

1. Survey Objectives

1.1 Survey findings and information presented in this annex provide supplementary information to the ecological baseline study and the ecological impact assessment.

1.2 Slope mitigation works will be carried out within the Clear Water Bay Country Park. Vegetation survey is required to identify plant species of conservation importance within the survey area. Moreover, the Collared Scops Owl found at the works area for slope mitigation works may change their roosting location according to the ecological baseline report. Therefore, a survey is needed to verify location of the concerned Collared Scops Owl. The objectives of the survey include

- To identify the plant species and their relative abundance, which would be affected by the proposed slope mitigation works;
- To identify the quantity of trees and their species, which would be affected by the proposed slope mitigation works;
- To report the findings of inspection of Collared Scops Owl within study area for slope mitigation works.

2. Survey scope

Vegetation Survey

2.1 The scope is to conduct vegetation and tree surveys at the accessible works area for the slope mitigation works. Surveys were conducted on 11, 12 and 14 May 2015.

Survey on Collared Scops Owl

2.2 The scope is to check the presence of Collared Scops Owl at the accessible works area for the slope mitigation works. 2 rounds of ecological survey (on day and one evening survey) were conducted on 14 May 2015.

3. Survey Methodology

Vegetation Survey

3.1 Plant species within the proposed works area on slopes were recorded by direct observation. The parameters to be covered in the survey include:

- Species Name (including Scientific Name and Common Name);
- Growth Form;
- Species Origin (native or exotic);
- Conservation Status; and
- Relative Abundance (common; occasional; or scarce)

3.2 Trees within the proposed works area on slopes were surveyed individually with reference numbers provided. The parameters to be covered in the survey include:

- Number of trees;
- Species Name (including Scientific Name and Common Name);
- Species Origin (native species or not)
- Protection Status (protected or not by local legislations Cap. 96. sub. leg. and/or Cap. 586)

3.3 The general health condition of the vegetation within the proposed Works Area was assessed qualitatively.

3.4 The general condition of the trees within the proposed Works Area was assessed qualitatively in terms of overall health and their average size in height and trunk diameter.

Collared Scops Owl Survey

3.5 Collared Scops Owl inspection was conducted by actively searching for any presence of active Collared Scops Owl nest within the study area for slope mitigation works by transect count method with focus on the presence of Collared Scops Owl and its nest. Inspection was conducted with the aid of 8x42 binoculars.

3.6 The ecological surveys follow the requirements set forth in:

- EIAO Guidance Note No. 6/2010 Some Observations on Ecological Assessment From the Environmental Impact Assessment Ordinance Perspective;
- EIAO Guidance Note No. 7/2010 Ecological Baseline Survey for Ecological Assessment;
- EIAO Guidance Note No. 10/2010 Methodologies for Terrestrial and Freshwater Ecological Baseline Surveys;
- Annexes 8 and 16 of the EIAO-TM; and
- EIA Study Brief No. ESB-266/2013.

4. Findings

Vegetation Survey

4.1 A vegetation survey at proposed works area was conducted on 14 May 2015. A total of 97 plant species were recorded and one species of conservation importance was identified.

4.2 This supplementary information collected from the vegetation survey is tabulated in the plant list as shown in **Table 1**.

4.3 The survey on existing trees was conducted in May 2015. A total of 154 trees were observed in the proposed works area which is accessible in the survey. There are no protected species or species of conservation importance identified.

Species of Conservation Importance

- 4.4 The species of conservation importance is *Marsdenia lachnostoma*, which has been included in AFCD's publication **Rare and Precious Plants of Hong Kong**. It is a very rare local plant species with status of Critically Endangered (CR) in mainland China.
- 4.5 A total of 10 individuals of *Marsdenia lachnostoma* were recorded during the survey and their locations are indicated in **Appendix 2**. As a protection measure, the flexible barrier will be realigned around this area to avoid this species totally as shown in **Appendix 2**.
- 4.6 Photographic records of this concerned species are given in **Appendix 1**.

General Condition of the Undergrowths

- 4.7 The survey area (i.e. the proposed works area) was observed to be disturbed recently by vegetation clearance and hill fires. The overall health condition of the undisturbed vegetation is fair in general. Photo records refer to **Appendix 2**.

General Condition of Trees

- 4.8 The survey area is located within a degraded mixed woodland which is evidenced by the presence of large proportion of invasive species of *Leucaena leucocephala* and common pioneer species of *Macaranga tanarius*. Most of the trees are young in age. The average trunk diameter ranges 100mm-200mm while the average height ranges 6-9m.
- 4.9 The overall health condition of the trees is fair in general. Photo records refer to **Appendix 2**.

Table 1 Plant Species Recorded within the Works Area

Scientific Name	Growth Form	Native	Conservation Status	Works Area (Note 1)
<i>Acacia auriculiformis</i>	Tree	Exotic	common, widely planted	s
<i>Acacia confusa</i>	Tree	Exotic	common, widely planted	o
<i>Alocasia odora</i>	Herb	Native	common	o
<i>Alpinia zerumbet</i>	Herb	Native	very common	o
<i>Alyxia sinensis</i>	Climber	Native	common	s
<i>Ampelopsis heterophylla</i>	Climber	Native	common	o
<i>Antidesma ghaesembilla</i>	Tree	Native	common	s
<i>Archidendron lucidum</i>	Tree	Native	common	s
<i>Ardisia crenata</i>	Shrub	Native	common	s
<i>Arundinella setosa</i>	Herb	Native	common	o
<i>Asparagus cochinchinensis</i>	Herb	Native	common	s
<i>Atalantia buxifolia</i>	Shrub	Native	common	o
<i>Baeckea frutescens</i>	Tree	Native	very common	s
<i>Bidens alba</i>	Herb	Exotic	very common	c
<i>Blechnum orientale</i>	Herb	Native	very common	o

Scientific Name	Growth Form	Native	Conservation Status	Works Area (Note 1)
<i>Boehmeria nivea</i>	Shrub	Exotic	common	s
<i>Breynia fruticosa</i>	Shrub	Native	very common	s
<i>Bridelia tomentosa</i>	Shrub	Native	very common	o
<i>Brucea javanica</i>	Shrub	Native	common	s
<i>Celtis sinensis</i>	Tree	Native	common; also planted	o
<i>Centella asiatica</i>	Herb	Native	very common	o
<i>Choerospondias axillaris</i>	Tree	Native	common	s
<i>Cocculus orbiculatus</i>	Climber	Native	common	s
<i>Cratoxylum cochinchinense</i>	Tree	Native	very common	c
<i>Curculigo orchioides</i>	Herb	Native	common	s
<i>Desmodium heterocarpon</i>	Shrub	Native	very common	s
<i>Desmos chinensis</i>	Shrub	Native	common	o
<i>Dianella ensifolia</i>	Herb	Native	very common	o
<i>Dicranopteris pedata</i>	Herb	Native	common	c
<i>Embelia laeta</i>	Climber	Native	very common	o
<i>Emilia sonchifolia</i>	Herb	Native	very common; pantropical weed	s
<i>Eurya nitida</i>	Shrub	Native	very common	s
<i>Ficus hirta</i>	Shrub	Native	common	s
<i>Ficus hispida</i>	Tree	Native	very common	c
<i>Ficus microcarpa</i>	Tree	Native	common	s
<i>Gahnia tristis</i>	Herb	Native	very common	s
<i>Gerbera piloselloides</i>	Herb	Native	restricted	s
<i>Glochidion eriocarpum</i>	Shrub	Native	common	o
<i>Glochidion lanceolarium</i>	Tree	Native	common	s
<i>Gymnema sylvestre</i>	Climber	Native	very common	s
<i>Helicteres angustifolia</i>	Shrub	Native	very common	o
<i>Ilex asprella</i>	Shrub	Native	very common	c
<i>Ilex pubescens</i>	Shrub	Native	very common	s
<i>Imperata cylindrica</i>	Herb	Native	common	o
<i>Indocalamus sp.</i>	Herb	-	#N/A	s
<i>Inula cappa</i>	Herb	Native	common	c
<i>Ipomoea triloba</i>	Herb	Native	a naturalized species of tropical American origin	s
<i>Ischaemum aristatum</i>	Herb	Native	common	o

Scientific Name	Growth Form	Native	Conservation Status	Works Area (Note 1)
<i>Lantana camara</i>	Shrub	Exotic	very common	o
<i>Leucaena leucocephala</i>	Tree	Exotic	common	c
<i>Liriope spicata</i>	Herb	Native	very common	s
<i>Litsea glutinosa</i>	Tree	Native	common	o
<i>Lygodium japonicum</i>	Herb	Native	very common	s
<i>Macaranga tanarius</i>	Tree	Native	common	c
<i>Mallotus paniculatus</i>	Tree	Native	common	s
<i>Marsdenia lachnostoma</i>	Climber	Native	very rare, listed in AFCD's <i>Rare and Precious Plants of Hong Kong</i>	s
<i>Melastoma sanguineum</i>	Shrub	Native	common	o
<i>Melia azedarach</i>	Tree	Exotic	common	s
<i>Melicope pteleifolia</i>	Shrub	Native	common	s
<i>Melodinus suaveolens</i>	Climber	Native	common	o
<i>Mikania micrantha</i>	Herb	Exotic	common	o
<i>Millettia nitida</i>	Climber	Native	very common	o
<i>Miscanthus sinensis</i>	Herb	Native	very common	c
<i>Morinda parvifolia</i>	Climber	Native	very common	s
<i>Mussaenda erosa</i>	Climber	Native	common	s
<i>Mussaenda pubescens</i>	Climber	Native	very common	s
<i>Neyraudia reynaudiana</i>	Herb	Native	common	o
<i>Oxalis corymbosa</i>	Herb	Exotic	common	s
<i>Paederia scandens</i>	Climber	Native	very common	o
<i>Passiflora foetida</i>	Climber	Exotic	common	s
<i>Perilla frutescens</i>	Herb	Native	restricted; cultivated and semi-naturalized	s
<i>Phoenix loureiroi</i>	Tree	Native	common	o
<i>Phyllanthus cochinchinensis</i>	Shrub	Native	common	o
<i>Phyllanthus emblica</i>	Tree	Native	very common	o
<i>Psychotria asiatica</i>	Tree	Native	common	s
<i>Psychotria serpens</i>	Climber	Native	very common	o
<i>Pueraria phaseoloides</i>	Climber	Native	very common	o
<i>Rhaphiolepis indica</i>	Shrub	Native	very common	s
<i>Rhapis excelsa</i>	Shrub	Native	common	s

Scientific Name	Growth Form	Native	Conservation Status	Works Area (Note 1)
<i>Rhodomyrtus tomentosa</i>	Shrub	Native	very common	o
<i>Rhus hypoleuca</i>	Shrub	Native	common	o
<i>Rhus succedanea</i>	Shrub	Native	common	o
<i>Rubus parvifolius</i>	Shrub	Native	common	s
<i>Sapium discolor</i>	Tree	Native	very common	s
<i>Schefflera heptaphylla</i>	Tree	Native	common	o
<i>Smilax china</i>	Climber	Native	very common	o
<i>Solena amplexicaulis</i>	Climber	Native	very common	s
<i>Sterculia lanceolata</i>	Tree	Native	very common	o
<i>Striga asiatica</i>	Herb	Native	restricted	s
<i>Strophanthus divaricatus</i>	Climber	Native	common	s
<i>Tetracera asiatica</i>	Climber	Native	very common	s
<i>Trema tomentosa</i>	Tree	Native	common	s
<i>Tylophora ovata</i>	Climber	Native	common	s
<i>Uraria crinita</i>	Shrub	Native	common	s
<i>Wikstroemia indica</i>	Shrub	Native	common	s
<i>Zanthoxylum avicennae</i>	Tree	Native	common	o
<i>Zanthoxylum nitidum</i>	Climber	Native	very common	o

Note 1: Relative Abundance: C = common, O = occasional, S = scarce

Description of Recorded Restricted Species

4.10 *Gerbera piloselloides* is a perennial herb species of Family Asteracea (Compositae). This species is usually found on hillside grassland and shrubland. Clear Water Bay region, which covering the proposed works area of the project (i.e. Desalination Plant at Tseung Kwan O) is within its natural range of local distributions in Hong Kong. Other recorded distributions include Ma On Shan, Tai Mo Shan, Lantau Island and Ping Chau. This species currently is not protected by any legislation in Hong Kong or mainland China.

4.11 *Striga asiatica* is an annual parasitic herb species of Family Scrophulariaceae. This species is usually found on exposed habitat of grassland. Recorded localities include Wong Nai Chung Gap, Ma On Shan, Tai Mei Tuk, Sai Kung, Lamma Island and Sunset Peak on Lantau. This species currently is not protected by any legislation in Hong Kong or mainland China.

Description of Recorded Species of Conservation Importance

4.12 *Marsdenia lachnostoma* is a scandent subshrub species of Asclepiadaceae. This species is usually found in thin forests or thickets. Recorded localities include North Point, Ma On Shan, Sai Kung, and Tung Lung Chau. Within China, Hong Kong is only

known location where this species can be found. This species is therefore considered to be of botanical interest. According to AFCD's *Rare and Precious Plants of Hong Kong*, this species is of Critically Endangered (CR) status in mainland China.

Collared Scops Owl Survey

4.13 No Collared Scops Owl was found during the day and night time field survey on 14 May 2015. An abandoned nest, but not belong to Collared Scops Owl, was discovered on a *Ficus microcarpa*, **Appendix 5**. Representative photographs are shown in **Appendix 4**. Neither breeding activities nor presence of Collared Scops Owl were observed at or in the vicinity of the abandoned nest.

4.14 During the day time field survey, bird call from Lesser Coucal was recorded, referring to **Appendix 5** for location. No sign of breeding of this bird was observed.

5. Ecological Valuations of Habitats of the Slope Mitigation Works Area and Species

Vegetation Survey

5.1 A total of 97 plant species were recorded and one species of conservation importance was identified.

5.2 A total of 154 trees were recorded in the survey within the works area. There are no protected species or species of conservation importance identified.

Table 2 Evaluation of Flora Species of Conservation Importance Recorded within the Works Area

Common Name	Scientific Name	Locations	Protection Status	Distribution	Rarity
Hairy-throat Condorvine	<i>Marsdenia lachnostoma</i>	Grassland/ shrubland on the hillslope within the works area for slope mitigation works	Status in China : Critically Endangered (CR)	thin forests or thickets	very rare

Collared Scops Owl Survey

5.3 The Collared Scops Owl inspection was undertaken on 14 May 2015 before EIA submission. The Collared Scops Owl inspection confirmed that no Collared Scops Owl was present at the area around the study area for slope mitigation works.

Table 3 Evaluation of Fauna Species of Conservation Importance Recorded within the Works Area

Species	Location	Protection / Conservation status	Distribution **	Commonness**
Lesser Coucal <i>Centropus bengalensis</i>	Wasteland within the Earmarked Site for Desalination Plant	Protected under Wild Animal Protection Ordinance.	Widespread but uncommon resident in areas of grassland or shrubland	Common

** “Distribution” and “Rarity” follow Hong Kong Biodiversity Online

Appendix 1
Photographic Record



Photo 1 – Flowers of *Marsdenia lachnostoma*



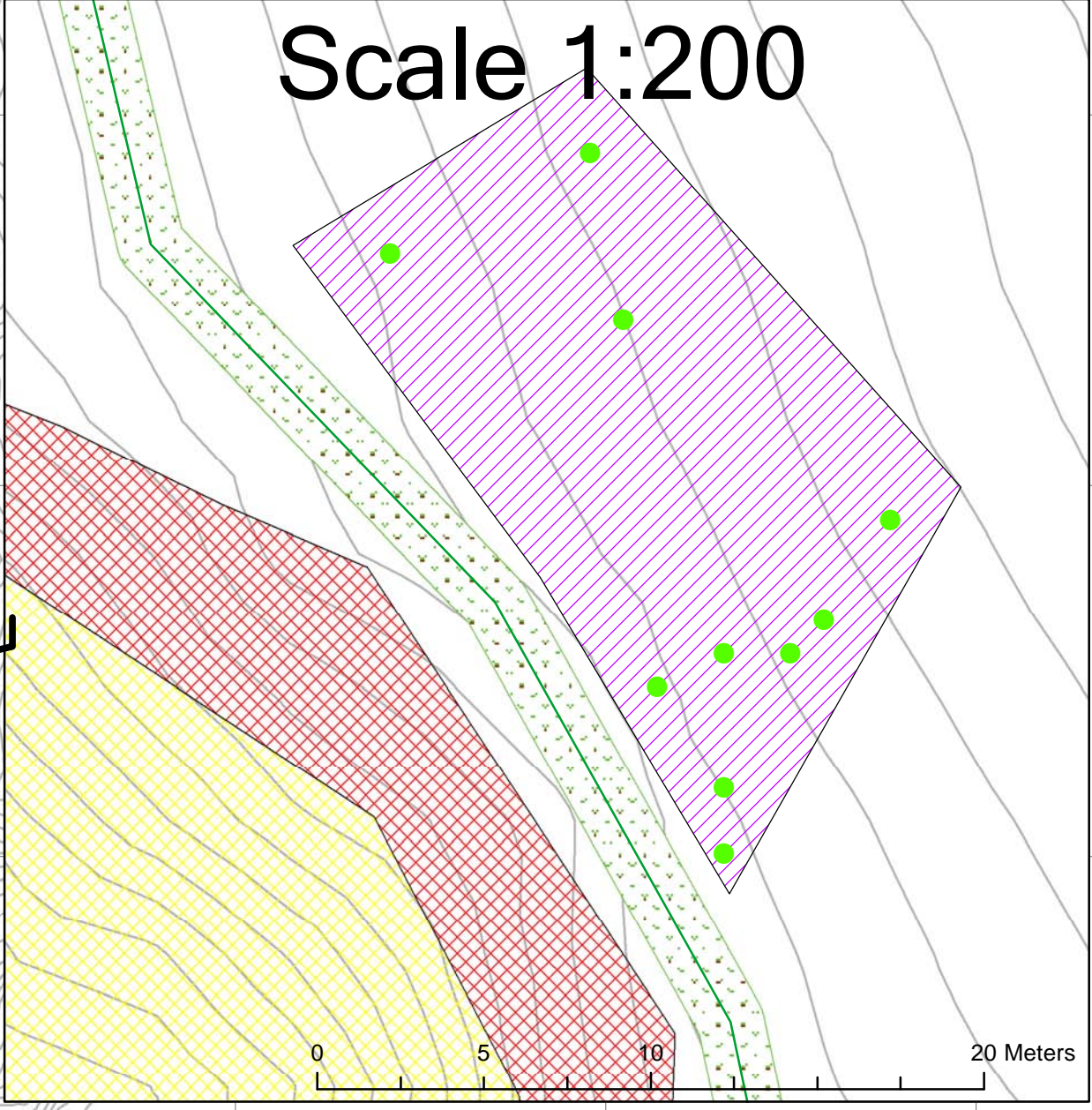
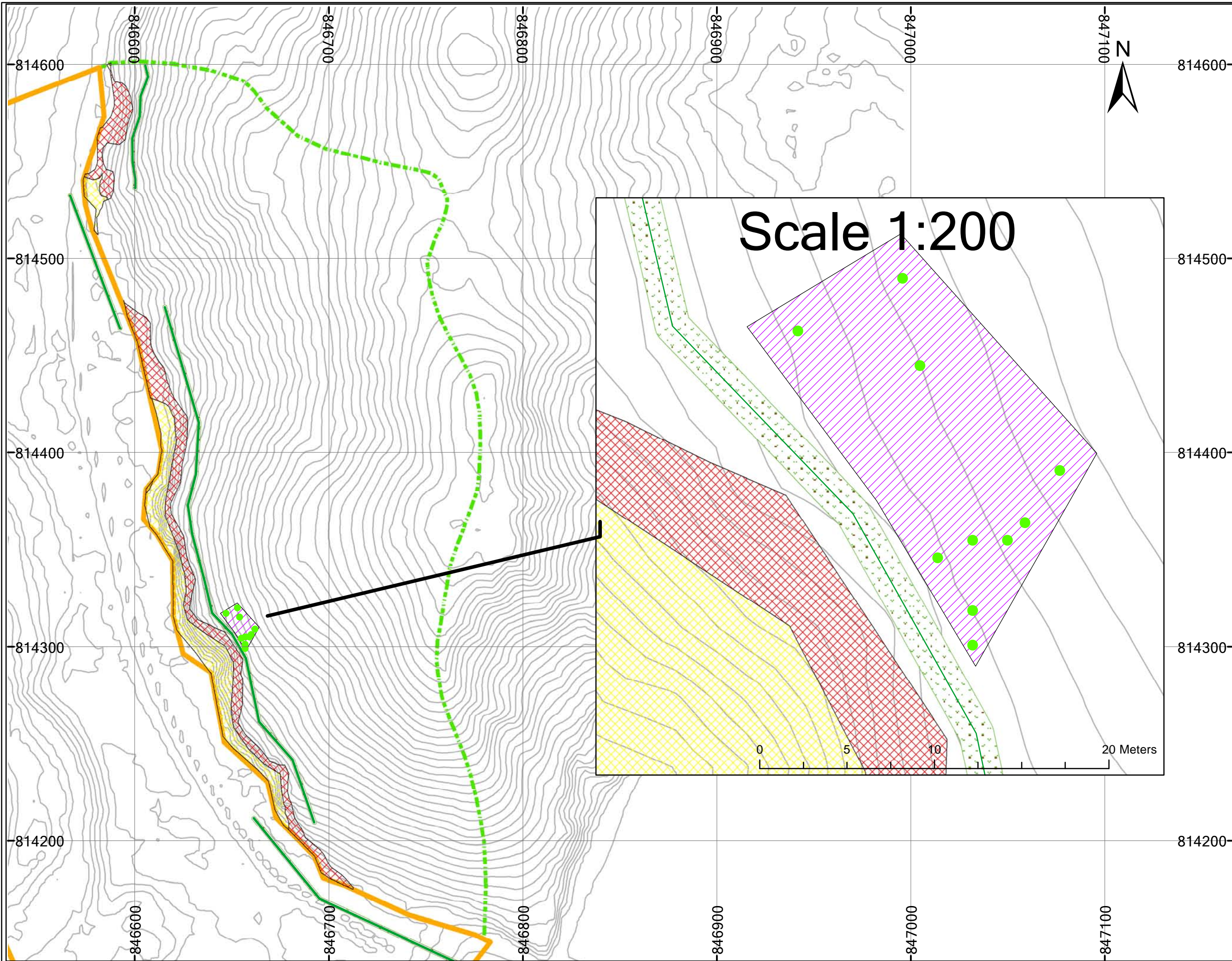
Photo 2 – Mature individual of *Marsdenia lachnostoma*



Photo 3 – Young individual of *Marsdenia lachnostoma*

Appendix 2

Location Plan and Protection Measures for *Marsdenia Lachnostoma*



© Copyright by Black & Veatch Hong Kong Limited
 Map data reproduced with permission of the Director of Lands
 © Hong Kong Special Administrative Region Government: G381/06

Initial	Designed	Reviewed	Drawn	Checked
	YLC	TT	YLC	KHL
Date	03/13	03/13	03/13	03/13
Revision	Date	Description	Initial	

- Legend**
- Marsdenia Lachnostoma
 - Flexible Barrier
 - Temporary Fence for Protection
 - Works Area of Flexible Barrier
 - Proposed Soil Slope Stabilisation Works
 - Proposed Rock Slope Stabilization Works
 - Proposed Fresh Water Main
 - Proposed Submarine Intake and Outfall
 - Proposed Desalination Plant
 - Study Area for Slope Mitigation Work

Agreement No. CE21/2012 (WS)

Project Title
 DESALINATION PLANT AT
 TSEUNG KWAN O
 - FEASIBILITY STUDY

Figure Title
 Location Plan and Protection Measures
 for Marsdenia Lachnostoma

Drawing No. Figure 9.1 **Scale** 1:1,800 @ A3



Appendix 3

Photo Records for Vegetation Survey



General Condition of Trees

The survey area is located within a degraded mixed woodland which is evidenced by the presence of large proportion of invasive species of *Leucaena leucocephala* and common pioneer species of *Macaranga tanarius*. Most of the trees are young in age. The average trunk diameter ranges 100mm-200mm while the average height ranges 6-9m. The overall health condition of the trees is fair in general.

General Condition of the Vegetation

The survey area (i.e. the proposed works area) was observed to be disturbed recently by vegetation clearance and hill fires. The overall health condition of the undisturbed vegetation is fair in general.

General Condition of Trees

The survey area is located within a degraded mixed woodland which is evidenced by the presence of large proportion of invasive species of *Leucaena leucocephala* and common pioneer species of *Macaranga tanarius*. Most of the trees are young in age. The average trunk diameter ranges 100mm-200mm while the average height ranges 6-9m.

The overall health condition of the trees is fair in general.



Plate 1



Plate 2

General Condition of the Vegetation

The survey area (i.e. the proposed works area) was observed to be disturbed recently by vegetation clearance and hill fires. The overall health condition of the undisturbed vegetation is fair in general.

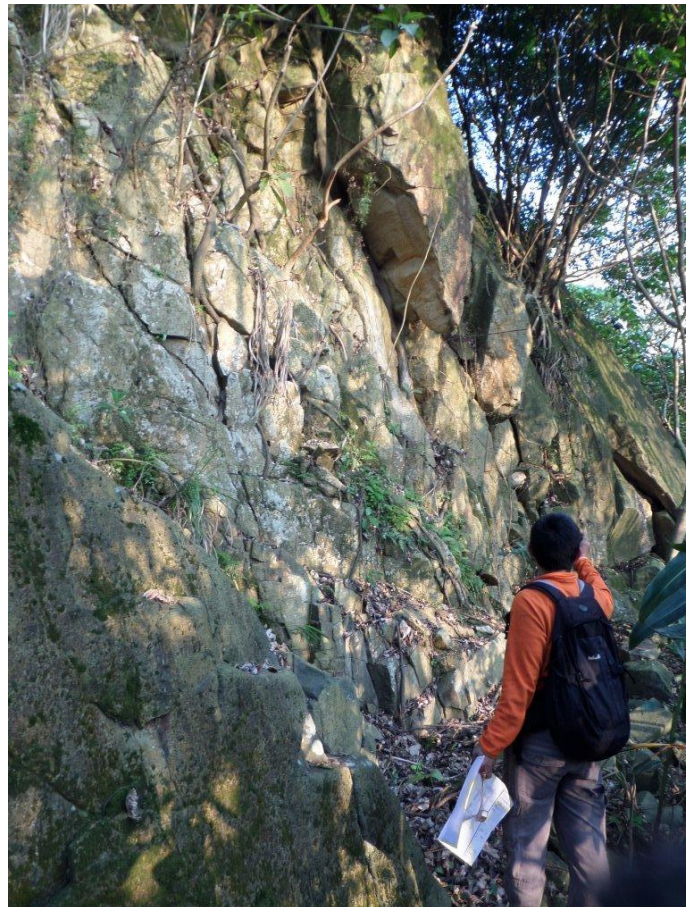
General Condition of Trees

The survey area is located within a degraded mixed woodland which is evidenced by the presence of large proportion of invasive species of *Leucaena leucocephala* and common pioneer species of *Macaranga tanarius*. Most of the trees are young in age. The average trunk diameter ranges 100mm-200mm while the average height ranges 6-9m.

The overall health condition of the trees is fair in general.



Plate 3



General Condition of the Vegetation

The survey area (i.e. the proposed works area) was observed to be disturbed recently by vegetation clearance and hill fires. The overall health condition of the undisturbed vegetation is fair in general.

General Condition of Trees

The survey area is located within a degraded mixed woodland which is evidenced by the presence of large proportion of invasive species of *Leucaena leucocephala* and common pioneer species of *Macaranga tanarius*. Most of the trees are young in age. The average trunk diameter ranges 100mm-200mm while the average height ranges 6-9m. The overall health condition of the trees is fair in general.



Plate 5



Plate 6

General Condition of the Vegetation

The survey area (i.e. the proposed works area) was observed to be disturbed recently by vegetation clearance and hill fires. The overall health condition of the undisturbed vegetation is fair in general.

General Condition of Trees

The survey area is located within a degraded mixed woodland which is evidenced by the presence of large proportion of invasive species of *Leucaena leucocephala* and common pioneer species of *Macaranga tanarius*. Most of the trees are young in age. The average trunk diameter ranges 100mm-200mm while the average height ranges 6-9m. The overall health condition of the trees is fair in general.



Plate 7

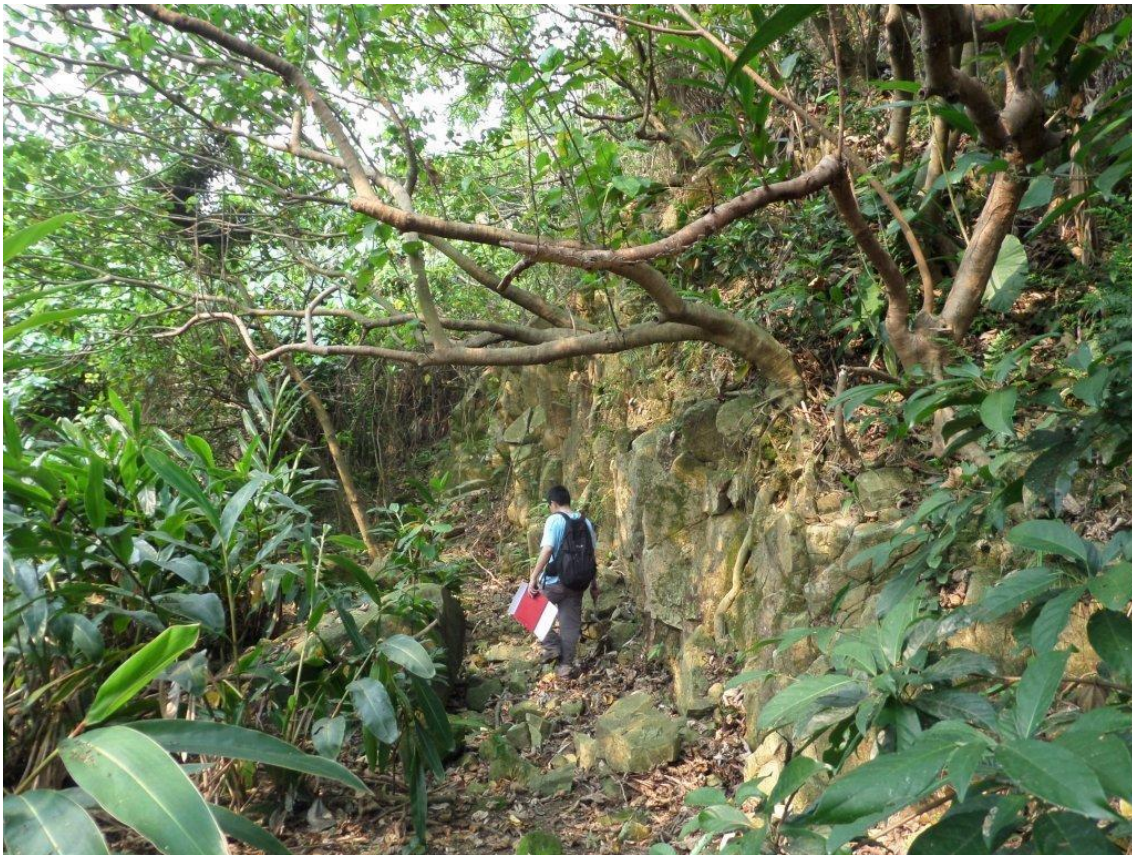


Plate 8

General Condition of the Vegetation

The survey area (i.e. the proposed works area) was observed to be disturbed recently by vegetation clearance and hill fires. The overall health condition of the undisturbed vegetation is fair in general.

General Condition of Trees

The survey area is located within a degraded mixed woodland which is evidenced by the presence of large proportion of invasive species of *Leucaena leucocephala* and common pioneer species of *Macaranga tanarius*. Most of the trees are young in age. The average trunk diameter ranges 100mm-200mm while the average height ranges 6-9m. The overall health condition of the trees is fair in general.



Plate 9



Plate 10

General Condition of the Vegetation

The survey area (i.e. the proposed works area) was observed to be disturbed recently by vegetation clearance and hill fires. The overall health condition of the undisturbed vegetation is fair in general.

General Condition of Trees

The survey area is located within a degraded mixed woodland which is evidenced by the presence of large proportion of invasive species of *Leucaena leucocephala* and common pioneer species of *Macaranga tanarius*. Most of the trees are young in age. The average trunk diameter ranges 100mm-200mm while the average height ranges 6-9m.

The overall health condition of the trees is fair in general.



Plate 11



General Condition of the Vegetation

The survey area (i.e. the proposed works area) was observed to be disturbed recently by vegetation clearance and hill fires. The overall health condition of the undisturbed vegetation is fair in general.

General Condition of Trees

The survey area is located within a degraded mixed woodland which is evidenced by the presence of large proportion of invasive species of *Leucaena leucocephala* and common pioneer species of *Macaranga tanarius*. Most of the trees are young in age. The average trunk diameter ranges 100mm-200mm while the average height ranges 6-9m. The overall health condition of the trees is fair in general.



Plate 13



Plate 14

General Condition of the Vegetation

The survey area (i.e. the proposed works area) was observed to be disturbed recently by vegetation clearance and hill fires. The overall health condition of the undisturbed vegetation is fair in general.

General Condition of Trees

The survey area is located within a degraded mixed woodland which is evidenced by the presence of large proportion of invasive species of *Leucaena leucocephala* and common pioneer species of *Macaranga tanarius*. Most of the trees are young in age. The average trunk diameter ranges 100mm-200mm while the average height ranges 6-9m.

The overall health condition of the trees is fair in general.



Plate 15



Plate 16

General Condition of the Vegetation

The survey area (i.e. the proposed works area) was observed to be disturbed recently by vegetation clearance and hill fires. The overall health condition of the undisturbed vegetation is fair in general.

General Condition of Trees

The survey area is located within a degraded mixed woodland which is evidenced by the presence of large proportion of invasive species of *Leucaena leucocephala* and common pioneer species of *Macaranga tanarius*. Most of the trees are young in age. The average trunk diameter ranges 100mm-200mm while the average height ranges 6-9m.

The overall health condition of the trees is fair in general.



Photo 17

General Condition of the Vegetation

The survey area (i.e. the proposed works area) was observed to be disturbed recently by vegetation clearance and hill fires. The overall health condition of the undisturbed vegetation is fair in general.

Appendix 4

Photographic Record of Collared Scops Owl Survey



Plate 1: General view of study area for slope mitigation works



Plate 2: General view of study area for slope mitigation works



Plate 3: Abandoned bird nest on *Ficus microcarpa* on 14 May 2015



Plate 4: *Ficus microcarpa* location
on 14 May 2015



Plate 5: Night time inspection
on 14 May 2015

Appendix 5

**Location of Hearing Bird Call
and
Location of Abandoned Nest**

