

Agreement No. CE 21/2012 (WS)
Ecological Survey for the Proposed Desalination Plant
at Tseung Kwan O

Ecological Baseline Report



Ecosystems Limited
生態系統顧問有限公司
Ecosystems Limited
Unit B13, 12/F, Block B2, Yau Tong Industrial City
17 Ko Fai Road
Yau Tong, Kowloon.
Tel. 電話: (852) 25530468
Fax 傳真: (852) 25529191
Email 電郵: ecosys@pacific.net.hk

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1. INTRODUCTION

1.1 Background

- 1.1.1 The proposed project (hereafter the “Project”) is about a new desalination plant and associated facilities, and the proposed Project Site lies on a reclamation area at the southern end of existing TKO Area 137.
- 1.1.2 The Project will involve the construction of a new desalination plant, the construction of a seawater intake and a submarine outfall, and the provision of a freshwater main along existing roads of Wan Po Road, Po Hong Road and Tsui Lam Road (**Figure 1**).
- 1.1.3 The reclamation area for the Project Site is located between Tit Cham Chau and a small unnamed hill to the west of Tin Ha Shan, both of which lie within the Clear Water Bay Country Park. In addition, slope mitigation works are anticipated on the adjacent slope of the unnamed hill. The Clear Water Bay Country Park is a recognized site of conservation importance. The proposed slope mitigation works will be implemented to stabilize the natural slopes and boulders within the Clear Water Bay Country Park overlooking the northeast boundary of the new desalination plant.
- 1.1.4 The Project will also require the construction of two submarine facilities. The construction of the submarine facilities would encroach subtidal marine habitats and the discharge during the operational phase might have indirect impacts on the surrounding marine habitats.
- 1.1.5 An EIA Study Brief was issued in January 2014 (ESB-266/2013) for the Project and stipulated the requirements of ecological baseline and ecological impact assessment. This report presents the baseline conditions of the terrestrial and marine ecological resources within the Assessment Area.

1.2 Relevant Legislation, Standards and Guidelines

- 1.2.1 The local ordinances, regulations and guidelines relevant to protection of species and habitats of ecological importance include the following:
- Environmental Impact Assessment Ordinance ("the EIAO", Cap. 499) and the associated Technical Memorandum (EIAO (TM))
 - EIAO Guidance Note No. 6/2010
 - EIAO Guidance Note No. 7/2010
 - EIAO Guidance Note No. 10/2010
 - EIAO Guidance Note No. 11/2010
 - Hong Kong Planning Standards and Guidelines Chapter 10 (HKPSG)
 - Forests and Countryside Ordinance (Cap. 96) and its subsidiary legislation, the Forestry Regulations
 - Wild Animals Protection Ordinance (Cap. 170)
 - Protection of Endangered Species of Animals and Plants Ordinance (Cap. 586)
 - Country Parks Ordinance (Cap. 208) and its subsidiary legislation
 - Town Planning Ordinance (Cap. 131)
 - PRC Regulations and Guidelines
 - China Red Data Book of Endangered Animals
 - IUCN Red List Categories and Criteria
 - United Nations Convention on Biological Diversity (1992)
 - The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)

- 1.2.2 Annex 16 of the EIAO-TM sets out the general approach and methodology for assessments of ecological impacts arising from a project or proposal, to allow a complete and objective identification, prediction and evaluation of the potential ecological impacts. Annex 8 recommends the criteria that can be used for evaluating ecological impacts.
- 1.2.3 EIAO Guidance Note No. 6/2010 clarifies the requirements of ecological assessments under the EIAO. EIAO Guidance Note No. 7/2010 provides general guidelines for conducting ecological baseline surveys in order to fulfill requirements stipulated in the EIAO-TM. EIAO Guidance Note No. 10/2010 provides Methodologies for Terrestrial and Freshwater Ecological Baseline Surveys and; Guidance Note No. 11/2010 provides Methodologies for Marine Ecological Baseline Surveys.
- 1.2.4 Chapter 10 of the HKPSG covers planning considerations relevant to conservation. This chapter details the principles of conservation, the conservation of natural landscape and habitats, historic buildings, archaeological sites and other antiquities. It also addresses the issue of enforcement. The appendices list the legislation and administrative controls for conservation, other conservation related measures in Hong Kong and Government departments involved in conservation.
- 1.2.5 The Forests and Countryside Ordinance (Cap 96) prohibits felling, cutting, burning or destroying of trees and live plants in forests and plantations on Government land. Related subsidiary Regulations prohibit the picking, felling or possession of listed rare and protected plant species. The list of protected species in Hong Kong, which comes under the Forestry Regulations, was last amended on 11 June 1993 under the Forestry (Amendment) Regulation 1993 made under Section 3 of the Forests and Countryside Ordinance.
- 1.2.6 Under the Wild Animals Protection Ordinance (Cap 170), designated wild animals are protected from being hunted, whilst their nests and eggs are protected from destruction and removal. All birds and most mammals are protected under this Ordinance. The Second Schedule of the Ordinance that lists all the animals protected was last revised in June 1992.
- 1.2.7 The Protection of Endangered Species of Animals and Plants Ordinance (Cap 586) was enacted to align Hong Kong to control regime with the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). With effect from 1 December 2006, it replaces the Animals and Plants (Protection of Endangered Species) Ordinance (Cap 187). The purpose of the Protection of Endangered Species of Animals and Plants Ordinance is to restrict the import and export of species listed in CITES Appendices so as to protect wildlife from overexploitation or extinction. The Ordinance is primarily related to controlling trade in threatened and endangered species and restricting the local possession of them.
- 1.2.8 The Country Parks Ordinance (Cap 208) provides for the designation and management of Country Parks and Special Areas. Country Parks are designated for the purpose of nature conservation, countryside recreation and outdoor education. Special Areas are reserved generally for the purpose of nature conservation.
- 1.2.9 The amended Town Planning Ordinance (Cap 131) provides for the designation of coastal Protection Areas, Sites of Special Scientific Interest (SSSI), Green Belt or other specified uses that promote conservation or protection of the environment, e.g., Conservation Areas. The authority responsible for administering the Town Planning Ordinance is the Town Planning Board.

- 1.2.10 The Peoples' Republic of China (PRC) is a Contracting Party to the United Nations Convention on Biological Diversity of 1992. The Convention requires signatories to make active efforts to protect and manage their biodiversity resources. The Government of the Hong Kong SAR has stated that it will be "committed to meeting the environmental objectives" of the Convention (PELB 1996). In 1988 the PRC ratified the Wild Animal Protection Law, which lays down basic principles for protecting wild animals. The Law prohibits killing of protected animals, controls hunting, and protects the habitats of wild animals, both protected and non-protected. The Law also provides for the creation of lists of animals protected at the state level, under Class I and Class II. There are 96 animal species in Class I and 156 in Class II. Class I provides a higher level of protection for animals considered to be more threatened.
- 1.2.11 China Red Data Book of Endangered Animals is a joint publication of China National Environmental Protection Agency (NEPA) and the Endangered Species Scientific Commission, PRC (ESSC). The first four volumes of this series cover China's vertebrates (i.e. aves, pisces, amphibia, reptilian and mammalia). The criteria of categories of species included in these volumes are 'extinct', 'extirpated', 'endangered', 'vulnerable', 'indeterminate' and 'rare'. These categories are basically based on the criteria set out by the IUCN Species Survival Commission (IUCN-SSC) for its global Red List. However, there are some important differences. The category "Extirpated" includes those species which experts believe have been lost from China, although they may be secure in the other countries. The use of the category "Rare" has been discontinued by the IUCN-SSC, however, it is used here for those species that have always been rare in China but are not necessary to be vulnerable or endangered.
- 1.2.12 The International Union for Conservation of Nature and Natural Resources (IUCN) Red List of Threatened Species provides taxonomic, conservation status and distribution information on taxa that have been evaluated using the IUCN Red List Categories and Criteria. This system is designed to determine the relative risk of extinction, and the main purpose of the IUCN Red List is to catalogue and highlight those taxa that are facing a higher risk of global extinction. The IUCN Red List also includes information on taxa that are either close to meeting the threatened thresholds or that would be threatened were it not for an ongoing taxon-specific conservation programme.
- 1.2.13 The Peoples' Republic of China (PRC) is a Contracting Party to the *United Nations Convention on Biological Diversity* of 1992. The Convention requires signatories to make active efforts to protect and manage their biodiversity resources. The Government of the Hong Kong Special Administrative Region (HKSAR) has stated that it will be "committed to meeting the environmental objectives" of the Convention (PELB 1996). As a matter of that, the Environment Bureau and the AFCD have embarked on an exercise to develop a city-level Biodiversity Strategy and Action Plan (BSAP) under the Convention on Biological Diversity.
- 1.2.14 CITES is an international agreement between governments. It aims to ensure that international trade in specimens of wild animals and plants does not threaten their survival. Roughly 5,000 species of animals and 28,000 species of plants are protected by CITES against over-exploitation through international trade. They are listed in the three CITES Appendices, in which the species are grouped according to how threatened they are by international trade. Appendix I lists species that are the most endangered and are threatened with extinction. Appendix II lists species that are not necessarily now threatened with extinction but that may become so unless trade is closely controlled. And Appendix III is a list of species included at the request of a Party that already regulates trade in the species and that needs the cooperation of other countries to prevent unsustainable or illegal exploitation.

2. METHODOLOGY

2.1 Literature Review of Ecological Characteristics and Historical Ecological Surveys

2.1.1 The ecological baseline condition was established by information collected from literature review and field survey. The baseline was used for evaluation of ecological resources, identification of sensitive receiver and assessment of potential impact arising from the proposed Project.

2.1.2 The Study Area for the present ecological survey programme was the same as the Assessment Area for Ecological Impact Assessment. The assessment area for terrestrial ecological impact assessment included areas within 500m from the site boundary of the Project, and any other areas likely to be impacted by the Project. For aquatic ecology, the assessment area was the same as the study area for water quality impact assessment, i.e. within 500m from the site boundary of the Project and extended to include other areas if they are found also being impacted during the course of the EIA study and have a bearing on the environmental acceptability of the Project.

2.1.3 A literature review was conducted to characterise the existing conditions within the Study Area and to identify habitats and species of conservation importance in the area. The literature review covered Government and private sector reports, independent and Government published literature, academic studies, vegetation maps and land use maps. Reviewed information was included, but not limited to, the following:

- *Hong Kong Biodiversity – Newsletter of Agriculture, Fisheries and Conservation Department (AFCD);*
- *Publications of AFCD;*
- *Annual reports and other publications of The Hong Kong Bird Watching Society;*
- *Memoirs of Hong Kong Natural History Society;*
- *Porcupine! Newsletter of Ecology & Biodiversity, The School of Biological Sciences, The University of Hong Kong;*
- *The “Consultancy Study on Marine Benthic Communities in Hong Kong” commissioned by AFCD.*
- *Cross Bay Link, Tseung Kwan O EIA (209/2013);*
- *Development of a Biodiesel Plant at Tseung Kwan O Industrial Estate EIA (156/2008);*
- *South East New Territories (SENT) Landfill Extension (147/2007);*
- *Further Development of Tseung Kwan O Feasibility Study (111/2005);*
- *Fill Bank at Tseung Kwan O Area 137 (076/2002);*
- *Tseung Kwan O Roads D1, D8 and D10 (061/2001);*

- *Tseung Kwan O Development - Contract F: Grade Separated Interchange T1/P1/P2 (023/1999); and*
- *Feasibility Study on the Alternative Alignment for the Western Coast Road, Tseung Kwan O (021/1999)*

2.2 Ecological Survey Methods

- 2.2.1 Besides literature review, ecological surveys were conducted to verify the information collected in the literature review, and to fill any data gaps identified. As per the requirements of the EIA Study Brief (ESB-266/2013), the recommended ecological field surveys of terrestrial and marine habitats were undertaken within a duration of at least six months, covering the wet and dry seasons.
- 2.2.2 The frequency of terrestrial surveys covered at least twice in dry season and four times in wet season to ensure that the field data obtained were representative. Survey effort was spread evenly across the six-month period where possible to enhance the representativeness of the results over the survey temporal scale. Effort for survey in the wet season was higher than the dry season to collect representative data for taxa groups such as herpetofauna, butterfly, odonates and freshwater fauna which are more active in the wet season. Frequency of marine surveys also well covered to ensure that the field data obtained was representative, with intertidal survey twice in both dry and wet seasons, benthic survey once in both dry and wet seasons, and the dive survey (Spot Dive Checks and REA survey) twice in wet season.
- 2.2.3 The methodology of the terrestrial ecological surveys made reference to the technical guidelines of ecological assessment in Annex 16 of EIAO-TM and the relevant Guidance Notes (GN 7/2010 and GN 10/2010). Methodology of marine ecological surveys made reference to the technical guidelines of ecological assessment in Annex 16 of EIAO-TM and the relevant Guidance Notes (GN 10/2010 and GN 11/2010).
- 2.2.4 The sampling locations for terrestrial survey focused on the 500m distance from the footprint of the proposed desalination plant as well as the Study Area of Slope Mitigation Works, but also covered the areas along the water main. While the locations of the marine survey covered the alignments of the submarine intake and outfall, as well as Fat Tong Chau, Tai Miu Wan and north of Tung Lung Chau.
- 2.2.5 It should be noted that the study area for slope mitigation lies within the Clear Water Bay Country Park, with inaccessible areas of steep slopes and cliffs at the toe of the hillside next to the Project Site for the desalination plant. Survey transects and locations were selected along accessible footpaths at the time of surveys to avoid disturbance to natural habitats.
- 2.2.6 All ecological surveys were carried out by qualified and experienced ecologists with relevant degree qualification and at least three years of working experience in terrestrial/marine field survey and identification.

Habitat and Vegetation Survey

- 2.2.7 Field survey focusing on terrestrial habitat and vegetation within the Study Area were conducted during both dry and wet seasons to establish the general ecological profile of the Study Area. A preliminary habitat map of suitable scale (i.e. 1:5,000) was prepared during the literature review, which was used during the baseline survey. The preliminary habitat map was produced based on government latest aerial photos and verified by field

ground-truthing to generate the final habitat map. Representative areas of each habitat type and the proposed Project Site were surveyed on foot.

- 2.2.8 Plant species within each habitat type were identified, and their relative abundance were recorded with special attention to rare or protected species. Nomenclature and conservation status of the plant species followed those documented in the AFCD's biodiversity database as well as Xing *et al.* (2000), Wu and Lee (2000), Siu (2000) and Yip *et al.* (2010). Conservation status of plants not listed in the above documents (mostly landscape species or crops) will be evaluated based on personal observation. Habitats were characterised and defined with reference to size, vegetation type, flora species present, dominant species, species diversity and abundance, community structure, seasonality and inter-dependence as well as the presence of any feature of ecological importance. Photographic records of identified habitats were taken for better illustration of the site conditions.

Terrestrial Wildlife Survey

- 2.2.9 Terrestrial wildlife surveys were conducted twice in dry season and four times in wet season. Wildlife surveys covered different faunal groups including mammals, birds, herpetofauna, butterflies and odonates. The survey locations focused on the 500m distance from the footprint of the proposed desalination plant as well as the Study Area of Slope Mitigation Works, but also covered the areas along the water main (**Figure 2**).
- 2.2.10 Terrestrial Mammals - All sightings, tracks, and signs of mammals (including scats, footprints) of terrestrial mammals were actively searched along sampling transects. Night surveys were conducted in March, April and June to survey nocturnal mammal species (e.g., bats). The survey locations covered the proposed desalination plant, Study Area of Slope Mitigation Works, as well as those along the water main and the 500m from the site boundary. AnaBat II Bat Detector was used to find bats during the night surveys. Nomenclature for mammals followed Shek (2006).
- 2.2.11 Avifauna - Birds in each habitat type within the Study Area were surveyed quantitatively using point count method and/or transect count method. In each survey location, sampling transects were established according to site conditions and also subject to accessibility. For transect count method, all birds seen or heard within 30m from either sides of the sampling transect were counted and identified to species where possible. Signs of breeding (e.g. nests, recently fledged juveniles), if any, within the Study Area were also recorded. Bird species encountered outside transects but within the Study Area were also recorded to produce a complete species list. Night surveys were conducted to survey nocturnal bird species (e.g., owls, nightjars). The locations of any bird species of conservation importance were recorded. Observations were made using binoculars (at least 8x) and photographic records were taken, if possible. Ornithological nomenclature followed List of Hong Kong Birds 2013 of Hong Kong Bird Watching Society or the most updated checklist.
- 2.2.12 Herpetofauna - Herpetofauna surveys were conducted qualitatively through direct observation and active searching in all habitat types along faunal sampling transects established during avifauna survey, and also in potential hiding places such as among leaf litter, inside holes, under stones and logs within the Study Area. Particular attention was given to streams and watercourses. Since reptile and amphibian are mostly nocturnal, night surveys were carried out. Auditory detection of species-specific calls was also used to survey frogs and toads. Nomenclature and status used for reptiles followed Karsen *et al.* (1998) and Chan *et al.* (2006) while those of amphibians followed Chan *et al.* (2005).

- 2.2.13 Butterfly and Odonate (i.e. Dragonflies & Damselflies) - Butterflies and odonates in different habitats of the Study Area were surveyed quantitatively using transect count method. The survey transects followed those adopted for avifauna survey and covered representative habitats within the Study Area. Particular attention was paid to aquatic habitats for survey of dragonflies and damselflies. Odonates and butterflies encountered outside survey transects but within the Study Area were also recorded in order to produce a complete species list. Nomenclature for butterflies followed Chan *et al.* (2011) and odonates nomenclature followed Tam *et al.* (2011).

Freshwater Aquatic Assemblage Survey

- 2.2.14 Aquatic fauna, including freshwater macro-invertebrates (e.g. freshwater crabs, shrimps, molluscs and aquatic insect larvae) and fishes, in streams identified within the Study Area and accessible were studied by direct observation, active searching by hand nets, and/or other standard field sampling technique (e.g. kick sampling if suitable substrates are found, and baited trapping method). Organisms were recorded and identified to the lowest possible taxon, and their relative abundances were reported. Nomenclature for fish followed Lee *et al.* (2004), while those for the macro-invertebrates followed Dudgeon (1999).
- 2.2.15 After field ground-truthing, the aquatic surveys were conducted in 5 locations. i.e. Channel (ditch) within Project Site (F-P), Southern side of Clear Water Bay Country Park (F-C), Tseung Kwan O Village (F-T), Service Reservoir near Tsui Lam Estate (F-R) and a channel near Shek Kok Road (F-S) (**Figure 3**).
- 2.2.16 Aquatic fauna surveys were conducted two times in dry season and four times in wet season, each of which individually covered the whole Study Area as well as the above-mentioned locations.

Intertidal Survey

- 2.2.17 Intertidal surveys were conducted to characterize the existing profile of the intertidal assemblages within and in the vicinity of the Project Site. It consists of qualitative walk-through survey and quantitative transect survey, and the locations covered included impact sites (coastlines to the east of the Project Site, and to the west of the Project Site i.e. Tit Cham Chau (I-O) and Tin Ha Au (I-I)) and reference sites (i.e. the coastal habitats at Fat Tong Chau (I-F), Tai Miu Wan (I-T), and north of Tung Lung Chau (I-L)) (**Figure 4**). For the artificial seawall next to the Project Site, qualitative walk-through survey were conducted, should the artificial seawall be found with significant intertidal assemblages, it was also covered by the quantitative transect survey. The surveys well covered both hard and soft shores, if present. The intertidal surveys were conducted twice in each of the dry and wet seasons, each of which individually covered the whole Study Area. Local tide tables were used to assess tidal height at the site and times of surveys.
- 2.2.18 For qualitative walk-through survey, organisms encountered were recorded and their relative abundance noted. The qualitative walk-through could help to assess whether the sampling exercise has collected representative data (e.g. the number and type of species encountered) and whether the sampling effort is deemed adequate.
- 2.2.19 For quantitative transect survey, at each impact site, three 50m horizontal transects along the shoreline were surveyed at each of the three shore heights: 2m (high-shore), 1.5m (mid-shore) and 1m (low-shore) above Chart Datum (CD). At each reference site, on each substrate type found (i.e. hard shore and soft shore), there was one 50m horizontal transect along the shoreline to be surveyed at the three shore heights stated above. On

each transect, five quadrats (50cm x 50cm) were placed randomly to assess the abundance and diversity of flora and fauna. All organisms found in each quadrat were identified and recorded to the lowest possible taxonomic level (at least “genus” level) to allow density to be calculated. Sessile species, such as algae (encrusting, foliose and filamentous), in each quadrat were also identified to the lowest possible taxonomic level (at least “genus” level) and estimated as percentage cover on the rock surface. In addition, should the transect locations prove to be soft shores, all organisms found in the top 50cm x 50cm x 10cm layer (length x width x depth) of the substrate were identified to the lowest possible taxonomic level (at least “genus” level) and recorded.

Subtidal Coral Survey

2.2.20 The subtidal coral survey was designated to encompass subtidal hard bottom habitat within the Study Area with a focus along the alignment of the proposed submarine intake and outfall (D-I and D-O), and subtidal habitats of Fat Tong Chau (D-F), Tai Miu Wan (D-T), to the east of Tai Miu (D-E), to the west of Tai Miu (D-W), and north of Tung Lung Chau (D-L) (**Figure 5**). Two targeted types of subtidal dive survey were carried out by a team of qualified coral specialists including:

- (i) Specific spot dive checks; and
- (ii) Rapid Ecological Assessment (REA) survey: this was conducted for the sites where corals are recorded by the spot dive surveys and are of concerns, to collect semi-quantitative ecological information of the coral communities.

2.2.21 The proposed coral survey was carried out by qualified and experienced coral specialist(s), with minimum three years of relevant working experience in coral field survey and identification.

2.2.22 Locations for dive surveys were sufficient to cover subtidal habitat within the Study Area. At each survey location, a spot dive reconnaissance check was conducted along a 100m transect and substrate type, associated sessile benthos, particularly the presence of coral communities (including all hard corals, octocorals and black corals) were recorded. Representative photographs of the seabed and associated fauna were taken.

2.2.23 Findings of the spot dive surveys were presented to AFCD to confirm whether REA survey would be necessary. Considerations were given to whether corals or other species of conservation importance are identified from the qualitative spot dive survey. Should AFCD confirm that semi-quantitative dive surveys are necessary, the location and number of survey transects were recommended based on findings of the spot dive survey for agreement by AFCD. The standardized REA survey technique (i.e. EIAO Guidance Note No.11/2010) was used to obtain semi-quantitative data on the benthic communities of the location where corals are found.

Subtidal Benthos Survey

2.2.24 Benthic sediment samples were collected from sampling points representative of the subtidal soft-bottom habitats, in particular the submarine intake and outfall (B-I and B-O), and subtidal habitats of Tit Cham Chau (B-B), Fat Tong Chau (B-F), Tai Miu Wan (B-T) and north of Tung Lung Chau (B-L) (**Figure 6**). The benthos survey covered once in dry and once in wet seasons.

2.2.25 At each survey location, three sub-stations approximately 100m apart were established at each site and three grab samples were collected from each sub-station. Sampling used a

grab sampler of 0.25m² and at least 15cm biting depth. Each grab sample collected was photographed and its conditions and physical characteristics described and documented. Sediments from the grab samples were sieved on board the survey vessel, washed onto a sieve (0.5mm meshes) and gently rinsed with seawater to remove all fine material. Following rinsing any material remaining on the sieve carefully using a minimal volume of seawater into pre-labelled thick double-bagged ziplock plastic bags. A 5% solution of formalin containing Rose Bengal in seawater was then added to the bag to ensure tissue preservation. Care should be taken to ensure the concentration of solution is not adversely diluted through rinsing into the bags. Samples were sealed in plastic containers for transfer to the taxonomy laboratory for sorting and identification.

- 2.2.26 The benthic laboratory performed sample re-screening after the samples had been held in formalin for a minimum of 24 hours to ensure adequate fixation of the organisms. Individual samples from the 0.5mm mesh sieve were gently rinsed with fresh water into a 0.25mm sieve to remove the formalin from the sediments. Sieves were partially filled while rinsing a specific sample to maximize washing efficiency and prevent loss of material. All material retained on the sieve were placed in a labeled plastic jar, covered with 70% ethanol, and lightly agitated to ensure complete mixing of the alcohol with sediments. Original labels were retained with the rescreened sample material.
- 2.2.27 Standard and accepted techniques were used for sorting organisms from the sediments. Small fractions of a sample were placed in a petri dish under a 10-power magnification dissecting microscope and scanned systematically with all animals and fragments removed using forceps. Each petri dish was sorted at least twice to ensure removal of all animals. Organisms representing major taxonomic groups, such as Polychaeta, Arthropoda, Mollusca, and miscellaneous tax, were sorted into separate, labeled vials containing 70% ethanol.

3. RESULTS

3.1 Literature Review of Ecological Characteristics and Historical Ecological Surveys

Terrestrial Fauna

- 3.1.1 There were sightings of Eurasian Wild Pig *Sus scrofa* within the Study Area of the present study (Shek 2006). This species is common in Hong Kong.
- 3.1.2 A couple of fauna species of conservation importance were recorded within the Study Area of the present study during the ecological surveys of EIA study of South East New Territories (SENT) Landfill Extension. The ecological surveys were conducted between November 2005 and July 2006 (ERM 2007). Fauna species of conservation importance recorded outside the Project Site and the hillside but within the Study Area of the Project included Japanese Pipistrelle *Pipistrellus abramus*, Brown Noctule *Nyctalus noctula*, Northern Boobook *Ninox japonica*, Eastern Buzzard *Buteo japonicus*, White-bellied Sea Eagle *Haliaeetus leucogaster*, Common Kestrel *Falco tinnunculus*, Greater Coucal *Centropus sinensis*, Chinese Hwamei *Garrulax canorus*, Common Dart *Potanthus pseudomaesa*, Lesser Band Dart *Potanthus trachala*, Common Nawab *Polyura athamas*, Indian Fritillary *Argyreus hyperbius*, Toothed Sunbeam *Curetis dentata*, Small Grass Blue *Famegana alsulus*, White-edged Blue Baron *Euthalia phemius*, Swallowtail *Papilio machaon*, Indian Palm Bob *Suastus gremius*, Grass Demon *Udaspes folus* and Common Rat Snake *Ptyas mucosus*. None of the fauna species of conservation importance was recorded within the Project Site of proposed Desalination Plant. Fauna species of conservation importance recorded in the Study Area of Slope Mitigation Works included White-bellied Sea Eagle *Haliaeetus leucogaster*, Common Kestrel *Falco tinnunculus*,

Greater Coucal *Centropus sinensis*, Chinese Hwamei *Garrulax canorus* and Common Dart *Potanthus pseudomaesa*.

- 3.1.3 “The Pak Shing Kok Development Area” of “Further Development of Tseung Kwan O Feasibility Study” fell within the Study Area of the Project. Ecological surveys were conducted between February and October 2004 (Maunsell Consultants Asia Ltd 2005). Fauna species of conservation importance recorded within the Pak Shing Kok Development Area included Japanese Pipistrelle *Pipistrellus abramus*, Black Kite *Milvus migrans*, Crested Goshawk *Accipiter trivirgatus*, Besra *A. virgatus*, Peregrine Falcon *Falco peregrinus*, Common Kestrel *Falco tinnunculus* and Greater Coucal *Centropus sinensis*.

Intertidal Fauna

- 3.1.4 The artificial seawall in Tseung Kwan O Industrial Estate exhibited a low diversity of species. Animals recorded were mainly the rock oyster *Saccostrea cucullata*, periwinkles *Echinolittorina radiata* and *E. trochoides*, and limpets *Nipponacmea concinna* and *Patelloida pygmaea* (Arup 2013). While the natural rocky shore in Fat Tong Chau exhibited higher species diversity and abundance than those of artificial shore. However, the species are all common on natural rocky shores of Hong Kong (ERM 2008).

Corals

- 3.1.5 Established coral communities of any size are regarded as important habitat types in Hong Kong as defined in Annex 8 of EIAO-TM. Stony corals, together with Blue Corals, Orange Pipe Corals, Black Corals, Fire Corals, and Lace Corals, are protected in Hong Kong by the Protection of Endangered Species of Animals and Plants Ordinance (Cap. 586), with restrictions on Import, export and possession of those corals, no matter dead or living.
- 3.1.6 Several dive surveys were previously conducted for EIA studies inside Junk Bay (Area 131, Tai Miu Wan and Fat Tong Chau), hard and soft coral colonies were recorded. Most corals were found at the western coast of Junk Bay, none of the corals (both hard and soft corals) is considered rare. Examples of the recorded corals include Faviid corals, *Goniopora* spp., *Tubastrea* spp., Gorgonians and *Dendronephthys* spp.. Uncommon hard coral species, i.e. *Favia helianthoides*, *Montipora mollis* and *Coscinaraea* sp. were also recorded in western Junk Bay (ARUP 2003).
- 3.1.7 The seabed of the natural shoreline of Fat Tong Chau was composed of mainly small to large sized boulders and soft sediment (silt), and only a few small hard coral colonies were observed (e.g. *Montipora venosa*, *Psammocora superficialis*, *Turbinaria peltata*, *Cyphastrea serailia*, and *Goniopora stutchburyi* (ERM 2008). The natural shoreline also had an extremely low coral cover (<1%) (*ibid*).
- 3.1.8 Only 8 species of hard corals and one soft coral were recorded in Tit Cham Chau (ERM 2007). In the western part of Tai Miu, 9 species of hard corals but no soft coral were recorded (*ibid*). While in Kwun Tsai near the proposed submarine intake, 11 species of hard corals were recorded. Among the recorded coral species in Kwun Tsai, an uncommon coral species *Acropora solitaryensis* was recorded (*ibid*).

Subtidal benthic fauna

- 3.1.9 The Consultancy Study on Marine Benthic Communities in Hong Kong commissioned by AFCD was reviewed (CityU Professional Services Limited, 2002). Stratified sampling at 120 stations including the waters near the Study Area was conducted.

Stations 80 were located in outer Tit Cham Chau about 1 km from the Project Site. The benthic habitat off the study area was composed of very fine sand and/or silt/clay. Results showed that in general the benthic assemblages in that station had relative high species diversity and evenness. Dominant species found in summer included polychaete *Chaetozone* sp. *Mediomastus* sp., *Magelona crenulifrons*, *Prionospio malmgreni*, and *Sipuncula Apionsoma trichocephalus*. While, polychaete *Heteromastus filiformis*, *Magelona crenulifrons*, *Notomastus* sp., *Prionospio malmgreni*, *Prionospio pygmaea*, and sipuncula *Apionsoma trichocephalus* were the dominant species in winter. No benthic species of conservation importance was recorded.

3.2 Results of Baseline Surveys

3.2.1 The frequency of conducted ecological surveys are shown in **Table 1**.

Table 1 Frequency of the conducted ecological surveys.

Ecological survey	Mar	Apr	May	Jun	Jul	Aug
	Dry season	Wet season				
Habitat and Vegetation	Twice	Once	Once	Once	Once	
Mammals	Twice	Once	Once	Once	Once	
Birds	Twice	Once	Once	Once	Once	
Herpetofauna	Twice	Twice		Once		Once
Night survey for mammals, birds and herpetofauna	Twice	Twice		Once		
Butterflies and Dragonflies	Twice		Once	Once	Once	Once
Freshwater Aquatic Assemblage Survey	Twice		Once	Once	Once	Once
Intertidal Survey	Twice			Once	Once	Once
Subtidal Coral Survey						Twice
Subtidal Benthic Survey	Once				Once	

Habitat and vegetation

3.2.2 Habitat types recorded within the Study Area include Mixed Woodland, Plantation, Shrubland/Grassland, Agricultural Land, Wasteland, Watercourse, Urbanised/Disturbed, Marine Waters, Rocky Shore, Sandy Shore and Seawall (**Figure 7, Table 2**). Photos of the habitats are shown in **Figure 8**.

Table 2 Size of Different Habitats Recorded within the Study Area and the Project Area

Habitat	Study Area		Project Area (Desalination Plant)	Project Area (Rock Slope Stabilization Area within Country Park)	Project Area (Soil Nailing Area within Country Park)	Project Area (Flexible Barrier within Country Park)
	Size (ha)	Percentage (%)	Size (ha)	Size (ha)	Size (ha)	Size (ha)
Mixed Woodland	57.47	5.6	0.61	0.10	0.08	-
Plantation	127.63	12.4	-	-	-	-

Habitat	Study Area		Project Area (Desalination Plant)	Project Area (Rock Slope Stabilization Area within Country Park)	Project Area (Soil Nailing Area within Country Park)	Project Area (Flexible Barrier within Country Park)
	Size (ha)	Percentage (%)	Size (ha)	Size (ha)	Size (ha)	Size (ha)
Shrubland/Grassland	195.32	19.0	0.38	0.10	0.14	0.07 (352 m x 2 m)
Agricultural Land	1.31	0.1	-	-	-	-
Wasteland	11.39	1.1	3.78	-	-	-
Watercourse	3.52 (5.4km)	0.3	0.18 (0.7km)*	-	-	-
Urbanised/Disturbed	519.66	50.4	5.24	-	-	-
Marine Waters (Subtidal hard and soft bottoms)	110.09	10.7	0.11	-	-	-
Rocky Shore	2.23	0.2	-	-	-	-
Sandy Shore	0.22	0.0	-	-	-	-
Seawall	1.61	0.2	0.28	-	-	-
Total	1030.45	100	-	-	-	-

*man-made channel and ditch

- 3.2.3 A total of 296 plant species were recorded, 201 of which are native species (**Appendix 1**). Eight species of conservation importance were recorded during the current surveys. These include one tree species, *Aquilaria sinensis*, one shrub species, *Diospyros vaccinioides*, six herb species, *Platycodon grandiflorus*, *Pecteilis susannae*, *Habenaria linguella*, *Lilium brownii*, *Nepenthes mirabilis*, and *Pachystoma pubescens*.
- 3.2.4 Mixed Woodland was mainly located on hillslopes on the northern part of the Study Area with a height ranged from 8-12m. It was composed of a moderate diversity of exotic and native species including *Acacia confusa*, *Leucaena leucocephala*, *Macaranga tanarius*, *Mallotus paniculatus*, *Schefflera heptaphylla* and *Cinnamomum camphora*. The understorey was colonised with a variety of young trees, shrubs and herbs, including *Psychotria asiatica*, *Ligustrum sinensis*, *Ilex asprella*, and *Alocasia odora*. Two species of conservation importance, *Aquilaria sinensis* and *Diospyros vaccinioides* were recorded in mixed woodland habitat outside the Project Site.
- 3.2.5 *Aquilaria sinensis* is protected in Hong Kong under Cap. 586 Protection of Endangered Species of Animals and Plants Ordinance. This tree species is common in Hong Kong, but is under the threat of illegal felling and over-exploitation in southern China including Hong Kong. It is included in China Plant Red Data Book and Illustration of Rare & endangered plant in Guangdong Province, and wild individuals are protected under State protection (Category II). It is also listed as Near Threatened (NT) in IUCN Red List. Mature trees as well as seedlings and saplings were recorded in mixed woodland outside the Project Site.
- 3.2.6 *Diospyros vaccinioides* is a shrub species not protected locally but is listed as critically endangered (CR) by IUCN because of exploitation by harvesting in China. It is recorded in the understorey of woodland habitat outside the Project Site and is quite common in shrubland in Hong Kong.

- 3.2.7 Plantation was mainly recorded on restored landfill and engineering slopes, with height ranged from 10-15m and of simple structure. Dominant tree species including the exotic trees *Acacia confusa*, *Acacia auriculiformis*, *Lophostemon confertus*, *Casuarina equisetifolia*, *Eucalyptus* spp. and *Leucaena leucocephala*. Common understorey species included *Bidens alba*, *Alocasia odora* and *Panicum maximum*.
- 3.2.8 Two types of Shrubland/Grassland habitats occurred on Project Site. One was natural on hillside (e.g. Study Area of Slope Mitigation Works) and the other type was artificial and hydroseeded recorded inside restored landfills. Shrubland/Grassland are simple in structure and young in age with a low to moderate diversity of plant, most of which are common with the exception inside Clear Water Bay Country Park where a number of protected herbs and orchid species were recorded. These included *Pecteilis susannae*, *Habenaria linguella*, *Pachystoma pubescens*, *Platycodon grandiflorus*, *Lilium brownii* and *Nepenthes mirabilis*. All of the six species are protected under Cap. 96A, while three orchid species are also protected under Cap 586. In addition, *Nepenthes mirabilis* are also listed as IUCN Red List of Threatened Species (Category LR/LC) and in CITES Appendix III. *Lilium brownii* and *Pachystoma pubescens* were recorded within the Study Area of Slope Mitigation Works. However, these two species, together with other flora species of conservation importance, were recorded outside the Project Site and proposed slope mitigation works area. Locations of the plant species of conservation importance are shown in **Figure 7**, and their photos are shown in **Figure 9**.
- 3.2.9 A small patch of Agricultural Land was recorded at the northern fringe of the Study Area. It was mainly composed of fruit trees including *Artocarpus macrocarpon*, *Citrus maxima*, *Mangifera indica*, *Morus alba*, and *Psidium guajava*.
- 3.2.10 A small section of natural Watercourse falls on the northern side of the Study Area. Common native riparian and woodland tree species including *Sterculia lanceolata*, *Cleistocalyx operculata*, and *Bridelia tomentosa* were recorded. Other watercourses recorded were man-made channel and ditches and void of vegetation.
- 3.2.11 Urbanised/Disturbed included existing landfill, fill bank restored landfill, roads, and residential and commercial blocks. Vegetation recorded was mainly composed of landscape and roadside planting and weeds. Wasteland was densely vegetated with weedy vegetation including *Leucaena leucocephala* and was recorded along the fringe of the Project Site and as patches inside the existing fill bank.
- 3.2.12 Most of the shorelines covered by the Study Area are bare artificial seawall and natural rocky shore. Natural rocky shore was found in southern part of Clear Water Bay Country Park, Tit Cham Chau and Tai Miu Wan; while a small portion of the rocky shore in the southern part of Clear Water Bay Country Park was pebble shore. A small section of Sandy Shore was recorded near Tai Miu Wan. A few shrub and herb species colonised on the crevices of the rocks or extended from the foothill of the Shrubland/Grassland habitat to the Rocky Shore. Species recorded include *Wikstroemia indica*, *Clerodendrum inerme*, and *Pycreus polystachyos*.
- 3.2.13 The proposed site for the desalination plant is within the existing fill bank (mainly urbanised/disturbed, wasteland) at Fat Tong Chau and is mostly void of vegetation. Only a few native tree species and mainly weedy vegetation including *Leucaena leucocephala*, *Mikania micrantha*, and *Pueraria phaseoloides* occupied the fringe and slope of the fill area. The Study Area of Slope Mitigation Works is proposed is mainly grassy shrubby in the proximity of Clear Water Bay Country Park. Two species of conservation concern, *Lilium brownii* and *Pachystoma pubescens*, were recorded within the Study Area of Slope Mitigation Works, however, they are recorded outside the proposed slope mitigation works area and desalination plant site. The proposed fresh water mains

alignment follow existing road from the desalination plant to Tseung Kwan O Primary Freshwater Reservoir on Tsui Lam Road.

Mammals

- 3.2.14 Four species of mammal were seen in the Study Area (**Appendix 2**). These included Domestic Dog *Canis lupus*, Domestic Cat *Felis catus*, Eurasian Wild Boar *Sus scrofa* and Japanese Pipistrelle *Pipistrellus abramus*. Apart from Japanese Pipistrelle, the mammal species recorded within the Study Area were of low conservation importance.
- 3.2.15 One Japanese Pipistrelle was recorded in Urbanized/Disturbed within the Study Area but outside the Project Site during night survey in the wet season. All bats are protected under WAPO (Cap. 170) in Hong Kong.

Birds

- 3.2.16 Fifty-two species of bird were recorded within the Study Area. Most are common and widespread in Hong Kong (**Appendix 3**).
- 3.2.17 Thirteen species are considered of conservation importance. These included Black-crowned Night Heron *Nycticorax nycticorax*, Little Egret *Egretta garzetta*, Pacific Reef Egret *Egretta sacra*, Black Kite *Milvus migrans*, White-bellied Sea Eagle *Haliaeetus leucogaster*, Crested Serpent Eagle *Spilornis cheela*, Crested Goshawk *Accipiter trivirgatus*, Collared Scops Owl *Otus lettia*, White-throated Kingfisher *Halcyon smyrnensis*, Greater Coucal *Centropus sinensis*, Grey-chinned Minivet *Pericrocotus solaris*, Chinese Hwamei *Garrulax canorus* and Collared Crow *Corvus torquatus*. Locations of sightings of these species are shown in **Figure 7**.
- 3.2.18 One Black-crowned Night Heron was recorded in wasteland within the proposed desalination plant area. In terms of breeding/roosting sites, this species is of “local concern” (Fellowes *et al.* 2002). Black-crowned Night Heron occurs in many types of wetland habitats in Hong Kong (Viney *et al.* 2005).
- 3.2.19 A flock of three Little Egrets flew over Urbanized/Disturbed outside the proposed desalination plant area in Fat Tong Chau. This species is considered of “potential regional concern” (Fellowes *et al.* 2002). Little Egret occurs in lowland wetland and coastal areas throughout Hong Kong (Carey *et al.* 2001).
- 3.2.20 A Pacific Reef Egret was sighted in rocky shore of Tit Cham Chau. This species is Class 2 Protected Animal of China (Wang 1998). Pacific Reef Egret usually occurs in rocky shores in Hong Kong (Carey *et al.* 2001).
- 3.2.21 Black Kites were soaring above Urbanized/Disturbed within proposed desalination plant area, Shrubland/Grassland within the Study Area of Slope Mitigation Works, and Mixed Woodland, Plantation, Shrubland/Grassland and Rocky Shore in other parts of the Study Area. This species is Class 2 Protected Animal of China and listed in Appendix 2 of CITES (Wang 1998). In terms of breeding/roosting sites, Black Kite is of “regional concern” (Fellowes *et al.* 2002).

- 3.2.22 A White-bellied Sea Eagle was sighted in Marine Waters of Joss House Bay. This species is Class 2 Protected Animal of China and listed in Appendix 2 of CITES (Wang 1998). In terms of breeding/roosting sites, White-bellied Sea Eagle is of “regional concern” (Fellowes *et al.* 2002). This species mainly occurs in coastal areas and offshore islands (Carey *et al.* 2001).
- 3.2.23 A Crested Serpent Eagle was soaring above Plantation near Pak Shing Kok. This species is Class 2 Protected Animal of China and listed in Appendix 2 of CITES (Wang 1998) and considered “vulnerable” by China Red Data Book. In terms of breeding/roosting sites, Crested Serpent Eagle is of “local concern” (Fellowes *et al.* 2002). This species mostly occurs in well-wooded areas (Carey *et al.* 2001).
- 3.2.24 Crested Goshawk is Class 2 Protected Animal of China and listed in Appendix 2 of CITES (Wang 1998). Two birds displayed above Shrubland/Grassland near O Tau. Crested Goshawk is mainly found in areas of forest and mature woodland in Hong Kong (Carey *et al.* 2001).
- 3.2.25 Collared Scops Owl is Class 2 Protected Animal of China and listed in Appendix 2 of CITES (Wang 1998). One bird was recorded in each of Shrubland/Grassland within the Actual Area of Slope Mitigation Works and wasteland in other part of the Study Area. Collared Scops Owl is found in a variety of wooded habitats including woodland, *fung shui* woods, shrubland with scattered big trees in Hong Kong (Carey *et al.* 2001).
- 3.2.26 One White-throated Kingfisher was recorded in Wasteland within the proposed desalination plant area. White-throated Kingfisher is considered of “local concern” in terms of breeding and/or roosting sites by Fellowes *et al.* (2002). This species is mainly found in coastal mudflat and mangroves, also seen in inland fishponds, wet agricultural areas (Carey *et al.* 2001).
- 3.2.27 Greater Coucal is Class 2 Protected Animal of China and considered “vulnerable” by China Red Data Book. Individuals were found in Shrubland/Grassland within the Study Area of Slope Mitigation Works, however, they are recorded outside the proposed slope mitigation works area, and urbanized/disturbed and plantation in other parts of the Study Area. Greater Coucal occurs in many types of habitats in Hong Kong (Carey *et al.* 2001).
- 3.2.28 Grey-chinned Minivet is considered of “local concern” (Fellowes *et al.* 2002). This species was recorded in Mixed Woodland near Tsui Lam Estate and Plantation near Tin Ha Wan Village. Grey-chinned Minivet occurs almost exclusively in forested areas in Hong Kong (Carey *et al.* 2001).
- 3.2.29 Chinese Hwamei is listed in Appendix 2 of CITES (Wang 1998). This species was recorded in Shrubland/Grassland near Tin Ha Au. Chinese Hwamei is widely distributed in hillside shrubland throughout Hong Kong.
- 3.2.30 Collared Crow is considered of “local concern” by Fellowes *et al.* (2002). One bird was recorded in Shrubland/Grassland within the Study Area of Slope Mitigation Works. Collared Crow is usually recorded in areas near coastline in Hong Kong (Carey *et al.* 2001).
- 3.2.31 Juvenile birds of Chinese Bulbul *Pycnonotus sinensis*, Red-whiskered Bulbul *P. jocosus*, Cinereous Tit *Parus cinereus* were sighted in Mixed Woodland near Tseng Kwan O Village. These species are common in Hong Kong.

- 3.2.32 A nest of Blue Whistling Thrush *Myophonus caeruleus* was found in Mixed Woodland in Tin Ha Wan Village. This species are common in Hong Kong.
- 3.2.33 Species richness of bird was low in Plantation, Seawall, Shrubland/Grassland, Urbanized/Disturbed, Watercourse and Mixed Woodland, and very low in other types of habitats within the Study Area. Abundance of bird was low to moderate in Plantation, Shrubland/Grassland and Mixed Woodland, low in Seawall, Urbanized/Disturbed and Watercourse, and very low in other types of habitats within the Study Area.
- 3.2.34 The proposed desalination plant area is composed of Urbanized/Disturbed, Wasteland, Watercourse and Mixed Woodland. The two major types of habitats, Urbanized/Disturbed and Wasteland, support low diversity of birds.

Herpetofauna

- 3.2.35 Two species of reptile were recorded within the Study Area (**Appendix 4**). These were Changeable Lizard *Calotes versicolor* and Bamboo Snake *Cryptelytrops albolabris*. Both species are widely distributed in Hong Kong. None of the recorded species is of conservation importance.
- 3.2.36 Six species of amphibian were recorded within the Study Area (**Appendix 4**). None of the recorded species is of conservation importance. All are common and widespread in Hong Kong (Chan *et al.* 2005).

Butterflies and dragonflies

- 3.2.37 Fifty-two species of butterfly were recorded within the Study Area (**Appendix 5**). Most are common in Hong Kong.
- 3.2.38 Five species were considered of conservation importance. These include rare species Pale Palm Dart *Telicota colon* and very rare species Plain Palm Dart *Cephrenes acalle*, , Vagrant *Vagrans egista*, Plain Hedge Blue *Celastrina lavendularis* and Danaid Eggfly *Hypolimnas misippus*. The three very rare species are considered of “local concern” by Fellowes *et al.* (2002).
- 3.2.39 Pale Palm Dart and Danaid Eggfly were recorded in Shrubland/Grassland within the study area for slope mitigation works but outside the proposed slope mitigation works area. Plain Hedge Blue was recorded in Plantation in Tin Ha Wan Village. Plain Palm Dart and Vagrant were recorded in Shrubland/Grassland near Tin Ha Au, which is outside the Project Site.
- 3.2.40 Abundance of butterfly was low to moderate in Shrubland/Grassland, low in Urbanized/Disturbed and Watercourse, and very low in other types of habitats within the Study Area. Species richness of butterfly was low to moderate in Shrubland/Grassland, low in Urbanized/Disturbed and Watercourse, and very low in other types of habitats within the Study Area.
- 3.2.41 Both abundance and species richness in Urbanized/Disturbed and Wasteland within the proposed desalination plant area were very low due to the high disturbance level. Butterflies in the Study Area of Slope Mitigation Works were mainly found in Shrubland/Grassland outside the rock slope stabilization area and soil nail area.

- 3.2.42 Seventeen species of odonate were recorded within the Study Area (**Appendix 6**). None of the recorded species is of conservation importance. All are common and widespread in Hong Kong.
- 3.2.43 Abundance of dragonfly was low to moderate in Urbanized/Disturbed (not including the Project Site) and Watercourse (not including the Project Site), low in Plantation and Shrubland/Grassland, and very low in other habitats within the Study Area. Species richness of dragonfly was low in Plantation, Shrubland/Grassland, Urbanized/Disturbed and Watercourse, and very low in other types of habitats within the Study Area.
- 3.2.44 Both abundance and species richness of dragonfly were low in the proposed desalination plant area due to the high level of disturbance. The drainage channel within the Project Site is not important habitat of dragonfly due to the simple habitat structure and poor water quality.

Freshwater Aquatic Assemblage Survey

- 3.2.45 The surveyed locations were not suitable to conduct kick-sampling because of the fast water flow in the stream of Tseung Kwan O Village (F-T), and the scarcity of water in the other surveyed locations. Only hand nets, baited traps and direct observation with binoculars were used for freshwater aquatic assemblage survey.
- 3.2.46 A total of 18 freshwater fauna were recorded in the surveyed locations within the Study Area during both seasons. They included gastropods, crustaceans, insects, fishes and tadpoles (**Appendices 7 and 8**).
- 3.2.47 Diversity of freshwater fauna was relatively higher in the stream of Tseung Kwan O Village (F-T), while the channel (ditch) in the Project Site (F-P) was the lowest. Fourteen species among the 18 recorded fauna were found in the stream of Tseung Kwan O Village (F-T). The water in the surveyed locations except the stream in Tseung Kwan O Village, low diversity of freshwater fauna was recorded. Even though the diversity of freshwater fauna was relatively higher in the stream of Tseung Kwan O Village, it was observed that the water was polluted by uphill villages, including Tseng Lan Shue, Pak Shek Wo, Au Tau. Most species recorded in the surveys were common and widespread in Hong Kong, only a species of conservation importance *Nanhaipotamon hongkongense* was recorded.
- 3.2.48 *Nanhaipotamon hongkongense* is an endemic crab species of Hong Kong. This species is considered as “Potential Global Concern” due to its endemism (Fellowes *et al.* 2002). It is found mostly in secondary forest (Cumberlidge 2008), it is very terrestrial and may be found far from streams after heavy rain, and remains in burrows during the dry season (Dudgeon 2003). *Nanhaipotamon hongkongense* is recorded in a stream near Tseung Kwan O Primary Fresh Water Service Reservoir (F-R) during the survey conducted in dry season.

Intertidal Survey

Qualitative Walk-through Survey

- 3.2.49 Within the Study Area, qualitative walk-through survey was conducted along all accessible shorelines in the impact sites (coastlines to the east of the Project Site, and to the west of the Project Site i.e. Tit Cham Chau (I-O) and Ting Ha Au(I-I)) and reference sites (i.e. the coastal habitats at Fat Tong Chau (I-F), Tai Miu Wan (I-T) and north of Tung Lung Chau(I-L)) to record organisms encountered with their relative abundance noted (**Appendices 9 and 10**).
- 3.2.50 Results of this qualitative survey showed that the shorelines along the Study Area mainly comprised of natural rocky shore, artificial seawall and mobile shores.
- 3.2.51 A total of 64 and 68 intertidal organisms were found in the Study Area during the qualitative surveys of dry season and wet season, respectively. Common intertidal organisms found at the Rocky Shore include *Balanus amphitrite*, *Capitulum mitella*, *Echinolittorina radiata*, *Echinolittorina trochoides*, *Monodonta labio*, *Planaxis sulcatus*, *Saccostrea cucullata* and *Tetraclita japonica*.
- 3.2.52 Number of species in different sites within the Study Area are shown in **Table 3**. Number of species in the rocky shore of Fat Tong Chau was the highest among the sites, while the lowest was recorded in the sandy shore of Tai Mui Wan.
- 3.2.53 Common species found in the artificial seawall include *Saccostrea cucullata* and *Tetraclita squamosa*.
- 3.2.54 Two types of mobile shores were found, i.e. coarse sandy shore and pebble shore. Coarse sandy shores were found in the coastline to the east of the Project Site (I-I), Fat Tong Chau (I-F), Tai Miu Wan (I-T), north of Tung Lung Chau (I-L). The diversity of this type of habitat is more 'difficult' habitat with a reduced species lists (Morton and Morton 1983). Common species found in the sandy shores include *Donax* sp. and *Ocypode* sp..
- 3.2.55 Pebble shore was found in the east of the Project Site, which is the coarsest of mobile shores, it is lack both the relative stability of large boulders and the cohesion and water retention of sand. They are virtually biological deserts (Morton and Morton 1983). *Monodonta labio* and *M. neritoides* were the common species found in the pebble shore.
- 3.2.56 Highly mobile fauna such as fishes and crabs were recorded in the qualitative surveys. Fishes such as *Bathygobius fuscus*, *Siganus canaliculatus* and *Terapon jarbua* were found in the rock pools in some of the rocky shores.
- 3.2.57 Significant seasonal variation was observed on macroalgae. Four species of macroalgae were recorded during the surveys in dry season, but none of those was recorded in wet season.
- 3.2.58 Two colonies of Zebra Coral *Oulastrea crispata* were found in the rocky shore of Fat Tong Chau (I-F) during the qualitative survey. As this species has special tolerance to extreme environment, Zebra Coral can be found in many places in Hong Kong (Chan *et al.* 2005). All hard corals are protected under Cap 586 Protection of Endangered Species of Animals and Plants Ordinance.

- 3.2.59 No other species of conservation importance was recorded except the Zebra Coral. All species recorded were considered to be common and widespread as in other intertidal shores in Hong Kong.

Quantitative Intertidal Survey

- 3.2.60 Three sets of transects were deployed in the shorelines of the impact sites (coastlines to the east of the Project Site, and to the west of the Project Site i.e. Tit Cham Chau (I-O) and Tin Ha Au (I-I)), while two sets of transects were deployed in the reference sites (i.e. the coastal habitats at Fat Tong Chau (I-F), Tai Miu Wan (I-T) and north of Tung Lung Chau (I-L)); covering the major habitats of the intertidal areas. Each set of the transects covered three shore heights: 2m (high-shore), 1.5m (mid-shore) and 1m (low-shore) above Chart Datum (CD). Dominant species among the transects were found to be quite different. The results of combined transects in each site is shown in **Appendices 11 and 12**.
- 3.2.61 A total of 62 and 57 organisms were recorded during the quantitative surveys in the dry and wet seasons, respectively. Dominant species found were typical species in that particular shore as described in the qualitative survey.
- 3.2.62 **Table 3** shows the number of species (*S*), density (*D*, i.e. individual/m²), evenness (*J*) and Shannon Diversity (*H'*) of intertidal organisms recorded in different sites of Study Area during dry and wet season surveys (both qualitative and quantitative surveys are present). Generally, number of species and Shannon diversity were higher in rocky shores than seawall and mobile shores among the sites within the Study Area. Number of species in the reference sites of rocky shores in Fat Tong Chau (I-F) and Tung Lung Chau (I-L) were the highest; and the Shannon diversity of rocky shore in Tai Mui Wan (I-T) was the highest and recorded in wet season. No species could be found in the sandy shore of Tai Mui Wan (I-T) during the quantitative surveys in both seasons, but 7 species were found in some boulders during qualitative surveys. Seasonal patterns varied among sites.
- 3.2.63 Overall, no species of conservation importance were recorded in the intertidal quantitative surveys within the Study Area. All species recorded were considered to be common and widespread as in other intertidal shores in Hong Kong.

Table 3 Number of species (*S*), density (*D* individual/m²), evenness (*J*) and Shannon Diversity (*H'*) of intertidal organisms recorded in different sites of Study Area during dry and wet season surveys (both qualitative and quantitative surveys are present, species recorded in coverage were excluded for quantitative analysis).

Site (type of shore)	Qualitative		Quantitative							
	S		S		D		J		H'	
	Dry	Wet	Dry	Wet	Dry	Wet	Dry	Wet	Dry	Wet
I-O (rocky A)	25	25	25	24	172	181	0.48	0.56	1.51	1.80
I-O (rocky B)	21	21	20	20	82	131	0.59	0.71	1.77	2.17
I-O (seawall)	15	21	15	21	82	63	0.67	0.67	1.81	2.03
I-I (rocky)	23	25	23	24	83	54	0.68	0.67	2.10	2.15
I-I (sandy)	3	2	3	2	3	3	0.40	0.27	0.44	0.18
I-I (pebble)	16	11	16	9	24	27	0.67	0.82	1.86	1.96
I-F (rocky)	35	43	33	37	385	559	0.61	0.52	2.13	1.88
I-F (sandy)	4	10	3	10	1	6	0.77	0.90	1.07	2.07

Site (type of shore)	Qualitative		Quantitative							
	S		S		D		J		H'	
	Dry	Wet	Dry	Wet	Dry	Wet	Dry	Wet	Dry	Wet
I-T (rocky)	22	41	22	34	208	163	0.62	0.74	1.91	2.66
I-T (sandy)	0	7	0	0	0	0	NA	NA	0.00	0.00
I-L (rocky)	37	20	37	19	138	39	0.60	0.70	2.12	2.09
I-L (sandy)	14	3	14	3	18	7	0.52	0.39	1.33	0.43

Subtidal Coral Survey

- 3.2.64 A total of 7 sites were surveyed by SCUBA diving twice in August 2014 for coral communities and associated marine fauna, including D-I (Intake pipeline), D-O (outfall pipeline), D-F (Fat Tong Chau), D-T (Tai Miu), D-E (east of Tai Mui), D-W (west of Tai Mui), and D-L (Tung Lung). The survey locations covered the impact sites (intake and outfall pipelines), and also the reference sites in the surroundings.
- 3.2.65 A total of 23 species of hard corals and one species of gorgonian were recorded during the dive surveys (**Table 4** and **Appendix 13**). Among the recorded hard coral species, three species are “Uncommon” and one species is “Undescribed” (Chan, *et al.* 2005), while others are all “Common”, “Abundant” or “Dominant”. The gorgonian recorded is also common in Hong Kong waters.
- 3.2.66 *Acropora solitaryensis*, *Favites flexuosa*, and *Psammocora haimeana* are considered as “Uncommon”. *Acropora solitaryensis* has a strong geographic distribution pattern, generally restricted to the oceanic offshore islands of southeastern Hong Kong and the coastline of exposed eastern mainland bays. *Favites flexuosa* occurs throughout the southern, eastern and northeastern waters of Hong Kong, and is represented in both shallow and deep coral habitats. The occurrence of *Psammocora haimeana* is associated with coral communities in northeastern water of Hong Kong, also with some records in eastern and southern waters.
- 3.2.67 *Coscinaraea* sp. is reported as “Undescribed”. Colonies of this species are usually massive to encrusting. It has been recorded from a few locations in northeastern, eastern, southeastern and western waters of Hong Kong, especially associated with low-light habitats.
- 3.2.68 Area 137, where the proposed desalination plant site is located, is an existing reclamation area and has artificial coastlines along its western and southern sides. The coastlines of Area 131 are predominant by artificial seawalls, though some remnant natural coasts left from the original Tit Cham Chau island could still be found at the southern end. The intake and outfall pipelines, where direct impacts are expected, originate from an existing sloping seawall at the southeast end of Area 131, and extend towards southeast and southwest respectively. The sloping seawalls are composed of boulders of irregular shapes. The sloping artificial seawalls maintained a similar gradient in the intertidal zone as well as the subtidal zone, and extended till it met the seabed. There was no coral colony found on the seawall, and the seabed was mainly sandy substrate with small sized natural boulders.
- 3.2.69 The other five dive survey sites are on natural coastlines, located at different directions from the Project Site. D-F is located to the northwest of the Project Site and at the western side of Fat Tong Chau, which was originally an island before the TKO new town development and had lost most of the coastlines except the western side. The coastline at D-F is of rather steep gradient, mainly composed of bedrock and small

sized natural boulders at its lower part, and changed to sandy seabed at the depth about 5m. Seven species of corals including 6 species of hard coral (including *Coscinaraea* sp. which is “undescribed” in accordance with Chan, *et al.* 2005) and one species of common gorgonian were recorded at this site.

- 3.2.70 D-L is located to the southern of the Project Site and at the northern coast of Tung Lung Island. The coastlines at Tung Lung Island are basically all natural except at the few piers on the island. There is an existing fish culture zone just offshore to the diving site D-L. The coastline at D-L is mainly medium and small sized boulders. There was a small sea anemone bed (about 20m x 5m) observed near D-L. But the coral diversity at D-L was low, only three species of hard corals (all common, abundant or dominant in Hong Kong) were recorded and the coverage was also very low (less than 1%).
- 3.2.71 D-W, D-T, and D-E are located to the east of the Project Site and along the coastlines at and near Tai Miu. Tai Miu is an embayment at the southern shore of Clear Water Bay Peninsula. There are sloping seawalls and a public pier at Tai Miu, occupying a significant portion of the original bay with a small section of sandy beach left. D-T is located at natural coastline just away from the sloping seawalls at Tai Miu. D-W and D-E are located at natural coastlines to the west and to the east of D-T respectively. The substrates at these three sites were similar, with bedrock together with boulders extending to sandy seabed, but the sizes of the boulders were larger at D-T, and smallest at D-E. D-T had a relatively higher coral diversity, with 14 species of hard corals recorded from spot check dives. The recorded coral species included two “uncommon” species (*Favites flexuosa* and *Psammocora haimeana*) together with the “undescribed” *Coscinaraea* sp.. The coral coverage percentage was below 10%. At D-W, 17 species of hard corals were recorded (the highest no. of coral species among the 7 dive survey sites), with three “uncommon” species (*Acropora solitaryensis* together with *Favites flexuosa* and *Psammocora haimeana*) and the “undescribed” *Coscinaraea* sp. The coral coverage percentage was also between 5-10%. D-E however was the lowest in terms of both coral diversity and coral coverage percentage among all dive survey sites of this study. Only one species of “Dominant” hard coral *Porites lutea* of less than 1 % coverage was recorded.
- 3.2.72 Among the 7 sites, the highest diversity of corals was recorded in D-W (to the west of Tai Miu) with 17 species of hard corals from the spot dive survey, and followed by D-T (Tai Miu). The intake and outfall pipeline (D-I & D-O), though the two alignments were mostly sandy substrate without coral colonization, the coastlines nearby were also of certain coral diversity. The rest of the dive survey sites are not found of significant coral diversity or coverage.
- 3.2.73 Based upon the findings from the spot dive surveys, three sites were recommended for REA survey for AFCD agreement. These three sites included the site with the highest coral diversity (i.e. D-W, to the west of Tai Miu), the intake pipeline site (D-I), and outfall pipeline site (D-O). At each site, seabed compositions along the transects were recorded and presented at **Appendix 14**. Each taxon in the inventory was ranked in terms of relative abundance in the community.
- 3.2.74 D-W – The REA transect at D-W was deployed parallel with the coastline, and the seabed along the transect was mainly composed of bedrock, with some boulders, cobbles, and sand. Hard coral colonies from 9 species were present and accounted for over 5 percent coverage along the REA transect. Other benthos present include sea urchins, mussels, and snails.
- 3.2.75 D-I – The REA transect at D-I followed the alignment of the proposed intake pipeline and parallel with the coastline of the nearby small island. For the intake alignment

transect, the section close to the shore (about 10m from the shore) was covered by large-sized boulders of the seawall, while the remaining part was mainly covered by sandy substrate, without coral colonization. The seabed along the nearby small island REA transect at D-I, like the D-W site, also consisted of bedrock, boulders, cobbles, and sand, but with more boulders and cobbles. Hard coral colonies (with 6 species) were also present and accounted for over 5% percent cover. Similar compositions of other benthos were also present.

3.2.76 D-O –The REA transect at D-O followed the alignment of the proposed outfall pipeline and parallel with the coastline of Tit Chan Chau. For the outfall pipeline alignment transect, like the nearby intake pipeline, the section close to the shore (around 10m from the shore) was covered by large-sized boulders of the seawall, while the remaining part was mainly covered by sandy substrate, and sandy muddy substrate (at the most seaward part), without coral colonization. The seabed along the Tit Cham Chau transect at D-O was similar with the small island transect of D-I, was mainly bedrocks and also colonized by coral colonies at similar coverage percentage. Hard coral colonies from 8 species were present and accounted for over 5% percent cover. The other benthos also consisted of sea urchins, mussels, and snails.

3.2.77 The REA results showed that the three sites are of similar conditions and coral coverage, with the D-W of higher diversity (from both spot dive results and REA results). Some of the selected photos during the dive surveys are shown in **Figure 10**.

Table 4 Species of Corals recorded during the dive survey

	Hard Coral	Commonness	D-L	D-E	D-T	D-W	D-I	D-O	D-F
1	<i>Acropora solitaryensis</i>	Uncommon				✓			
2	<i>Cyphastrea serailia</i>	Dominant	✓			✓	✓	✓	
3	<i>Favia speciosa</i>	Abundant			✓	✓	✓	✓	
4	<i>Favia fавus</i>	Common			✓	✓			
5	<i>Favia lizardensis</i>	Common				✓			
6	<i>Favia veroni</i>	Abundant						✓	
7	<i>Favia rotumana</i>	Abundant			✓	✓		✓	
8	<i>Favites abdita</i>	Dominant				✓	✓	✓	✓
9	<i>Favites chinensis</i>	Dominant					✓	✓	
10	<i>Favites flexuosa</i>	Uncommon			✓	✓	✓		
11	<i>Favites pentagona</i>	Dominant			✓	✓		✓	
12	<i>Goniastrea aspera</i>	Common				✓		✓	✓
13	<i>Coscinaraea sp.</i>	Undescribed			✓	✓			✓
14	<i>Goniopora stutchburyi</i>	Common			✓	✓	✓		✓
15	<i>Montipora peltiformis</i>	Common			✓		✓	✓	
16	<i>Oulastrea crispata</i>	Common	✓		✓		✓	✓	✓
17	<i>Pavona decussata</i>	Abundant				✓			
18	<i>Platygyra carnosus</i>	Common				✓			
19	<i>Plesiastrea versipora</i>	Abundant			✓	✓		✓	
20	<i>Porites lutea</i>	Dominant		✓	✓		✓	✓	
21	<i>Psammocora haimeana</i>	Uncommon			✓	✓			
22	<i>Psammocora superficialis</i>	Abundant	✓		✓	✓		✓	✓
23	<i>Turbinaria peltata</i>	Common			✓		✓		

	Hard Coral	Commonness	D-L	D-E	D-T	D-W	D-I	D-O	D-F
	Gorgonian								
24	<i>Guaiagorgia</i> sp.	Common							✓
	Total No. of coral species		3	1	14	17	10	13	7

Subtidal Benthic Survey

- 3.2.78 Subtidal benthic surveys at 6 sampling locations in the Study Area showed that 1176 and 4149 individuals of organisms in 9 and 10 phyla, 78 and 83 families, and 106 and 123 species in 108 grab samples during dry and wet seasons, respectively.
- 3.2.79 In terms of infaunal abundance, the majority of the organisms recorded in the subtidal soft bottom habitat were from the Phylum Annelida (dry season: 46%, wet season 60%), followed by Arthropoda (dry season: 12%, wet season: 27%) and Mollusca (dry season: 33%, wet season: 7%) (**Table 5**). Each of the other phyla contributed to around or less than 5% of the total population abundance. Generally, the subtidal soft-bottom habitat in the Study Area was dominated by polychaete *Amaeana trilobata*, *Prionospio ehlersi* and amphipod *Byblis* sp. during dry season; while in wet season, polychaetes *Amaeana trilobata*, *Prionospio ehlersi*, and bivalve *Theora lata* were the dominant species (**Appendices 15-18**). Most of the species recorded are common and widespread in Hong Kong, except an individual of amphioxus *Branchiostoma belcheri*, a benthic species considered of conservation importance, was found in the submarine outfall (B-O), during both dry and wet seasons. The individuals recorded were relatively small in size (length: ~2cm, biomass: 0.0004g), no gonad development was observed.
- 3.2.80 Amphioxus is of conservation significance because of its primitive morphology and because of its over-exploitation as a fishery resource in coastal waters of the South China Sea, especially near Xiamen (Lu *et al.* 1998). Amphioxus is classified as a Class II protected species in China (Huang 2006).
- 3.2.81 The data analysis in **Table 6** indicated that the numerical abundance at the submarine outfall (B-O) was much higher than the other locations during the wet season. Number of species ranged from 58 at the submarine intake to 30 at Fat Tong Chau (B-F) during dry season. While in wet season, it ranged from 74 at submarine outfall (B-O) to 44 at Fat Tong Chau (B-F). Both locations of submarine outfall and intake had higher number of species than the other locations. Number of species and abundance were both higher in wet season than dry season.
- 3.2.82 In terms of infaunal biomass, organisms from the Phylum Mollusca contributed to about 59% (dry season) and 29% (wet season) of the total biomass recorded, followed by Echinodermata (22% in dry season) and Annelida (25% in wet season) (**Table 5**). **Table 6** indicated that the highest wet weight was observed at proposed submarine outfall (B-O), while north of Tung Lung (B-L) exhibited the lowest wet weight. The highest biomass value at B-L was due to the presence of a large specimen of *Trachycardium impolitum*. Benthic Shannon Diversity Index (H') ranged from 3.48 at proposed submarine intake (B-I) to 2.54 at proposed submarine outfall (B-O) during dry season, and from 3.40 at proposed submarine outfall (B-O) to 2.53 at location of Tai Miu Wan (B-T) during wet season. Pielou's Evenness Index (J) ranged from 0.94 at B-B to 0.66 at B-O during dry season, and from 0.81 at B-L to 0.59 at B-T.

- 3.2.83 The benthic assemblages within the Study Area are relatively higher than that in Hong Kong waters. Previous studies of benthic surveys showed that value of H' varied from 2.21 – 3.50 in the eastern waters, which is higher than Victoria Harbour (1.10 – 2.49), Tolo Harbour and Channel (1.51 – 1.85), western waters at out Deep Bay (2.14 – 2.86) and southern waters (2.53 – 2.98) (CityU Professional Services Limited. 2002).
- 3.2.84 On the whole, except the only individual of amphioxus, the subtidal benthos survey showed that the infaunal assemblages of the surveyed locations mostly consisted of common, widespread species which are typical of disturbed environment, i.e. the presence of numerical dominance of low biomass, stress-tolerant and short-lived polychaete species in the Phylum Annelida. Infaunal assemblages were largely similar among the six surveyed locations within the Study Area.

Table 5 Benthic fauna composition within the Study Area

Phylum / season	No. of families		No. of species		No. of individuals		% of abundance		Biomass (g)		% of biomass	
	Dry	Wet	Dry	Wet	Dry	Wet	Dry	Wet	Dry	Wet	Dry	Wet
Annelida	33	35	50	60	538	2485	45.79	59.89	9.39	34.78	8.52	24.76
Arthropoda	13	20	14	24	145	1103	12.34	26.58	9.50	33.59	8.62	23.91
Chordata	3	3	3	4	6	19	0.51	0.46	1.66	26.06	1.51	18.55
Cnidaria	2	1	2	1	2	1	0.17	0.02	0.00	3.24	0.00	2.31
Echinodermata	3	1	3	1	51	9	4.34	0.22	23.92	0.16	21.71	0.11
Euchiura	0	1	0	1	0	8	0.00	0.19	0.00	0.16	0.00	0.11
Mollusca	21	19	30	28	387	306	32.94	7.38	65.11	41.06	59.08	29.23
Nemertinea	1	1	1	4	26	52	2.21	1.25	0.45	1.05	0.41	0.75
Plathyelminthes	1	1	1	1	4	3	0.34	0.07	0.10	0.01	0.09	0.01
Sipuncula	1	1	2	2	17	163	1.45	3.93	0.07	0.36	0.06	0.25
Total	78	83	106	126	1176	4149	100	100	110.2	140.47	100	100

Table 6 Summary Information from Subtidal Benthic Survey in Dry and Wet Seasons (replicates of sub-stations are pooled together).

Location / season	No. of species		Abundance		Wet weight (g)		Evenness		Shannon diversity	
	Dry	Wet	Dry	Wet	Dry	Wet	Dry	Wet	Dry	Wet
B-O	59	71	236	1167	45	31	0.86	0.59	3.48	2.53
B-I	54	74	225	786	18	27	0.86	0.79	3.45	3.40
B-T	48	62	310	603	17	30	0.66	0.77	2.54	3.19
B-B	38	64	187	706	13	11	0.82	0.81	3.00	3.36
B-L	32	60	68	480	5	16	0.94	0.75	3.26	3.06
B-F	30	44	150	407	12	24	0.79	0.76	2.70	2.88

4. EVALUATION OF HABITATS AND SPECIES

4.1 Ecological values of habitats

- 4.1.1 The habitats within the Study Area were evaluated in accordance with the criteria stipulated in Annex 8 of EIAO-Technical Memorandum (TM) (Tables 7 to 15). The overall ecological values of most of the habitats are ranked as very low to low, while Mixed Woodland, Shrubland/Grassland and natural section of Watercourse are ranked as low to moderate; Rocky Shore and Marine Waters are ranked as moderate.

Table 7 Evaluation of Mixed Woodland within the Study Area

Criterion	Description
Naturalness	Semi-natural, with a mixture of native and exotic species.
Size	57.47 ha
Diversity	Low floral diversity; low diversity of bird, very low for butterfly and dragonfly
Rarity	Flora of conservation importance included <i>Aquilaria sinensis</i> and <i>Diospyros vaccinioides</i> . Fauna species of conservation importance included Black Kite, Grey-chinned Minivet.
Re-creatability	Quite easy to recreate as it was formed of common species, but take times to mature.
Fragmentation	Relatively fragmented within the Study Area.
Ecological linkage	Not functionally linked to habitats of conservation importance
Potential value	High with protection and management to allow natural succession.
Nursery/breeding ground	Juveniles and nest of common bird species were sighted. No significant observation. Could provide breeding habitats for birds, reptiles and butterflies.
Age	About 20 years for young woodland, over 40 years for mature woodland.
Abundance/richness of wildlife	Low abundance of bird and very low for butterfly and dragonfly.
Overall ecological value	Low to moderate

Table 8 Evaluation of Plantation within the Study Area

Criterion	Description
Naturalness	Man-made (planted).
Size	127.63 ha
Diversity	Low flora diversity. Low diversity of bird and dragonfly, and very low for butterfly.
Rarity	None for flora. Fauna species of conservation importance included Black Kite, Crested Serpent Eagle, Greater Coucal, Grey-chinned Minivet, Plain Hedge Blue.
Re-creatability	Easy to recreate
Fragmentation	Formed thin belts on engineered slopes
Ecological linkage	Functionally linked to adjacent woodland.
Potential value	Low
Nursery/breeding ground	No significant records. Value as breeding habitat for terrestrial fauna is low due to sparse canopy and exotic tree species composition, and subject to high level of disturbance.
Age	Young
Abundance/richness of wildlife	Low for bird, and low for dragonfly, very low for butterfly.
Overall ecological value	Low

Table 9 Evaluation of Shrubland/Grassland within the Study Area

Criterion	Description
Naturalness	Fairly natural
Size	195.32 ha
Diversity	Moderate flora diversity. Low to moderate diversity of butterfly, low for bird and dragonfly.
Rarity	Flora of conservation importance included <i>Habenaria linguella</i> , <i>Lilium brownii</i> , <i>Pachystoma pubescens</i> , <i>Pecteilis susanna</i> , <i>Platycodon grandiflorus</i> and <i>Nepenthes mirabilis</i> . Fauna species of conservation importance included Black Kite, Crested Goshawk, Collared Scops Owl, Greater Coucal, Chinese Hwamei, Collared Crow, Pale Palm Dart, Danaid Eggfly, Plain Palm Dart and Vagrant
Re-creatability	Easy to recreate
Fragmentation	Formed thin belts on engineered slopes
Ecological linkage	Functionally linked to adjacent woodland.
Potential value	Low for the artificial and hydroseeded areas, moderate for the natural shrubland/grassland within the Clear Water Bay Country Park.
Nursery/breeding ground	No significant records. However, the shrubland/grassland within Clear Water Bay Country Park may provide nursery and breeding ground for birds and butterflies.
Age	Young
Abundance/richness of wildlife	Low to moderate for bird and butterfly, and low for dragonfly.
Overall ecological value	Low to moderate

Table 10 Evaluation of Agricultural Land within the Study Area

Criterion	Description
Naturalness	Man-made.
Size	1.31 ha
Diversity	Low flora diversity. Very low diversity of bird, butterfly and dragonfly.
Rarity	None for flora and fauna.
Re-creatability	Easy to recreate
Fragmentation	Formed thin belts on engineered slopes
Ecological linkage	Functionally linked to adjacent woodland.
Potential value	Low
Nursery/breeding ground	No significant records. Value as breeding habitat for terrestrial fauna is low due to small size, high level of human activities and sparse vegetation cover.
Age	Young
Abundance/richness of wildlife	Low for butterfly and bird, and very low for dragonfly.
Overall ecological value	Low

Table 11 Evaluation of Wasteland within the Study Area

Criterion	Description
Naturalness	Man-made (planted).
Size	11.39 ha
Diversity	Low flora diversity. Very low diversity of bird, butterfly and dragonfly.
Rarity	None for flora. Fauna species of conservation importance included Black-crowned Night Heron, Collared Scops Owl and White-throated Kingfisher.
Re-creatability	Easy to recreate
Fragmentation	Formed thin belts on engineered slopes
Ecological linkage	Functionally linked to adjacent woodland.
Potential value	Low
Nursery/breeding ground	No significant records. Value as breeding habitat for terrestrial fauna is low due to low vegetation cover, and subject to high level of disturbance.
Age	Young
Abundance/richness of wildlife	Low for butterfly and bird, and very low for dragonfly.
Overall ecological value	Low

Table 12 Evaluation of Watercourse within the Study Area

Criterion	Description
Naturalness	Mostly modified/channelled, only short sections of natural upstream
Size	3.52 ha (3.8km for man-made channel and 0.2km for natural section)
Diversity	Low for flora. Low for bird, butterfly and dragonfly. Low diversity of aquatic fauna
Rarity	Species of conservation importance included <i>Nanhaipotamon hongkongense</i>
Re-creatability	Easy to recreate for the man-made channel, difficult for the natural section
Fragmentation	Natural section fragmented by roads and channel
Ecological linkage	Not observed
Potential value	Low
Nursery/breeding ground	Limited as breeding habitats for dragonfly and amphibian due to poor water quality and simple habitat structure; but may provide breeding habitat to <i>Nanhaipotamon hongkongense</i>
Age	N/A
Abundance/richness of wildlife	Low to moderate for dragonfly, low for butterfly, low for aquatic fauna
Overall ecological value	Low for man-made channel and ditch, low to moderate for the natural section

Table 13 Evaluation of Urbanised/disturbed within the Study Area

Criterion	Description
Naturalness	Man-made habitat
Size	519.66 ha

Criterion	Description
Diversity	Low flora diversity. Low diversity of bird, butterfly and dragonfly.
Rarity	None for flora. Fauna species of conservation importance included Japanese Pipistrelle, Little Egret, Black Kite, Greater Coucal.
Re-creatability	Easy to recreate
Fragmentation	N/A
Ecological linkage	Not functionally linked to habitats of conservation importance.
Potential value	Low
Nursery/breeding ground	No significant record. Minimal due to high level of disturbance.
Age	N/A
Abundance/richness of wildlife	Low for butterfly, low to moderate for dragonfly.
Overall ecological value	Very Low

Table 14 Evaluation of Rocky Shore and Sandy Shore within the Study Area

Criterion	Description	
	Rocky Shore	Sandy Shore
Naturalness	Natural	Natural
Size	2.23 ha	0.22 ha
Diversity	Very low diversity of plant, bird, butterfly and dragonfly; moderate diversity of intertidal organisms	Very low diversity of bird, butterfly and dragonfly; low diversity of intertidal organisms
Rarity	Fauna species of conservation importance included Black Kite, Pacific Reef Egret and Zebra Coral	No fauna species of conservation importance
Re-creatability	Difficult to recreate, but hard bottom substrata may be – recolonized by intertidal and subtidal organisms	Easy to recreate
Fragmentation	Not fragmented	Not fragmented
Ecological linkage	The habitat is not functionally linked to any high value habitat in a significant way	The habitat is not functionally linked to any high value habitat in a significant way
Potential value	Moderate, natural rocky shores can provide substrate for intertidal organisms	Low. Unlikely to become an area of conservation value
Nursery/breeding ground	Not identified during the literature review or field surveys	Not identified during the literature review or field surveys
Age	N/A	N/A
Abundance/richness of wildlife	Very low for butterfly and dragonfly; moderate for intertidal organisms	Very low for butterfly and dragonfly; low for intertidal organisms
Overall ecological value	Moderate	Low

Table 15 Evaluation of Seawall and Marine Waters within the Study Area

Criterion	Description	
	Seawall	Marine Waters (Subtidal hard and soft bottoms)
Naturalness	Man-made	N/A
Size	1.61 ha	110.09 ha
Diversity	Low diversity of bird, very low for butterfly and dragonfly; low diversity for intertidal organisms	High for subtidal benthic organisms Moderate for corals.
Rarity	Fauna species of conservation importance included White-bellied Sea Eagle	An individual of amphioxus was found Three “Uncommon” hard coral spp. (<i>Acropora solitaryensis</i> , <i>Favites flexuosa</i> , and <i>Psammocora haimeana</i>) and one “undescribed” coral <i>Coscinaraea</i> sp. were recorded.
Re-creatability	Easy	No precedent case for marine waters. Coral communities and benthic infauna are able to self-recovery by re-colonisation.
Fragmentation	The surrounding coastlines are composed of natural rocky shores	The habitat is not fragmented
Ecological linkage	The habitat is not functionally linked to any high value habitat in a significant way	Connect with other marine waters and intertidal habitats
Potential value	Very low. This artificial habitat only supported low diversity of intertidal organisms	Low as these habitats have established for a long time without disturbance.
Nursery/breeding ground	Not identified during the literature review or field surveys	Not identified
Age	N/A	N/A
Abundance/richness of wildlife	Very low for butterfly and dragonfly; very low for intertidal organisms	Moderate for subtidal benthic organisms Low to Moderate for corals
Overall ecological value	Very low	Low to Moderate for subtidal hard bottom Low to moderate for subtidal soft bottom

4.2 Species of conservation importance

4.2.1 In accordance with Table 3, Annex 8 of the EIAO-TM, the ecological value of species was assessed in terms of protection status (e.g. fauna protected under WAPO (except birds), and flora and fauna protected under regional/global legislation/conventions), species distribution (e.g. endemism), and rarity (e.g. rare or restricted).

4.2.2 From the ecological surveys of the Study, eight flora and twenty-one fauna species recorded are of conservation importance which are summarised in **Table 16** and **Table 17** respectively.

Table 16 Evaluation of Flora Species of Conservation Importance Recorded within the Study Area

Common Name	Scientific Name	Locations	Protection Status	Distribution	Rarity
Pitcher Plant	<i>Nepenthes mirabilis</i>	Grassland/shrubland at ravine outside Project Site	Scheduled under Cap 96, IUCN Red List of Threatened Species (Category LR/lc), CITES Appendix II	Wet, open places on granite and sedimentary rocks (western New Territories)	common
Incense Tree	<i>Aquilaria sinensis</i>	Woodland outside the Project Site	Cap 586, Category II nationally protected species in China and is listed as vulnerable in the China Plant Red Data Book and by IUCN (2002).	Lowland forests and fung shui woods	locally common
Small Persimmon	<i>Diospyros vaccinioides</i>	Woodland outside the Project Site	listed as critically endangered by IUCN (2002).	Shrubland	Very common
Tongue Habenaria	<i>Habenaria linguella</i>	Grassland/Shrubland	Scheduled under Cap 96, Protected under Cap 586,	Grassland	restricted
Chinese Lily	<i>Lilium brownii</i>	Grassland/Shrubland	Scheduled under Cap 96	Grassland	restricted
Pubescent Pachystoma	<i>Pachystoma pubescens</i>	Grassland/Shrubland	Scheduled under Cap 96, Protected under Cap 586,	Grassland	rare
Susan Orchid	<i>Pecteilis susannae</i>	Grassland/Shrubland	Scheduled under Cap 96, Protected under Cap 586,	Grassland	restricted
Balloon Flower	<i>Platycodon grandiflorus</i>	Grassland/Shrubland	Scheduled under Cap 96	Grassland and shrubland	restricted

Table 17 Evaluation of Fauna Species of Conservation Importance Recorded within the Study Area

Species	Location	Protection Conservation status	/Distribution**	Commonness**
Mammal				
Japanese Pipistrelle <i>Pipistrellus abramus</i>	One individual recorded in urbanized/disturbed within the Study Area outside the Project Site	WAPO	Widely distributed in Hong Kong	Common
Birds				
Black-crowned Night Heron <i>Nycticorax nycticorax</i>	One bird was recorded in wasteland within the proposed desalination plant area	WAPO; Fellowes <i>et al.</i> (2002): (LC)	Widely distributed in Hong Kong	Common resident and winter visitor
Little Egret <i>Egretta garzetta</i>	Three birds flew over urbanized/disturbed near the proposed desalination plant area	WAPO; Fellowes <i>et al.</i> (2002): PRC, (RC)	Widely distributed in lowlying wet or coastal areas in Hong Kong	Common resident
Pacific Reef Egret <i>Egretta sacra</i>	A bird was sighted in rocky shore in Tit Cham Chau	WAPO; Class II Protected Animal of PRC; Fellowes <i>et al.</i> (2002): (LC)	Mainly found in rocky shores	Locally uncommon resident
Black Kite <i>Milvus migrans</i>	Individuals soared above urbanized/disturbed within proposed desalination plant area, shrubland/grassland within the Study Area of Slope Mitigation works (but outside the proposed slope mitigation works area), and Mixed Woodland, Plantation, Shrubland/Grassland and Rocky Shore in other parts of the Study Area.	WAPO; Class II Protected Animal of PRC; Appendix 2 of CITES; Fellowes <i>et al.</i> (2002): (RC)	Widely distributed in Hong Kong and occurs in many types of habitats	Common resident and winter visitor
White-bellied Sea Eagle <i>Haliaeetus leucogaster</i>	One bird was sighted in marine water of Joss House Bay.	WAPO; Class 1 Protected Animal of China; Listed in Appendix II of CITES Fellowes <i>et al.</i> (2002): (RC)	Widely distributed in coastal areas throughout Hong Kong	Uncommon resident
Crested Serpent Eagle <i>Spilornis cheela</i>	One bird soared above plantation near Pak Shing Kok	WAPO; Class 2 Protected Animal of China; CITES: Appendix II; China Red Data Book: Vulnerable Fellowes <i>et al.</i> (2002): (LC)	Mostly recorded from well-wooded areas	Uncommon resident
Crested Goshawk <i>Accipiter trivirgatus</i>	Two birds displayed above shrubland/grassland	Class 2 Protected Animal of China;	Mainly found in areas of forest	Uncommon resident

Species	Location	Protection Conservation status	Distribution**	Commonness**
	near O Tau.	CITES: Appendix II	and mature woodland	
Collared Scops Owl <i>Otus lettia</i>	One bird was recorded in each of shrubland/grassland within the Area of Slope Mitigation Works and wasteland in other part of the Study Area	Class 2 Protected Animal of China; CITES: Appendix II	Found in a variety of wooded habitats including woodland, <i>fung shui</i> woods, shrubland with scattered big trees.	Common resident
Greater Coucal <i>Centropus sinensis</i>	Individuals were found in urbanized/disturbed, plantation and shrubland/grassland within the Study Area.	WAPO; China Red Data Book: Vulnerable; Class 2 Protected Animal of PRC	Widely distributed in Hong Kong and occurs in many types of habitats	Common resident
White-throated Kingfisher <i>Halcyon smyrnensis</i>	One bird was recorded in wasteland within the proposed desalination plant area	WAPO; Fellowes <i>et al.</i> (2002): (LC)	Mainly found in coastal mudflat and mangroves, also seen in inland fishponds, wet agricultural areas	Common resident.
Grey-chinned Minivet <i>Pericrocotus solaris</i>	Individuals recorded in woodland near Tsui Lam Estate and plantation near Tin Ha Wan Village within the Study Area.	WAPO; Fellowes <i>et al.</i> (2002): LC	Occur almost exclusively in wooded areas of the Central New Territories	Common in winter, scarce in summer.
Chinese Hwamei <i>Garrulax canorus</i>	One bird was recorded in shrubland/grassland near Tin Ha Au	WAPO; CITES: Appendix II	Widely distributed in hillside shrubland throughout Hong Kong	Common resident
Collared Crow <i>Corvus torquatus</i>	Recorded from shrubland/grassland inside and outside the Project Site	WAPO; Fellowes <i>et al.</i> (2002): LC	Usually found near coastal areas	Uncommon resident
Butterfly				
Pale Palm Dart <i>Telicota colon</i>	Shrubland/grassland within the Study Area of Slope Mitigation Works but outside the proposed slope mitigation works area	Fellowes <i>et al.</i> (2002): LC	Widely distributed in grassland and shrubland throughout Hong Kong	Rare
Danaid Eggfly <i>Hypolimnys misippus</i>	Shrubland/grassland within the Study Area of Slope Mitigation Works but outside the proposed slope mitigation works area	Fellowes <i>et al.</i> (2002): LC	Recorded from Ngau Ngak Shan, Lung Kwu Tan, Hong Kong Wetland Park, Mount Parker, Cloudy Hill, Lin Ma Hang	Uncommon
Plain Hedge Blue <i>Celastrina lavendularis</i>	Plantation in Tin Ha Wan Village	Fellowes <i>et al.</i> (2002): LC	Recorded from scattered locations	Very rare

Species	Location	Protection Conservation status	Distribution**	Commonness**
			including Tai Po Kau, Tai Lam Country Park, Kadoorie Farm and Botanic Garden, Ngau Ngak Shan	
Plain Palm Dart <i>Cephrenes acalle</i>	Shrubland/grassland near Tin Ha Au	-	Recorded from Ngong Ping	Very rare
Vagrant <i>Vagrans egista</i>	Shrubland/grassland near Tin Ha Au	Fellowes <i>et al.</i> (2002): LC	Recorded from scattered locations including Lam Chuen, Plover Cove, Kadoorie Farm and Botanic Garden	Very rare
Aquatic fauna				
<i>Nanhaipotamon hongkongense</i>	Near Tseung Kwan O Primary Fresh Water Service Reservoir	Fellowes <i>et al.</i> (2002): PGC	Found mostly in secondary forest, it is very terrestrial and may be found far from streams after heavy rain, and remains in burrows during the dry season.	Uncommon
Subtidal benthos				
Amphioxus <i>Branchiostoma belcheri</i>	Found in proposed submarine outfall	Class 2 Protected Animal of China	Sai Kung waters include Tai Long Wan and Pak Lap	Recorded in limited sites in Hong Kong
Corals (Hard corals)	Hard corals found in all dive survey sites	Cap 586.	Widely distributed in Hong Kong waters in particular northeastern, eastern and southeastern waters	Most species common in Hong Kong.

* "Protection / Conservation status" follow Hong Kong Biodiversity Online, Fellowes *et al.* (2002)

** "Distribution" and "Rarity" follow Hong Kong Biodiversity Online

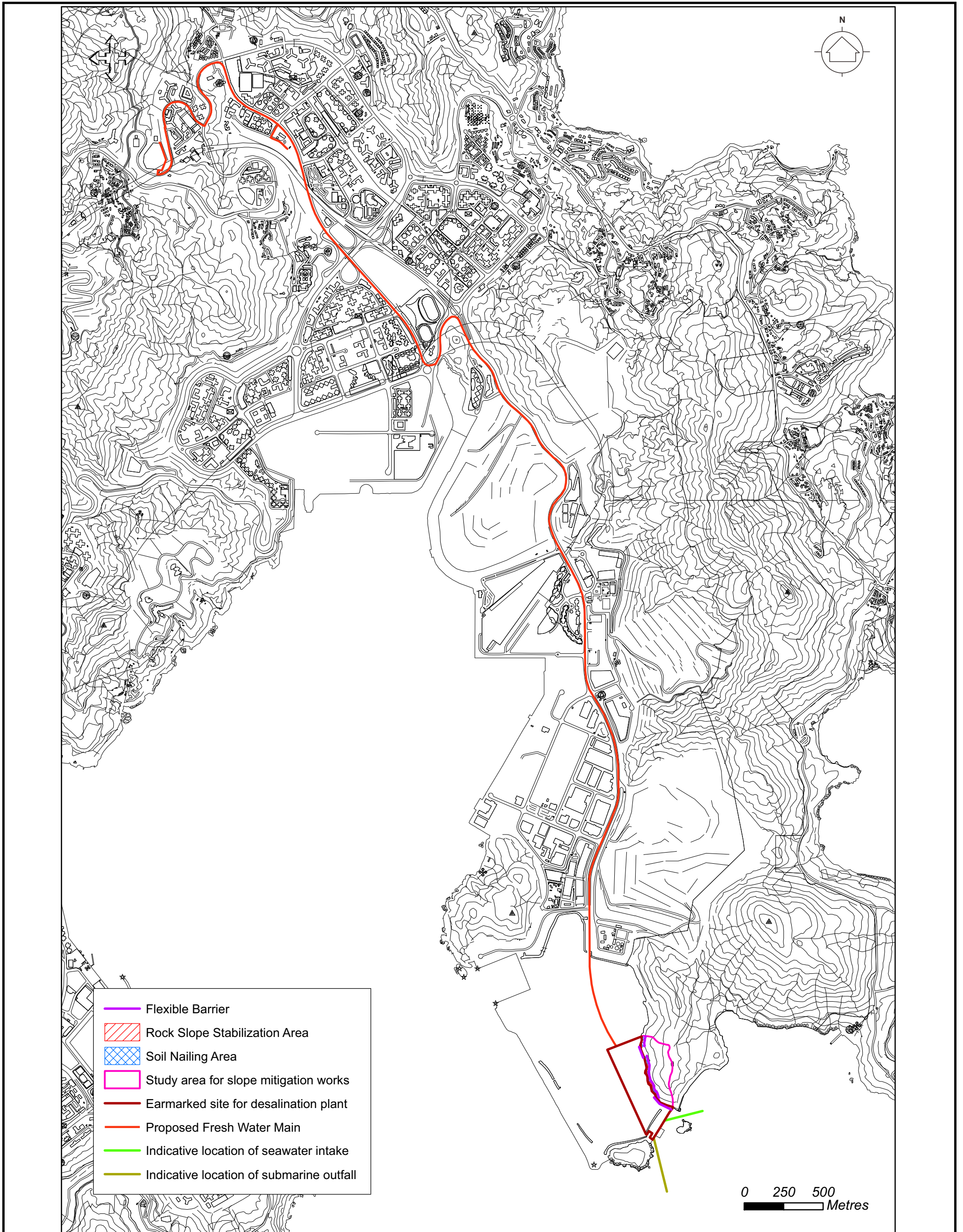
Level of concern: LC = local concern, PRC = potential regional concern, RC = regional concern, GC = global concern, PGC = potential global concern; Letters in parentheses indicate that the assessment is on the basis of restrictedness in breeding and/or roosting sites rather than in general occurrence (Fellowes *et al.*, 2002)

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Figures



- Flexible Barrier
- Rock Slope Stabilization Area
- Soil Nailing Area
- Study area for slope mitigation works
- Earmarked site for desalination plant
- Proposed Fresh Water Main
- Indicative location of seawater intake
- Indicative location of submarine outfall

0 250 500
Metres

LOCATION OF THE PROPOSED DESALINATION PLANT AT TKO

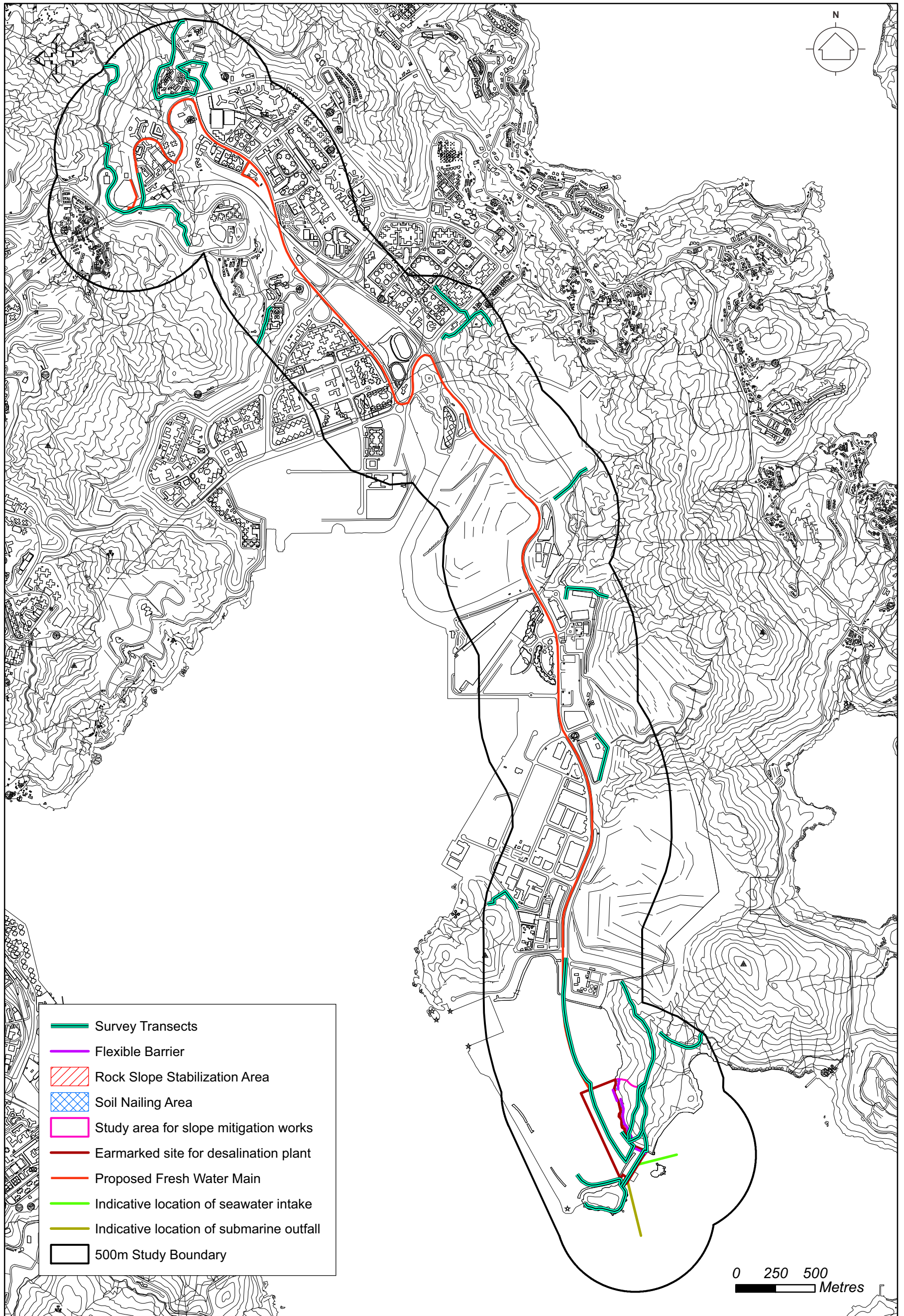
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FIGURE 1

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Date Scale



- Survey Transects
- Flexible Barrier
- Rock Slope Stabilization Area
- Soil Nailing Area
- Study area for slope mitigation works
- Earmarked site for desalination plant
- Proposed Fresh Water Main
- Indicative location of seawater intake
- Indicative location of submarine outfall
- 500m Study Boundary

0 250 500
Metres

LOCATIONS OF SURVEY TRANSECTS

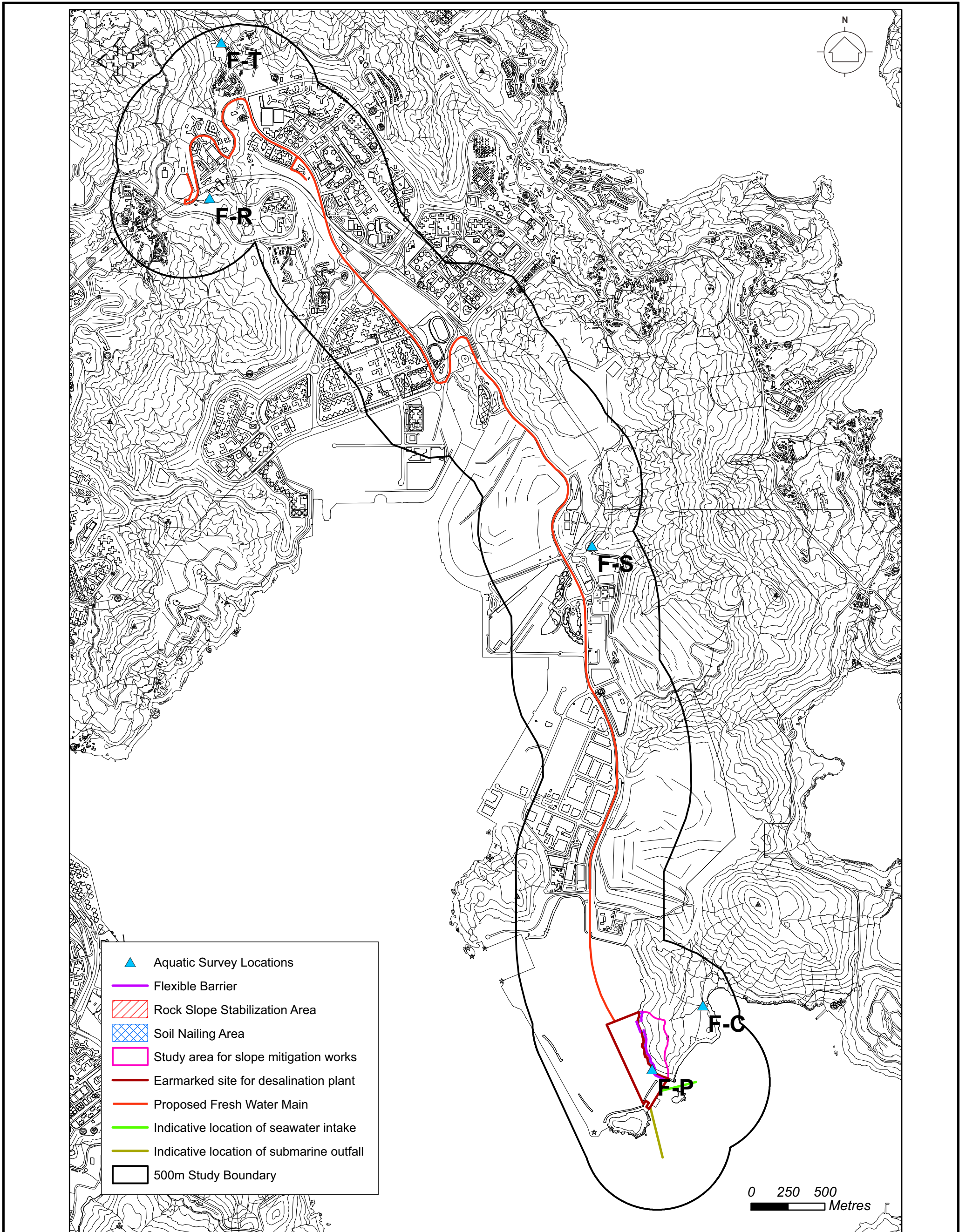
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FIGURE 2



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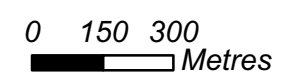
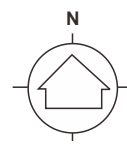
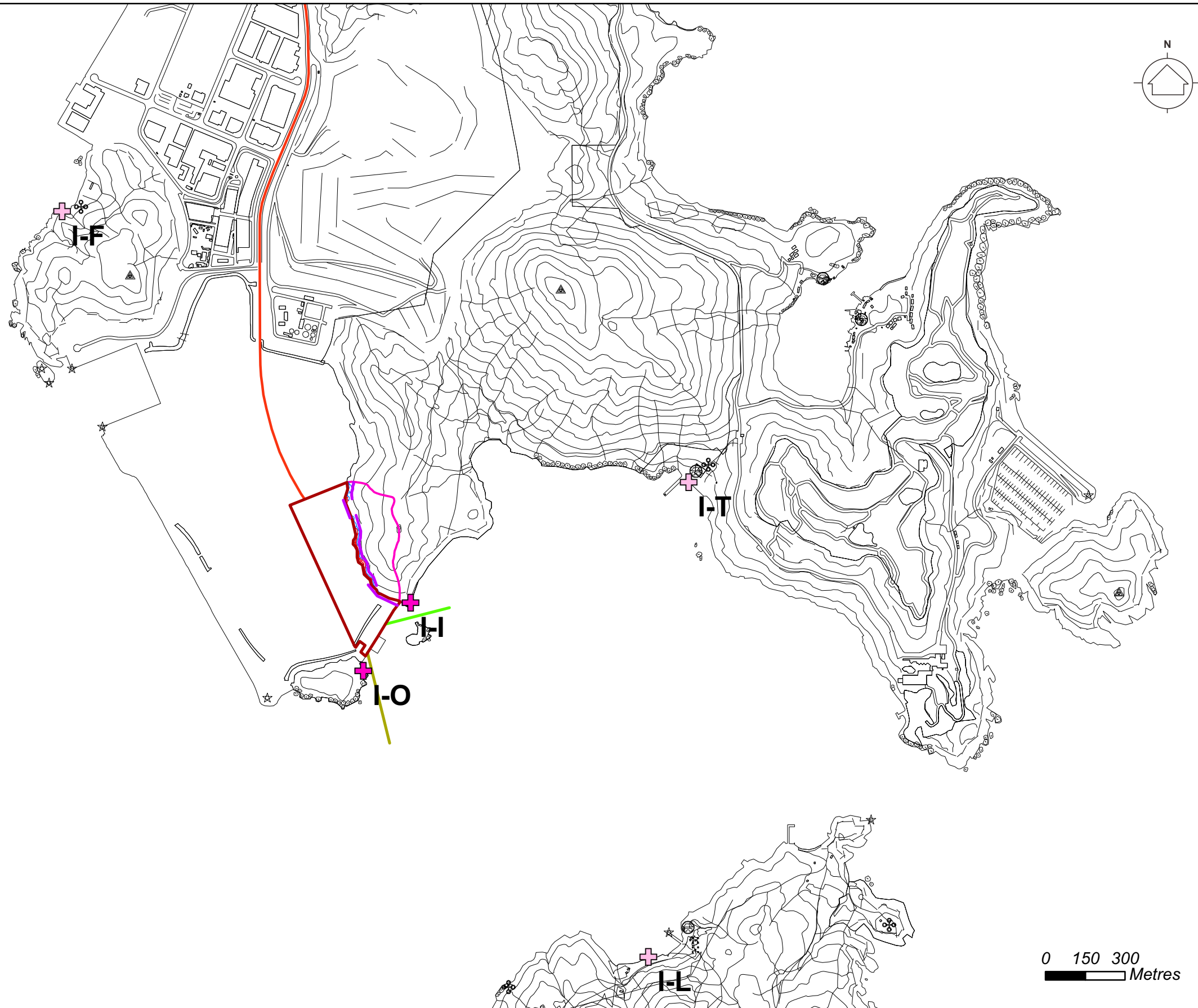
LOCATIONS OF AQUATIC SURVEY

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FIGURE 3

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- Intertidal Survey Locations - Impact
- Intertidal Survey Locations - Reference
- Flexible Barrier
- Rock Slope Stabilization Area
- Soil Nailing Area
- Study area for slope mitigation works
- Earmarked site for desalination plant
- Proposed Fresh Water Main
- Indicative location of seawater intake
- Indicative location of submarine outfall

Revision	Date	Description	Initial
	Designed	Checked	Drawn
Initial			
Date			

Agreement No. CE 21/2012 (WS)

Contract title
DESALINATION PLANT AT TSEUNG KWAN O - FEASIBILITY STUDY

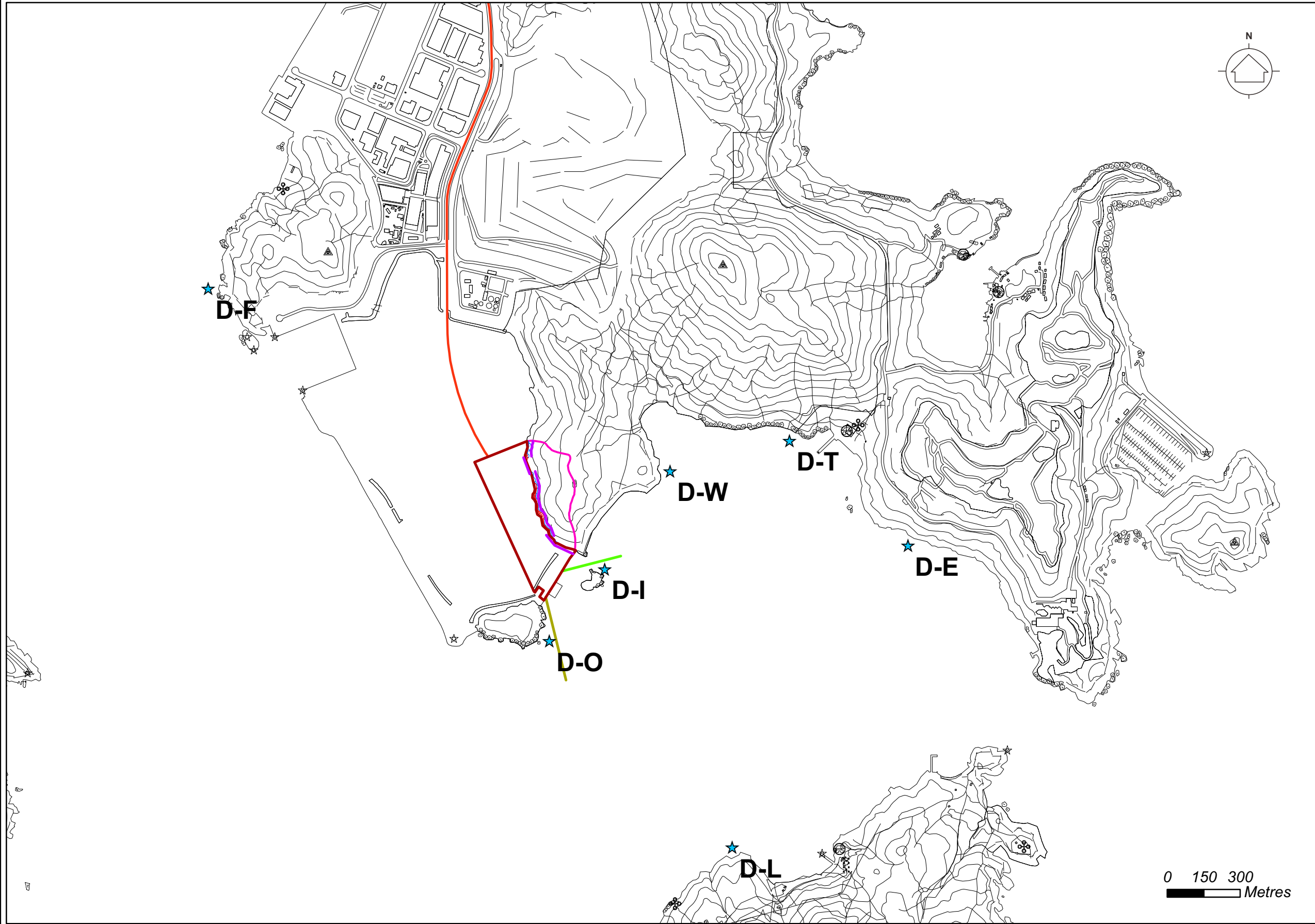
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LOCATIONS OF INTERTIDAL SURVEY

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- ★ Dive Survey Locations
- Flexible Barrier
- Rock Slope Stabilization Area
- Soil Nailing Area
- Study area for slope mitigation works
- Earmarked site for desalination plant
- Proposed Fresh Water Main
- Indicative location of seawater intake
- Indicative location of submarine outfall

Revision	Date	Description	Initial
	Designed	Checked	Drawn
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Date			

Agreement No. CE 21/2012 (WS)

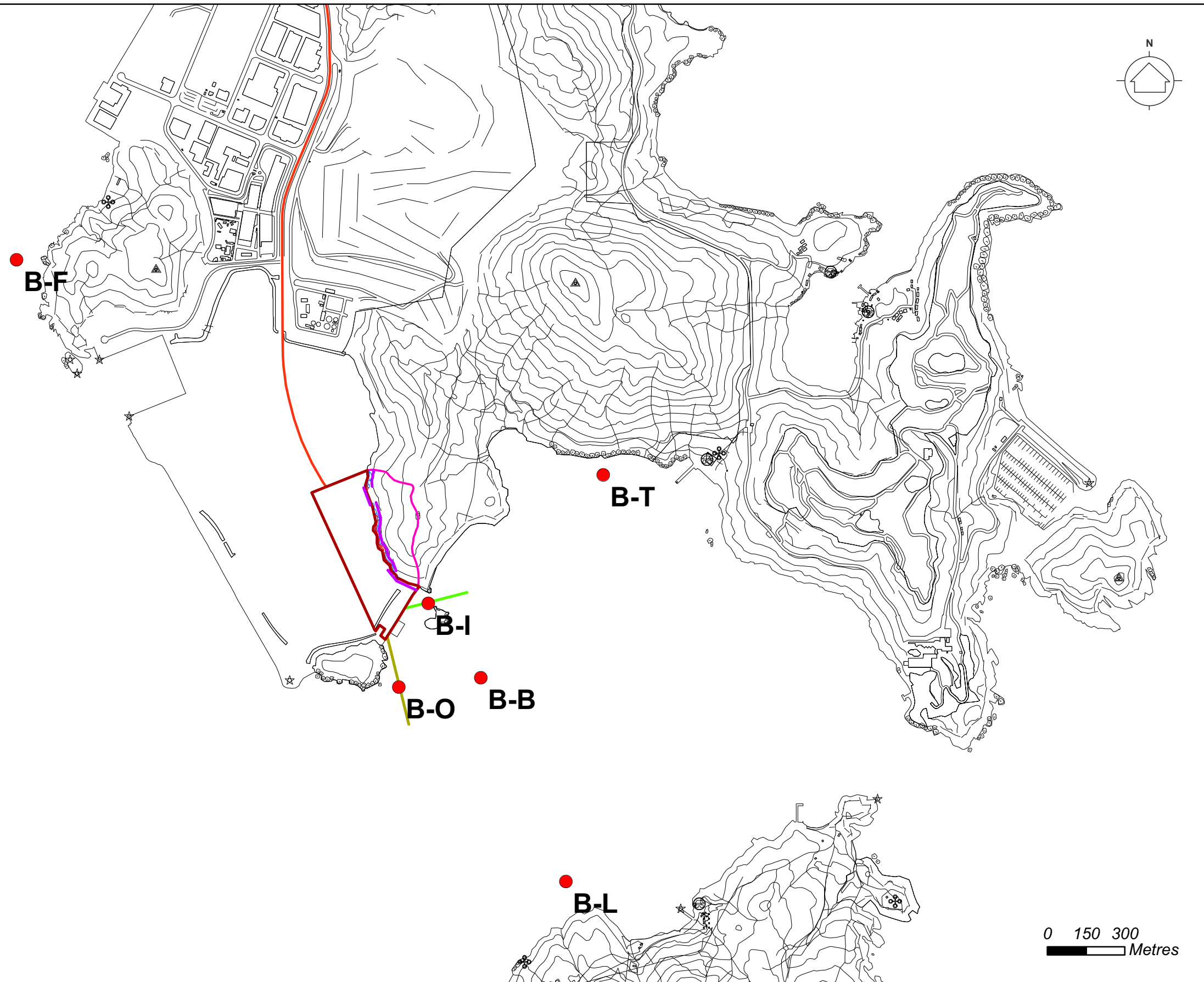
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DESALINATION PLANT AT TSEUNG KWAN O - FEASIBILITY STUDY

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LOCATIONS OF DIVE SURVEY

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Scale





- Benthic Sampling Locations
- Flexible Barrier
- Rock Slope Stabilization Area
- Soil Nailing Area
- Study area for slope mitigation works
- Earmarked site for desalination plant
- Proposed Fresh Water Main
- Indicative location of seawater intake
- Indicative location of submarine outfall

Revision	Date	Description	Initial
	Designed	Checked	Drawn
Initial			
Date			

Agreement No. CE 21/2012 (WS)

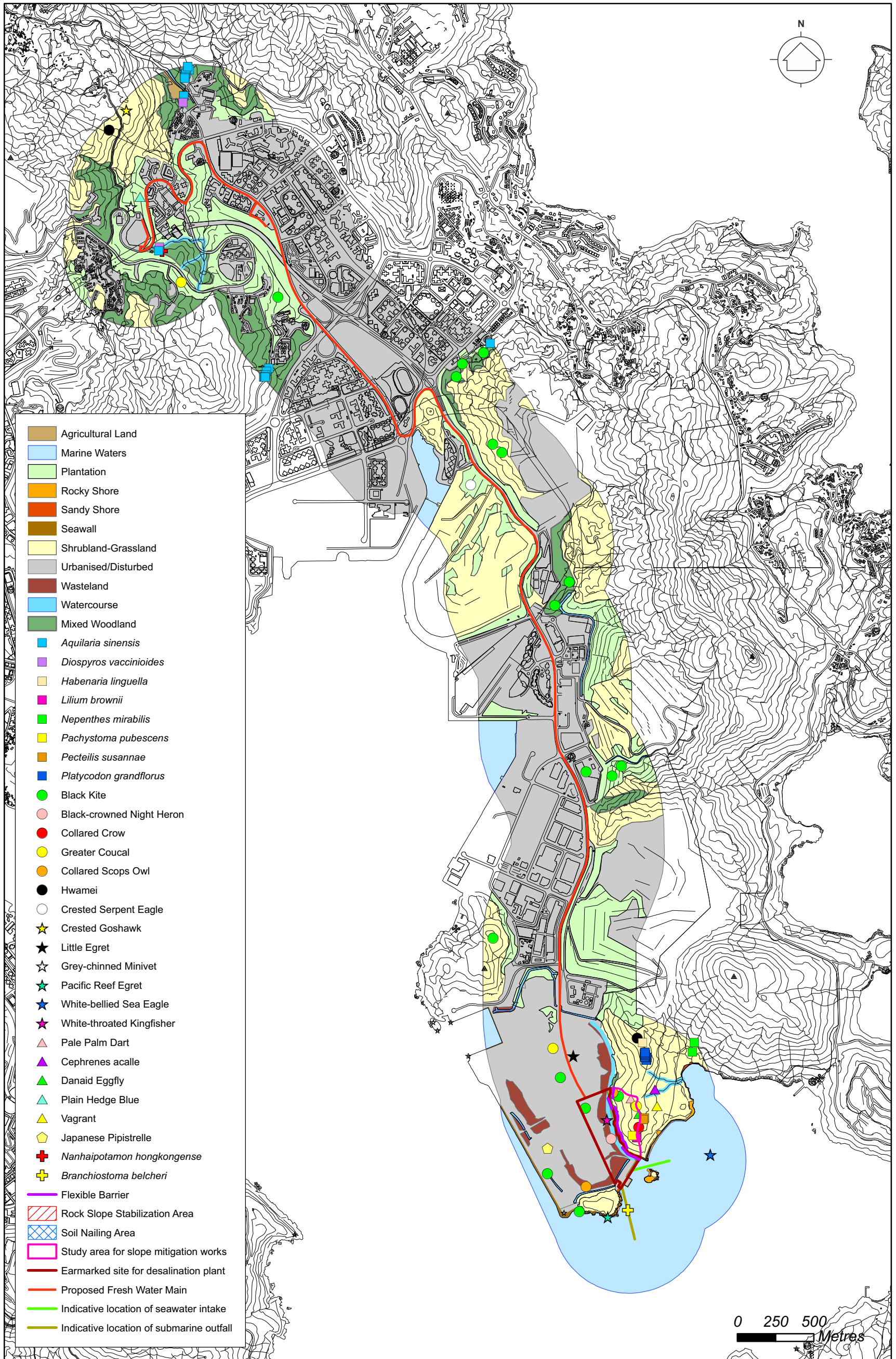
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DESALINATION PLANT AT TSEUNG KWAN O - FEASIBILITY STUDY

Drawing title
LOCATIONS OF SUBTIDAL BENTHOS SURVEY

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HABITATS AND LOCATIONS OF SPECIES OF CONSERVATION IMPORTANCE (OVERVIEW)

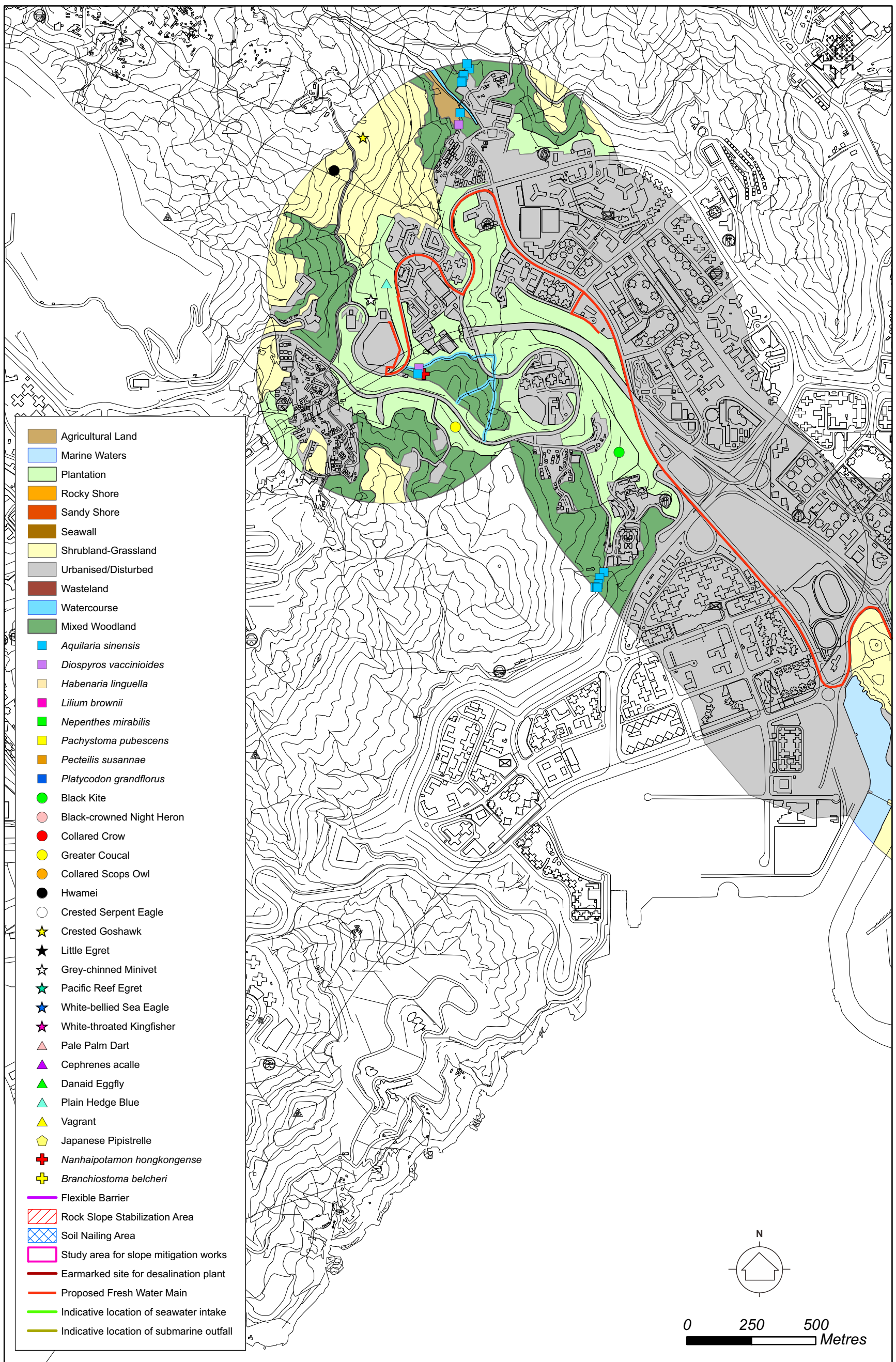
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FIGURE 7a



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HABITATS AND LOCATIONS OF SPECIES OF CONSERVATION IMPORTANCE (CLOSE-UP)

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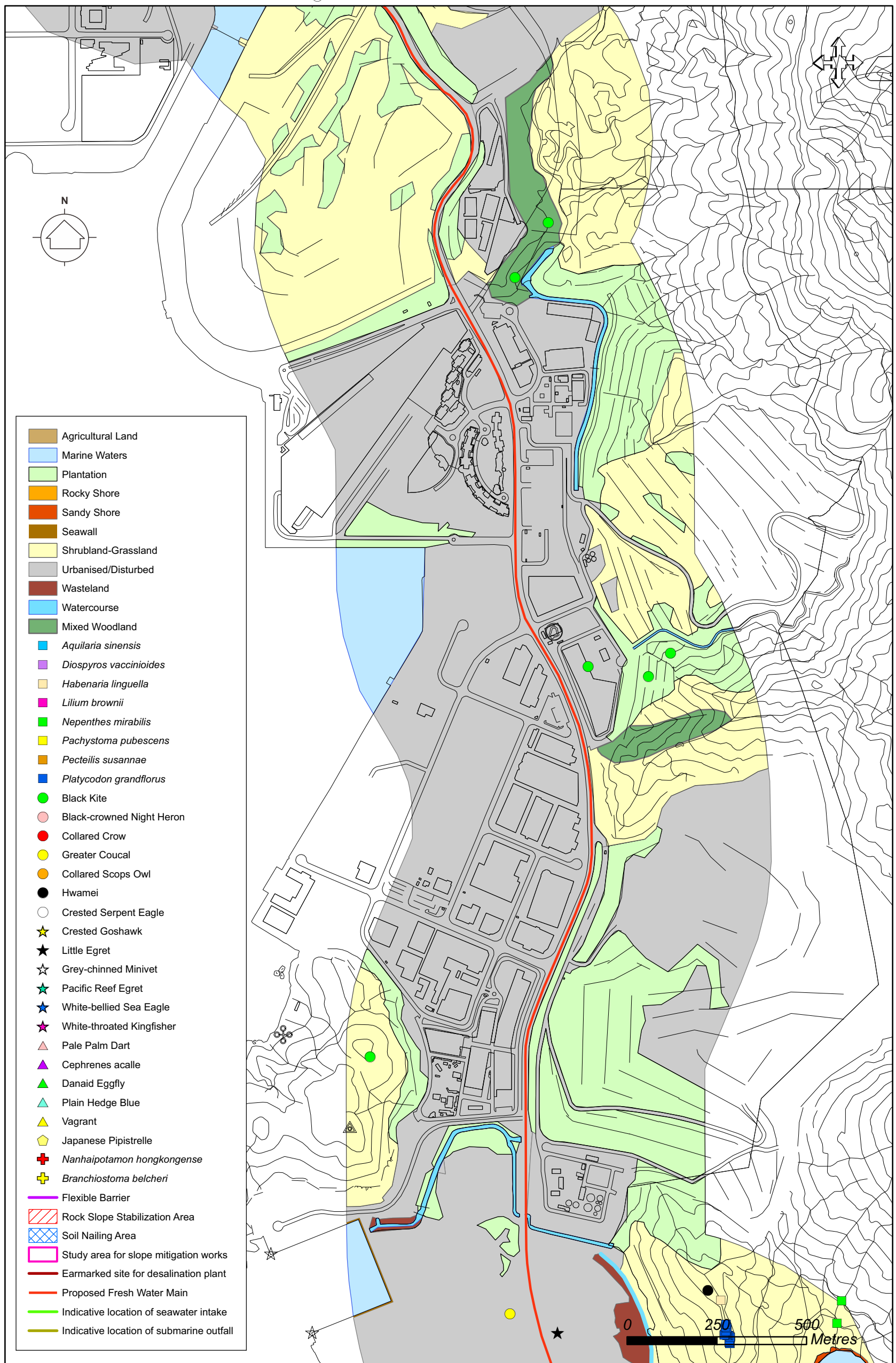
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HABITATS AND LOCATIONS OF SPECIES OF CONSERVATION IMPORTANCE (CLOSE-UP)

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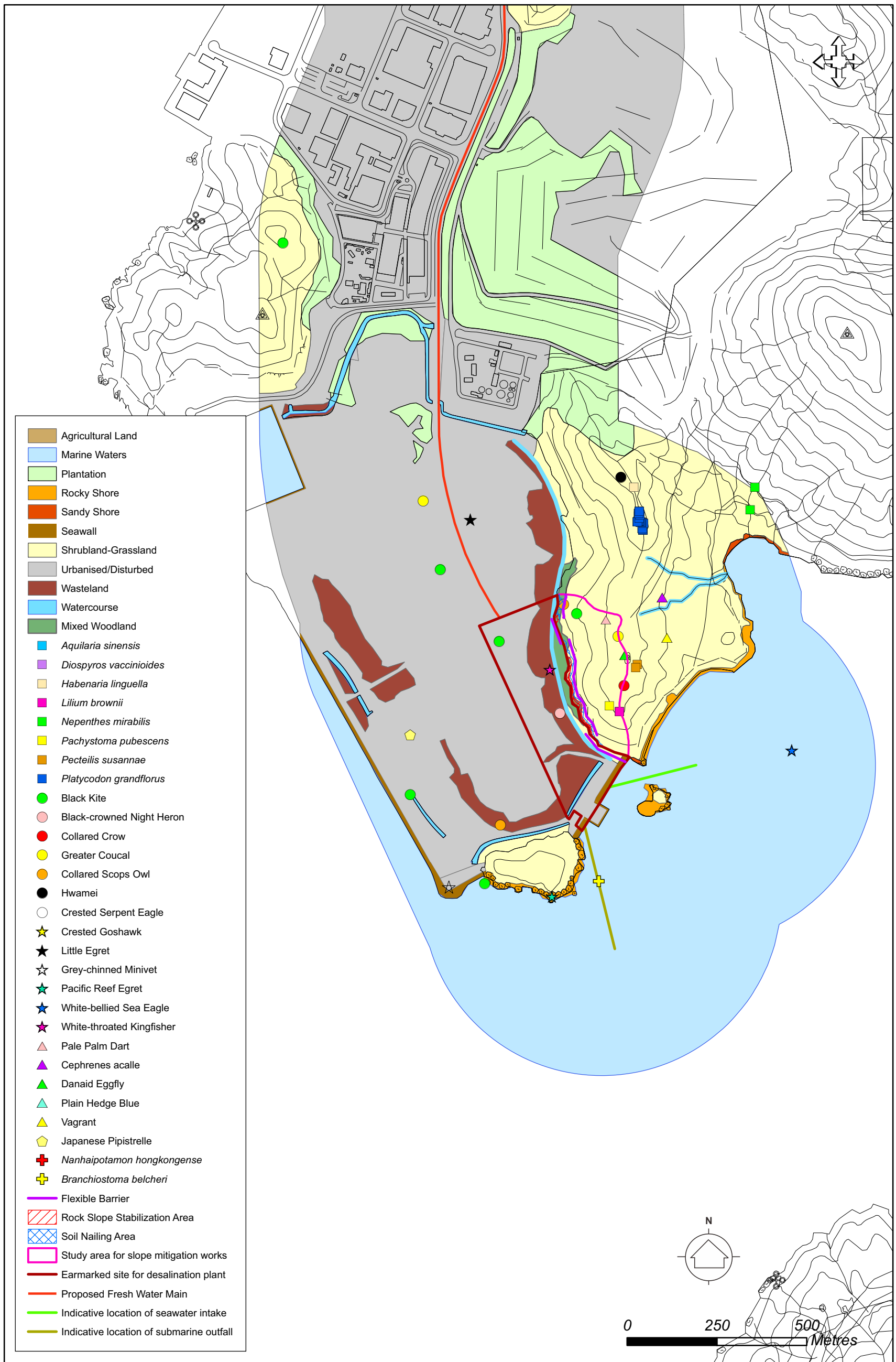
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HABITATS AND LOCATIONS OF SPECIES OF CONSERVATION IMPORTANCE (CLOSE-UP)

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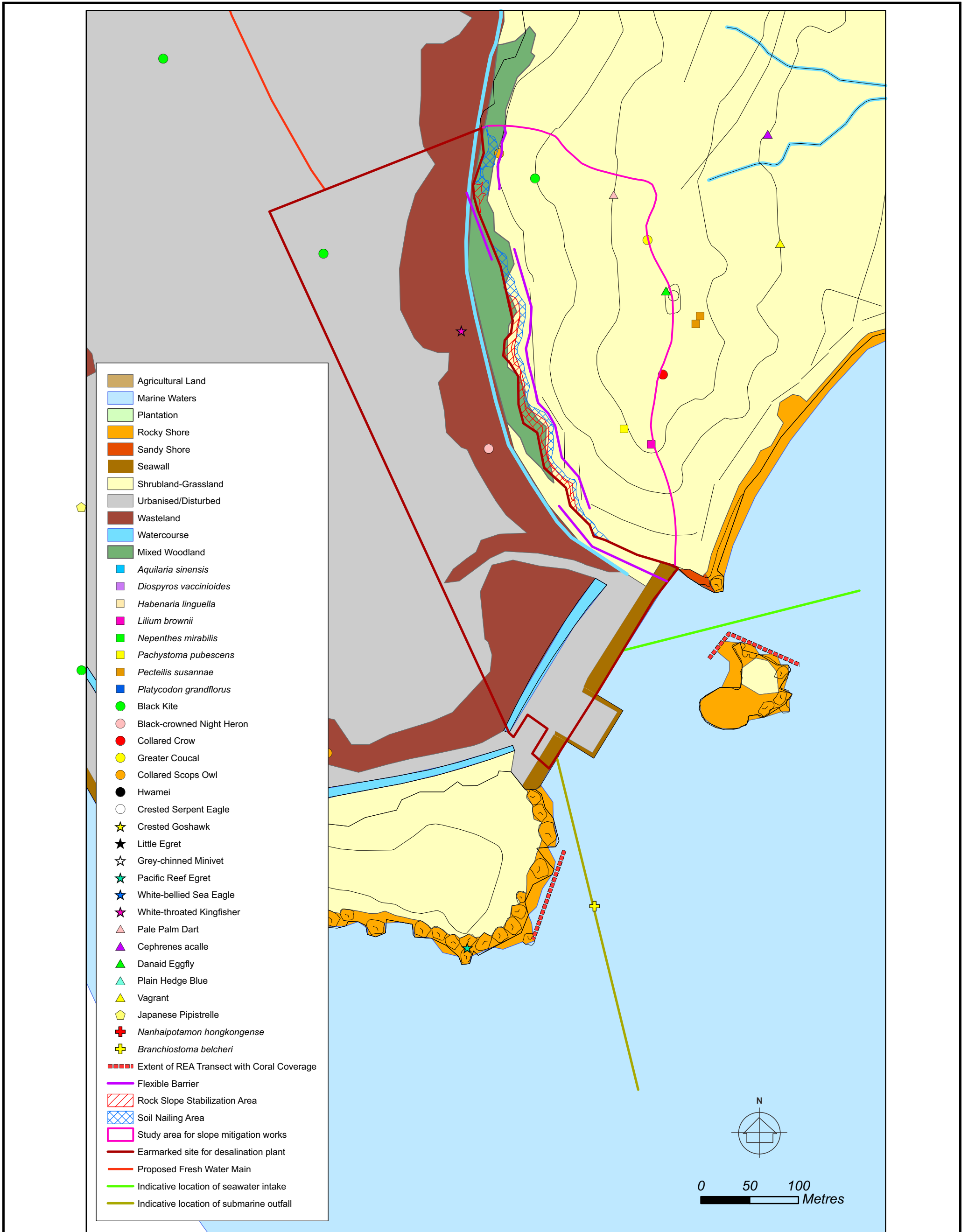
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HABITATS AND LOCATIONS OF SPECIES OF CONSERVATION IMPORTANCE (CLOSE-UP)

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FIGURE 7e




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<p>Project Site</p>	<p>Hillslope of Landslip Mitigation Measures</p>	<p>Proposed Freshwater Main Alignment</p>
		
<p>Mix Woodland</p>	<p>Plantation</p>	<p>Shrubland/Grassland</p>








		
Watercourse (natural)	Watercourse (Man-made Channel)	Seawall
		
Rocky Shore	Sandy Shore	Urbanised/disturbed

Figure 8 Photos of Habitats

		
<p><i>Diospyros vaccinioides</i></p>	<p><i>Habenaria linguella</i></p>	<p><i>Platycodon grandiflorus</i></p>
		
<p><i>Pecteilis susannae</i></p>	<p><i>Aquilaria sinensis</i></p>	<p><i>Lilium brownii</i></p>

		
<p><i>Pachystoma pubescens</i></p>		

Figure 9 Selected photos of species of conservation importance







		
<i>Acropora solitaryensis</i>	<i>Psammocora haimeana</i>	<i>Favia lizardensis</i>
		
<i>Platygyra carnosus</i>	<i>Diadema setosum</i>	Sea anemone bed

Figure 10 Selected photos from dive surveys

APPENDICES

Appendix 1 Plant Species Recorded within the Study Area

Scientific Name	Growth Form	Native	Conservation Status	MW	SG	WC	WL	AL	UD	PL	RS	Project Site
<i>Acacia auriculiformis</i>	Tree	Exotic	common, widely planted	o	s		o			c		o
<i>Acacia confusa</i>	Tree	Exotic	common, widely planted	c			o		c	c		c
<i>Acacia mangium</i>	Tree	Exotic	common, widely planted							o		
<i>Acalypha wilkesiana</i>	Shrub	Exotic	common, landscape species						o			
<i>Acorus tatarinowii</i>	Herb	Native	very common			o						
<i>Acronychia pedunculata</i>	Tree	Native	very common	o	c							
<i>Adiantum flabellulatum</i>	Herb	Native	very common	s								
<i>Adiantum philippense</i>	Herb	Native	restricted	s								
<i>Adina pilulifera</i>	Tree	Native	very common			o						
<i>Adinandra millettii</i>	Shrub	Native	common		s							s
<i>Agave angustifolia</i>	Herb	Exotic	common, landscape species						s			
<i>Aglaia odorata</i>	Shrub	Exotic	common, landscape species						o			
<i>Alangium chinense</i>	Tree	Native	common	c								
<i>Albizia lebbek</i>	Tree	Exotic	common, landscape species							o		
<i>Aleurites moluccana</i>	Tree	Exotic	common, landscape species	o						c		
<i>Allamanda cathartica</i>	Climber	Exotic	common, landscape species						c			
<i>Alocasia odora</i>	Herb	Native	common	c						c		
<i>Alpinia officinarum</i>	Herb	Native	restricted	c	c							c
<i>Alpinia zerumbet</i>	Herb	Native	very common	o	o		o			o		o
<i>Alternanthera philoxeroides</i>	Herb	Exotic	common				o					o

Scientific Name	Growth Form	Native	Conservation Status	MW	SG	WC	WL	AL	UD	PL	RS	Project Site
<i>Alternanthera sessilis</i>	Herb	Native	common; pantropical weed				o					
<i>Alyxia sinensis</i>	Climber	Native	common		s							
<i>Ampelopsis heterophylla</i>	Climber	Native	common		o							s
<i>Antidesma ghaesembilla</i>	Tree	Native	common		s							s
<i>Aporusa dioica</i>	Tree	Native	very common	c	c					c		
<i>Aquilaria sinensis</i>	Tree	Native	common, protected under Cap. 586, listed as Vulnerable in China Plant Red Data Book	o								
<i>Araucaria heterophylla</i>	Tree	Exotic	common, landscape species						o			o
<i>Archidendron clypearia</i>	Tree	Native	common	s								
<i>Archontophoenix alexandrae</i>	Tree	Exotic	common, landscape species						o			
<i>Ardisia quinquegona</i>	Shrub	Native	very common	o		o						
<i>Artocarpus macrocarpon</i>	Tree	Exotic	common, fruit tree					c				
<i>Arundinella setosa</i>	Herb	Native	common		c						o	c
<i>Asparagus cochinchinensis</i>	Herb	Native	common								s	
<i>Aster baccharoides</i>	Herb	Native	very common		c							
<i>Atalantia buxifolia</i>	Shrub	Native	common		s							
<i>Averrhoa carambola</i>	Tree	Exotic	common, fruit tree						s			
<i>Baeckea frutescens</i>	Tree	Native	very common		c							
<i>Bambusa</i> spp.	Tree	-	#N/A							o		
<i>Bambusa vulgaris</i>	Bamboo	Exotic	common, landscape species	s					s			s

Scientific Name	Growth Form	Native	Conservation Status	MW	SG	WC	WL	AL	UD	PL	RS	Project Site
<i>Bauhinia blakeana</i>	Tree	Native	common						c			c
<i>Bauhinia purpurea</i>	Tree	Exotic	common							o		
<i>Bauhinia variegata</i>	Tree	Exotic	common						o			
<i>Bidens alba</i>	Herb	Exotic	very common	c	c	c	c		c	c		c
<i>Bischofia javanica</i>	Tree	Native	common	o						o		
<i>Blechnum orientale</i>	Herb	Native	very common	c	c		o					c
<i>Boehmeria nivea</i>	Shrub	Exotic	common			o						
<i>Bombax ceiba</i>	Tree	Exotic	common, landscape species						o			
<i>Bougainvillea spectabilis</i>	Climber	Exotic	common, landscape species						c			c
<i>Breynia fruticosa</i>	Shrub	Native	very common	o	o							o
<i>Bridelia tomentosa</i>	Shrub	Native	very common		c	c	c					c
<i>Brucea javanica</i>	Shrub	Native	common		s							
<i>Bryophyllum pinnatum</i>	Herb	Exotic	common		s							s
<i>Byttneria aspera</i>	Climber	Native	very common				o					o
<i>Calliandra haematocephala</i>	Shrub	Exotic	common, landscape species						o			
<i>Carica papaya</i>	Tree	Exotic	common, fruit tree						o			s
<i>Caryota mitis</i>	Tree	Exotic	common, landscape species						o	o		o
<i>Cassia fistula</i>	Tree	Exotic	common, landscape species						o			
<i>Cassia siamea</i>	Tree	Exotic	common, landscape species						o			o
<i>Cassia surattensis</i>	Shrub	Exotic	common, landscape species						c			
<i>Castanopsis fissa</i>	Tree	Native	common	o	c							

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<i>Casuarina equisetifolia</i>	Tree	Exotic	common	o	o		c		c	c		o
<i>Cayratia corniculata</i>	Climber	Native	very common	s								
<i>Celtis sinensis</i>	Tree	Native	common; also planted	c	o				o	c		
<i>Centella asiatica</i>	Herb	Native	very common		o							
<i>Cerbera manghas</i>	Tree	Native	common		s							
<i>Cheilosoria tenuifolia</i>	Herb	Native	common		s							s
<i>Chloris barbata</i>	Herb	Native	very common				c				o	o
<i>Choerospondias axillaris</i>	Tree	Native	common		o							
<i>Chrysalidocarpus lutescens</i>	Shrub	Exotic	common, landscape species						o			
<i>Chukrasia tabularia</i>	Tree	Exotic	common, landscape species						o			
<i>Cinnamomum camphora</i>	Tree	Native	common; also widely planted	c		c			c			
<i>Cinnamomum parthenoxylon</i>	Tree	Native	common	o	o					c		
<i>Citrus maxima</i>	Tree	Exotic	common, fruit tree					c	o			
<i>Clausena lansium</i>	Tree	Exotic	common, fruit tree						o			
<i>Cleistocalyx operculatus</i>	Tree	Native	very common			c						
<i>Clerodendrum fortunatum</i>	Shrub	Native	common		c							
<i>Clerodendrum inerme</i>	Shrub	Native	common								o	
<i>Clerodendrum japonicum</i>	Shrub	Exotic	common							o		
<i>Colocasia esculenta</i>	Herb	Native	common	s								
<i>Commelina communis</i>	Herb	Native	restricted			o						
<i>Crateva unilocularis</i>	Tree	Exotic	common, landscape species						c			

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<i>Cratoxylum cochinchinense</i>	Tree	Native	very common	c	c							o
<i>Cyclosorus parasiticus</i>	Herb	Native	common	c						c		
<i>Cymbopogon goeringii</i>	Herb	Native	common		c							c
<i>Cynodon dactylon</i>	Herb	Native	common		c		c					c
<i>Cyperus diffusus</i>	Herb	Native	common		o							
<i>Cyperus flabelliformis</i>	Herb	Exotic	common			s						
<i>Cyrtococcum patens</i>	Herb	Native	very common							o		
<i>Dalbergia benthamii</i>	Climber	Native	common		o							o
<i>Dalbergia hancei</i>	Climber	Native	common		c							
<i>Daphniphyllum calycinum</i>	Tree	Native	common		o							s
<i>Delonix regia</i>	Tree	Exotic	common, landscape species						c			c
<i>Dendropanax proteus</i>	Shrub	Native	common		o							
<i>Desmodium heterocarpon</i>	Shrub	Native	very common		s							
<i>Desmos chinensis</i>	Shrub	Native	common	c								
<i>Dianella ensifolia</i>	Herb	Native	very common		o							o
<i>Dicranopteris pedata</i>	Herb	Native	common	c	c		c					c
<i>Dimocarpus longan</i>	Tree	Exotic	common, cultivated						c			
<i>Diospyros vaccinioides</i>	Shrub	Native	listed as Critically Endangered in IUCN Red List of Threatened Species, but very common locally	s								
<i>Diplospora dubia</i>	Tree	Native	common				o					

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<i>Duranta erecta</i>	Climber	Exotic	common, landscape species							o		
<i>Elaeocarpus balanse</i>	Tree	Native	common						o			
<i>Elaeocarpus chinensis</i>	Tree	Native	common	o								
<i>Elephantopus scaber</i>	Herb	Native	common				o					c
<i>Elephantopus tomentosus</i>	Herb	Native	common		o							
<i>Embelia laeta</i>	Climber	Native	very common		s							
<i>Emilia sonchifolia</i>	Herb	Native	very common; pantropical weed		o							o
<i>Epipremnum aureum</i>	Climber	Exotic	common	o								
<i>Eriobotrya fragrans</i>	Shrub	Native	common						c			
<i>Eriosema chinense</i>	Herb	Native	common		s							
<i>Erythrina speciosa</i>	Tree	Exotic	common						o			o
<i>Eucalyptus citriodora</i>	Tree	Exotic	common							c		
<i>Eucalyptus robusta</i>	Tree	Exotic	common							c		
<i>Eucalyptus</i> sp.	Tree	Exotic	#N/A							o		
<i>Eucalyptus tereticornis</i>	Tree	Exotic	common		o					c		
<i>Eurya nitida</i>	Shrub	Native	very common	o						o		
<i>Eurya nitida</i>	Shrub	Native	very common	o								
<i>Evolvulus alsinoides</i>	Herb	Native	restricted		s							
<i>Ficus benjamina</i>	Tree	Exotic	common, landscape species						c			c
<i>Ficus elastica</i>	Tree	Exotic	common, landscape species	s						c		
<i>Ficus fistulosa</i>	Tree	Native	common	s		s						

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<i>Ficus hirta</i>	Shrub	Native	common		c							
<i>Ficus hispida</i>	Tree	Native	very common	c		c	c		c	c	o	c
<i>Ficus microcarpa</i>	Tree	Native	common				o		c	c		c
<i>Ficus superba var. japonica</i>	Tree	Native	common								o	
<i>Ficus variegata</i>	Tree	Native	common				o			o		
<i>Ficus variolosa</i>	Tree	Native	very common	o	o							
<i>Ficus virens var. sublanceolata</i>	Tree	Native	common	o								
<i>Gahnia tristis</i>	Herb	Native	very common		o							
<i>Garcinia oblongifolia</i>	Tree	Native	very common	o								
<i>Garcinia subelliptica</i>	Tree	Exotic	common, landscape species						s			
<i>Gardenia jasminoides</i>	Shrub	Exotic	common, landscape species		c							
<i>Glochidion eriocarpum</i>	Shrub	Native	common	s	o					c		
<i>Glochidion lanceolarium</i>	Tree	Native	common	s	o							
<i>Gnetum luofuense</i>	Climber	Native	very common		o							o
<i>Gymnanthera oblonga</i>	Climber	Native	common		s							
<i>Habenaria linguella</i>	Herb	Native	restricted, scheduled under Cap. 96, protected under Cap. 586		s							
<i>Hedyotis hedyotideae</i>	Shrub	Native	very common							o		
<i>Hedyotis uncinella</i>	Herb	Native	very common		c							
<i>Helicteres angustifolia</i>	Shrub	Native	very common		c							o
<i>Hibiscus rosa-sinensis</i>	Shrub	Exotic	common, landscape species						o			

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<i>Homalium cochinchinensis</i>	Tree	Native	common				o					c
<i>Hygrophila salicifolia</i>	Herb	Native	common			o						
<i>Ilex asprella</i>	Shrub	Native	very common	c	c							c
<i>Ilex pubescens</i>	Shrub	Native	very common	c	c		o			o		c
<i>Imperata cylindrica</i>	Herb	Native	common		o							o
<i>Indocalamus sp.</i>	Herb	-	#N/A		o							s
<i>Inula cappa</i>	Herb	Native	common		o							o
<i>Ipomoea cairica</i>	Climber	Exotic	very common			c				c		
<i>Ipomoea triloba</i>	Herb	Native	a naturalized species of tropical American origin	o								
<i>Ischaemum aristatum</i>	Herb	Native	common		c							c
<i>Itea chinensis</i>	Shrub	Native	very common	o								
<i>Ixora chinensis</i>	Shrub	Native	common	s								
<i>Ixora stricta</i>	Shrub	Exotic	common							s		
<i>Juniperus chinensis</i>	Tree	Exotic	common							o		
<i>Lagerstroemia speciosa</i>	Tree	Native	common							c		
<i>Lantana camara</i>	Shrub	Exotic	very common	o			c		c	c		c
<i>Lepidosperma chinense</i>	Herb	Native	very common		c							c
<i>Leucaena leucocephala</i>	Tree	Exotic	common	c	c		c		c	c		c
<i>Ligustrum sinense</i>	Tree	Native	common	c						c		
<i>Lilium brownii</i>	Herb	Native	restricted, scheduled under Cap. 96		s							

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<i>Liquidambar formosana</i>	Tree	Native	common		s							
<i>Liriope spicata</i>	Herb	Native	very common	s								
<i>Litchi chinensis</i>	Tree	Exotic	very common	o								
<i>Litsea cubeba</i>	Shrub	Native	common	o	c							o
<i>Litsea glutinosa</i>	Tree	Native	common	c	o		o					c
<i>Litsea monopetala</i>	Tree	Native	restricted; sometimes planted	o								
<i>Litsea rotundifolia</i>	Shrub	Native	very common							o		
<i>Livistona chinensis</i>	Tree	Exotic	common, landscape species						o			
<i>Lophatherum gracile</i>	Herb	Native	very common	o						o		
<i>Lophostemon confertus</i>	Tree	Exotic	common		c				c	c		
<i>Loropetalum chinense</i>	Shrub	Exotic	common, landscape species						s			s
<i>Lygodium japonicum</i>	Herb	Native	very common	c			o					o
<i>Macaranga tanarius</i>	Tree	Native	rare	c	c	c	c		c	c		c
<i>Machilus chekiangensis</i>	Tree	Native	common	c	o					o		o
<i>Machilus velutina</i>	Tree	Native	common	o								
<i>Maesa perlarius</i>	Shrub	Native	common	c								
<i>Magnolia grandiflora</i>	Tree	Exotic	common, landscape species						s			
<i>Mallotus paniculatus</i>	Tree	Native	common	c	c	c	c			c		c
<i>Mangifera indica</i>	Tree	Exotic	common, fruit tree					c	o			
<i>Melaleuca quinquenervia</i>	Tree	Exotic	common	o					c			c
<i>Melastoma dodecandrum</i>	Shrub	Native	common		o							

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<i>Melastoma sanguineum</i>	Shrub	Native	common		c		o					c
<i>Melia azedarach</i>	Tree	Exotic	common						c			o
<i>Melicope pteleifolia</i>	Shrub	Native	common	o								
<i>Melodinus suaveolens</i>	Climber	Native	common	s	o							
<i>Michelia x alba</i>	Tree	Exotic	common, landscape species						c			
<i>Microcos paniculata</i>	Shrub	Native	common	c								
<i>Microstegium ciliatum</i>	Herb	Native	rare	c		c		c		c		
<i>Mikania micrantha</i>	Herb	Exotic	common	c	c	c	c	c	c	c		c
<i>Millettia nitida</i>	Climber	Native	very common		o							
<i>Millettia speciosa</i>	Climber	Native	common		c							o
<i>Mimosa pudica</i>	Herb	Exotic	common		o		c					c
<i>Miscanthus floridulus</i>	Herb	Native	common	c	c		c					c
<i>Miscanthus sinensis</i>	Herb	Native	very common	c	c							
<i>Morinda parvifolia</i>	Climber	Native	very common		c							
<i>Morinda umbellata</i>	Climber	Native	common		o							o
<i>Morus alba</i>	Tree	Native	common					c				
<i>Murraya paniculata</i>	Tree	Exotic	common							s		
<i>Musa x paradisiaca</i>	Herb	Exotic	common, fruit tree			o			s	o		
<i>Mussaenda erosa</i>	Climber	Native	common	o								
<i>Mussaenda pubescens</i>	Climber	Native	very common	o	o							
<i>Myrica rubra</i>	Tree	Native	common		c							

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<i>Nepenthes mirabilis</i>	Herb	Native	common, Scheduled under Cap 96, IUCN Red List of Threatened Species (Category LR/lc), CITES Appendix II		o							
<i>Nephrolepis auriculata</i>	Herb	Native	common							o		
<i>Neyraudia reynaudiana</i>	Herb	Native	common		c	c	c					c
<i>Osbeckia chinensis</i>	Herb	Native	very common		s							
<i>Osmunda vachelii</i>	Herb	Native	common		o							
<i>Osterium citriodorum</i>	Herb	Native	common		o							s
<i>Oxalis corniculata</i>	Herb	Native	very common						o	o		
<i>Oxalis corymbosa</i>	Herb	Exotic	common		o					o		
<i>Pachystoma pubescens</i>	Herb	Native	rare, scheduled under Cap. 96, protected under Cap. 586		s							-
<i>Paederia scandens</i>	Climber	Native	very common		o						o	o
<i>Palhinhaea cernua</i>	Herb	Native	very common		s							
<i>Pandanus sp.</i>	Shrub	-	#N/A	s								
<i>Pandanus tectorius</i>	Shrub	Native	very common		c							
<i>Panicum maximum</i>	Herb	Exotic	common						c	c		o
<i>Panicum repens</i>	Herb	Native	common			c						
<i>Parthenocissus dalzielii</i>	Climber	Exotic	rare		s					o		
<i>Passiflora foetida</i>	Climber	Exotic	common		c		c					o

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<i>Pecteilis susannae</i>	Herb	Native	restricted, scheduled under Cap. 96, protected under Cap. 586		s							
<i>Pennisetum polystachyon</i>	Herb	Exotic	common		o							o
<i>Pennisetum purpureum</i>	Herb	Exotic	common							o		
<i>Perilla frutescens</i>	Herb	Native	restricted; cultivated and semi-naturalized	s								
<i>Phoenix hanceana</i>	Tree	Native	common		c		o			o		c
<i>Phyllanthus cochinchinensis</i>	Shrub	Native	common	c	c							
<i>Phyllanthus emblica</i>	Tree	Native	very common		o							o
<i>Phyllodium pulchellum</i>	Shrub	Native	very common,		s							s
<i>Platycodon grandiflorus</i>	Herb	Native	restricted, scheduled under Cap. 96		o							
<i>Plumeria rubra</i>	Tree	Exotic	common, landscape species							o		o
<i>Podocarpus macrophyllus</i>	Tree	Native	restricted							o		
<i>Psidium guajava</i>	Tree	Exotic	common					c				
<i>Psychotria asiatica</i>	Tree	Native	common	c	c							o
<i>Psychotria serpens</i>	Climber	Native	very common		o							
<i>Pteridium aquilinum</i>	Herb	Native	common		c							
<i>Pteris biaurita</i>	Herb	Native	common	s								
<i>Pteris semipinnata</i>	Herb	Native	very common	s						c		
<i>Pueraria phaseoloides</i>	Climber	Native	very common	c	o		c					c
<i>Pycneus polystachyus</i>	Herb	Native	very common								s	

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<i>Pyrrhosia adnascens</i>	Herb	Native	common	s								
<i>Reevesia thyrsoidea</i>	Tree	Exotic	common	s								
<i>Rhaphiolepis indica</i>	Shrub	Native	very common		c		s					c
<i>Rhapis excelsa</i>	Shrub	Native	common		c							
<i>Rhododendron pulchrum</i>	Shrub	Exotic	common, landscape species						c			c
<i>Rhodomyrtus tomentosa</i>	Shrub	Native	very common		c							c
<i>Rhus hypoleuca</i>	Shrub	Native	common		o							s
<i>Rhus succedanea</i>	Shrub	Native	common	c	c							
<i>Rhynchospora rubra</i>	Herb	Native	very common		s							
<i>Roystonea regia</i>	Tree	Exotic	common, landscape species						o			
<i>Rubus parvifolius</i>	Shrub	Native	common		o							o
<i>Rubus reflexus</i>	Climber	Native	very common	c						o		
<i>Sansevieria trifasciata</i>	Herb	Exotic	common, landscape species						s			
<i>Sapium discolor</i>	Tree	Native	very common	o								
<i>Sapium sebiferum</i>	Tree	Native	common		o							
<i>Sarcandra glabra</i>	Shrub	Native	very common		o							
<i>Scaevola taccada</i>	Shrub	Native	very common		c							
<i>Schefflera arboricola</i>	Climber	Exotic	common, landscape species						o			
<i>Schefflera heptaphylla</i>	Tree	Native	common	c	c					c		c
<i>Schima superba</i>	Tree	Native	common	o								
<i>Scoparia dulcis</i>	Herb	Exotic	common			s					s	

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<i>Scutellaria indica</i>	Herb	Native	common		o							s
<i>Setaria geniculata</i>	Herb	Native	common		o							o
<i>Smilax china</i>	Climber	Native	very common		c							c
<i>Smilax glabra</i>	Climber	Native	very common		c							
<i>Solanum nigrum</i>	Herb	Native	common		o							
<i>Solanum torvum</i>	Shrub	Exotic	common						o			
<i>Sonchus arvensis</i>	Herb	Native	very common		o		o					o
<i>Stachytarpheta jamaicensis</i>	Shrub	Exotic	common		o		o					c
<i>Sterculia lanceolata</i>	Tree	Native	rare	c	c	c				c		
<i>Strobilanthes cusia</i>	Herb	Native	common	s								
<i>Strophanthus divaricatus</i>	Climber	Native	common		o							
<i>Symplocos glauca</i>	Tree	Native	common	s	s							
<i>Symplocos lancifolia</i>	Tree	Native	common	o								
<i>Syzygium hancei</i>	Tree	Native	common	o								
<i>Syzygium jambos</i>	Tree	Exotic	common							o		
<i>Syzygium levinei</i>	Tree	Native	common	c								
<i>Tadehagi triquetrum</i>	Shrub	Native	very common		o							o
<i>Tamarix chinensis</i>	Tree	Exotic	common						s			
<i>Terminalia catappa</i>	Tree	Exotic	common									s
<i>Tetracera asiatica</i>	Climber	Native	very common	c	o							
<i>Tetradium glabrifolium</i>	Tree	Native	common	o								

Scientific Name	Growth Form	Native	Conservation Status	MW	SG	WC	WL	AL	UD	PL	RS	Project Site
<i>Tradescantia spathacea</i>	Herb	Exotic	common						s			
<i>Trema orientalis</i>	Tree	Native	common		o							o
<i>Tridax procumbens</i>	Herb	Exotic	very common; pantropical weed of Central American origin.								o	
<i>Tylophora ovata</i>	Climber	Native	common		o							
<i>Uraria crinita</i>	Shrub	Native	common		s							
<i>Uvaria macrophylla</i>	Climber	Native	common	c								
<i>Vernicia montana</i>	Tree	Exotic	common						c	o		
<i>Vernonia cinerea</i>	Herb	Native	very common		o							o
<i>Viburnum odoratissimum</i>	Shrub	Native	very common	o						c		
<i>Vigna unguiculata</i>	Herb	Exotic	common	s								
<i>Wedelia trilobata</i>	Herb	Exotic	common		s		c					c
<i>Wikstroemia indica</i>	Shrub	Native	common		s						o	
<i>Youngia japonica</i>	Herb	Native	very common						c	c		c
<i>Zanthoxylum avicennae</i>	Tree	Native	common	c	c							c
<i>Zanthoxylum nitidum</i>	Climber	Native	very common		c							

Habitat: MW=mixed woodland, SG=shrubland/grassland, WC=watercourse, WL=wasteland, AL= Agricultural Land, UD= urbanised/disturbed, PL= plantation, RS= natural (rocky/sandy) shore

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

#N/A = not available

Appendix 2 Mammal Recorded within the Study Area

Common names	Scientific names	Agri	P	RS	SS	SW	S/G	U/D	Wa	C	MW	Project Site S		Commonness*	Protection / Conservation status**
												S/G	U/D		
Domestic Dog	<i>Canis lupus familiaris</i>	0	0	0	0	0	10	6	0	0	0	4	0	Common	
Domestic Cat	<i>Felis catus</i>	0	0	0	0	0	0	5	0	0	0	0	0	Uncommon	
Eurasian Wild Pig	<i>Sus scrofa</i>	0	0	0	0	0	2	0	0	0	0	Digging sign	0	Very common	
Japanese Pipistrelle	<i>Pipistrellus abramus</i>	0	0	0	0	0	0	1	0	0	0	0	0	Very common	WAPO

Habitats: Agri = agricultural land, P = plantation, RS = rocky shore, SS = sandy shore, SW = seawall, S/G = shrubland/grassland, U/D = urbanized/disturbed, Wa = wasteland, C = watercourse, MW = mixed woodland,

* "commonness" follow Hong Kong Biodiversity Online

** "Protection / Conservation status" follow Hong Kong Biodiversity Online, Fellowes *et al.* (2002)

Appendix 3 Bird Recorded within the Study Area

Common names	Scientific names	Agri	P	RS	SS	SW	S/G	U/D	Wa	C	MW	Project Site				Commonness*	Protection / Conservation status**
												U/D	Wa	RS	S/G		
Chinese Francolin	<i>Francolinus pintadeanus</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	1	Common resident	
Black-crowned Night Heron	<i>Nycticorax nycticorax</i>	0	0	0	0	0	0	0	0	0	0	0	1	0	0	Common resident and winter visitor	Fellowes <i>et al.</i> (2002): (LC)
Little Egret	<i>Egretta garzetta</i>	0	3	0	0	0	0	0	0	0	0	0	0	0	0	Common resident	Fellowes <i>et al.</i> (2002): PRC, (RC)
Pacific Reef Heron	<i>Egretta sacra</i>	0	0	0	0	1	1	0	0	0	0	0	0	0	0	Uncommon resident	Fellowes <i>et al.</i> (2002): (LC)
Black Kite	<i>Milvus migrans</i>	0	57	1	0	0	9	3	0	0	13	6	0	0	4	Common resident	Class II Protected Animal of PRC; Appendix 2 of CITES; Fellowes <i>et al.</i> (2002): (RC)
White-bellied Sea Eagle	<i>Haliaeetus leucogaster</i>	0	0	0	0	2	0	0	0	0	0	0	0	0	0	Uncommon resident	Class 1 Protected Animal of China; Listed in Appendix II of CITES Fellowes <i>et al.</i> (2002): (RC)
Crested Serpent Eagle	<i>Spilornis cheela</i>	0	0	0	0	0	0	0	0	0	1	0	0	0	0	Uncommon resident	China Red Data Book: Vulnerable Class 2 Protected

Common names	Scientific names	Agri	P	RS	SS	SW	S/G	U/D	Wa	C	MW	Project Site				Commonness*	Protection / Conservation status**
												U/D	Wa	RS	S/G		
																	Animal of China; CITES: Appendix II; China Red Data Book: Vulnerable Fellowes <i>et al.</i> (2002): (LC)
Crested Goshawk	<i>Accipiter trivirgatus</i>	0	0	0	0	0	2	0	0	0	0	0	0	0	0	Uncommon resident	Class 2 Protected Animal of China; CITES: Appendix II;
Spotted Dove	<i>Spilopelia chinensis</i>	0	9	0	0	0	6	3	0	1	3	1	2	0	0	Abundant resident	
Greater Coucal	<i>Centropus sinensis</i>	0	1	0	0	0	1	1	0	0	0	0	0	0	0	Common resident	China Red Data Book: Vulnerable Class 2 Protected Animal of PRC
Asian Koel	<i>Eudynamys scolopaceus</i>	0	3	0	0	0	1	0	0	1	0	0	0	0	0	Common resident	
Large Hawk Cuckoo	<i>Hierococcyx sparverioides</i>	0	0	0	0	1	1	0	0	0	1	0	0	0	0	Common passage migrant and summer visitor	
Collared Scops Owl	<i>Otus lettia</i>	0	0	0	0	0	0	0	0	0	0	0	1	0	1	Common resident	Class 2 Protected

Common names	Scientific names	Agri	P	RS	SS	SW	S/G	U/D	Wa	C	MW	Project Site				Commonness*	Protection / Conservation status**
												U/D	Wa	RS	S/G		
																	Animal of China; CITES: Appendix II;
Savanna Nightjar	<i>Caprimulgus affinis</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	1	Uncommon resident and passage migrant	
House Swift	<i>Apus nipalensis</i>	0	4	0	0	0	30	2	0	0	0	3	0	0	1	Abundant spring migrant and locally common resident	
White-throated Kingfisher	<i>Halcyon smyrnensis</i>	0	0	0	0	0	0	0	0	0	0	0	1	0	0	Common resident	Fellowes <i>et al.</i> (2002): (LC)
Common Kingfisher	<i>Alcedo atthis</i>	0	0	0	0	0	0	0	0	1	2	0	0	0	0	Common passage migrant and winter visitor.	
Grey-chinned Minivet	<i>Pericrocotus solaris</i>	0	1	0	0	0	0	0	0	0	3	0	0	0	0	Common in winter, scarce in summer	Fellowes <i>et al.</i> (2002): LC
Long-tailed Shrike	<i>Lanius schach</i>	0	1	0	0	0	0	0	0	0	0	0	0	0	1	Common resident	
Black Drongo	<i>Dicrurus macrocercus</i>	0	0	0	0	0	2	0	0	0	0	0	0	0	0	Common summer visitor	
Red-billed Blue Magpie	<i>Urocissa erythroryncha</i>	0	1	0	0	0	0	0	0	0	3	1	0	0	0	Common resident	

Common names	Scientific names	Agri	P	RS	SS	SW	S/G	U/D	Wa	C	MW	Project Site				Commonness*	Protection / Conservation status**
												U/D	Wa	RS	S/G		
House Crow	<i>Corvus splendens</i>	0	1	0	0	0	0	0	0	0	0	0	0	0	0	Resident	
Collared Crow	<i>Corvus torquatus</i>	0	0	0	0	1	1	0	0	0	0	0	0	0	0	Uncommon resident	IUCN: Near threatened Fellowes <i>et al.</i> (2002): LC
Large-billed Crow	<i>Corvus macrorhynchos</i>	0	3	0	0	0	14	2	0	1	0	0	2	0	0	Common resident	
Cinereous Tit	<i>Parus cinereus</i>	0	2	0	0	0	2	1	0	1	3	0	1	0	0	Common resident	
Red-whiskered Bulbul	<i>Pycnonotus jocosus</i>	0	15	0	0	5	6	7	0	20	31	2	2	0	2	Abundant resident	
Chinese Bulbul	<i>Pycnonotus sinensis</i>	0	35	0	0	4	25	9	0	0	36	0	9	0	22	Abundant resident in Hong Kong.	
Sooty-headed Bulbul	<i>Pycnonotus aurigaster</i>	0	0	0	0	0	0	0	0	0	0	2	0	0	0	Uncommon resident	
Barn Swallow	<i>Hirundo rustica</i>	0	3	0	0	0	6	2	0	0	0	3	6	0	8	Abundant passage migrant and summer visitor	
Mountain Tailorbird	<i>Phyllergates cuculatus</i>	0	0	0	0	0	0	0	0	0	1	0	0	0	0	Uncommon resident	
Pallas's Leaf Warbler	<i>Phylloscopus proregulus</i>	0	0	0	0	0	0	1	0	0	0	0	0	0	0	Common winter visitor	
Yellow-browed Warbler	<i>Phylloscopus inornatus</i>	0	1	0	0	0	1	0	0	0	2	0	0	0	0	Common winter visitor	

Common names	Scientific names	Agri	P	RS	SS	SW	S/G	U/D	Wa	C	MW	Project Site				Commonness*	Protection / Conservation status**
												U/D	Wa	RS	S/G		
Yellow-bellied Prinia	<i>Prinia flaviventris</i>	0	0	0	0	0	5	0	0	1	1	0	3	0	11	Common resident	
Plain Prinia	<i>Prinia inornata</i>	0	0	0	0	0	0	2	0	1	0	0	0	0	2	Common resident	
Common Tailorbird	<i>Orthotomus sutorius</i>	0	6	0	0	0	1	2	0	0	4	0	0	0	4	Common resident	
Chinese Hwamei	<i>Garrulax canorus</i>	0	0	0	0	0	1	0	0	0	0	0	0	0	0	Common resident	CITES: Appendix II
Masked Laughingthrush	<i>Garrulax perspicillatus</i>	0	6	0	0	0	2	0	0	0	8	0	3	2	1	Abundant resident	
Greater Necklaced Laughingthrush	<i>Garrulax pectoralis</i>	0	0	0	0	0	1	0	0	0	8	0	0	0	0	Common resident	
Black-throated Laughingthrush	<i>Garrulax chinensis</i>	0	0	0	0	0	3	1	0	0	0	0	0	0	1	Common resident	
Japanese White-eye	<i>Zosterops japonicus</i>	0	35	0	0	1	4	0	0	0	13	0	0	0	0	Abundant resident	
Crested Myna	<i>Acridotheres cristatellus</i>	0	5	0	0	0	5	0	0	0	1	3	7	0	1	Common resident	
Black-collared Starling	<i>Gracupica nigricollis</i>	0	0	0	0	0	3	1	0	0	3	0	2	0	1	Common resident	
Blue Whistling Thrush	<i>Myophonus caeruleus</i>	0	4	0	0	0	1	0	0	2	2	0	1	0	0	Common resident	
Grey-backed Thrush	<i>Turdus hortulorum</i>	0	0	0	0	0	2	0	0	0	0	0	0	0	0	Common winter visitor	
Oriental Magpie Robin	<i>Copsychus saularis</i>	0	4	0	0	0	3	1	0	1	8	0	2	0	1	Abundant resident	
Blue Rock Thrush	<i>Monticola solitarius</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Uncommon passage migrant and winter visitor	
Fork-tailed Sunbird	<i>Aethopyga christinae</i>	0	4	0	0	0	1	0	0	0	2	0	0	0	0	Common resident	
Eurasian Tree Sparrow	<i>Passer montanus</i>	0	10	0	0	0	2	4	0	0	0	0	0	0	0	Abundant resident	

Common names	Scientific names	Agri	P	RS	SS	SW	S/G	U/D	Wa	C	MW	Project Site				Commonness*	Protection / Conservation status**
												U/D	Wa	RS	S/G		
White-rumped Munia	<i>Lonchura striata</i>	0	0	0	0	0	0	0	0	1	0	0	0	0	0	Common resident	
Scaly-breasted Munia	<i>Lonchura punctulata</i>	0	0	0	0	0	0	0	0	1	0	0	0	0	0	Common resident	
Grey Wagtail	<i>Motacilla cinerea</i>	0	0	0	0	0	0	0	0	2	0	0	0	0	0	Common passage migrant and winter visitor	
White Wagtail	<i>Motacilla alba</i>	0	0	0	0	0	0	4	0	4	0	0	0	0	0	Common passage migrant and winter visitor	
Total species		0	24	0	0	7	28	16	0	14	22	7	15	2	19		
Total birds		0	214	0	0	15	143	46	0	38	149	21	43	3	62		

Habitats: Agri = agricultural land, P = plantation, RS = rocky shore, SS = sandy shore, SW = seawall, S/G = shrubland/grassland, U/D = urbanized/disturbed, Wa = wasteland, C = watercourse, MW = mixed woodland,

PS = Project Site

* "commonness" follow Hong Kong Biodiversity Online

** "Protection / Conservation status" follow Hong Kong Biodiversity Online, Fellowes et al. (2002); LC = local concern, PRC = potential regional concern, RC = regional concern, GC = global concern; Letters in parentheses indicate that the assessment is on the basis of restrictedness in breeding and/or roosting sites rather than in general occurrence (Fellowes *et al.*, 2002)

Appendix 4 Herpetofauna Recorded within the Study Area

Common names	Scientific names	Agri	P	RS	SS	SW	S/G	U/D	Wa	C	MW	Project Site		Commonness*
												Wa	C	
Reptiles		0	0	0	0	0	0	0	0	0	0	0	0	
Bamboo Snake	<i>Cryptelytrops albolabris</i>	0	0	0	0	0	0	0	0	0	0	1	0	Common
Changeable Lizard	<i>Calotes versicolor</i>	0	0	0	0	0	1	0	0	0	0	0	0	Common
Amphibians		0	0	0	0	0	0	0	0	0	0	0	0	
Asian Common Toad	<i>Bufo melanostictus</i>	0	1	0	0	0	0	0	0	0	0	0	0	Very common
Asiatic Painted Frog	<i>Kaloula pulchra</i>	0	0	0	0	0	0	0	0	0	1	0	0	Common
Ornate Pigmy Frog	<i>Microhyla fissipes</i>	0	0	0	0	0	0	0	5	0	0	0	0	Common
Paddy Frog	<i>Fejervarya limnocharis</i>	0	0	0	0	0	0	0	8	0	0	0	2	Very common
Gunther's Frog	<i>Rana guentheri</i>	0	0	0	0	0	0	1	2	0	1	0	1	Very common
Brown Tree Frog	<i>Polypedates megacephalus</i>	0	0	0	0	1	0	1	1	0	1	0	1	Very common

Habitats: Agri = agricultural land, P = plantation, RS = rocky shore, SS = sandy shore, SW = seawall, S/G = shrubland/grassland, U/D = urbanized/disturbed, Wa = wasteland, C = watercourse, MW = mixed woodland,

* "commonness" follow Hong Kong Biodiversity Online, Karsen *et al.* (1998), Chan *et al.* (2005) and (2006)

** "Protection / Conservation status" follow Hong Kong Biodiversity Online, Fellowes *et al.* (2002)

Appendix 5 Butterfly Recorded within the Study Area

Common names	Scientific names	Agri	P	RS	SS	SW	S/G	U/D	Wa	C	MW	Project Site			Commonness*	Protection / Conservation status**
												Wa	U/D	S/G		
Bush Hopper	<i>Ampittia dioscorides</i>	0	0	0	0	0	0	0	0	0	0	0	0	2	UC	
Forest Hopper	<i>Astictopterus jama</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	C	
Plain Palm Dart	<i>Cephenes acalle</i>	0	0	0	0	0	1	0	0	0	0	0	0	0	VR	
Banana Skipper	<i>Erionota torus</i>	0	0	0	0	0	0	0	0	0	1	0	0	0	UC	
Bevan's Swift	<i>Pseudoborbo bevani</i>	0	0	0	0	0	0	0	0	0	0	0	0	1	UC	
Water Snow Flat	<i>Tagiades litigiousus</i>	0	0	0	0	0	0	0	0	2	0	0	0	0	C	
Pale Palm Dart	<i>Telicota colon</i>	0	0	0	0	0	1	0	0	0	0	0	0	0	R	Local Concern
Plum Judy	<i>Abisara echerius</i>	0	1	0	0	0	1	0	0	0	1	0	0	0	VC	
Plain Hedge Blue	<i>Celastrina lavendularis</i>	0	1	0	0	0	0	0	0	0	0	0	0	0	VR	Local Concern
Lime Blue	<i>Chilades lajus</i>	0	2	0	0	0	2	0	0	0	0	0	0	0	C	
Pale Grass Blue	<i>Pseudozizeeria maha</i>	0	0	0	0	0	0	9	0	1	0	0	1	1	VC	
Dark Grass Blue	<i>Zizeeria karsandra</i>	0	0	0	0	0	0	0	0	0	0	0	0	1	UC	
Banded Tree Brown	<i>Lethe confusa</i>	0	0	0	0	0	1	0	0	0	0	0	0	0	C	
Indian Fritillary	<i>Argyreus hyperbius</i>	0	0	0	0	0	0	0	0	0	0	0	0	1	C	
Common Sergeant	<i>Athyma perius</i>	0	0	0	0	0	0	0	0	0	0	0	0	7	UC	
Tawny Rajah	<i>Charaxes bernardus</i>	0	0	0	0	0	0	1	0	1	0	0	0	0	C	
Rustic	<i>Cupha erymanthis</i>	0	0	0	0	0	2	0	0	1	0	0	0	0	VC	
Common Mapwing	<i>Cyrestis thyodamas</i>	0	0	0	0	0	0	0	0	1	0	0	0	0	C	

Common names	Scientific names	Agri	P	RS	SS	SW	S/G	U/D	Wa	C	MW	Project Site			Commonness*	Protection / Conservation status**
												Wa	U/D	S/G		
Common Palmfly	<i>Elymnias hypermnestra</i>	0	0	0	0	0	0	1	0	0	0	0	0	0	C	
Large Faun	<i>Faunis eumeus</i>	0	0	0	0	0	0	1	0	0	3	0	0	9	C	
Great Eggfly	<i>Hypolimnas bolina</i>	0	1	0	0	0	0	1	0	0	0	0	0	0	C	
Danaid Eggfly	<i>Hypolimnas misippus</i>	0	0	0	0	0	1	0	0	0	0	0	0	0	UC	Local Concern
Ceylon Blue Glassy Tiger	<i>Ideopsis similis</i>	0	0	0	0	0	0	3	0	0	0	0	0	0	VC	
Peacock Pansy	<i>Junonia almana</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	C	
Blue Admiral	<i>Kaniska canace</i>	0	1	0	0	0	0	0	0	0	0	0	0	0	C	
Banded Tree Brown	<i>Lethe confusa</i>	0	0	0	0	0	0	1	0	0	0	0	0	0	C	
Dark Brand Bush Brown	<i>Mycalesis mineus</i>	0	2	0	0	0	1	3	0	4	2	0	0	1	VC	
Southern Sullied Sailer	<i>Neptis clinia</i>	0	0	0	0	0	0	0	0	1	0	0	0	0	C	
Common Sailer	<i>Neptis hylas</i>	0	1	0	0	0	0	4	0	1	0	0	0	4	VC	
White Commodore	<i>Parasarpa dudu</i>	0	0	0	0	0	0	0	0	0	0	0	0	1	C	
Black Prince	<i>Rohana parisatis</i>	0	0	0	0	0	0	0	0	1	0	0	0	1	C	
Common Jester	<i>Symbrenthia lilaea</i>	0	0	0	0	0	0	1	0	0	0	0	0	0	C	
Vagrant	<i>Vagrans egista</i>	0	0	0	0	0	5	0	0	0	0	0	0	0	VR	Local Concern
Common Five-ring	<i>Ypthima baldus</i>	0	0	0	0	0	0	0	0	0	0	0	0	3	VC	
Straight Five-ring	<i>Ypthima lisandra</i>	0	0	0	0	0	1	0	0	0	0	0	0	0	C	
Common Mime	<i>Papilo clytia</i>	0	0	0	0	0	0	0	0	0	0	0	0	5	C	
Tailed Jay	<i>Graphium agamemnon</i>	0	1	0	0	0	0	1	0	0	0	0	0	0	C	

Common names	Scientific names	Agri	P	RS	SS	SW	S/G	U/D	Wa	C	MW	Project Site			Commonness*	Protection / Conservation status**
												Wa	U/D	S/G		
Common Bluebottle	<i>Graphium sarpedon</i>	0	0	0	0	0	0	0	0	1	0	0	0	0	VC	
Red Helen	<i>Papilio helenus</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	VC	
Great Mormon	<i>Papilio memnon</i>	0	0	0	0	0	0	0	0	2	2	0	0	0	VC	
Paris Peacock	<i>Papilio paris</i>	0	0	0	0	0	0	0	0	0	0	0	0	1	VC	
Common Mormon	<i>Papilio polytes</i>	0	0	0	0	0	0	1	0	2	2	0	0	3	VC	
Spangle	<i>Papilio protenor</i>	0	0	0	0	0	0	4	0	1	0	0	0	0	VC	
Indian Cabbage White	<i>Pieris canidia canidia</i>	0	4	0	0	0	0	0	0	0	1	0	0	0	VC	
Lemon Emigrant	<i>Catopsilia pomona</i>	0	0	0	0	0	0	2	0	7	0	0	0	1	C	
Mottled Emigrant	<i>Catopsilia pyranthe</i>	0	0	0	0	0	0	1	0	0	0	0	0	0	VC	
Common Gull	<i>Cepora nerissa</i>	0	0	0	0	0	0	0	0	0	1	0	0	0	C	
Red-base Jezebe	<i>Delias pasithoe</i>	0	0	0	0	0	0	0	0	0	1	0	0	0	VC	
Three-spot Grass Yellow	<i>Eurema blanda</i>	0	0	0	0	0	0	0	0	0	0	0	0	1	C	
Common Grass Yellow	<i>Eurema hecabe</i>	0	0	0	0	0	0	2	0	2	0	0	0	3	VC	
Great Orange Tip	<i>Hebomoia glaucippe</i>	0	0	0	0	0	0	0	0	0	0	0	0	1	C	
Yellow Orange Tip	<i>Ixias pyrene</i>	0	0	0	0	0	0	0	0	0	0	0	0	1	UC	
Total species		0	9	0	0	0	9	16	0	15	9	0	1	20		
Total butterflies		0	14	0	0	0	16	36	0	28	14	0	1	48		

Habitats: Agri = agricultural land, P = plantation, RS = rocky shore, SS = sandy shore, SW = seawall, S/G = shrubland/grassland, U/D = urbanized/disturbed, Wa = wasteland, C = watercourse, MW = mixed woodland,
 PS = Project Site

*Commonness: VC = very common, C = common, UC = uncommon, R = rare, VR = very rare (Follow Hong Kong Biodiversity Online)

** "Protection / Conservation status" follow Hong Kong Biodiversity Online, Fellowes *et al.* (2002)

Appendix 6 Dragonfly Recorded within the Study Area

Common names	Scientific names	Agri	P	RS	SS	SW	S/G	U/D	Wa	C	MW	PS*	Commonness**
Black-banded Gossamerwing	<i>Euphaea decorata</i>	0	0	0	0	0	0	1	0	0	0	0	A
Chinese Yellowface	<i>Agriomorpha fusca</i>	0	0	0	0	0	0	0	0	1	0	0	A
Orange-tailed Midget	<i>Agriocnemis femina</i>	0	0	0	0	0	0	0	0	1	0	0	A
Yellow Featherlegs	<i>Copera marginipes</i>	0	0	0	0	0	0	1	0	2	0	0	A
Black Threadtail	<i>Prodasineura autumnalis</i>	0	0	0	0	0	0	1	0	1	0	0	A
Pale-spotted Emperor	<i>Anax guttatus</i>	0	0	0	0	0	0	0	0	0	0	0	C
Dancing Shadow-emerald	<i>Idionyx victor</i>	0	0	0	0	0	0	1	0	0	0	0	C
Blue Dasher	<i>Brachydiplax chalybea</i>	0	0	0	0	0	0	0	0	1	0	0	C
Asian Amberwing	<i>Brachythemis contaminata</i>	0	0	0	0	0	0	0	0	1	0	0	A
Amber-winged Glider	<i>Hydrobasileus croceus</i>	0	0	0	0	0	0	0	0	0	0	1	C
Common Blue Skimmer	<i>Orthetrum glaucum</i>	0	0	0	0	0	0	0	0	1	0	0	A
Marsh Skimmer	<i>Orthetrum luzonicum</i>	0	0	0	0	0	0	1	0	0	0	0	A
Common Red Skimmer	<i>Orthetrum pruinosum</i>	0	0	0	0	0	0	1	0	0	0	0	A
Green Skimmer	<i>Orthetrum sabina sabina</i>	0	0	0	0	0	0	1	0	0	0	0	A
Lesser Blue Skimmer	<i>Orthetrum triangulare</i>	0	2	0	0	0	0	0	0	0	0	0	C
Wandering Glider	<i>Pantala flavescens</i>	0	1	0	0	0	3	36	0	41	0	5	A
Saddlebag Glider	<i>Tramea virginia</i>	0	0	0	0	0	0	0	0	1	0	0	A

Common names	Scientific names	Agri	P	RS	SS	SW	S/G	U/D	Wa	C	MW	PS*	Commonness**
Total species		0	2	0	0	0	1	8	0	9	0	2	
Total dragonflies		0	3	0	0	0	3	43	0	50	0	6	

Habitats: Agri = agricultural land, P = plantation, RS = rocky shore, SS = sandy shore, SW = seawall, S/G = shrubland/grassland, U/D = urbanized/disturbed, Wa = wasteland, C = watercourse, MW = mixed woodland,

PS = Project Site

* all dragonfly within the Project Site were recorded in watercourse

** Commonness: A = abundant, C = common (Follow Hong Kong Biodiversity Online)

Appendix 7 Freshwater Fauna Recorded within the Study Area during Dry Season

Species / Order Name	Common Name	Relative Abundance					Conservation status
		Project Site	East to slope within country park	Tseung Kwan O Village	Freshwater service reservoir	Channel near Shek Kok Road	
Gastropods							
<i>Radix plicatulus</i>				+			
Crustaceans							
<i>Caridina cantonensis</i>			+++		+		
<i>Macrobrachium</i> sp.				+			
<i>Nanhaipotamon hongkongense</i>					+		Fellowes <i>et al.</i> (2002): Potential Global Concern
Insects							
<i>Enithares</i> sp.	Backswimmer		+				
<i>Trichoptera</i> larvae	Caddisfly larvae			+			
<i>Ephemeroptera</i> larvae	Mayfly larvae			+			
<i>Coleoptera</i> larvae	Beetle larvae			+			
<i>Chironomidae</i> larvae	Non-biting midge					+	
<i>damsel</i> fly larvae			+	+			

Species / Order Name	Common Name	Relative Abundance					Conservation status
		Project Site	East to slope within country park	Tseung Kwan O Village	Freshwater service reservoir	Channel near Shek Kok Road	
Fishes							
<i>Poecilia reticulata</i>	Guppy			+			
Tadpoles							
<i>Bufo melanostictus</i>	Asian Common Toad				+		

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

Appendix 8 Freshwater Fauna Recorded within the Study Area during Wet Season

Species / Order Name	Common Name	Relative Abundance					Conservation status
		F-P	F-C	F-T	F-R	F-S	
Gastropods							
<i>Physella acuta</i>	Bladder snail			+			
<i>Biomphalaria straminea</i>				+			
<i>Radix plicatulus</i>				+			
Crustaceans							
<i>Caridina cantonensis</i>			+++	+	+		
<i>Caridina longirostris</i>				+			
<i>Macrobrachium</i> sp.				+			
<i>Nanhaipotamon hongkongense</i>					+		Fellowes <i>et al.</i> (2002): Potential Global Concern
Insects							
<i>Enithares</i> sp.	Backswimmer		+				
<i>Metrocoris</i> sp.	Water skater	+		++			
<i>Trichoptera</i> larvae	Caddisfly larvae			+			
<i>Ephemeroptera</i> larvae	Mayfly larvae			+			
<i>Coleoptera</i> larvae	Beetle larvae			+			

Species / Order Name	Common Name	Relative Abundance					Conservation status
		F-P	F-C	F-T	F-R	F-S	
<i>Chironomidae larvae</i>	Non-biting midge larvae					+	
<i>Zygopteran larvae</i>	Damselfly larvae		+	+			
Fishes							
<i>Xiphophorus hellerii</i>	Swordtail			+			
<i>Puntius semifasciolatus</i>	Chinese Barb			+			
<i>Poecilia reticulata</i>	Guppy			+			

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

Appendix 9 Intertidal organisms Recorded in the Qualitative Survey within the Study Area during Dry Season

Species	I-O (rocky A)	I-O (rocky B)	I-O (seawall)	I-I (rocky)	I-I (sandy)	I-I (pebble)	I-F (rocky)	I-F (sandy)	I-T (rocky)	I-T (sandy)	I-L (rocky)	I-L (sandy)
Algae												
<i>Corallina</i> sp.											+	
<i>Gelidium</i> sp.											+	
<i>Endarachne</i> sp.	+	+		+							+	
<i>Sargassum</i> sp.	+											
<i>Ulva</i> sp.							++					++
Unknown green algae											+	
Polychaete												
<i>Hydroides</i> sp.					+			+			+	+
<i>Serpulorbis imbricatus</i>	+						+				+	
<i>Spirorbis</i> sp.											++	
Unknown polychaete (Nereidae)												+
Chiton												
<i>Acanthopleura japonica</i>	+	+	+	+			+		++		+	
Limpet												
<i>Cellana grata</i>	+	+		+		+	++		+		+	
<i>Cellana toreuma</i>	+	+	+	+		+	+		++		+	
<i>Collisella dorsuosa</i>		+										

Species	I-O (rocky A)	I-O (rocky B)	I-O (seawall)	I-I (rocky)	I-I (sandy)	I-I (pebble)	I-F (rocky)	I-F (sandy)	I-T (rocky)	I-T (sandy)	I-L (rocky)	I-L (sandy)
<i>Nipponacmea concinna</i>				+					+		+++	+
<i>Patelloida pygmaea</i>							+		+++		+	
<i>Patelloida saccharina</i>	+		+			+	++		+		+	
<i>Siphonaria laciniosa</i>	+	+	+	+			+		+			
<i>Siphonaria japonica</i>	+	+	++	++			+				++	
Snail												
<i>Anthocidaris crassipina</i>	+											
<i>Chlorostoma argyrostoma</i>							+				+	
<i>Cronia margariticola</i>	+	+				+						
<i>Echinolittorina radiata</i>	+++	+++	+	+			+++		+++		++	
<i>Echinolittorina trochoides</i>	+	+++	++	++		+	+++		+++		+	
<i>Echinolittorina vidua</i>											+	
<i>Littoraria articulata</i>						+			+			
<i>Lunella coronata</i>				+			+++		+		++	
<i>Mitra</i> sp.				+			+++				+	
<i>Monodonta labio</i>									+++		+++	+
<i>Monodonta neritoides</i>		+	+	+		+++	++					
<i>Nerita albicilla</i>						+			+		+	
<i>Nerita chamaeleon</i>	+	+		+		+	+					
<i>Peasiella</i> sp.	+	+	+	+			+		+		+	

Species	I-O (rocky A)	I-O (rocky B)	I-O (seawall)	I-I (rocky)	I-I (sandy)	I-I (pebble)	I-F (rocky)	I-F (sandy)	I-T (rocky)	I-T (sandy)	I-L (rocky)	I-L (sandy)
<i>Planaxis sulcatus</i>						+			++		+	
<i>Thais clavigera</i>	+	+	+	+		+	++		+		+	
<i>Umbonium</i> sp.						+					+	+
Bivalve												
<i>Barbatia virescens</i>							+		+		+	
<i>Cardita leana</i>			+								+	
<i>Donax</i> sp.					+			+				++
<i>Saccostrea cucullata</i>	+	+	++	+++			+++					
<i>Septifer virgatus</i>	+	+		+			+		+		+	
<i>Solidicorbula erythrodon</i>					+							
<i>Tapes variegatus</i>											+	
<i>Perna viridis</i>				+								
Barnacle												
<i>Balanus amphitrite</i>							+		+			+
<i>Captiulum mitella</i>	+++	+++	+++	+++			+		++		+	
<i>Chthamalus moro</i>	+	+	+	+			+					
<i>Tetraclita japonica</i>	+++	+	+++	+			+					
<i>Tetraclita squamosa</i>							+					
Crab												
<i>Clibanarius</i> sp.	+	+					+				+	+

Species	I-O (rocky A)	I-O (rocky B)	I-O (seawall)	I-I (rocky)	I-I (sandy)	I-I (pebble)	I-F (rocky)	I-F (sandy)	I-T (rocky)	I-T (sandy)	I-L (rocky)	I-L (sandy)
<i>Epixanthus frontalis</i>												+
<i>Gaetice</i> sp.						+	+	+			+	+
<i>Hemigrapsus</i> sp.							+				+	+
<i>Hippa pacifica</i>						+						+
<i>Leptodius exaratus</i>				+		+	+					
<i>Petrolishthes japonicus</i>	+	++					+++	+			+	+
Others												
<i>Cypraea caurica</i>	+											
<i>Anthopleura pacifica</i>							+		+			
<i>Haliplanella lineata</i>				+					+		+	
<i>Ligia exotica</i>						+					+	
<i>Styela plicata</i>							+					
<i>Salmacis sphaeroides</i>							+					
<i>Anthocardis crassipina</i>	+						+					

Appendix 10 Intertidal organisms Recorded in the Qualitative Survey within the Study Area during Wet Season

Species	I-O (rocky A)	I-O (rocky B)	I-O (seawall)	I-I (rocky)	I-I (sandy)	I-I (pebble)	I-F (rocky)	I-F (sandy)	I-T (rocky)	I-T (sandy)	I-L (rocky)	I-L (sandy)
Polychaete												
<i>Hydroides</i> sp.	+			+			++	+	+++			
<i>Serpulorbis imbricatus</i>	+		+				+		+			
<i>Spirorbis</i> sp.	++		+				+		+			
Chiton												
<i>Acanthopleura japonica</i>	++	++	+	+			+		++			
<i>Onithochiton hirasei</i>									+			
Limpet												
<i>Cellana grata</i>	+	+	+	+		+	+		+			
<i>Cellana toreuma</i>	+	+	+	+			+		+		+	
<i>Nipponacmea concinna</i>	+	+	+	+		+	+	+	+			
<i>Patelloida pygmaea</i>	+	+	+	+			+		+			
<i>Patelloida saccharina</i>	+	+	+	+					+		+	
<i>Siphonaria laciniosa</i>	+	+	+	+			+		+			
<i>Siphonaria japonica</i>	+	+	+				+					
Snail												
<i>Cerithidea diadjariensis</i>											+	+
<i>Chlorostoma argyrostoma</i>									+			
<i>Cronia margariticola</i>	+						+		+			

Species	I-O (rocky A)	I-O (rocky B)	I-O (seawall)	I-I (rocky)	I-I (sandy)	I-I (pebble)	I-F (rocky)	I-F (sandy)	I-T (rocky)	I-T (sandy)	I-L (rocky)	I-L (sandy)
<i>Echinolittorina radiata</i>	++	++	+	+		+	+++		+++	+	+	
<i>Echinolittorina trochoides</i>	++	+++	++	+		+	+++		+++	+	+	
<i>Echinolittorina vidua</i>							+				+	
<i>Littoraria articulata</i>							+					
<i>Lunella coronata</i>				+			++		+		++	
<i>Monodonta labio</i>	+	+	+	+		++	+++	+	+++		++	
<i>Monodonta neritoides</i>				+		++	+	+				
<i>Nerita albicilla</i>		+		+		+	+		+		+	
<i>Nerita chamaeleon</i>		+	+	+								
<i>Peasiella</i> sp.			+									
<i>Planaxis sulcatus</i>	+	+		+			+++	+	++		+	
<i>Scutus sinensis</i>											+	
<i>Tectus pyramis</i>							+		+		+	
<i>Thais clavigera</i>	+	+	+	+			+		++		++	
<i>Thais luteostoma</i>									+			
Unknown gastropod									+			
Bivalve												
<i>Donax</i> sp.					+		+	+				++
<i>Isognomon</i> sp.									+			
<i>Perna viridis</i>	+			+			+		+			

Species	I-O (rocky A)	I-O (rocky B)	I-O (seawall)	I-I (rocky)	I-I (sandy)	I-I (pebble)	I-F (rocky)	I-F (sandy)	I-T (rocky)	I-T (sandy)	I-L (rocky)	I-L (sandy)
<i>Saccostrea cucullata</i>	+	++	+++	++			+++	+	+			
<i>Septifer virgatus</i>	+++	++		+			++		+		+	
<i>Barbatia virescens</i>							+		+			
Barnacle												
<i>Captiulum mitella</i>	+++	+++	+	+++			+		+			
<i>Chthamalus moro</i>	+							+				
<i>Tetraclita japonica</i>	+++	+++	++	+			++					
<i>Tetraclita squamosa</i>		+	+	+					+			
<i>Balanus amphitrite</i>	++	+	+	+			+++	+	+			
Crab and shrimp												
<i>Clibanarius</i> sp.							+		+		+	
<i>Gaetice</i> sp.						++	+	+	+			
<i>Grapsus albolineatus</i>											+	
<i>Hemigrapsus</i> sp.									+		+	+
<i>Hippa pacifica</i>					+							
<i>Leptodius exaratus</i>						+					+	
<i>Petrolishthes japonicus</i>											+	
<i>Palaemon pacificus</i>									+			
<i>Parasesarma pictum</i>										+		
<i>Thalamita danae</i>							+					

Species	I-O (rocky A)	I-O (rocky B)	I-O (seawall)	I-I (rocky)	I-I (sandy)	I-I (pebble)	I-F (rocky)	I-F (sandy)	I-T (rocky)	I-T (sandy)	I-L (rocky)	I-L (sandy)
<i>Ocypode</i> sp.										+		
<i>Grapsus albolineatus</i>										+		
Others												
<i>Cypraea arabicus</i>							+				+	
<i>Haliplanela lineata</i>				+			+					
<i>Spheractis cheungae</i>							+					
<i>Ligia exotica</i>						++	+			+		
<i>Anthocidaris crassipina</i>	+						+		+	+		
<i>Salmacis sphaeroides</i>						+	+					
<i>Styela plicata</i>							+		+			
Isopoda							+					
Holothuroidea							+					
<i>Oulastrea crispata</i>							+					
<i>Bathygobius fuscus</i>									+			
<i>Siganus canaliculatus</i>									+			
<i>Abudefduf bengalensis</i>									+			
<i>Terapon jarbua</i>									+			

Appendix 11 Intertidal organisms Recorded in the Quantitative Survey within the Study Area during Dry Season

Species	I-O (rocky A)	I-O (rocky B)	I-O (seawall)	I-I (rocky)	I-I (sandy)	I-I (pebble)	I-F (rocky)	I-F (sandy)	I-T (rocky)	I-T (sandy)	I-L (rocky)	I-L (sandy)
Algae												
<i>Corallina</i> sp.	0	0	0	0	0	0	0	0	0	0	4%	0
<i>Gelidium</i> sp.	0	0	0	0	0	0	0	0	0	0	4%	0
<i>Endarachne</i> sp.	3%	4%	0	2%	0	0	0	0	0	0	7%	0
<i>Sargassum</i> sp.	3%	0	0	0	0	0	0	0	0	0	0	0
<i>Ulva</i> sp.	0	0	0	0	0	0	19%	0	0	0	0	3%
Unknown green algae	0	0	0	0	0	0	0	0	0	0	5%	0
Polychaete												
<i>Hydroides</i> sp.	0	0	0	0	2	0	0	1	0	0	13	4
<i>Serpulorbis imbricatus</i>	1	0	0	0	0	0	1	0	0	0	1	0
<i>Spirorbis</i> sp.	0	0	0	0	0	0	0	0	0	0	61	0
Unknown polychaete (Nereidae)	0	0	0	0	0	0	0	0	0	0	0	1
Chiton												
<i>Acanthopleura japonica</i>	2	8	4	1	0	0	26	0	25	0	2	0
Limpet												
<i>Cellana grata</i>	12	7	0	36	0	3	31	0	26	0	9	0
<i>Cellana toreuma</i>	19	14	33	14	0	2	18	0	36	0	9	0
<i>Collisella dorsuosa</i>	0	3	0	0	0	0	0	0	0	0	0	0
<i>Nipponacmea concinna</i>	0	0	0	1	0	0	0	0	6	0	79	3

Species	I-O (rocky A)	I-O (rocky B)	I-O (seawall)	I-I (rocky)	I-I (sandy)	I-I (pebble)	I-F (rocky)	I-F (sandy)	I-T (rocky)	I-T (sandy)	I-L (rocky)	I-L (sandy)
<i>Patelloida pygmaea</i>	0	0	0	0	0	0	1	0	83	0	8	0
<i>Patelloida saccharina</i>	3	0	1	0	0	11	52	0	5	0	1	0
<i>Siphonaria lacinosia</i>	18	4	1	14	0	0	9	0	4	0	0	0
<i>Siphonaria japonica</i>	16	2	98	37	0	0	5	0	0	0	39	0
Snail												
<i>Anthocidaris crassipina</i>	1	0	0	0	0	0	0	0	0	0	0	0
<i>Chlorostoma argyrostoma</i>	0	0	0	0	0	0	1	0	0	0	27	0
<i>Cronia margariticola</i>	2	2	0	0	0	1	0	0	0	0	0	0
<i>Echinolittorina radiata</i>	221	164	48	23	0	0	665	0	391	0	78	0
<i>Echinolittorina trochoides</i>	21	223	12	126	0	16	499	0	549	0	26	0
<i>Echinolittorina vidua</i>	0	0	0	0	0	0	0	0	0	0	17	0
<i>Littoraria articulata</i>	0	0	0	0	0	1	0	0	2	0	0	0
<i>Lunella coronata</i>	0	0	0	2	0	0	111	0	12	0	31	0
<i>Mitra</i> sp.	0	0	0	5	0	0	133	0	0	0	1	0
<i>Monodonta labio</i>	0	0	0	0	0	0	0	0	231	0	515	5
<i>Monodonta neritoides</i>	0	6	1	6	0	87	31	0	0	0	0	0
<i>Nerita albicilla</i>	0	0	0	0	0	5	0	0	18	0	3	0
<i>Nerita chamaeleon</i>	2	12	0	2	0	6	18	0	0	0	0	0
<i>Peasiella</i> sp.	9	8	5	12	0	0	6	0	2	0	4	0
<i>Planaxis sulcatus</i>	0	0	0	0	0	2	0	0	81	0	9	0

Species	I-O (rocky A)	I-O (rocky B)	I-O (seawall)	I-I (rocky)	I-I (sandy)	I-I (pebble)	I-F (rocky)	I-F (sandy)	I-T (rocky)	I-T (sandy)	I-L (rocky)	I-L (sandy)
<i>Thais clavigera</i>	6	4	2	13	0	7	86	0	17	0	16	0
<i>Umbonium</i> sp.	0	0	0	0	0	4	0	0	0	0	5	8
Bivalve												
<i>Barbatia virescens</i>	0	0	0	0	0	0	21	0	1	0	1	0
<i>Cardita leana</i>	0	0	1	0	0	0	0	0	0	0	1	0
<i>Donax</i> sp.	0	0	0	0	22	0	0	1	0	0	0	91
<i>Saccostrea cucullata</i>	1	2	82	171	0	0	391	0	0	0	0	0
<i>Septifer virgatus</i>	21	1	0	1	0	0	5	0	3	0	4	0
<i>Solidicorbula erythrodon</i>	0	0	0	0	1	0	0	0	0	0	0	0
<i>Tapes variegatus</i>	0	0	0	0	0	0	0	0	0	0	9	0
<i>Perna viridis</i>	0	0	0	5	0	0	0	0	0	0	0	0
Barnacle												
<i>Balanus amphitrite</i>	0	0	0	0	0	0	9	0	1	0	0	2
<i>Captulum mitella</i>	319	115	111	138	0	0	28	0	64	0	26	0
<i>Chthamalus moro</i>	1	3	1	1	0	0	1	0	0	0	0	0
<i>Tetraclita japonica</i>	612	1	217	6	0	0	9	0	0	0	0	0
<i>Tetraclita squamosa</i>	0	0	0	0	0	0	1	0	0	0	0	0
Crab												
<i>Clibanarius</i> sp.	2	2	0	0	0	0	1	0	0	0	3	3
<i>Epixanthus frontalis</i>	0	0	0	0	0	0	0	0	0	0	0	1

Species	I-O (rocky A)	I-O (rocky B)	I-O (seawall)	I-I (rocky)	I-I (sandy)	I-I (pebble)	I-F (rocky)	I-F (sandy)	I-T (rocky)	I-T (sandy)	I-L (rocky)	I-L (sandy)
<i>Gaetice</i> sp.	0	0	0	0	0	25	1	5	0	0	3	6
<i>Hemigrapsus</i> sp.	0	0	0	0	0	0	2	0	0	0	4	1
<i>Hippa pacifica</i>	0	0	0	0	0	6	0	0	0	0	0	1
<i>Leptodius exaratus</i>	0	0	0	6	0	1	6	0	0	0	0	0
<i>Petrolisthes japonicus</i>	1	0	0	0	0	0	1	0	0	0	7	7
Others												
<i>Cypraea caurica</i>	1	0	0	0	0	0	0	0	0	0	0	0
<i>Anthopleura pacifica</i>	0	0	0	0	0	0	4	0	5	0	0	0
<i>Haliplanella lineata</i>	0	0	0	1	0	0	0	0	1	0	15	0
<i>Ligia exotica</i>	0	0	0	0	0	2	0	0	0	0	5	0
<i>Styela plicata</i>	0	0	0	0	0	0	1	0	0	0	0	0
<i>Anthocidaris crassipina</i>	1	0	0	0	0	0	0	0	0	0	0	0

Appendix 12 Intertidal organisms Recorded in the Quantitative Survey within the Study Area during Wet Season

Species	I-O (rocky A)	I-O (rocky B)	I-O (seawall)	I-I (rocky)	I-I (sandy)	I-I (pebble)	I-F (rocky)	I-F (sandy)	I-T (rocky)	I-T (sandy)	I-L (rocky)	I-L (sandy)
Polychaete												
<i>Hydroides</i> sp.	1	0	0	9	0	0	32	5	127	0	0	0
<i>Serpulorbis imbricatus</i>	6	0	3	0	0	0	13	0	1	0	0	0
<i>Spirorbis</i> sp.	51	0	1	0	0	0	12	0	21	0	0	0
Chiton												
<i>Acanthopleura japonica</i>	69	41	6	1	0	0	18	0	65	0	0	0
<i>Onithochiton hirasei</i>	0	0	0	0	0	0	0	0	2	0	0	0
Limpet												
<i>Cellana grata</i>	23	5	7	9	0	1	6	0	3	0	0	0
<i>Cellana toreuma</i>	8	2	16	5	0	0	4	0	51	0	17	0
<i>Nipponacmea concinna</i>	9	17	3	15	0	21	5	3	14	0	0	0
<i>Patelloida pygmaea</i>	14	19	9	8	0	0	16	0	11	0	0	0
<i>Patelloida saccharina</i>	27	23	14	4	0	0	0	0	19	0	1	0
<i>Siphonaria laciniosa</i>	8	6	11	5	0	0	4	0	13	0	0	0
<i>Siphonaria japonica</i>	7	3	6	0	0	0	3	0	0	0	0	0
Snail												
<i>Cerithidea diadjarimensis</i>	0	0	0	0	0	0	0	0	0	0	22	4
<i>Chlorostoma argyrostoma</i>	0	0	0	0	0	0	0	0	3	0	0	0
<i>Cronia margariticola</i>	2	0	0	0	0	0	1	0	21	0	0	0

Species	I-O (rocky A)	I-O (rocky B)	I-O (seawall)	I-I (rocky)	I-I (sandy)	I-I (pebble)	I-F (rocky)	I-F (sandy)	I-T (rocky)	I-T (sandy)	I-L (rocky)	I-L (sandy)
<i>Echinolittorina radiata</i>	4	12	1	1	0	0	79	0	0	0	0	0
<i>Echinolittorina trochoides</i>	0	0	73	0	0	0	216	0	0	0	0	0
<i>Echinolittorina vidua</i>	0	0	0	0	0	0	2	0	0	0	2	0
<i>Littoraria articulata</i>	0	0	0	0	0	0	3	0	0	0	0	0
<i>Lunella coronata</i>	0	0	0	1	0	0	82	0	24	0	66	0
<i>Monodonta labio</i>	9	22	19	24	0	42	113	13	247	0	76	0
<i>Monodonta neritoides</i>	0	0	0	2	0	36	12	3	0	0	0	0
<i>Nerita albicilla</i>	0	2	0	2	0	1	2	0	12	0	1	0
<i>Nerita chamaeleon</i>	0	1	1	1	0	0	0	0	0	0	0	0
<i>Peasiella</i> sp.	0	0	1	0	0	0	0	0	0	0	0	0
<i>Planaxis sulcatus</i>	1	19	0	1	0	0	437	1	39	0	1	0
<i>Scutus sinensis</i>	0	0	0	0	0	0	0	0	0	0	1	0
<i>Tectus pyramis</i>	0	0	0	0	0	0	6	0	22	0	1	0
<i>Thais clavigera</i>	13	15	16	24	0	0	19	0	46	0	56	0
<i>Thais luteostoma</i>	0	0	0	0	0	0	0	0	23	0	0	0
Unknown gastropod	0	0	0	0	0	0	0	0	3	0	0	0
Bivalve												
<i>Donax</i> sp.	0	0	0	0	21	0	3	6	0	0	0	46
<i>Isognomon</i> sp.	0	0	0	0	0	0	0	0	1	0	0	0
<i>Perna viridis</i>	2	0	0	1	0	0	1	0	8	0	0	0

Species	I-O (rocky A)	I-O (rocky B)	I-O (seawall)	I-I (rocky)	I-I (sandy)	I-I (pebble)	I-F (rocky)	I-F (sandy)	I-T (rocky)	I-T (sandy)	I-L (rocky)	I-L (sandy)
<i>Saccostrea cucullata</i>	1	47	212	96	0	0	163.48	1	29	0	0	0
<i>Septifer virgatus</i>	127	75	0	5	0	0	31	0	3	0	1	0
<i>Barbatia virescens</i>	0	0	0	0	0	0	15	0	15	0	0	0
Barnacle												
<i>Captiulum mitella</i>	111	124	9	148	0	0	1	0	8	0	0	0
<i>Chthamalus moro</i>	1	0	0	0	0	0	0	3	0	0	0	0
<i>Tetraclita japonica</i>	746	146	43	3	0	0	45	0	0	0	0	0
<i>Tetraclita squamosa</i>	0	6	9	2	0	0	0	0	1	0	0	0
<i>Balanus amphitrite</i>	43	2	3	9	0	0	922	6	3	0	0	0
Crab and shrimp												
<i>Clibanarius</i> sp.	0	0	0	0	0	0	17	0	6	0	15	0
<i>Gaetice</i> sp.	0	0	0	0	0	35	2	6	3	0	0	0
<i>Grapsus albolineatus</i>	0	0	0	0	0	0	0	0	0	0	3	0
<i>Hemigrapsus</i> sp.	0	0	0	0	0	0	0	0	1	0	1	2
<i>Hippa pacifica</i>	0	0	0	0	1	0	0	0	0	0	0	0
<i>Leptodius exaratus</i>	0	0	0	0	0	3	0	0	0	0	4	0
<i>Petrolishthes japonicus</i>	0	0	0	0	0	0	0	0	0	0	9	0
<i>Grapsus albolineatus</i>	0	0	0	0	0	0	0	0	0	0	3	0
Others												
<i>Cypraea arabicus</i>	0	0	0	0	0	0	1	0	0	0	1	0

Species	I-O (rocky A)	I-O (rocky B)	I-O (seawall)	I-I (rocky)	I-I (sandy)	I-I (pebble)	I-F (rocky)	I-F (sandy)	I-T (rocky)	I-T (sandy)	I-L (rocky)	I-L (sandy)
<i>Haliplanella lineata</i>	0	0	0	1	0	0	1	0	0	0	0	0
<i>Spheractis cheungae</i>	0	0	0	0	0	0	1	0	0	0	0	0
<i>Ligia exotica</i>	0	0	0	0	0	39	2	0	0	0	0	0
<i>Anthocidaris crassipina</i>	1	0	0	0	0	0	0	0	5	0	0	0
<i>Salmacis sphaeroides</i>	0	0	0	0	0	1	0	0	0	0	0	0
<i>Styela plicata</i>	0	0	0	0	0	0	2	0	3	0	0	0

Appendix 13 Spot Check Dive Survey Results

First Spot Check Survey

Coral Species	D-L	D-E	D-T	D-W	D-I	D-O	D-F	Commonness in Hong Kong
Depth (m)	3.9m	5.4m	4.4m	2.9m	3.0m	4.6m	5.6m	
Hard Coral								
<i>Acropora solitaryensis</i>				x				Uncommon
<i>Cyphastrea serailia</i>	x			x	x	x		Dominant
<i>Favia speciosa</i>			x	x	x	x		Abundant
<i>Favia fавus</i>			x	x				Common
<i>Favia lizardensis</i>				x				Common
<i>Favia veroni</i>						x		Abundant
<i>Favia rotumana</i>			x	x		x		Abundant
<i>Favites abdita</i>				x	x	x	x	Dominant
<i>Favites chinensis</i>					x	x		Dominant
<i>Favites flexuosa</i>			x	x	x			Uncommon
<i>Favites pentagona</i>			x	x		x		Dominant
<i>Goniastrea aspera</i>				x		x	x	Common
<i>Coscinaraea sp.</i>			x	x			x	Undescribed
<i>Goniopora stutchburyi</i>			x	x	x		x	Common
<i>Montipora peltiformis</i>			x		x	x		Common

Coral Species	D-L	D-E	D-T	D-W	D-I	D-O	D-F	Commonness in Hong Kong
<i>Oulastrea crispata</i>	x		x		x	x	x	Common
<i>Pavona decussata</i>				x				Abundant
<i>Platygyra carnosus</i>				x				Common
<i>Plesiastrea versipora</i>			x	x		x		Abundant
<i>Porites lutea</i>		x	x		x	x		Dominant
<i>Psammocora haimeana</i>			x	x				Uncommon
<i>Psammocora superficialis</i>	x		x	x		x	x	Abundant
<i>Turbinaria peltata</i>			x		x			Common
Gorgonian								
<i>Guaiagorgia</i> sp.							x	Common
Total No. of Coral Species	3	1	14	17	10	13	7	
Approximate Coral Coverage (%)	<1	<1	<10	5 to 10	5 to 10	5 to 10	<5	

Second Spot Check Survey

Coral Species	D-L	D-E	D-T	D-W	D-I	D-O	D-F	Commonness in Hong Kong

Coral Species	D-L	D-E	D-T	D-W	D-I	D-O	D-F	Commonness in Hong Kong
Depth (m)	3.9m	5.4m	4.4m	2.9m	3.0m	4.6m	5.6m	
Hard Coral								
<i>Acropora solitaryensis</i>								Uncommon
<i>Cyphastrea serailia</i>	x			x	x	x		Dominant
<i>Favia speciosa</i>			x	x	x	x		Abundant
<i>Favia fавus</i>			x	x				Common
<i>Favia lizardensis</i>				x				Common
<i>Favia veroni</i>						x		Abundant
<i>Favia rotumana</i>			x	x		x		Abundant
<i>Favites abdita</i>				x	x	x	x	Dominant
<i>Favites chinensis</i>					x	x		Dominant
<i>Favites flexuosa</i>			x	x				Uncommon
<i>Favites pentagona</i>			x	x		x		Dominant
<i>Goniastrea aspera</i>				x		x	x	Common
<i>Coscinaraea sp.</i>			x					Undescribed
<i>Goniopora stutchburyi</i>			x	x	x		x	Common
<i>Montipora peltiformis</i>			x		x	x		Common
<i>Oulastrea crispata</i>	x		x		x	x	x	Common
<i>Pavona decussata</i>				x				Abundant
<i>Platygyra carnosus</i>				x				Common

Coral Species	D-L	D-E	D-T	D-W	D-I	D-O	D-F	Commonness in Hong Kong
<i>Plesiastrea versipora</i>				x		x		Abundant
<i>Porites lutea</i>		x	x		x	x		Dominant
<i>Psammocora haimeana</i>			x					Uncommon
<i>Psammocora superficialis</i>	x		x	x		x	x	Abundant
<i>Turbinaria peltata</i>			x		x			Common
Gorgonian								
<i>Guaiagorgia</i> sp.							x	Common
Total No. of Coral Species	3	1	13	14	9	13	6	
Approximate Coral Coverage (%)	<1	<1	<10	5 to 10	5 to 10	5 to 10	<5	

Appendix 14 REA Dive Survey Results

REA Data – First REA Survey

Ecological and Substratum Attributes

SITE	D-I	D-O	D-W
Ecological Attributes	Rank	Rank	Rank
Hard Corals	1	1	1
Dead Coral	0	0	0
Octocoral	0	0	0
Sea anemone beds	0	0	0
Dead Standing Corals	0	0	0
Other Benthos	1	1	1
Macroalgae	0	0	0
Substrate			
Bedrock	4	4	5
Boulders (diameter >50cm)	3	4	2
Cobbles (diameter <50cm)	2	2	1
Rubble (dead corals)	0	0	0

SITE	D-I	D-O	D-W
Ecological Attributes	Rank	Rank	Rank
Sand with gravel	1	1	1
Mud & Silt	0	0	0

Taxon Abundance

SITE	D-I	D-O	D-W
Benthic Communities	Abundance in the Site	Abundance in the Site	Abundance in the Site
Hard Corals			
<i>Cyphastrea serailia</i>	1	1	1
<i>Favia speciosa</i>	1	1	1
<i>Favia lizardensis</i>			1
<i>Favites abdita</i>	1	1	1
<i>Favites chinensis</i>	1	1	1
<i>Oulastrea crispata</i>	1	1	1
<i>Pavona decussata</i>			1
<i>Platygyra carnosus</i>		1	
<i>Plesiastrea versipora</i>		1	

SITE	D-I	D-O	D-W
Benthic Communities	Abundance in the Site	Abundance in the Site	Abundance in the Site
<i>Porties lutea</i>	1		1
<i>Psammocora superficialis</i>		1	
<i>Turbinaria peltata</i>			1
Other Benthos			
<i>Thais luteostoma</i>	1	1	1
<i>Septifer virgatus</i>	1	1	1
<i>Anthocidaris crassispina</i>	1	1	1
<i>Diadema sp.</i>	1	1	1
Coral %:	>5%	>5%	>5%

REA Data – Second REA Survey

Ecological and Substratum Attributes

SITE	D-I	D-O	D-W
Ecological Attributes	Rank	Rank	Rank
Hard Corals	1	1	1
Dead Coral	0	0	0
Octocoral	0	0	0
Sea anemone beds	0	0	0
Dead Standing Corals	0	0	0
Other Benthos	1	1	1
Macroalgae	0	0	0
Substrate			
Bedrock	4	5	5
Boulders (diameter >50cm)	3	3	2
Cobbles (diameter <50cm)	2	2	1
Rubble (dead corals)	0	0	0
Sand with gravel	1	1	1
Mud & Silt	0	0	0

Taxon Abundance

SITE	D-I	D-O	D-W
Benthic Communities	Abundance in the Site	Abundance in the Site	Abundance in the Site
Hard Corals			
<i>Cyphastrea serailia</i>	1	1	1
<i>Favia lizardensis</i>			
<i>Favia speciosa</i>		1	1
<i>Favites abdita</i>	1	1	1
<i>Favites chinensis</i>	1	1	1
<i>Oulastrea crispata</i>	1	1	1
<i>Platygyra carnosus</i>		1	
<i>Plesiastrea versipora</i>			
<i>Porties lutea</i>	1		1
<i>Psammocora superficialis</i>		1	
<i>Turbinaria peltata</i>			1
Other Benthos			
<i>Thais luteostoma</i>	1	1	1
<i>Septifer virgatus</i>	1	1	1

SITE	D-I	D-O	D-W
Benthic Communities	Abundance in the Site	Abundance in the Site	Abundance in the Site
<i>Anthocidaris crassispina</i>	1	1	1
<i>Diadema</i> sp.	1	1	1
Coral %:	>5%	>5%	>5%

Appendix 15 Abundance of Subtidal Benthos species Recorded at Each Sampling Location within the Study Area during Dry Season (replicates of sub-stations are pooled together).

Phylum	Class	Order	Family	Species	B-O	B-I	B-T	B-B	B-L	B-F
Annelida	Polychaeta	Phyllodocida	Nephtyidae	<i>Aglaophamus dibranchis</i>	5	1	18	12	5	10
Arthropoda	Crustacea	Decapoda	Alpheidae	<i>Alpheus</i> sp.	15	0	2	0	3	0
Annelida	Polychaeta	Terebellida	Terebellidae	<i>Amaeana trilobata</i>	20	18	30	15	4	11
Annelida	Polychaeta	Opheliida	Opheliidae	<i>Amandia intermedia</i>	5	7	0	0	0	0
Echinodermata	Stelleroidea	Ophiurida	Amphiuridae	<i>Amphioplus laevis</i>	2	3	0	0	1	0
Mollusca	Bivalvia	Myoida	Corbulidae	<i>Anisocorbula scaphoides</i>	6	2	2	9	3	1
Annelida	Polychaeta	Orbiniida	Orbiniidae	<i>Anoides oxycephala</i>	1	0	0	0	0	0
Sipuncula	Phascolosomatidea	Phascolosomaliformes	Phascolosomatidae	<i>Apionsoma trichocephalus</i>	3	1	1	9	2	0
Arthropoda	Crustacea	Tanaidacea	Aspeudidae	<i>Apseudes</i> sp.	0	6	1	0	0	0
Mollusca	Gastropoda	Nudibnanchia	Arminidae	<i>Armina babai</i>	1	0	0	0	0	0
Mollusca	Bivalvia	Veneroida	Mesodesmatidae	<i>Atactodea striata</i>	0	3	0	2	0	0
Annelida	Polychaeta	Phyllodocida	Chrysopetalidae	<i>Bhawania goodei</i>	1	0	0	0	0	0
Chordata	Amphioxii	Amphioxiformes	Amphioxidae	<i>Branchiostoma belcheri</i>	1	0	0	0	0	0
Arthropoda	Crustacea	Amphipoda	Ampeliscidae	<i>Byblis</i> sp.	21	30	2	2	0	1
Arthropoda	Crustacea	Astacidea	Callianassidae	<i>Callianassa japonica</i>	2	4	1	2	3	3
Mollusca	Bivalvia	Pholadomyoida	Cuspidariida	<i>Cardiomya singaporensis</i>	0	0	1	0	0	0
Nemertinea	Anopla	Heteronemertea	Cerebratulidae	<i>Cerebratulina</i> sp.	5	7	3	4	2	5
Mollusca	Gastropoda	Mesogastropoda	Potamididae	<i>Cerithidea</i> sp.	0	1	0	0	0	0
Arthropoda	Crustacea	Decapoda	Portunidae	<i>Charybdis variegata</i>	1	2	0	0	1	1

Phylum	Class	Order	Family	Species	B-O	B-I	B-T	B-B	B-L	B-F
Mollusca	Bivalvia	Veneroida	Veneridae	<i>Circe tumefacta</i>	0	1	0	0	0	0
Arthropoda	Crustacea	Amphipoda	Corophiidae	<i>Corophium</i> sp.	0	1	0	0	0	0
Annelida	Polychaeta	Cossurida	Cossuridae	<i>Cossurella dimorpha</i>	0	0	0	4	1	0
Mollusca	Bivalvia	Pholadomyoida	Cuspidariidae	<i>Cuspidaria corrugata</i>	0	0	0	1	0	0
Annelida	Polychaeta	Capitellida	Capitellidae	<i>Dasybrachus caducus</i>	2	0	0	0	0	0
Annelida	Polychaeta	Eunicida	Dorvilleidae	<i>Dorvillea</i> sp.	2	0	0	0	0	0
Mollusca	Gastropoda	Cephalaspidea	Tricliidae	<i>Eocylichna braunsi</i>	1	0	2	0	0	1
Annelida	Polychaeta	Capitellida	Maldanidae	<i>Euclymene</i> sp.	0	0	0	0	0	1
Annelida	Polychaeta	Eunicida	Eunicidae	<i>Eunice indica</i>	20	1	0	0	0	0
Annelida	Polychaeta	Phyllodocida	Syllidae	<i>Eusyllis</i> sp.	1	0	0	0	0	0
Arthropoda	Crustacea	Decapoda	Palaemonidae	<i>Exopalaemon</i> sp.	0	1	0	0	0	0
Mollusca	Bivalvia	Veneroida	Cardiidae	<i>Fulvia bullata</i>	2	3	0	2	2	1
Arthropoda	Crustacea	Decapoda	Galatheidae	<i>Galathea orientalis</i>	1	0	0	0	0	0
Annelida	Polychaeta	Phyllodocida	Polynoidae	<i>Gattyana</i> sp.	3	0	1	0	0	0
Annelida	Polychaeta	Phyllodocida	Glyceridae	<i>Glycera onomichiensis</i>	2	6	0	2	2	1
Annelida	Polychaeta	Phyllodocida	Goniadidae	<i>Glycinde gurjanovae</i>	1	1	3	0	0	0
Annelida	Polychaeta	Phyllodocida	Goniadidae	<i>Goniada japonica</i>	0	2	0	0	0	0
Cnidaria	Anthozoa	Gorgonacea	Ellisellidae	<i>Junceella</i> sp.	0	0	0	1	0	0
Mollusca	Bivalvia	Veneroida	Cardiidae	<i>Laevicardium</i> sp.	0	0	0	0	1	0
Annelida	Polychaeta	Spionida	Spionidae	<i>Laonice cirrata</i>	3	0	1	0	1	1
Annelida	Polychaeta	Phyllodocida	Hesionidae	<i>Leocrates chinensis</i>	2	0	1	1	1	0

Phylum	Class	Order	Family	Species	B-O	B-I	B-T	B-B	B-L	B-F
Annelida	Polychaeta	Phyllodocida	Polynoidae	<i>Lepidonotus</i> sp.	0	0	0	0	1	0
Platyhelminthes	Turbellaria	Polycladida	Leptoplanidae	<i>Leptoplana</i> sp.	0	0	1	0	3	0
Mollusca	Bivalvia	Pterioida	Limidae	<i>Limaria perfragilis</i>	1	0	0	0	0	0
Annelida	Polychaeta	Terebellida	Terebellidae	<i>Loimia medusa</i>	2	3	1	0	0	0
Annelida	Polychaeta	Eunicida	Lumbrineridae	<i>Lumbrineris</i> sp.	6	1	1	2	0	0
Annelida	Polychaeta	Spionida	Magelonidae	<i>Magelona pacifica</i>	0	2	1	0	0	0
Annelida	Polychaeta	Eunicida	Eunicidae	<i>Marphysa stragulum</i>	2	9	0	1	0	0
Annelida	Polychaeta	Capitellida	Capitellidae	<i>Mediomastus californiensis</i>	0	1	1	0	0	0
Mollusca	Bivalvia	Veneroida	Mactridae	<i>Meropesta pellucida</i>	0	0	1	0	0	0
Mollusca	Bivalvia	Veneroida	Tellinidae	<i>Moerella culter</i>	0	1	0	1	0	0
Mollusca	Bivalvia	Veneroida	Tellinidae	<i>Moerella jedoensis</i>	0	1	0	0	0	0
Mollusca	Bivalvia	Mytiloida	Mytilidae	<i>Musculus japonica</i>	0	1	0	2	0	0
Annelida	Polychaeta	Phyllodocida	Nephtyidae	<i>Nephtys oligobranchia</i>	0	7	0	0	0	0
Annelida	Polychaeta	Phyllodocida	Nereidae	<i>Nereis</i> sp.	1	3	0	0	1	1
Mollusca	Bivalvia	Veneroida	Tellinidae	<i>Nitidotellina iridella</i>	0	3	0	8	0	1
Mollusca	Bivalvia	Veneroida	Tellinidae	<i>Nitidotellina minuta</i>	1	4	0	0	0	0
Annelida	Polychaeta	Capitellida	Capitellidae	<i>Notomastus latericens</i>	0	5	2	1	0	0
Mollusca	Bivalvia	Nuculoida	Nuculidae	<i>Nucula faba</i>	1	0	1	0	0	0
Annelida	Polychaeta	Eunicida	Onuphidae	<i>Onuphis eremita</i>	0	3	0	1	0	0
Annelida	Polychaeta	Opheliida	Opheliidae	<i>Ophelina grandis</i>	2	4	6	3	2	6
Annelida	Polychaeta	Oweniida	Oweniidae	<i>Owenia fusformis</i>	0	1	0	0	0	0

Phylum	Class	Order	Family	Species	B-O	B-I	B-T	B-B	B-L	B-F
Mollusca	Bivalvia	Veneroida	Veneridae	<i>Paphia undulata</i>	0	0	1	0	0	0
Annelida	Polychaeta	Phyllodocida	Lacydoniidae	<i>Paralacydonia paradoxa</i>	1	1	0	0	0	0
Annelida	Polychaeta	Spionida	Spionidae	<i>Paraprionospio pinnata</i>	2	1	1	0	0	0
Annelida	Polychaeta	Terebellida	Pectinoridae	<i>Pectinaria</i> sp.	3	2	1	4	0	4
Arthropoda	Malacostraca	Decapoda	Porcellanidae	<i>Petrolisthes japonicus</i>	1	0	0	0	0	0
Sipuncula	Phascolosomatidea	Phascolosomaliformes	Phascolosomatidae	<i>Phascolosoma</i> sp.	1	0	0	0	0	0
Annelida	Polychaeta	Flabelligerida	Flabelligeridae	<i>Pherusa parmata</i>	0	0	3	0	0	0
Mollusca	Gastropoda	Cephalaspidea	Philinidae	<i>Philine japonica</i>	1	3	11	2	0	2
Annelida	Polychaeta	Phyllodocida	Phyllodocidae	<i>Phyllodoce malmgreni</i>	1	0	0	0	1	0
Annelida	Polychaeta	Phyllodocida	Pilargiidae	<i>Pilargis</i> sp.	0	0	1	0	0	0
Annelida	Polychaeta	Terebellida	Terebellidae	<i>Pista cristata</i>	0	1	2	0	0	0
Mollusca	Gastropoda	Pleurobranchidae	Pleurobranchaea	<i>Pleurobranchaea brock</i>	0	0	0	0	1	0
Annelida	Polychaeta	Spionida	Poecilochaetidae	<i>Poecilochaetus serpens</i>	0	1	0	0	0	0
Annelida	Polychaeta	Spionida	Spionidae	<i>Polydora</i> sp.	0	1	0	0	0	0
Mollusca	Gastropoda	Heteropoda	Naticidae	<i>Polynices mammata</i>	0	0	0	0	1	0
Arthropoda	Malacostraca	Decapoda	Portunidae	<i>Portunus hastatoides</i>	0	0	0	1	0	0
Annelida	Polychaeta	Sabellida	Sabellariidae	<i>Potamilla</i> sp.	7	0	0	0	0	0
Annelida	Polychaeta	Capitellida	Maldanidae	<i>Praxillella gracilis</i>	0	0	0	4	0	0
Annelida	Polychaeta	Spionida	Spionidae	<i>Prionospio ehlersi</i>	10	9	22	18	8	20
Annelida	Polychaeta	Spionida	Spionidae	<i>Prionospio queenslandica</i>	0	10	0	0	1	6
Echinodermata	Holothuroidea	Apoda	Synaptidae	<i>Protankyra bidentata</i>	1	0	0	0	1	1

Phylum	Class	Order	Family	Species	B-O	B-I	B-T	B-B	B-L	B-F
Mollusca	Bivalvia	Veneroida	Mactridae	<i>Raetellops pulchella</i>	0	0	3	0	0	2
Arthropoda	Crustacea	Decapoda	Porcellanidae	<i>Raphidopus ciliatus</i>	0	0	0	1	0	0
Mollusca	Bivalvia	Nuculoida	Nuculanidae	<i>Saccella cuspidata</i>	0	5	0	1	0	5
Annelida	Polychaeta	Opheliida	Scalibregmidae	<i>Scalibregma inflatum</i>	3	2	1	0	0	0
Mollusca	Bivalvia	Arcoida	Arcidae	<i>Scapharca satowi</i>	3	0	0	1	0	0
Chordata	Actinopterygii	Perciformes	Periophthalmidae	<i>Scartelaos histophorus</i>	1	0	0	0	0	0
Annelida	Polychaeta	Spionida	Spionidae	<i>Scolelepis squamata</i>	0	0	1	0	0	1
Annelida	Polychaeta	Orbiniida	Orbiniidae	<i>Scoloplos</i> sp.	0	3	2	0	2	2
Annelida	Polychaeta	Phyllodocida	Pilargiidae	<i>Sigambra hanaokai</i>	0	0	1	0	0	0
Mollusca	Bivalvia	Veneroida	Solenidae	<i>Solen dunkerianus</i>	0	0	0	1	0	0
Annelida	Polychaeta	Sternaspida	Sternaspidae	<i>Sternaspis sculata</i>	1	0	6	7	1	1
Annelida	Polychaeta	phyllodocimorpha	Sigalionidae	<i>Sthenolepis japonica</i>	5	2	7	5	1	1
Echinodermata	Echinoidea	Camarodonta	Temnopleuridae	<i>Temnopleurus toreumaticus</i>	2	1	12	8	3	16
Annelida	Polychaeta	Terebellida	Trichobranchidae	<i>Terebellides stroemii</i>	9	0	8	0	3	0
Annelida	Polychaeta	Spionida	Cirratulidae	<i>Tharyx</i> sp.	1	0	1	0	0	2
Mollusca	Bivalvia	Veneroida	Semelidae	<i>Theora lata</i>	22	25	127	42	4	37
Mollusca	Bivalvia	Veneroida	Veneridae	<i>Timoclea imbricata</i>	0	3	5	2	0	0
Mollusca	Bivalvia	Pholadomyoida	Thraciidae	<i>Trachycardium impolitum</i>	1	0	0	0	0	0
Arthropoda	Crustacea	Decapoda	Penaeidae	<i>Trachypenaeus</i> sp.	10	0	0	0	0	0
Mollusca	Bivalvia	Pholadomyoida	Thraciidae	<i>Trigonothracia jinxiingae</i>	1	0	0	0	0	0
Chordata	Osteichthyes	Perciformes	Taenioididae	<i>Trypauchen vagina</i>	0	0	1	1	2	0

Phylum	Class	Order	Family	Species	B-O	B-I	B-T	B-B	B-L	B-F
Arthropoda	Crustacea	Decapoda	Pilumnidae	<i>Typhlocarcinus nudus</i>	3	5	1	4	0	5
Arthropoda	Crustacea	Decapoda	Pilumnidae	<i>Typhlocarcinus villosus</i>	1	0	7	0	0	0
Cnidaria	Antuozoa	Pennatulacea	Virgulariidae	<i>Virgularia gustaviana</i>	0	0	1	0	0	0

Appendix 16 Biomass of Subtidal Benthos species Recorded at Each Sampling Location within the Study Area during Dry Season (replicates of sub-stations are pooled together).

Phylum	Class	Order	Family	Species	B-O	B-I	B-T	B-B	B-L	B-F
Annelida	Polychaeta	Phyllodocida	Nephtyidae	<i>Aglaophamus dibranchis</i>	0.0269	0.0045	0.1413	0.1347	0.0248	0.1242
Arthropoda	Crustacea	Decapoda	Alpheidae	<i>Alpheus</i> sp.	0.9586	0	0.0479	0	0.4328	0
Annelida	Polychaeta	Terebellida	Terebellidae	<i>Amaeana trilobata</i>	0.1021	0.1642	0.2039	0.0876	0.029	0.1188
Annelida	Polychaeta	Opheliida	Opheliidae	<i>Amandia intermedia</i>	0.0104	0.0205	0	0	0	0
Echinodermata	Stelleroidea	Ophiurida	Amphiuridae	<i>Amphioplus laevis</i>	0.074	0.0733	0.0045	0.0006	0.0048	0.0099
Mollusca	Bivalvia	Myoida	Corbulidae	<i>Anisocorbula scaphoides</i>	0.0999	0.0353	0.0153	0.1486	0.063	0.0222
Annelida	Polychaeta	Orbiniida	Orbiniidae	<i>Anoides oxycephala</i>	0.0032	0	0	0	0	0
Sipuncula	Phascolosomatidea	Phascolosomaliformes	Phascolosomatidae	<i>Apionsoma trichocephalus</i>	0.0257	0.0019	0.0039	0.0215	0.0046	0
Arthropoda	Crustacea	Tanaidacea	Aspeudidae	<i>Apseudes</i> sp.	0	0.0046	0.0018	0	0	0
Mollusca	Gastropoda	Nudibnanchia	Arminidae	<i>Armina babai</i>	0.0147	0	0	0	0	0
Mollusca	Bivalvia	Veneroida	Mesodesmatidae	<i>Atactodea striata</i>	0	0.0765	0	0.023	0	0
Annelida	Polychaeta	Phyllodocida	Chrysopetalidae	<i>Bhawania goodei</i>	0.0004	0	0	0	0	0
Chordata	Amphioxi	Amphioxiformes	Amphioxidae	<i>Branchiostoma belcheri</i>	0.0004	0	0	0	0	0
Arthropoda	Crustacea	Amphipoda	Ampeliscidae	<i>Byblis</i> sp.	0.0702	0.0264	0.0032	0.0007	0	0.0003
Arthropoda	Crustacea	Astacidea	Callianassidae	<i>Callianassa japonica</i> .	0.0069	0.1215	0.0081	0.0288	0.3027	0.1437
Mollusca	Bivalvia	Pholadomyoidea	Cuspidariida	<i>Cardiomya singaporensis</i>	0	0	0.0303	0	0	0
Nemertinea	Anopla	Heteronemertea	Cerebratulidae	<i>Cerebratulina</i> sp.	0.0156	0.1008	0.0539	0.0423	0.0162	0.2178
Mollusca	Gastropoda	Mesogastropoda	Potamididae	<i>Cerithidea</i> sp.	0	0.0057	0	0	0	0
Arthropoda	Crustacea	Decapoda	Portunidae	<i>Charybdis variegata</i>	0.7658	0.7381	0	0	0.0417	0.0886

Phylum	Class	Order	Family	Species	B-O	B-I	B-T	B-B	B-L	B-F
Mollusca	Bivalvia	Veneroida	Veneridae	<i>Circe tumefacta</i>	0	7.5702	0	0	0	0
Arthropoda	Crustacea	Amphipoda	Corophiidae	<i>Corophium</i> sp.	0	0.0005	0	0	0	0
Annelida	Polychaeta	Cossurida	Cossuridae	<i>Cossurella dimorpha</i>	0	0	0	0.0229	0.004	0
Mollusca	Bivalvia	Pholadomyoidea	Cuspidariidae	<i>Cuspidaria corrugata</i>	0	0	0	0.0594	0	0
Annelida	Polychaeta	Capitellida	Capitellidae	<i>Dasybrachus caducus</i>	0.6387	0	0	0	0	0
Annelida	Polychaeta	Eunicida	Dorvilleidae	<i>Dorvillea</i> sp.	0.0025	0	0	0	0	0
Mollusca	Gastropoda	Cephalaspidea	Tricliidae	<i>Eocylichna braunsi</i>	0.0182	0	0.0708	0	0	0.0176
Annelida	Polychaeta	Capitellida	Maldanidae	<i>Euclymene</i> sp.	0	0	0	0	0	0.0002
Annelida	Polychaeta	Eunicida	Eunicidae	<i>Eunice indica</i>	0.2764	0.0074	0	0	0	0
Annelida	Polychaeta	Phyllodocida	Syllidae	<i>Eusyllis</i> sp.	0.0032	0	0	0	0	0
Arthropoda	Crustacea	Decapoda	Palaemonidae	<i>Exopalaemon</i> sp.	0	0.0004	0	0	0	0
Mollusca	Bivalvia	Veneroida	Cardiidae	<i>Fulvia bullata</i>	0.3059	6.0398	0	0.6673	0.7824	0.2725
Arthropoda	Crustacea	Decapoda	Galatheidae	<i>Galathea orientalis</i>	0.5826	0	0	0	0	0
Annelida	Polychaeta	Phyllodocida	Polynoidae	<i>Gattyana</i> sp.	0.0308	0	0.0009	0	0	0
Annelida	Polychaeta	Phyllodocida	Glyceridae	<i>Glycera onomichiensis</i>	0.0254	0.035	0	0.0217	0.0087	0.0169
Annelida	Polychaeta	Phyllodocida	Goniadidae	<i>Glycinde gurjanovae</i>	0.0014	0.0001	0.0202	0	0	0
Annelida	Polychaeta	Phyllodocida	Goniadidae	<i>Goniada japonica</i>	0	0.0039	0	0	0	0
Cnidaria	Anthozoa	Gorgonacea	Ellisellidae	<i>Junceella</i> sp.	0	0	0	0.0016	0	0
Mollusca	Bivalvia	Veneroida	Cardiidae	<i>Laevicardium</i> sp.	0	0	0	0	0.1053	0
Annelida	Polychaeta	Spionida	Spionidae	<i>Laonice cirrata</i>	0.0665	0	0.0071	0	0.0083	1.1036
Annelida	Polychaeta	Phyllodocida	Hesionidae	<i>Leocrates chinensis</i>	0.0645	0	0.01	0.0279	0.0257	0

Phylum	Class	Order	Family	Species	B-O	B-I	B-T	B-B	B-L	B-F
Annelida	Polychaeta	Phyllodocida	Polynoidae	<i>Lepidonotus</i> sp.	0	0	0	0	0.0014	0
Platyhelminthes	Turbellaria	Polycladida	Leptoplanidae	<i>Leptoplana</i> sp.	0	0	0.0459	0	0.0494	0
Mollusca	Bivalvia	Pterioida	Limidae	<i>Limaria perfragilis</i>	0.0023	0	0	0	0	0
Annelida	Polychaeta	Terebellida	Terebellidae	<i>Loimia medusa</i>	0.0486	0.3562	0.0035	0	0	0
Annelida	Polychaeta	Eunicida	Lumbrineridae	<i>Lumbrineris</i> sp.	0.0195	0.0043	0.0035	0.011	0	0
Annelida	Polychaeta	Spionida	Magelonidae	<i>Magelona pacifica</i>	0	0.0025	0.01	0	0	0
Annelida	Polychaeta	Eunicida	Eunicidae	<i>Marphysa stragulum</i>	0.0513	0.1568	0	0.0493	0	0
Annelida	Polychaeta	Capitellida	Capitellidae	<i>Mediomastus californiensis</i>	0	0.0012	0.0058	0	0	0
Mollusca	Bivalvia	Veneroida	Mactridae	<i>Meropesta pellucida</i>	0	0	0.0809	0	0	0
Mollusca	Bivalvia	Veneroida	Tellinidae	<i>Moerella culter</i>	0	0.0114	0	0.006	0	0
Mollusca	Bivalvia	Veneroida	Tellinidae	<i>Moerella jedoensis</i>	0	0.0045	0	0	0	0
Mollusca	Bivalvia	Mytiloida	Mytilidae	<i>Musculus japonica</i>	0	0.0886	0	0.0456	0	0
Annelida	Polychaeta	Phyllodocida	Nephtyidae	<i>Nephtys oligobranchia</i>	0	0.0204	0	0	0	0
Annelida	Polychaeta	Phyllodocida	Nereidae	<i>Nereis</i> sp.	0.0018	0.016	0	0	0.1383	0.0085
Mollusca	Bivalvia	Veneroida	Tellinidae	<i>Nitidotellina iridella</i>	0	0.3513	0	0.388	0	0.0598
Mollusca	Bivalvia	Veneroida	Tellinidae	<i>Nitidotellina minuta</i>	0.0105	0.2836	0	0	0	0
Annelida	Polychaeta	Capitellida	Capitellidae	<i>Notomastus latericens</i>	0	0.0197	0.0542	0.0106	0	0
Mollusca	Bivalvia	Nuculoida	Nuculidae	<i>Nucula faba</i>	0.0097	0	0.0048	0	0	0
Annelida	Polychaeta	Eunicida	Onuphidae	<i>Onuphis eremita</i>	0	0.0569	0	0.0115	0	0
Annelida	Polychaeta	Opheliida	Opheliidae	<i>Ophelina grandis</i>	0.1385	0.007	0.3757	0.2735	0.2253	0.5858
Annelida	Polychaeta	Oweniida	Oweniidae	<i>Owenia fusiformis</i>	0	0.0026	0	0	0	0

Phylum	Class	Order	Family	Species	B-O	B-I	B-T	B-B	B-L	B-F
Mollusca	Bivalvia	Veneroida	Veneridae	<i>Paphia undulata</i>	0	0	2.5278	0	0	0
Annelida	Polychaeta	Phyllodocida	Lacydoniidae	<i>Paralacydonia paradoxa</i>	0.0001	0.0004	0	0	0	0
Annelida	Polychaeta	Spionida	Spionidae	<i>Paraprionospio pinnata</i>	0.0074	0.0127	0.0005	0	0	0
Annelida	Polychaeta	Terebellida	Pectinariidae	<i>Pectinaria</i> sp.	0.0157	0.0223	0.0196	0.0499	0	0.0256
Arthropoda	Malacostraca	Decapoda	Porcellanidae	<i>Petrolisthes japonicus</i>	0.0155	0	0	0	0	0
Sipuncula	Phascolosomatidea	Phascolosomaliformes	Phascolosomatidae	<i>Phascolosoma</i> sp.	0.009	0	0	0	0	0
Annelida	Polychaeta	Flabelligerida	Flabelligeridae	<i>Pherusa parmata</i>	0	0	0.0807	0	0	0
Mollusca	Gastropoda	Cephalaspidea	Philinidae	<i>Philine japonica</i>	0.0062	0.0236	0.0994	0.0672	0	0.0072
Annelida	Polychaeta	Phyllodocida	Phyllodocidae	<i>Phyllodoce malmgreni</i>	0.0001	0	0	0	0.0019	0
Annelida	Polychaeta	Phyllodocida	Pilargiidae	<i>Pilargis</i> sp.	0	0	0.0025	0	0	0
Annelida	Polychaeta	Terebellida	Terebellidae	<i>Pista cristata</i>	0	0.0155	0.0162	0	0	0
Mollusca	Gastropoda	Pleurobranchidae	Pleurobranchaea	<i>Pleurobranchaea brock</i>	0	0	0	0	0.1675	0
Annelida	Polychaeta	Spionida	Poecilochaetidae	<i>Poecilochaetus serpens</i>	0	0.0015	0	0	0	0
Annelida	Polychaeta	Spionida	Spionidae	<i>Polydora</i> sp.	0	0.0001	0	0	0	0
Mollusca	Gastropoda	Heteropoda	Naticidae	<i>Polynices mammata</i>	0	0	0	0	0.2798	0
Arthropoda	Malacostraca	Decapoda	Portunidae	<i>Portunus hastatoides</i>	0	0	0	1.4097	0	0
Annelida	Polychaeta	Sabellida	Sabellariidae	<i>Potamilla</i> sp.	0.0514	0	0	0	0	0
Annelida	Polychaeta	Capitellida	Maldanidae	<i>Praxillella gracilis</i>	0	0	0	0.0101	0	0
Annelida	Polychaeta	Spionida	Spionidae	<i>Prionospio ehlersi</i>	0.0933	0.0292	0.1105	0.1743	0.0537	0.144
Annelida	Polychaeta	Spionida	Spionidae	<i>Prionospio queenslandica</i>	0	0.0609	0	0	0.004	0.0494
Echinodermata	Holothuroidea	Apoda	Synaptidae	<i>Protankyra bidentata</i>	0.026	0	0	0	0.0157	0.0036

Phylum	Class	Order	Family	Species	B-O	B-I	B-T	B-B	B-L	B-F
Mollusca	Bivalvia	Veneroida	Macluridae	<i>Raetellops pulchella</i>	0	0	0.048	0	0	0.1811
Arthropoda	Crustacea	Decapoda	Porcellanidae	<i>Raphidopus ciliatus</i>	0	0	0	0.4027	0	0
Mollusca	Bivalvia	Nuculoida	Nuculanidae	<i>Saccella cuspidata</i>	0	0.1292	0	0.025	0	0.2872
Annelida	Polychaeta	Opheliida	Scalibregmidae	<i>Scalibregma inflatum</i>	0.0191	0.0052	0.0021	0	0	0
Mollusca	Bivalvia	Arcoidea	Arcidae	<i>Scapharca satowi</i>	0.1908	0	0	0.2422	0	0
Chordata	Actinopterygii	Perciformes	Periophthalmidae	<i>Scartelaos histophorus</i>	0.2595	0	0	0	0	0
Annelida	Polychaeta	Spionida	Spionidae	<i>Scolecopsis squamata</i>	0	0	0.0033	0	0	0.0028
Annelida	Polychaeta	Orbiniida	Orbiniidae	<i>Scoloplos</i> sp.	0	0.076	0.0098	0	0.0165	0.0271
Annelida	Polychaeta	Phyllodocida	Pilargiidae	<i>Sigambra hanaokai</i>	0	0	0.0005	0	0	0
Mollusca	Bivalvia	Veneroida	Solenidae	<i>Solen dunkerianus</i>	0	0	0	0.0263	0	0
Annelida	Polychaeta	Sternaspida	Sternaspidae	<i>Sternaspis sculata</i>	0.0105	0	0.03	0.0534	0.0023	0.0086
Annelida	Polychaeta	phyllodocimorpha	Sigalionidae	<i>Sthenolepis japonica</i>	0.7461	0.0501	0.3544	0.4182	0.0191	0.0138
Echinodermata	Echinoidea	Camarodonta	Temnopleuridae	<i>Temnopleurus toreumaticus</i>	0.1425	0.429	8.8795	5.803	0.9584	7.4979
Annelida	Polychaeta	Terebellida	Trichobranchidae	<i>Terebellides stroemii</i>	0.0934	0	0.0582	0	0.0013	0
Annelida	Polychaeta	Spionida	Cirratulidae	<i>Tharyx</i> sp.	0.0074	0	0.0016	0	0	0.0085
Mollusca	Bivalvia	Veneroida	Semelidae	<i>Theora lata</i>	0.321	0.4688	2.582	1.0373	0.0811	0.8737
Mollusca	Bivalvia	Veneroida	Veneridae	<i>Timoclea imbricata</i>	0	0.0832	0.0208	0.1051	0	0
Mollusca	Bivalvia	Pholadomyoidea	Thraciidae	<i>Trachycardium impositum</i>	37.4135	0	0	0	0	0
Arthropoda	Crustacea	Decapoda	Penaeidae	<i>Trachypenaeus</i> sp.	0.1505	0	0	0	0	0
Mollusca	Bivalvia	Pholadomyoidea	Thraciidae	<i>Trigonothracia jinxiingae</i>	0.0233	0	0	0	0	0
Chordata	Osteichthyes	Perciformes	Taenioididae	<i>Trypauchen vagina</i>	0	0	0.3208	0.3564	0.7232	0

Phylum	Class	Order	Family	Species	B-O	B-I	B-T	B-B	B-L	B-F
Arthropoda	Crustacea	Decapoda	Pilumnidae	<i>Typhlocarcinus nudus</i>	0.9459	0.6224	0.5412	0.2455	0	0.2723
Arthropoda	Crustacea	Decapoda	Pilumnidae	<i>Typhlocarcinus villosus</i>	0.0652	0	0.4574	0	0	0
Cnidaria	Antuozoa	Pennatulacea	Virgulariidae	<i>Virgularia gustaviana</i>	0	0	0.0017	0	0	0

Appendix 17 Abundance of Subtidal Benthos species Recorded at Each Sampling Location within the Study Area during Wet Season (replicates of sub-stations are pooled together).

Phylum	Class	Order	Family	Species	B-O	B-I	B-T	B-B	B-L	B-F
Annelida	Polychaeta	Phyllodocida	Nephtyidae	<i>Aglaophamus dibranchis</i>	8	30	28	7	11	49
Annelida	Polychaeta	Phyllodocida	Nephtyidae	<i>Aglaophamus sinensis</i>	1	0	0	0	0	0
Arthropoda	Crustacea	Decapoda	Alpheidae	<i>Alpheus</i> sp.	64	27	25	20	12	9
Annelida	Polychaeta	Terebellida	Terebellidae	<i>Amaeana trilobata</i>	197	81	77	72	54	0
Annelida	Polychaeta	Terebellida	Ampharetidae	<i>Ampharete acutifrons</i>	0	0	0	2	0	0
Annelida	Polychaeta	Amphinomida	Amphinomidae	<i>Amphinome rostrata</i>	0	1	2	0	0	0
Echinodermata	Stelleroidea	Ophiurida	Amphiuridae	<i>Amphioplus laevis</i>	1	2	1	4	1	0
Mollusca	Bivalvia	Arcoida	Arcidae	<i>Anadara clathrata</i>	0	0	1	0	0	0
Mollusca	Bivalvia	Myoida	Corbulidae	<i>Anisocorbula scaphoides</i>	0	3	0	2	4	0
Sipuncula	Phascolosomatidea	Phascolosomaliformes	Phascolosomatidae	<i>Apionsoma trichocephalus</i>	12	29	6	105	7	3
Mollusca	Bivalvia	Veneroida	Tellinidae	<i>Apolymetis meyeri</i>	0	0	0	0	1	0
Annelida	Polychaeta	Orbiniida	Paraonidae	<i>Aricidea fragilis</i>	1	0	0	0	1	0
Mollusca	Bivalvia	Veneroida	Mesodesmatidae	<i>Atactodea striata</i>	1	8	0	8	0	0
Chordata	Amphioxi	Amphioxiformes	Amphioxidae	<i>Branchiostoma belcheri</i>	1	0	0	0	0	0
Annelida	Polychaeta	Phyllodocida	Chrysopetalidae	<i>Bhawania goodei</i>	2	0	0	0	0	0
Annelida	Polychaeta	Flabelligerida	Flabelligeridae	<i>Brada villosa</i>	0	1	0	0	0	0
Arthropoda	Crustacea	Amphipoda	Ampeliscidae	<i>Byblis</i> sp.	431	43	94	53	129	5
Arthropoda	Crustacea	Astacidea	Callianassidae	<i>Callianassa japonica</i>	2	7	4	6	2	7
Arthropoda	Crustacea	Decapoda	Ocypodidae	<i>Camptandrium sexdentatum</i>	0	0	0	0	0	0

Phylum	Class	Order	Family	Species	B-O	B-I	B-T	B-B	B-L	B-F
Nemertinea	Anopla	Heteronemertea	Cerebratulidae	<i>Cerebratulina</i> sp.	7	6	6	5	6	22
Arthropoda	Crustacea	Decapoda	Portunidae	<i>Charybdis variegata</i>	4	0	0	1	0	0
Annelida	Polychaeta	Cossurida	Cossuridae	<i>Cossurella dimorpha</i>	1	0	1	7	1	0
Mollusca	Gastropoda	Mesogastropoda	Calyptraeidae	<i>Crepidula onyx</i>	0	0	1	0	0	0
Mollusca	Bivalvia	Pholadomyoidea	Cuspidariidae	<i>Cuspidaria corrugata</i>	0	3	0	0	0	0
Annelida	Polychaeta	Capitellida	Capitellidae	<i>Dasybranchus caducus</i>	1	0	0	0	0	0
Arthropoda	Crustacea	Decapoda	Diogenidae	<i>Diogenes</i> sp.	1	0	0	0	0	0
Annelida	Polychaeta	Eunicida	Dorvilleidae	<i>Dorvillea</i> sp.	1	1	0	0	0	0
Annelida	Polychaeta	Eunicida	Arabellidae	<i>Drilonereis filum</i>	0	0	0	0	1	0
Arthropoda	Crustacea	Cumacea	Bodotriidae	<i>Eocuma lata</i>	0	1	0	2	1	2
Annelida	Polychaeta	Capitellida	Maldanidae	<i>Euclymene</i> sp.	2	5	4	1	5	0
Arthropoda	Malacostraca	Decapoda	Goneplacidae	<i>Eucrate haswelli</i>	2	0	0	0	0	0
Annelida	Polychaeta	Eunicida	Eunicidae	<i>Eunice indica</i>	64	7	0	3	3	1
Annelida	Polychaeta	Phyllodocida	Syllidae	<i>Eusyllis</i> sp.	5	0	0	1	2	0
Mollusca	Bivalvia	Veneroidea	Cardiidae	<i>Fulvia bullata</i>	0	4	3	0	0	0
Annelida	Polychaeta	Phyllodocida	Polynoidae	<i>Gattyana</i> sp.	4	4	0	5	0	0
Annelida	Polychaeta	Phyllodocida	Glyceridae	<i>Glycera chirori</i>	4	1	1	1	0	3
Annelida	Polychaeta	Phyllodocida	Glyceridae	<i>Glycera onomichiensis</i>	0	3	0	1	2	2
Annelida	Polychaeta	Phyllodocida	Goniadidae	<i>Glycinde gurjanovae</i>	0	9	6	11	5	1
Arthropoda	Crustacea	Decapoda	Pinnotheridae	<i>Indopinixia sipunculana</i>	0	1	1	0	0	0
Arthropoda	Crustacea	Cumacea	Bodotriidae	<i>Iphione</i> sp.	1	1	0	0	0	0

Phylum	Class	Order	Family	Species	B-O	B-I	B-T	B-B	B-L	B-F
Cnidaria	Anthozoa	Gorgonacea	Ellisellidae	<i>Junceella</i> sp.	1	0	0	0	0	0
Annelida	Polychaeta	Spionida	Spionidae	<i>Laonice cirrata</i>	2	0	1	3	6	0
Annelida	Polychaeta	Phyllodocida	Hesionidae	<i>Leocrates chinensis</i>	1	1	3	2	1	2
Annelida	Polychaeta	Nereidida	Nereidae	<i>Leonnates persica</i>	0	0	2	0	0	0
Annelida	Polychaeta	Phyllodocida	Polynoidae	<i>Lepidonotus</i> sp.	8	2	7	5	5	1
Mollusca	Polyplacophora	Neoloricata	Ischnochitonidae	<i>Lepidozona corearica</i>	4	0	0	0	0	0
Platyhelminthes	Turbellaria	Polycladida	Leptoplanidae	<i>Leptoplana</i> sp.	1	0	0	0	0	2
Arthropoda	Malacostraca	Decapoda	Xanthidae	<i>Liomera margaritata</i>	1	0	0	0	0	0
Mollusca	Bivalvia	Veneroida	Lucinidae	<i>Lucina edemtula</i>	0	0	0	2	0	0
Annelida	Polychaeta	Terebellida	Terebellidae	<i>Loimia medusa</i>	5	4	6	8	2	4
Annelida	Polychaeta	Eunicida	Lumbrineridae	<i>Lumbrineris latericeus</i>	0	1	0	0	0	0
Annelida	Polychaeta	Eunicida	Lumbrineridae	<i>Lumbrineris</i> sp.	24	11	19	9	5	5
Arthropoda	Crustacea	Decapoda	Macrophthalmidae	<i>Macrophthalmus latreillei</i>	0	0	1	0	0	0
Annelida	Polychaeta	Spionida	Magelonidae	<i>Magelona cincta</i>	0	0	0	1	1	0
Annelida	Polychaeta	Spionida	Magelonidae	<i>Magelona pacifica</i>	0	6	3	6	2	0
Mollusca	Bivalvia	Veneroida	Cardiidae	<i>Maoricardium mansittii</i>	0	1	0	0	0	0
Annelida	Polychaeta	Eunicida	Eunicidae	<i>Marphysa sanguinea</i>	19	19	31	32	11	1
Annelida	Polychaeta	Eunicida	Eunicidae	<i>Marphysa stragulum</i>	0	0	0	0	1	0
Annelida	Polychaeta	Capitellida	Capitellidae	<i>Mediomastus californiensis</i>	5	20	0	19	1	11
Annelida	Polychaeta	Terebellida	Ampharetidae	<i>Melinna cristata</i>	0	1	0	0	0	0
Arthropoda	Crustacea	Decapoda	Penaeidae	<i>Metapenaeus ensis</i>	0	1	0	1	1	0

Phylum	Class	Order	Family	Species	B-O	B-I	B-T	B-B	B-L	B-F
Annelida	Polychaeta	Phyllodocida	Hesionidae	<i>Micropodarke dubia</i>	5	6	8	6	0	3
Mollusca	Bivalvia	Mytiloida	Mytilidae	<i>Modiolus flavidus</i>	0	1	0	0	0	0
Mollusca	Bivalvia	Veneroida	Tellinidae	<i>Moerella iridescens</i>	0	12	7	0	1	5
Mollusca	Bivalvia	Veneroida	Tellinidae	<i>Moerella jedoensis</i>	0	0	0	1	0	0
Arthropoda	Crustacea	Decapoda	Xenophthalmidae	<i>Neoxenophthalmus obscurus</i>	8	2	7	3	0	3
Annelida	Polychaeta	Phyllodocida	Nephtyidae	<i>Nephtys oligobranchia</i>	0	0	0	0	17	10
Annelida	Polychaeta	Phyllodocida	Nereidae	<i>Nereis</i> sp.	13	5	2	19	0	0
Mollusca	Bivalvia	Veneroida	Tellinidae	<i>Nitidotellina iridella</i>	0	8	0	3	0	0
Annelida	Polychaeta	Capitellida	Capitellidae	<i>Notomastus latericens</i>	3	5	11	15	4	4
Mollusca	Bivalvia	Nuculoida	Nuculidae	<i>Nucula faba</i>	2	5	0	0	0	0
Arthropoda	Crustacea	Decapoda	Leucosiidae	<i>Nursia minor</i>	0	0	0	0	1	0
Arthropoda	Crustacea	Decapoda	Ogyrididae	<i>Ogyrides striaticauda</i>	0	0	1	0	4	2
Arthropoda	Crustacea	Stomatopoda	Squillidae	<i>Oratosquilla oratoria</i>	0	1	0	0	0	0
Annelida	Polychaeta	Opheliida	Opheliidae	<i>Ophelina grandis</i>	3	1	4	2	7	3
Annelida	Polychaeta	Phyllodocida	Hesionidae	<i>Ophiodromus angustifrons</i>	0	0	0	0	1	0
Mollusca	Bivalvia	Veneroida	Veneridae	<i>Paphia undulata</i>	1	0	0	0	1	1
Annelida	Polychaeta	Phyllodocida	Lacydoniidae	<i>Paralacydonia paradoxa</i>	6	10	5	6	6	0
Arthropoda	Crustacea	Amphipoda	Ingolfiellidae	<i>Paranthura japonica</i>	0	0	1	0	0	0
Annelida	Polychaeta	Orbiniida	Paraonidae	<i>Paraonis gracilis</i>	0	3	0	3	0	0
Annelida	Polychaeta	Spionida	Spionidae	<i>Paraprionospio pinnata</i>	11	6	2	1	0	7
Annelida	Polychaeta	Terebellida	Pectenaridae	<i>Pectinaria</i> sp.	0	0	0	1	0	0

Phylum	Class	Order	Family	Species	B-O	B-I	B-T	B-B	B-L	B-F
Chordata	Osteichthyes	Perciformes	Taenioididae	<i>Periophthalmus modestus</i>	2	4	0	0	0	0
Sipuncula	Phascolosomatidea	Phascolosomaliformes	Phascolosomatidae	<i>Phascolosoma</i> sp.	0	0	0	0	0	1
Annelida	Polychaeta	Flabelligerida	Flabelligeridae	<i>Pherusa plumosa</i>	1	0	1	1	2	0
Mollusca	Gastropoda	Cephalaspidea	Philinidae	<i>Philine japonica</i>	4	22	20	19	6	13
Annelida	Polychaeta	Phyllodocida	Phyllodocidae	<i>Phyllodoce malmgreni</i>	27	2	1	1	0	1
Arthropoda	Crustacea	Decapoda	Porcellanidae	<i>Pisidia</i> sp.	2	0	0	0	0	0
Chordata	Actinopterygii	Anguilliformes	Ophichthyidae	<i>Pisoodonophis boro</i>	0	0	1	0	0	1
Annelida	Polychaeta	Terebellida	Terebellidae	<i>Pista cristata</i>	3	0	1	0	0	0
Mollusca	Gastropoda	Notaspidea	Pleurobranchidae	<i>Pleurobranchaea brock</i>	0	0	2	0	0	0
Annelida	Polychaeta	Spionida	Poecilochaetidae	<i>Poecilochaetus serpens</i>	3	21	3	22	5	2
Annelida	Polychaeta	Spionida	Spionidae	<i>Polydora</i> sp.	8	5	0	2	1	0
Annelida	Polychaeta	Sabellida	Sabellariidae	<i>Potamilla</i> sp.	0	0	1	0	0	0
Annelida	Polychaeta	Capitellida	Maldanidae	<i>Praxillella gracilis</i>	1	4	12	10	4	1
Annelida	Polychaeta	Spionida	Spionidae	<i>Prionospio cirrifera</i>	0	1	0	0	0	0
Annelida	Polychaeta	Spionida	Spionidae	<i>Prionospio ehlersi</i>	90	153	81	51	52	99
Mollusca	Bivalvia	Veneroida	Mactridae	<i>Raetellops pulchella</i>	2	2	0	0	0	0
Arthropoda	Crustacea	Decapoda	Porcellanidae	<i>Raphidopas ciliatus</i>	1	4	1	2	0	0
Mollusca	Bivalvia	Nuculoida	Nuculanidae	<i>Saccella cuspidata</i>	1	3	3	5	3	0
Mollusca	Bivalvia	Nuculoida	Nuculanidae	<i>Saccella confusa</i>	1	0	0	0	0	0
Annelida	Polychaeta	Terebellida	Ampharetidae	<i>Samytha sexcirrata</i>	0	0	0	0	1	0
Mollusca	Bivalvia	Nuculoida	Nuculanidae	<i>Sarepta speciosa</i>	0	1	0	0	0	0

Phylum	Class	Order	Family	Species	B-O	B-I	B-T	B-B	B-L	B-F
Annelida	Polychaeta	Opheliida	Scalibregmidae	<i>Scalibregma inflatum</i>	1	4	2	12	4	0
Mollusca	Bivalvia	Arcoida	Arcidae	<i>Scapharca satowi</i>	1	0	0	0	0	0
Annelida	Polychaeta	Spionida	Spionidae	<i>Scolelepis squamata</i>	0	1	1	0	0	0
Annelida	Polychaeta	Orbiniida	Orbiniidae	<i>Scoloplos</i> sp.	1	0	2	2	4	0
Annelida	Polychaeta	Phyllodocida	Pilargiidae	<i>Sigambra hanaokai</i>	3	28	9	17	9	22
Mollusca	Bivalvia	Myoida	Corbulidae	<i>Solidicorbula erythroden</i>	0	0	1	0	0	0
Annelida	Polychaeta	Sternaspida	Sternaspidae	<i>Sternaspis sculata</i>	3	14	9	14	21	2
Annelida	Polychaeta	Phyllodocida	Sigalionidae	<i>Sthenolepis japonica</i>	0	0	4	3	4	6
Mollusca	Gastropoda	Mesogastropoda	Strombidae	<i>Strombus marginatus</i>	1	0	0	0	0	0
Arthropoda	Crustacea	Isopoda	Idotheidae	<i>Syniotea laeacidorsalis</i>	0	2	0	0	0	0
Annelida	Polychaeta	Terebellida	Trichobranchidae	<i>Terebellides stroemii</i>	3	17	18	24	10	3
Euchiura	Euchiurida	Echiuroinea	Euchiuridae	<i>Thalassema mortenseni</i>	2	2	0	0	1	3
Annelida	Polychaeta	Spionida	Cirratulidae	<i>Tharyx</i> sp.	30	29	7	38	11	45
Mollusca	Bivalvia	Veneroidea	Semelidae	<i>Theora lata</i>	8	27	23	1	1	29
Mollusca	Bivalvia	Veneroidea	Veneridae	<i>Timoclea imbricata</i>	1	4	0	1	3	0
Mollusca	Bivalvia	Pholadomyoidea	Thraciidae	<i>Trigonothracia jinxingae</i>	0	3	1	0	0	0
Arthropoda	Crustacea	Decapoda	Macrophthalmidae	<i>Tritodynamia</i> sp.	0	2	0	0	0	0
Chordata	Osteichthyes	Perciformes	Taenioididae	<i>Trypauchen vagina</i>	0	0	1	2	3	4
Arthropoda	Crustacea	Decapoda	Pilumnidae	<i>Typhlocarcinus nudus</i>	26	20	10	13	6	5
Arthropoda	Crustacea	Decapoda	Pilumnidae	<i>Typhlocarcinus villosus</i>	0	1	6	1	3	2

Appendix 18 Biomass of Subtidal Benthos species Recorded at Each Sampling Location within the Study Area during Wet Season (replicates of sub-stations are pooled together).

Phylum	Class	Order	Family	Species	B-O	B-I	B-T	B-B	B-L	B-F
Annelida	Polychaeta	Phyllodocida	Nephtyidae	<i>Aglaophamus dibranchis</i>	0.0265	0.1523	0.2315	0.0144	0.0583	0.3537
Annelida	Polychaeta	Phyllodocida	Nephtyidae	<i>Aglaophamus sinensis</i>	0.0679	0	0	0	0	0
Arthropoda	Crustacea	Decapoda	Alpheidae	<i>Alpheus</i> sp.	0.9555	0.6858	0.2839	0.4993	0.1284	0.2589
Annelida	Polychaeta	Terebellida	Terebellidae	<i>Amaeana trilobata</i>	3.9586	2.2139	2.2326	1.8052	2.8065	0
Annelida	Polychaeta	Terebellida	Ampharetidae	<i>Ampharete acutifrons</i>	0	0	0	0.0011	0	0
Annelida	Polychaeta	Amphinomida	Amphinomidae	<i>Amphinome rostrata</i>	0	0.0109	0.0065	0	0	0
Echinodermata	Stellerioidea	Ophiurida	Amphiuridae	<i>Amphioplus laevis</i>	0.0166	0.0315	0.0007	0.095	0.015	0
Mollusca	Bivalvia	Arcoida	Arcidae	<i>Anadara clathrata</i>	0	0	1.778	0	0	0
Mollusca	Bivalvia	Myoida	Corbulidae	<i>Anisocorbula scaphoides</i>	0	0.0542	0	0.0365	0.1101	0
Sipuncula	Phascolosomatidea	Phascolosomaliformes	Phascolosomatidae	<i>Apionsoma trichocephalus</i>	0.0277	0.0392	0.0392	0.2244	0.0222	0
Mollusca	Bivalvia	Veneroida	Tellinidae	<i>Apolymetis meyeri</i>	0	0	0	0	0.1486	0
Annelida	Polychaeta	Orbiniida	Paraonidae	<i>Aricidea fragilis</i>	0.0004	0	0	0	0.0002	0
Mollusca	Bivalvia	Veneroida	Mesodesmatidae	<i>Atactodea striata</i>	0.1789	0.2504	0	0.2859	0	0
Chordata	Amphioxi	Amphioxiformes	Amphioxidae	<i>Branchiostoma belcheri</i>	0.0004	0	0	0	0	0
Annelida	Polychaeta	Phyllodocida	Chrysopetalidae	<i>Bhawania goodei</i>	0.0007	0	0	0	0	0
Annelida	Polychaeta	Flabelligerida	Flabelligeridae	<i>Brada villosa</i>	0	0.0021	0	0	0	0
Arthropoda	Crustacea	Amphipoda	Ampeliscidae	<i>Byblis</i> sp.	0.2488	0.0286	0.0707	0.0332	0.0699	0.0025
Arthropoda	Crustacea	Astacidea	Callianassidae	<i>Callianassa japonica</i>	0.0035	0.0239	0.19	0.0074	0.0876	0.0608
Arthropoda	Crustacea	Decapoda	Ocypodidae	<i>Camptandrium sexdentatum</i>	0	0	0	0	0	0

Phylum	Class	Order	Family	Species	B-O	B-I	B-T	B-B	B-L	B-F
Nemertinea	Anopla	Heteronemertea	Cerebratulidae	<i>Cerebratulina</i> sp.	0.1817	0.0506	0.0518	0.0407	0.2457	0.4823
Arthropoda	Crustacea	Decapoda	Portunidae	<i>Charybdis variegata</i>	0.0338	0	0	0.0682	0	0
Annelida	Polychaeta	Cossurida	Cossuridae	<i>Cossurella dimorpha</i>	0.0002	0	0.0054	0.0206	0.0047	0
Mollusca	Gastropoda	Mesogastropoda	Calyptraeidae	<i>Crepidula onyx</i>	0	0	0.2745	0	0	0
Mollusca	Bivalvia	Pholadomyoidea	Cuspidariidae	<i>Cuspidaria corrugata</i>	0	0.0446	0	0	0	0
Annelida	Polychaeta	Capitellida	Capitellidae	<i>Dasybranchus caducus</i>	0.0838	0	0	0	0	0
Arthropoda	Crustacea	Decapoda	Diogenidae	<i>Diogenes</i> sp.	0.0011	0	0	0	0	0
Annelida	Polychaeta	Eunicida	Dorvilleidae	<i>Dorvillea</i> sp.	0.0002	0.0027	0	0	0	0
Annelida	Polychaeta	Eunicida	Arabellidae	<i>Drilonereis filum</i>	0	0	0	0	0.0002	0
Arthropoda	Crustacea	Cumacea	Bodotriidae	<i>Eocuma lata</i>	0	0.0002	0	0.0039	0.0009	0.0055
Annelida	Polychaeta	Capitellida	Maldanidae	<i>Euclymene</i> sp.	0.0353	0.0211	0.0191	0.0029	0.0334	0
Arthropoda	Malacostraca	Decapoda	Goneplacidae	<i>Eucrate haswelli</i>	0.2208	0	0	0	0	0
Annelida	Polychaeta	Eunicida	Eunicidae	<i>Eunice indica</i>	1.4193	0.197	0	0.0151	0.0427	0.0004
Annelida	Polychaeta	Phyllodocida	Syllidae	<i>Eusyllis</i> sp.	0.0021	0	0	0.0013	0.0004	0
Mollusca	Bivalvia	Veneroidea	Cardiidae	<i>Fulvia bullata</i>	0	0.0482	0.0232	0	0	0
Annelida	Polychaeta	Phyllodocida	Polynoidae	<i>Gattyana</i> sp.	0.0244	0.0035	0	0.0342	0	0
Annelida	Polychaeta	Phyllodocida	Glyceridae	<i>Glycera chirori</i>	0.0033	0.001	0.0095	0.001	0	0.0148
Annelida	Polychaeta	Phyllodocida	Glyceridae	<i>Glycera onomichiensis</i>	0	0.0109	0	0.0023	0.0344	0.1051
Annelida	Polychaeta	Phyllodocida	Goniadidae	<i>Glycinde gurjanovae</i>	0	0.0115	0.0133	0.0115	0.0051	0.0042
Arthropoda	Crustacea	Decapoda	Pinnotheridae	<i>Indopinixia sipunculana</i>	0	0.005	0.0144	0	0	0
Arthropoda	Crustacea	Cumacea	Bodotriidae	<i>Iphione</i> sp.	0.0004	0.0002	0	0	0	0

Phylum	Class	Order	Family	Species	B-O	B-I	B-T	B-B	B-L	B-F
Cnidaria	Anthozoa	Gorgonacea	Ellisellidae	<i>Junceella</i> sp.	3.2425	0	0	0	0	0
Annelida	Polychaeta	Spionida	Spionidae	<i>Laonice cirrata</i>	1.0014	0	0.0649	0.1212	0.1494	0
Annelida	Polychaeta	Phyllodocida	Hesionidae	<i>Leocrates chinensis</i>	0.0401	0.0203	0.0149	0.0147	0.0043	0.0036
Annelida	Polychaeta	Nereidida	Nereidae	<i>Leonnates persica</i>	0	0	0.0624	0	0	0
Annelida	Polychaeta	Phyllodocida	Polynoidae	<i>Lepidonotus</i> sp.	0.0833	0.0127	0.0882	0.0709	0.1127	0.03
Mollusca	Polyplacophora	Neoloricata	Ischnochitonidae	<i>Lepidozona corearica</i>	0.0589	0	0	0	0	0
Platyhelminthes	Turbellaria	Polycladida	Leptoplanidae	<i>Leptoplana</i> sp.	0.0038	0	0	0	0	0.0043
Arthropoda	Malacostraca	Decapoda	Xanthidae	<i>Liomera margaritata</i>	0.4699	0	0	0	0	0
Mollusca	Bivalvia	Veneroida	Lucinidae	<i>Lucina edemtula</i>	0	0	0	0.0447	0	0
Annelida	Polychaeta	Terebellida	Terebellidae	<i>Loimia medusa</i>	0.1623	0.069	2.0347	1.6946	0.3327	0.9607
Annelida	Polychaeta	Eunicida	Lumbrineridae	<i>Lumbrineris latericeus</i>	0	0.0294	0	0	0	0
Annelida	Polychaeta	Eunicida	Lumbrineridae	<i>Lumbrineris</i> sp.	0.1037	0.0554	0.0455	0.0816	0.0188	0.0731
Arthropoda	Crustacea	Decapoda	Macrophthalmidae	<i>Macrophthalmus latreillei</i>	0	0	0.2138	0	0	0
Annelida	Polychaeta	Spionida	Magelonidae	<i>Magelona cincta</i>	0	0	0	0.0002	0.0004	0
Annelida	Polychaeta	Spionida	Magelonidae	<i>Magelona pacifica</i>	0	0.0052	0.0019	0.0028	0.0088	0
Mollusca	Bivalvia	Veneroida	Cardiidae	<i>Maoricardium mansittii</i>	0	11.631	0	0	0	0
Annelida	Polychaeta	Eunicida	Eunicidae	<i>Marphysa sanguinea</i>	0.1589	0.2082	0.316	0.6986	0.1694	0.0016
Annelida	Polychaeta	Eunicida	Eunicidae	<i>Marphysa stragulum</i>	0	0	0	0	0.0025	0
Annelida	Polychaeta	Capitellida	Capitellidae	<i>Mediomastus californiensis</i>	0.0053	0.0891	0	0.1342	0.0021	0.0372
Annelida	Polychaeta	Terebellida	Ampharetidae	<i>Melinna cristata</i>	0	0.0002	0	0	0	0
Arthropoda	Crustacea	Decapoda	Penaeidae	<i>Metapenaeus ensis</i>	0	0.1223	0	0.3961	0.688	0

Phylum	Class	Order	Family	Species	B-O	B-I	B-T	B-B	B-L	B-F
Annelida	Polychaeta	Phyllodocida	Hesionidae	<i>Micropodarke dubia</i>	0.0025	0.0026	0.0147	0.011	0	0.0065
Mollusca	Bivalvia	Mytiloida	Mytilidae	<i>Modiolus flavidus</i>	0	0.0489	0	0	0	0
Mollusca	Bivalvia	Veneroida	Tellinidae	<i>Moerella iridescens</i>	0	0.2581	0.1745	0	0.0244	0.5294
Mollusca	Bivalvia	Veneroida	Tellinidae	<i>Moerella jedoensis</i>	0	0	0	0.0845	0	0
Arthropoda	Crustacea	Decapoda	Xenophthalmidae	<i>Neoxenophthalmus obscurus</i>	0.2068	0.0724	0.0814	0.0175	0	0.1079
Annelida	Polychaeta	Phyllodocida	Nephtyidae	<i>Nephtys oligobranchia</i>	0	0	0	0	0.0778	0.0797
Annelida	Polychaeta	Phyllodocida	Nereidae	<i>Nereis</i> sp.	0.038	0.0739	0.3894	0.6363	0	0
Mollusca	Bivalvia	Veneroida	Tellinidae	<i>Nitidotellina iridella</i>	0	0.0689	0	0.1227	0	0
Annelida	Polychaeta	Capitellida	Capitellidae	<i>Notomastus latericens</i>	0.0203	0.0269	0.1222	0.2351	0.0643	0.069
Mollusca	Bivalvia	Nuculoida	Nuculidae	<i>Nucula faba</i>	0.0264	0.0254	0	0	0	0
Arthropoda	Crustacea	Decapoda	Leucosiidae	<i>Nursia minor</i>	0	0	0	0	0.2903	0
Arthropoda	Crustacea	Decapoda	Ogyrididae	<i>Ogyrides striaticauda</i>	0	0	0.0074	0	0.0146	0.0013
Arthropoda	Crustacea	Stomatopoda	Squillidae	<i>Oratosquilla oratoria</i>	0	0.0332	0	0	0	0
Annelida	Polychaeta	Opheliida	Opheliidae	<i>Ophelina grandis</i>	0.0177	0.0123	0.2299	0.0077	0.1289	0.1724
Annelida	Polychaeta	Phyllodocida	Hesionidae	<i>Ophiodromus angustifrons</i>	0	0	0	0	0.0016	0
Mollusca	Bivalvia	Veneroida	Veneridae	<i>Paphia undulata</i>	0.9521	0	0	0	1.005	0.3776
Annelida	Polychaeta	Phyllodocida	Lacydoniidae	<i>Paralacydonia paradoxa</i>	0.0022	0.0085	0.0037	0.0043	0.0055	0
Arthropoda	Crustacea	Amphipoda	Ingolfiellidae	<i>Paranthura japonica</i>	0	0	0.0002	0	0	0
Annelida	Polychaeta	Orbiniida	Paraonidae	<i>Paraonis gracilis</i>	0	0.0015	0	0.0027	0	0
Annelida	Polychaeta	Spionida	Spionidae	<i>Parapriospio pinnata</i>	0.0078	0.0047	0.0048	0.0011	0	0.0089
Annelida	Polychaeta	Terebellida	Pectinoridae	<i>Pectinaria</i> sp.	0	0	0	0.003	0	0

Phylum	Class	Order	Family	Species	B-O	B-I	B-T	B-B	B-L	B-F
Chordata	Osteichthyes	Perciformes	Taenioididae	<i>Periophthalmus modestus</i>	0.3901	4.9852	0	0	0	0
Sipuncula	Phascolosomatidea	Phascolosomaliformes	Phascolosomatidae	<i>Phascolosoma</i> sp.	0	0	0	0	0	0.0023
Annelida	Polychaeta	Flabelligerida	Flabelligeridae	<i>Pherusa plumosa</i>	0.0007	0	0.0394	0.0061	0.0738	0
Mollusca	Gastropoda	Cephalaspidea	Philinidae	<i>Philine japonica</i>	0.0145	0.126	0.1236	0.0577	0.0459	0.091
Annelida	Polychaeta	Phyllodocida	Phyllodocidae	<i>Phyllodoce malmgreni</i>	0.0362	0.0034	0.0015	0.0004	0	0.0334
Arthropoda	Crustacea	Decapoda	Porcellanidae	<i>Pisidia</i> sp.	0.0647	0	0	0	0	0
Chordata	Actinopterygii	Anguilliformes	Ophichthyidae	<i>Pisoodonophis boro</i>	0	0	9.6523	0	0	9.7095
Annelida	Polychaeta	Terebellida	Terebellidae	<i>Pista cristata</i>	0.0541	0	0.0311	0	0	0
Mollusca	Gastropoda	Notaspidea	Pleurobranchidae	<i>Pleurobranchaea brock</i>	0	0	0.0681	0	0	0
Annelida	Polychaeta	Spionida	Poecilochaetidae	<i>Poecilochaetus serpens</i>	0.001	0.0602	0.0248	0.0337	0.027	0.0068
Annelida	Polychaeta	Spionida	Spionidae	<i>Polydora</i> sp.	0.0027	0.0032	0	0.0041	0.0028	0
Annelida	Polychaeta	Sabellida	Sabellariidae	<i>Potamilla</i> sp.	0	0	0.01	0	0	0
Annelida	Polychaeta	Capitellida	Maldanidae	<i>Praxillella gracilis</i>	0.0087	0.0242	0.2045	0.1059	0.0759	0.021
Annelida	Polychaeta	Spionida	Spionidae	<i>Prionospio cirrifera</i>	0	0.0002	0	0	0	0
Annelida	Polychaeta	Spionida	Spionidae	<i>Prionospio ehlersi</i>	0.2891	0.5337	0.3312	0.2723	0.1442	0.2928
Mollusca	Bivalvia	Veneroida	Mactridae	<i>Raetellops pulchella</i>	0.0098	0.0357	0	0	0	0
Arthropoda	Crustacea	Decapoda	Porcellanidae	<i>Raphidopas ciliatus</i>	0.0241	0.4464	0.0073	2811	0	0
Mollusca	Bivalvia	Nuculoida	Nuculanidae	<i>Saccella cuspidata</i>	0.0079	0.0547	0.152	0.0543	4.1934	0
Mollusca	Bivalvia	Nuculoida	Nuculanidae	<i>Saccella confusa</i>	0.0071	0	0	0	0	0
Annelida	Polychaeta	Terebellida	Ampharetidae	<i>Samytha sexcirrata</i>	0	0	0	0	0.0021	0
Mollusca	Bivalvia	Nuculoida	Nuculanidae	<i>Sarepta speciosa</i>	0	0.0297	0	0	0	0

Phylum	Class	Order	Family	Species	B-O	B-I	B-T	B-B	B-L	B-F
Annelida	Polychaeta	Opheliida	Scalibregmidae	<i>Scalibregma inflatum</i>	0.0004	0.0117	0.0365	0.0274	0.0097	0
Mollusca	Bivalvia	Arcoida	Arcidae	<i>Scapharca satowi</i>	0.1548	0	0	0	0	0
Annelida	Polychaeta	Spionida	Spionidae	<i>Scolecopsis squamata</i>	0	0.1098	0.0013	0	0	0
Annelida	Polychaeta	Orbiniida	Orbiniidae	<i>Scoloplos</i> sp.	0.0011	0	0.002	0.0031	0.0054	0
Annelida	Polychaeta	Phyllodocida	Pilargiidae	<i>Sigambra hanaokai</i>	0.0031	0.0414	0.007	0.0224	0.0064	0.0293
Mollusca	Bivalvia	Myoida	Corbulidae	<i>Solidicorbula erythroden</i>	0	0	0.0183	0	0	0
Annelida	Polychaeta	Sternaspida	Sternaspidae	<i>Sternaspis sculata</i>	0.0081	0.0103	0.04	0.0478	0.136	0.0021
Annelida	Polychaeta	Phyllodocida	Sigalionidae	<i>Sthenolepis japonica</i>	0	0	0.1505	0.0187	0.0186	0.2526
Mollusca	Gastropoda	Mesogastropoda	Strombidae	<i>Strombus marginatus</i>	14.4178	0	0	0	0	0
Arthropoda	Crustacea	Isopoda	Idotheidae	<i>Syniotea laeacidorsalis</i>	0	0.002	0	0	0	0
Annelida	Polychaeta	Terebellida	Trichobranchidae	<i>Terebellides stroemii</i>	0.0108	0.4662	0.784	0.6219	0.2926	0.1082
Euchiura	Euchiurida	Echiuroinea	Euchiuridae	<i>Thalassema mortenseni</i>	0.0039	0.0066	0	0	0.0047	0.1459
Annelida	Polychaeta	Spionida	Cirratulidae	<i>Tharyx</i> sp.	0.0757	0.1098	0.0196	0.0824	0.0332	0.3735
Mollusca	Bivalvia	Veneroidea	Semelidae	<i>Theora lata</i>	0.1423	0.4719	0.5517	0.0006	0.1186	1.0013
Mollusca	Bivalvia	Veneroidea	Veneridae	<i>Timoclea imbricata</i>	0.0365	0.1468	0	0.046	0.1462	0
Mollusca	Bivalvia	Pholadomyoidea	Thraciidae	<i>Trigonothracia jinxingae</i>	0	0.0696	0.0013	0	0	0
Arthropoda	Crustacea	Decapoda	Macrophthalmidae	<i>Tritodynamia</i> sp.	0	0.0063	0	0	0	0
Chordata	Osteichthyes	Perciformes	Taenioididae	<i>Trypauchen vagina</i>	0	0	0.004	0.107	0.2703	0.9444
Arthropoda	Crustacea	Decapoda	Pilumnidae	<i>Typhlocarcinus nudus</i>	1.3992	1.1213	3.3928	1.987	2.9965	3.5348
Arthropoda	Crustacea	Decapoda	Pilumnidae	<i>Typhlocarcinus villosus</i>	0	1.2929	5.2846	0.1014	0.801	4.1271