CHAPTER 19
Habitat Restoration Resulting in the Establishment of Hampstead Wetlands Park

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Introduction

In a wetland incongruous with its surrounding industrial buildings, wildlife enthusiasts can be seen gathered on a boardwalk, under the shade of lush Rain Trees, comparing their latest observations of wildlife seen in the area. The friendly enthusiasts would kindly point out to curious onlookers, if they asked, the interesting biodiversity which can be appreciated at Hampstead Wetlands Park.

The usual resident bird species attracting the enthusiasts at the park are the Oriental Pied Hornbill (*Anthracoceros albirostris*), Banded Woodpecker (*Chrysophlegma miniaceum*), Common Flameback (*Dinopium javanense*), Coppersmith Barbet (*Psilopogon haemacephalus*), Buffy Fish Owl (*Ketupa ketupu*), and White-throated Kingfisher (*Halcyon smyrnensis*). When the migratory season arrives, the acrobatic Blue-tailed Bee-eaters (*Merops philippinus*) swoop across the wetlands, delighting many photographers with their aerial hunting moves. Other visitors include the Lesser Whistling Duck (*Dendrocygna javanica*) and Asian Openbill (*Anastomus oscitans*).

With Hampstead Wetlands Park's long list of biodiversity (which is usually associated with larger parks), one would be surprised that this park is a small 3.23-hectare constructed wetland. Jointly developed by JTC Corporation and the National Parks Board (NParks), the rustic green sanctuary provides rest and recreation for the workers from the Seletar Aerospace Park and residents in the vicinity.

The land which Hampstead Wetlands Park currently sits on was previously part of the Seletar Base Golf Club, which was closed in 2007. Its lower-lying area gradually collected run-off and the surrounding vegetation became overgrown until the park was developed in 2019.

Geography

How did Hampstead Wetlands Park attract biodiversity, despite its small size, and unlikely location within an industrial zone?

At first glance, it might appear that Hampstead Wetlands Park is an isolated spot of green amidst an otherwise industrial area. The park is located in the northern region of Singapore, on the eastern side of Lower Seletar Reservoir, and unconnected to Nature Reserves or Nature Parks such as the Central Catchment Nature Reserve, as well as the island of Pulau Ubin (Fig. 1).

Taking a closer look at the surrounding geography, Hampstead Wetlands Park is positioned within 2 kilometres of Seletar Mangroves, Seletar Wet Gap, Sungei Punggol Mangroves, and Yio Chu Kang Woods. The first three are wetlands while the fourth is a secondary forest. Together with these naturally vegetated sites, Hampstead Wetlands Park serves as an ecological "stepping stone" between biodiversity source sites such as Central Catchment Nature Reserve and Pulau Ubin. The ecological connectivity between these "stepping stones" is further enhanced and complemented by Nature Ways, Seletar West Park Connector, and other natural areas. Together, they form the Seletar Nature Corridor, which is an ecological corridor between Central Catchment Nature Reserve and Pulau Ubin.

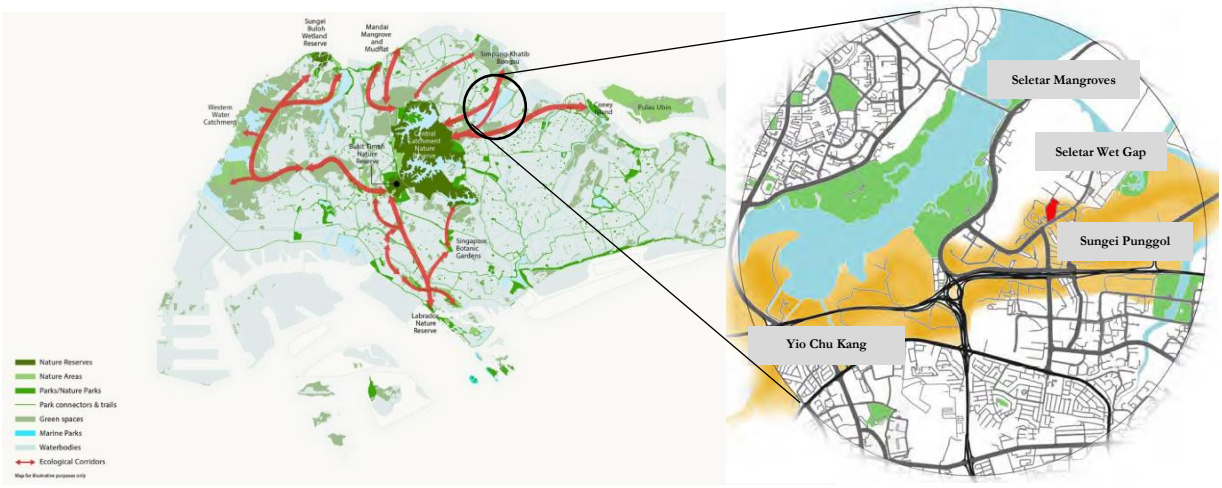


Fig. 1. A map showing possible pathways of ecological connection in Singapore, taken from an Ecological Profiling Exercise conducted as part of the Long Term Planning Review exhibition in 2022. The inset highlights the location of Hampstead Wetlands Park (red) in relation to the nearby rich biodiversity areas and Seletar Nature Corridor.

Habitat restoration during development

After a deeper understanding of the geography was obtained, the existing landscape prior to development was studied closely (Fig. 2). The pre-development landscape at Hampstead Wetlands Park could be broadly categorised into the forest core, the freshwater pond, and perimeter vegetation consisting of turf area and sparse trees.

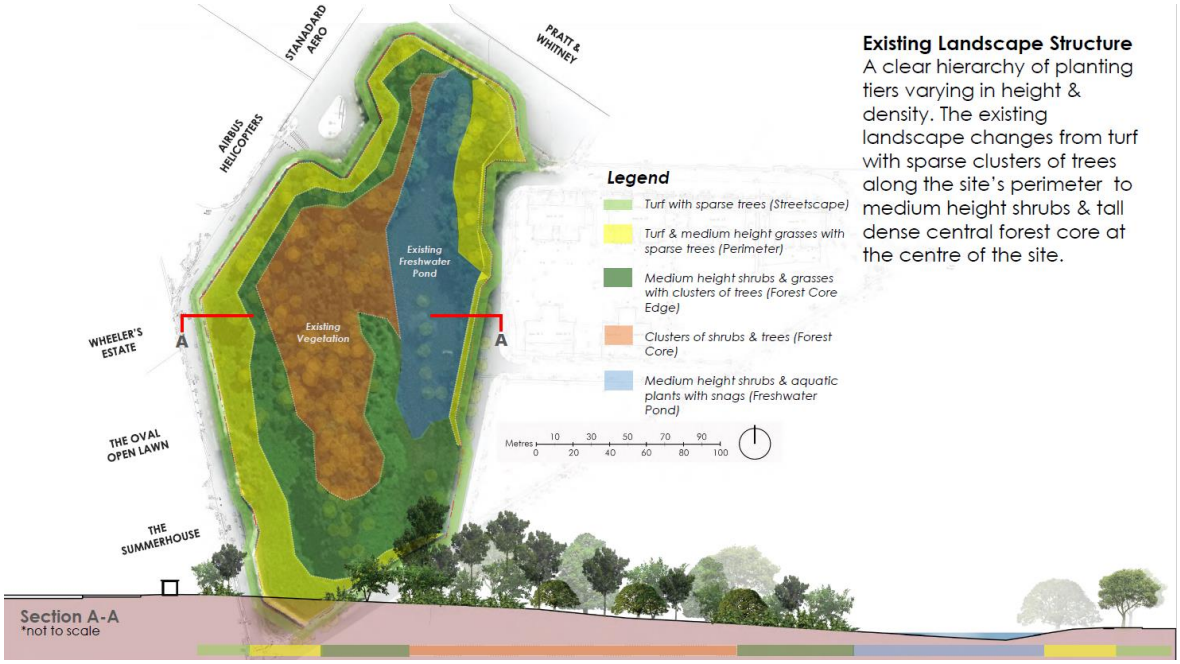
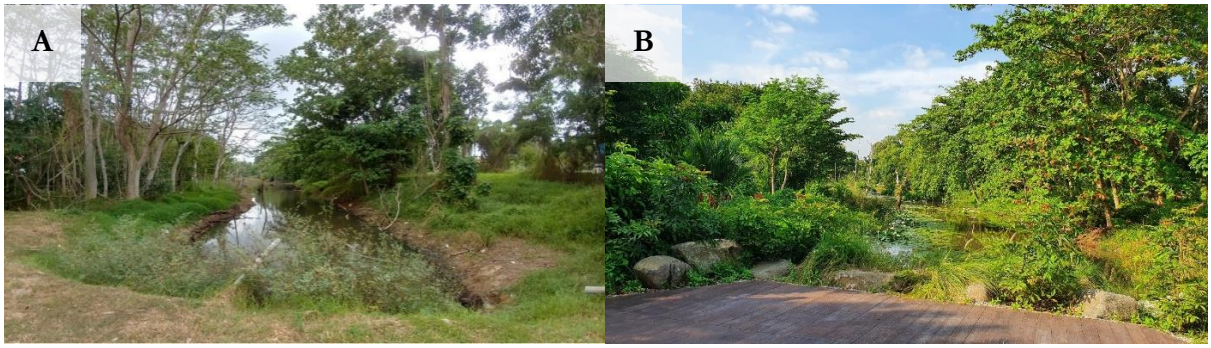


Fig. 2. Characterisation of the existing landscape at Hampstead Wetlands Park prior to development.

The forest core



Figs. 3. (A) Before development – Invasive dominated young secondary forest. The left side was dominated by Albizia trees; (B) After development – A diversity of freshwater swamp forest and tropical forest species were added into Hampstead Wetlands Park.

Prior to development, the young secondary forest which surrounded the wetlands comprised largely pioneer species and invasive species such as African Tulip (*Spathodea campanulata*), Albizia (*Falcataria moluccana*), and Leucaena (*Leucaena leucocephala*) (Fig. 3A). These tree species were known to have rapid growth in open sites which in turn dominated the landscape and could prevent the recovery of native forest on open sites (Nghiem *et al.*, 2015). These undesirable tree species were removed, and the forest was restored with largely native species to emulate the rainforest layers (Table 1).

Table 1. A list of tree and palm species planted at Hampstead Wetlands Park

Emergent	**Canopy**	**Understory**
Alstonia angustiloba	*Alstonia spatulata*	*Ardisia elliptica*
Cyrtophyllum fragrans	*Aquilaria malaccensis*	*Barringtonia asiatica*
Horsfieldia irya	*Buchanania arborescens*	*Barringtonia racemosa*
Palaquium obovatum	*Cerbera manghas*	*Eurycoma longifolia*
Pometia pinnata	*Cordia subcordata*	*Gnetum gnemon*
Sterculia macrophylla	*Cratoxylum cochinchinense*	*Ploiarium elegens*
	Cratoxylum formosum	*Syzygium borneense*
	Diospyros lanceifolia	*Syzygium zeylanicum*
	Elaeocarpus mastersii	*Tristaniopsis whiteana*
	Parkia speciosa	*Cyrtostachys renda*
	Sterculia parviflora	*Licuala spinosa*
	Syzygium syzygioides	*Oncosperma tigillarium*

Freshwater swamp forest species that could tolerate waterlogged soil or some inundation, such as *Alstonia spatulata*, *Horsfieldia irya*, *Ploiarium elegens*, and *Cyrtostachys renda*, were planted along the wetland edges (Fig. 3B). The forest edges were also planted with buffer shrubs such as *Melastoma malabathricum* and *Leea indica* which are characteristic of young secondary forests.

Native species are well suited to the local condition and therefore require less maintenance as well. These trees and shrubs provided shade, focal points, and screening as well as expanded on the range of habitats for biodiversity. Taking into consideration the eventual height of the tree saplings as they matured, the planting emulated the tiered structure of a forest, i.e., turf with sparse clusters of trees to medium height shrubs planted in the perimeter, and a tall, dense forest structure was deliberately created at the core.

Other than being part of a forest structure, the planted trees and shrubs could also support more biodiversity in the park. Fruit-bearing tree species were planted to diversify food options, such as *Ardisia elliptica*, *Syzygium zeylanicum*, and *Buchanania arborescens*. These attracted frugivorous birds such as the Yellow-vented Bulbul (*Pycnonotus goiavier*), Asian Glossy Starling (*Aplonis panayensis*), and Pink-necked Green Pigeon (*Treron vernans*). The flowering plants attracted many insect pollinators, which in turn attracted insectivorous animals such the Blue-tailed Bee-eater and Changeable Lizard (*Calotes versicolor*), that were then preyed upon by raptors.

The wetlands

Figs. 4. (A) Taken in March 2018 before development – the water body was badly polluted with rubbish; (B) Post development – an enhanced and diversified habitat for biodiversity.

Prior to development, the freshwater pond was badly polluted with rubbish, and the water body was almost devoid of aquatic plants (Fig. 4A). Macrophytes (aquatic plants that grow in or near water, and can be categorised as emergent, submergent, or floating) were planted within the water body, and water tolerant shrubs were planted at the margins of the water.

With the wetland habitat enhanced with a diversity of plants, microhabitats were created to accommodate biodiversity of different niche requirements (Fig. 4B). For example, different species of dragonfly nymph needed different microhabitats within a waterbody. Some burrowed into the pond sediment or leaf litter while some hid amidst the roots of the macrophytes (Ngiam, 2011). As the nymphs emerged from the water to transform into adult dragonflies, some would seek vertical support such as twigs or emergent plants (i.e., *Lepironia articulata*) to assist in its emergence. The reedbeds of sedges and shrubs also acted as hides for the water birds such as the White-breasted Waterhen (*Amaurornis phoenicurus*) and Slaty-breasted Rail (*Gallirallus striatus*) while cavity nesting birds such as woodpeckers, barbets, and parakeets made their nests in the snags within the wetlands. The constructed habitat mounds also served as a place of rest for biodiversity such as monitor lizards or Smooth-coated Otters (*Lutrogale perspicillata*).

The submerged parts of the plants also provided a surface for the attachment and growth of microbial biofilms, which were important for microbial processes that took up nutrients from the system such as nitrogen reduction (Yeo *et al.*, 2010). Wetlands help to remove sediments from surface run-off when it rained, acting as a natural filter before the water was drained into stormwater drains.

Perimeter vegetation

Fig. 5. Post development, a nature trail flanked with native shrub species.

Previously, the open sites were dominated by Lalang (*Imperata cylindrica*) that grew aggressively. During development, the invasive Lalang were removed and a Nature Trail flanked with native shrubs on both sides was created (Fig. 5). Passive rewilding was trialled at the edges of the forest, where the area was left to naturally recruit and form a buffer.

A butterfly garden with informal pathways had also been added to the park to provide habitat for biodiversity (Fig. 6). Butterfly-attracting nectar shrubs such as Common Lantana (*Lantana camara*) were planted, as well as host plants such as Candle Bush (*Senna alata*), Stinking Passionflower (*Passiflora foetida*), and Rukam Masam (*Flacourtia inermis*).

Figs. 6. A butterfly habitat with informal pathways and habitat log structures.

Enhancing the park user's experience

Besides habitat restoration, the park was also designed to allow users of the park to appreciate the landscape. The existing access and circulation of pedestrians were studied, as well as the sun path throughout the year.

The pre-development site was surrounded by covered linkways and concrete footpaths (Fig. 7). Workers from the surrounding offices and industrial areas used these footpaths as thoroughfares to the bus stop.

Fig. 7. The existing access and pedestrian's pathway around the pre-development land parcel.

After the site improvement, the wetlands buffered the noise and air pollution produced by the surrounding buildings and roads.

Careful design interventions using landscape layers enhanced the park user's experience. In creating these landscape layers, the design tapped on existing views of the forest core and wetland (Fig. 8). Strategically aligned around the forest core and wetland, the access routes comprising elevated boardwalks, nature trails, viewing decks, and informal paths, brought park users closer to nature while ensuring minimal disturbances to the habitats. Snags, tall reeds, and habitat mounds within the wetlands provided areas for organisms such as birds and dragonflies to perch on and escape from predators, while being easily observed by park users at a safe distance. Viewing decks were strategically located to draw the user's attention towards a view that gave a sense of continuity and depth (Fig. 9).

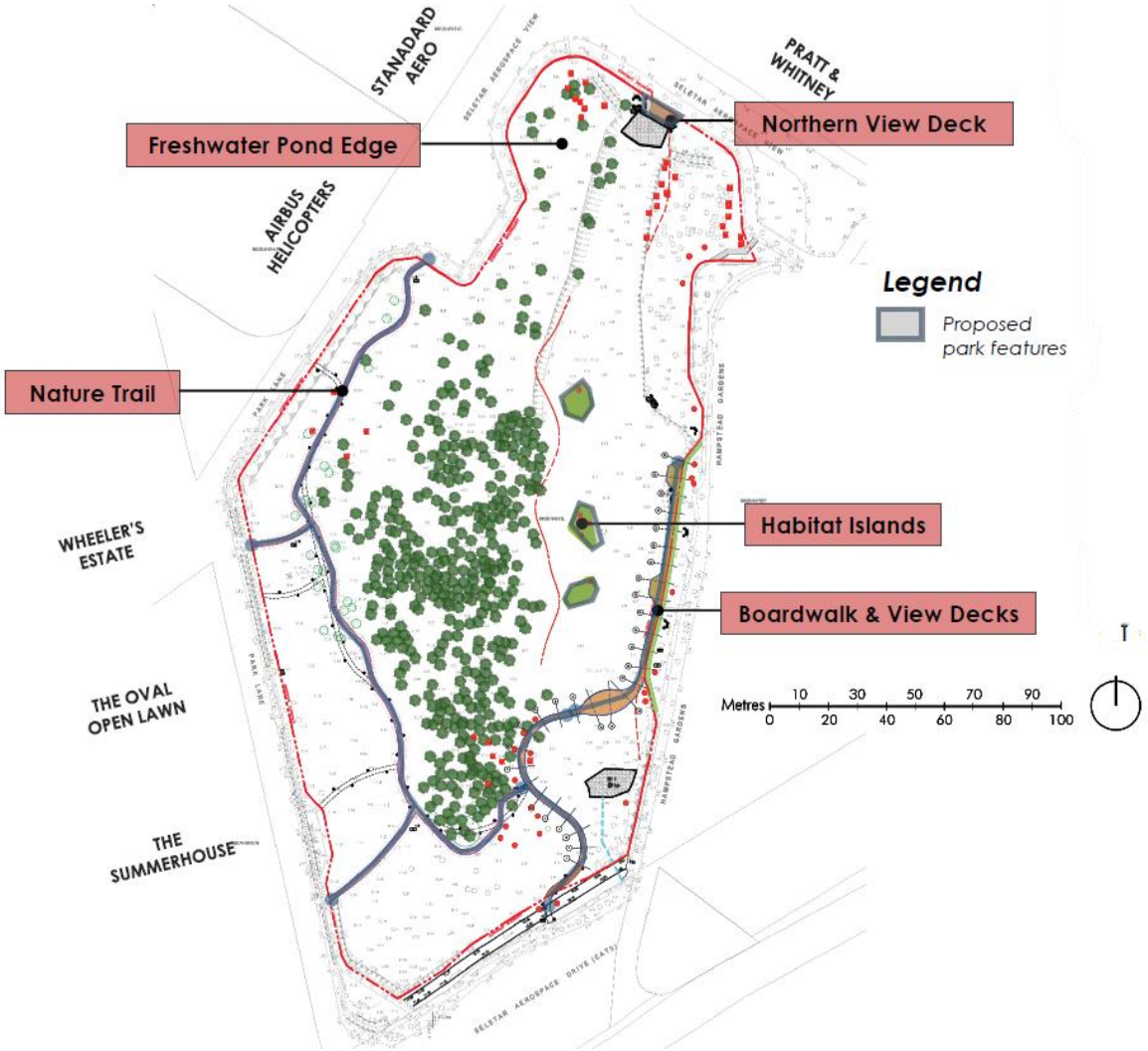


Fig. 8. Post development – Boardwalks, nature trail, habitat island, and view decks were added.

Fig. 9. Scene from the viewing decks that had been strategically located to guide park users' attention towards the wetlands and forest core.

As the design of the boardwalk takes into consideration the east-west orientation of the sun's direction, park users on the boardwalk are able to enjoy the shade from the spreading canopy of the Rain Trees (*Samanea saman*) along the road, while the morning sun casts light on the snags and forest core, providing photography opportunities for wildlife enthusiasts.

Materials and colours used for the park were selected to blend seamlessly with the natural surroundings. Soft edge planting helped to merge the built forms with the natural environment and encourage direct exploration of these natural habitats at close proximity. Educational elements such as interpretive signage found throughout the park enriched the park user experience by highlighting some of the rich biodiversity that can be found there.

Biodiversity

A brief survey was carried out prior to development in 2019. Only a handful of species was recorded: Blue-tailed Bee-eater, Blue-throated Bee-eater (*Merops viridis*), White-throated Kingfisher, Oriental Pied Hornbill, Blue Percher (*Diplacodes trivialis*), Common Parasol (*Neurothemis fluctuans*), and Common Grass Yellow (*Eurema hecabe contubernalis*).

Since its opening in April 2020, at least 120 species of birds (28.4% of the total number of bird species in Singapore) (Table 2), 33 species of butterflies (9.9% of the total number of butterfly species in Singapore) (Table 3), and 14 species of dragonflies and damselflies (10.3% of the total

number of odonate species in Singapore) (Table 4) had been observed in the park. Inferring from the comparative figures above, Hampstead Wetlands Park appears to be supporting more bird, butterfly and odonate species than expected based on its physical size. Its location and enhanced habitats must have contributed significantly to these records.

Table 2: Bird species recorded at Hampstead Wetlands Park (Source: eBird)

	Common name	**Scientific name**
1	Lesser Whistling-Duck	*Dendrocygna javanica*
2	Cotton Pygmy-Goose	*Nettapus coromandelianus*
3	Mallard	*Anas platyrhynchos*
4	Red Junglefowl	*Gallus gallus*
5	Rock Pigeon	*Columba livia*
6	Spotted Dove	*Spilopelia chinensis*
7	Zebra Dove	*Geopelia striata*
8	Pink-necked Green-Pigeon	*Treron vernans*
9	Thick-billed Green-Pigeon	*Treron curvirostra*
10	Pied Imperial-Pigeon	*Ducula bicolor*
11	Lesser Coucal	*Centropus bengalensis*
12	Chestnut-winged Cuckoo	*Clamator coromandus*
13	Asian Koel	*Eudynamys scolopaceus*
14	Little Bronze-Cuckoo	*Chrysococcyx minutillus*
15	Banded Bay Cuckoo	*Cacomantis sonneratii*
16	Plaintive Cuckoo	*Cacomantis merulinus*
17	Brush Cuckoo	*Cacomantis variolosus*
18	Square-tailed Drongo-Cuckoo	*Surniculus lugubris*
19	Hodgson's Hawk-Cuckoo	*Hierococcyx nisicolor*
20	Gray Nightjar	*Caprimulgus jotaka*
21	Large-tailed Nightjar	*Caprimulgus macrurus*
22	Plume-toed Swiftlet	*Collocalia affinis*
23	Pacific Swift	*Apus pacificus*
24	Asian Palm Swift	*Cypsiurus balasiensis*

Table 2: Bird species recorded at Hampstead Wetlands Park (Source: eBird) *(Cont'd)*

	Common name	Scientific name
25	Slaty-breasted Rail	*Lewinia striata*
26	White-breasted Waterhen	*Amaurornis phoenicurus*
27	Common Sandpiper	*Actitis hypoleucos*
28	Asian Openbill	*Anastomus oscitans*
29	Yellow Bittern	*Ixobrychus sinensis*
30	Cinnamon Bittern	*Ixobrychus cinnamomeus*
31	Black Bittern	*Ixobrychus flavicollis*
32	Gray Heron	*Ardea cinera*
33	Purple Heron	*Ardea purpurea*
34	Great Egret	*Ardea alba*
35	Intermediate Egret	*Ardea intermedia*
36	Little Egret	*Egretta garzetta*
37	Cattle Egret	*Bubulcus ibis*
38	Striated Heron	*Butorides striata*
39	Osprey	*Pandion haliaetus*
40	Black-winged Kite	*Elanus caeruleus*
41	Oriental Honey-buzzard	*Pernis ptilorhynchus*
42	Changeable Hawk-Eagle	*Nisaetus cirrhatus*
43	Crested Goshawk	*Accipiter trivirgatus*
44	Japanese Sparrowhawk	*Accipiter gularis*
45	Brahminy Kite	*Haliastur indus*
46	White-bellied Sea-Eagle	*Haliaeetus leucogaster*
47	Gray-headed Fish-Eagle	*Haliaeetus ichthyaetus*
48	Buffy Fish-Owl	*Ketupa ketupu*
49	Spotted Wood-Owl	*Strix seloputo*
50	Oriental Pied-Hornbill	*Anthracoceros albirostris*
51	Common Kingfisher	*Alcedo atthis*
52	Black-backed Dwarf-Kingfisher	*Ceyx erithaca*
53	Stork-billed Kingfisher	*Pelargopsis capensis*

Table 2: Bird species recorded at Hampstead Wetlands Park (Source: eBird) *(Cont'd)*

	Common name	Scientific name
54	White-throated Kingfisher	*Halcyon smyrnensis*
55	Collared Kingfisher	*Todiramphus chloris*
56	Blue-throated Bee-eater	*Merops viridis*
57	Blue-tailed Bee-eater	*Merops philippinus*
58	Dollarbird	*Eurystomus orientalis*
59	Coppersmith Barbet	*Psilopogon haemacephalus*
60	Lineated Barbet	*Psilopogon lineatus*
61	Sunda Pygmy Woodpecker	*Yungicus moluccensis*
62	Rufous Woodpecker	*Micropternus brachyurus*
63	Common Flameback	*Dinopium javanense*
64	Laced Woodpecker	*Picus vittatus*
65	Banded Woodpecker	*Chrysophlegma miniaceum*
66	Peregrine Falcon	*Falco peregrinus*
67	Rose-ringed Parakeet	*Psittacula krameri*
68	Red-breasted Parakeet	*Psittacula alexandri*
69	Long-tailed Parakeet	*Psittacula longicauda*
70	Blue-crowned Hanging-Parrot	*Loriculus galgulus*
71	Blue-winged Pitta	*Pitta moluccensis*
72	Golden-bellied Gerygone	*Gerygone sulphurea*
73	Ashy Minivet	*Pericrocotus divaricatus*
74	Pied Triller	*Lalage nigra*
75	Black-naped Oriole	*Oriolus chinensis*
76	Common Iora	*Aegithina tiphia*
77	Malaysian Pied-Fantail	*Rhipidura javanica*
78	Amur Paradise-Flycatcher	*Terpsiphone incei*
79	Brown Shrike	*Lanius cristatus*
80	Long-tailed Shrike	*Lanius schach*
81	House Crow	*Corvus splendens*
82	Large-billed Crow	*Corvus macrorhynchos*

Table 2: Bird species recorded at Hampstead Wetlands Park (Source: eBird) *(Cont'd)*

	Common name	Scientific name
83	Common Tailorbird	*Orthotomus sutorius*
84	Dark-necked Tailorbird	*Orthotomus atrogularis*
85	Ashy Tailorbird	*Orthotomus ruficeps*
86	Rufous-tailed Tailorbird	*Orthotomus sericeua*
87	Yellow-bellied Prinia	*Prinia flaviventris*
88	Zitting Cisticola	*Cisticola juncidis*
89	Oriental Reed Warbler	*Acrocephalus orientalis*
90	Barn Swallow	*Hirundo rustica*
91	Pacific Swallow	*Hirundo tahitica*
92	Red-whiskered Bulbul	*Pycnontus jocosus*
93	Sooty-headed Bulbul	*Pycnonotus aurigaster*
94	Yellow-vented Bulbul	*Pycnonotus goiavier*
95	Yellow-browed Warbler	*Phylloscopus inornatus*
96	Arctic Warbler	*Phylloscopus borealis*
97	Swinhoe's White-eye	*Zosterops simplex*
98	Pin-striped Tit-Babbler	*Mixornis gularis*
99	White-crested Laughingthrush	*Garrulax leucolophus*
100	Asian Glossy Starling	*Aplonis panayensis*
101	Daurian Starling	*Agropsar sturninus*
102	White-shouldered Starling	*Sturnia sinensis*
103	Common Myna	*Acridotheres tristis*
104	Javan Myna	*Acridotheres javanicus*
105	Dark-sided Flycatcher	*Muscicapa sibirica*
106	Asian Brown Flycatcher	*Muscicapa dauurica*
107	Brown-steaked Flycatcher	*Muscicapa williamsoni*
108	Oriental Magpie-Robin	*Copsychus saularis*
109	Yellow-rumped Flycatcher	*Ficedula zanthopygia*
110	Orange-bellied Flowerpecker	*Dicaeum trigonostigma*
111	Scarlet-backed Flowerpecker	*Dicaeum cruentatum*

Table 2: Bird species recorded at Hampstead Wetlands Park (Source: eBird) *(Cont'd)*

	Common name	Scientific name
112	Brown-throated Sunbird	*Anthreptes malacensis*
113	Olive-backed Sunbird	*Cinnyris jugularis*
114	Asian Golden Weaver	*Ploceus hypoxanthus*
115	Scaly-breasted Munia	*Lonchura punctulata*
116	Javan Munia	*Lonchura leucogastroides*
117	Chestnut Munia	*Lonchura atricapilla*
118	White-headed Munia	*Lonchura maja*
119	Eurasian Tree Sparrow	*Passer montanus*
120	Paddyfield Pipit	*Anthus rufulus*

Table 3: Butterfly species recorded at Hampstead Wetlands Park

	Common name	Scientific name
1	Bengal Swift	*Pelopidas agna agna*
2	Blue Pansy	*Junonia orithya wallacei*
3	Chestnut Bob	*Iambrix salsala salsala*
4	Chocolate Pansy	*Junonia hedonia ida*
5	Ciliate Blue	*Anthene emolus goberus*
6	Common Bluebottle	*Graphium sarpedon luctatius*
7	Common Grass Yellow	*Eurema hecabe contubernalis*
8	Common Mime	*Chilasa clytia clytia*
9	Common Mormon	*Papilio polytes romulus*
10	Common Palm Dart	*Telicota colon stinga*
11	Common Palmfly	*Elymnias hypermnestra agina*
12	Common Tit	*Hypolycaena erylus teatus*
13	Contiguous Swift	*Polytremis lubricans lubricans*
14	Copper Flash	*Rapala pheretima sequeira*
15	Dingy Bush Brown	*Mycalesis perseus cepheus*
16	Formosan Swift	*Borbo cinnara*
17	Ganda Dart	*Potanthus ganda ganda*

Table 3: Butterfly species recorded at Hampstead Wetlands Park *(Cont'd)*

	Common name	Scientific name
18	Julia Heliconian	*Dryas iulia*
19	King Crow	*Euploea phaenareta castelnaui*
20	Lemon Emigrant	*Catopsilia pomona pomona*
21	Lesser Dart	*Potanthus omaha omaha*
22	Lesser Grass Blue	*Zizina otis lampa*
23	Lime Butterfly	*Papilio demoleus malayanus*
24	Long Brand Bush Brown	*Mycalesis visala phamis*
25	Mottled Emigrant	*Catopsilia pyranthe pyranthe*
26	Painted Jezebel	*Delias hyparete metarete*
27	Peacock Pansy	*Junonia almana javana*
28	Pygmy Grass Blue	*Zizula hylax pygmaea*
29	Short Banded Sailor	*Phaedyma columella singa*
30	Small Branded Swift	*Pelopidas mathias mathias*
31	Striped Albatross	*Appias libythea olferna*
32	Tawny Coster	*Acraea terpsicore*
33	White-tipped Skipper	*Erionota hiraca apicalis*

Table 4: Dragonfly and damselfly species recorded at Hampstead Wetlands Park

	Common name	Scientific name
1	Blue Dasher	*Brachydiplax chalybea*
2	Blue Sprite	*Pseudagrion microcephalum*
3	Common Bluetail	*Ischnura senegalensis*
4	Common Parasol	*Neurothemis fluctuans*
5	Common Scarlet	*Crocothemis servilia*
6	Dancing Dropwing	*Trithemis pallidinervis*
7	Emperor	*Anax guttatus*
8	Ornate Coraltail	*Ceriagrion cerinorubellum*
9	Scarlet Pygmy	*Nannophya pygmaea*
10	Scarlet Skimmer	*Crocothemis servilia*

Table 4: Dragonfly and damselfly species recorded at Hampstead Wetlands Park *(Cont'd)*

11	Spine-Tufted Skimmer	*Orthetrum chrysis*
12	Variegated Green Skimmer	*Orthetrum sabina*
13	Wandering Glider	*Pantala flavescens*
14	Yellow-barred Flutterer	*Rhyothemis phyllis*

Relationship between people and the park

Just steps away from the road and bus stop, Hampstead Wetlands Park is easily accessible, which meant that it could be easily exposed to negative anthropogenic issues. Illegal release or accidental contamination could result in the presence of Red-eared Slider (*Trachemys scripta elegans*), Arowana (*Scleropages* sp.), Motoro Stingray (*Potamotrygon* sp.), Golden Apple Snails (*Pomacea canaliculata*), *Hydrilla*, and poultry such as Chukar Partridge (*Alectoris chukar*) and Cayuga Ducks (*Anas platyrhynchos domesticus*) being found in the park. While some of the alien species were easily removed or relocated, some species reproduced rapidly and dominated the habitat, such as the *Hydrilla*, and active maintenance was required to rebalance the habitat. The habitats at Hampstead Wetlands Park had been vastly improved by the inclusion of native species to emulate a rainforest or a freshwater swamp.

Although Hampstead Wetlands Park occupies only 3.23 hectares, nevertheless, the ecological, recreational, and social benefits contributed by this small site far outweigh its physical size when we take on a bigger picture perspective. Hampstead Wetlands Park serves as an accessible educational platform, where the public can have a positive encounter with biodiversity and learn about the native biodiversity and habitats which they would otherwise not have been able to experience in a usual urban setting.

The appeal of Hampstead Wetlands Park cuts across all ages, as attested by the sharing of the experiences of four stalwarts. Mr Lau Foon Wah, 65, is a regular visitor to the Seletar area as part of his daily morning routine. He observed that he was able to encounter more biodiversity in the park after the habitat restoration and development works in the park and had picked up photography to document the biodiversity in the park. Mr Lau commented that it was easy to observe wildlife from the boardwalk and recounted that one of his fondest experiences at the park was witnessing a family of Common Flamebacks – from the mating pair forming a nest together to when the fledgings left the nest.

Figs. 10. A pair of Common Flamebacks taking turns to excavate a cavity nest in a snag located within the wetlands. The male has a crimson marking while the female has duller markings. (Photo credit: Lau Foon Wah)

Mr Siew Weng Chee, 66, is another regular visitor at Hampstead Wetlands Park. He commented that his visits and encounters with biodiversity energised and improved his well-being. He added that the interaction with the nature-watching community in the park was equally important in improving his well-being as well as adding to his knowledge of biodiversity.

Ms Joey Gao, 23, first heard of Hampstead Wetlands Parks when she saw photographs of a family of Buffy Fish Owls. Interest piqued, she visited the park multiple times and was fascinated to witness the growth of the Buffy Fish Owl juvenile, its attempts to leave its nest, hunt, and interactions with other bird species. Mr Wayne Chng (26 years old) enjoyed visiting the park as it was easily accessible and recounted his experience in the rain where he was able to observe the wildlife reacting to the rain. He was amazed to see Smooth-coated Otters diving into the ponds, Buffy Fish Owls, and Blue-tailed Bee Eaters finding spots to perch to escape the rain.

Habitat restoration and enhancement works has resulted in a notable increase in biodiversity in Hampstead Wetlands Park. Consequently, the ecosystem services' benefits that arose were manifold, including physical, mental, and psychological well-being. There are multiple hypotheses on the restorative benefits of people immersing themselves in nature, including casual observation of biodiversity such as birdwatching. According to the Attention Restoration Theory, a person spending time in nature uses involuntary or effortless attention on his surroundings, and this could improve his concentration and relieve mental fatigue. Several park users expressed the positive psychological effects that they experienced due to the increase in biodiversity. With the popularity of social media platforms, many park users were able to share their positive biodiversity encounters.

Conclusion

As Singapore continues to urbanise, it is important to ensure that Singapore remains a highly liveable city. NParks' vision of creating a City in Nature is a part of the Singapore 2030 Green Plan that is a whole-of-nation movement to advance Singapore's national agenda on sustainable development. Restoring nature into the urban landscape, as exemplified by the development of Hampstead Wetlands Park within the Seletar industrial zone, is one of the key strategies to achieve this vision.

While Hampstead Wetlands Park is a mere 3.23 hectares, the continuing efforts to enhance the habitat at a small scale by deliberately planning to improve ecological connectivity showed that large improvements to biodiversity and positive park user experience could be achieved despite other limitations and challenges. Beyond the tangible presence of the park, the shared experiences of a community planting trees together to enhance the habitat, as well as the casual sharing of biodiversity knowledge between park users or through social media, played a multiplier effect in enriching liveability and social cohesion in Singapore.

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