



# **Implementation of National Biodiversity Strategy and Action Plans in Singapore: An Integrated Approach**

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**Regional Workshop for South,  
Southeast, and East Asia on NBSAP  
and Mainstreaming Biodiversity  
Singapore, 14-18 Jan 2008**

# Premise for Biodiversity Conservation in Singapore

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- Singapore's indigenous biodiversity is an integral part of the heritage of Singaporeans
- Present generation needs to ensure its conservation for future generations
- Commitment as a party to the CBD and as responsible member of the global community

# Biodiversity Conservation Objectives

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- To conserve and enhance biodiversity at the genetic, species and ecosystem levels
- To ensure that any use of Singapore's biodiversity is carried out in a sustainable manner
- To facilitate access to, and ensure appropriate benefit sharing from the use of biodiversity resources

# Integrated Approach

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- In line with Art 6(b) of CBD: “To integrate, as far as possible and as appropriate, the conservation and sustainable use of biological diversity into relevant sectoral or cross-sectoral plans, programmes and policies”
- NParks takes primary responsibility for biodiversity conservation, but multi-sectoral jurisdictions make integration essential and not optional in the Singapore context

# Multi-sectoral Involvement in Biodiversity Conservation

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- Urban Redevelopment Authority: urban master planning
- National Environment Agency: urban environmental management
- Public Utilities Board: urban water resource management
- National Parks Board: urban biodiversity conservation

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# **AGENCY PRESENTATIONS**



# **Biodiversity Conservation in an Urban Environment**

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# Realities of Urban Biodiversity Conservation

- **High population density**
- **Intense land-use requirements**
- **Multiple stakeholder priorities**
- **Multiple, ongoing impacts**
- **Habitat loss and fragmentation**
- **Species Loss**

**What conservation approaches can we adopt?**





# Inter-Sectoral Collaboration

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- Master planning
- Pollution control
- 'ABC' Programme in reservoirs
- Park Connector Network

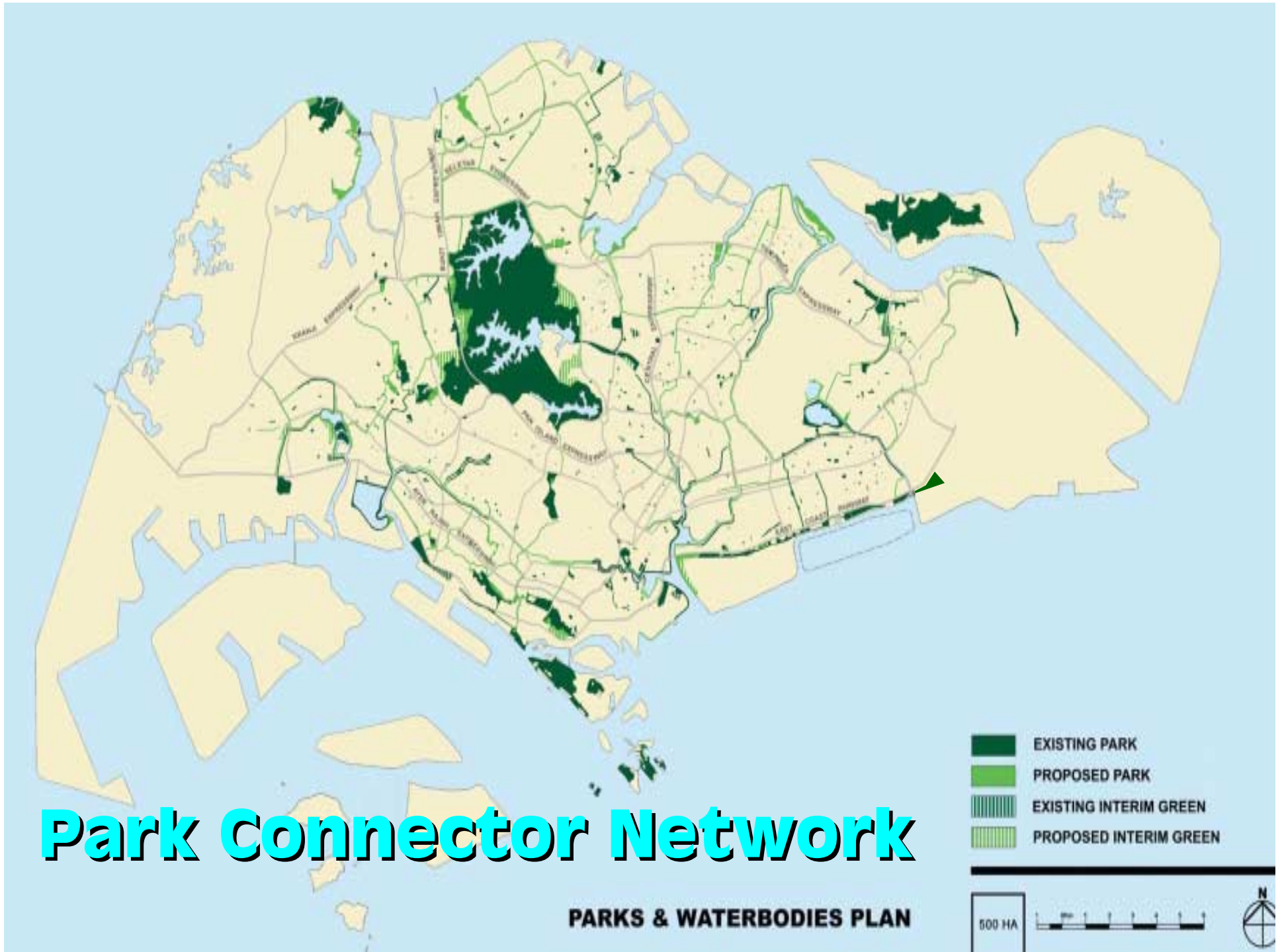
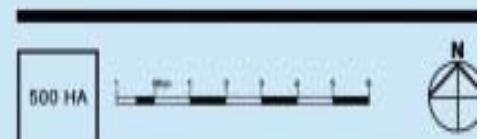
## **Urban Realities:**

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# Park Connector Network

PARKS & WATERBODIES PLAN

- EXISTING PARK
- PROPOSED PARK
- EXISTING INTERIM GREEN
- PROPOSED INTERIM GREEN



# Engagement with Stakeholders and Public

A group of people, including children and adults, are walking along a boardwalk in a wetland area. The boardwalk is made of wooden planks and is surrounded by shallow water and green vegetation. The people are dressed in casual outdoor attire, and some are wearing hats. The background shows a line of trees under a clear sky.

- Awareness building
- Increased public accessibility to habitats, e.g., Sungei Buloh Wetland Reserve, Chek Jawa boardwalk, etc
- Proactive partnership programme, e.g., local flora/fauna interest groups, Seagrass Watch, Reef Check, industry

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# Pragmatism in Biodiversity Protection

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- Balance & compromise
- Strategic perspective
- Win-win – e.g., real-time environmental feedback monitoring

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# Beyond 'Preservation' Mindset

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- Rare plant propagation programme
- Dragonfly & bird habitat enhancement
- Seahorse ex-situ breeding
- Coral nursery

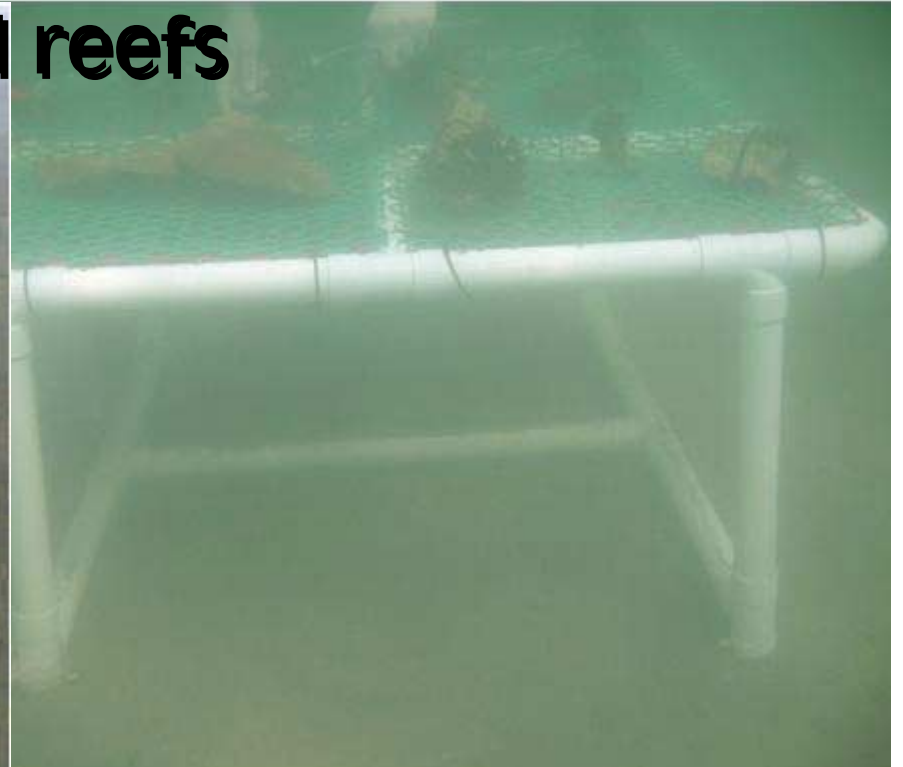
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# Coral Nursery Strategy

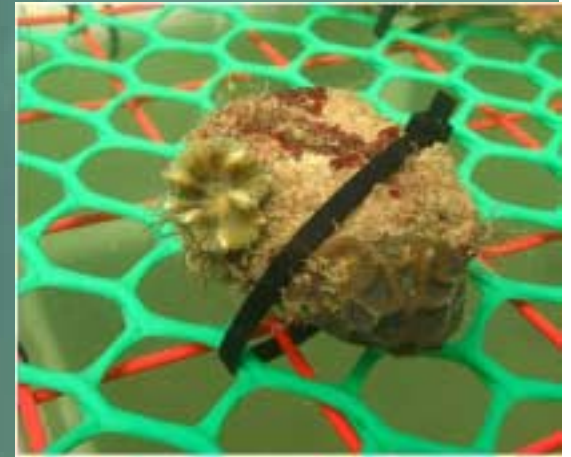
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- Site selection
- Collection of 'natural' coral fragments
- 'Grow out' at nursery
- **Transplant to natural reefs**



# Significance of Coral Nursery

- Conservation-based – ‘corals of opportunity’
- Habitat restoration focus
- Proactively addresses problem of sub-optimal coral cover
- Partnership approach: Keppel Corp, NEA, NUS, NParks



# Biodiversity in Singapore?

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- Is biodiversity worth conserving within a city of more than 4.6 million in 700 km<sup>2</sup> of island space?
- Is conservation in such a scenario 'making mountains out of molehills'?





# Terrestrial Fauna in Singapore

- > 400 birds
- > 265 butterflies
- > 120 amphibians and reptiles
- > 55 mammals
- > 65 freshwater fishes



Hard coral  
Sister Islands  
Jan 04

# Marine Fauna in Singapore

- > 800 marine fish
- > 550 molluscs
- > 450 crustaceans
- > 250 hard corals (600 in SE Asia and 800 worldwide)
- > 200 sponges
- > 68 echinoderms
- > 31 sea fans and sea whips
- Ascidians diverse but poorly studied

# Singapore Flora

- **> 2000 vascular plants**
- **35 out of 56 true Indo-Pacific mangroves**
- **11 out of 23 Indo-Pacific seagrasses**
- **Lower plants not included**



## Some Other Remarkable Global Benchmarks ...

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- More plant species than the whole of the UK (or Fiji or Hawaii)
- More than 4x no. of butterflies compared to UK
- About 2x more reptiles than the whole of Europe
- More higher vertebrates (amphibians, reptiles, birds, mammals) than Cuba (tropical, and 200x larger)
- More coral reef species per hectare than the Great Barrier Reef!

# Beating the odds ...

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- Hornbills reported lost (Corlett, 1992) have returned
- Colugos (Flying Lemurs) now encountered quite often at BTNR and CCNR



# Beating the odds ...

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- Healthy populations of pangolins on Pulau Tekong
- *Dipteris conjugata* still clinging on at 2-3 known localities



# Beating the odds ...

- Crinoid (Featherstar) populations have recolonised many reefs
- Sentosa – healthy intertidal reef right under our noses!



The rich shore  
is easily seen  
at low tide  
*Sentosa*  
Oct 03



**Thank you!**

Sunsets are beautiful in Bali ...