Singapore – A City in a Garden

Enhancing Greenery and Biodiversity

OVERVIEW

Short introduction
Greening our urban landscape – A Garden City
From a “Garden City” to a “City in a Garden”
Conserving our biodiversity
Take home message

Singapore

- City – State – Island
- Population: **5.3 million**
- Population Density: **7,422 persons/ sq km**
- Per capita GDP: **SGD65,000/ USD52,500**
- No natural resources
- Only “natural resource” – **PEOPLE**
- Change - Transformational

DESIGNING OUR CITY

Planning for a sustainable Singapore

- HOUSING
- BUSINESS
- SOCIAL NEEDS
- RECREATIONAL NEEDS

- SEAPORTS
- AIRPORTS
- WATER CATCHMENT AREAS
- WASTE TREATMENT PLANTS
- POWER STATIONS
- MILITARY FACILITIES

1960s

Greening paid off

Even in the 1960s when planners grappled with slums and overcrowding, greening was made a priority. Today, Singapore stands out as a City in a Garden.

NOW

DID YOU KNOW?

Since 1971, a Tree Planting Day has been held every year without fail, where Members of Parliament, community leaders, and others plant saplings throughout the island.

1970s

Marina Bay realised

Marina Bay as a seamless extension of the Central Business District, was first mooted in the 1970s. From just an empty land, it has become an iconic destination.

NOW

DID YOU KNOW?

Land around Marina Bay was reclaimed throughout the 1970s, 1980s and 1990s. The first detailed land use plan was exhibited in 1992. Planners have worked on this project from the 1970s until today.

1971

Airport relocated

The international airport was relocated to the east as decided in the 1971 Concept Plan, allowing for several expansions. It is one of the busiest in the world.

NOW

DID YOU KNOW?

The idea of reclaiming land at Changi was inspired by then Prime Minister Lee Kuan Yew's visit to Boston's Logan Airport, where planes took off and landed over water, reducing aircraft noise.

The first 1971 Concept Plan guided Singapore's early development and into the 1990s. It was devised with United Nations' help and ensured that essential infrastructure was provided for.

1991

Jurong Island

Jurong Island as a chemicals hub was conceived in 1991. It not only supports our industrial needs but frees up land for other needs. It is one of Asia's leading petrochemical hubs.

NOW

DID YOU KNOW?

Jurong Island has a dedicated "plug and play" infrastructure to help companies save on capital costs and build synergy through product integration.

The island has a rock cavern at a depth of 130 m, Southeast Asia's first underground liquid hydrocarbon storage facility.

1991

Bustling hubs

The idea for commercial and regional centres was introduced in the 1991 Concept Plan. Tampines Regional and Novena Fringe Centres have since become bustling hubs. More are underway.

NOW

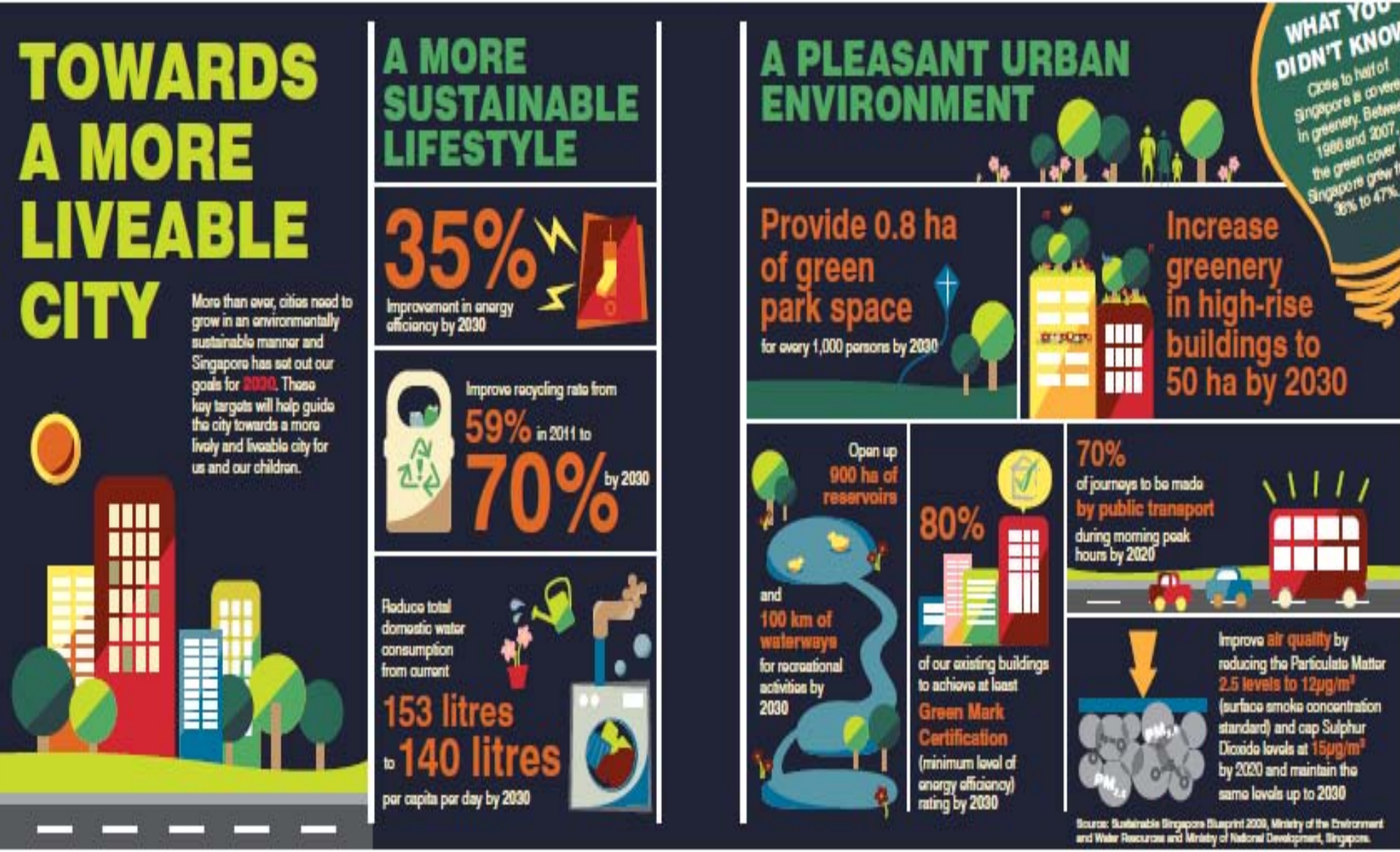
DID YOU KNOW?

The centres were mooted by planners as a way to better manage peak-hour congestion traffic in and out of the city and to bring jobs closer to homes.

harbour, 1957

Singapore – Then and Now

Sustainable Blueprint Singapore - 2009



The beginning of the Garden City programme
16 June 1963

50 years of Greening Singapore
Our City in a Garden

Planting in built-up areas

Roadside tree planting

Labrador Nature Reserve

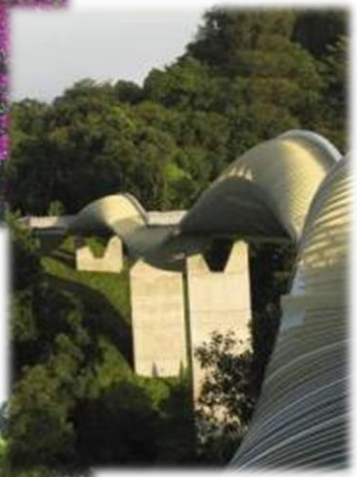
Sungei Buloh Wetland Reserve

NATURE RESERVES – CORE PROTECTED AREAS

Central Catchment Nature Reserve

Bukit Timah Nature Reserve

A Diversity of Parks that Cater to All



Telok Blangah Hill Park

East Coast Park

Fort Canning Park

Pasir Ris Park

Bukit Batok Town Park

Legislation | Parks and Trees Act

An Act to provide for the planting, maintenance and conservation of trees and plants within national parks, nature reserves, tree conservation areas, heritage road green buffers and other specified areas.

National parks and nature reserves are set aside for the following purposes:
(a)The propagation, protection and conservation of the trees, plants, animals and other organisms of Singapore;
(b)The study, research and preservation of objects and places of aesthetic, historical or scientific interest;
(c)The study, research and dissemination of knowledge in botany, horticulture, biotechnology, or natural and local history; and
(d)Recreational and educational use by the public.

Vegetation Cover

(2) Changing Landscapes : two important classes of vegetation

Then:
~ 100% primary forest

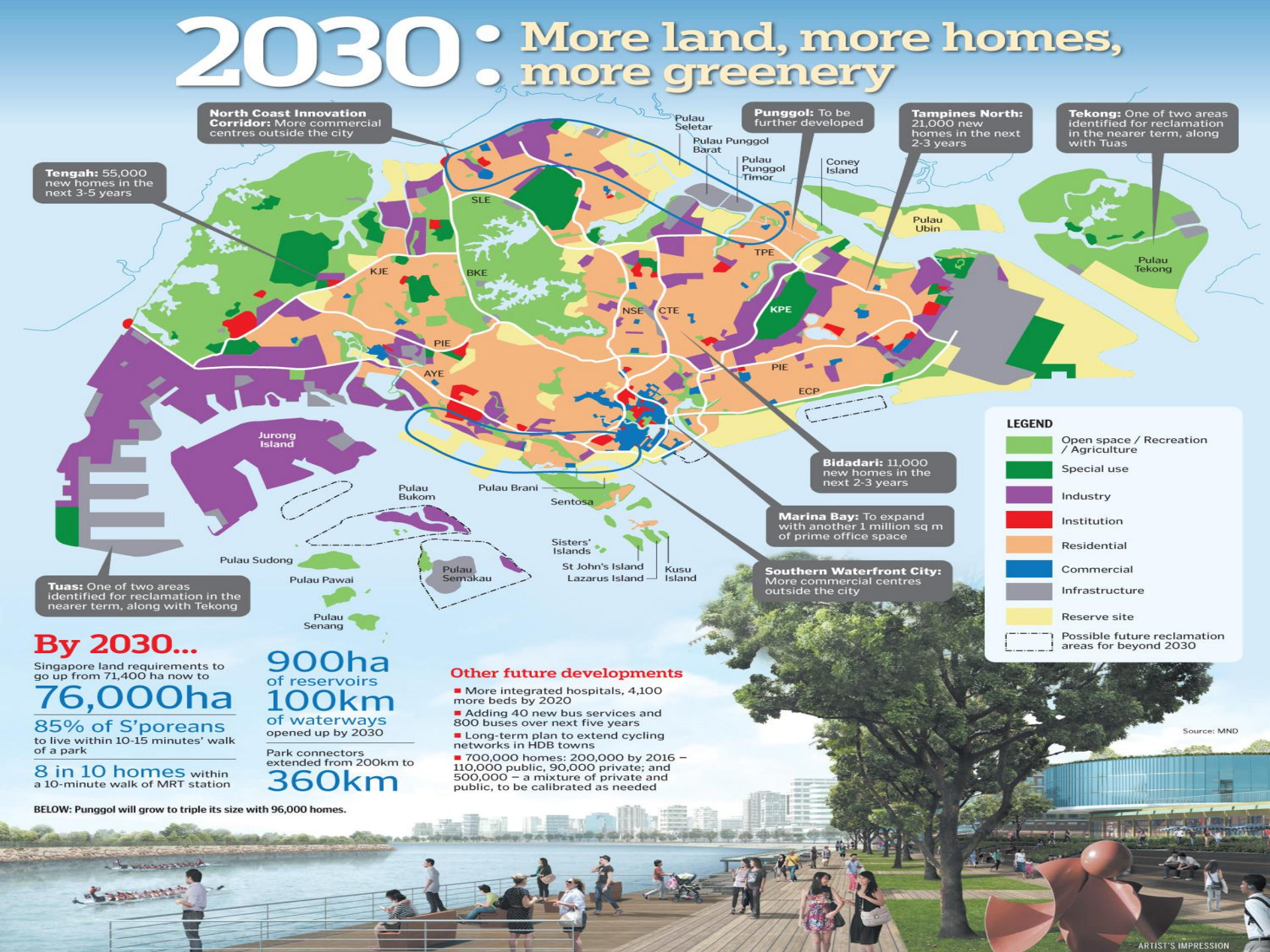
Now:
Vegetation cover (%) (2010)

Managed Vegetation (Urban Green Spaces)	27.5
Public parks	3.2
Roadside greenery	3.7
Green spaces in other public and private estates	20.6
Unmanaged Vegetation	28.5
Scrubland	5.92
Young secondary forest	19.64
Old secondary forest	1.37
Primary forest	0.16
Mangrove forest	0.91
Freshwater marsh	0.11
Freshwater swamp forest	0.39
Total Vegetation Cover	56.0

(Adapted from Yee et al., 2011)

Source: Slide extracted from presentation by Tan Puay Yok, December 2012

2030: More land, more homes, more greenery



By 2030...

Singapore land requirements to go up from 71,400 ha now to **76,000ha**

85% of S'poreans to live within 10-15 minutes' walk of a park

8 in 10 homes within a 10-minute walk of MRT station

900ha of reservoirs

100km of waterways opened up by 2030

Park connectors extended from 200km to **360km**

Other future developments

- More integrated hospitals, 4,100 more beds by 2020
- Adding 40 new bus services and 800 buses over next five years
- Long-term plan to extend cycling networks in HDB towns
- 700,000 homes: 200,000 by 2016 – 110,000 public, 90,000 private; and 500,000 – a mixture of private and public, to be calibrated as needed

Source: MND

BELOW: Punggol will grow to triple its size with 96,000 homes.

ARTIST'S IMPRESSION

Singapore's National Biodiversity Strategy and Action Plan

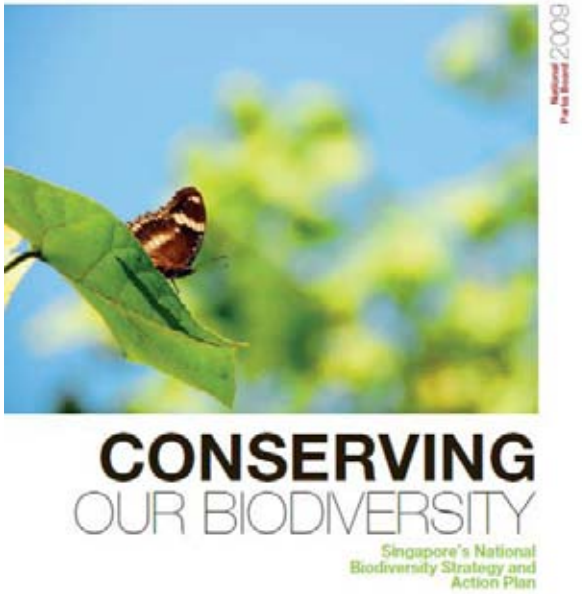
Strategy 1: Safeguard Our Biodiversity

Strategy 2: Consider Biodiversity Issues in Policy and Decision- making

Strategy 3: Improve Knowledge of Our Biodiversity and the Natural Environment

Strategy 4: Enhance Education and Public Awareness

Strategy 5: Strengthen Partnerships with All Stakeholders and Promote International Collaboration



NBSAP

“Garden City” to a “City in a Garden”

- Establish world-class gardens
- Rejuvenate urban parks and enliven our streetscape
- Optimise urban spaces for greenery and recreation
- Enrich biodiversity in our urban environment
- Enhance competencies of our landscape and horticultural industry
- Engage and inspire communities to co-create a greener Singapore

Thrust 1 Establish world-class gardens

Singapore Botanic Gardens

Gardens by the Bay

Thrust 2 Rejuvenate urban parks and enliven our streetscape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Nature Ways

Enhancing Biodiversity in Nature Ways

Nature Ways Bringing nature closer to you!

Leea rubra
This very attractive native shrub grows up to 3 m tall and is an excellent plant in attracting both birds and butterflies

Melastoma malabathricum
Melastoma malabathricum is a common native shrub that can grow from 1 m to 3 m tall, and acts as a bird-attracting as well as butterfly nectar and host plant.

Flacourtia inermis
Flacourtia inermis is a fruit tree that can grow from 9 m to 15 m tall and is a butterfly host plant for the Leopard butterfly.

Syzygium zeylanicum
This native coastal forest tree attracts butterflies and sunbirds to its sweetly scented flowers. The white coloured fruits are also eaten by small birds.

Lime Butterfly (*Papilio demoleus malayanus*)
The Lime Butterfly flies rapidly, but stops occasionally to sunbathe with its wings opened flat.

Peacock Pansy (*Junonia almana javana*)
The butterfly has wings with a bright orange upperside and has prominent eyespots on it.

Black Veined Tiger (*Danaus melanippus hegesippus*)
This beautiful butterfly has stained-glass like patterned wings of orange, white and black.

Blue Pansy (*Junonia orithya wallacei*)
This butterfly is commonly encountered as its caterpillars feed on *Asystasia gangetica* ssp. *micrantha*, a common weed in Singapore.

Yellow-vented Bulbul (*Pycnonotus goiavier*)
This bird with its characteristic masked eyes, forages in bushes and trees for fruits, nectar, young shoots and insects.

Pink-necked Pigeon (*Treron vernans*)
Commonly found in all urban habitats, this native pigeon usually perches high up on trees, but also comes down to feed on small fruits along roads.

Scarlet-backed flowerpecker
(*Dicaeum cruentatum ignitum*)
This diminutive bird forages around forest edges and urban gardens and parks for fruits.

Black-naped Oriole (*Oriolus chinensis*)
This easily recognisable bird with its bright yellow plumage and masked eyes is found throughout Singapore and feeds mainly on small fruits.

More information can be found on http://florafaunaweb.nparks.gov.sg

Greening Public Infrastructure

Expressways

City area

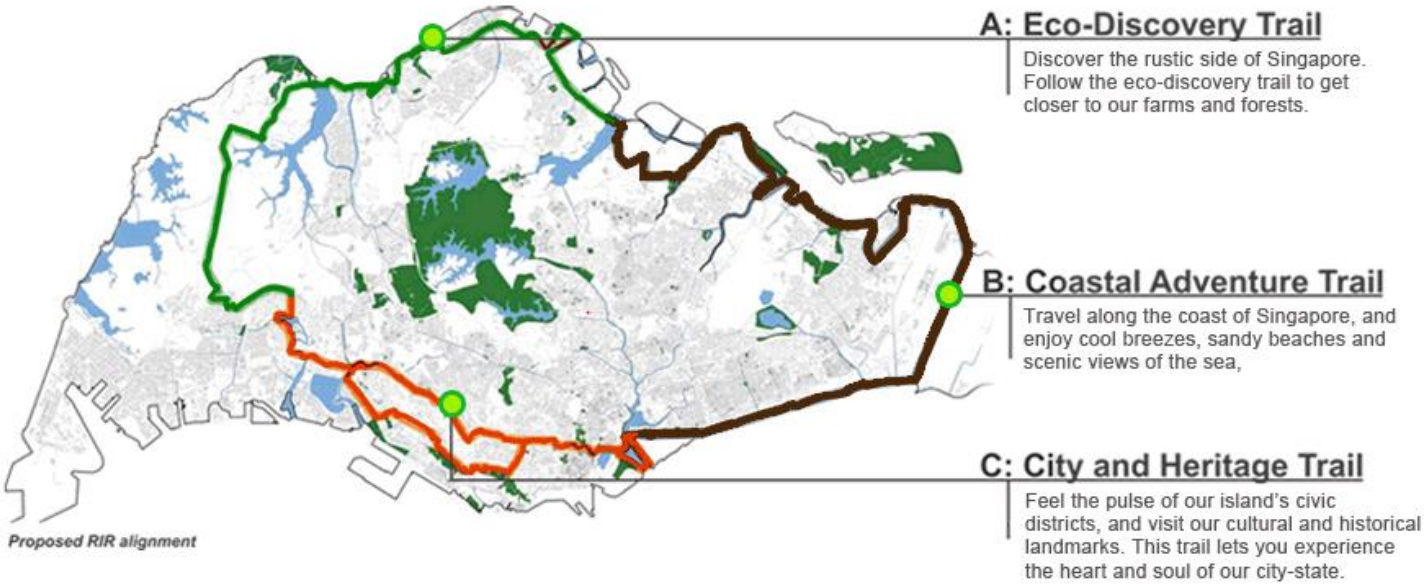
Tiger Orchid in City Area

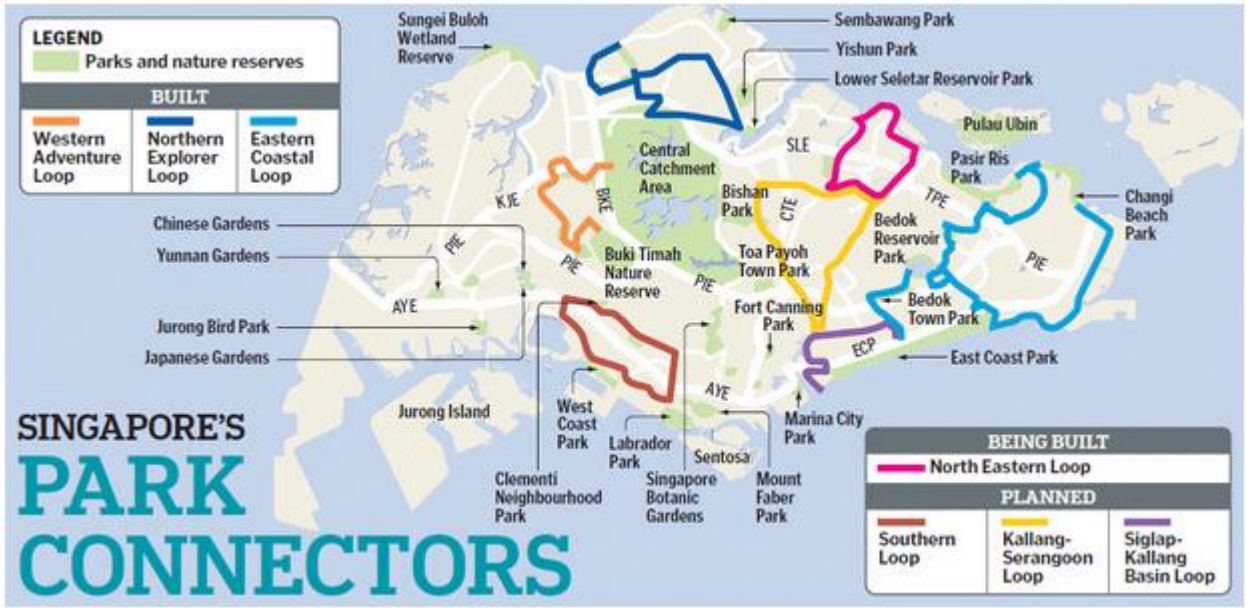
Thrust 3 Optimise urban spaces for greenery and recreation

For more information: www.skyrisegreenery.com

Elevated Linear Park

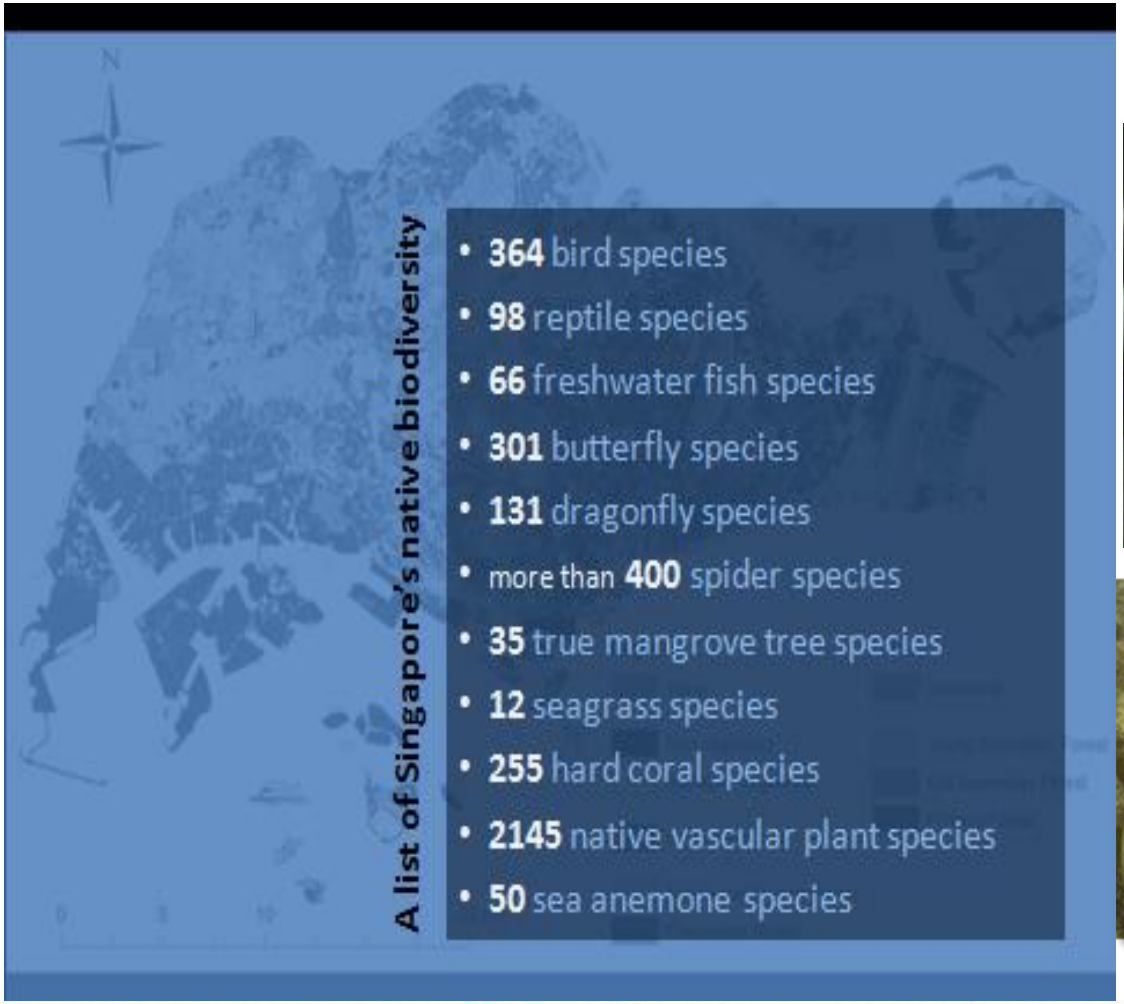
Round Island Route and Park Connectors Network





Thrust 4 Enrich biodiversity in our urban environment

Singapore's rich native biodiversity



THE SINGAPORE RED DATA BOOK

THREATENED PLANTS & ANIMALS OF SINGAPORE

Edited by
G.W.H. Davison, P.K.L. Ng and Ho Hua Chew

SECOND EDITION

Thrust 4 Enrich biodiversity in our urban environment

Thrust 5 Enhance competencies of our landscape and horticultural industry

CUGE®

Centre for Urban Greenery and Ecology

Thrust 6 Engage and inspire communities to co-create a greener Singapore

Community in Nature

Community in Bloom

SINGAPORE INDEX ON CITIES' BIODIVERSITY (CITY BIODIVERSITY INDEX)

- Self monitoring tool for cities to evaluate their urban biodiversity conservation efforts

- Developed in collaboration with SCBD and Global Partnership on Local and Subnational Action for Biodiversity

SINGAPORE INDEX ON CITIES' BIODIVERSITY

PART I – Profile of the City

- Location and size (geographical coordinates (latitudes and longitudes); climate (temperate or tropical); rainfall/ precipitation (range and average); area and include map or satellite image, and define city boundaries)
- Physical features of the city (geography, altitude of the city, area of impermeable surface, information on brownfield sites, etc.)
- Demographics (including total population and population density of the city; the population of the region could also be included if appropriate, and for the purpose of placing it in the regional context)
- Economic parameters (Gross Domestic Product (GDP), Gross National Product (GNP), per capita income, key economic activities, drivers and pressures on biodiversity)
- Biodiversity features (ecosystems found in the city, species found in the city, quantitative data on populations of key biodiversity indicators, relevant qualitative biodiversity data)
- Administration of biodiversity (Relevant information include agencies and departments responsible for biodiversity; how natural areas are protected (through national parks, nature reserves, forest reserves, secured areas, parks, etc., references to Aichi Biodiversity Targets)
- Links to relevant websites including the city's website, environmental or biodiversity specific websites, websites of agencies responsible for biodiversity

PART II - Indicators

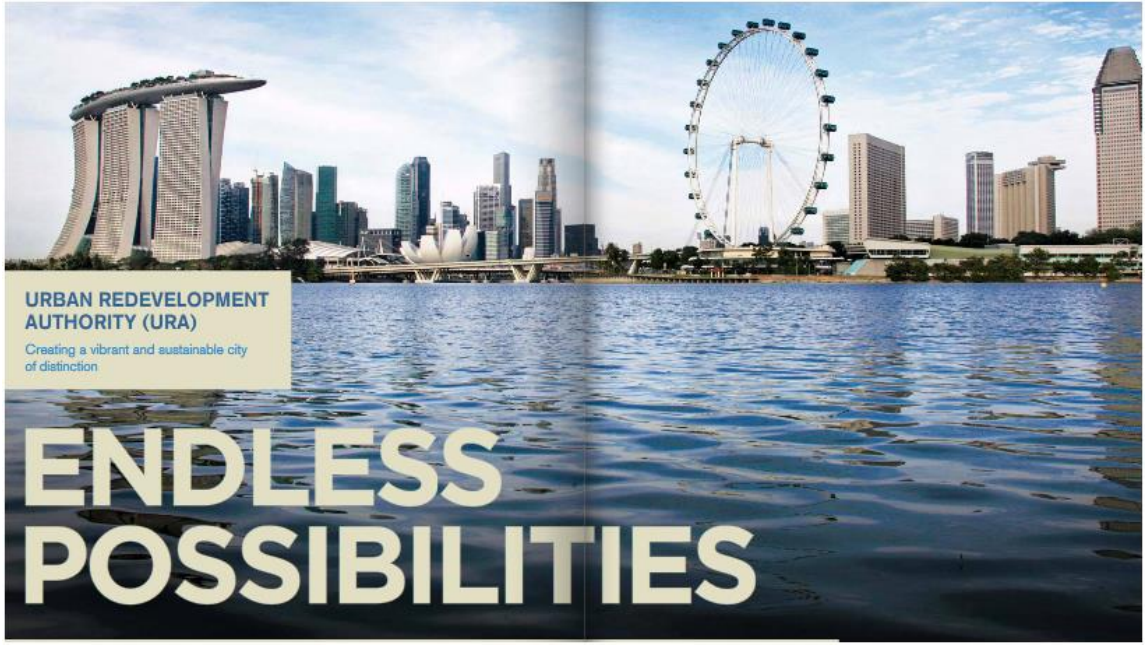
Core Components	Indicators	Maximum Score
Native Biodiversity in the City	1. Proportion of Natural Areas in the City	4 points
	2. Connectivity Measures	4 points
	3. Native Biodiversity in Built-up Areas (Bird Species)	4 points
	4. Change in Number of Vascular Plant Species	4 points
	5. Change in Number of Bird Species	4 points
	6. Change in Number of Butterfly Species	4 points
	7. Change in Number of Species (any other taxonomic group selected by the city)	4 points
	8. Change in Number of Species (any other taxonomic group selected by the city)	4 points
	9. Proportion of Protected Natural Areas	4 points
	10. Proportion of Invasive Alien Species	4 points
Ecosystem Services	11. Regulation of Quantity of Water	4 points
	12. Climate Regulation: Carbon Storage and Cooling Effect of Vegetation	4 points
	13. Recreation and Education: Area of Parks with Natural Areas	4 points
	14. Recreation and Education: Number of Formal Education Visits per Child Below 16 Years to Parks with Natural Areas per Year	4 points
Governance and Management of Biodiversity	15. Budget Allocated to Biodiversity	4 points
	16. Number of Biodiversity Projects Implemented by the City Annually	4 points
	17. Existence of Local Biodiversity Strategy and Action Plan	4 points
	18. Institutional Capacity: Number of Biodiversity-related Functions	4 points
	19. Institutional Capacity: Number of City or Local Government Agencies Involved in Inter-agency Cooperation Pertaining to Biodiversity Matters	4 points
	20. Participation and Partnership: Existence of Formal or Informal Public Consultation Process	4 points
	21. Participation and Partnership: Number of Agencies/Private Companies/NGOs/Academic Institutions/International Organisations with which the City is Partnering in Biodiversity Activities, Projects and Programmes	4 points
	22. Education and Awareness: Is Biodiversity or Nature Awareness Included in the School Curriculum	4 points
	23. Education and Awareness: Number of Outreach or Public Awareness Events Held in the City per Year	4 points

PART III - Calculation

Native Biodiversity in the City (Sub-total for Indicatfor 1-10)	**40 points**
Ecosystem Services (Sub-total for Indicators 11-14)	**16 points**
Governance and Management of Biodiversity (Sub-total for Indicators 15-23)	**36 points**
Maximum Total:	**92 points**

KEY ELEMENTS to Success

- GOOD GOVERNANCE
- GOOD PLANNING/ VISION
- INNOVATION
- WHOLE OF GOVERNMENT –
    - STRONG LEADERSHIP
    - EFFECTIVE IMPLEMENTATION
    - PRAGMATISM
- CO-CREATION (GOV WITH PEOPLE)



"The cities of the 21st Century are where human destiny will be played out, and where the future of the biosphere will be determined. There will be no sustainable world without sustainable cities." --Herbert Girardet

THANK YOU

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