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Review of Habitat Management of Hong Kong Wetland Park

PURPOSE

This paper briefs Members on the findings and recommendations of the consultancy study on the review of habitat management of the Hong Kong Wetland Park (HKWP) commissioned by the Agriculture, Fisheries and Conservation Department (AFCD).

BACKGROUND

2. HKWP is a world-class conservation, education and tourism facility, located in the immediate vicinity to the Mai Po Inner Deep Bay Ramsar Site under the management of the AFCD. It covers some 60 hectares and is built upon an ecological mitigation area to compensate for the loss of natural habitats and minimise the impacts on the Ramsar Site due to new town development in Tin Shui Wai. There is a visitor centre of about one-hectare in HKWP equipped with exhibition galleries showcasing the functions and values of wetlands, lecture theatres, classrooms, resource centre, café and souvenir shop. The outdoor area is the recreated Wetland Reserve, including freshwater marshes, woodlands, shrublands, reedbeds and mudflat which provide important and well-managed habitats for wildlife (please see the map and photos of the habitats of the Wetland Reserve at **Annex A and B**). Part of the Wetland Reserve is not open to public to serve as conservation zones and avoid excessive disturbance to wildlife.

3. As HKWP (including the Wetland Reserve) has operated for more than 10 years, AFCD commissioned a consultancy study in 2017 to conduct a “Review on

Habitat Management and Ecological Monitoring of Hong Kong Wetland Park” (the Study) to evaluate the performance and effectiveness of habitat management measures implemented in HKWP. Ecological monitoring data of all taxa for the period 2003 – 2016 were used to analyse the ecological conditions of HKWP and review the effectiveness of habitat management measures. The study has suggested recommendations on future management measures based on the result of the Study.

REVIEW RESULT

Ecological Conditions of HKWP

4. According to the ecological monitoring data, a total of 264 species of birds, 10 species of amphibians, 30 species of reptiles, 52 species of odonates, 168 species of butterflies, 26 species of fishes, 19 species of crabs, 15 species of mammals, 5 species of fireflies and 602 species of plants (including 242 species of aquatic plants) were recorded within HKWP (please see the photos at [Annex C](#)). A number of these species recorded are of great conservation importance.

5. The spatial and temporal trends of ecological changes in the Wetland Reserve were studied based on the data collected. In the Study, it was observed that both increasing and decreasing trends could be found in the species richness and abundance of individuals of some specific species groups. For example, the abundance of the endangered Black-faced Spoonbill showed a significant increasing trend while that of Common Moorhen, a target bird species of HKWP, showed a significant declining trend.

6. Changes of bird species composition were found throughout the study period. For the summer period (i.e. April to September), it was found that ardeids and prinias were the two main bird species groups recorded at the outset of monitoring (2003-2005). The composition changed over time to domination by waders and prinias (2006-2008), and then to waders (2009-2016). For the winter period (October to March), although the bird species groups (i.e. ducks, waders, ardeids) were similar throughout the years, Black-faced Spoonbill became one of the top five species recorded in the later years of monitoring. These changes reflected the maturation of wetland habitats and their increased attractiveness to waterbirds.

7. For amphibians, there was a significant increase in their abundance in freshwater marsh throughout the years and species richness in freshwater marsh, education pond and spur pond in HKWP. As amphibians typically inhabit in water during the early stages of their life cycle, the result indicated that HKWP was

accomplishing their objectives of conserving wetland-dependent species.

8. For the insect groups, although there was a decrease in abundance, there was no significant trend observed for the species richness of odonates in general. The abundance and species richness of the wetland dependent species of butterflies showed no clear trend as well as they fluctuated throughout the years. The total abundance of the two dominant species of fireflies in (i.e. *Pyrocoelia analis* and *Pteroptyx maipo*) was analysed. A significant increasing trend was found on the abundance of *Pyrocoelia analis* during the monitoring period while that of *Pteroptyx maipo*, a mangrove-dependent species first recorded in HKWP in 2009, maintained a steady population in HKWP.

9. A total of 419 plant species were recorded within HKWP, with 15 species of conservation importance. Most of the plant species in HKWP were from plantation and found in good conditions, except a few individuals (e.g. *Ixora* sp. at Education Pond) appeared to be affected by pests. Individuals of invasive species including *Mikania micrantha* and *Leucaena leucocephala* were seen but mostly in low abundance or coverage, indicating an effective management control of these invasive species in HKWP.

Evaluation of the Effectiveness of Management Measures

10. In addition to the general improvement in habitat conditions of the Wetland Reserve since its establishment as mentioned above, the effectiveness of management measures adopted was also evaluated, so that further studies on the enhancement could be explored and considered. In the evaluation, particular target bird species were used as an indicator and the available data within the Deep Bay area were used as a reference to provide a meaningful analysis. The temporal trends of target species in HKWP were compared to the regional trends revealed from the Waterbird Count data of the Hong Kong Bird Watching Society recorded within the Deep Bay area. For example, if the temporal trend of a target species in HKWP is increasing while there is no clear trend for their respective regional data, the habitat conditions for the target species in HKWP would be considered as improved and the management measures effective. The major findings of the evaluation result is summarised in the following paragraphs.

11. The management objective for the mudflat in HKWP is to maintain a vegetation-free environment with optimised control of water level for the use of waterbirds including Black-faced Spoonbill, ducks, ardeids and shorebirds. These

waterbirds were mostly found in winters in mudflat with the shorebirds, with Common Greenshank and Marsh Sandpiper being the two most abundant bird species. The abundance of Black-faced Spoonbill in the mudflat showed a significant increasing trend. In view that the regional changes of its abundance did not vary significantly during the same time period, this indicated that the management measures in mudflat was effective for Black-faced Spoonbill.

12. For freshwater marsh, it aims to provide islands without vegetation and open water for ducks (i.e. Freshwater Marsh 2) or shallow water with dense vegetation for some secretive waterbirds like Little Grebe, White-breasted Waterhen and Common Moorhen (i.e. Freshwater Marsh 1). Temporal trends of ducks in Freshwater Marsh 2 were consistent with regional trends, indicating the management work was effective in maintaining its functions. For Freshwater Marsh 1, significant declining trend was observed for Common Moorhen while its regional population has been steady. This might reflect that the management work in Freshwater Marsh 1 has to be further enhanced for Common Moorhen.

RECOMMENDATIONS FROM THE STUDY

13. Based on the evaluation result, the study has suggested key directions for enhancement of the management measures which warranted further studies. Some of the potential areas worthy of further studies include exploring the relationship between habitat conditions and the production of larger clutches in specific bird species; the impact of different vegetation management or pattern on behaviours of target bird species; importance of different levels of water depths for target waterbird groups in wetland; and relationship between insects and attracting birds in reedbed.

14. With regard to the relationship between habitat conditions and bird clutch sizes, during the evaluation of Freshwater Marsh 1, the habitat conditions were found to be not effective enough in attracting target species such as Common Moorhen whose abundance showed significant declining trend in the marsh. Detailed habitat requirements should be studied and explored to provide suitable habitats for these species, such as recording changes in data of target species while comparing plantation in different habitat environments. If the species can produce significantly larger clutches in certain habitats (e.g. in rice fields than in marshes), the planting plan could be adjusted to provide more suitable environment for their breeding.

15. Moreover, it is note that grass-cutting and removal of weeds at the mudflat which provide feeding and roosting habitats for waders could bring relevant

behavioural change of the target species. Record of the behaviours of the target species during the bird survey could indicate how this vegetation management could have affected their behaviour.

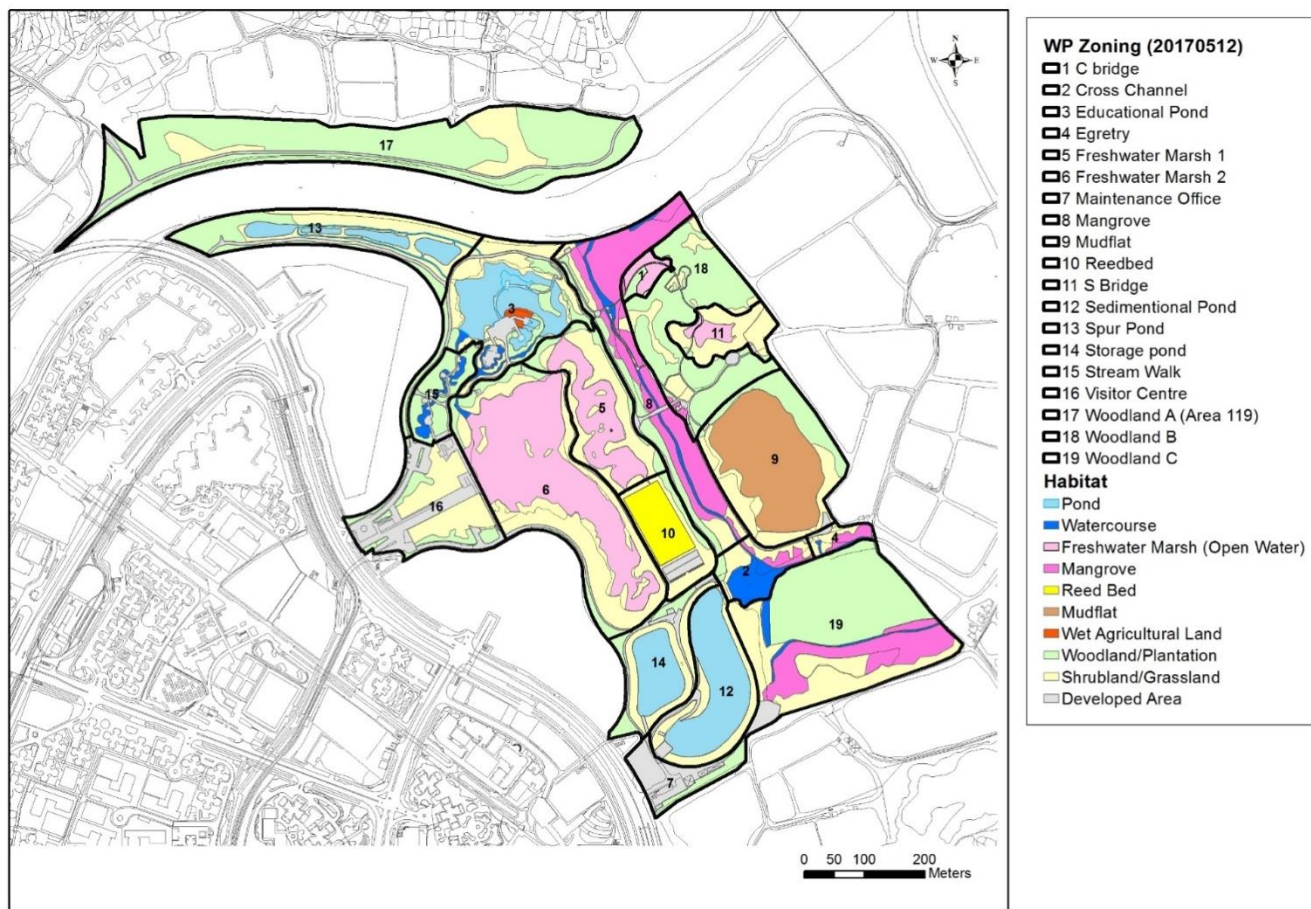
16. In addition, water depth is also an important factor affecting the utilisation of wetland habitats by waterbirds. Analysis of the relationship between water depth (or percentage exposure) of mudflat and abundance of the three target bird groups (i.e. ardeids, ducks and shorebirds) would provide useful information for management of waterbirds in the future. A survey on the profile of the water depth in the mudflat is therefore recommended to provide further information for enhancement measures. The Study has also recommended that surveys on particular insects should be conducted in relation to the reedbed in HKWP. The reedbed is designed to provide habitat for insects which in turn are important food source for birds. Evaluation of birds and insects in the area could provide the basis to enhance the management work of reedbed.

ADVICE SOUGHT

17. Members are invited to note and offer views on the findings and recommendations from the Study.






Agriculture, Fisheries and Conservation Department
Environmental Protection Department
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Habitat Map of Hong Kong Wetland Park



Habitat	Size (ha)	Percentage (%)
Woodland/Plantation	19.14	31
Shrubland/Grassland	15.50	25
Freshwater Marsh (Open Water)	5.87	10
Mangrove	4.47	7
Mudflat	2.86	5
Pond	4.96	8
Reed Bed	0.83	1
Watercourse	1.43	2
Wet Agricultural Land	0.07	0
Developed Area	5.84	10
Total	60.97	100

Photos of habitats of HKWP Wetland Reserve

<p>Freshwater Marshes</p>	<p>Shrubland</p>
	
<p>Woodland</p>	<p>Mudflat</p>
	
<p>Reedbed</p>	
	

Species photos

Birds	
<p><i>Platalea minor</i> Black-faced Spoonbill 黑臉琵鷺</p> 	<p><i>Gallinula chloropus</i> Common Moorhen 黑水雞</p> 
<p><i>Tringa nebularia</i> Common Greenshank 青腳鷸</p> 	<p><i>Tringa stagnatilis</i> Marsh Sandpiper 澤鷸</p> 
<p><i>Tachybaptus ruficollis</i> Little Grebe 小鵝鶩</p> 	<p><i>Amaurornis phoenicurus</i> White-breasted Waterhen 白胸苦惡鳥</p> 
Fireflies	

Pyrocoelia analis

大陸窗螢



Pteroptyx maipo

香港曲翅螢



Plants

Ixora spp.

龍船花

