outside the works

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)

Species		Status	Commonness	Baseline 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											
				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	Reference	T1	T2	T3								
<i>Channa maculata</i>	斑鱧	NP	C																																				
<i>Clarias gariepinus</i>	革胡子鯰	NP	VC																																				
<i>Gambusia affinis</i>	食蚊魚	NP	VC			++	++	+		+	+	+					+		+		+		+	+		+	+	+		+		+		+		+			
<i>Misgurnus anguillicaudatus</i>	泥鰍	NP	C																+		+																		
<i>Oreochromis niloticus</i>	尼羅口孵非鯽	NP	C			+	++					+		+						+		+	++		+														
<i>Parazacco spilurus</i>	異鱧	NP, V	C	+	++	+	++	+	+	+	++	+	+	+					+	+		+	++		+														
<i>Poecilia reticulata</i>	孔雀花魚將	NP	VC			++	++					+	+						+		+	+		+	+		+												
<i>Pterocryptis cochinchinensis</i>	越南隱鱧鯉	NP	C																																				
<i>Puntius semifasciolatus</i>	七星魚	NP	C	+++	++	+++	+++	++		+	+	+					+		+		+	+	+	+	+	+		+											
<i>Rhinogobius spp.</i>	鰕虎魚	NP	C			+	+	+		+	+	+							+		+	+	+	+	+	+		+											
<i>Xiphophorus hellerii</i>	劍尾魚	NP	C	+	+	++	++	+		+	+	+			+++	+		+		+		+	+	+	+	+		+											
<i>Xiphophorus variatus</i>	雜色劍尾魚	NP	C			+	+															+	+																
<i>Zacco platypus</i>	寬鱧鱮	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																																							
<i>Paramesotriton hongkongensis</i>	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 Animals Protection Ordinance (Cap.170)
 "NT" - Near Threatened in IUCN Red List Status
 "PGC" - Potential Global Concern by Fellowes *et al* (2002)
 "V" - Vulnerable - 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)

Species		Status	Commonness	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			
				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
<i>Channa maculata</i>	斑鱧	NP	C																					+				+	+	+	
<i>Clarias gariepinus</i>	革胡子鯰	NP	VC																					+				+			
<i>Gambusia affinis</i>	食蚊魚	NP	VC	+	+	+		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Misgurnus anguillicaudatus</i>	泥鰍	NP	C					+				+				+				+				+				+	+	+	
<i>Oreochromis niloticus</i>	尼羅口孵非鯽	NP	C	+				+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Parazacco spilurus</i>	異鱾	NP, V	C	+				+	+	+		+	+	+		+	+	+		+	+	++	++	+	+	+		+	+	+	+
<i>Poecilia reticulata</i>	孔雀花魚將	NP	VC	+	+			+				+	+	+										+				+	+	+	+
<i>Pterocryptis cochinchinensis</i>	越南隱鱮	NP	C																					+				+			
<i>Puntius semifasciolatus</i>	七星魚	NP	C	+	+			+	+	+		+	+	+		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Rhinogobius spp.</i>	鰕虎魚	NP	C	+	+			+	+	+		+	+	+		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Xiphophorus hellerii</i>	劍尾魚	NP	C	+	+			+	+	+	+	+	+	+	+	+	+	+	+	+	+	++	++	+	+	+	+	+	+	+	+
<i>Xiphophorus variatus</i>	雜色劍尾魚	NP	C													+				+					+				+	+	
<i>Zacco platypus</i>	寬鱮	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																															
<i>Paramesotriton hongkongensis</i>	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 Animals Protection Ordinance (Cap.170)

"NT" - Near Threatened in IUCN Red List Status

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

"V" - Vulnerable - 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)

Species		Status	Commonness	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			
				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
<i>Channa maculata</i>	斑鱧	NP	C	+	+	+		+	+	+		+	+			+	+			+	+	+		+	+	+		+	+		
<i>Clarias gariepinus</i>	革胡子鯰	NP	VC	+						+				+			+	+			+	+			+	+			+	+	
<i>Gambusia affinis</i>	食蚊魚	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
<i>Misgurnus anguillicaudatus</i>	泥鰍	NP	C	+	+	+		+	+	+		+		+	+	+		+		+	+	+	+	+	+	+	+	+	+	+	
<i>Oreochromis niloticus</i>	尼羅口孵非鯽	NP	C	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
<i>Parazacco spilurus</i>	異鱧	NP, V	C	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
<i>Poecilia reticulata</i>	孔雀花魚將	NP	VC	+	+	+	+	+	+	+	+	+		+						+										+	
<i>Pterocryptis cochinchinensis</i>	越南隱鱧	NP	C	+		+				+						+					+									+	
<i>Puntius semifasciolatus</i>	七星魚	NP	C	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
<i>Rhinogobius spp.</i>	鰕虎魚	NP	C	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
<i>Xiphophorus hellerii</i>	劍尾魚	NP	C	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
<i>Xiphophorus variatus</i>	雜色劍尾魚	NP	C		+	+	+			+	+			+			+			+			+								
<i>Zacco platypus</i>	寬鱧	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																															
<i>Paramesotriton hongkongensis</i>	香港瘰螈	P, Cap 170, NT, PGC	R			+								+																+	

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

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

"V" - Vulnerable - 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)

Species		Status	Commonness	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				
				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
<i>Channa maculata</i>	斑鱧	NP	C		+	+							+				+				+				+			
<i>Clarias gariepinus</i>	革胡子鯰	NP	VC			+				+				+				+			+	+				+		+
<i>Gambusia affinis</i>	食蚊魚	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Misgurnus anguillicaudatus</i>	泥鰍	NP	C	+	+	+				+				+	+			+	+		+	+	+		+	+	+	
<i>Oreochromis niloticus</i>	尼羅口孵非鯽	NP	C	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	++	+		+	+	++	+
<i>Parazacco spilurus</i>	異鱾	NP, V	C	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Poecilia reticulata</i>	孔雀花魚將	NP	VC				+									+	+				+	+				+	+	
<i>Pterocryptis cochinchinensis</i>	越南隱鱮	NP	C			+				+					+						+						+	
<i>Puntius semifasciolatus</i>	七星魚	NP	C	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Rhinogobius spp.</i>	鰕虎魚	NP	C	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Xiphophorus hellerii</i>	劍尾魚	NP	C	+	+	+	+	+			+	+			+	+			+	+	+	+		+	+	+	+	+
<i>Xiphophorus variatus</i>	雜色劍尾魚	NP	C			+				+					+					+	+			+	+	+	+	
<i>Zacco platypus</i>	寬鱮	NP	C	+	++	++	+	+	++	++	+	+	++	++	+	+	++	++	+	+	++	++	+	+	++	++	+	+
			2x2m fish number	50	50	60	50	60	50	50	40	50	40	40	50	40	30	40	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																												
<i>Paramesotriton hongkongensis</i>	香港瘰螈	P, Cap 170, NT, PGC	R			+				+				+						+						+		

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"V" - Vulnerable - 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)

Species		Status	Commonness	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			
				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
<i>Channa maculata</i>	斑鱧	NP	C		+	+				+				+					+					+				+			
<i>Clarias gariepinus</i>	革胡子鯰	NP	VC			+	+			+	+			+	+				+	+				+	+			+	+		
<i>Gambusia affinis</i>	食蚊魚	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		
<i>Misgurnus anguillicaudatus</i>	泥鰍	NP	C	+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+	+		
<i>Oreochromis niloticus</i>	尼羅口孵非鯽	NP	C	+	+	++	++	+	+	++	++	+	+	++	++	+	++	++	+	++	++	+	++	++	+	++	++	+	++	++	
<i>Parazacco spilurus</i>	異鱧	NP, V	C	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		
<i>Poecilia reticulata</i>	孔雀花魚將	NP	VC			+	+			+	+			+	+				+	+				+	+			+	+		
<i>Pterocryptis cochinchinensis</i>	越南隱鱨	NP	C			+				+				+					+					+				+			
<i>Puntius semifasciolatus</i>	七星魚	NP	C	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		
<i>Rhinogobius spp.</i>	鰕虎魚	NP	C	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		
<i>Xiphophorus hellerii</i>	劍尾魚	NP	C	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		
<i>Xiphophorus variatus</i>	雜色劍尾魚	NP	C			+	+			+	+			+	+				+	+				+	+			+	+		
<i>Zacco platypus</i>	寬鱮	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																															
<i>Paramesotriton hongkongensis</i>	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)

Species		Status	Commonness	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				
				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
<i>Channa maculata</i>	斑鱧	NP	C			+				+					+					+							+	
<i>Clarias gariepinus</i>	革胡子鯰	NP	VC			+	+			+	+			+	+				+	+					+	+		+
<i>Gambusia affinis</i>	食蚊魚	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Misgurnus anguillicaudatus</i>	泥鰍	NP	C	+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+
<i>Oreochromis niloticus</i>	尼羅口孵非鯽	NP	C	+	++	++		+	++	++	+	+	++	++	+	+	++	++	+	+	++	++	+	+	++	++	+	+
<i>Parazacco spilurus</i>	異鱧	NP, V	C	+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+
<i>Poecilia reticulata</i>	孔雀花魚將	NP	VC			+	+			+	+			+	+			+	+			+	+			+	+	
<i>Pterocryptis cochinchinensis</i>	越南隱鱨	NP	C			+																						
<i>Puntius semifasciolatus</i>	七星魚	NP	C	+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+
<i>Rhinogobius spp.</i>	鰕虎魚	NP	C	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Xiphophorus hellerii</i>	劍尾魚	NP	C	+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+	+	+		+
<i>Xiphophorus variatus</i>	雜色劍尾魚	NP	C			+	+			+	+			+	+			+	+			+	+			+	+	
<i>Zacco platypus</i>	寬鱮	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	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																												
<i>Paramesotriton hongkongensis</i>	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)

Species		Status	Commonness	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			
				Reference	T1	T2	T3	Reference	T1	T2	T3	Reference	T1	T2	T3	Reference	T1	T2	T3	Reference	T1	T2	T3
<i>Channa maculata</i>	斑鱧	NP	C			+				+					+						+		
<i>Clarias gariepinus</i>	革胡子鯰	NP	VC			+	+			+	+				+						+		
<i>Gambusia affinis</i>	食蚊魚	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
<i>Misgurnus anguillicaudatus</i>	泥鰍	NP	C	+	+	+		+	+	+		+	+	+		+	+	+		+	+		
<i>Oreochromis niloticus</i>	尼羅口孵非鯽	NP	C	+	++	++	+	+	++	++	+	+	++	++	+	+	++	++	+	+	++	++	+
<i>Parazacco spilurus</i>	異鱧	NP, V	C	+	+	+		+	+	+		+	+	+		+	+	+		+	+	+	
<i>Poecilia reticulata</i>	孔雀花魚將	NP	VC			+	+			+	+				+						+		
<i>Pterocryptis cochinchinensis</i>	越南隱鱮	NP	C																				
<i>Puntius semifasciolatus</i>	七星魚	NP	C	+	+	+		+	+	+		+	+	+		+	+	+		+	+	+	
<i>Rhinogobius spp.</i>	鰕虎魚	NP	C	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
<i>Xiphophorus hellerii</i>	劍尾魚	NP	C	+	+	+		+	+	+		+	+	+		+	+	+		+	+	+	
<i>Xiphophorus variatus</i>	雜色劍尾魚	NP	C			+	+			+	+			+			+				+		
<i>Zacco platypus</i>	寬鱮	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
			No of Species	8	8	12	7	8	8	12	8	8	8	12	5	8	8	12	5	8	8	12	5
Amphibian																							
<i>Paramesotriton hongkongensis</i>	香港瘰螈	P, Cap 170, NT, PGC	R															+				+	

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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.

"Cap 170" - List in Wild Animals Protection Ordinance (Cap.170)

"NT" - Near Threatened in IUCN Red List Status

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

"V" - Vulnerable - 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)

Species		Status	Commonness	Post construction monitoring				Post construction monitoring				Post construction monitoring				Post construction monitoring			
				Nov-16				Dec-16				Jan-17				Feb-17			
				Reference	T1	T2	T3	Reference	T1	T2	T3	Reference	T1	T2	T3	Reference	T1	T2	T3
<i>Channa maculata</i>	斑鱧	NP	C			+				+					+				
<i>Clarias gariepinus</i>	革胡子鯰	NP	VC			+				+					+				
<i>Gambusia affinis</i>	食蚊魚	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
<i>Misgurnus anguillicaudatus</i>	泥鰍	NP	C	+	+	+		+	+	+		+	+	+		+	+	+	
<i>Oreochromis niloticus</i>	尼羅口孵非鯽	NP	C	+	++	++	+	+	++	++	+	+	++	++	+	+	++	++	+
<i>Parazacco spilurus</i>	異鱧	NP, V	C	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
<i>Poecilia reticulata</i>	孔雀花魚將	NP	VC			+				+					+				
<i>Pterocryptis cochinchinensis</i>	越南隱鱨	NP	C																
<i>Puntius semifasciolatus</i>	七星魚	NP	C	+	+	+		+	+	+		+	+	+		+	+	+	
<i>Rhinogobius spp.</i>	鰕虎魚	NP	C	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
<i>Xiphophorus hellerii</i>	劍尾魚	NP	C	+	+	+		+	+	+		+	+	+		+	+	+	
<i>Xiphophorus variatus</i>	雜色劍尾魚	NP	C			+				+				+			+		
<i>Zacco platypus</i>	寬鱮	NP	C	+	++	++	+	+	++	++	+	+	++	++	+	+	++	++	+
		2x2m fish number		35	35	30	20	45	40	40	20	45	45	45	20	50	50	50	30
		No of Species		8	8	12	5	8	8	12	5	8	8	12	5	8	8	12	5
Amphibian																			
<i>Paramesotriton hongkongensis</i>	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 Animals Protection Ordinance (Cap.170)

"NT" - Near Threatened in IUCN Red List Status

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

"V" - Vulnerable - in Red China Data Book

Table 4.7 Abotic data for the Upper She Shan River

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

Parameter / date	Baseline monitoring	Impact monitoring			Impact monitoring			Impact monitoring			Impact monitoring			Impact monitoring			Impact monitoring			Impact monitoring		
	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 Abiotic data for the Upper She Shan River

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

Parameter / date	Impact 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		
	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)

Parameter / date	Post construction monitoring			Post construction monitoring			Post construction monitoring		
	Dec-16			Jan-17			Feb-17		
Replicate	T1	T2	T3	T1	T2	T3	T1	T2	T3
DO (mg/L)	7.9	8.0	7.9	8.0	8.0	7.9	8.1	7.9	7.9
pH	7.6	7.5	7.6	7.6	7.6	7.6	7.7	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
Ammonia (mg N/L)	< 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
Conductivity (µS/cm)	30	29	26	29	29	32	33	29	33
BOD (mg/L)	<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
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
Sand (%)	5	5	5	5	5	5	5	5	5
Stone (%)	80	80	30	80	80	30	80	80	30
Mud (%)	5	5	2	5	5	2	5	5	2
Concrete (%)	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. 38)
Upper Tai Po River**

February 2017



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March 21, 2017

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March 21, 2017

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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.38)
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 38 post-construction ecological monitoring report for the project conducted **on 16th February 2017**. 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, 55 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 the same as last month's result; and
- Hong Kong 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 AFCDD 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 AFCDD 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°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 sparsely 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, 55 flora species were recorded within the survey transects along the river course. Abundant native species *Commelina diffusa* was the dominant species established in the river bed. 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 0.3m 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, 18 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 5) and *Egretta garzetta* (Photo 6). 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. A raptor *buteo japonica* (Photo 7) was recorded hovering above the river. It is under protection of Endangered Species of Animals and Plants Ordinance (Cap. 586). 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 similar to last month and the previous surveys conducted in approximate period of last year. In total, 2 species odonata was found, the recorded odonata species was common species in Hong Kong (Photo 8). Most of the odonata species in Hong Kong has the peak emergence from spring to late summer. The decrease in abundance of odonata was due to seasonality. It is expected that number of odonata will 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 9-10). 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 Hong Kong 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 in reference site. 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. No 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 similar to last month's result.

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.

6 REFERENCES

Carey, G.J., Chalmers, M.L., Diskin, D.A., Kennerley, P.R., Leader, P.J., Leven, M.R., Lewthwaite, R.W., Melville, D.S., Turnbull, M. and Yung, L. (2001) *The Avifauna of Hong Kong*. Hong Kong Bird Watching Society.

Dudgeon, D. and Corlett, R. (1994). *Hills and Streams - An Ecology of Hong Kong*. Hong Kong University Press, Hong Kong.

Hong Kong Herbarium (2015):
<http://herbarium.gov.hk/>

Hong Kong Biodiversity Website (2015):
<http://www.afcd.gov.hk/english/conservation/hkbiodiversity/hkbiodiversity.html>

Lai, P.C.C., Lam, Y.W., So, P.S., Tam, K.Y., Wan, P.Y.M. and Yip, K.L. (2004). *Check List of Hong Kong Plants*, Agriculture, Fisheries and Conservation Department. Hong Kong.

Lee, V.L.F., Lam, S.K.S., NG, F.K.Y., Chan, T.K.T. and Young, M.L.C. (2004). *Field Guide to the Freshwater Fish of Hong Kong*, Friends of the Country Parks and Cosmos Books Ltd, Hong Kong.

Tam, T.W., Leung, K.K., Kwan, B.P. S., Wu, K. K. Y., Tang, S. S. H., So, I.W.Y., Cheng, J.C.Y., Yuen, E.F.M., Tsang, Y.M and Leung, H.W. (2011). *The Dragonflies of Hong Kong*. Agriculture, Fisheries and Conservation Department, Friends of the Country Parks and Cosmos Books Ltd., Hong Kong.

Wilson, K.D.P., Tam, K.W., Kwan, B.S.P., Wu, K.K.Y., Wong, B.S.F. and Wong, J.K. (2004). *Field guide to the dragonflies of Hong Kong (2nd Edition)*. Agriculture, Fisheries and Conservation Department, Friends of the Country Parks and Cosmos Books Ltd., Hong Kong.

FIGURE

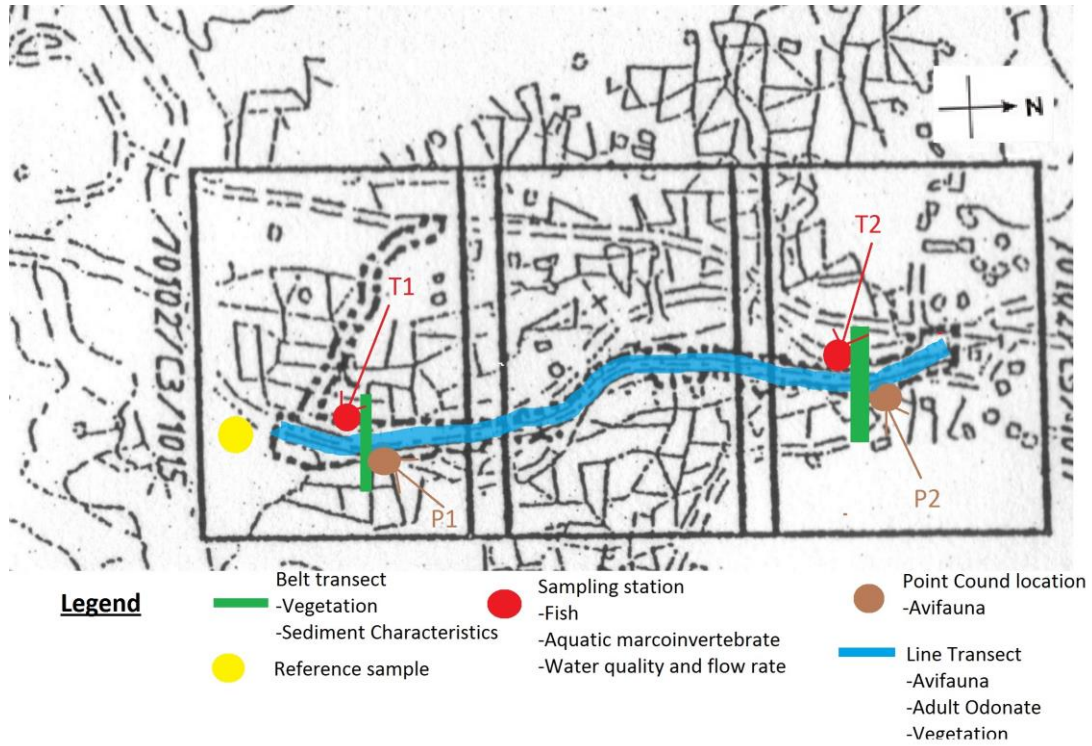


Figure 1. Sampling Location of Ecological Survey and Monitoring at Upper Tai Po River, Tai Po.

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 alba*



Photo 6: Avifauna – *Egretta garzetta*



Photo 7: Avifauna – *Buteo japonicus*



Photo 8: Odonata - *Orthetrum luzonicum*



Photo 9: Aquatic sample



Photo 10: Aquatic sample

TABLE

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)

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

Family	Species	Stream Transect Chinese name	Impact monitoring				Impact monitoring				Impact monitoring				Impact monitoring				Impact monitoring									
			Jan-11				Jul-11				Jan-12				Jul-12				Mar-13									
			Reference	T1	T2		Reference	T1	T2		Reference	T1	T2		Reference	T1	T2		Reference	T1	T2							
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	<i>Mikania micrantha</i>	薇甘菊	0.5	10					0.5	10								0.4	10									
Moraceae	<i>Ficus hispida</i>	對葉榕																										
Ulmaceae	<i>Celtis sinensis</i>	朴樹																										
Poaceae	<i>Microstegium ciliatum</i>	剛秀竹	1	15	1	5	0.5	2	1	2																		
Euphorbiaceae	<i>Macaranga tanarius</i>	血桐			4m	5																						
Araceae	<i>Alocasia odora</i>	海芋					0.4	3																				
Araceae	<i>Colocasia esculenta</i>	芋																										
Myrtaceae	<i>Cleistocalyx operculatus</i>	水翁	0.4	5	5m	5																						
Athyriaceae	<i>Callipteris esculenta</i>	菜蕨																										
Poaceae	<i>Phragmites karka</i>	卡開蘆	1.5	2					1.5	2																		
Thelypteridaceae	<i>Cyclosorus parasiticus</i>	華南毛蕨																										
Equisetaceae	<i>Equisetum debile</i>	筆管草																										
Asteraceae	<i>Ageratum conyzoides</i>	勝紅薊					0.3	2	1.2	10																		
Commelinaceae	<i>Commelina diffusa</i>	節節草					0.2	4																				
Solanaceae	<i>Solanum nigrum</i>	龍葵																										
Euphorbiaceae	<i>Mallotus paniculatus</i>	白楸																										
Poaceae	<i>Eleusine indica</i>	牛筋草																										
Poaceae	<i>Pennisetum purpureum</i>	象草																										
Asteraceae	<i>Wedelia chinensis</i>	蟛蜞菊																										
Asteraceae	<i>Bidens alba</i>	白花鬼針草			0.5	5		3																				
Poaceae	<i>Panicum repens</i>	枯骨草							1.5	5																		
Poaceae	<i>Coix lacryma-jobi</i>	薏苡																										
Convolvulaceae	<i>Ipomoea cairica</i>	五爪金龍																										
Cucurbitaceae	<i>Benincasa hispida</i>	冬瓜					0.2	5																				
Fabaceae	<i>Pueraria lobata</i>	野葛																										
Convolvulaceae	<i>Merremia hederacea</i>	魚黃草																										
Poaceae	<i>Pennisetum alopecuroides</i>	狼尾草																										
Poaceae	<i>Brachiaria mutica</i>	巴拉草																										
Onagraceae	<i>Ludwigia erecta</i>	美洲水丁香																										
Malvaceae	<i>Hibiscus rosa-sinensis</i>	大紅花																										
Cyperaceae	<i>Cyperus sp.</i>	莎草																										
Balsaminaceae	<i>Impatiens walleriana</i>	非洲鳳仙																										
Amaranthaceae	<i>Celosia argentea</i>	青葙																										
Bare Gound				68		80		89		71		100		89		35		100		100		20		100		100		10

- 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)

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

- 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)

Family	Species	Chinese name	Post construction monitoring								Post construction monitoring								Post construction monitoring								Post construction monitoring								Post construction monitoring							
			Stream		May-14				Jun-14				Jul-14				Aug-14				Sep-14																					
			Transect	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2																					
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	<i>Mikania micrantha</i>	薇甘菊	0.3	5	0.3	25					0.3	5	0.3	25					0.4	8	0.4	25					0.4	10	0.4	28					0.4	10	0.4	28				
Moraceae	<i>Ficus hispida</i>	對葉榕																																								
Ulmaceae	<i>Celtis sinensis</i>	朴樹																																								
Poaceae	<i>Microstegium ciliatum</i>	剛秀竹	0.4	5															0.6	5																						
Euphorbiaceae	<i>Macaranga tanarius</i>	血桐			0.5	1															0.6	1																				
Araceae	<i>Alocasia odora</i>	海芋																																								
Araceae	<i>Colocasia esculenta</i>	芋																																								
Myrtaceae	<i>Cleistocalyx operculatus</i>	水翁																																								
Athyriaceae	<i>Callipteris esculenta</i>	菜蕨																																								
Poaceae	<i>Phragmites karka</i>	卡開蘆	1.5	5															1.5	5																						
Thelypteridaceae	<i>Cyclosorus parasiticus</i>	華南毛蕨																																								
Equisetaceae	<i>Equisetum debile</i>	筆管草																																								
Asteraceae	<i>Ageratum conyzoides</i>	勝紅薊																																								
Commelinaceae	<i>Commelina diffusa</i>	節節草			0.1	3															0.2	4																				
Solanaceae	<i>Solanum nigrum</i>	龍葵																																								
Euphorbiaceae	<i>Mallotus paniculatus</i>	白楸																																								
Poaceae	<i>Eleusine indica</i>	牛筋草																																								
Poaceae	<i>Pennisetum purpureum</i>	象草																																								
Asteraceae	<i>Wedelia chinensis</i>	蟛蜞菊																																								
Asteraceae	<i>Bidens alba</i>	白花鬼針草																																								
Poaceae	<i>Panicum repens</i>	枯骨草	0.3	3																	0.4	3																				
Poaceae	<i>Coix lacryma-jobi</i>	薏苡																																								
Convolvulaceae	<i>Ipomoea cairica</i>	五爪金龍																																								
Cucurbitaceae	<i>Benincasa hispida</i>	冬瓜																																								
Fabaceae	<i>Pueraria lobata</i>	野葛	0.4	15																	0.4	15																				
Convolvulaceae	<i>Merremia hederacea</i>	魚黃草																																								
Poaceae	<i>Pennisetum alopecuroides</i>	狼尾草			1.5	5																																				
Poaceae	<i>Brachiaria mutica</i>	巴拉草																																								
Onagraceae	<i>Ludwigia erecta</i>	美洲水丁香																																								
Malvaceae	<i>Hibiscus rosa-sinensis</i>	大紅花																																								
Cyperaceae	<i>Cyperus sp.</i>	莎草																																								
Balsaminaceae	<i>Impatiens walleriana</i>	非洲鳳仙																																								
Amaranthaceae	<i>Celosia argentea</i>	青葙																																								
Bare Gound				67		66				67		66									64		65															58		61		

- 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)

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

- 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)

Family	Species	Chinese name	Post construction monitoring						Post construction monitoring						Post construction monitoring						Post construction monitoring						Post construction monitoring									
			Stream		Mar-14				Apr-14				May-15				Jun-15				Jul-15															
			Transect	Reference	T1		T2		Reference	T1		T2		Reference	T1		T2		Reference	T1		T2		Reference	T1		T2									
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	<i>Mikania micrantha</i>	薇甘菊	0.8	15			0.3	10					0.3	10			0.5	10			0.3	3	0.5	10												
Moraceae	<i>Ficus hispida</i>	對葉榕																																		
Ulmaceae	<i>Celtis sinensis</i>	朴樹																																		
Poaceae	<i>Microstegium ciliatum</i>	剛秀竹	1.3	5			1	5					1	5			1	3			1	3	1	5			1	1								
Euphorbiaceae	<i>Macaranga tanarius</i>	血桐					0.6	1					0.6	1			0.5	1			0.5	1							1.5	5						
Araceae	<i>Alocasia odora</i>	海芋																																		
Araceae	<i>Colocasia esculenta</i>	芋	0.8	5					0.8	5					0.5	5				0.5	5			0.5	5	1.2	10									
Myrtaceae	<i>Cleistocalyx operculatus</i>	水翁																																		
Athyriaceae	<i>Callipteris esculenta</i>	菜蕨																																		
Poaceae	<i>Phragmites karka</i>	卡開蘆	1.7	10					1.7	10					1.5	10				1.5	10			1.5	10											
Thelypteridaceae	<i>Cyclosorus parasiticus</i>	華南毛蕨																																		
Equisetaceae	<i>Equisetum debile</i>	筆管草	0.3	5					0.3	5					0.3	5				0.3	5			0.3	5											
Asteraceae	<i>Ageratum conyzoides</i>	勝紅薊			0.3	2			0.3	2					0.3	2				0.3	5															
Commelinaceae	<i>Commelina diffusa</i>	節節草	0.3	10			0.5	60	0.3	10			0.5	60	0.3	10			0.5	35	0.3	10			0.5	35	0.3	10			0.4	40				
Solanaceae	<i>Solanum nigrum</i>	龍葵																																		
Euphorbiaceae	<i>Mallotus paniculatus</i>	白楸																																		
Poaceae	<i>Eleusine indica</i>	牛筋草																																		
Poaceae	<i>Pennisetum purpureum</i>	象草																																		
Asteraceae	<i>Wedelia chinensis</i>	蟛蜞菊																																		
Asteraceae	<i>Bidens alba</i>	白花鬼針草	1	5			0.8	2	1	5			0.8	2	0.7	5			0.6	2	0.7	5			0.6	2	0.7	5			0.5	5				
Poaceae	<i>Panicum repens</i>	枯骨草	0.6	5					0.6	5					0.4	5				0.4	5			0.4	5			0.4	5							
Poaceae	<i>Coix lacryma-jobi</i>	薏苡																																		
Convolvulaceae	<i>Ipomoea cairica</i>	五爪金龍																																		
Cucurbitaceae	<i>Benincasa hispida</i>	冬瓜																																		
Fabaceae	<i>Pueraria lobata</i>	野葛																																		
Convolvulaceae	<i>Merremia hederacea</i>	魚黃草																																		
Poaceae	<i>Pennisetum alopecuroides</i>	狼尾草					4	10					4	10			2	7			2	7			2	7			2.5	20	2	30				
Poaceae	<i>Brachiaria mutica</i>	巴拉草																											1.2	50	0.5	15				
Onagraceae	<i>Ludwigia erecta</i>	美洲水丁香			0.3	4							0.3	4						0.3	5															
Malvaceae	<i>Hibiscus rosa-sinensis</i>	大紅花																																		
Cyperaceae	<i>Cyperus sp.</i>	莎草			0.2	6							0.2	6						0.2	5							0.2	5							
Balsaminaceae	<i>Impatiens walleriana</i>	非洲鳳仙					1	5					1	5														1	3							
Amaranthaceae	<i>Celosia argentea</i>	青葙	1.7	5					1.7	5					1.7	5				1.7	5			1.7	5			1.7	5							
Bare Gound				35		88		7		35		88		7		40		93		46		40		85		46		40		14				5		

- 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)

Family	Species	Chinese name	Post construction monitoring								Post construction monitoring								Post construction monitoring								Post construction monitoring								Post construction monitoring							
			Aug-15								Sep-15								Oct-15								Nov-15								Dec-15							
			Reference	T1		T2		Reference	T1		T2		Reference	T1		T2		Reference	T1		T2		Reference	T1		T2		Reference	T1		T2											
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	<i>Mikania micrantha</i>	薇甘菊	0.5	10					0.5	10					0.5	10					0.5	10					0.5	5														
Moraceae	<i>Ficus hispida</i>	對葉榕																																								
Ulmaceae	<i>Celtis sinensis</i>	朴樹																																								
Poaceae	<i>Microstegium ciliatum</i>	剛秀竹	1	5	1	1		1	5	1	1		1	5	1	3		1	5	1	3		1	5	1	3																
Euphorbiaceae	<i>Macaranga tanarius</i>	血桐			1.5	5					1.5	5				1.5	5				1.5	5						1.5	5													
Araceae	<i>Alocasia odora</i>	海芋																																								
Araceae	<i>Colocasia esculenta</i>	芋	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																
Myrtaceae	<i>Cleistocalyx operculatus</i>	水翁																																								
Athyriaceae	<i>Callipteris esculenta</i>	菜蕨																																								
Poaceae	<i>Phragmites karka</i>	卡開蘆	1.5	10				1.5	10				1.5	10				1.5	10						1.5	7																
Thelypteridaceae	<i>Cyclosorus parasiticus</i>	華南毛蕨																																								
Equisetaceae	<i>Equisetum debile</i>	筆管草	0.3	5				0.3	5				0.3	5				0.3	5						0.3	5																
Asteraceae	<i>Ageratum conyzoides</i>	勝紅薊																																								
Commelinaceae	<i>Commelina diffusa</i>	節節草	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										
Solanaceae	<i>Solanum nigrum</i>	龍葵																																								
Euphorbiaceae	<i>Mallotus paniculatus</i>	白楸																																								
Poaceae	<i>Eleusine indica</i>	牛筋草																																								
Poaceae	<i>Pennisetum purpureum</i>	象草																																								
Asteraceae	<i>Wedelia chinensis</i>	蟛蜞菊																																								
Asteraceae	<i>Bidens alba</i>	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	5		0.5	5											
Poaceae	<i>Panicum repens</i>	枯骨草	0.4	5				0.4	5				0.4	5				0.4	5					0.4	5																	
Poaceae	<i>Coix lacryma-jobi</i>	薏苡																																								
Convolvulaceae	<i>Ipomoea cairica</i>	五爪金龍																																								
Cucurbitaceae	<i>Benincasa hispida</i>	冬瓜																																								
Fabaceae	<i>Pueraria lobata</i>	野葛																																								
Convolvulaceae	<i>Merremia hederacea</i>	魚黃草																																								
Poaceae	<i>Pennisetum alopecuroides</i>	狼尾草			2.5	5	2	20		2.5	5	2	20		2	7	2	20		2	10	2	20		2	10	2	20		2	20											
Poaceae	<i>Brachiaria mutica</i>	巴拉草			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											
Onagraceae	<i>Ludwigia erecta</i>	美洲水丁香																																								
Malvaceae	<i>Hibiscus rosa-sinensis</i>	大紅花																																								
Cyperaceae	<i>Cyperus sp.</i>	莎草			0.2	5				0.2	2				0.2	2					0.2	2					0.2	2														
Balsaminaceae	<i>Impatiens walleriana</i>	非洲鳳仙																																								
Amaranthaceae	<i>Celosia argentea</i>	青葙	1.7	5				1.7	5				1.7	5				1.7	5					1.7	5																	
Bare Gound				40		34		25		40		83		25		40		66		25		40		58		25		40		58		25										

- 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)

Family	Species	Chinese name	Post construction monitoring								Post construction monitoring								Post construction monitoring								Post construction monitoring								Post construction monitoring							
			Stream		Jan-16		Feb-16		Mar-16		Apr-16		May-16		Reference		T1		T2		Reference		T1		T2		Reference		T1		T2		Reference		T1		T2					
			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	<i>Mikania micrantha</i>	薇甘菊	0.5	5					0.5	5					0.6	5					0.6	5					0.6	5														
Moraceae	<i>Ficus hispida</i>	對葉榕																																								
Ulmaceae	<i>Celtis sinensis</i>	朴樹																																								
Poaceae	<i>Microstegium ciliatum</i>	剛秀竹	1	5	1	3			1	5	1	3			1.2	5	1	3			1.2	5	1	3			1.2	5														
Euphorbiaceae	<i>Macaranga tanarius</i>	血桐					1.5	5					1.5	5					1.5	5					1.5	5							1.5	5								
Araceae	<i>Alocasia odora</i>	海芋																																								
Araceae	<i>Colocasia esculenta</i>	芋	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														
Myrtaceae	<i>Cleistocalyx operculatus</i>	水翁																																								
Athyriaceae	<i>Callipteris esculenta</i>	菜蕨																																								
Poaceae	<i>Phragmites karka</i>	卡開蘆	1.5	7					1.5	7					1.5	7					1.5	7					1.5	7														
Thelypteridaceae	<i>Cyclosorus parasiticus</i>	華南毛蕨																																								
Equisetaceae	<i>Equisetum debile</i>	筆管草	0.3	5					0.3	5					0.3	5					0.3	5					0.3	5														
Asteraceae	<i>Ageratum conyzoides</i>	勝紅薊																																								
Commelinaceae	<i>Commelina diffusa</i>	節節草	0.4	10	0.2	25	0.4	35	0.4	10	0.2	25	0.4	35	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										
Solanaceae	<i>Solanum nigrum</i>	龍葵																																								
Euphorbiaceae	<i>Mallotus paniculatus</i>	白楸																																								
Poaceae	<i>Eleusine indica</i>	牛筋草																																								
Poaceae	<i>Pennisetum purpureum</i>	象草																																								
Asteraceae	<i>Wedelia chinensis</i>	蟛蜞菊																																								
Asteraceae	<i>Bidens alba</i>	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	5			0.5	5						
Poaceae	<i>Panicum repens</i>	枯骨草	0.4	5					0.4	5					0.4	5					0.4	5					0.4	5														
Poaceae	<i>Coix lacryma-jobi</i>	薏苡																																								
Convolvulaceae	<i>Ipomoea cairica</i>	五爪金龍																																								
Cucurbitaceae	<i>Benincasa hispida</i>	冬瓜																																								
Fabaceae	<i>Pueraria lobata</i>	野葛																																								
Convolvulaceae	<i>Merremia hederacea</i>	魚黃草																																								
Poaceae	<i>Pennisetum alopecuroides</i>	狼尾草		2	10	2	20		2	10	2	20		2	10	2	20		2	10	2	8	2	10		2	8	2	10		2	3										
Poaceae	<i>Brachiaria mutica</i>	巴拉草		1.2	2	0.5	15		1.2	2	0.5	15		1.2	2	0.5	15		1.2	2	0.5	10		1.2	2	0.5	10		1.2	2												
Onagraceae	<i>Ludwigia erecta</i>	美洲水丁香																																								
Malvaceae	<i>Hibiscus rosa-sinensis</i>	大紅花																																								
Cyperaceae	<i>Cyperus sp.</i>	莎草			0.2	2					0.2	2					0.2	2					0.2	2																		
Balsaminaceae	<i>Impatiens walleriana</i>	非洲鳳仙																																								
Amaranthaceae	<i>Celosia argentea</i>	青葙	1.7	5					1.7	5					1.7	5					1.7	5					1.7	5														
Bare Gound				48		53		20		48		53		20		48		53		55		50		60		70		55		93						85						

- 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)

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

Family	Species	Stream Transect Chinese name	Post construction monitoring						Post construction monitoring						Post construction monitoring					
			Aug-16						Sep-16						Oct-16					
			Reference		T1		T2		Reference		T1		T2		Reference		T1		T2	
Height (m)	%	Height (m)	%	Height (m)	%	Height (m)	%	Height (m)	%	Height (m)	%	Height (m)	%	Height (m)	%	Height (m)	%	Height (m)	%	
Asteraceae	<i>Mikania micrantha</i>	薇甘菊	0.6	5					0.5	10					0.5	10				
Moraceae	<i>Ficus hispida</i>	對葉榕																		
Ulmaceae	<i>Celtis sinensis</i>	朴樹																		
Poaceae	<i>Microstegium ciliatum</i>	剛秀竹	1.2	5					1.5	10					1.5	10				
Euphorbiaceae	<i>Macaranga tanarius</i>	血桐					1.5	10					1.5	10					1.6	10
Araceae	<i>Alocasia odora</i>	海芋							0.4	5					0.4	5				
Araceae	<i>Colocasia esculenta</i>	芋	0.5	5					0.5	5					0.5	5				
Myrtaceae	<i>Cleistocalyx operculatus</i>	水翁																		
Athyriaceae	<i>Callipteris esculenta</i>	菜蕨																		
Poaceae	<i>Phragmites karka</i>	卡開蘆	1.5	5					1.6	5					1.6	5				
Thelypteridaceae	<i>Cyclosorus parasiticus</i>	華南毛蕨																		
Equisetaceae	<i>Equisetum debile</i>	筆管草	0.3	5					0.5	5					0.5	5				
Asteraceae	<i>Ageratum conyzoides</i>	勝紅薊																		
Commelinaceae	<i>Commelina diffusa</i>	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
Solanaceae	<i>Solanum nigrum</i>	龍葵																		
Euphorbiaceae	<i>Mallotus paniculatus</i>	白楸																		
Poaceae	<i>Eleusine indica</i>	牛筋草																		
Poaceae	<i>Pennisetum purpureum</i>	象草																		
Asteraceae	<i>Wedelia chinensis</i>	蟛蜞菊																		
Asteraceae	<i>Bidens alba</i>	白花鬼針草	0.7	5			0.5	8	0.7	5			0.5	8	0.8	5			0.5	8
Poaceae	<i>Panicum repens</i>	枯骨草	0.4	5					0.4	5					0.4	5				
Poaceae	<i>Coix lacryma-jobi</i>	薏苡																		
Convolvulaceae	<i>Ipomoea cairica</i>	五爪金龍																		
Cucurbitaceae	<i>Benincasa hispida</i>	冬瓜																		
Fabaceae	<i>Pueraria lobata</i>	野葛																		
Convolvulaceae	<i>Merremia hederacea</i>	魚黃草																		
Poaceae	<i>Pennisetum alopecuroides</i>	狼尾草					2	5					1.6	5					1.6	5
Poaceae	<i>Brachiaria mutica</i>	巴拉草			1.2	2					1.2	5	1.3	5			1.2	5	1.3	5
Onagraceae	<i>Ludwigia erecta</i>	美洲水丁香																		
Malvaceae	<i>Hibiscus rosa-sinensis</i>	大紅花																		
Cyperaceae	<i>Cyperus sp.</i>	莎草																		
Balsaminaceae	<i>Impatiens walleriana</i>	非洲鳳仙																		
Amaranthaceae	<i>Celosia argentea</i>	青葙	1.7	5					1.5	5					1.5	5				
Bare Gound				55		93		72		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 4.2. Flora species recorded from belt transect survey at the Upper Tai Po stream (T1- Upper stream sampling site and T2 - Lower stream sampling site)

Family	Species	Stream Transect Chinese name	Post construction monitoring						Post construction monitoring						Post construction monitoring						Post construction monitoring					
			Nov-16						Dec-16						Jan-17						Feb-17					
			Reference		T1		T2		Reference		T1		T2		Reference		T1		T2		Reference		T1		T2	
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	<i>Mikania micrantha</i>	薇甘菊	0.5	10					0.5	10					0.5	10					0.5	10				
Moraceae	<i>Ficus hispida</i>	對葉榕																								
Ulmaceae	<i>Celtis sinensis</i>	朴樹																								
Poaceae	<i>Microstegium ciliatum</i>	剛秀竹	1.5	10					1.5	10					1.5	10					1.5	10				
Euphorbiaceae	<i>Macaranga tanarius</i>	血桐			0.1	10					0.2	10					0.3	10					0.3	10		
Araceae	<i>Alocasia odora</i>	海芋	0.4	5					0.4	5					0.4	5					0.4	5				
Araceae	<i>Colocasia esculenta</i>	芋	0.5	5					0.5	5					0.5	5					0.5	5				
Myrtaceae	<i>Cleistocalyx operculatus</i>	水翁																								
Athyriaceae	<i>Callipteris esculenta</i>	菜蕨																								
Poaceae	<i>Phragmites karka</i>	卡開蘆	1.6	5					1.6	5					1.6	5					1.6	5				
Thelypteridaceae	<i>Cyclosorus parasiticus</i>	華南毛蕨																								
Equisetaceae	<i>Equisetum debile</i>	筆管草	0.5	5					0.5	5					0.5	5					0.5	5				
Asteraceae	<i>Ageratum conyzoides</i>	勝紅薊																								
Commelinaceae	<i>Commelina diffusa</i>	節節草	0.5	10	0.1	10	0.1	10	0.5	10	0.2	10	0.2	10	0.5	10	0.3	10	0.2	10	0.6	10	0.4	10	0.3	10
Solanaceae	<i>Solanum nigrum</i>	龍葵																								
Euphorbiaceae	<i>Mallotus paniculatus</i>	白楸																								
Poaceae	<i>Eleusine indica</i>	牛筋草																								
Poaceae	<i>Pennisetum purpureum</i>	象草																								
Asteraceae	<i>Wedelia chinensis</i>	蟛蜞菊																								
Asteraceae	<i>Bidens alba</i>	白花鬼針草	0.8	5			0.1	8	0.8	5			0.3	8	0.8	5			0.3	8	0.8	5			0.4	8
Poaceae	<i>Panicum repens</i>	枯骨草	0.4	5					0.4	5					0.4	5					0.4	5				
Poaceae	<i>Coix lacryma-jobi</i>	薏苡																								
Convolvulaceae	<i>Ipomoea cairica</i>	五爪金龍																								
Cucurbitaceae	<i>Benincasa hispida</i>	冬瓜																								
Fabaceae	<i>Pueraria lobata</i>	野葛																								
Convolvulaceae	<i>Merremia hederacea</i>	魚黃草																								
Poaceae	<i>Pennisetum alopecuroides</i>	狼尾草					0.1	5					0.3	5					0.3	5					0.3	5
Poaceae	<i>Brachiaria mutica</i>	巴拉草			0.1	5	0.1	5			0.3	5	0.3	5			0.3	5	0.3	5			0.3	5	0.3	5
Onagraceae	<i>Ludwigia erecta</i>	美洲水丁香																								
Malvaceae	<i>Hibiscus rosa-sinensis</i>	大紅花																								
Cyperaceae	<i>Cyperus sp.</i>	莎草																								
Balsaminaceae	<i>Impatiens walleriana</i>	非洲鳳仙																								
Amaranthaceae	<i>Celosia argentea</i>	青葙	1.5	5					1.5	5					1.5	5					1.5	5				
Bare Gound				35		85		62		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 4.4. Odonate species recorded at the UpperTai Po River

Species	Common name	Chinese name	Status	Commonness	Baseline survey	Impact monitoring					Impact 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
<i>Aethriamanta brevipennis brevipennis</i>	Elusive Adjutant	短腹異蜻	NP	U																					
<i>Macrodiplox cora</i>	Coastal Glider	高翔濚蜻	NP	C																					
<i>Ceriagrion auranticum ryukyuanum</i>	Orange-tailed Sprite	琉球橘黃蠅	NP	VC															+	+					
<i>Copera marginipes</i>	Yellow Featherlegs	黃挾扇蠅	NP	VC																			+	+	+
<i>Crocothemis servilia servilia</i>	Crimson Darter	紅蜻	NP	VC	+		+		+																
<i>Euphaea decorata</i>	Black-banded Gossamerwing	方帶幽蠅	NP	VC									+										+	+	
<i>Neurobasis chinensis</i>	Chinese Greenwing	華艷色蠅	NP	C					+									+	+	+			+	+	+
<i>Neurothemis fulvia</i>	Russet Percher	網脈蜻	NP	VC																					
<i>Orthetrum chrysis</i>	Red-faced Skimmer	華麗灰蜻	NP	VC		+	+		+				+												
<i>Orthetrum glaucum</i>	Common blue skimmer	黑尾灰蜻	NP	VC	+	+	+																	+	+
<i>Orthetrum luzonicum</i>	Marsh Skimmer	呂宋灰蜻	NP	VC									+											+	+
<i>Orthetrum pruinosum neglectum</i>	Common Red Skimmer	赤褐灰蜻	NP	VC																					
<i>Palpopleura sexmaculata sexmaculata</i>	Asian Widow	六斑曲綠蜻	NP	C									+												
<i>Pantala flavescens</i>	Wandering Glider	黃蜻	NP	VC	+		+	+	+	+	++	+	+	+	+										+
<i>Paracercion calamorum dyeri</i>	Dusky Lilysquatter	暮尾蠅	P, LC	C															+						
<i>Prodasineura autumnalis</i>	Black Threadtail	烏齒原蠅	NP	VC																					
<i>Pseudagrion rubriceps rubriceps</i>	Orange-faced Sprite	丹頂斑蠅	NP	C									+											+	
<i>Rhinocypha perforata</i>	Common Blue Jewel	三斑鼻蠅	NP	VC					+															+	+
<i>Trithemis Aurora</i>	Crimson dropwing	曉褐蜻	NP	VC	+				+										+					+	+
<i>Trithemis festiva</i>	Indigo Dropwing	慶褐蜻	NP	VC							+		+					+						+	+
<i>Urothemis signata signata</i>	Scarlet Basket	赤斑曲鈞脈蜻	NP	C									+				+							+	+
<i>Zygonyx iris insignis</i>	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

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 according 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

Species	Common name	Chinese name	Status	Commonness	Post construction monitoring																	
					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	
<i>Aethriamanta brevipennis brevipennis</i>	Elusive Adjutant	短腹異蜻	NP	U																		
<i>Macrodiplax cora</i>	Coastal Glider	高翔濼蜻	NP	C								+	+									
<i>Ceriagrion auranticum ryukyuanum</i>	Orange-tailed Sprite	琉球橘黃蟳	NP	VC	+						+	+	+	+								
<i>Copera marginipes</i>	Yellow Featherlegs	黃狹扇蟳	NP	VC							+	+	+	+								
<i>Crocothemis servilia servilia</i>	Crimson Darter	紅蜻	NP	VC								+	+	+	+							
<i>Euphaea decorata</i>	Black-banded Gossamerwing	方帶幽蟳	NP	VC																		
<i>Neurobasis chinensis</i>	Chinese Greenwing	華麗色蟳	NP	C	+				+	+				+	+	+						
<i>Neurothemis fulvia</i>	Russet Percher	網脈蜻	NP	VC									+	+	+							
<i>Orthetrum chrysis</i>	Red-faced Skimmer	華麗灰蜻	NP	VC										+	+	+	+					+
<i>Orthetrum glaucum</i>	Common blue skimmer	黑尾灰蜻	NP	VC													+	+				
<i>Orthetrum luzonicum</i>	Marsh Skimmer	呂宋灰蜻	NP	VC					+	+	+	+	+	+								
<i>Orthetrum pruinosum neglectum</i>	Common Red Skimmer	赤褐灰蜻	NP	VC							+	+	+									
<i>Palpopleura sexmaculata sexmaculata</i>	Asian Widow	六斑曲綠蜻	NP	C								+	+									
<i>Pantala flavescens</i>	Wandering Glider	黃蜻	NP	VC	+												+	+	+	+	+	+
<i>Paracercion calamorum dyeri</i>	Dusky Lilysquatter	暮尾蟳	P, LC	C																		
<i>Prodasineura autumnalis</i>	Black Threadtail	烏齒原蟳	NP	VC										+								
<i>Pseudagrion rubriceps rubriceps</i>	Orange-faced Sprite	丹頂斑蟳	NP	C							+	+	+									
<i>Rhinocypha perforata</i>	Common Blue Jewel	三斑鼻蟳	NP	VC							+	+	+	+	+	+						
<i>Trithemis Aurora</i>	Crimson dropwing	曉褐蜻	NP	VC	+	+	+									+	+					
<i>Trithemis festiva</i>	Indigo Dropwing	慶褐蜻	NP	VC	+	+	+	+	+	+	+	+	+	+	+					+		
<i>Urothemis signata signata</i>	Scarlet Basket	赤斑曲鈎脈蜻	NP	C																		
<i>Zygonyx iris insignis</i>	Emerald Cascader	彩虹蜻	P	P,PGC	+																	
No of Species					6	2	2	1	3	6	7	9	11	10	8	8	5	1	2	1	2	

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 according to AFCD biodiversity website (www.hkbiobiodiversity.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	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Jan-17	Feb-17
<i>Aethriamanta brevipennis brevipennis</i>	Elusive Adjutant	短腹異蜻	NP	U		+	+	+							
<i>Macrodiplax cora</i>	Coastal Glider	高翔濚蜻	NP	C											
<i>Ceriagrion auranticum ryukyuanum</i>	Orange-tailed Sprite	琉球橘黃蠅	NP	VC		+	+	+	+						
<i>Copera marginipes</i>	Yellow Featherlegs	黃狹扇蠅	NP	VC											
<i>Crocothemis servilia servilia</i>	Crimson Darter	紅蜻	NP	VC			+	+	+	+	+				
<i>Euphaea decorata</i>	Black-banded Gossamerwing	方帶幽蠅	NP	VC											
<i>Neurobasis chinensis</i>	Chinese Greenwing	華麗色蠅	NP	C	+	+	+	+	+	+	+				
<i>Neurothemis fulvia</i>	Russet Percher	網脈蜻	NP	VC											
<i>Orthetrum chrysis</i>	Red-faced Skimmer	華麗灰蜻	NP	VC	+	+	+	+	+	+	+	+			
<i>Orthetrum glaucum</i>	Common blue skimmer	黑尾灰蜻	NP	VC											
<i>Orthetrum luzonicum</i>	Marsh Skimmer	呂宋灰蜻	NP	VC	+	+	+	+	+	+	+	+			+
<i>Orthetrum pruinosum neglectum</i>	Common Red Skimmer	赤褐灰蜻	NP	VC	+	+	+	+	+						
<i>Palpopleura sexmaculata sexmaculata</i>	Asian Widow	六斑曲綠蜻	NP	C											
<i>Pantala flavescens</i>	Wandering Glider	黃蜻	NP	VC	+	+	+	+	+	+	+	+	+	+	+
<i>Paracercion calamorum dyeri</i>	Dusky Lilysquatter	薑尾蠅	P, LC	C											
<i>Prodasineura autumnalis</i>	Black Threadtail	烏齒原蠅	NP	VC											
<i>Pseudagrion rubriceps rubriceps</i>	Orange-faced Sprite	丹頂斑蠅	NP	C											
<i>Rhinocypha perforata</i>	Common Blue Jewel	三斑鼻蠅	NP	VC		+	+	+	+	+					
<i>Trithemis Aurora</i>	Crimson dropwing	曉褐蜻	NP	VC	+	+	+	+	+	+	+	+			
<i>Trithemis festiva</i>	Indigo Dropwing	慶褐蜻	NP	VC	+	+	+	+	+	+	+	+			
<i>Urothemis signata signata</i>	Scarlet Basket	赤斑曲鈎脈蜻	NP	C											
<i>Zygonyx iris insignis</i>	Emerald Cascader	彩虹蜻	P	P,PGC											
No of Species					7	10	11	11	10	8	7	5	1	1	2

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 according to AFCD biodiversity website (www.hkbiobiodiversity.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)

Species	Chinese name	Sampling point	Baseline survey		Impact monitoring		Impact monitoring		Impact monitoring		Impact monitoring		Impact monitoring		Impact monitoring		Impact monitoring		Impact monitoring		Impact monitoring		Impact monitoring		Impact monitoring		Impact monitoring		Impact monitoring					
			Oct-07		Jan-09		Jul-09		Jan-10		Jul-10		Jan-11		Jul-11		Jan-12		Jul-12		Mar-13		Jul-13											
			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			
Mollusca																																		
<i>Biomphalaria sp.</i>	--	NP VC		+			+			+			+	+						+														
<i>Brotia hainanensis</i>	--	NP VC	++	+	++				++			++	+		++	+			+	+							+							
<i>Melanooides tuberculata</i>	瘤擬黑螺	NP VC					+		+	+	+			+		++	+			+		+		+	+		+	+						
<i>Physella acuta</i>	尖膀胱螺	NP VC															+	+	++									+						
<i>Pomacea canaliculata</i>	蘋果螺	NP VC					+		+		++	+		+		++			+	+		+	+	+	+		+		+	+				
<i>Radix plicatulus</i>	羅白螺	NP VC		++			+			+		+	+		+	+			+		+	+	+	+			+		+					
<i>Sinotaia quadrata</i>	田螺	NP VC						++		+	++			++		+++					+				+	+		+		+				
Insects																																		
<i>Anisocentropus sp.</i>	--	NP VC																																
<i>Arctopora sp.</i>	--	NP VC																																
<i>Aulocodes sp.</i>	--	NP VC											+			+																		
<i>Baetis sp.</i>	--	NP VC	+		+				+			+	+		+	+											+		+					
<i>Chironomus sp.</i>	蠓幼虫	NP VC	+	+	+				+			+	+		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+				
<i>Ephemera sp.</i>		NP VC																																
<i>Indobaetis sp.</i>	--	NP VC	+		+				+			+	+		+	+														+				
<i>Mnais sp.</i>	--	NP VC		+	+				+			+	+		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+				
Odonate Larvae	--	NP VC																																
<i>Orthetrum sp.</i>	--	NP VC	+	+	+				+			+	+		+	+			+	+		+	+		+	+		+		+				
<i>Perla sp.</i>	--	NP VC											+			+																		
<i>Rhaphium sp.</i>	--	NP VC																								+	+		+					
<i>Tipulidae spp.</i>	--	NP VC												+		+																		
Crustacea																																		
<i>Caridina cantonensis</i>	廣東米蝦	NP VC			+				+			+	++		+	++	+	+	+	+	+	+	+	+	+	+	+	+	+	+				
<i>Cryptopotamon anacoluthon</i>	銀刺溪蟹	NP C			+				+			+			+	+										+		+		+				
<i>Eriocheir japonica</i>	日本絨螯蟹	NP C																																
<i>Macrobrachium hainanense</i>	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

Note:

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- "+" – 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 Upper Tai Po River (T1- Upper stream sampling site and T2- Lower stream sampling site)

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

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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)

Species	Chinese name	Sampling point	Post construction monitoring															Post construction monitoring									
			Oct-14			Nov-14			Dec-14			Jan-15			Feb-15			Mar-15			Apr-15			May-15			
			Reference	T1	T2	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2	
Mollusca																											
<i>Biomphalaria sp.</i>	--	NP	VC	+								+			+			+	+	+	+			+			
<i>Brotia hainanensis</i>	--	NP	VC	+	+		+	+		+	+	+	+		+	+		+			+	+		+	+		
<i>Melanoides tuberculata</i>	瘤擬黑螺	NP	VC	+			+			+		+			+			+			+			+		+	
<i>Physella acuta</i>	尖膀胱螺	NP	VC	+			+			+		+			+			+			+			+			
<i>Pomacea canaliculata</i>	蘋果螺	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
<i>Radix plicatulus</i>	羅白螺	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
<i>Sinotaia quadrata</i>	田螺	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
Insects																											
<i>Anisocentropus sp.</i>	--	NP	VC	+	+		+	+		+	+	+	+		+	+		+			+			+			
<i>Arctopora sp.</i>	--	NP	VC	+			+								+			+			+			+			
<i>Aulocodes sp.</i>	--	NP	VC				+			+		+						+									
<i>Baetis sp.</i>	--	NP	VC	+	+		+	+		+		+			+			+	+	+	+						
<i>Chironomus sp.</i>	蠅幼虫	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
<i>Ephemera sp.</i>		NP	VC	+	+		+					+			+			+	+		+			+			
<i>Indobaetis sp.</i>	--	NP	VC	+	+		+			+		+			+			+			+			+			
<i>Mnais sp.</i>	--	NP	VC	+	+	+	+	+		+	+	+	+		+						+			+			
Odonate Larvae	--	NP	VC																								
<i>Orthetrum sp.</i>	--	NP	VC	+	+	+	+	+	+	+	+	+	+		+	+				+	+		+	+			
<i>Perla sp.</i>	--	NP	VC				+					+						+			+			+			
<i>Rhaphium sp.</i>	--	NP	VC	+														+									
<i>Tipulidae spp.</i>	--	NP	VC																								
Crustacea																											
<i>Caridina cantonensis</i>	廣東米蝦	NP	VC	+	++	+	+	++	+	+	++	+	+	++	+	+	++	+	+		++	++		++	++	+	
<i>Cryptopotamon anacoluthon</i>	銀刺溪蟹	NP	C	+			+			+					+			++	++	+	+			+		+	
<i>Eriocheir japonica</i>	日本絨螯蟹	NP	C																								
<i>Macrobrachium hainanense</i>	海南沼蝦	NP	VC	+	+		+	+		+	+		+	+	+	+	+	+	+	+	+	+	+	+	+	+	
No of Species				19	13	7	19	11	6	16	10	5	19	10	5	18	7	4	19	7	5	20	7	4	15	7	4

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

Species	Chinese name	Sampling point	Monitoring									Post construction monitoring																	
			Jun-15			Jul-15			Aug-15			Sep-15			Oct-15			Nov-15			Dec-15			Jan-16			Feb-16		
			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
Mollusca																													
<i>Biomphalaria sp.</i>	--	NP VC	+			+			+			+			+			+			+			+			+		
<i>Brotia hainanensis</i>	--	NP VC	+	+		+	+		+	+		+	+		+	+		+	+		+	+		+	+		+	+	
<i>Melanooides tuberculata</i>	瘤擬黑螺	NP VC	+		+	+		+	+		+		+	+		+		+		+	+		+		+		+		+
<i>Physella acuta</i>	尖膀胱螺	NP VC																											
<i>Pomacea canaliculata</i>	蘋果螺	NP VC	+	++	+	++	++	+	++	+	+	++	+	+	++	+	+	++	+	+	++	+	+	++	+	+	++	+	+
<i>Radix plicatulus</i>	羅白螺	NP VC	+			+			+			+			+			+			+			+			+		
<i>Sinotaia quadrata</i>	田螺	NP VC	+	+		+	+		+	+		+	+		+	+		+	+		+	+		+	+		+	+	
Insects																													
<i>Anisocentropus sp.</i>	--	NP VC	+			+			+			+			+			+			+			+			+		
<i>Arctopora sp.</i>	--	NP VC	+			+			+			+			+			+			+			+			+		
<i>Aulocodes sp.</i>	--	NP VC																											
<i>Baetis sp.</i>	--	NP VC																											
<i>Chironomus sp.</i>	蠓幼虫	NP VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Ephemera sp.</i>		NP VC																											
<i>Indobaetis sp.</i>	--	NP VC	+			+			+			+			+			+			+			+			+		
<i>Mnais sp.</i>	--	NP VC	+			+			+			+			+			+			+			+			+		
Odonate Larvae	--	NP VC																											
<i>Orthetrum sp.</i>	--	NP VC	+	+		+	+		+	+		+	+		+	+		+	+		+	+		+	+		+	+	
<i>Perla sp.</i>	--	NP VC	+			+			+			+			+			+			+			+			+		
<i>Rhaphium sp.</i>	--	NP VC																											
<i>Tipulidae spp.</i>	--	NP VC																											
Crustacea																													
<i>Caridina cantonensis</i>	廣東米蝦	NP VC	++	++	+	++	++	+	++	+	+	++	+		++	+		++	+		++	+		++	+		++	+	
<i>Cryptopotamon anacoluthon</i>	鯪刺溪蟹	NP C		+			+																						
<i>Eriocheir japonica</i>	日本絨螯蟹	NP C																											
<i>Macrobrachium hainanense</i>	海南沼蝦	NP VC	+			+			+			+			+			+			+			+			+		
No of Species			15	7	4	15	7	4	16	6	4	16	6	3	16	6	3	16	6	3	16	6	3	16	6	3	16	6	3

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- "+++" – Species abundance in the study area
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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	Sampling point	Mar-16			Apr-16			May-16			Jun-16			Jul-16			Aug-16			Sep-16		
			Reference	T1	T2	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2
Mollusca																							
<i>Biomphalaria sp.</i>	--	NP	VC	+			+			+			+			+			+			+	
<i>Brotia hainanensis</i>	--	NP	VC	+	+		+	+		+	+		+	+		+	+		+	+		+	
<i>Melanoides tuberculata</i>	瘤擬黑螺	NP	VC	+		+	+		+	+		+		+	+		+		+		+	+	
<i>Physella acuta</i>	尖膀胱螺	NP	VC																				
<i>Pomacea canaliculata</i>	蘋果螺	NP	VC	++	+	+	++	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
<i>Radix plicatulus</i>	羅白螺	NP	VC	+			+			+			+			+			+			+	
<i>Sinotaia quadrata</i>	田螺	NP	VC	+	+		+	+		+	+		+	+		+	+		+	+		+	
Insects																							
<i>Anisocentropus sp.</i>	--	NP	VC	+			+			+			+			+			+			+	
<i>Arctopora sp.</i>	--	NP	VC	+			+			+			+			+			+			+	
<i>Aulocodes sp.</i>	--	NP	VC																				
<i>Baetis sp.</i>	--	NP	VC																				
<i>Chironomus sp.</i>	蠓幼虫	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
<i>Ephemera sp.</i>		NP	VC																				
<i>Indobaetis sp.</i>	--	NP	VC	+			+			+			+			+			+			+	
<i>Mnais sp.</i>	--	NP	VC	+			+			+			+			+			+			+	
Odonate Larvae	--	NP	VC	+			+			+			+			+			+			+	
<i>Orthetrum sp.</i>	--	NP	VC	+	+		+	+		+	+		+	+		+	+		+	+		+	
<i>Perla sp.</i>	--	NP	VC	+			+			+			+			+			+			+	
<i>Rhaphium sp.</i>	--	NP	VC																				
<i>Tipulidae spp.</i>	--	NP	VC																				
Crustacea																							
<i>Caridina cantonensis</i>	廣東米蝦	NP	VC	++	+		++	+		+	+		+	+		+	+		+	+		+	
<i>Cryptopotamon anacoluthon</i>	鯪刺溪蟹	NP	C																			+	
<i>Eriocheir japonica</i>	日本絨螯蟹	NP	C																				
<i>Macrobrachium hainanense</i>	海南沼蝦	NP	VC	+			+															+	
No of Species				16	6	3	16	6	3	15	6	3	15	6	3	15	6	3	15	6	3	17	

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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 Upper Tai Po River (T1- Upper stream sampling site and T2- Lower stream sampling site)

Species	Chinese name	Sampling point	Oct-16			Nov-16			Dec-16			Jan-17			Feb-17			
			Reference	T1	T2	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2	
Mollusca																		
<i>Biomphalaria sp.</i>	--	NP	VC	+			+			+			+			+		
<i>Brotia hainanensis</i>	--	NP	VC	+	+		+	+		+	+		+	+		+	+	
<i>Melanoides tuberculata</i>	瘤擬黑螺	NP	VC	+		+	+		+		+		+		+		+	
<i>Physella acuta</i>	尖膀胱螺	NP	VC															
<i>Pomacea canaliculata</i>	蘋果螺	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
<i>Radix plicatulus</i>	羅白螺	NP	VC	+			+			+			+			+		
<i>Sinotaia quadrata</i>	田螺	NP	VC	+	+		+	+		+	+		+	+		+	+	
Insects																		
<i>Anisocentropus sp.</i>	--	NP	VC	+			+			+			+			+		
<i>Arctopora sp.</i>	--	NP	VC	+			+			+			+			+		
<i>Aulocodes sp.</i>	--	NP	VC															
<i>Baetis sp.</i>	--	NP	VC															
<i>Chironomus sp.</i>	蠓幼虫	NP	VC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
<i>Ephemera sp.</i>		NP	VC															
<i>Indobaetis sp.</i>	--	NP	VC	+			+			+			+			+		
<i>Mnais sp.</i>	--	NP	VC	+			+			+			+			+		
Odonate Larvae	--	NP	VC	+			+			+			+			+		
<i>Orthetrum sp.</i>	--	NP	VC	+	+		+	+		+	+		+	+		+	+	
<i>Perla sp.</i>	--	NP	VC	+			+			+			+			+		
<i>Rhaphium sp.</i>	--	NP	VC															
<i>Tipulidae spp.</i>	--	NP	VC															
Crustacea																		
<i>Caridina cantonensis</i>	廣東米蝦	NP	VC	+	+		+	+		+	+		+	+		+	+	
<i>Cryptopotamon anacoluthon</i>	銀刺溪蟹	NP	C	+			+			+			+			+		
<i>Eriocheir japonica</i>	日本絨螯蟹	NP	C										+			+		
<i>Macrobrachium hainanense</i>	海南沼蝦	NP	VC	+			+			+			+			+		
No of Species				17	6	3	17	6	3	17	6	3	18	6	3	18	6	3

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 "L" - 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 4.0 Fish species and Hong Kong newt recorded at Upper Tai Po River (T1 - Upper stream sampling site and T2 - Lower stream sampling site)

Species		Status	Commonness	Post construction monitoring															Post construction monitoring								
				Oct-15			Nov-15			Dec-15			Jan-16			Feb-16			Mar-16			Apr-16			May-16		
				Reference	T1	T2	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2
<i>Cyprinus carpio var. viridiviolaceus</i>	錦鯉	NP	C																								
<i>Gambusia affinis</i>	食蚊魚	NP	VC	+	+		+	+		+	+		+	+		+	+		+	+		+	+		+		
<i>Glyptothorax pallozonum</i>	白線紋胸鮡	NP	R																								
<i>Liniparhomaloptera disparis</i>	擬平鰈	NP	C	+			+			+			+			+			+			+			+		
<i>Misgurnus anguillicaudatus</i>	泥鰌	NP	C																								
<i>Oreochromis niloticus</i>	尼羅口孵非鯽	NP	C	+			+			+			+			+			+			+			+		
<i>Parazacco spilurus</i>	異鱧	V and	C	+	+		+	+		+	+		+	+		+	+		+	+		+	+		+	+	
<i>Poecilia reticulata</i>	孔雀花魚將	NP	C																								
<i>Pseudobagrus trilineatus</i>	三線擬鱧	NP,GC	R	+			+			+			+			+			+			+			+		
<i>Pseudogastromyzon myersi</i>	麥氏擬腹吸鰈	NP	C	+			+			+			+			+			+			+			+		
<i>Pterocryptis cochinchinensis</i>	越南隱鱧鯰	NP	C	+			+			+			+			+			+			+			+		
<i>Puntius semifasciolatus</i>	七星魚	NP	C	+	+		+	+		+	+		+	+		+	+		+	+		+	+		+		
<i>Rhinogobius spp.</i>	鰕虎魚	NP	C	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
<i>Schistura fasciolata</i>	橫紋南鰈	NP	C	+			+			+			+			+			+			+			+		
<i>Xiphophorus hellerii</i>	劍尾魚	NP	C	+			+			+			+			+			+			+			+		
<i>Xiphophorus variatus</i>	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	20	5	40	15	5	25	10	5
		No of Speices		12	4	1	12	4	1	12	4	1	11	4	1	11	4	1	11	4	1	11	4	1	12	2	1
Amphibian																											
<i>Paramesotriton hongkongensis</i>	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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“+++” – Species abundance in the study area

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 4.0 Fish species and Hong Kong newt recorded at Upper Tai Po River (T1- Upper stream sampling site and T2 - Lower stream sampling site)

Species	Status	Commonness	Post construction monitoring															
			Jun-16			Jul-16			Aug-16			Sep-16			Oct-16			
			Reference	T1	T2	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2	
<i>Cyprinus carpio var. viridiviolaceus</i>	錦鯉	NP	C															
<i>Gambusia affinis</i>	食蚊魚	NP	VC	+			+			+			+			+		
<i>Glyptothorax pallozonum</i>	白線紋胸鮡	NP	R				+			+			+			+		
<i>Liniparhomaloptera disparis</i>	擬平鰕	NP	C	+			+			+			+			+		
<i>Misgurnus anguillicaudatus</i>	泥鰕	NP	C															
<i>Oreochromis niloticus</i>	尼羅口孵非鯽	NP	C	+			+			+			+			+		
<i>Parazacco spilurus</i>	異鱧	V and	C	+	+		+	+		+	+		+			+		
<i>Poecilia reticulata</i>	孔雀花魚將	NP	C															
<i>Pseudobagrus trilineatus</i>	三線擬鱮	NP,GC	R	+			+			+			+			+		
<i>Pseudogastromyzon myersi</i>	麥氏擬腹吸鰕	NP	C	+			+			+			+			+		
<i>Pterocryptis cochinchinensis</i>	越南隱鱮鯢	NP	C	+			+			+			+			+		
<i>Puntius semifasciolatus</i>	七星魚	NP	C	+			+			+			+			+		
<i>Rhinogobius spp.</i>	鰕虎魚	NP	C	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
<i>Schistura fasciolata</i>	橫紋南鰕	NP	C	+			+			+			+			+		
<i>Xiphophorus hellerii</i>	劍尾魚	NP	C	+			+			+			+			+		
<i>Xiphophorus variatus</i>	雜色劍尾魚	NP	C															
		2x2m fish		25	10	5	20	7	2	22	5	2	22	2	2	25	2	2
		No of Speices		11	2	1	12	2	1	12	2	1	12	1	1	12	1	1
Amphibian																		
<i>Paramesotriton hongkongensis</i>	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

“++” – Species common in the study area

“+++” – Species abundance in the study area

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 4.0 Fish species and Hong Kong newts recorded at Upper Tai Po River (T1- Upper stream sampling site and T2 - Lower stream sampling site)

Species		Status	Commonness	Post construction monitoring			Post construction monitoring			Post construction monitoring			Post construction monitoring		
				Nov-16			Dec-16			Jan-17			Feb-17		
				Reference	T1	T2	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2
<i>Cyprinus carpio var. viridiviolaceus</i>	錦鯉	NP	C												
<i>Gambusia affinis</i>	食蚊魚	NP	VC	+			+			+			+		
<i>Glyptothorax pallozonum</i>	白線紋胸鮡	NP	R	+			+			+			+		
<i>Liniparhomaloptera disparis</i>	擬平鰻	NP	C	+			+			+			+		
<i>Misgurnus anguillicaudatus</i>	泥鰻	NP	C												
<i>Oreochromis niloticus</i>	尼羅口孵非鯽	NP	C	+			+			+			+		
<i>Parazacco spilurus</i>	異鱧	V and	C	+			+			+			+		
<i>Poecilia reticulata</i>	孔雀花魚將	NP	C												
<i>Pseudobagrus trilineatus</i>	三線擬鱧	NP,GC	R	+			+			+			+		
<i>Pseudogastromyzon myersi</i>	麥氏擬腹吸鰻	NP	C	+			+			+			+		
<i>Pterocryptis cochinchinensis</i>	越南隱鱮鯢	NP	C	+			+			+			+		
<i>Puntius semifasciolatus</i>	七星魚	NP	C	+			+			+			+		
<i>Rhinogobius spp.</i>	鰕虎魚	NP	C	+	+	+	+	+	+	+	+	+	+	+	+
<i>Schistura fasciolata</i>	橫紋南鰻	NP	C	+			+			+			+		
<i>Xiphophorus hellerii</i>	劍尾魚	NP	C	+			+			+			+		
<i>Xiphophorus variatus</i>	雜色劍尾魚	NP	C												
		2x2m fish		30	2	2	35	2	2	40	2	2	45	2	2
		No of Speices		12	1	1	12	1	1	12	1	1	12	1	1
Amphibian															
<i>Paramesotriton hongkongensis</i>	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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Table 4.7 Abotic data for Upper Tai Po River (T1- Upper stream sampling site and T2- Lower stream sampling site)

Parameters/ Date	Baseline survey	Impact monitoring														Impact monitoring					
	Oct-07	Jan-09		Jul-09		Jan-10		Jul-10		Jan-11		Jul-11		Jan-12		Jul-12		Mar-13		Jul-13	
Replicate	T1	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
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
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
Ammonia (mg/L)	<0.01	PO4-P (µg 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
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
Conductivity (mS/cm)	40	40	190	34	118	42	72	49	43	50	60	50	60	65	74	52	54	54	58	44	42
BOD (mg/L)	< 2	< 2	12	< 2	< 2	< 2	2	< 2	2	2	< 2	< 2	2	< 2	3	< 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	
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	
Sand (%)	15	15		15	25	15	25	15	25	15	25	15	15	15	15	15	15	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
Mud (%)	5	5		5	5	5	5	5	5	5	5	5	5	5	5	5	5	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

