9. Ecological Impact (Terrestrial)

9.1 Introduction

The ecological impact assessment has been conducted in accordance with the requirements of Annexes 8 and 16 of the Technical Memorandum on Environmental Impact Assessment Process (EIAO-TM) and the requirements stated in Section 3.2.1 (viii), Section 3.4.10 and Appendix F of the EIA Study Brief (No. ESB-237/2011). This chapter presents the potential terrestrial ecological impacts that may arise due to construction and operation of the WKCD project.

As confirmed with site verification, the coast along the Project Area and its vicinity is of artificial nature, with no natural coastal habitat identified. As no marine dredging will be involved in the Project, impact assessment for marine ecology is therefore considered not necessary. Nonetheless, the terrestrial fauna associated with the coastal habitat, noticeable the avifauna, is discussed in this chapter.

9.2 Ecological Legislations, Standards and Guidelines

A number of international conventions, local legislation and guidelines provide the framework for protection of species and habitats of ecological importance. Those related to this Project are:

- *Forests and Countryside Ordinance* (Cap. 96), which protects the rare plant species from selling, offering for sale, or possession illegally;
- *Wild Animals Protection Ordinance* (Cap. 170), which protects wild animals listed under the second schedule from being hunted, possession, sale or export, disturbance of their nest or egg without permission by authorized officer;
- *Protection of Endangered Species of Animals and Plants Ordinance* (Cap. 586), which regulates the import, introduction from the sea, export, re-export, and possession of specimens of a scheduled species, including the live, dead, parts or derivatives. The Ordinance applies to all activities involving endangered species which include the parties of traders, tourists and individuals;
- *Environmental Impact Assessment Ordinance* (EIAO) (Cap. 499), which specifies designated projects under the Ordinance, unless exempted, must follow the statutory environmental impact assessment (EIA) process;
- *Annexes 8 and 16 of the Technical Memorandum on Environmental Impact Assessment Process* (EIAO-TM): Annex 8 recommends the criteria for evaluating ecological impacts. Annex 16 sets out the general approach and methodology for assessment of ecological impacts arising from a project or proposal, to allow a complete and objective identification, prediction and evaluation of the potential ecological impacts;
- EIAO Guidance Note No. 7/2010 "*Ecological Baseline Survey for Ecological Assessment*", provides the general guidelines for conducting an ecological baseline survey to fulfil the requirements stipulated in the EIAO-TM in respect of ecological assessment for a proposed development;
- EIAO Guidance Note No. 10/2010 "*Methodologies for Terrestrial and Freshwater Ecological Baseline Surveys*", provides some methodologies in conducting terrestrial and freshwater ecological baseline surveys. This guidance note should be read in conjunction with EIAO Guidance Note 7/2010;
- *Town Planning Ordinance* (Cap. 131), which gives designation to country parks, conservation area, green belts, sites of special scientific interest, coastal protection area and other specified uses to promote conservation , protection and education of the valuable environment; and

- *Hong Kong Planning Standards and Guidelines Chapter* 10 (HKPSG) provides the guidelines on landscape and conservation to achieve a balance between the need for development and the need to minimise disruption of the landscape and natural resources.

9.3 Assessment Methodology

9.3.1 Study Area

The Study Area for impact assessment of terrestrial ecology covers all the areas within 500m from the Project site boundary and the areas likely to be affected by the Project. The study was firstly conducted by literature review and supplemented by on site ecological baseline surveys where it is found necessary.

9.3.2 Literature Review

The ecological baseline condition of the Study Area was collected through a combination of both literature review and updated field survey. Preliminary desktop study and literature review were conducted to investigate the existing condition within the Study Area and identify habitats or species with conservation concern. Available sources of information relevant to this Project including Government and private sector reports, published literature and academic studies were covered in the literature review.

9.3.3 Ecological Baseline Surveys

Since previous literature for this urban area is very limited, ecological baseline survey was conducted to supplement the literature review finding. The ecological baseline condition was updated through ecological field surveys, which were conducted in accordance with the requirements stated in the EIA Study Brief (No. ESB-237/2011) and guidelines stated in EIAO Guidance Note No. 7/2010 "*Ecological Baseline Survey for Ecological Assessment*" and EIAO Guidance Note No. 10/2010 "*Methodologies for Terrestrial and Freshwater Ecological Baseline Surveys*".

Habitat and vegetation surveys were conducted for 4 months (during July to December 2011) covering both wet and dry seasons within the ecological Study Area. Special attention was paid on species of conservation concern and habitats within the proposed works area where the vegetation will be directly impacted.

Habitat map of suitable scale showing the type and location of habitats recorded within the Study Area, with the overlay plot of the Project boundary was produced, as shown in **Figure 9.1**.

Fauna surveys were conducted within the Study Area for 4 months (during July to December 2011) covering both wet and dry seasons. Since the Project Area are newly created through reclamation and enclosed by developed area, the colonization of flora and fauna species are of low ecological importance. Only the highly mobile bird species would have better chance of colonization of the newly created habitat and also use the habitat for stopover ground during migration; so, the baseline survey is mainly focused on avifauna. Transect count surveys were adopted with the aid by a pair of binoculars to assist the identification of species. The transect route is indicated in **Figure 9.2**.

9.4 Baseline Conditions

9.4.1 Terrestrial Habitat and Vegetation

The Project Area is located at the West Kowloon reclamation area at the south of Austin Road West and the Western Harbour Crossing toll plaza. The site reserved for the West Kowloon Cultural District (WKCD) development is currently occupied by local roads, temporary storage/ packing facilities, a temporary promenade at the Waterfront and a number of existing infrastructure facilities such as sea water pumping station, ventilation buildings for the Western Harbour Crossing and the MTR railway line.

There are 4 types of terrestrial habitat identified in the Study Area, namely:

- Plantation;
- Open Field;
- Artificial Seawall; and
- Developed Area.

A habitat map showing the location of each type of habitat is presented in **Figure 9.1**. Representative photographs of each type of habitats are illustrated in **Appendix 9.1**. Brief descriptions of these habitat types and the dominant floral species assemble of the habitat are described as follows:

Plantation

- Plantation refers to landscape plantation. This man-made habitat comprises short shrubs and ornamental trees. This habitat is scattered at a few locations within the Project Area, mainly at the site boundary near the Western Harbour Crossing. Dominant tree species identified in these locations are common native species such as *Acacia auriculiformis*, *Ficus microcarpa* and *Hibiscus tiliaceus*, and exotic species *Leucaena leucocephala*.

Open Field

- Open field refers to bare ground or wasteland. This type of habitat is mainly identified close to West Kowloon Waterfront Promenade. It is sparsely vegetated with a few common self-seeded species, e.g. *Rhynchelytrum repens, Imperata koenigii* and *Bidens alba*.

Artificial Seawall

- The artificial seawall refers to the sloping waterfront formed by large boulders for protection of shoreline and typhoon shelter. It happens in the southwest of the WKCD site boundary and the breakwaters in the New Yau Ma Tei Typhoon Shelter. Owing to the short history of the artificial habitat, the intertidal habitat are mainly colonized by pioneer species which are common and widespread in Hong Kong coastal area.

Developed Area

- Developed areas are artificial habitats. This man-made habitat comprises the existing buildings, sitting-out area, work site, paths and roads within the Project Area. This urbanised land use is of negligible ecological importance.

- To the northwest of the Project Area is a New Yau Ma Tei Typhoon Shelter, which is enclosed by artificial breakwater structure. It is generally of low ecological value due to high level of marine traffic but sometimes used by ardeid species for foraging.

Within the Project Area, both open field and plantation habitats are of limited ecological value owing to the high level of anthropogenic disturbance, low vegetation cover, high commonness of the flora and fauna species and short history of the vegetated habitat. The fauna species associated with these two habitats are mostly common species adapted to urbanized areas. The bird species found in the site is dominated by generalist species such as Tree Sparrow, Chinese Bulbul and Black-collared Starling, which are common in urban areas.

The West Kowloon district is an urbanized area where ecological resources are limited. Habitats recorded outside the Project Area but within the Study Area comprise mainly developed area and plantation Vegetated habitat is mainly found along roadside in form of plantation and in urban park plantation, noticeably in Kowloon Park, where it is used by a small number of fauna species adapted to urbanized areas. No site of conservation importance was identified in the Study Area.

9.4.2 Terrestrial Fauna

The fauna species inhabiting the Project Area are mostly generalist species adapted to urban area, with some migratory bird species which sometimes use the fragmented vegetated habitat in urban area as temporary stopover point during their migratory journey. It is noted that open field and plantation in urban area are generally not the prime habitats for wild birds. Field surveys were conducted during July to December 2011 to verify the ecological status of the habitats.

Field surveys for avifauna were conducted on 18 July, 26 September, 30 November and 28 December 2011 covering both the wet and dry seasons, which also include bird's breeding and wintering season. The checklist of avifauna recorded within the Project Area is presented in **Appendix 9.2**. It was observed that the open field and plantation habitats within the Project Area were inhabited by a number of generalist species, such as Black-collared Starling, Eurasian Tree Sparrow, Spotted Dove, Chinese Bulbul, Red-whiskered Bulbul and Crested Myna. All of them are very common in urban area. Long-tailed Shrike and Plain Prinia are less common in urban area; both were seen in the open field area. A few migratory species including Brown Shrike, Common Blackbird, Blue Rock Thrush and Yellow-browed Warbler were seen during the surveys conducted in September to December 2011, in the period of migratory season. The low number of migratory species recorded indicates that the habitats within the Study Area are not the prime habitat for migratory birds, probably due to lack of mature vegetation and proximity to high rise buildings. With regard to raptor species, only Black Kite, which is of conservation concern, was recorded during the survey. The wintering population of Black Kite forage along Victoria Harbour, therefore it is quite common along the Victoria Harbour coast.

The southern part of the New Yau Ma Tei Typhoon Shelter lies within the 500m Study Area. Typhoon shelter is generally not an optimal habitat for avifauna but a few seashore associated species such as ardeids and Black Kite are often found foraging in the typhoon shelter. Also, a passage migrant species Whiskered Tern was recorded in autumn migration period.

To the south of the project area is Victoria Harbour which is also not a prime habitat for bird species, but ardeids species and Black Kites are also common in the area. Low density of ardeids was recorded along the coastline of Victoria Harbour whilst Black Kites are commonly found soaring over the sky of Victoria Harbour.

Kowloon Park located about 50m to the east boundary of WKCD is considered as an oasis for avifauna in the urbanized area environed by modern buildings. The park is well vegetated with various type of tall trees resembling natural habitats for wild birds. The Bird Lake within the Park also provides an artificial wetland habitat for wild waterbirds. It supports a small population of Black-crowned Night Heron and provides a sub-optimal habitat for other wild bird species. The checklist of avifauna recorded in the park during the field survey is presented in **Appendix 9.2**.

9.4.3 Habitat Evaluation

Habitats identified within the Ecological Study Area are evaluated in accordance with the guidelines set forth in the Annex 8 of the EIAO-TM. Overall ecological values for each habitat type are ranked as follows:

- High
- High-moderate
- Moderate
- Moderate-low
- Low
- Very Low

Evaluation of these habitats is given in **Table 9.1**. Each habitat is evaluated in accordance with the requirements stipulated in Annex 8, Table (2) of the EIAO-TM.

Table 9.1: Habitat Evaluation

Criteria	Developed Area	Open Field	Plantation	Artificial Seawall
Naturalness	Man-made habitat	Man-made habitat	Man-made habitat	Man-made habitat
Size	Large (within Project Area: 27.15 ha; within Study Area outside site boundary: 134.62 ha)	Small (within Project Area: 11.84 ha)	Small (within Project Area: 0.95 ha; within Study Area outside site boundary: 9.53 ha)	Small (within Project Area: 1.06 ha; outside site boundary: 0.87 ha)
Diversity	Low in both fauna and flora species diversity	Low in both fauna and flora species diversity; self-seeded flora species are common and widespread	Low in both fauna and flora species diversity	Low diversity of coastal fauna in new artificial habitat
Rarity	Habitat not rare	Common habitat	Common habitat	Common artificial habitat
Re-creatability	Readily re-creatable	Readily re-creatable	Readily re-creatable	Readily re-creatable
Fragmentation	N/A	N/A	These habitats are patchily created/ modified for urban land use	N/A
Ecological linkage	No ecological linkage	Low ecological linkage with other habitats	Low ecological linkage with other habitats	Ecological linkage to marine habitat
Potential value	Low potential value	Low potential value	Low potential value as the habitat is being maintained for urban landscaping	Low potential value
Nursery/ breeding ground	Not significant nursery/ breeding ground	Not significant nursery/ breeding ground	Not significant nursery/ breeding ground	Not significant nursery/ breeding ground

Criteria	Developed Area	Open Field	Plantation	Artificial Seawall
Age	N/A	5 – 10 years	10 years or more	10 years or more
Abundance/ Richness of wildlife	Low	Low	Low	Low
Overall Ecological Value	Very Low	Very low	Low	Low

9.5 Evaluation and Assessment of Ecological Impacts

In view of the developments proposed in Section 2, ecological impact on habitat, flora and fauna species are predicted and evaluated in accordance with Annex 16 of the EIAO-TM and the criteria set forth in Annex 8 of the EIAO-TM.

The potential ecological impact due to the construction and operation of the Project include following:

- Habitat Loss
- Indirect Impact
- Habitat Fragmentation
- Operation Phase Impact

Evaluation of the impacts is given below and a summary of the ecological impact is presented in **Table 9.2**.

9.5.1 Habitat Loss

The construction and operation of the WKCD would cause the loss of existing habitat in the West Kowloon Reclamation area. Owing to the low ecological value of the artificial habitat, the ecological impact due to the loss of open field and plantation is considered to be insignificant. With regard to avifauna, since the habitats are used by very common generalist species, the impact on avifauna due to loss of open field and plantation is also insignificant.

9.5.2 Indirect Impact

Indirect impact through construction activities may cause local disturbance to off-site habitats. Excessive noise, vibrations, dust generation and increased human activities may all contribute to disturbance impact during construction and operation phases. The fauna species occurring in urban areas can generally tolerate a high level of human disturbance, so the impact on fauna species is considered to be minimal. Given that the West Kowloon Reclamation and adjacent area are predominately urbanized area with low to very low ecological value, the impact of indirect off-site disturbance is also considered to be insignificant.

New Yau Ma Tei Typhoon Shelter

As observed in the field survey, Black Kite was commonly seen soaring high above the New Yau Ma Tei Typhoon Shelter. Although it is the only raptor of conservation concern recorded, no impact on this species is predicted as it is adapted to urbanized area along the Victoria Harbour coast.

Also commonly recorded in the New Yau Ma Tei Typhoon Shelter is the ardeid species, foraging at the breakwater or standing on boats. The New Yau Ma Tei Typhoon Shelter is not particularly important to the ardeids as this species is common along the coastline in Victoria Harbour. The ardeids at the typhoon shelter has adapted a certain level of human activities, e.g. marine traffic, therefore it is expected the indirect off-site impact to the ardeids in New Yau Ma Tei Typhoon Shelter is not significant.

During the survey in September, a group of Whiskered Tern were observed foraging over the sea around the typhoon shelter. This species is an uncommon passage migrant in Hong Kong, not of conservation concern. It is not anticipated that construction activities at the WKCD site will have any indirect impact on this species.

Victoria Harbour

Little Egret were commonly found passing and sometimes foraging along the coast of Victoria Harbour. As similar habitat is readily available in the vicinity, such as the intertidal habitat in New Yau Ma Tei Typhoon Shelter and Stonecutters Island, for their foraging activities, they are unlikely to be affected by the construction activities. Also, no indirect impact on the Black Kite recorded is predicted as it is adapted to urbanized area along the Victoria Harbour coast.

Kowloon Park

The existing buildings surrounding Kowloon Park act as a buffer zone for any potential indirect disturbance of construction of WKCD on the bird community inhabit in the Kowloon Park. In considering the Kowloon Park is at least 200m apart from the proposed construction and environed by modern buildings, and the bird community in Kowloon Park have isolated themselves from the surrounding urbanized area, the indirect disturbance on this bird community is anticipated to be of insignificant.

9.5.3 Habitat Fragmentation

Given that the Project Area neighbours with urban area and no habitat of conservation concern is identified in the Study Area, there is no ecological linkage identified in the Study Area. As such, there is no habitat fragmentation impact.

9.5.4 Potential Impacts during Operation Phase

No ecological impacts are anticipated during the operation of the proposed Project. Conversely, the Project will include a considerable amount of green area (in the proposed Park) in the form of plantation and landscape measures. The trees and landscape features which resemble natural environment will have potential contribution to ecological enhancement in the Project Area. Since the WKCD is located on waterfront, the plantation would potentially provide a stopover resting place for the birds, such as ardeid species, foraging and travelling along the Victoria Harbour. During operation phase, the fauna species inhabit in the project area will adapt to the WKCD environment, and they will locate themselves to the area with lesser disturbance, e.g. location with lesser light intensity.

Table 9.2: Summary of the potential ecological impact

Criteria	Habitat Loss	Indirect Impact (disturbance)	Habitat Fragmentation	Operation Phase
Duration	Construction Phase	Construction Phase	Construction and operation phase	Operation Phase

Criteria	Habitat Loss	Indirect Impact (disturbance)	Habitat Fragmentation	Operation Phase
Reversibility	Not Reversible	Reversible	Reversible	Not Reversible
Magnitude	Moderate-low for loss of open field of large size but of very low ecological value	Moderate	Low	Low
Impact Severity	Insignificant, the habitat to be lost is of low to very low ecological value	Insignificant, the ecological value of the urbanized area is very low	Negligible	Insignificant / potentially positive

9.6 Mitigation Measures

Since no significant ecological impact due to the WKCD development was identified, no specific ecological mitigation measures other than good site practice is required.

9.7 Residual Impacts

Since no significant ecological impact will arise from the proposed Project, no residual impact is expected without specific ecological mitigation measures.

9.8 Environmental Monitoring and Audit

The implementation of good site practices would avoid and minimize any ecological impacts to an acceptable level. No specific ecological monitoring programme is thus required for the WKCD Development.

9.9 Conclusion

The findings from the field survey and desktop review indicated that the major terrestrial habitat in the Study Area is developed area, while the rest is small amounts of open field and plantation and sloping seawall along the coastline. All these habitats are with low vegetation cover, short planting history and of low to very low ecological value. Therefore, direct ecological impact on loss of habitat is considered to be of insignificant. The indirect disturbance impact to offsite habitat is considered to be of insignificant in both construction and operation phases, since the Project Area is surrounded by urbanized area. The plantation and landscape planting included in the development plan would have potential positive contribution to the local ecology.

9.10 Reference

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