



GREEN DIVERSITY

A botanical drawing of *Zingiber chrysostachys*



Gingers

play an important role in tropical forests as ground cover



Future in Our Hands
Kranji Secondary School:
Group of 5B and 5C
art students

We used our fingers and handprints to create an image of a tulip flower. We want to present the idea, quite literally, that if we put our hands together, we will be able to make our world a better and more beautiful place.



Cycle or Pollute
Kranji Secondary School:
Chew Yeh Hern, Yap Chee
Keng, Lim Wen Kang

The bicycle is created with recycled materials while we show trees being destroyed by the gases produced by cars. We hope to encourage people to use bicycles or public transport to help save the environment.

Singapore is one of only two cities in the world with tropical lowland rainforest within the city boundaries.

Saving our Native Plants

To save our rare and endangered native plants, we have put in place a Plant Conservation Strategy to monitor rare plant populations, salvage plants that are in danger of losing their habitats, propagate selected species, and track reintroduced plants.

We are also collaborating with external agencies, organisations and individuals to strengthen our plant conservation efforts.

Putting the Zing in Ginger Research

There are over 1,500 ginger species worldwide, yet more than 3,700 ginger names have been published. It is clear that some species have been named more than once while others have been incorrectly named. This poses a hindrance to ginger research and conservation in Asia.

To set things right, Singapore Botanic Gardens has established an Asian Zingiberaceae Information Centre (AZIC) to gather the original literature in which the names of Asian gingers were first published. Funded by NParks and the Botanic Gardens Conservation International, AZIC has collected 70% of original literature relating to Asian ginger names. Copies of the publications are accessible at the Herbarium in Singapore Botanic Gardens to botanists, researchers and students in Asia.

The Centre not only advances our understanding and protection of ginger biodiversity in Asia, but also strengthens the role of the Botanic Gardens as a tropical botanical institution.

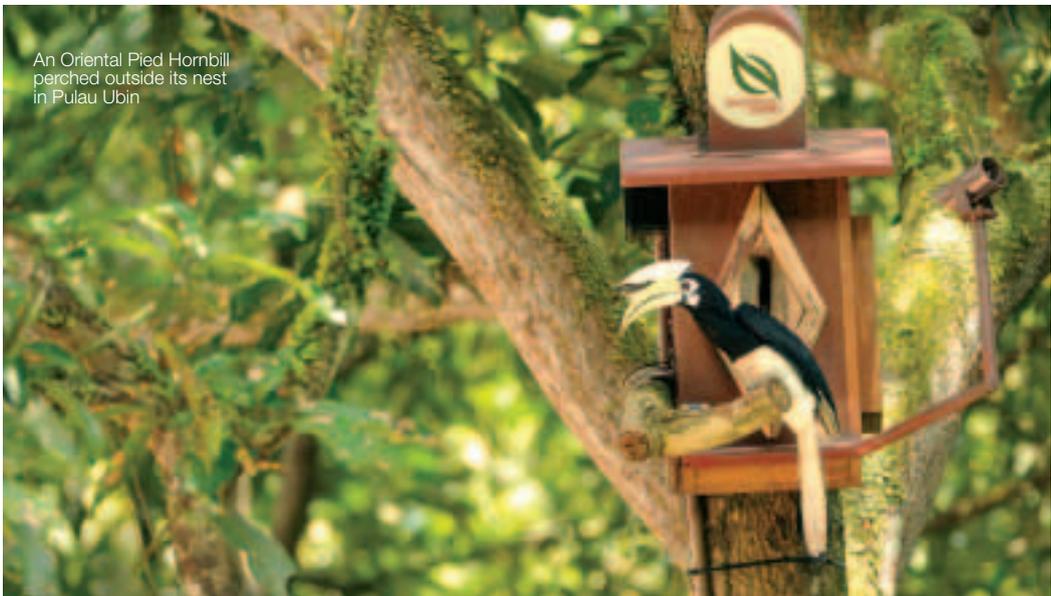


Pink-necked
green pigeon
(*Treron vernans*)

Bird Conservation Takes Flight

To protect the bird life in Singapore, NParks has initiated a project to monitor the native bird species and their habitat preferences.

Efforts are also being made to increase the presence of rare birds by studying their life cycles and providing incentives for breeding, such as growing plants that they can feed on.



An Oriental Pied Hornbill perched outside its nest in Pulau Ubin

Return of the Oriental Pied Hornbill

Once thought to be extinct in Singapore, the Oriental Pied Hornbill is re-establishing healthy populations here, thanks to the collective efforts of NParks, Jurong BirdPark and Nanyang Technological University.

Initiated in 2004 by French researcher Marc Cremades and avid naturalist Prof Ng Soon Chye, the Singapore Hornbill Project monitors the bird's breeding behaviour to better understand the factors behind nesting success and failure. Infra-red video cameras to capture what happens after a female seals herself in to raise her brood of chicks have been installed in both natural and artificial nests.

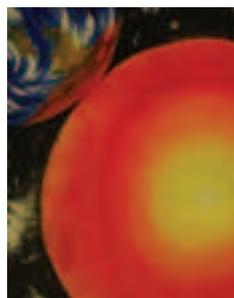
This conservation project will be showcased at the 5th International Hornbill Conference in Singapore in 2009.



Concrete Forest

Catholic High School:
Tan Jie Qi, Han Jie Chou

This painting shows a city with a dead tree on one side and a live tree on the other. The message is that even though urbanisation is good, if we do not take care of the environment just as well, all the beautiful trees and plants will die.



Collision

Catholic High School:
Shi Cheng Zi Jing

If we humans do not protect our own environment (Earth), then the forces of the universe (Sun) will destroy it for us.



The Bicolour Damselfly or *Ceriagrion cerinorubellum* is commonly seen in many of our parks.

Creating Homes for Dragonflies

NParks has been working with the Dragonfly Interest Group of Nature Society (Singapore) to carry out surveys on dragonfly species and to find out the environmental parameters related to dragonfly ecology. The findings will be used to make recommendations on creating dragonfly-friendly habitats within our parks.



Green Responsibility

Catholic High School:
Kong Choong Lee, Lee Kwok Yuen Shaun Raphael

Globalisation results in the pollution of our world. Singaporeans have the full responsibility of beautifying the country, to make it pollution-free and a conducive environment to live in.



Four Leaves

Raffles Institution:
See Yong Xin, Raphael Quek Hao Chong, John Kee Jia Liang, Sean Cham Fan Yang, Marcus Peh Jim Keng, Daniel Siew Jihan

The four seasons of nature are represented by four leaves in this collage. Each leaf has a different texture that corresponds with the season.

over

27

stray pangolins
released back into the
wild in the last decade

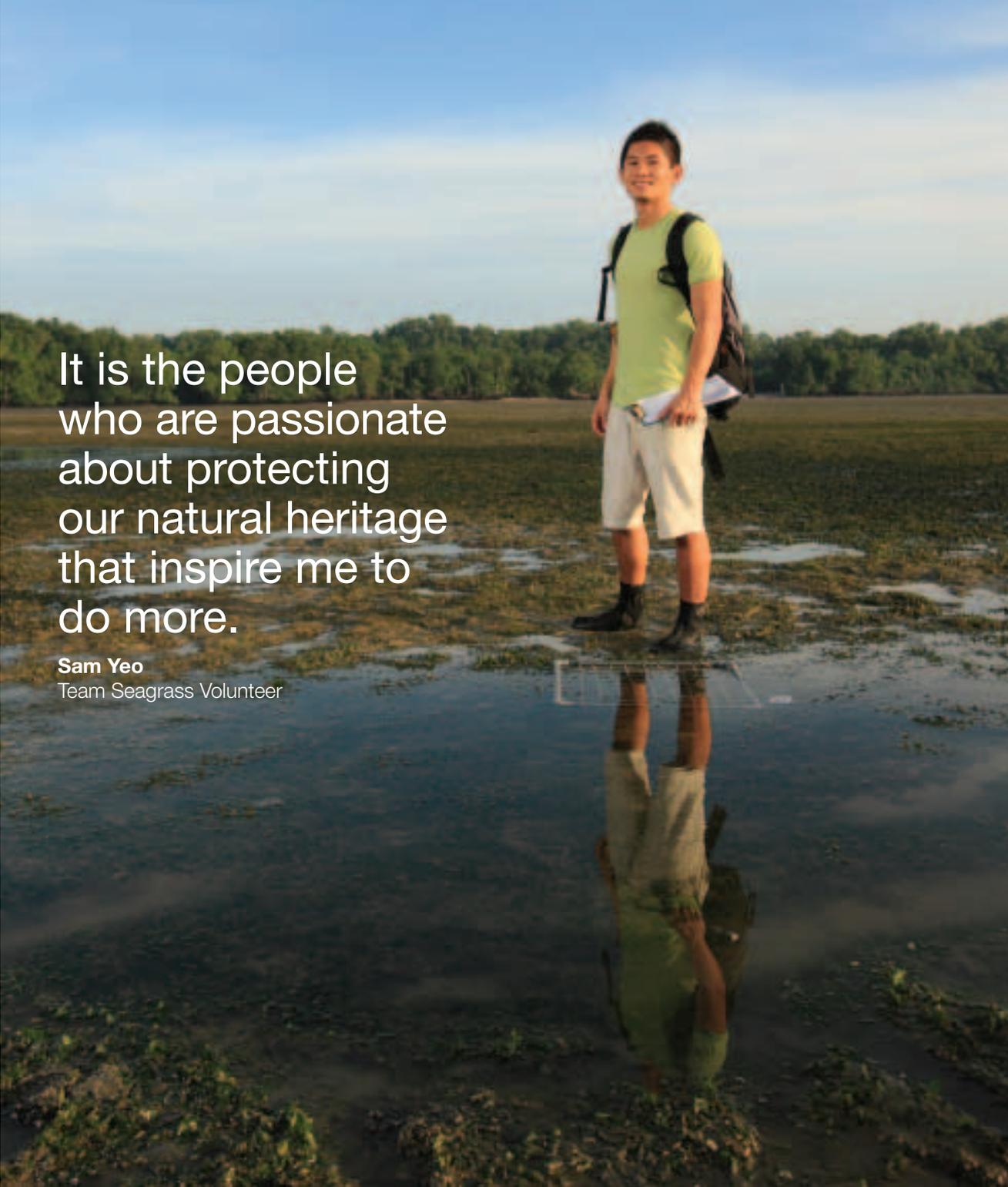
Returning the Pangolins to the Forest

The Malayan Pangolin resides in forested areas and is considered endangered in Singapore and the world. Being solitary animals, they often stray out of the forest in search of food, a mate or a new home.

NParks works with Singapore Zoo and the Agri-Food and Veterinary Authority to return stray pangolins back into the wild. In the past decade, we have released over 27 pangolins into the nature reserves.



The nature reserves
have been safeguarded
for native wildlife like the
Malayan Pangolin

A photograph of a man standing in a shallow, wet seagrass meadow. He is wearing a light green t-shirt, white shorts, and black boots, and has a backpack on. The water is calm, creating a clear reflection of him. The background shows a line of trees under a clear sky.

It is the people
who are passionate
about protecting
our natural heritage
that inspire me to
do more.

Sam Yeo
Team Seagrass Volunteer

Underwater Meadows

Seagrass beds are shallow-water ecosystems that are important habitats, food sources, and sediment stabilisers. Since 2006, NParks has been working with Team Seagrass, Raffles Girls' School, and pharmaceutical firm Schering-Plough to monitor the seagrasses and other intertidal life at Chek Jawa Wetlands, Pulau Semakau, Cyrene Reef, and Tanjong Rimau in Sentosa. The data collected will help us to better understand and manage our seagrass meadows.

Cultivating Corals

NParks has been teaming up with the Blue Water Volunteers to carry out surveys of hard corals, mobile invertebrates and reef fish at nine locations in the Southern Islands.

In April 2007, we documented the yearly mass synchronous coral spawning as part of our research work with the Marine Biology Lab of National University of Singapore.

The first coral nursery in Singapore was launched in July 2007 by NParks, Keppel Group, National University of Singapore and National Environment Agency. Located off Pulau Semakau, this two-year initiative aims to grow out hard coral fragments that would otherwise have died without our intervention. These 'corals of opportunity' will be grown to sufficient size and transplanted to coral reefs off the southern coast of Singapore to enhance the ecological health of our marine habitats. We aim to grow 500 to 600 coral fragments by mid-2009.



Sound urbanisation and environmentally well-managed cities can exist. Singapore ... is indeed a living testimony of this reality.

Dr Ahmed Djoghlaif

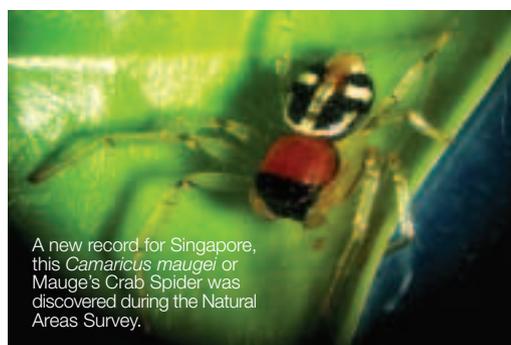
Executive Secretary
Convention on Biological Diversity

Marine Conservation: The Next Wave

Singapore recognises the importance of integrated coastal and marine management in environmental sustainability. In April 2008, NParks was tasked to establish a Coastal and Marine Environment Programme Office to support the Government's multi-agency technical and policy committees. This new initiative enables NParks to take a more systematic approach in marine conservation and research.

Nature's Database

The first edition of the Singapore Red Data Book, published in 1994, lists the conservation status of our native species. An updated edition is being published using the findings from our island-wide survey of natural areas.



The information that we have gathered from our monitoring activities will also be used to start an electronic database to better document, analyse and share data on the biodiversity of Singapore.



Singapore is becoming the reference site in Southeast Asia for mangrove insects. National parks with natural or semi-natural habitats are open-air laboratories within hand's reach, making intense observation simple. My study of mangrove insects in Singapore revealed very rich and diverse fauna, with numerous new species for science found and described.

Dr Patrick Grootaert (above)
Head, Department of Entomology
Royal Belgian Institute of Natural Sciences



Creating a Sustainable Environment

The prototype glasshouse complex in HortPark is a research facility of NParks. It tests the growing conditions of plants from various parts of the world and the technologies that would support them in the most energy-efficient manner.

Current research is already providing valuable data for the Cooled Conservatories of Gardens by the Bay. Studies have shown that by applying a combination of the latest cooling technologies, the energy consumption for the Conservatories will be lower than that of a typical commercial building of similar size.

By featuring some of the rarest plant species, the Cooled Conservatories will help raise awareness of the impact of climate change.

Sean Koh (left)

Manager of Floriculture for Gardens by the Bay

Greener Parks

NParks and the Building and Construction Authority have jointly introduced a Green Mark for Parks to measure the environmental, economic and social sustainability of parks. Green Mark for Parks takes into consideration areas such as waste and material minimisation, water and energy efficiency, park management, conservation and heritage, and other green features. Sungei Buloh Wetland Reserve and Fort Canning Park were among the first in Singapore to attain the mark.

Our other parks are also getting greener. In March 2008, we completed a one-and-a-half-year effort to replace the light bulbs of all 13,000 lamps in our parks and nature reserves with energy-saving ones. This reduces energy consumption by half. Other eco-friendly measures being pursued include using solar power and recycling horticultural waste and rainwater.

