Coney Island: Ecological Efforts to Retain its Rustic Coastal Charm

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Known by several names, including “Pulau Serangoon” and “Haw Par Island”, Coney Island has seen changes to its ownership over the century. Burmese born Haw Par Brothers built a beach villa on the island in the 1930s, an Indian businessman Ghulam Mahmood endeavoured to develop it into a resort in the 1950s, and in 1972, the Port of Singapore Authority purchased the land for recreational development. Today, Coney Island is home to a 50-hectare park managed by the National Parks Board (NParks).

The park was conceived as an ecologically sustainable park in 2013 with the intention of retaining the island park’s existing rustic natural vegetation, while enhancing it with carefully selected native flora from various habitats. Abiding by its fundamentals on ecological sustainability, its recent 18 months long redevelopment saw the addition of environmentally friendly park features—intentionally kept to a minimum—and reintroduction of native plants, including critically endangered species. It is a haven for at least 157 fauna species and about 86 plant species, of which 53 fauna and 17 plant species are considered locally threatened.

Why does Coney Island matter?

In the face of global threats to our natural environment and biodiversity, parks can play an increasingly important role in speaking about ecological processes. As a role model to demonstrate the importance of preserving existing natural resources and promoting the quality of the ecosystem, Coney Island Park fits into what Cranz (2004) describes as the “sustainable park” model. A shift from the traditional park model, the sustainable park is premised on self-sufficiency in our current urban environment.[1]

Coney Island Park forms a repository of best eco-friendly practices which showcases a natural and sustainable ecosystem. A zero-energy toilet with facilities that reuse wood from fallen *Casuarina equisetifolia*, or Casuarina Trees, and a natural flotsam screen lining the beach are just some examples of environmental initiatives which invite park users to rethink the cost and value of maintaining a functioning natural system.

The park serves as an outdoor classroom for members of the public to learn more about ecology by exposing them directly to new ideas and attitudes about nature and the urban landscape. Through the careful selection of native plant choices and the creation of diverse plant communities, Coney Island Park emphasises the ecological value of native plants within the entire system and restoration of the island’s ecological function. Moreover, rather than a mere native plant palette, plants have been selected with the intention of secondary plant succession being able to carry on by itself.

Coney Island provides the space to reconnect citizens with nature through the immersive experience of the park’s rustic environment. The true essence of a sustainable park is certainly not solely in its tangible resources, but its social and cultural viability. Its sustainable design and planning,

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as well as ecological restoration efforts, can only provide the structural foundation. That Coney Island Park speaks to urban citizens and inspires them to recognise the part they can play in protecting the environment—that is what matters.

Habitats

While the island park is a predominant Casuarina woodlands habitat, it also comprises a series of eco-habitats—an enclave to a wide variety of critically endangered or locally extinct rare plants. These eco-habitats include coastal forests, grasslands, and mangroves, which are further enhanced by the creation of landscaped areas with various native coastal plants. For example, the curated coastal meadows, each located at both ends of the island, present a collection of free-flowering plants that are commonly found along sandy, coastal beaches of Singapore. Most of these flora species are well-adapted to the harsh conditions of coastal areas—high exposure to light, salt sprays, and windy conditions—with special adaptations such as succulent leaves that protect the plants from dehydration.

The eastern end of the island houses the collection of riverine and coastal *Barringtonia* plants. Introduced to the island by conservationists from NParks, these *Barringtonia* species include the critically endangered *Barringtonia reticulata*, a shrub with leathery leaves and pink flowers that grow in sandy forests near the sea, and also the presumed nationally extinct *Barringtonia conoidea* which has white flowers and thick membranous leaves. Each of the five beach areas on the island also displays coastal plants of a particular theme. Beach Area A, for example, features species from the back mangrove habitat such as the critically endangered *Calophyllum inophyllum*, endangered *Heriteria littoralis*, and *Knema globularia*. Beach Area C features rare coastal trees species such as *Hemandia nymphaeifolia*, a previously presumed nationally extinct species with a fruit that resembles a lantern.

Environmentally sustainable efforts

Conceived as a rustic getaway without basic amenities like water and electricity, Coney Island Park simulates an outdoor classroom on sustainability through a showcase of eco-friendly practices. They include the use of recycled materials found on the island, and energy and water conservation practices. Thus, the maintenance of the island generates a lower carbon footprint and long-term environmental costs. For its efforts in upholding green practices, Coney Island Park was awarded the Platinum Award for Green Mark by the Building and Construction Authority in 2015.

Interestingly, one of its eco-friendly showcases takes the form of a humble toilet. However, unlike the conventional ones we are more familiar with, the toilet on the island is an exemplary zero-energy self-sufficient model. This toilet uses harvested storm runoff which is filtered before use. Also, on its roof are solar panels which store the converted energy in a battery before being used to power the toilet pump for flushing and hand-washing. The toilet has been designed to allow natural light to stream in and thus electricity is not required for lighting. Instead, the light tubes installed on the ceiling uses transparent and reflective materials to channel and amplify natural light indoors.

1. Coney Island Park's iconic entrance gate at the western end of the island (Photo: Ken Chang).
2. Coney Island was conceived as an ecologically sustainable park in 2013 with the intention of retaining its existing rustic natural vegetation (Photo: National Parks Board).
3. The pinkish-red fruits of the critically endangered *Barringtonia reticulata* (Photo: Ang Wee Foong).
4. Rooftop solar panels to power the facilities on the island (Photo: Alex Tam).
5. Aerated concrete pathways allow water to percolate through thus preventing erosion of the sand layer beneath it (Photo: Alex Tam).
6. Signboards made of recycled timber from fallen Casuarina trees uprooted during a storm (Photo: Ken Chang).

To make the most out of nature's resources, energy from the sun is harvested to power amenities on the island. Solar panels have been attached on lamp posts and on rooftops of the toilet and some shelters to provide park lighting at night. The buggies used within the park by the park management team are, too, entirely powered by solar energy from the solar cells installed on top of the vehicles.

Another showcase is the recycling of the island's resource into park amenities. Some Casuarina Trees had been uprooted during a storm on the island in 2014, but they were assembled onsite and given a new lease of life as park signage, seats, benches, boardwalk, and exhibits at the Casuarina Exploration, a playground area open to all ages.

Efforts have also been made to minimise the impact of visitors' movements through the island park. The paths within the park are made of aerated concrete, allowing water to percolate through while preventing any erosion of the sand layer just beneath it.

Biodiversity conservation efforts

Coney Island Park has also found its place as a haven to many rare coastal plant species through conservation efforts by NParks. In 2015, two *Cycas edentata* trees which would have been affected by construction in Katong were transplanted from a private property to Coney Island. Given their sizes, as well as their location at a very sandy substrate along the original coastline, it is believed that these trees were part of the original vegetation at Katong, Known to have a long fossil history, cycads are locally rare and typically grow very slowly and live for as long as 1,000 years. One of the wild cycads on the island is currently about 3.5 metres tall, while the other is a cluster of more than 2 metres

in diameter. According to its current size, botanists would estimate each of its age to be about 100 years old. To recreate the association of related coastal species on the island, the Katong tree, *Cynometra ramiflora*, was closely planted near to the cycads.

Despite botanical rediscoveries being a relatively rare phenomenon, the park's conservation team was pleasantly surprised to find plant species which were once presumed to be nationally extinct on Coney Island. The *Scolopia macrophylla* and *Cocculus orbiculatus* were found while carrying out the reforestation process on the island in 2014. The collected fruiting specimens of the native *Scolopia macrophylla* tree were then sent to NParks' herbarium for identification. According to records, it was first collected from Changi back in 1890 by Henry Nicholas Ridley, former director of the Singapore Botanic Gardens. He also collected specimens from mangroves at Tampines, Serangoon, and Punggol in the late 19th century. Sporting beautiful greenish-white flowers that produce orange or black berries, this rare species can be found in various areas in the Malayan region, including Indochina, southern Thailand, Peninsula Malaya, Borneo, and Java. It is the only species of the *Scolopia* genus recorded in Singapore, out of the three species found in the region.

Biodiversity conservation efforts in Coney Island Park also include increasing the habitat of locally existing wildlife, such as bee-eaters, kingfishers, and woodpeckers, with the help of supplementary nesting resources. These bird species face a limited supply of natural nest sites in Singapore—in particular, bee-eaters, which excavate holes in mounds as nest sites, nest at a limited number of sites in Singapore, located predominantly in the northeastern region. To attract this bird

7. The *Cocculus orbiculatus* is a slender woody climber, which produces small yellowish-white flowers and reddish fruits (Photo: Ang Wee Foong).
8. The branches of the *Scolopia macrophylla* are armed with thorns, one of the distinctive features of this plant (Photo: Ang Wee Foong).
9. The Brahman bull, Coney Island's resident cow, is under the care of NParks and undergoes regular veterinary check-ups every six months (Photo: Alex Tam).
10. Relocation of the wild cycads to Coney Island Park (Photo: Alex Tam).
11. Nest boxes made out of Casuarina wood for wildlife, such as kingfishers and woodpeckers, to call home (Photo: Alex Tam).
12. Demonstration plots which were created to showcase the potential species for planting in various habitats (Image: National Parks Board).
13. The unique staggered arrangement of the flotsam screen at the estuary mouth prevents flotsam from depositing on the island yet allows for the movement of wildlife into the mangroves (Photo: Tan Yit Chuan).
14. The *Heritiera littoralis*, a native endangered tree, was planted as part of reforestation efforts on Coney Island (Photo: Alex Tam).

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species, the park management has installed the nest box for the Blue-throated bee-eaters (*Merops viridis*) in underground bunds on the sandy slopes. In addition, nest boxes made of Casuarina wood have been installed on tall trees around the island primarily to attract kingfishers, such as the resident Collared (*Todirhamphus chloris*) and White-throated kingfishers (*Halcyon smyrnensis*), or other species which make their stopover on the island during migration season. Resident woodpeckers recorded on the island—Sunda Pygmy (*Dendrocopos moluccensis*), Laced (*Picus vittatus*), Rufous (*Micropternus brachyurus*) and Common Flameback (*Dinopium javanense*)—that have a preference for nesting in tree holes have also been sighted using these nests. These nest boxes will hopefully increase the availability of nest sites within the birds' primary breeding area in Singapore, and sustain the resident bird population overtime.

Habitat enhancement

Coney Island was in fact made up of two islands before it underwent land reclamation in 1972. Casuarina trees, a pioneer tree species characteristic of sandy coastal areas which grew on the island, helped to form the base vegetation of this natural coastal forest and increase land stability.

At both beaches and the estuary mouth, Bakau pile screens have been installed to minimise the amount of flotsam being washed onto shore or mangrove and depositing on the island. The park's maintenance crew can then easily retrieve and clear waste materials trapped by the screen. The screen at the estuary mouth, however, has been specially designed in a unique staggered arrangement which allows for the movement of animals like fishes and otters to swim through them and into the mangroves. These simple screens, while created by reusing fallen branches, have helped in easing cleansing operations on the island and maintaining the existing intertidal wildlife.

A concerted effort has been made to restore the natural ecosystem of Coney Island. Reforestation efforts were made to the mangrove and coastal forests through the reintroduction of rare endangered trees such as *Planchonella chartacea* and *Knema globularia*. Native critically endangered trees like *Intsia bijuga* and *Cerbera manghas* have also been planted. The reforestation effort also contributes to the increased resilience of the island park's ecosystem. The carefully selected plantings in the park have produced a sustainable and self-regenerating landscape that requires establishment irrigation and weeding only for the first few years. The planting also ensures that secondary plant succession can proceed on its own without human interference. Consequently, appropriate wildlife and pollinators such as butterflies and birds that might otherwise be endangered are able to live here. The demonstration plot, located along the boardwalk nearest to Beach Area C, is one area which features species that could potentially be planted into the native and back mangroves as well as coastal forest areas on the island.

Future plans: reforestation

For now, restoration efforts in the park remain a work in progress, as upcoming reforestation plans focus on buffering the vulnerable central mangrove area of Coney Island. According to the literature (Elliott et al., 2013; Goosem and Tucker, 2013), different tree planting options can be employed in the reforestation process depending on the present conditions of the natural environment.[2,3] The framework species method and the maximum diversity methods are two examples of reforestation tools, with the former conceived during the restoration of degraded sites within Queensland's Wet Tropics World Heritage Site Area. According to Elliott et al. (2013), the framework species method exploits natural seed dispersal mechanisms to bring about the recovery of biodiversity while planting the smallest number of trees necessary to shade out weeds and attract seed-dispersing animals.[4] On the other hand, the maximum diversity method, a more intensive tool, is used when natural seed dispersals are less capable of recovering more tree species at an acceptable rate.

Coney Island is now open to public and can be accessed via two bridges that link its western and eastern ends to Punggol Promenade and Pasir Ris Coast Industrial Park 6 (off Lorong Halus) respectively. The park's guided walks received overwhelming response during its opening on 10 October 2015.

References

1 Cranz, G. and Boland, M. 2004. Defining the Sustainable Park: A Fifth Model for Urban Parks. Landscape Journal 23:2-04, pp 102-120.

2 Elliott, S., Blakesley, D., and Hardwick, K. 2013. *Restoring Tropical Forests: a practical guide.* Royal Botanic Gardens, Kew; pp 124-138.

3 Goosem, S. and Tucker, N.I.J. 2013. *Repairing the Rainforest (second edition).* Wet Tropics Management Authority and Biotropica Australia Pty. Ltd. Cairns.

4 Elliott et. al., *Restoring Tropical Forests.*