

CHAPTER 1

Habitat Restoration and Enhancement as a Thrust in the Nature Conservation Masterplan and City in Nature Vision

Lena Chan & Lim Liang Jim

Singapore's ecological history and rationale for habitat restoration

Singapore was originally covered with a diversity of tropical ecosystems, including rainforests, freshwater swamps, and mangroves until the end of the 19th century when more than 95% of Singapore's original forest cover were cleared (Corlett, 1992; Ng & Corlett, 2011).

Two important fundamental questions need to be addressed for habitat restoration. Firstly, has Singapore reached its tipping point and hence is it possible to restore its natural ecosystems? Secondly, are there benefits to restoring ecosystems and ecosystem services in urban areas to justify restoration efforts?

Despite the rapid loss of natural habitats before 1930, it is still possible to find lowland dipterocarp forests, different types of secondary forests, freshwater swamps, grasslands, mangroves, sandy beach forest, rocky beach forest, freshwater streams, intertidal mudflats, seagrass meadows, algal beds, coral reefs and other habitats in Singapore in the 21st century (Tan *et al.*, 2010). It can be inferred that a rich diversity of natural ecosystems exists in Singapore. Research on and monitoring of Bukit Timah Nature Reserve indicated that the dispersal of large-seeded plant species continued in spite of the absence of large mammals, possibly by small-mammals and birds (Lum & Ngo, 2021). The lush forest thriving on the 10-year-old Eco-Link@BKE also shows that habitat restoration efforts can assist in the re-establishment of lost habitats. The above examples affirm that Singapore has not reached its tipping point and habitat restoration can bear fruit.

The benefits of ecosystem services that are provided by green and blue spaces in urban areas are numerous (Elmqvist *et al.*, 2015), including a) microclimate regulation, b) water regulation, c) pollution reduction and health effects, d) innate and inherent values of habitats, and e) cultural services.

Habitat restoration is a key thrust of the Nature Conservation Masterplan and City in Nature

The late Mr Lee Kuan Yew planted a Mempat tree (*Cratoxylum formosum*) on 16 June 1963, marking the beginning of the tree-planting campaign that has continued since. Following this, over the last sixty years, ecosystem restoration, enhancement and species recovery have increasingly become vital components of Singapore’s greening and biodiversity efforts. As an obligation of a signatory of the Convention on Biological Diversity, Singapore developed its National Biodiversity Strategy and Action Plan (NBSAP), a framework to guide its biodiversity conservation efforts that was presented in 2009. One of the actions of its first strategy, i.e., Safeguard Our Biodiversity, was to “rehabilitate areas that have previously been degraded”. Keeping the momentum, the Nature Conservation Masterplan (NCMP) (National Parks Board, 2015) serves to operationalise the NBSAP.

The four thrusts of the NCMP are:

- Conservation of Key Habitats
- Habitat Enhancement, Restoration, and Species Recovery
- Applied Research in Conservation Biology and Planning; and
- Community Stewardship and Outreach in Nature

Recognising the contribution of natural ecosystems to ecological resilience, climate resilience and social resilience, NParks embarked on a new paradigm shift to transform Singapore into a City in Nature on 4 March 2020 through restoring nature into the city for livability, sustainability, and well-being.

The strategies adopted are fine-tuned from those of the NCMP:

- a) Expanding the Nature Park Network
- b) Intensifying nature in gardens and parks
- c) Restoring nature into the urban landscape
- d) Strengthening connectivity between Singapore’s green spaces

Every greening initiative that Singapore has set about visioning included habitat restoration and enhancement as one of the key strategies, attesting to its pivotal role in successful biodiversity conservation. This handbook is to ensure that the rich experiences and lessons learnt from NParks and other researchers are more shared more widely. Building on current knowledge can only improve and escalate the learning curve, especially with the application of digitalisation, scientific advancement, technological and technical innovations. With the implementation of more habitat restoration initiatives, Singapore will be able to contribute positively to the UN Decade of Ecosystem Restoration and meeting targets of the Kunming-Montreal Global Biodiversity Framework that pertain to ecosystem restoration and enhancement.

References

- Corlett RT (1992) The Ecological Transformation of Singapore, 1819–1990. *Journal of Biogeography*, 19: 411–420.
- Elmqvist T, Setälä H, Handel SN, van der Ploeg S, Aronson J, Blignaut JN, Gomez-Baggethun E, Nowak DJ, Kronenberg J & de Groot R (2015) Benefits of restoring ecosystem services in urban areas. *Current Opinion in Environmental Sustainability*, 14: 101–108.
- Lum S & Ngo KM (2021) Lessons in ecology and conservation from a tropical forest fragment in Singapore. *Biological Conservation*, 254: 108847.
- National Parks Board (2015) Nature Conservation Masterplan. <http://nparks.gov.sg/biodiversity/our-national-plan-for-conservation/nature-conservation-masterplan> (Accessed 9 May 2023).
- Ng PKL & Corlett RT (2011) Biodiversity in Singapore: An Overview. In: Ng PKL, Corlett RT & Tan HTW (eds.) *Singapore Biodiversity: An Encyclopedia of the Natural Environment and Sustainable Development*. Singapore: Raffles Museum of Biodiversity Research & Editions Didier Millet, pp. 18–27.
- Tan HTW, Chou LM, Yeo DCJ & Ng PKL (2010) *The Natural Heritage of Singapore* (3rd edition) Singapore: Prentice Hall, 323 pp.