

ANNUAL REPORT  
2018/2019

# Living with Nature



A photograph of a dense green forest. In the foreground, there is a metal walkway with railings. A few people and a dog are visible on the walkway. In the background, a building with a glass facade is visible through the trees. The sky is a pale, overcast grey.

## Content

- 02 CHAIRMAN'S MESSAGE
- 04 MEMBERS OF THE BOARD
- 06 MANAGEMENT TEAM
- 08 ORGANISATION STRUCTURE
- 10 THRIVING GREENERY
- 20 A BIOPHILIC HOME
- 28 A GROWING INTEREST
- 36 NURTURING THE FIELD
- 44 GARDEN CITY FUND
- 48 SUSTAINABILITY REPORT
- 52 FACTS & FIGURES
- 58 CORPORATE GOVERNANCE
- 60 PUBLICATIONS
- 66 FINANCIAL REVIEW
- 70 FINANCIAL STATEMENTS



## When our History and Natural Heritage intersect

In 2019, Singapore celebrates 200 years of the intersection between our history and our natural heritage – entrenched in our nature ways and nature reserves, our parks and park connectors, as well as our flora and fauna.

The idea for a national garden was planted in 1822 when Sir Stamford Raffles, the founder of modern Singapore, developed the first Botanical and Experimental Garden at Fort Canning. In 1859, the Singapore Botanic Gardens was established at the Tanglin site and in the 160 years past, it has flourished from a pleasure garden for the colonial community to a place cherished by all Singaporeans, a botanical institution known internationally.

Singapore's greening journey took root in the 1960s when founding Prime Minister, Mr Lee Kuan Yew planted a Empat Tree at Farrer Circus. This kickstarted a national effort for tree planting, sowing the seed of a green home where beautiful parks and green belts would be the birthright of every Singaporean.

Today, the intricate lattice of greenery we have woven into the cityscape supports thriving biodiversity and provides residents with a quality living environment. This not only draws the appreciation and marvel of visitors, but has become a part of our national identity. This is the green culture we now impart to the next generation as we continue living harmoniously with nature.

## Chairman's Message

Vested with the mission to make Singapore our City in a Garden, NParks aspires to create the best living environment for our residents.

In 2019, Singapore commemorates our bicentennial, re-visiting not only the history of modern Singapore since 1819 but also re-visiting and re-vitalising the story of its less well-known but no less rich pre-modern history dating almost 500 years before that.

The Bicentennial Office (PMO) chose Fort Canning Park as the site hosting the centre-piece of the national bicentennial programme – a spectacular multi-media sensory experience telling the story of 700 years of Singapore history. Fort Canning (“Government Hill” under the British or “Bukit Larangan” in the earlier times of local Malay kings) is an iconic site in Singapore’s historical geography.

Fort Canning housed our first “botanic gardens” as plants of economic or potential economic significance were planted there for study by Raffles and Farquhar. It represents a unique convergence of our history and our rich natural heritage. NParks officers worked hard to develop and articulate this heritage and these efforts came to fruition in 2019 with the creation and completion of nine historical gardens reflecting a time-line dating to the 14th century.

This reporting year has been an active time for our officers on many other fronts.

We commemorated the International Year of the Reef, establishing Singapore’s largest purpose-built reef structures at the Sisters’ Islands Marine Park. We celebrated 25 Years of Community Stewardship in Nature Conservation, acknowledging and recognising the critical importance of an active and informed citizen partnership in these endeavours.

Singaporeans have been consistent in their love for Nature. The Singapore Garden Festival in 2018 welcomed a record number of more than 600,000 local and international visitors. Our Festival of Biodiversity involving 44 partners reached out to 31,000 people. We also saw a record number of participating gardens in the Community In Bloom Awards in 2018 – almost 550 gardens took part in this event.

Vested with the mission to make Singapore our City in a Garden, NParks aspires to create the best living environment for our residents. To optimise urban spaces for greenery, we planted more than 77,000 trees across the island over the last 12 months. We also completed the greening of 12 MRT stations as well as more than 20 km of Nature Ways. The plan is to achieve 180 km of Nature Ways along our streets by 2030 and we are well on track to do so.

A major challenge for NParks is the need to maintain and enrich our greenery and biodiversity. This involves not just specific interventions by way of special programmes but also requires enhancing operational capacities and deepening expert knowledge and competencies. We launched the Forest Restoration Action Plan, covering the next 10 years, to strengthen the resilience of our native rainforests by restoring ecological processes and enhancing the biodiversity and ecological connectivity in Bukit Timah Nature Reserve, Central Catchment Nature Reserve and Nature Park Network. We established Singapore’s first Seed Bank to safeguard the plant germplasm of Southeast Asia, a major development in the spectrum of our conservation capabilities.

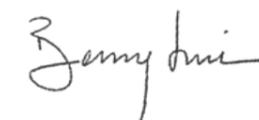
We also worked hard to enhance the competencies of the local landscape and horticulture industries. In 2018, CUGE offered more than 1,700 WSQ training places, with more than 90% of Singapore’s landscape workforce covered under the Landscape Progressive Wage Model.

NParks as an organisation has also been assigned new functions, taking over some of the work previously performed by AVA.

In this connection, the newly formed Animal & Veterinary Service cluster in NParks will serve to be the main touch-point on animal and veterinary-related issues for pet owners and businesses, and animal welfare groups. As the first responder for animal-related feedback, it has an important role in ensuring animals and humans in our society stay healthy and safe from the threat of animal diseases.

Much has been done over this busy year. This would not have been possible without the continued commitment and support of our volunteers, our partners in the corporate, civic and public service realms.

We thank you for your support and invite you to continue on this journey with us in NParks to create a city in a garden and a biophilic society, where a love for and connection with Nature may cultivate over time, a culture of care beyond self – a care for others and for the environment we share each day with all things living.



**Mr Benny Lim**  
Chairman, National Parks Board

## Members of the Board

As of October 2019



**MR BENNY LIM**  
Chairman

Mr Benny Lim was Permanent Secretary of the Ministry of National Development from 2011 to 2016, and held concurrent appointments as Permanent Secretary in the Prime Minister's Office and for National Security & Intelligence Coordination. Prior to that, he was Permanent Secretary of the Ministry of Home Affairs from 2005 to 2011. Mr Lim was awarded the Meritorious Service Medal in 2010. He retired from the Civil Service in 2016 and serves presently as Special Advisor to the Centre for Liveable Cities, Special Advisor to the National Security Studies Programme, RSIS/NTU as well as Chairman of Temasek Foundation Connects CLG.



**ANDREAS SOHMEN-PAO**  
Board Member

Mr Sohmen-Pao is Chairman of BW Group Limited, BW LPG Limited, BW Offshore Limited and Singapore Maritime Foundation. He is also a non-executive director of Singapore Symphonia Company Ltd. Mr Sohmen-Pao was previously Chief Executive Officer of BW Group. He has also served as a non-executive director of the Hongkong Shanghai Banking Corporation, Maritime and Port Authority of Singapore, Sport Singapore and The Esplanade Co Ltd amongst others. Mr Sohmen-Pao holds an honours degree (BA Hons) from Oxford University and an MBA from Harvard Business School.



**WARREN FERNANDEZ**  
Board Member

Mr Fernandez is Editor-in-Chief of The Straits Times and English/Malay/Tamil Media Group of Singapore Press Holdings (SPH). He has been with SPH since 1990. Mr Fernandez graduated with First Class Honours from Oxford University, where he read Philosophy, Politics and Economics, and also has a Master's Degree in Public Administration from Harvard University. He is currently a board member of National Heritage Board, SPH (Overseas) Ltd, SPH (America) Ltd, The Straits Times Press Ltd, and is Chairman of the board for The Straits Times School Pocket Money Fund.



**DR SURIANI SURATMAN**  
Board Member

Dr Suriani is Senior Lecturer at the Department of Malay Studies, National University of Singapore. She is trained as a social anthropologist. Her teaching and research cover areas on Malay culture and society. She has conducted research in Singapore, Malaysia and the Philippines. She is currently Deputy Chairman of the Malay Heritage Foundation Board of Directors. She is also a board member of the National Gallery Singapore and National Heritage Board. In addition, Dr Suriani is a potter and has done commissioned creative pieces for Temasek Holdings, The Sentosa Resort and Spa, National Heritage Board, Patron of the Year Award and Singapore International Foundation.



**GUY HARVEY-SAMUEL**  
Board Member

Mr Harvey-Samuel was formerly Group General Manager, Chief Executive Officer of The Hongkong and Shanghai Banking Corporation Limited (HSBC), Singapore. A member of HSBC's Asian Executive Committee, Mr Harvey-Samuel was directly responsible for all HSBC operations based in Singapore. He continues to serve HSBC as a non-executive Director, and is also currently a member of the Advisory Board of the National Youth Achievement Award Council and National Arts Council, as well as the boards of Surbana Jurong Private Limited and Jurong Town Corporation.



**GEORGE HUANG**  
Board Member

Mr Huang is Managing Director of Amoy Canning Corporation (S) Ltd, a pioneer in the food processing industry in Asia. An active leader and contributor in business and the community, he serves on the boards and committees of various organisations including Singapore Manufacturing Federation, Singapore Business Advisors & Consultants Council and Consumers Association of Singapore. He was also formerly the Honorary Consul General of the Federal Democratic Republic of Ethiopia to Singapore.



**CHENG HSING YAO**  
Board Member

Mr Cheng is the Group Managing Director of GuocoLand Singapore and a director of Eco World International Berhad. He joined GuocoLand Singapore in 2012. Prior to this, he was with the public service, holding leadership positions at the Centre for Liveable Cities and Urban Redevelopment Authority (URA). He is a member of URA's Design Advisory Committee as well as Heritage and Identity Partnership, and a member of the Urban Land Institute Singapore Executive Committee. He holds a Bachelor of Architecture from Newcastle University, UK, and a Master in Design Studies from Harvard University.



**MS SHANTINI RAMACHANDRA**  
Board Member

Ms Shantini is a Tax Partner at Deloitte & Touche LLP and the South East Asia Tax Leader for Deloitte Private. She has a Bachelor of Laws degree from the National University of Singapore and a Master of Laws degree from the University of London, King's College. She has been admitted as an Advocate and Solicitor of the Supreme Court of Singapore and is also an Accredited Tax Advisor (Income Tax) with the Singapore Institute of Accredited Tax Professionals Limited. Ms Shantini practised law in the area of commercial and corporate law before joining a Big Four accounting firm and has about 20 years of international tax experience.



**MUSA FAZAL**  
Board Member

Mr Musa heads the SkillsFuture Division in the Ministry of Education where he is responsible for policy matters associated with adult training and the SkillsFuture movement. He holds a concurrent appointment in SkillsFuture Singapore (SSG) where he oversees the agency's strategic and resource planning efforts. Prior to this, he has served in various agencies in the public service, including the Ministry of Manpower, Ministry of Finance and Monetary Authority of Singapore.



**KENNETH ER**  
Board Member and Chief Executive Officer

Mr Er began his career in National Parks Board (NParks) and has been involved in the planning, implementation and management of parks and streetscapes in the city. In 2003, he was seconded to the Ministry of National Development, where he oversaw policies and was actively involved in the review of legislation pertaining to parks and greenery infrastructure, agri-veterinary issues, and building and construction. Mr Er was subsequently appointed General Manager at Gardens by the Bay, where he played a pivotal role in developing the Gardens from concept to form. He was also concurrently Assistant Chief Executive Officer (Corporate Development & Services) at NParks. He was appointed Chief Operating Officer of Gardens by the Bay in 2012. Mr Er is presently the Chief Executive Officer of NParks.

# Management Team

As of October 2019

LEFT TO RIGHT

**DR KIAT W TAN**  
Advisor to NParks

**KENNETH ER PIN**  
Chief Executive Officer

**MS LEE PIN PIN**  
Group Director, Communications & Community Engagement

**DR LEONG CHEE CHIEW**  
Deputy Chief Executive Officer, Professional Development & Services Cluster; Executive Director, National Parks, Gardens & Nature Reserves Cluster and Commissioner Of Parks & Recreation

**MS ANG WEI PING**  
Group Director, Policy & Planning

**NG CHEOW KHENG**  
Group Director, Horticulture & Community Gardening

**DR ADRIAN LOO**  
Group Director, Conservation and Wildlife Management

**OH CHEOW SHENG**  
Group Director, Streetscape

**WONG TUAN WAH**  
Group Director, Fort Canning Park & Istana and Senior Curator, Istana

**BIN HEE JUM**  
Group Director, Finance & Procurement

**DR LENA CHAN**  
Senior Director, International Biodiversity Conservation

**KONG YIT SAN**  
Assistant Chief Executive Officer, Park Management & Lifestyle Cluster

**LIM LIANG JIM**  
Group Director, National Biodiversity Centre

**DAMIAN TANG**  
Senior Director, Design



**TEVA RAJ**  
Senior Director, Municipal Landscapes

**\*DR NIGEL TAYLOR**  
Group Director, Singapore Botanic Gardens

**CHUAH HOCK SEONG**  
Group Director, Parks 2 and Associate Director, Centre for Urban Greenery and Ecology (CUGE)

**TAN CHONG LEE**  
Assistant Chief Executive Officer, Corporate Development & Services Cluster

**DR CHUA TZE HOONG**  
Group Director, Industry & Biosecurity Management

**SIM CHENG HAI**  
Group Director, Industry/CUGE

**MS TAN LAI KHENG**  
Senior Director, Lifestyle Business

**FRANCIS LIM**  
Group Director, Corporate Services

**DR CHANG SIOW FOONG**  
Group Director, Professional & Scientific Services

**MS SOPHIANNE MOHD ARAIB**  
Group Director, Corporate Strategy & Planning and Parks Central

**DR YAP HIM HOO**  
Director-General, Animal & Veterinary Service Cluster

**CHIA SENG JIANG**  
Group Director, Parks 1

**MS KARTINI OMAR**  
Group Director, Parks Development and Jurong Lake Gardens

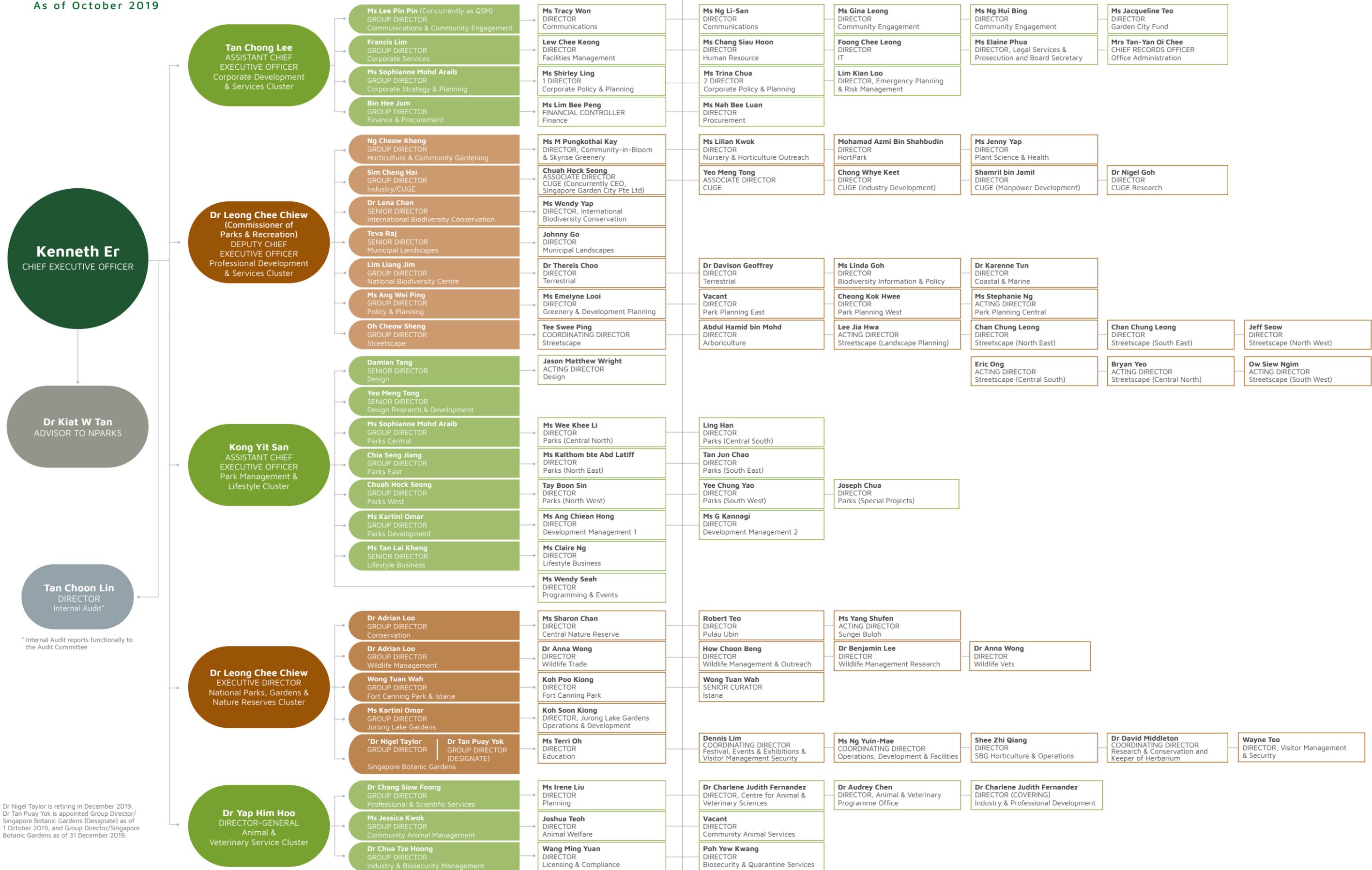
**YEO MENG TONG**  
Senior Director, Design Research & Development and Associate Director, CUGE

\*Dr Nigel Taylor is retiring in December 2019. Dr Tan Puay Yok is appointed Group Director/Singapore Botanic Gardens (Designate) as of 1 October 2019, and Group Director/Singapore Botanic Gardens as of 31 December 2019.

The Management Team photos were taken at Fort Canning Park  
Not in picture: Ms Jessica Kwok, Group Director, Community Animal Management

# Organisation Structure

As of October 2019



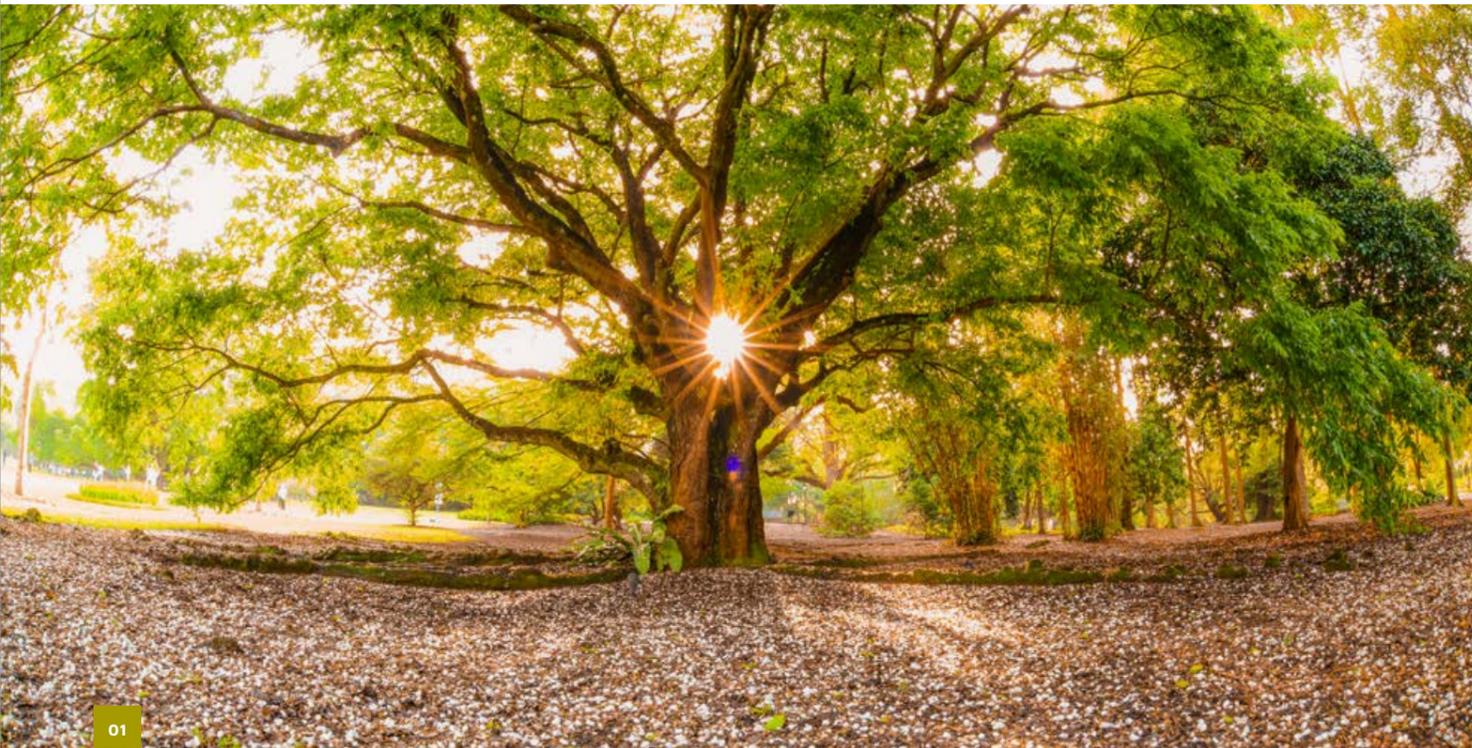
\* Internal Audit reports functionally to the Audit Committee

\* Dr Nigel Taylor is retiring in December 2019. Dr Tan Puay Yok is appointed Group Director/Singapore Botanic Gardens (Designate) as of 1 October 2019, and Group Director/Singapore Botanic Gardens as of 31 December 2019.



## THRIVING GREENERY

With more than 350 parks and four nature reserves, our green spaces are living examples of our rich natural heritage. NParks continues to strengthen our green infrastructure, contributing towards a biophilic City in a Garden for all.



01

### BRIDGING HISTORY TO THE FUTURE

Since its establishment in 1859, the Singapore Botanic Gardens has played a pivotal role in conserving our natural heritage. As part of its 160th anniversary celebrations, it will open an 8-hectare extension along Gallop Road in late 2019 where visitors will find an arboretum holding dipterocarp forest species as well as Singapore’s first permanent collection of botanical art on display.

The Ethnobotany Garden opened in June 2018, housing the largest collection of economic, medicinal and ethnobotanical plants in Southeast Asia. It includes a Centre for Ethnobotany that complements the outdoor landscape with an exhibition of artefacts and interactive elements. This development showcases Singapore Botanic Gardens’ unrivalled collections and enhances its role as an educational provider, aligned with its UNESCO World Heritage status.

In the same month, the Gardens held its annual Heritage Festival. Over 160,000 visitors, almost double the visitorship for 2017, enjoyed activities like a carnival, concerts and educational tours held over two weekends.



02



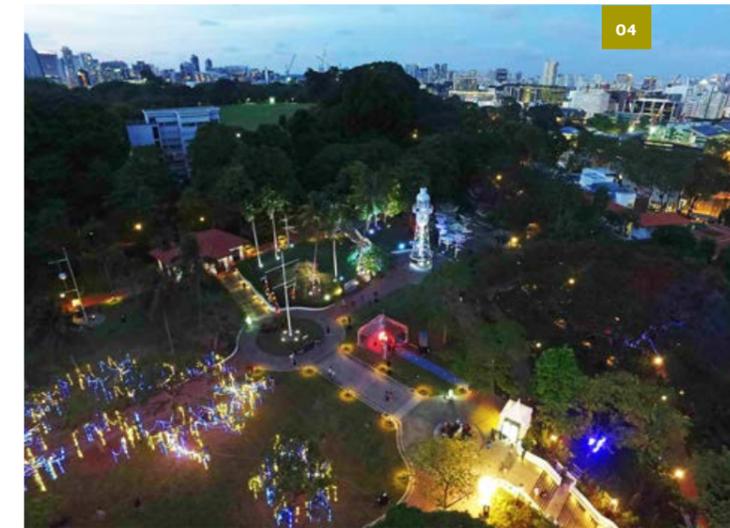
03

### SHOWCASE FOR SINGAPORE’S HERITAGE AND NATURE

As part of Singapore Bicentennial in 2019, the heritage landscapes of Fort Canning Hill and its surroundings will be restored and weaved into Fort Canning Park. As one of Singapore’s two National Parks, these enhancements highlight the significance of Fort Canning Hill and retrace the history of Singapore across the 14th, 19th and 20th centuries.

Fort Canning Centre will be repurposed as a gallery for visitors to learn about the hill’s history. They can also enjoy new vibrant public spaces as a section of Armenian Street has been turned into a park featuring plants that were historically introduced to Singapore as economic crops, for the spice trade, food and horticulture, as part of the First Botanic Garden. In addition, Jubilee Park will be restored, availing more outdoor family-friendly venues for arts and culture activities.

For a more immersive experience, visitors can expect a re-curation of existing heritage trails of the 14th and 19th centuries as well as the Raffles Garden and Farquhar Garden. Nature lovers can also volunteer in areas such as gardening and archaeology research. History



04

buffs can enjoy more hands-on interactive spaces and participate in newly-developed archaeology-related activities at the refreshed Archaeological Dig showcase when it is opened in June 2019.

The second edition of Festival at the Fort was held from 28 January to 24 February 2019 at Raffles Terrace. As a lead-up to the Bicentennial activities, it was held together with the i Light Singapore art festival and focused on the life and legacy of Sir Stamford Raffles.



05

- 1 The Singapore Botanic Gardens celebrates its 160th anniversary in 2019. As Singapore’s first UNESCO World Heritage Site, it has a rich history of research, conservation, education and recreation.
- 2 Minister for Social & Family Development and Second Minister for National Development Desmond Lee observes the inhabitants of a bee hotel, a man-made structure that provides an area for bees to nest in, during the opening of the Ethnobotany Garden.
- 3 Visitors to the Centre for Ethnobotany explore its range of physical artefacts and interactive exhibits, gaining insight into the significant role plants have in shaping human culture.
- 4 Fort Canning Park was specially lit up during the Festival at the Fort event, held together with the i Light Singapore art festival.
- 5 Armenian Street Park was formerly part of a road and today offers visitors seamless connectivity between Fort Canning Park and the surrounding civic district.

## READYING THE NATIONAL GARDENS IN THE HEARTLANDS

NParks is readying the opening of Lakeside Garden in April 2019. Together with Chinese and Japanese Gardens and Garden Promenade, which will open progressively from 2021, this will form the 90-hectare Jurong Lake Gardens that is envisioned to be a people's garden with sensitively landscaped spaces for the community to come together.

This National Gardens in the Heartlands will have lush greenery, restored wetlands and habitats, and vibrant programming, enhancing the living environment of residents in the west.

To this end, more than 32,000 suggestions and feedback have been gathered during a three-year public engagement exercise that included roving townhalls, exhibitions, focus group discussions and online surveys. This past year, even more groups in the community were engaged, including cyclists, community gardeners and students of Delta Senior School (under the Association for Persons with Special Needs) who will host tours for visitors.



## MORE GREEN SPACES TO ENJOY

Marsiling Park, formerly Woodlands Town Garden, opened in April 2018. Visitors now enjoy a range of day and night experiences including new amenities such as a ribbon playscape and 3-Generation fitness equipment. They can also learn about the ecosystem of the sensitively enhanced mangrove area along the park's western edge. During the park's redevelopment, critically endangered mangrove species like the Berembang (*Sonneratia caseolaris*) were reintroduced to boost the biodiversity and ecological resilience of the mangrove.

With its scenic sea views and open spaces framed by lush gardens, visitors to Raintree Cove at East Coast Park can enjoy a more tranquil experience compared to the bustle of the adjacent Marine Cove area. Raintree Cove was re-opened in March 2019 while the former Big Splash and Goldkist Chalets locations will open progressively in the next few years.



- 1 In the lead up to the opening of Jurong Lake Gardens, feedback was actively sought, such as at this engagement session where members of the public could vote for features they would most like to see in the Gardens.
- 2 Students from APSN Delta Senior School host a special plant guided tour in Jurong Lake Gardens, giving participants a peek into the flora that can be found in Singapore's new National Gardens in the Heartlands.
- 3 When completed, the 90-hectare Jurong Lake Gardens will comprise of Lakeside Garden, Chinese and Japanese Gardens and Garden Promenade. Lakeside Garden opens first in end-April 2019, while the rest will be completed from 2021 onwards.
- 4 Take in the views of the picturesque pond at Marsiling Park from the boardwalks. Nature-lovers will also appreciate the enhanced mangrove habitat found along the park's western edge.
- 5&6 Rest, lounge about or hang out with friends – Raintree Cove has plenty of spots to enjoy a more tranquil experience at East Coast Park.

## POSITIVE EFFECTS OF GREENERY

Centred upon the concept of biophilia (the innate emotional connection humans have with nature), a Nature Playgarden was opened at HortPark in March 2019. Nestled within greenery and built with natural materials, this area encourages spontaneous outdoor play among pre-schoolers and serves as a research test bed to develop guidelines for similar playgardens, conducted in consultation with the Early Childhood Development Agency and National Institute of Early Childhood Development.

Three new inclusive playgrounds were opened at Choa Chu Kang Park, Jurong Lake Gardens and Sun Plaza Park respectively during the year in review. A joint collaboration with the National Council of Social Service, their opening is part of an ongoing initiative to create more inclusive public spaces for children of all abilities to interact together.

A therapeutic garden at Choa Chu Kang Park opened in July 2018, the latest of such gardens to serve the residents of Singapore. Located next to a Community in Bloom garden, allotment garden and a children's play area, this new garden is a restful spot for the community to enjoy the restorative effects of greenery.

NParks continues to widen its research on the health benefits of such interactions with nature for a holistic approach to enhancing the design of future green spaces and therapeutic horticulture programmes.



01



02

## GREENING OUR STREETS AND BUILDINGS

Singapore continues to strengthen our green legacy, with multiple locations being rejuvenated with the planting of trees. NParks planted more than 77,000 trees and introduced six new species. Seven new Heritage Trees were endorsed in the past year. The community can visit [www.trees.sg](http://www.trees.sg) to learn more about our urban trees and discover the trees in their own neighbourhood.

Under the centralisation of greenery maintenance, NParks has been replacing self-sown trees with native tree species to enhance the habitat. Over 4,700 native plants were planted to replace storm-vulnerable species on state land.

To optimise urban spaces for greenery, the greening of 12 MRT stations was completed in the year in review, with some 1.6 km of covered linkways planted with creepers and climbers.

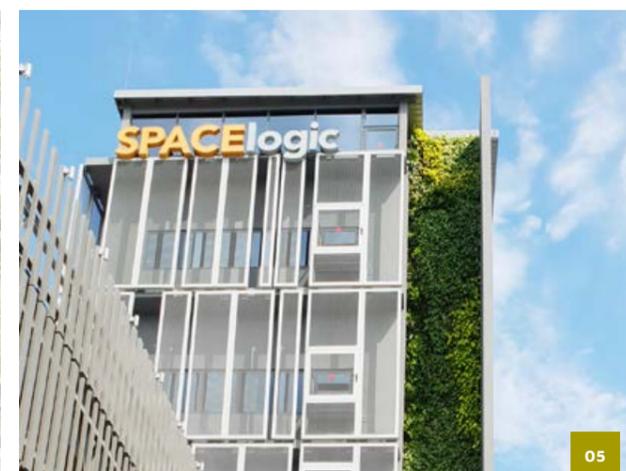
Singapore's green footprint continues to increase, with buildings like the University Cultural Centre, Institution of Engineers Singapore and SPACElogic Headquarters building being retro-fitted with skysrise greenery. To date, 110 hectares of skysrise greenery has been established, on target to achieve 200 hectares by 2030.



03



04



05

- 1&2 Flowering species and plants with colourful foliage have been introduced across Singapore, making our streetscape more vibrant. From bus stops to sheltered linkways outside MRT stations, such verdant greenery enhances the quality of life for all residents.
- 3 Nature Playgardens are designed with biophilic elements and natural materials for the young to engage in spontaneous play. Here, children play at the Building Huts in HortPark. These are teepees that they can build upon using twigs, branches or dried fronds found in the play area.
- 4 Visitors to the therapeutic garden in Choa Chu Kang Park can immerse themselves in nature and benefit from the restorative effects of greenery.
- 5 Look for vertical greenery in our city such as this outdoor green wall on the façade of the SPACElogic headquarters building in Changi South. This project was a recipient of the Skyrise Greenery Incentive Scheme in 2018.



## CONNECTING PARKS, CONNECTING HEARTS

NParks remains on track to achieve 180 km of Nature Ways along our streets by 2030. In 2018, we completed 20.9 km of Nature Ways along our streets. To date, we have achieved 100 km of Nature Ways across Singapore. Besides giving commuters more touchpoints to enjoy greenery, Nature Ways also connect areas of high biodiversity to urban communities and facilitate fauna movement between green spaces.

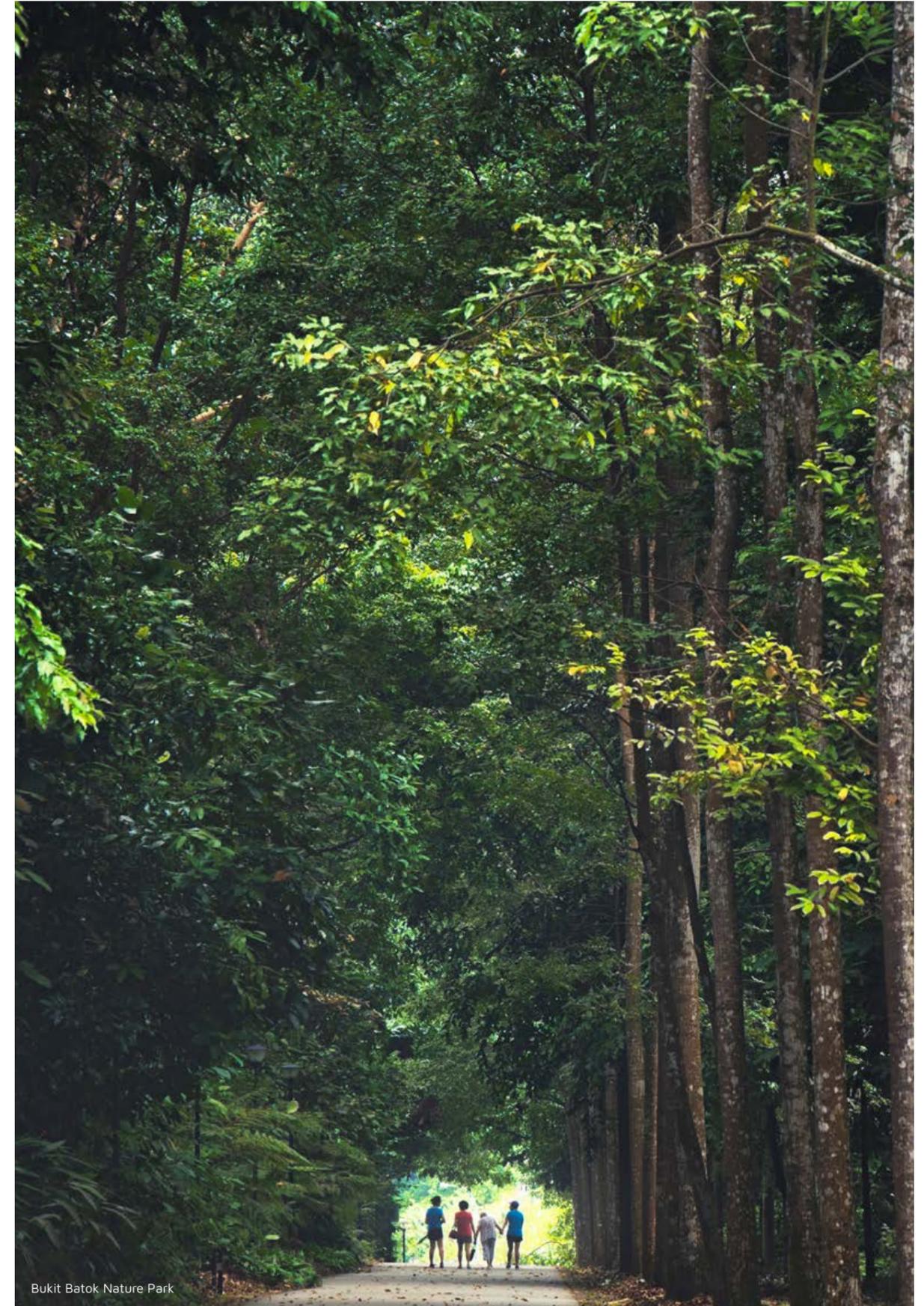
To further connect residents to nature, 16.9 km of park connectors – including Whampoa Opposite Bank, Woodsville, Outdoor Play Corridor, Geylang Opposite Bank, Kallang Riverine Park Tracks, Potong Pasir and Coney Island – have been completed. Upgrading works on 7.2 km of existing park connectors were also completed, including Ulu Pandan, Jurong, Sembawang, Canberra

Sembawang and Khatib Bongsu Park Connectors. By the end of the year in review, some 330 km of park connectors were completed.

To provide residents with more opportunities to connect with nature, NParks opened the Coast-to-Coast Trail and Rower's Bay on 30 March 2019. Stretching from Jurong Lake Gardens in the west to Coney Island Park in the northeast, this 36 km trail is complemented by a C2C Mobile App ([www.nparks.gov.sg/gardens-parks-and-nature/parks-and-nature-reserves/coast-to-coast#C2C\\_Mobile\\_app](http://www.nparks.gov.sg/gardens-parks-and-nature/parks-and-nature-reserves/coast-to-coast#C2C_Mobile_app)) that deploys interactive elements to give users a unique curated walking experience.

The new Rower's Bay, located on the banks of Lower Seletar Reservoir, features a boardwalk and a wetland habitat. This node is part of the first phase of completed works along the Round Island Route, and is also part of a future Park Connector Network loop, enhancing the seamless interlacing of nature into our living environs.

1 Take a ride along the new Coney Island Park Connector that offers beautiful views of its lush greenery and of the adjacent Serangoon Reservoir.  
2 Enjoy stunning vistas of Lower Seletar Reservoir while exploring the boardwalk at the new Rower's Bay, a node along the Round Island Route.



## A BIOPHILIC HOME

NParks strengthened our efforts to conserve, protect, and enrich our local biodiversity. With greater stewardship on the ground, we continue working with the community to nurture nature and conserve our natural heritage.



01



## STRENGTHENING OUR NATIVE FORESTS

The resilience of our native rainforests is sustained by ecological processes and enhanced through its rich biodiversity and ecological connectivity. This will be realised through the Forest Restoration Action Plan to be carried out over the next decade. It will assist secondary forests in nature parks buffering the Bukit Timah and Central Catchment Nature Reserves as well as disturbed patches within the reserves to regenerate and approximate a mature forest in time.

This plan, announced in January 2019, is part of NParks' habitat enhancement and restoration programme under the Nature Conservation Masterplan that charts Singapore's biodiversity conservation efforts. The community will help lead the Forest Restoration Action Plan; more than 250,000 trees and shrubs will be planted through efforts spearheaded by schools, organisations and the Friends of the Parks community.

Restoration works for the 67-hectare Rifle Range Nature Park began in early 2019. Its secondary rainforests will be sensitively enhanced with native plants to improve the habitat for biodiversity to flourish. Aerial rope bridges will also be installed across Rifle Range Road for arboreal animals to move about safely, increasing their chances for long-term survival.



02



03

As part of the Forest Restoration Action Plan, NParks and the Urban Redevelopment Authority are working with the Friends of Rail Corridor community to rewild the Rail Corridor (Central) and enhance a belt of native forest along the 4 km stretch. This belt will be an important passage, habitat and source of food for native fauna, particularly those from the nearby Bukit Timah Nature Reserve. Members of the Friends of TreesSg, Bukit Timah Forest and Chestnut Nature Park communities also supported this initiative by carrying out stream enhancement along the Rail Corridor.

## WONDERS OF THE WETLANDS

NParks celebrated World Wetlands Day in early 2019, highlighting the vital role of wetlands in mitigating the impact of climate change. More than 700 visitors participated in activities in Sungei Buloh Wetland Reserve, Pasir Ris Park, Pulau Ubin and the Singapore Botanic Gardens from 26 January till 3 February.

In October 2018, Sungei Buloh Wetland Reserve turned 25, a milestone made possible by the strong support of a nationwide community of corporations, schools, partners and volunteers like the Friends of Sungei Buloh Wetland Reserve community. Today, it is recognised as a major stopover for migratory shorebirds on the East Asian-Australasian Flyway and an important player in the international biodiversity scene.

Over the years, the Reserve's conservation approach has been guided by scientific knowledge and technology – it was among the first in Southeast Asia to employ latest tracking technology to follow the cross-border movements of migratory shorebirds. This included, in 2017, the latest in satellite tracking project with enhanced resolution compared to earlier geolocator and radio tracking.

The Reserve's capacity in conservation was enhanced this past year with the designation of Mandai Mangrove and Mudflat as our newest Nature Park. Situated about 3 km to the east of the Reserve, this 72.8-hectare site is a habitat for threatened species of mangrove plants,

seagrasses, and horseshoe crabs, providing migratory shorebirds with a rich feeding ground. Collectively, the new Nature Park, Kranji Marshes and the Reserve safeguard a variety of complementary wetland habitats, including mangroves, mudflats and freshwater marshes, strengthening the conservation of wetland biodiversity in northwest Singapore.



05



06



04

- 1 The Central Catchment Nature Reserve is home to some of the richest forests in terms of biodiversity. The Forest Restoration Action Plan, to be carried out over the next decade, will help strengthen the resilience of our native forests.
- 2 The upcoming Rifle Range Nature Park will provide complementary forest habitats for biodiversity from the nearby Bukit Timah Nature Reserve as well as serve as an alternative venue for the public to enjoy nature-related activities.
- 3 These students are just some of the many volunteers from the community working together to rewild the Rail Corridor (Central). When completed, visitors can enjoy unique cultural, historical and natural journeys in this green space.
- 4 The Sungei Mandai Kechil runs through the Mandai Mangrove and Mudflat. This 72.8-hectare site is home to threatened species of plants and has been designated as a Nature Park.
- 5&6 Thousands of shorebirds visit Sungei Buloh Wetland Reserve annually, flying south to escape the harsh winters up north. For more than 25 years, the Reserve has monitored these journeys through a bird ringing programme. Since 2014, it has used technologies to better understand shorebird ecology, contributing towards global conservation efforts.

## TREASURING OUR REEFS

To celebrate the International Year of the Reef in 2018, NParks worked with corporate partners and Friends of Marine Park community to raise awareness of the impact of human activity on marine ecosystems. There were roadshows, marine trash monitoring, intertidal watches and BioBlitzes that helped instil a greater sense of environmental stewardship in participants and enthused others to join in our conservation efforts.

## NEW SPECIES OF FAUNA RECORDED ON UBIN

Five new species of fauna were recorded for Singapore at Pulau Ubin: the Little Stint (*Calidris minuta*), Long-winged Tomb Bat (*Taphozous longimanus*), Big-eared Pipistrelle (*Hypsugo macrotis*), Arrow Emperor (*Anax panybeus*) dragonfly, and Raccoon Pseudo-orb Weaver (*Fecenia ochracea*) spider. This was announced during the annual Ubin Day in June 2018.

Of special significance is the Little Stint's sighting which is a new record of this migratory bird species in Singapore. An observation gleaned from the past year's bird monitoring data suggested that Pulau Ubin complements Sungei Buloh Wetland Reserve as another possible stopover for migratory birds along the East Asian-Australasian Flyway.

Such findings enrich Pulau Ubin's diverse biodiversity and underscore the importance of conserving its rich natural heritage. To this end, a multi-disciplinary and experiential learning journey for students, developed with members of the Friends of Ubin Network community and educators, is being piloted. NParks also completed a mangrove arboretum and nursery, which serve as a living reference collection for researchers and students, and will provide planting materials for mangrove restoration work on the island.

Pulau Ubin's cultural heritage was also boosted, with the Friends of Ubin Network community working with National University of Singapore students and Singapore Heritage Society to rebuild Ah Ma's Drink Stall. A space with wood-working equipment was created at the Ubin Living Lab, facilitating onsite restoration work. Moreover, the project functions as a prototype for the future reconstruction of kampong houses.



01



02



03



04



05

## SCALING UP CONSERVATION EFFORTS

The world's most widely trafficked mammal, the Sunda Pangolin (*Manis javanica*), has found refuge in urban Singapore. NParks aims for greater collaborations with partners to develop long-term conservation and management strategies through the National Conservation Strategy and Action Plan for Sunda Pangolins. Measures such as setting aside buffer parks and habitat restoration to enhance the critically endangered animal's ecosystem will be intensified. This was announced in September 2018 and will be implemented by the Singapore Pangolin Working Group.



06



07



08

Two more batches of the Critically Endangered native Singapore Freshwater Crab (*Johora singaporensis*) were born in captivity, bringing the total number of such captive-born crabs to 300 in 2018. NParks' freshwater facility for conservation and research purposes has also been expanded, increasing the capacity for captive breeding of other native species like the Swamp Forest Crab (*Parathelphusa reticulata*) and Sunda Leaf Fish (*Nandus nebulosus*).

Singapore's first turtle hatchery at the Sisters' Islands Marine Park was opened in September 2018, increasing our native turtles' chances of survival. The site provides suitable habitats and feeding grounds for the Hawksbill Sea Turtle (*Eretmochelys imbricata*) and Green Turtle (*Chelonia mydas*), while smart technology such as Bluetooth sensors monitor water levels around nests in the hatchery to prevent saltwater from affecting incubating eggs. The hatchery also enables opportunities for research work as well as outreach and educational programmes.

- 1-5 Five new fauna species were recorded at Pulau Ubin – the Little Stint, Long-winged Tomb Bat, Big-eared Pipistrelle, Arrow Emperor dragonfly and Raccoon Pseudo-orb Weaver spider. These findings enrich the island's biodiversity as well as the wealth of our natural heritage.
- 6 The announcement of the National Conservation Strategy and Action Plan for Sunda Pangolins sets the foundation for greater and longer-term conservation and management strategies to help the world's most widely trafficked mammal.
- 7 By expanding our freshwater facility for conservation and research, the capacity for captive breeding for native species like the Sunda Leaf Fish has also increased.
- 8 The opening of a turtle hatchery at the Sisters' Islands Marine Park will help boost the survival rate of the Critically Endangered Green Turtle.



NParks continues to leverage technology to boost conservation efforts. For example, we have developed a predictive agent-based model to help assess coral reef, intertidal flats and mangrove connectivity within Singapore's coastal waters. By understanding the way isolated habitat patches are connected, better intervention measures can be developed to safeguard patches of interest and the biodiversity they support.

Camera traps, or remotely activated digital cameras with sensitive infra-red motion sensors, have also captured invaluable footage of native wildlife such as the Lesser Mousedeer (*Tragulus kanchil*) and Sambar Deer (*Rusa unicolor*) which are rarely disturbed by human interference.

There have been successes on the flora biodiversity front as well. Some 30 species of native plants have been rediscovered in recent years after being thought to be extinct locally, or were newly recorded in Singapore. About 1,500 plants from these rare species have been propagated so far, and about 640 plants of 15 species have since been reintroduced into our urban areas. Three species have also been introduced to the public through Gardeners' Day Out plant sales held at HortPark.

Looking ahead, NParks has announced a new targeted conservation approach for native birds, butterflies, bees and bats to be implemented over the next five years in collaboration with various partners. Projects will focus on these species as agents of pollination and seed dispersal, and their importance to ensure the diversity of forest flora species, so as to strengthen the ecological resilience of our ecosystems against climate change.

## GLOBAL CONNECTIONS

Singapore continues to be an active partner in global conservation efforts and knowledge exchange. In April 2018, Sungei Buloh Wetland Reserve hosted the inaugural meeting of the ASEAN Network on Wetlands and Migratory Waterbirds Conservation, for greater regional cooperation to protect migratory birds. The Network has since been renamed the ASEAN Flyway Network.

In a related meeting, NParks participated in the 6th Global Biodiversity Summit of Local and Subnational Governments from 23 to 24 November 2018 in Egypt. This was held parallel to the 14th Meeting of the Conference of Parties to the Convention on Biodiversity (CBD COP14). The event called on CBD Parties to recognise the catalytic role of local and subnational governments in contributing solutions to achieve the CBD's vision of Living in Harmony with Nature by 2050.

NParks also hosted delegates from Brunei, Indonesia and the Philippines as part of the Asian Forest Cooperation Organisation (AFoCO) Regional Project and Special Project Coordination Committee Meeting from 26 to 28 February 2019.



## CITIZEN SCIENCE IN ACTION

In May 2018, the international community commemorated 25 years of action for biodiversity, as part of the International Day for Biological Diversity. Locally, NParks adopted the theme "25 Years of Community Stewardship in Nature Conservation", celebrating active citizenry in nature conservation and partnerships, with activities that culminated in the annual Festival of Biodiversity held in June. With 44 partners, the event reached out to some 31,000 people, raising awareness of our natural heritage among the public.

Leading up to the festival, more than 26,000 people took part in Biodiversity Week activities across parks, nature areas and schools held in May and June. Under the Community in Nature (CIN) Citizen Science school programme, a total of 390 schools and 38,000 students were empowered to mobilise for biodiversity, of which 780 students were trained to be CIN Student Ambassadors who become advocates of our conservation efforts by engaging with the public in creative ways.



In the year in review, more than 4,500 citizen scientists participated in biodiversity surveys like Butterfly, Dragonfly, Heron and Garden Bird Watches as well as BioBlitz. For the first time in the Nationwide BioBlitz, participants helped spot and log useful data about bees and the species of flowers they were found interacting with.

- 1 Camera trap footage catch the elusive Lesser Mousedeer in our forests. Using such technologies enable researchers to study the movement of fauna that are usually frightened off by human presence.
- 2 By using activity sheets, puzzles and interactive displays, the annual Festival of Biodiversity is a good platform to inform and educate the public, particularly the young, about Singapore's rich biological diversity.
- 3 With a wing span of about 2 m, the White-bellied Sea Eagle (*Haliaeetus leucogaster*) is reputed to be Singapore's largest bird of prey. Each year, biodiversity surveys led by citizen scientists help identify and count such birds, contributing towards important conservation programmes.
- 4 Students and teachers from West Grove Primary School participating in a BioBlitz survey. This past year, more than 4,500 citizen scientists were engaged in activities, boosting our biodiversity conservation efforts.



## A GROWING INTEREST

Different communities turn our parks and gardens into vibrant hubs of life and activities, coming together to appreciate greenery and take ownership of the environment. Together, we endeavour to foster and grow a love for nature among all.



01

## SHOWCASE OF HORTICULTURAL EXCELLENCE

The Singapore Garden Festival (SGF) returned in July 2018. A record of more than 600,000 local and international visitors entered this wonderland of 73 gardens and floral displays by 40 acclaimed floral and garden designers, community gardeners and floral enthusiasts. Held at Gardens by the Bay, the festival took visitors on a journey, from displays like The Mountains, Gothic Gate and Lost Forest to a Secret Garden of Edibles – a collection of flowering edible plants from temperate and tropical regions.

Having achieved recognition at home and overseas for six editions, this past year, SGF grew into three complementary flower and horticultural shows. More than 150,000 visitors were treated to a kaleidoscopic collection of over 100 varieties of award-winning and heritage orchids at the inaugural SGF Orchid Show held in the Singapore Botanic Gardens in April 2018. Next, the public can look forward to the inaugural SGF Horticulture Show taking place in late April 2019 at Jurong Lake Gardens.



02



03

## PARKS ALIVE

Our green spaces were filled with the sound of music and excitement in 2018. More than 4,200 events were held, attracting over 1 million visitors of diverse interests. For example, Gardeners' Day Out at HortPark is a much anticipated monthly event for local gardeners, presenting a variety of products and services to meet the needs of a blossoming gardening community.

Vocals and instruments took centre stage among verdant greenery at the NParks Concert Series in the Park: Rockestra®. Its 9th and 10th instalments, held at East Coast Park and Empress Green respectively, were presented in 2018. Complementing this was NParks' talent incubation programme, Live Out Loud, which returned in May 2018 as a platform for undiscovered performers to showcase their abilities.

Adding to the growing buzz in the city were Parks Festival held in the Civic District in October and Artists' Night Out that enlivened Dhoby Ghaut Green in August. And shopaholics can browse for artisan items at the sustainable

lifestyle market or attend upcycling workshops and yoga sessions, part of the monthly Weekends in the Park activity held in East Coast Park.

NParks continues to tap on social media to promote such activities, stepping up our online efforts in FY2018 and reaching over 111,000, 28,000 and 34,400 fans and followers on NParks Facebook, Instagram and Twitter accounts respectively.



04



05

- 1 Visitors to the inaugural SGF Orchid Show held in the Singapore Botanic Gardens were treated to the colourful and brilliant splendour of over 100 varieties of award-winning and heritage orchids.
- 2 The curled flower petals of the *Dendrobium spectabile* catch the attention of President Halimah Yacob while Minister for National Development and Second Minister for Finance Lawrence Wong and NParks CEO Kenneth Er look on, during the launch of the SGF Orchid Show.
- 3 Prime Minister Lee Hsien Loong admires the blooms from the Hibiscus (*Malvaceae*) family used in "The Mallows Dance". This display, designed by Community in Bloom gardeners from the Central Singapore Community Development Council district, picked up the SGF 2018 Gardener's Cup Best Floral Design Award.
- 4 Activities such as guided walks, like this conducted at HortPark as part of Gardeners' Day Out, are well-attended and effective in drawing more people to the blossoming gardening community.
- 5 The NParks Concert Series in the Park: Rockestra® provides a platform for local artistes to showcase their talents and an opportunity for the community to gather and bond in our green spaces.



01

To seed conservation messages into educational resources, NParks builds on the strong relationship we have with partners like Ministry of Education, Early Childhood Development Agency (ECDA) and Academy of Singapore Teachers.

NParks has been collaborating with ECDA since 2015, on the 'Start Small Dream Big' Initiative. In it, we work with participating pre-schools and childcare centres to design and implement community projects. To date, we have reached about 100,000 preschool students and educators with our programmes and activities. This past year, we also contributed educational materials for use in a resource package distributed by ECDA to some 47,500 children in 800 pre-school centres.

### STARTING YOUNG

It is never too early to start cultivating the love of nature. As part of ongoing education and outreach efforts, NParks held interactive talks, guided walks and hands-on activities throughout the year to introduce students in some 1,700 preschools to our natural heritage.

This included those from PCF Sparkletots @ Bishan who visited the various habitats in Bishan-Ang Mo Kio Park to see our biodiversity firsthand. This past year, more than 30 My First Skool centres signed up to participate in a Community in Bloom (CIB) programme where gardens were started within their centres or they partnered with neighbouring community gardens to enhance the school curriculum. This was another means to introduce gardening as an activity to pre-schoolers. By end March 2019, CIB has facilitated more than 270 pre-school centres under this programme.

At Sengkang Riverside Park, the Skool4Kidz Campus was opened in July 2018. Besides indoor classrooms, its pre-schoolers can learn in a community garden and play amidst a lush park landscape. To introduce children to the importance of conserving our biodiversity, an activity book paired with a video clip called Playtime with Shelly the Hawksbill Turtle, was created and reached out to students in more than 240 pre-schools.



02



03

- 1 Most children like being outdoors and are naturally interested in the world around them. This past year, NParks worked with some 1,700 preschools to introduce their students to our natural heritage.
- 2 What do you see? Students from My First Skool @ Toa Payoh also touch and smell plant specimens, stimulating their senses to spark interest in the flora and fauna around them.
- 3 Students from the Chen Su Land Methodist Children's Home engage in hands-on activities after viewing the Playtime with Shelly the Hawksbill Turtle video, enhancing their learning about Singapore's rich marine biodiversity.
- 4&5 Community gardeners contribute much towards Singapore's greening movement. Besides sowing edible crops, community gardens also attract wildlife to our urban greenery and provide a platform for people to bond over a common interest in gardening.



04

### A THRIVING GARDENING COMMUNITY

The gardening communities across Singapore continue to branch out with the set up of more than 50 new CIB gardens, by end FY2018. While ornamental and biodiversity-enhancing gardens remain popular, interest in edible-growing community gardens continues to rise steadily. There are now more than 1,400 community gardens, on track to achieve the target of 2,000 community gardens by 2030.

There were two new community gardens of interest. Kampung Admiralty features a garden landscape with over 30 edible plant species and the longest espalier fruit tree display, featuring 14 species, in an HDB estate. Over at Oasis Terraces, a mixed development in Punggol, CIB gardeners come together to forge new friendships with their neighbours through gardening.

The CIB Awards 2018 recognised horticulture standards and the outreach of community gardens in public and private housing estates, as well as in educational institutions and organisations. A total of 541 community gardens participated, the highest in its history. For the first time, a People's Choice Award was introduced for the public to vote for their favourites. The multi-faceted contributions of community gardens in the areas of inclusivity and outreach to the underprivileged were also recognised.

NParks continues to offer more Allotment Gardening plots in our parks. Registration for 300 of such plots at Jurong Lake Gardens and 50 plots at Ang Mo Kio Town Garden West were made available online in November 2018, giving gardening enthusiasts greater convenience during application. These slots were quickly taken up, reflecting the flourishing interest in allotment gardening. There are now over 1,000 allotment gardening plots in 11 parks across the island.



05

## A FRIEND OF THE PARKS IS A FRIEND TO NATURE

The Friends of the Parks community remains an indispensable partner working hand in glove with NParks to promote safe and responsible behaviours to improve park users' experience while enabling people to take greater ownership of our parks. The contributions of the communities were felt in multiple activities that cover conservation, outreach and education, over the past 12 months.

The enthusiasm of newer communities was evident, with the Friends of Rail Corridor community holding its inaugural meeting on 9 April 2018 where members discussed issues of stewardship, accessibility and heritage to refine a vision guiding the future use of the Rail Corridor. They followed this by conducting its first BioBlitz in May 2018 when some 30 volunteers held three surveys to document the wildlife along the stretch between Hindhede Drive and Fuyong Park.

Nearby, more than 70 volunteers of the Friends of Chestnut Nature Park community planted 100 trees in May 2018 to enhance the floral diversity and provide food resources to fauna from the nearby Central Catchment Nature Reserve.

And in July 2018, members from the Friends of TreesSg community gathered at the Marina Tree Bank for a hands-on experience pruning, mulching, fertilising, and watering tree saplings there.

Other communities built upon the good work done over the years. For example, about 40 members of the Friends of Park Connector Network (PCN) and other volunteers gathered at Punggol Point Park pond for a habitat enhancement project in May 2018, while another group of its volunteers carried out track widening and planting works along Yishun Park Connector, part of a greening and track improvement effort in July.



01

## APPRECIATING OUR VOLUNTEERS

Volunteers are an essential driving force in our shared passion of conserving our natural heritage. To celebrate their invaluable contributions, NParks rolled out a benefit package in December 2018. It includes discounts at selected F&B outlets in the parks, exclusive plant sales and opportunities to join customised tours, workshops and training programmes.

To date, NParks has some 45,000 volunteers integral to the running of a wide range of activities including conducting guided walks, conservation programmes and marine biodiversity surveys. NParks' network of volunteers includes CIB gardeners, citizen scientists from CIN and members of the Friends of the Parks community.

Some highlights in the calendar this past year: Adult and children participating in the first edible gardening session in Jurong Lake Gardens in October 2018, Friends of Marine Park community volunteers working with staff to spread the message of marine conservation during the Asia Dive Expo in April 2018, and guides and members of the Friends of Bishan-Ang Mo Kio Park community getting together in March 2019 to celebrate the work done.

## PROMOTING A CULTURE OF SAFE RIDING

As the concept of a car-lite future gains traction, new bicycle parking spaces have opened up across the island. NParks works closely with partners like the Land Transport Authority's Active Mobility enforcement officers, to tackle the issue of reckless riding and to promote safe and responsible use of the PCN and cycle paths among the community.

The frequency of such activities increased after the Active Mobility Act kicked in on 1 May 2018. They were focused along Yishun, Lorong Halus and West Coast, among others, to strengthen the culture of safe riding in Singapore.



02



03



04

1 Participants at a Friends of Chestnut Nature Park community-organised habitat enhancement activity volunteered their time to plant trees, so as to enhance the park's floral diversity.  
2-4 From conducting guided tours and greening up our gardens to being citizen scientists as part of CIN programmes, our 45,000-strong volunteers contribute greatly to a wide range of activities.



## NURTURING THE FIELD

The horticulture and landscape industries have vital roles in realising a biophilic City in a Garden. NParks remains committed to strengthening the ground, investing in and spearheading initiatives that deepen core competencies for a thriving ecosystem.

01



**EXPANDED SCOPE FOR NPARKS**

NParks is to become the lead agency for animal and wildlife management, as well as animal and plant health, effective 1 April 2019. This follows an announcement in July 2018 that Singapore Food Agency will replace the Agri-Food & Veterinary Authority of Singapore (AVA) to oversee Singapore’s food safety and security while all non-food plant and animal-related functions of AVA will be transferred to NParks.

The NParks (Amendment) Bill was passed by Parliament in February 2019, paving the way for the set up of Animal & Veterinary Service, a new cluster of NParks, that will take on the role as first responder for animal-related feedback as well as maintaining standards in animal welfare and health. It will also be the main touch-point for animal health and animal-related issues for pet owners and businesses, as well as animal welfare groups.

**BOOSTING THE INDUSTRY**

In the year in review, NParks engaged owners and staff from over 80% of local orchid nurseries to share the progressive land parcel tendering details. The first orchid land tender was also launched, following the announcement in January 2018 that NParks would have oversight of the whole orchid industry to consolidate efforts and develop policies to grow the sector.



02



04

To boost continual skills upgrading and capability-building, CUGE offered more than 3,400 Workforce Skills Qualifications (WSQ) training places in the reporting year. This included those recommended under the Progressive Wage Model (PWM) and over 1,400 non-WSQ training places. Currently, more than 90% of Singapore’s landscape workforce are covered under the Landscape PWM.

CUGE has also completed the development of the Skills Framework (SFw) for Landscape and SkillsFuture Singapore and Workforce Singapore. SFw is an integral component of the Industry Transformation Maps and provides up-to-date information on jobs, skills and education as well as training programmes, preparing workers better for the industry.

**DIGITALISATION BOOSTS OPERATIONAL EFFICIENCY**

To manage the 2 million urban trees along our roads and in our parks and gardens, NParks has adopted smart technology to improve our operational efficiency and processes.

Officers have been using a mobile map application to access information needed for daily tree inspections and maintenance. This app enhances NParks’ capabilities in Geographic

Information System (GIS) data collection on trees and park facilities, and allows important inspection records to be updated and synchronised to the main operation system, helping officers complete work quickly and with greater accuracy.

NParks has also been testing an electronic tilt sensor, placed on mature trees to detect lean. The sensor alerts officers to such movements for them to assess structural stability under strong wind conditions and to take mitigation measures. Such technology is especially pertinent given the adverse impact of climate change on Singapore.



03

- 1 The Animal & Veterinary Service, a new cluster under NParks, is the first responder for animal-related feedback and maintains the standards in animal welfare and health.
- 2&3 While officers continue to physically inspect and maintain our urban trees, they have been increasingly using technology to boost efficiency. Here, a sonic tomograph measures the velocity of sound waves in wood, providing users a picture of the internal condition of the trunk without having to drill into it.
- 4 Urban trees generally grow in soil that is likely to be less nutrient-rich while construction activities and vehicles can damage their roots, trunks and branches. To ensure the continual health and safety of an urban forest, its trees must be professionally inspected and maintained.



01

## UPLIFTING EDUCATIONAL INSTITUTES

The Landscape Design Challenge was held at the Singapore Garden Festival for the second time. Twelve teams from the polytechnics, Institutes of Technical Education and design schools were each challenged to transform a 9 m<sup>2</sup> plot of land into an outdoor landscape display within 4 hours. This landscaping and design-based competition for youths from Institutes of Higher Learning (IHLs) is a platform to showcase their creativity while introducing them to the range of opportunities in the industry.

In early 2019, CUGE piloted a structured programme aimed at providing certification and employment opportunities for Special Education schools. This includes attachment opportunities at Pasir Panjang Nursery and National Orchid Garden. CUGE is also collaborating with ITE College East on a pilot student-run initiative to enable students in urban greenery and landscape management courses to hone their skills in a real workplace environment. Students get to apply new technologies and innovative solutions, such as a sonic tomograph, resistograph microdrill, as well as drones for tree inspection. NParks continues to adopt such smart technology to improve our operational efficiency and processes.

In September, CUGE invited educators from IHLs to HortPark for a workshop and to share on latest horticulture and arboriculture trends in the landscaping sector, as well as technologies deployed to green up Singapore more effectively. Educators also learnt about the Landscape Industry Transformation Map and discussed potential collaborations.

## SHARING AND LEARNING

NParks continues to build strong ties with the industry. A series of seminars, on research, arboriculture and habitat enhancement, was held in 2018. Participants included academics, government officials, researchers and industry practitioners. They found the events opportune platforms to share findings and learn about topics as varied as root biology and soil, biomechanics for tree stability and biophilic guidelines to enhance urban areas.

As part of a collaboration with the Hong Kong Technological and Higher Education Institute (THEi), CUGE hosted a study visit group from 4 to 8 June 2018 where the guests, comprising students and teachers, gleaned insights on Singapore's greenery and management processes while visiting our parks and gardens.



02



03



04

## GROWING EXPERTISE IN THERAPEUTIC HORTICULTURE

NParks continues to grow our knowledge in therapeutic horticulture. In April, CUGE launched the Client Management in Therapeutic Horticulture workshop for stroke rehabilitation clients. Meanwhile, HortPark organised the inaugural nature therapy session with a group of seniors from Apex Harmony Lodge in collaboration with a certified nature and forest therapy guide. These activities encouraged participants to use their senses to become more immersed in nature.

Interest in the restorative effects of nature remains high, evident in a healthy 30% increase in attendance for the second Therapeutic Horticulture Seminar held at the Singapore Botanic Gardens on 7 September 2018. Nearly 100 professionals and practitioners from the landscape, education and healthcare sectors attended the event.

As more Therapeutic Gardens are developed, in-house capability in therapeutic horticulture also has to be strengthened. A second sharing workshop on therapeutic horticulture facilitation was held at HortPark on 11 July, giving participants the chance to learn new techniques.

A notable publication in the year under review was the scientific paper, Effects of Horticultural Therapy on Asian Older Adults: A Randomised Controlled Trial, published in the International Journal of Environmental Research and Public Health. It presented the findings of a joint trial between National University Health System (NUHS) and NParks to determine if engagement in Horticultural Therapy improves the mental health and well-being of the elderly. There were significant changes observed in terms of higher social connectedness, and lower risk of depression and inflammatory disorders.



05

- 1 Participants of the study group from THEi visit green spaces within the civic district to learn more about Singapore's greenery efforts.
- 2 A student participant of the Landscape Design Challenge, held at the Singapore Garden Festival 2018, readies her display before judging. Competitions like this give youth the chance to demonstrate their creativity and give them insight into the industry.
- 3 Students from ITE College East gain valuable hands-on experience using technologies such as the resistograph microdrill, part of a pilot initiative between CUGE and educational institutions.
- 4 In-house trainers conduct a sharing workshop on Therapeutic Horticulture Facilitation at HortPark for colleagues. They were taught low-cost and environmentally sustainable activities that also provide opportunities for participants to practise their motor skills.
- 5 Natural elements such as leaves and grasses stimulate the senses of participants in a Therapeutic Horticulture workshop, helping to evoke their memories.



01

### TOWARDS A GOOD CAUSE

Outside the office, staff volunteered their time to give back to the community. During Kindness Week held in December, different groups helped out at a variety of welfare organisations. Activities included preparing ingredients for a soup kitchen, packing canned food for needy families, engaging with the elderly through therapeutic horticulture and tending to animals at the Society for the Prevention of Cruelty to Animals.

Throughout the rest of the year, staff readily answered the call of volunteerism, participating in the quarterly blood donation drives, tutoring and mentoring children and gardening at NParks' adopted charity, the Handicaps Welfare Association.



02



03



04

### WINNING RECOGNITION

Innovative minds and service excellence in NParks were recognised by the Public Sector Transformation Awards 2018. The Therapeutic Garden Movement team was recognised with the Excel Innovation Project while Peter Lim, Assistant, Security Management at the Singapore Botanic Gardens received the Star Service Individual award and Ms Taryn Yap, Senior Legal Counsel, Corporate Services, received the Star Service Manager award.

- 1 Peter Lim, Security Management Assistant at the Singapore Botanic Gardens, helps a lost visitor with directions. With his ready smile and an in-depth knowledge of the Gardens, Peter is the recipient of the Star Service Individual award.
- 2 Ms Taryn Yap, Senior Legal Counsel, Corporate Services, in deep discussion with a colleague. Taryn provides clear and well-reasoned legal analysis and advice, and received the Star Service Manager award.
- 3 More hands make light work! Staff volunteered their time to pack cans and dried food stuff for needy households, just one of the many ways they give back to the community.
- 4 Regularly-held blood donation drives demonstrate the big hearts of our staff who readily donate their blood to build up Singapore's blood bank.
- 5 Staff came together to learn how to build bee hotels to house solitary bees such as the leafcutter and resin bees. These structures can be easily constructed using recycled wood and bamboo.
- 6 Only leafcutter and resin bees nest in bee hotels. Here, a Broad-headed Leafcutter Bee (*Megachile laticeps*) is carrying a piece of leaf.
- 7 Parks Senior Manager Ms Pauline Tan shares a lighter moment with a co-worker from Albert Park in Melbourne, Australia, as they transport stuffed animals for use in an educational programme for young rangers. She was attached to Parks Victoria for six months.
- 8 Ms Chin Li Li, a Senior Officer specialising in Molecular Biology at the Singapore Botanic Gardens, enjoyed the hands-on training she received during her one-month attachment at the National Taiwan University in Taipei.



05



06

### BUILDING UP IN-HOUSE TALENT

In its ongoing commitment to nurture and retain talent, NParks awarded 10 scholarships comprising undergraduate, postgraduate and overseas merit awards to deserving staff and external candidates. Two staff members were also offered professional exchange attachments to Kings Park and Parks Victoria in Australia.

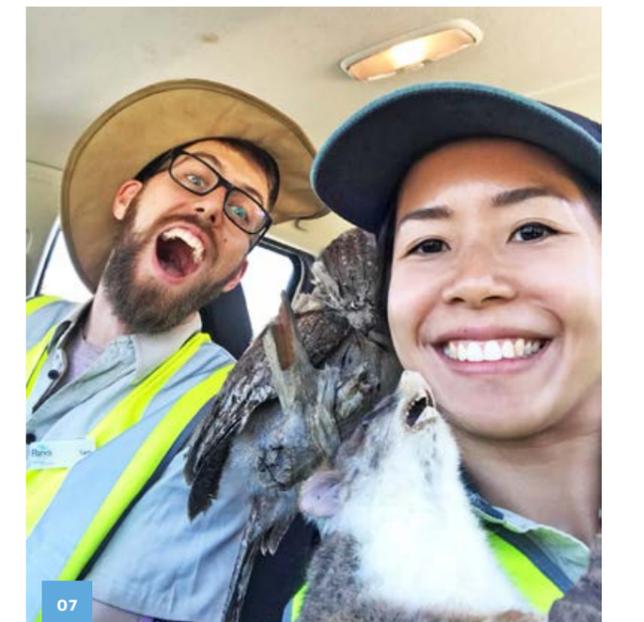
Hort Colloquiums are an educational platform to share industry knowledge and domain expertise. This past year, the colloquiums, conducted every three months, saw staff sharing on a diverse range of topics such as botanical nomenclature, landscape industry trends, digital technologies for 3D mapping of trees, principles of plant decoration and how to support and co-exist with caterpillars in our landscapes, amongst others.

Knowledge begets more knowledge through sharing and Hort Champs best exemplify this. For example, thanks to workshops conducted by Hort Champs, staff learnt how to build bee hotels in August, to support solitary bees in

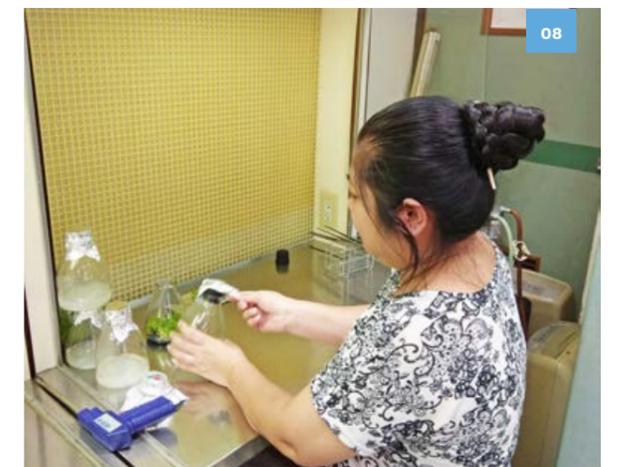
our parks and gardens and gained hands-on knowledge on field identification of native plants in the Central Catchment Nature Reserve in October. Hort Champs are staff who take part in horticultural workshops and field trips and then share this knowledge with other staff or visitors.

The NParks Staff Conference 2018 was held at Suntec City Convention Centre on 2 April 2018. Speakers shared upcoming initiatives including the role of technology in expanding and developing capabilities, and new biophilic design and typologies for our parks and gardens, as well as the organisation's transformative journey.

During the conference, the NParks Greenery Excellence Awards were presented, recognising outstanding staff and team projects that demonstrated hard work and innovative thinking.



07



08

# Garden City Fund



CHARITY REGISTRATION NUMBER/UNIQUE ENTITY NUMBER:  
**T02CC1634C**

CHARITY REGISTRATION DATE:  
**19 November 2002**

IPC NUMBER:  
**IPC000104**

AUDITOR:  
**Ernst & Young LLP**

The Garden City Fund (GCF) is a registered charity and an Institution of Public Character (IPC), with its registered address at National Parks Board, Singapore Botanic Gardens, 1 Cluny Road, Singapore 259569.

It seeks to enhance the enjoyment of our City in a Garden by working with corporations and individuals to support the development of amenities and special features in Singapore's green spaces; community activities and programmes that promote awareness, research and education in nature and conservation; and citizen involvement to encourage greater ownership of our City in a Garden.

The Board of NParks serves as the trustee of the GCF and has appointed the GCF Management Committee to plan, develop, promote and manage the GCF in accordance with its Trust Deed.

The GCF Management Committee comprises mainly non-executive members except for the GCF Secretary Dr Leong Chee Chiew, who is also the Deputy Chief Executive Officer, Professional Development & Services Cluster

at NParks; Executive Director, National Parks, Gardens & Nature Reserves Cluster; and the Commissioner of Parks & Recreation.

Between 1 April 2018 and 31 March 2019, the total amount of cash donation income through the GCF was about S\$6.5 million.

The members of the 8<sup>th</sup> GCF Management Committee were appointed from 1 November 2016 to 30 October 2018 and the 9<sup>th</sup> GCF Management Committee were appointed from 1 November 2018 to 31 October 2020.

The 8<sup>th</sup> and 9<sup>th</sup> GCF Management Committee for the Year in Review

Appointment	Name	Attendance at Management Committee meeting (FY2018)	
		8 <sup>th</sup> Committee	9 <sup>th</sup> Committee
Chairman	Professor Leo Tan Wee Hin	3/3	1/1
Treasurer	Mr Goh Kong Aik	2/3	1/1
Secretary	Dr Leong Chee Chiew	2/3	1/1
Members	Mr Tan Khin Nguan	3/3	0/1
	Mrs E-Len Fu*	2/3	--
	Mrs Kirtida Mekani	3/3	1/1
	Dr Malone-Lee Lai Choo*	1/3	--
	Mr Daren Shiau	3/3	0/1
	Mr Vincent Lien Jown Jing*	0/3	--
	Mr Cheng Hsing Yao**	--	1/1

\*Members retired after serving on the 8<sup>th</sup> GCF Management Committee.  
\*\*Mr Cheng was newly appointed to the 9<sup>th</sup> GCF Management Committee since November 2018.

As part of the GCF Accountability and Governance Framework, any member of the Board, Committee or Sub-committee has to give prior written disclosure of any actual or potential conflict of interest for any transaction or project in connection with the GCF, and will not be able to participate or cast a vote in the transaction/project.

## CONNECTING PEOPLE TO NATURE

NParks' biodiversity and conservation efforts were augmented by the robust support from individuals and corporate sponsors, through the GCF.

As a natural extension of the Singapore Botanic Gardens' nature area, an 8-hectare extension to the Gardens along Gallop Road was announced to open by late 2019. Visitors would be able to learn about forest ecology and the importance of conservation in one location, promoting the Gardens' mission of connecting people with plants.

Key developments in the Gallop Extension included the OCBC Arboretum which will house 200 to 300 species of dipterocarp forest species, the HPL Canopy Link which allows up close viewing of the Gardens' native forest tree species, the Mingxin Foundation Rambler's Ridge that offers vantage points to view critically endangered flora species, and the COMO Adventure Grove, a biophilic area that encourages children to learn about and appreciate native flora and fauna through play.

In appreciation of the key role the community has played in the Gardens' conservation efforts and programmes and their contribution of at least S\$1 million, NParks dedicated Heritage Trees to COMO Foundation, HPL, Keppel Corporation, Mingxin Foundation, OCBC Bank, and Mr Tan Jiew Hoe.

## CONSERVATION AND RESEARCH

With the support of HSBC, Singapore's first turtle hatchery at the Sisters' Islands Marine Park – a protected area zoned for conservation and research – was launched. The hatchery provides research opportunities for scientists to study two critically endangered and native species – the Hawksbill Turtle and Green Turtle. Acknowledging the importance of engaging the community in marine turtle conservation

outreach, volunteer training, and education programmes are also organised at the hatchery.

In partnership with Temasek Foundation Ecosperity, the GCF also secured support for dragonfly research and species recovery. The research seeks to study the potential of the dragonfly as natural pest control in our urban environment, as well as to restore a dragonfly habitat in Jurong Lake Gardens.

Under the GCF, NParks collaborated with JTC for the "Grow-a-Reef Garden" initiative. In Singapore's largest reef project, the purpose-built reef structures are designed to contribute some 1,000 m<sup>2</sup> of additional reef substrate to the Marine Park by 2030. A total of eight structures were installed by the end of 2018 to form the JTC-NParks Reef Garden.

This initiative complements NParks' ongoing reef enhancement efforts, expanding the habitat restoration and enhancement programme in both scope and scale. The reef structures will provide opportunities for various research initiatives to be implemented and to serve as test beds for new technologies to study coral reef resilience.

Supported by 11 donor companies from JTC's estates and developments with contributions ranging from S\$5,000 to S\$100,000 per company, these included Chang Chun Dairen, Denka, ExxonMobil, GSK, Keppel Group, Mitsui, Oiltanking Asia, Petrochemical Corporation of Singapore, Siltronic, Sumitomo Chemicals and Vopak Terminals.



1 The Monkey Pot (*Lecythis pisonis*) Heritage Trees at Lower Ring Road in the Singapore Botanic Gardens were dedicated to COMO Foundation and HPL.  
2 To appreciate individuals and organisations for their contributions of at least S\$1 million, Minister for National Development and Second Minister for Finance Lawrence Wong joined NParks CEO Kenneth Er and Garden City Fund Chairman Professor Leo Tan in dedicating Heritage Trees within the Singapore Botanic Gardens to (from left) COMO Foundation, Keppel Corporation, Mr Tan Jiew Hoe, HPL, OCBC Bank and Mingxin Foundation.

## EDUCATION AND OUTREACH

With a record 600,000 visitors over 14 days, the 2018 Singapore Garden Festival concluded on a successful note not least because of the robust support of sponsors – both corporates including Takashimaya Singapore and Singapore Press Holdings (official media partner), and individuals – who collectively donated S\$1.9 million worth of cash and in-kind donations through the GCF as part of the capacity-building thrust in the landscape industry and the ongoing effort to connect people with nature.

Companies like Ascendas-Singbridge also chose to sponsor specific curations like the Learning Garden display whilst Woh Hup sponsored the Balcony Garden display.

## GREENING OUR CITY

The GCF's Plant-A-Tree (PAT) programme continued to garner strong support from individuals and corporations with over 34,000 trees pledged by more than 600 corporations and some 2,800 individuals since the programme's inception in 2007. The programme provides a platform for organisations and



individuals to actively participate in the greening of our city by planting trees.

In 2018, the programme saw regular participants like Shimano, Shimizu, Singtel, Ikea, Maybank, and Singapore Pools coming forth in faithful support even as we are heartened to welcome new participants like the Goldbell Group, Yokogawa and Samwoh Corporation Pte Ltd.

In collaboration with JTC, GCF also engaged business and industry partners including 16 companies and eight individuals to plant 115 trees at one-north Park.

To commemorate its 93 years of history and heritage, Shuqun Secondary School planted 93 trees in August at Jurong Central Park. In like manner, Singapore Pools planted 50 trees in May at East Coast Park to celebrate the company's 50<sup>th</sup> anniversary whilst UPS pledged to plant 200 trees as part of its global initiative to plant 12.5 million trees over a period of six years.

## FORGING AHEAD

Looking forward, the GCF pledges to continually engage its various stakeholders in the community, to support NParks' conservation and research endeavours, as well as its outreach and educational programmes.

Its mission remains to nurture a love for nature, advocate a sense of ownership, and exhort the community to play an active part in preserving Singapore's legacy as a City in a Garden.

Visit [www.gardencityfund.org](http://www.gardencityfund.org) for more information.



- 1 Students from seven schools and two youth organisations pitched in to paint nine garden swings located at Raintree Cove in East Coast Park. This community project was a platform for youths to express their creativity while beautifying our parks, and was made possible through a generous donation from Mr and Mrs Bharat Mekani.
- 2 Thanks to support from the community and HSBC, Singapore's first turtle hatchery was opened at the Sisters' Islands Marine Park, boosting the survivability of hatchlings of the Hawksbill and Green Turtles.
- 3 The Learning Garden, sponsored by Ascendas-Singbridge, at the Singapore Garden Festival 2018 enabled visitors of all ages to discover more about plants and their pollinators such as butterflies, birds and bees.

## Garden City Fund Donors' Acknowledgement (FY 2018)

We acknowledge and thank the following donors who have generously supported our City in a Garden efforts, including those who wish to remain anonymous.

### \$1 million and above

- PSA Corporation Ltd
- Singapore Press Holdings Limited

### \$100,000 and above

- Advance Sports Technologies Pte Ltd
- Ascendas Land (Singapore) Pte Ltd
- COMO Foundation
- ExxonMobil Asia Pacific Pte Ltd
- Goh Foundation Ltd
- Harvestland Development Pte Ltd
- Lim Eng Hock
- McNeice Anthony Terence
- Nanyang INC Pte Ltd
- Nipsea Pte Ltd
- Oversea-Chinese Banking Corporation Limited
- Rosslyn Leong Sou Fong
- SymAsia Singapore Fund for Mingxin Foundation
- Takashimaya Singapore Ltd
- Temasek Foundation Ecosperity CLG Ltd
- Tsiens Samuel Nag
- Wearnes Automotive Pte Ltd

### \$10,000 and above

- AMD
- Biomax Green Pte Ltd
- CCD Singapore Pte Ltd
- Christina Ong
- Cistech International Pte Ltd
- Citrix Systems Singapore Pte Ltd
- Clarins Pte Ltd
- DBS Bank Ltd
- Event Business Management Pte Ltd
- FC North Gem Trustee Pte Ltd
- Glaxo Wellcome Manufacturing Pte Ltd
- Goldbell Foundation
- GrabTaxi Holding Pte Ltd
- Huang Xuhuai
- Keppel Care Foundation
- Lim Chee Kian
- Lim Hock Leng
- Malayan Banking Berhad
- Mark Anthony Taylor
- Moove Media Pte Ltd
- Mountain Teak
- Oiltanking Asia Pacific Pte Ltd
- Panasonic Asia Pacific Pte Ltd
- Petrochemical Corporation of Singapore (Pte) Ltd
- Pico Art International Pte Ltd
- Relx (Singapore) Pte Ltd
- Ruth Gimberg
- Samwoh Corporation Pte Ltd
- Sharon Grimberg
- Shimano (Singapore) Pte Ltd
- Siltroic Singapore Pte Ltd
- Singapore Pools Pte Ltd
- Singapore Press Holdings Foundation Ltd
- Singapore Telecommunications Limited
- Starhub Ltd
- Sumitomo Chemical Asia Pte Ltd
- SymAsia Singapore Fund for Stephen Riady Foundation
- The UPS Foundation
- Tides Foundation (Estee Lauder Cosmetics Pte Ltd)
- Tomy Winata
- Total Oil Asia-Pacific Pte Ltd
- Vopak Terminals Singapore Pte Ltd
- Woh Hup Pte Ltd
- WWF Singapore
- Yokogawa Engineering Asia Pte Ltd
- Accenture Rec Club
- Active Fire Protection Systems Pte Ltd
- Agape Little UNI.@Clementi
- Amriteswari Society
- Anand Pradyot
- Andreas Sohmen Pao
- APP Engineering Pte Ltd
- Applied Materials SEA Pte Ltd
- Art of Living Foundation & Staff
- Avani Resources Pte Ltd
- Carl Ward
- Central Singapore Community Development Council
- Central Star (S) Pte Ltd
- Christoph Markus Aebischer
- Chua Beng Tong
- Chugai Pharmabody Research Pte Ltd
- CPG Corporation Ltd
- Debbie Lo
- Denka Chemicals Holdings Asia Pacific Pte Ltd
- DHL Express (Singapore) Pte Ltd
- Elisabeth Clarice Esther Gustava de Rothschild
- Enny Wijaya
- Equinix Singapore Pte Ltd
- Feinmetall Singapore Pte Ltd
- Foo Siang Keng
- Fujitsu Asia Pte Ltd
- Golden Energy And Resources Ltd
- Gooi Ling Chieh
- Gooi Seong Lim
- Heather Leigh-Ann Emslie
- Hidehiko Kojima
- Ho Bee (One North) Pte Ltd
- Hock Tong Bee Pte Ltd
- HSBC Institutional Trust Services (Singapore) Limited
- HSL Ground Engineering Pte Ltd
- Huang Chang Yi
- Interbev (S) Ltd
- Jurong Engineering Ltd
- 'K' Line Ship Management (S) Pte Ltd
- Kandenko Co Ltd
- Karen Singarayar

### Below \$10,000

- Kayakasia Paddlesports Pte Ltd
- Kong Hwee Iron Works & Construction Pte Ltd
- Kwan Im Thong Hood Cho Temple
- Lek Yian Ping
- Leo Tan Wee Hin
- Live Nation (S) Pte Ltd
- Marianne Marais
- McKinsey & Company Singapore Pte Ltd
- Ministry of Culture, Community & Youth
- Ministry of Education
- Mitsubishi Electric Asia Pte Ltd
- Mitsui Chemicals Asia Pacific Ltd
- Mitsui Chemicals Singapore R&D Centre Pte Ltd
- Mitsui Elastomers Singapore Pte Ltd
- Mitsui Phenols Singapore Pte Ltd
- Neo & Goh Construction Pte Ltd
- Ngien Hoon Ping
- Nisshinbo Singapore Pte Ltd
- Oiltanking Helios Singapore Pte Ltd
- Oiltanking Singapore Chemical Storage Pte Ltd
- Oiltanking Singapore Ltd
- Orthosports@ Novena
- PEC Ltd
- Pernod Richard Singapore Pte Ltd
- Philip Lim Feng
- Pramerica Financial Asia Headquarters Pte Ltd
- Prime Evolve Singapore Pte Ltd
- Procter and Gamble International Operations SA Singapore Branch
- Q'SON Kitchen Equipment Pte Ltd
- Quantedge Foundation (S) Ltd
- Rhodium Resources Pte Ltd
- Rolls-Royce Singapore Pte Ltd
- S&P Global
- Sato Asia Pacific Pte Ltd
- SB Property Services Pte Ltd
- SB REIT Management Pte Ltd
- Shinryo Corporation
- Sim Beng Mei Mildred
- Singapore Institute of Technology
- Sumitomo Rubber Asia (Tyre) Pte Ltd
- Synergy Trade and Finance Pte Ltd
- Telekomunikasi Indonesia International Pte Ltd
- Tham Pui San
- Thekchen Choling (Singapore)
- TP Utilities Pte Ltd
- Trade Sea International Pte Ltd
- Tridex Pte Ltd
- TTJ Design & Engineering Pte Ltd
- Uniseal Creative Solutions Pte Ltd
- United Test And Assembly Center Ltd
- UTAC Manufacturing Services Singapore Pte Ltd
- Wong Ying Le
- Yip Teem Wing

Donations listed above are of a minimum amount of S\$1,000.

**We thank all other individuals and organisations who have given to the charity.**

# Sustainability Report



## OUR SUSTAINABILITY STORY

Greenery is very much a part of Singapore's DNA and has been integral to our socioeconomic as well as infrastructure development journey. Our parks, gardens, nature reserves and verdant streetscapes are valuable assets that make Singapore highly liveable and will continue to play a vital role in improving the quality of our living environment.

NParks is committed to conserving nature and biodiversity, nurturing greater community stewardship, and building capabilities within the organisation and industry to uphold Singapore's reputation and standing as a City in a Garden.

## OUR SUSTAINABILITY STRATEGIES ARE:



**Sustaining our City in a Garden**  
Creating the best possible living environment through excellent greenery and recreation.



**Nurturing Communities**  
Strengthening Singapore's greenery and biodiversity in partnership with the community.



**Creating a Great Workplace**  
Developing our staff and taking care of their well-being.

## SUSTAINING OUR CITY IN A GARDEN

### CREATING A NETWORK OF GREENERY

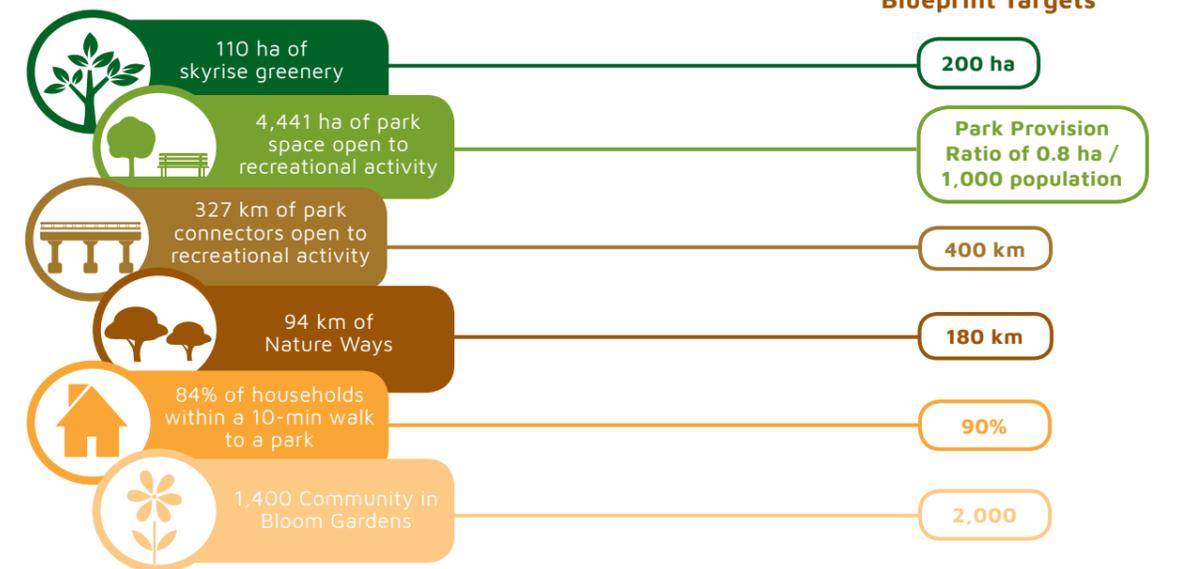
NParks is responsible for maintaining and enhancing Singapore's greenery for future generations. Our nature reserves function as hotspots of rich biodiversity where the public can discover a plethora of wildlife in their natural habitats.

Nature parks have been established on the margins of the nature reserves, acting as green buffers. We enhance the habitats within these buffers so that they provide a rustic and forested environment which serves as recreation spaces.

We have launched the Forest Restoration Action Plan for the Bukit Timah Nature Reserve, Central Catchment Nature Reserve and Nature Park Network in January 2019. The Action Plan will chart the restoration that will be undertaken over the next 10 years to regenerate the secondary forests in the nature parks buffering the two nature reserves, as well as disturbed patches within the reserves. This will assist the forests to regenerate and approximate a mature forest in time.

Complementing this is an extensive network of roadside greenery and strategic green corridors called Nature Ways that facilitates movement of biodiversity such as birds and butterflies. In addition, NParks champions the integration of skyrise greenery into our built environment, as well as the creation of community gardens to connect residents with nature.

### 2018 Achievements



### CREATING URBAN ECOSYSTEMS

Our greening approach is aimed at restoring natural habitats and bringing people closer to nature. For example, the wetland and forest habitats at the Singapore Botanic Gardens' Learning Forest were restored and recreated to conserve a wide variety of native flora and fauna.

A network of park connectors, roadside greenery and Nature Ways also helps strengthen the ecological resilience of our nature reserves, the primary repository of native biodiversity.

### ENHANCING CLIMATE RESILIENCE THROUGH GREENERY

More than 40% of Singapore is covered in green, in the form of nature reserves, parks, gardens, roadside greenery, skyrise greenery and vacant lands. In 2018, NParks planted about 77,000 trees. Our greenery and green open spaces are well-distributed all over Singapore. These help cool urban temperatures via shade provision and evapotranspiration.

Actively greening Singapore for future generations remains an important aspect as Singapore continues to develop. NParks conserves and enhances existing greenery, and safeguards spaces for future greenery.

These are accomplished in two ways:

- Embedding climate resilience features into urban green spaces. Our Nature Ways replicate the tiered structure of a tropical forest with native trees and shrubs. They provide important ecosystem services to people and facilitate ecological connectivity for some species.
- Protecting and strengthening our nature reserves and nature areas. Currently, six nature parks adjacent to our nature reserves have been developed to provide more than 250 ha of protective green buffers. By 2020, we will add two more nature parks at Rifle Range and Thomson to increase our green buffers to more than 370 ha.

### SAVING SPECIES

A species recovery programme was initiated in 2015 to conserve native flora and fauna by targeting locally endemic, rare or threatened native species through reintroduction, habitat enhancement and protection efforts. Some of these species occur in small populations in only a few places, and the programme aims to increase these populations and help them survive adverse environmental changes.

<sup>1</sup> The Forest Restoration Action Plan will chart the restoration effort that will be undertaken in the next decade for the Bukit Timah Nature Reserve, Central Catchment Nature Reserve and Nature Park Network.

# Sustainability Report

## NURTURING COMMUNITIES

### ACTIVATING GREEN SPACES

Our gardens and parks are important shared spaces for different communities. These common green spaces provide access to people from all walks of life to come together and enjoy their time amidst nature.

NParks injects vibrancy into our parks and gardens by hosting an average of 4,000 activities, events and programmes island-wide yearly. Signature events include NParks Concert Series in the Park - Rockestra®, Parks Festival, Festival of Biodiversity, and Community Garden Festival.

### GETTING INVOLVED

To date, we have more than 45,000 volunteers who play an integral role in helping us achieve our vision of making Singapore our City in a Garden. Our network of volunteers includes community gardeners from the Community in Bloom programme, citizen scientists from the Community in Nature initiative, and members of Friends of the Parks, amongst others. Aged from nine to over 80, they range from students, homemakers, and working professionals, to retirees. Many of them volunteer because they appreciate the opportunity to learn about and contribute towards our conservation efforts. Volunteers often become advocates of our messages, and share with others important biophilic issues.

In December 2018, NParks rolled out a volunteer benefit package to recognise the volunteers' efforts in co-creating a biophilic City in a Garden through their contributions in areas like nature conservation, gardening, and education and outreach.

### STRENGTHENING COMMUNITY STEWARDSHIP

The nationwide Community in Bloom (CIB) gardening movement aims to foster community spirit and bring residents together to make Singapore our garden. Today, there are more than 1,400 community gardens across Singapore, set up and managed by outdoor and indoor gardening groups. NParks will continue to work towards the target of building 2,000 CIB gardens by 2030.

The introduction of the Edible Horticulture Masterplan in November 2017 has further bolstered the CIB programme by encouraging the community to grow edibles. It has helped to engender greater interest in gardening and enables both gardeners and residents to enjoy various benefits of gardening together.

There are also more opportunities to grow edibles via NParks' allotment gardening scheme. 80 plots were launched at HortPark in July 2016. New plots were released in 10 other parks island-wide from 2016 to 2018 and have been fully taken up. More than 1,000 allotment garden plots have been made available to the community.

Introduced in 2016, the Friends of the Parks initiative builds on the groundswell of community participation. There are now nine Friends of the Parks communities; each comprises local stakeholders, volunteers and enthusiasts coming together to develop ground-led initiatives to promote stewardship and responsible use of our parks and nature reserves.

## CREATING A GREAT WORKPLACE

### LEARNING AND DEVELOPMENT

Staff are encouraged to grow their professionalism, build capabilities and provide service excellence. NParks develops staff through a competency development framework focusing on business, operational and people excellence.

The Centre for Urban Greenery and Ecology (CUGE) and professional certification bodies conduct in-depth training for operational staff, including formulating a specialised roadmap to develop professional arborist competency.

Corporate staff can get certified by industry-recognised agencies such as the Institute of Singapore Chartered Accountants and Institute for Human Resource Professionals.

### STAFF WITH PROFESSIONAL OPERATIONAL CERTIFICATIONS (AS OF 2018)

**127 Certified Park Managers**

**235 ISA Certified Arborists**

**107 Certified Practising Horticulturists**

**39 Certified Playground Safety Inspectors**



### Healthy Lifestyle

Promotes active and healthy living by encouraging staff to participate in sports interest groups and through lunchtime talks.

### Social & Recreation

Provides avenues for self-improvement and learning while networking with others through learning journeys and workshops.

### Kindness Movement

Nurtures a culture of kindness, compassion and volunteerism among staff for the less privileged in our society.

## STAFF WELL-BEING

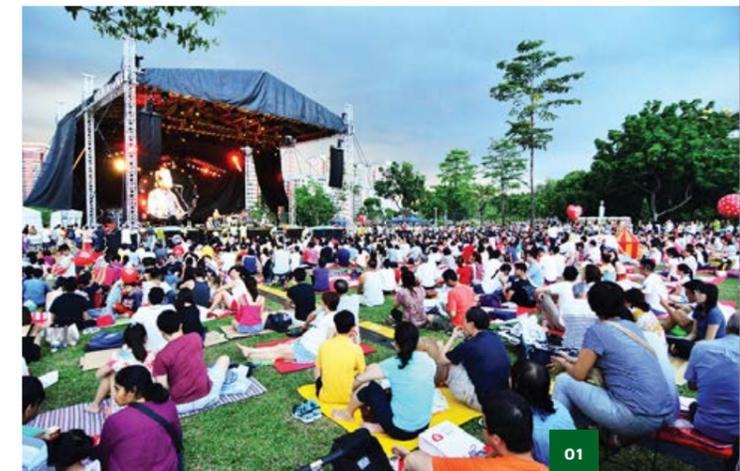
The Staff Well-Being Committee works with the Human Resource branch and Staff Union to organise activities that engage our workforce. Each sub-committee comprises approximately 20 members from various divisions who volunteer their time and effort to curate a calendar of events and activities for staff.

In FY2018, more than 300 staff members have contributed over 2,400 hours of their time towards kindness-related activities. Besides ongoing engagements with the Handicaps Welfare Association and Voluntary Welfare Organisations, staff also participated in guiding over 8,000 underprivileged beneficiaries of charities at the Singapore Garden Festival 2018.

## RECOGNITION AND AWARDS

Each year, deserving staff are recognised for their exemplary service and work via the Excellent Service Award and Divisional Star Award. In 2018, 30 staff were commended for providing excellent service to internal and external customers, while 11 teams, including members across units and functions, were awarded the Greenery Excellence Awards for their outstanding teamwork and operational standards.

This past year, 202 staff received their Long Service Award for their contributions towards building and caring for our City in a Garden.



1 Different communities regularly come together at our green spaces to enjoy a host of concerts, performances and festivals.

2 In the reporting year, more than 300 staff members contributed over 2,400 hours towards kindness-related activities such as helping out at the Food Bank.

# Facts & Figures FY 2018



## NATIONAL DAY AWARDS

### Public Administration Medal (Bronze)

**Ms Chang Siau Hoon**  
DIRECTOR (HUMAN RESOURCE)  
CORPORATE SERVICES

**Ms Phua Chui-Ping Elaine**  
DIRECTOR (LEGAL SERVICES & PROSECUTION)  
AND BOARD SECRETARY  
CORPORATE SERVICES

### Commendation Medal

**Ms Camelia H Marican**  
DEPUTY DIRECTOR (PROGRAMMING & OUTREACH)  
HORTPARK

**Ng Aik Guan**  
DEPUTY DIRECTOR (STREETSCAPE (SOUTH WEST))  
STREETSCAPE

**Tan Swee Kwang**  
SENIOR MANAGER (STREETSCAPE)  
STREETSCAPE

**Wong Wai Sung**  
DEPUTY DIRECTOR (DEVELOPMENT MANAGEMENT)  
PARKS DEVELOPMENT

### Efficiency Medal

**Ms Chin Li Li**  
SENIOR OFFICER (MOLECULAR BIOLOGY &  
MICROPROPAGATION)  
SINGAPORE BOTANIC GARDENS

**Ms Lim Yen Nghoh**  
MANAGER (NURSERY MANAGEMENT)  
HORTICULTURE AND COMMUNITY GARDENING

## LONG SERVICE MEDAL

**Ms Chan Khar Luang**  
COORDINATING DIRECTOR (WILDLIFE MANAGEMENT) AND  
DIRECTOR (CENTRAL NATURE RESERVE)  
CONSERVATION

**Ms Chew Ping Ting**  
SENIOR MANAGER (CONSERVATION)  
CONSERVATION

**Mawardi bin Amat**  
SENIOR OFFICER (PARKS)  
PARKS CENTRAL

**Ng Aik Guan**  
DEPUTY DIRECTOR (STREETSCAPE (SOUTH WEST))  
STREETSCAPE

**Ms Ng Sok Hong**  
DEPUTY DIRECTOR (GREENERY AND PEOPLE)  
INDUSTRY & CUGE

**Ramakrishnan s/o R Kolandavelu**  
SENIOR OFFICER (CONSERVATION)  
CONSERVATION

**Tay Soon Lian**  
MANAGER (CONSERVATION)  
CONSERVATION

**Wong Wei Jue**  
DEPUTY DIRECTOR (PARKS)  
PARKS EAST

## AWARDS AND ACCOLADES

### 2018 MAY DAY AWARDS Medal of Commendation

**Kenneth Er**  
CHIEF EXECUTIVE OFFICER

**Innovative Breakthrough Award**  
**Kampong Admiralty Silver Community Initiative**

### EXCELLENT SERVICE AWARD 2018

**Attractions**  
2 STAR, 4 GOLD, 1 SILVER

### PUBLIC SECTOR TRANSFORMATION AWARDS 2018

**Star Service Individual**  
**Peter Lim**

**Star Service Manager**  
**Ms Taryn Yap**

**Excel Innovation Project**  
**Therapeutic Garden Movement**

### MND MINISTER'S AWARD (TEAM) 2018

**NParks Maven**  
**Species Recovery of Singapore's Critically  
Endangered Freshwater Crab**

### MUNICIPAL SERVICES AWARDS 2018

**Team Category**  
PUBLIC ENGAGEMENT ON USE OF PERSONAL MOBILITY  
DEVICES ALONG PARK CONNECTORS

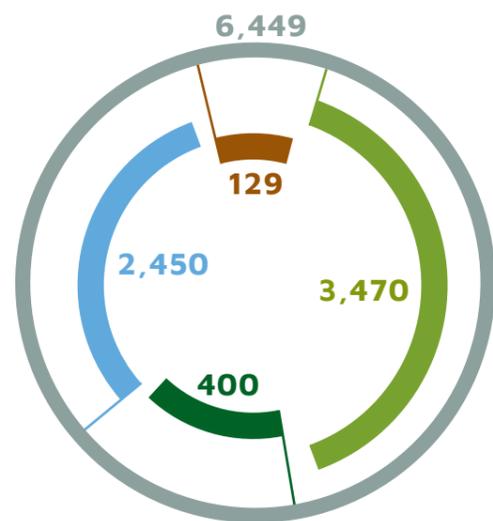
**Community Category**  
RESOLUTION OF SEGAR ROAD MONKEY INCIDENT

### COMMUNITY CHEST BRONZE AWARD 2018

# Facts & Figures FY 2018

## CUGE TRAINING PROGRAMMES

The Centre for Urban Greenery and Ecology (CUGE) was established by NParks as a regional centre of excellence to advance an urban and green living environment, and a one-stop training and knowledge hub in urban greenery and ecology.



International Briefings / Overseas Executive Programmes

**400**

Short Courses, Seminars, Workshops & Professional Speaker Series

**2,450**

WSQ Courses

**3,470**

Certification Programmes

**129**

TOTAL NUMBER OF TRAINING PLACES

**6,449**

### Workforce Skills Qualification (WSQ) Courses

- WSQ Certificate in Landscape Operations
- WSQ Higher Certificate in Landscape Operations (Arboriculture)
- WSQ Advanced Certificate in Landscape Supervision (Arboriculture)
- WSQ Advanced Certificate in Landscape Supervision (Landscape Design and Construction)
- WSQ Advanced Certificate in Landscape Supervision (Nursery)
- WSQ Advanced Certificate in Landscape Supervision (Parks, Reserves and Gardens)
- WSQ Advanced Certificate in Landscape Supervision (Turf, Sports Grounds and Greens)
- WSQ Diploma in Landscape Management (Arboriculture)
- WSQ Diploma in Landscape Management (Landscape Design and Construction)
- WSQ Diploma in Landscape Management (Nursery)
- WSQ Diploma in Landscape Management (Parks, Reserves and Gardens)
- WSQ Diploma in Landscape Management (Turf, Sports Grounds and Greens)
- WSQ in Nature Interpretation

### Professional Certification Programmes

- Certificate in Therapeutic Horticulture
- Certified Park Manager Programme
- Certified Playground Safety Inspector Programme
- Certified Practising Horticulturist Programme
- ISA Certified Arborist Preparatory Programme
- ISA Tree Risk Assessment Qualification

### International Briefings and Overseas International Programmes

- CUGE Overseas International Programme on Greenery Planning & Management
- Briefings for Overseas Delegates

### Seminars/Professional Speaker Series/Workshops

- 8th Regional Arboriculture Seminar: Tree Feet Under
- Basic Tree Defects Identification
- Client Management for Therapeutic Horticulture (Persons with Stroke)
- CUGE Professional Speaker Series: How can we Build a Bee-friendly City in the Garden
- CUGE Professional Speaker Series: Play with Nature - A Different Type of Playground Experience
- CUGE Professional Speaker Series: Biophilic Design Theory, Practice and Process
- CUGE Research Seminar: Understanding Ecosystem Services in the Urban Environment
- Ecological Restoration Workshop
- Edible Landscaping Series - Identification of Site and Design
- Fireflies in Urban Setting
- Forensics for Urban Trees
- Gross Floor Area Calculation
- Habitat Enhancement Seminar
- Human-Wildlife Coexistence - Macaques in Singapore
- Importance of Insects in Environmental Assessments
- Insect Identification for Field Surveys
- Landscape Safety Orientation Course

- Plant Diversity & Nomenclature Series - Discovering Moraceae & Arecaceae
- Plant Diversity & Nomenclature Series - Discovering Dipterocarpaceae and Meliaceae
- Plant Diversity & Nomenclature Series - Discovering Orchidaceae
- Playground Maintenance Technician Course
- Safety in Arboriculture Practices
- Skyrise Greenery Module 2 - Design for Safety on Rooftop Greenery
- Standardised Tree Baseline Risk Management Using Tree Geometry and Parameters
- Themed Gardens - Butterfly Gardens: A Practical Design
- Themed Gardens - Dragonflies and Damselflies, Guardians of Watersheds
- Themed Gardens - Fragrant Garden
- Therapeutic Horticulture Seminar
- Tree Decay - The Fundamentals
- Tree Inspection - The Basics
- Tree Inspection - Advanced
- Tree Inspection - Failure Documentation and Analysis
- Tree Statics, Reconsidering the Likelihood of Failure
- Trees and Construction: Understanding the Arboriculture Impact
- Tropical Wood Anatomy
- Up By Roots - A Technical and Practical Workshop on Trees, Soils and Stormwater
- Urban Ecology Strategies for Coexistence with Bees
- Urban Soils and Soil Conditions

# Facts & Figures FY 2018

## REGIONAL PARKS MAINTAINED BY NPARKS

AREA (HA)		AREA (HA)	
Admiralty Park	25.67	MacRitchie Reservoir Park	12.00
Ang Mo Kio Town Garden East	4.88	Marina Promenade	15.10
Ang Mo Kio Town Garden West	20.63	Marsiling Park	11.35
Bedok Reservoir Park	42.39	Mount Faber Park	58.80
Bedok Town Park	13.66	My Waterway @ Punggol	12.30
Bishan-Ang Mo Kio Park	62.00	one-North Park	3.39
Bukit Batok Nature Park	35.74	Pasir Ris Park	73.39
Bukit Batok Town Park - Little Guillin	41.60	Pasir Ris Town Park	12.36
Bukit Timah Nature Reserve	162.64	Pearl's Hill City Park	8.50
Central Catchment Nature Reserve	455.00	Pulau Ubin Recreation Area	692.18
Changi Beach Park (including Changi Point Promenade)	29.15	Punggol Park	16.66
Chestnut Nature Park	81.00	Rifle Range Nature Park	67.00
Choa Chu Kang Park	11.81	Sembawang Park	15.58
Clementi Woods Park	11.48	Sengkang Riverside Park	21.08
Coney Island Park	83.30	Singapore Botanic Gardens	82.00
Dairy Farm Nature Park	63.00	Sisters' Islands Marine Park	47.68
East Coast Park	238.08	Springleaf Nature Park	10.78
Esplanade Park	2.40	Sun Plaza Park	9.60
Fort Canning Park	18.04	Sungei Buloh Wetland Reserve	193.31
Hindhede Nature Park	9.00	Tampines Eco-Green	36.61
Hong Lim Park	1.28	Telok Blangah Hill Park	36.88
HortPark	24.04	Tiong Bahru Park	3.33
Istana Park	1.29	Toa Payoh Town Park	4.91
Jurong Central Park	7.98	Upper Peirce Reservoir Park	4.00
Jurong Lake Gardens	84.69	Upper Seletar Reservoir Park	15.00
Kallang Riverside Park	5.16	War Memorial Park	1.74
Kent Ridge Park	48.40	West Coast Park	50.13
Kranji Marshes	56.29	Windsor Nature Park	75.00
Kranji Reservoir Park	4.13	Woodlands Waterfront Park	11.22
Labrador Park and Nature Reserve	22.78	Yishun Park	13.22
Lower Peirce Reservoir Park	10.00	Youth Olympic Park	0.66
Lower Seletar Reservoir Park	8.49	Zhenghua Nature Park	17.30
<b>Total</b>	<b>3319.03</b>	<b>Total</b>	<b>3319.03</b>

TOTAL NUMBER OF PARKS	
Regional Parks	64
Neighbourhood Parks	316
<b>Total</b>	<b>380</b>

TOTAL AREA MAINTAINED	AREA (HA)
Parks, playgrounds, open spaces, fitness corners and park connectors**	2,810.98
Nature reserves	3,347
Istana and Parliament House grounds	42
Roadside greenery	2,110.73
Vacant state land	58.77
State land taken over from Mar 2019***	4,311
<b>Total</b>	<b>12,680.48</b>



\*\* Excludes Bukit Timah Nature Reserve, Central Catchment Nature Reserve, Sungei Buloh Wetland Reserve and Labrador Nature Reserve which have been computed under "Nature reserves"  
 \*\*\* Greenery on vacant land taken over from agencies

# Corporate Governance FY 2018



## BOARD MEMBERS

NParks is overseen by a Board comprising 10 members. All the Board members are non-executive members, except for the Chief Executive Officer. The Board derives its strength from the extensive and complementary backgrounds, qualifications and experience of its members.

Responsibilities of the Board:

Provide oversight and endorsement on broad directions, policies and strategies relating to NParks' achievement of its vision, mission and objectives, and performance of its functions;

Oversee NParks' operating and financial performance taking into account NParks' budget, expenditure, assets, transactions and projects;

Provide guidance on matters relating to NParks' parks and infrastructure development programmes; and

Approve NParks' tenders as members of the relevant Tender Approving Authority for approval of tenders.

The Board has established the following committees to assist it in carrying out its duties:

### Audit Committee

The Audit Committee comprises three non-executive Board members. The Audit Committee ensures a high standard of corporate governance through independent reviews of internal controls, financial reporting processes and financial risks. In addition, the Audit Committee reviews the audited financial statements, as well as the audit plans and observations of external and internal auditors, and also reviews the effectiveness of internal audit.

<b>CHAIRMAN</b>	<b>MEMBERS</b>
Mr Guy Harvey-Samuel	Ms Shantini Ramachandra Mr Musa Fazal

### Human Resource and Compensation Committee

The Human Resource and Compensation Committee comprises three non-executive Board members. Its role is to review key human resource policies and provide strategic oversight of related risks.

<b>CHAIRMAN</b>	<b>MEMBERS</b>
Mr Andreas Sohmen-Pao	Dr Suriani Suratman Mr Warren Fernandez

### Operations Risk Committee

The Operations Risk Committee comprises three non-executive Board members, including the Chairman of the Board. Its role is to provide strategic oversight on NParks' operations risk management framework and conduct reviews of NParks' operations risks. The Operations Risk Committee also oversees the implementation of risk mitigation plans, policies and practices.

<b>CHAIRMAN</b>	<b>MEMBERS</b>
Mr Benny Lim	Mr George Huang Mr Cheng Hsing Yao

### Garden City Fund Management Committee

The Garden City Fund Management Committee manages and administers the Garden City Fund, a registered charity and an Institution of Public Character to plan, develop, promote and manage the Garden City Fund in accordance with its Trust Deed.

### Board's Conduct of its Affairs

The Board meets four times a year and as and when necessary to address any significant matters that may arise. To enable the Board to fulfil its responsibilities, the Management Team provides the Board members adequate information during Board meetings and on an ongoing basis. The Board also has direct and independent access to the Management Team if further information and explanation are required.

### Code of Conduct

Members of the Board are guided by a set of key principles and guidelines to ensure fairness and impartiality in carrying out its responsibilities, as well as to uphold the integrity and reputation of the Public Service, including adhering to the Public Sector (Governance) Act (Act 5 of 2018).

### Accountability and Audit

The Board's accounts are audited by the Auditor-General or such other auditor who may be appointed annually by the Minister in consultation with the Auditor-General. The auditor engaged for the financial year which ended on 31 March 2019 was Ernst & Young LLP. The audited financial statements and the auditor's report were submitted to the Board and the Ministry of National Development, and also presented to Parliament.

### Internal Control Framework

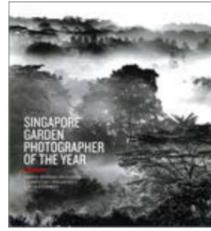
NParks' internal control system ensures that assets are safeguarded, proper accounting records are maintained, and financial information is reliable. The overall control framework includes:

- An organisation structure with clearly defined authority and delegation limits and reporting mechanisms to higher levels of management and to the Board;
- An annual budgeting and quarterly financial reporting system for all operating units that enables progress against annual plans and objectives to be monitored;
- Compliance with the provisions of the National Parks Board Act (Chapter 198A), Public Sector (Governance) Act (Act 5 of 2018), Statutory Board Financial Reporting Standards, Government Instruction Manuals, Finance and PSD Circulars and Minutes for policies and procedures related to operations, human resource management and financial controls and regulations; and
- A risk management framework which ensures close monitoring with proper mitigating measures for all identified high risk areas.

Please refer to pg 46 for the work of Garden City Fund in the year in review.

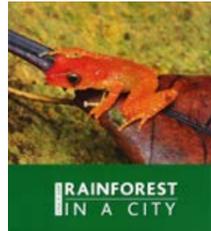
# Publications

## BOOKS



### Singapore Garden Photographer of the Year

Singapore Garden Photographer of the Year won the Grand Award in the 2016 APEX Awards for Publication Excellence under the category of One-of-a-Kind Publication – Green.



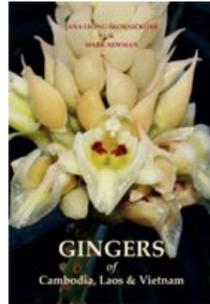
### Rainforest in a City

Rainforest in a City won the Bronze medal in the 2015 Independent Publisher Book Awards under the category of Environment/Ecology/Nature, and the Silver award in the 2015 Nautilus Book Awards under the category of Ecology/Environment.



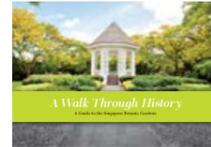
### Footprints on an Island – Rediscovering Pulau Ubin

Footprints on an Island – Rediscovering Pulau Ubin won the Nautilus 2016 Silver Award in the Multicultural & Indigenous category, and was recognised in the One-Of-A-Kind Publication (Green) category at the 30th Annual APEX Awards for Publication Excellence competition.



### Gingers of Cambodia, Laos & Vietnam

Gingers of Cambodia, Laos & Vietnam by Jana Leong-Skorničková and Mark Newman



### A Walk Through History – A Guide to the Singapore Botanic Gardens

BY NIGEL TAYLOR AND ADA DAVIS



### Migratory Birds of Sungei Buloh Wetland Reserve

BY JAMES GAN, MENDIS TAN AND DAVID LI



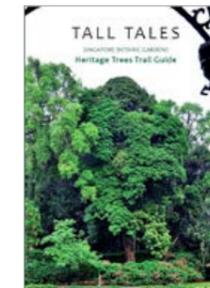
### My Green Space: Indoor Gardening Made Simple

BY LILY CHEN, NG SHAN JUN, ANG WEE FOONG, ET AL.



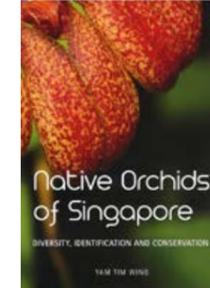
### A Guide to the Common Epiphytes and Mistletoes of Singapore

BY JEAN W.H. YONG, JAMES WANG WEI, JOANNE Y.T. KHEW, SHEUE CHIOU RONG AND WONG WEI SAN



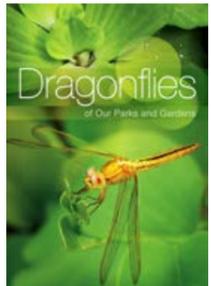
### Tall Tales: Singapore Botanic Gardens Heritage Trees Trail Guide

BY SHEE ZHI QIANG, ANG XING QI, LAHIRU WIJEDASA AND NIGEL TAYLOR (SINGAPORE BOTANIC GARDENS)



### Native Orchids of Singapore – Diversity, Identification and Conservation

BY DR YAM TIM WING



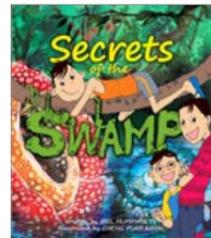
### Dragonflies of Our Parks and Gardens

BY ROBIN NGIAM



### The Hunt for the Green Boomerang

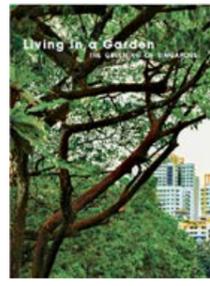
BY NEIL HUMPHREYS AND ILLUSTRATED BY CHENG PUAY KOON



### Secrets of the Swamp

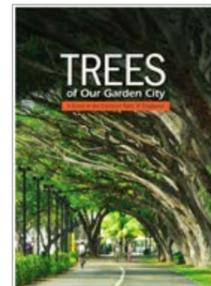
BY NEIL HUMPHREYS AND ILLUSTRATED BY CHENG PUAY KOON

Secrets of the Swamp won the Best Book award for 6-8 year olds in the 2014 Harper's Bazaar Junior Toy Awards.



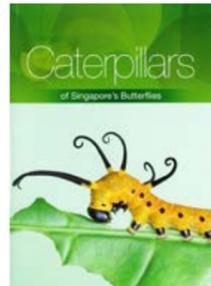
### Living in a Garden – The Greening of Singapore

BY TIMOTHY AUGER



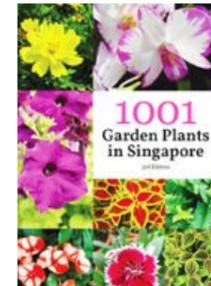
### Trees of Our Garden City

EDITED BY TEE SWEE PING



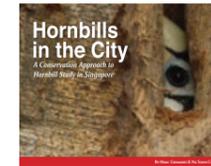
### Caterpillars of Singapore's Butterflies

BY HORACE TAN AND KHEW SIN KHOON



### 1001 Garden Plants in Singapore

BY LILY CHEN, ANG WEE FOONG, ARTHUR NG, JESSICA TEO AND DR JENNIE TANG



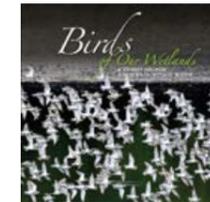
### Hornbills in the City – A Conservation Approach to Hornbill Study in Singapore

BY MARC CREMADES AND NG SOON CHYE



### Our Fragile Rainforest

BY DR LEONG TZI MING AND JAMES GAN



### Birds of Our Wetlands – A Journey Through Sungei Buloh Wetland Reserve

(EDS.) WONG TUAN WAH, VICTORIA CHEONG, ADA DAVIS, HOW CHOON BENG, DAVID LI, LOW BING WEN, FLORENCE SIM AND YANG SHUFEN

## JOURNALS



### The Gardens' Bulletin Singapore, May 2018 & December 2018



## PERIODICALS



### Gardenwise, August 2018 & February 2019



### CITYGREEN, issue 16 - Nature for Urban Minds

The CUGE publication CITYGREEN won the APEX Awards for Publication Excellence in 2018, 2017, 2016, 2015, 2014, 2013 and 2012.

# Staff Publications

## PAPERS AND OTHER PUBLICATIONS

Ardi, W.H., Chikmawati, T., Witono, J.R. & **Thomas, D.C.** (2018). A synopsis of Begonia (Begoniaceae) from Southeastern Sulawesi including four new species. *Phytotaxa* 381(1): 27–50.

**Ho, B.C., Lua, H.K., Leong, P.K.F., Lindsay, S., Seah, W.W., Bazilah Ibrahim, Loo, A.H.B., Koh, S.L., Ali Ibrahim & Athen, P.** (2018). New records and rediscoveries of vascular plants in Bukit Timah Nature Reserve, Singapore. *Gardens Bulletin Singapore* 70: 33–55.

Bai, L., **Leong-Škorničková, J.**, Xia, N.H. & Li, D.Z. (2018). Taxonomic studies on Zingiber (Zingiberaceae) in China VI: *z. leucochilum*, a new species with running rhizome from Sichuan. *Nordic Journal of Botany* 36(9): e01840. <https://doi.org/10.1111/njb.01840>

Bombonato, J.R., Bonatelli, I.A.S., Silva, G.A.R., Moraes, E.M., Zappi, D.C., **Taylor, N.P.** & Franco, F.F. (2019). Cross-genera SSR transferability in cacti revealed by a case study using *Cereus* (Cereaceae, Cactaceae). *Genetics and Molecular Biology* 42: 87–99. <https://dx.doi.org/10.1590/1678-4685-GMB-2017-0293>

**Burcham, D.C.**, Brazee, N.J., Marra, R.E., & Kane, B. (2019). Can sonic tomography predict loss in load-bearing capacity for trees with internal defects? A comparison of sonic tomograms with destructive measurements. *Trees*. doi:10.1007/s00468-018-01808-z

Chen, C.-W., **Lindsay, S.**, Mynssen, C.M., Kuo, L.-Y., Amoroso, V.B. & Huang, Y.-M. (2018). A new *Haplopteris* species from the Philippines and clarification of the status of *H. ambinensis* in China and Indochina. *Gardens Bulletin Singapore* 70: 177–190.

Cabactulan, D.D, Aurigue, F., Pimentel, R., De Leon, M.D., Sahagun, J. & **Rodda, M.** (2018). Hoya of the Philippines, part II: *Hoya pulchra* (Apocynaceae), a new species from southern Philippines. *Annales Botanici Fennici* 56: 49–53.

Carlsen, M., Fer, T., Schmickl, R., **Leong-Škorničková, J.**, Newman, M. & Kress, W.J. (2018). Resolving the rapid plant radiation of early diverging lineages in the tropical Zingiberales: Pushing the limits of genomic data. *Molecular Phylogenetics and Evolution* 128: 55–68.

Chatrou, L.W., **Turner, I.M.**, Klitgaard, B.B., Maas, P.J.M. & Utteridge, T.M.A. (2018). A linear sequence to facilitate curation of herbarium specimens of Annonaceae. *Kew Bulletin* 73(39): 1–10.

**Chen, J., Turner, I.M.**, Saunders, R.M.K. & **Thomas, D.C.** (2018). *Artabotrys scortechinii* (Annonaceae): an augmented species description and a new record for Singapore. *Gardens' Bulletin Singapore* 70(1): 3–8.

**Chen, L.M.J., Ho, B.C., Choo, L.M. & Koh, S.L.** (2018). Additions to the Flora of Singapore, new and overlooked records of naturalised plant species (1). *Gardens' Bulletin Singapore* 70(1): 91–101.

**Chen, L.M.J., Lua, H.K., Yeo, R.S.W., Choo, L.M., Ho, B.C.,** Chua, K.S. & **Koh, S.L.** (2018). Additions to the Flora of Singapore—new and overlooked records of naturalised plant species (2). *Nature in Singapore* 11: 63–75

Chen, W.H., Nguyen, H.Q., Chen, R.Z., Nguyen, T.H, Nguyen, K.S., Nguyen, V.T., Möller, M., **Middleton, D.J.** & Shui, Y.M. (2018). Two new species of *Oreocharis* (Gesneriaceae) from Fan Si Pan, the highest mountain in Vietnam. *Phytokeys* 94: 95–106.

**Cheong, N.** (2018). The extension of the Jacob Ballas Children's Garden. *Gardenwise* 50: 2–8.

Chew, M.Y. & **Rodda, M.** (2018). New locality record of a rare climber—*Genianthus maingayi* Hook.f. *Conservation Malaysia* 27: 8.

Chisholm, R.A., Lim, F., Yeoh, Y.S., **Seah, W.W.**, Condit, R. & Rosindell, J. (2018). Species-area relationships and biodiversity loss in fragmented landscapes. *Ecology Letters* 21: 804–813.

**Choo, L.M.** (2019). DNA barcoding for the identification of a *Pterocarpus* tree. *Gardenwise* 52: 6–8.

Chong, K.Y., Lim, R.C.J, Loh, J.W., Neo, L., **Seah, W.W.**, Tan, S.Y., Tan, H.T.W. (2018). Rediscoveries, new records, and the floristic value of the Nee Soon freshwater swamp forest, Singapore. *Gardens' Bulletin Singapore* 70 (Suppl. 1): 49–69.

Chua, M.-S., **Ho, B.C.**, Suleiman, M., Zuo, Q., Zhang, D.X. & Zhang, L. (2018). Lectotypification of *Acroporium hyalinum* (Reinw. ex Schwägr.) Mitt. (Hypnales: Sematophyllaceae). *Telopea* 21: 175–185.

Dăng, H.T., Truong, H.L., Đạt, Q.N., Cường, H.N., **Parusuraman, A. & Wong, K.M.** (2018). Identification, sexual dimorphism and aspects of the natural history of *Sapria himalayana* (Rafflesiaceae) on Vietnam's Lang Biang Plateau. *Botanical Studies* 59: 29. Pp. 1–10.

**Davison, G., Cheng, T. & Velautham, E.** (2018). Death of a palm. *Gardenwise* 51: 18–19.

De Boer, H., Newman, M. Poulsen, A.D., Droop, J., Fer, T., Le, T.T.H., Hlavata, K., Lamxay, V., Richardson, J.E., Steffen, K. & **Leong-Škorničková, J.** (2018). Convergent morphology in Alpinieae (Zingiberaceae): *Recircumscribing Amomum* as a monophyletic genus. *Taxon* 67(1): 6–36.

Endress M.E., Meve U., **Middleton D.J.**, Liede-Schumann S. (2018). Apocynaceae. In: Kadereit J., Bittrich V. (eds) *Flowering Plants. Eudicots. The Families and Genera of Vascular Plants*, vol 15: 207–411. Springer, Cham.

**Ganesan, S.K.** (2018). Flora of Singapore precursors, 10. Validation of *Mangifera paludosa* (Anacardiaceae) and notes on its distribution, ecology and conservation status in Singapore. *Gardens' Bulletin Singapore* 70(2): 301–305

**Ganesan, S.K.** (2018). Getting to know the Binjai. *My Green Space* 39(4). <https://www.nparks.gov.sg/mygreenspace/issue-39-vol-4-2018/conservation/getting-to-know-the-binjai>

**Ganesan, S.K.** (2019). *Mangifera quadrifida* (Anacardiaceae), a new record for Singapore. *Nature in Singapore* 12: 1–5.

**Ganesan, S.K. & Ali Ibrahim.** (2018). Our local *kampung* mango flowers. *Gardenwise* 51: 12–13.

**Ganesan, S.K. & Ali Ibrahim.** (2018). *Shorea sumatrana* (Dipterocarpaceae), a remarkable new addition to the flora of Singapore. *Gardens' Bulletin Singapore*. 70(2): 261–266.

**Ganesan S.K., Lua, H.K. & Ali Ibrahim** (2018). *Melochia umbellata* (Malvaceae subfam. Byttnerioideae), a new record for Singapore. *Gardens' Bulletin Singapore* 70(1): 25–31.

**Ganesan S.K., Lua, H.K. & Ali Ibrahim** (2018). *Shorea johorensis* (Dipterocarpaceae), an addition to the flora of Singapore. *Gardens' Bulletin Singapore* 70(1): 19–23.

**Ghosh, S., Ow, L.F., Mohd. Yusof, M.L.** (2018). Biochar application for sustainable soil quality: a case study in tropical urban environment. In: Rakshit, A., Sarkar, B. & Abhilash, P. (eds.) *Soil Amendments for Sustainability: Challenges and Perspectives* (Chp 23). Routledge.

**Ghosh, S., Pal, P., Ow, L.F., Burcham, D.C., & Rakshit, A.** (2018). Effect of Compost and Hydroabsorbent Polymer on Tree Growth and Soil Properties in a Tropical Urban Environment. *Communications in Soil Science and Plant Analysis* 49(10): 1229–1238.

Gobeawan, L., **Lin, E.S.**, Tandon, A., **Yee, A.T.K.**, Khoo, V.H.S., Teo, S.N., Yi, S., Lim, C.W., Wong, S.T., Wise, D.J., Cheng, P., Liew, S.C., Huang, X., Li, Q.H., Teo, L.S., Fekete, G.S., & Poto, M.T. (2018). *Modeling trees for virtual Singapore: From data acquisition to Citygml models*. 13th 3D Geoinfo Conference, Delft.

Goh, W.L., Sungkaew, S., Teerawatananon, A., Ohrnberger, D., Xia, N.-H., Chan, K.S., How, Y.X. & **Wong, K.M.** (2018). The hybrid origin of Phai Liang, a bamboo of recent introduction into horticulture in Southeast Asia, and a new nothogenus, *x Thyrsocalamus* (Bambuseae: Bambusinae). *Phytotaxa* 362(3): 271–281.

Guo, X., **Thomas, D.C.** & Saunders, R.M.K. (2018). Gene tree discordance and coalescent methods support ancient intergeneric hybridisation between *Dasymaschalon* and *Friesodielsia* (Annonaceae). *Molecular Phylogenetics and Evolution* 127: 14–29.

Guo, X., **Thomas, D.C.** & Saunders, R.M.K. (2018). Organ Homologies and Perianth Evolution in the *Dasymaschalon Alliance* (Annonaceae): Inner Petal Loss and its Functional Consequences. *Frontiers in Plant Science* 218(9): 174.

**Ho, B.C. & Choo, L.M.** (2019). The 7th International Legume Conference in Sendai, Japan. *Gardenwise* 52: 37–39.

**Ho, B.C., Lua, H.K., Leong, P.K.F., Lindsay, S., Seah, W.W., Bazilah Ibrahim, Loo, A.H.B., Koh, S.L., Ali Ibrahim & Athen, P.** (2018). New records and rediscoveries of vascular plants in Bukit Timah Nature Reserve, Singapore. *Gardens' Bulletin Singapore* 70(1): 33–55.

**Ho, B.C.** & Shevock, J.R. (2018). A tribute to Benito C. Tan (1946–2016), distinguished muscologist. *Philippine Journal of Systematic Biology* 12: iv–xxiii.

**Ho, B.C.** & Yeo, R. (2018). Algae, the unseen beauties in the Gardens' lakes. *Gardenwise* 50: 9–10.

Hwang, Y.H., Yue, Z.E., **Ling, S.K. & Tan, H.H.** (2019). It's ok to be wilder: Preference for natural growth in urban green spaces in a tropical city. *Urban Forestry & Urban Greening*, 38: 165–176. doi:10.1016/j.ufug.2018.12.005

Izuddin, M., **Yam, T.W.**, Webb, E.L. (2018). Specific niche requirements drive long-term survival and growth of translocated epiphytic orchids in an urbanised tropical landscape. *Urban Ecosystems* 21: 531–540. <https://doi.org/10.1007/s11252-018-0733-2>

Chong, K.Y., **Lim, R.C.J.**, Loh, J.W., Neo, L., **Seah, W.W.**, Tan, S.Y. & Tan, H.T.W. (2018). Rediscoveries, new records, and the floristic value of the Nee Soon Freshwater Swamp Forest, Singapore. *Gardens' Bulletin Singapore* 70 (Suppl. 1): 49–69.

Khmelnitsky, O., Davoodian, N., Singh, P., Raspé, O., **Lee, S.M.L.**, Fechner, N., Bonito, G., Lebel, T. & Halling, R.E. (2019). *Ionosporus*: a new genus for *Boletus longipes* (Boletaceae), with a new species, *I. australis*, from Australia. *Mycological Progress* 18: 439–451.

**Koh, J.** (2018). Bulbiferous ferns in the Gardens. *Gardenwise* 51: 20–22.

**Koh, S. & Choo, M.** (2019). Lim Hock Lye, 'Uncle David' (1945–2018). *Gardenwise* 52: 2.

**Koh, T.S.** (2018). Beyond the Gardens: Professional exchange programme with Kings Park and Botanic Garden. *Gardenwise* 51: 38–39.

**Kurzweil, H.** & Fujikawa, K. (2018). Makino Botanical Garden (Japan) and its orchid collection. *Malayan Orchid Review* 52: 59–63.

**Kurzweil, H.** & Ormerod, P. (2018). Precursory studies on the orchid flora of Myanmar with one new species and thirty eight new distribution records. *Rheedea* 28: 1–15.

**Lai, S.** (2018). The opening of the Ethnobotany Garden. *Gardenwise* 51: 2–5.

**Lee, Benjamin, P.Y.H. & Teo, Robert C.H.** (2018). First record of the big-eared pipistrelle in Singapore. Singapore Biodiversity Records 2018: 57–58.

**Lee, S.** (2018). Collaborators in Research: International researchers on the Flora of Singapore Project. *Gardenwise* 51: 28.

**Lee, S.** (2018). From the Earth: *Phallus* or Stinkhorn Fungi. *Gardenwise* 50: 24–25.

**Lee, S.** (2018). From the Earth: Puffballs, earthballs and earthstars, oh my! *Gardenwise* 51: 29–31.

**Lee, S.** (2019). From the Earth: Sponge Bob's cousin found in Singapore. *Gardenwise* 52: 28–30.

**Lee, S. & Bazilah Ibrahim** (2018). Around the Gardens: The SING boxes – to infinity and beyond! *Gardenwise* 50: 33–34.

Leitgeb, E., **Ghosh, S.**, Dobbs, M., Englisch, M., Michel, K. (2019). Distribution of nutrients and trace elements in forest soils of Singapore. *Chemosphere* 222: 62–70. doi: 10.1016/j.chemosphere.2019.01.106

**Leong, P., Rodda, M.** & Ragai, R. (2018). Botanising in the montane forests of Lanjak-Entimau Wildlife Sanctuary in Sarawak. *Gardenwise* 51: 8–11.

**Leong, P.K.F., Lee, C., Teo, S., Tay, F.E.L., Ang, P., Lin, E.S. & Yam, T.W.** (2018). *Acriopsis ridleyi* Hook.f. (Orchidaceae): Re-encounter of an orchid thought extinct since its 1889 holotype collection in Singapore. *Nature in Singapore* 11: 27–36.

**Leong-Škorničková, J.** (2019). The 8th International Zingiberales Symposium – continuing a legacy of ginger research in the Gardens. *Gardenwise* 52: 9–12.

**Lim, R.C.J., Lindsay, S., Middleton, D.J., Ho, B.C., Leong, P.K.F., Niissalo, M.A., H.K., Johnson, D.M. & Murray, N.A., Leong-Škorničková, J., Thomas, D.C. & Ali Ibrahim** (2018). New records and rediscoveries of plants in Singapore. *Gardens' Bulletin Singapore* 70(1): 67–90.

**Lin, C., Muhammad Taufiq Jumal, Tan, H.M.** (2019). From Education Outreach: A day out at the library. *Gardenwise* 52: 33–34.

**Lin, E.S.**, Teo, L. S., **Yee, A.**, & Li, Q. H. (2018). Populating large scale virtual city models with 3D trees. *International Federation of Landscape Architects, Singapore.*

**Lindsay, S. & Middleton, D.J.** (2018). The gardens of Singapore – enthusing and educating the public in the world of plants. *Sibbaldia* 16: 169–177.

Livshultz, T., **Middleton, D.J.**, Van der Ham, R. & **Khew, G.** (2018). Generic delimitation in Apocynae (Apocynaceae). *Taxon* 67(2): 341–358.

Ly, N.S. & **Leong-Škorničková, J.** (2018). *Amomum cristatissimum* (Zingiberaceae; Alpinieae), a new species with echinate fruits from central Vietnam. *Nordic Journal of Botany* 36(3): e01691. <https://doi.org/10.1111/njb.01691>

Mahyuni, R., Chikmawati, T., Ariyanti, N.S. & **Wong, K.M.** (2018). The *Psydrax dicoccos* complex (Rubiaceae) in Malesia, with three new species. *Floribunda* 5(8): 322–331.

**Middleton, D.** (2018). From the Taxonomy Corner: The International Code of Nomenclature for algae, fungi and plants. *Gardenwise* 50: 22–23.

**Middleton, D.** (2018). From the Taxonomy Corner: Plants and fungi named after botanists of the Singapore Botanic Gardens. *Gardenwise* 51: 25–27.

**Middleton, D.** (2019). From the Taxonomy Corner: Peer review. *Gardenwise* 52: 24–25.

**Middleton, D.J.** (2018). Editorial. *Gardens' Bulletin Singapore* 70: 1–2.

**Middleton, D.J.** (2018). A new combination in *Microchirita* (Gesneriaceae) from India. *Edinburgh Journal of Botany* 75: 305–307.

**Middleton, D.J.** (2018). Two new species of *Paraboea* from Vietnam. *Edinburgh Journal of Botany* 75: 421–425.

**Middleton, D.J.** & Atkins, H.J. (2018). A new species of *Aeschynanthus* (Gesneriaceae) from Vietnam. *Edinburgh Journal of Botany*, e-published. <https://doi.org/10.1017/S0960428618000252>

**Middleton, D.J., Ho, B.C., Thomas, D., Lindsay, S. & Nura Abdul Karim** (2018). Beyond the Gardens: The XIX International Botanical Congress. *Gardenwise* 50: 38–40.

**Middleton, D.J., Khew, G.S.**, Poopath, M., Möller, M. & **Puglisi, C.** (2018). *Rachunia cymbiformis*, a new genus and species of Gesneriaceae from Thailand. *Nordic Journal of Botany* 36: 1–6.

**Middleton, D.J., Lua, H.K. & Leong, P.K.F.** (2018). *Micrechites lancifolia* (Apocynaceae: Apocynoideae), a new record for Singapore. *Gardens' Bulletin Singapore* 70: 13–17.

Möller, M., Atkins, H.J., Bramley, G.L.C., **Middleton, D.J.**, Baines, R., Nguyen, V.D., Quang, B.H. & Barber, S. (2018). Two new species of *Oreocharis* (Gesneriaceae) from Northern Vietnam. *Edinburgh Journal of Botany* 75: 309–319.

Müller-Riemenschneider, F., Petrunoff N., **Sia, A.**, Ramiah, A., Ng, A., Han, A., Wong, M., Tai, B.C. & Uijtdevilligen, L. (2018). Prescribing Physical Activity in Parks to Improve Health and Wellbeing: Protocol of the Park Prescription Randomized Controlled Trial. *International Journal of Environment and Public Health* 15 (6): 1154. doi:10.3390/ijerph15061154

Moonlight, P.W., et al. [27 authors including **Thomas, D.C.**]. (2018). Dividing and conquering the fastest-growing genus: Towards a natural sectional classification of the mega-diverse genus *Begonia* (Begoniaceae). *Taxon* 67(2): 267–323.

Nazre, M., Newman, M.F., Pennington, R.T. & **Middleton, D.J.** (2018). Taxonomic Revision of *Garcinia Garcinia* (Clusiaceae). *Phytotaxa* 373: 1–52.

Ng, K. S. T., **Sia, A.**, Ng, M. K. W., Tan, T. Y. C., Chan, H. Y., Tan, C. H., Rawtaer, I., Feng, L., Mahendran, R., Larbi, A., Kua, E. H., and Ho, R. C. M. (2018). Effects of Horticultural Therapy on Asian Older Adults: A Randomized Controlled Trial. *International Journal of Environmental Research and Public Health*, 15 (8), 1705.

**Niissalo, M.** (2018). Mass flowering of *Dracaena* in Singapore. *Gardenwise* 51: 14–17.

**Niissalo, M. & Leong-Škorničková, J.** (2019). Native *Dracaena* in Singapore – Part 1, Cantley's *Dracaena*. *Gardenwise* 52: 3–5.

**Niissalo, M.A., Leong-Škorničková, J.**, Webb, E.L. & **Khew, G.** (2018). Pedigree analyses and next-generation sequencing reveal critically low regeneration in extremely threatened *Zingiber singaporense* (Zingiberaceae). *Botanical Journal of the Linnean Society* 187(2): 346–361.

**Nura Abdul Karim** (2018). Around the Gardens: Memorandum-of-Understanding signed with the National Arboretum Canberra. *Gardenwise* 50: 35.

**Nura Abdul Karim** (2018). Beyond the Gardens: A historical link revived. *Gardenwise* 51: 37.

# Staff Publications

## PAPERS AND OTHER PUBLICATIONS

**Nura Abdul Karim** (2018). Beyond the Gardens: Strengthening ties between the world's botanic gardens. *Gardenwise* 50: 36–37.

**Nura Abdul Karim** (2018). What's Blooming: Nature's offering fit for a god. *Gardenwise* 51: 40.

**Nura Abdul Karim** (2018). What's Blooming: The Snowy Orchid – an 'orchid' that isn't an orchid at all. *Gardenwise* 50: 30.

**Nura Abdul Karim** (2019). Beyond the Gardens: Bringing the Global Strategy for Plant Conservation Targets beyond 2020. *Gardenwise* 52: 34–36.

**Nura Abdul Karim** (2019). What's Blooming: A tropical African plant in Singapore. *Gardenwise* 52: 40.

**Ow, L.F., Ghosh, S., Mohd. Yusof, M.L.** (2018). Effects of varying establishment approaches on the growth of urban street trees. *Arboriculture Journal* 40(4): 201–209. doi: 10.1080/03071375.2018.1528092

**Ow, L.F., & Mohd. Yusof, M.L.** (2018). Mulch – Benefits Relating to Growth and Water Conservation in Ornamental Shrubs in a Tropical Environment. *Research & Reviews: Journal of Botanical Sciences* 7 (2): 36–43.

**Ow, L.F., & Mohd. Yusof, M.L.** (2018). Effects of localised liquid fertilization of N, P, K and Ca on Root development in *Zoysia matrella*, *Cynodon dactylon* and *Stenotaphrum secundatum*. *Weed & Turfgrass Science* 7 (1): 76–86.

**Ow, L.F. and Mohd. Yusof, M.L.** (2018). Stability of four urban tree species in engineered and regular urban soil blends. *Journal of Urban Ecology* 4 (1): 1–6.

**Puglisi, C.** (2018). Ebonies of Singapore. *Gardenwise* 51: 23–24.

**Lim, R.C.J., Lindsay, S., Middleton, D.J., Ho, B.C., Leong, P.K.F., Niissalo, M.A., van Welzen, P.C., Esser, H.-J., Ganesan, S.K., Lua, H.K., Johnson, D.M., Murray, N.A., Leong-Skornickova, J., Thomas, D.C. & Ali Ibrahim** (2018). New records and rediscoveries of plants in Singapore. *Gardens Bulletin Singapore* 70(1): 67–90.

**Lim, R.C.J., Ng, X.Y., Yeo, C.K. & Ang, W.F.** (2018). Rediscovery in Singapore of *Fagraea splendens* Blume (Gentianaceae), with notes on propagation. *Nature in Singapore* 11: 7–14.

Rahayu, S. & **Rodda, M.** (2019). *Hoya* of Sumatra, an updated checklist, three new species, and a new subspecies. *European Journal of Taxonomy* 508: 1–23.

Ranasinghe, S., **Middleton, D.J.**, Atkins, H.J., Milne, R. & Möller, M. (2019). Typification of Sri Lankan Gesneriaceae. *Edinburgh Journal of Botany* 77: doi: 10.1017/S0960428619000027.

**Rodda, M.** (2018). An introduction to traditional Japanese horticulture. *Gardenwise* 51: 6–7.

**Rodda, M.** (2018). Proposal to conserve the name *Cryptolepis buchananii* against *Periploca dubia* (Apocynaceae). *Taxon* 67: 209–210.

**Rodda, M. & Lai, J.** (2018). The rediscovery of *Hoya obtusifolia* (Apocynaceae, Asclepiadoideae) in Singapore. *Nature in Singapore* 11: 45–51.

**Rodda, M.**, Lamb, A.L., L. Gokusing, L. & Rahayu, S. (2018). *Hoya fauziana* ssp. *angulata* (Apocynaceae, Asclepiadoideae), a new subspecies from Borneo and Sumatra. *Blumea* 63: 144–146.

**Rodda, M. & Monro, A.K.** (2018). *Elatostema muluense* (Urticaceae), a new species from the extraordinary caves of Gunung Mulu National Park, Malaysia. *Kew Bulletin* 73: 41.

**Rodda, M. & Rahayu, S.** (2018). A revision of the *Hoya uncinata* complex (Apocynaceae, Asclepiadoideae), with description of a new species. *Phytotaxa* 383 (3): 252–258.

**Lindsay, S.** (2018). *Adiantum alleniae*, a new species, and *Adiantum siamense*, a new record for Peninsular Malaysia. *Gardens Bulletin Singapore* 70: 119–122.

**Seah, W.W. & Wong, K.M.** (2018). Flora of Singapore precursors, 1. *Gynochthodes praetermissa* (Rubiaceae: Morindeae), a new West Malesian species, with notes on related taxa. *Gardens' Bulletin Singapore* 70(2): 267–273.

**Seah, W.W. & Wong, K.M.** (2018). Flora of Singapore precursors, 7. A newly diagnosed species of *Neonauclea* (Rubiaceae: Naucleaeae) now extinct in Singapore and notes on *Neonauclea excelsa* and *N. calycina*. *Gardens' Bulletin Singapore* 70(2): 289–294

**Sia, A.**, Ng, K. S. T., Ng, M. K. W., Chan, H. Y., Tan, C. H., Rawtaer, I., Feng, L., Mahendran, R., Kua, E. H., Ho, R. C. M. (2018). The Effect of Therapeutic Horticulture on the Psychological Wellbeing of Elderly in Singapore. *Journal of Therapeutic Horticulture* 28 (1).

**Soh, C.** (2018). From the Archives: The Japanese Garden. *Gardenwise* 51: Back cover.

**Soh, C.** (2018). From the Archives: Miniature Waterfall Garden. *Gardenwise* 50: Back cover.

**Soh, C.** (2019). From the Archives: The Pará Rubber centenary monument. *Gardenwise* 52: Back cover.

**Soh, Z.** (2019). Ridley's encounters with bees. *Gardenwise* 52: 22–23.

Souvannakhoummane, K. & **Leong-Škorničková, J.** (2018). Eight new records of *Zingiber* Mill. (Zingiberaceae) for the flora of Lao P.D.R. *Edinburgh Journal of Botany* 75(1): 3–18.

Stratoulas, D., Yin, T.G., Wei, S.S., Samatamantri, K.V., Xinran, S., Dissegna, A., Whittle, A.J., **Ow, L.F. & Mohd. Yusof, M.L.** (2018). Urban tree species and health identification in Singapore based on very high spatial resolution satellite images. *Proceedings at the 2nd LIESMARS International*.

**Tan, Justin C.H.** (2018). Fireflies of Pulau Ubin, Singapore. *Nature in Singapore* 2018 11: 127–138.

**Taylor, N.** (2018). Dear Friends of *Echinocereus*. *Der Echinocereenfreund* 31(4): 92 [German translation, p. 93].

**Taylor, N. & Zappi, D.** (2018). Additions and corrections to Cacti of Eastern Brazil. *Bradleya* 36: 2–21.

**Taylor, N.P.** (2018). New to cultivation in Singapore – *Anthurium gracile*. *Gardenwise* 50: 14–15.

**Taylor, N.P.** (2018). Two Epiphyllums for easy cultivation in Singapore. *Gardenwise* 50: 20–21.

**Taylor, N.P.** (2019). Historic specimens in the Singapore Botanic Gardens. *Gardenwise* 52: 13–19.

**Taylor, N.** (2019). *Singapore Botanic Gardens UNESCO World Heritage Site, Site Management Plan* [2nd edition, 2019–2023]. National Parks Board, Singapore. Pp. XI + 139.

**Taylor, N.P.**, Oliveira, D.M.G., Oliveira Azevedo, L., Stehmann, J.R. & Machado, M. (2018). *Micranthocereus oliveirae* P.J. Braun = *M. aureispinus* Ritter (Cactaceae). *Bradleya* 36: 173–175.

**Teo, Robert C.H.** (2018). First record of the long-winged tomb bat in Singapore. *Singapore Biodiversity Records* 2018: 65–67.

**Thomas, D.C.** (2018). Species Portraits: *Begonia aptera*, *Begonia grandipetala*, *Begonia guttapila*, *Begonia lasioura*, *Begonia nobmanniae*, *Begonia ozotothrix*, *Begonia rantemarioensis*, *Begonia siregarii*, *Begonia varipeltata*, *Begonia vermeulenii*. In: Hughes, M. & Peng, C.-I (eds.) *Asian Begonia: 300 Species Portraits*. Pp. 14, 123, 130, 172, 219, 227, 267, 293, 336, 338. Taipei and Edinburgh: KBC Press and RBGE.

**Thomas, D.C.**, Bour, A. & Ardi, W.H. (2018). *Begonia of the Mataramebo karst*, Southeast Sulawesi, Indonesia, including two new species. *Gardens' Bulletin Singapore* 70(1): 163–176.

Thompson, S.A., et al. [184 authors including **Thomas, D.C.**] (2018). Taxonomy based on science is necessary for global conservation. *PLoS Biology* 16(3): e2005075.

Trần, H.D., Luu, H.T., Trần, N.T., Nguyễn, T.T., Nguyễn, Q.B. & **Leong-Škorničková, J.** (2018). Three new *Newmania* species (Zingiberaceae: Zingibereae) from central Vietnam. *Phytotaxa* 367(2): 145–157.

Trần, T.B., Hoang, X.L., Bui, N.D., Bui, T.H., Sangmi, E., Bui, H.Q., Do, V.H., Nuraliev, M., Kuznetsov, A., Kuznetova, S. & **Rodda, M.** (2018). *Jasminanthes tuyetanhi* (Apocynaceae, Asclepiadoideae), a new species from Vietnam, and *J. pilosa* new for Vietnam. *Annales Botanici Fennici* 55: 163–169.

Tran, T.B., Van, D.H., Ha, B.T. Choi, S., Emu, S. & **Rodda, M.** (2018). *Dregea taynguyenensis* (Apocynaceae, Asclepiadoideae), a new species from Vietnam. *Phytotaxa* 333: 267–273.

**Turner, I.M.** (2018). Annonaceae of the Asia-Pacific region: names, types and distributions. *Gardens' Bulletin Singapore* 70: 409–744.

**Turner, I.M.** (2018). Flora of Singapore precursors, 5. Some resolution of a long-standing problem in *Psychotria* (Rubiaceae) of Singapore. *Gardens' Bulletin Singapore* 70: 283–288.

**Turner, I.M.** (2018). The importance of the plates in the Verhandelingen over de natuurlijke geschiedenis der Nederlandsche overzeesche bezittingen, Botanie for the nomenclature of South-East Asian plants. *Taxon* 67(3): 621–631.

**Turner, I.M.** (2018). A new combination in *Genianthus* (Apocynaceae – Secamonoideae). *Thai Forest Bulletin (Botany)* 46(1): 40–43.

**Turner, I.M.** (2018). A new combination in *Pseuderanthemum* (Acanthaceae). *Reinwardtia* 17(1): 55–57.

**Turner, I.M.** (2018). A note on *Euonymus bullatus* (Celastraceae). *Edinburgh Journal of Botany* 75(1): 1–2.

**Turner, I.M.** (2018). Notes on the genus *Uncaria* (Rubiaceae) in Singapore. *Gardens' Bulletin Singapore* 70: 9–12.

**Turner, I.M.** (2018). A revised conspectus of *Uncaria* (Rubiaceae). *Webbia* 73(1): 9–21

**Turner, I.M.** (2019). *Annonaceae of Malesia: species lists for the floristic region and some related geopolitical units*. Lee Kong Chian Natural History Museum, Singapore.

**Turner, I.M.** (2019). Three new combinations in *Eumachia* (Rubiaceae-Palicoeae) from Southeast Asia. *Edinburgh Journal of Botany* 76: 23–27.

**Turner, I.M. & Kumar, V.S.** (2018). Flora of Singapore precursors, 4. A summary of scandent *Psychotria* (Rubiaceae) in Singapore and Peninsular Malaysia. *Phytotaxa* 361(2): 183–197. <https://doi.org/10.11646/phytotaxa.361.2.4>

**Turner, I.M., Low, Y.W., Rodda, M., Wong, K.M. & Middleton, D.J.** (2018). The plant taxa of H.N. Ridley, 5. The Gentianales. *Gardens' Bulletin Singapore* 70: 307–395.

**Turner, I.M., Rodda, M., Wong, K.M. & Middleton, D.J.** (2018). Flora of Singapore precursors, 9: The identities of two unplaced taxa based on types from Singapore. *Gardens' Bulletin Singapore* 70: 295–299.

**Turner, I.M.**, Tan, J.P.C. & Utteridge, T.M.A. (2018). From stowaways to karst-aways: unloading the Peninsular Malaysia endemic *Polyalthia brunneifolia* (Annonaceae). *Nordic Journal of Botany* 36(5): e01693: 1–14. <https://doi.org/10.1111/njb.01693>

**Turner, I.M. & Veldkamp, J.F.** (2018). The publication and typification of the name *Thalia dealbata* (Marantaceae). *Kew Bulletin* 73: 60.

Vogt, C., **Kho, C.** Parks and Trail Hubs as Green Gyms. *Cities and the Environment* 11 (1): 3.

Wei, Y.-M., Tang, Q.-M., **Ho, B.-C.**, Wei, Q.-Q. (2018). An annotated checklist of the bryophytes of Guangxi, China. *Chenia* 13 (Special Issue 1): 1–138.

**Whang, L.K.** (2018). Around the Gardens: The Singapore Garden Festival Orchid Show 2018. *Gardenwise* 51: 36.

**Whang, L.K. & Lim, D.** (2018). The Gardens' orchid hybrids and its VIP Orchid Programme. *Gardenwise* 50: 16–19.

Wong, D.P.W., Ng, M.Y., Leung, J.Y., Boh, B.K., Lim, E.C., Tan, S.H., Lim, S., Seah, W.H., Hu, C.Z., **Ho, B.C.**, Ng, D.H.P. & Hagen, T. (2018). Regulation of NRF2 transcription factor of KEAP1 by andrographolide and organic extracts from plant endophytes. *PLoS One* 13(10): e0204853.

**Wong, K.M.** (2018). Flora of Singapore Precursors, 11. A new species of *Urophyllum* (Rubiaceae) from the Malay Peninsula. *Phytotaxa* 373(3): 236–240.

**Wong, K.M. & Lua, H.K.** (2018). Flora of Singapore precursors, 3. A new species of *Canthium* (Rubiaceae: Vanguerieae) previously confused with *C. horridum*. *Gardens' Bulletin Singapore* 70(2): 275–282.

**Wong, K.M. & Mahyuni, R.** (2018). Flora of Singapore precursors, 3. A new species and two new combinations in *Psydrax* (Rubiaceae: Vanguerieae) for West Malesia. *Reinwardtia* 17(1): 77–84.

**Wong, K.M.**, Mahyuni, R., Ng, X.Y. & Neo, L. (2018). Flora of Singapore precursors, 8. Systematy of the new Southeast Asian genera *Canthiumera* and *Dibridsonia* (Rubiaceae: Vanguerieae), with notes on plant architecture and reproductive ecology. *Reinwardtia* 17(2): 101–124.

**Wong, W. [Wilson]** (2018). Edibles: Basil basics. *Gardenwise* 51: 32–33.

**Wong, W. [Wilson]** (2018). Edibles: Gingers Galore! *Gardenwise* 50: 26–29.

**Wong, W. [Wilson]** (2019). Edibles: Edible weeds in Singapore. *Gardenwise* 52: 30–32.

**Wong, W. [Winnie]** (2018). The Gardens' Speaker Series. *Gardenwise* 50: 11–13.

Wu, G., **Lee, S.M.L.**, Horak, E. and Yang, Z.L. (2018). *Spongispora temakensis*, a new boletoid genus and species from Singapore. *Mycologia* 16: 1–11.

Xue, B., Tan, Y.-H., Chaowasku, T., **Thomas, D.C. & Saunders, R.M.K.** (2018). A new Annonaceae genus, *Wuodendron*, provides support for a post-boreotropical origin of the Asian-Neotropical disjunction in the tribe Miliuseae. *Taxon* 67(2): 250–266.

**Yam, T.W.** (2018). Conservation, propagation and reintroduction of two-colored cymbidium orchid in Singapore. In: Soorae, P.S. (ed.) *Global Reintroduction Perspectives: 2018. Case studies from around the globe*. Pp. 238–242. Gland, Switzerland: IUCN/SSC Reintroduction Specialist Group and Abu Dhabi, UAE: Environment Agency-Abu Dhabi.

**Yam, T.W., Ang, P., & Tay, F.** (2019). Successful reintroduction of two critically endangered taxa, *Cymbidium bicolor* subsp. *pubescens* and *Robiquetia spathulata*, in Singapore. In: Pridgeon, A.M. & Arosemena, A.R. (eds.) *Proceedings of the 22nd World Orchid Conference*. Pp. 669–677. Asociación Ecuatoriana de Orquideología, Guayaquil, Ecuador.

**Yam, T.W. & Arditti, J.** (2018). Orchid Micropropagation: An Overview of Approaches and Methodologies. In: Lee, Y.I. and Yeung, E.C. (eds.) *Orchid Propagation: From Laboratories to Greenhouses-Methods and Protocols*. Pp. 151–178. Springer Protocols Handbooks: Humana Press.

Yang, J.B., Dong, Y.R., **Wong, K.M.**, Gu, Z.J., Yang, H.Q & Li, D.Z. (2018). Genetic structure and differentiation in *Dendrocalamus sinicus* (Poaceae: Bambusoideae) populations provide insight into evolutionary history and speciation of woody bamboos. *Scientific Reports* 8: 16933. <https://doi.org/10.1038/s41598-018-35269-8>

**Yau, J., Lin, C. & Loe, S.** (2018). From Education Outreach: Training and development workshops for the Gardens' Education Branch. *Gardenwise* 51: 34–35.

Ye, X.-E., Bai, L., Ye, Y.-Sh., Xia, N.H. & **Leong-Škorničková, J.** (2018). Taxonomic studies of *Amomum* (Zingiberaceae) in China II: transfer of *Hornstedtia tibetica* to *Amomum* and supplementary description of *H. hainanensis*. *Plant Systematics and Evolution* 304(9): 1165–1180. <https://doi.org/10.1007/s00606-018-1539-7>

Ye, X.-E., **Leong-Škorničková, J.** & Xia, N.H. (2018). Taxonomic studies on *Amomum* (Zingiberaceae) in China I: Introducing the subject and *Amomum velutinum* sp. nov. previously misidentified as *A. repense* and *A. subcapitatum*. *Nordic Journal of Botany* 36(5): e01661. <https://doi.org/10.1111/njb.01661>

**Yeo, R.S.W. & Ho, B.C.** (2019). Cordyceps – the 'real deal'? *Gardenwise* 20–21.

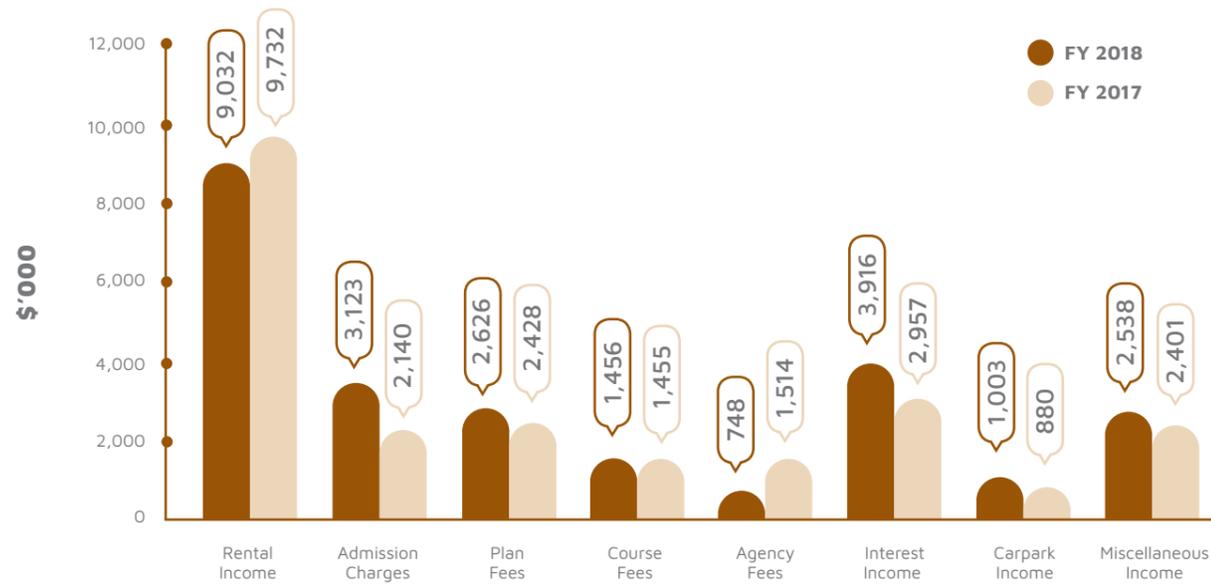
Zappi, D.C., **Taylor, N.P.**, Damasceno Jr, G.A., Pott, V.J. & Machado, M.C. (2018). Check-list das Cactaceae do estado do Mato Grosso do Sul, Brasil. *Iheringia, Série Botânica* 73(suppl.): 169–173.

# Financial Review

## INCOME

The Group's income comprised mainly rental income from souvenir kiosks and food & beverage outlets in Singapore Botanic Gardens and Fort Canning Park. The income for the year was \$24.4 million. The increase from last year's income was mainly due to the increase in admission charges and interest income, offset by the decrease in agency fees.

### Income for FY 2018 & FY 2017

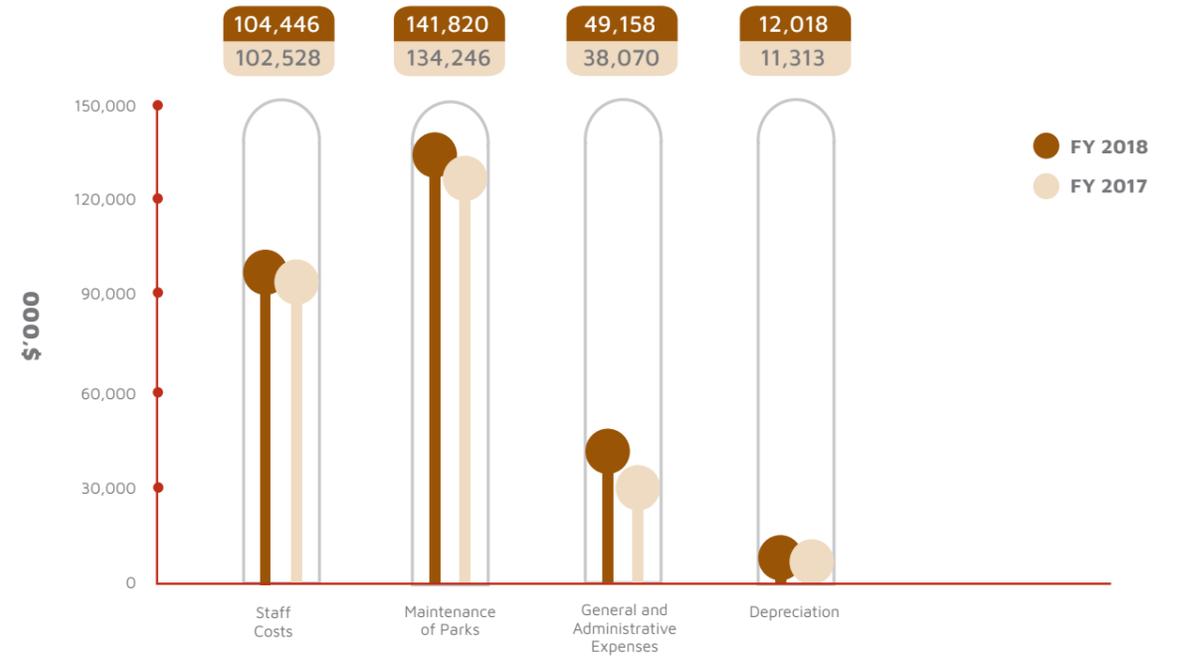


Income	FY 2018	FY 2017	Increase/(Decrease)	
	\$ '000	\$ '000	\$ '000	% Change
Rental income	9,032	9,732	(700)	(7)
Admission charges	3,123	2,140	983	46
Plan fees	2,626	2,428	198	8
Course fees	1,456	1,455	1	< 1
Agency fees	748	1,514	(766)	(51)
Interest income	3,916	2,957	959	32
Carpark income	1,003	880	123	14
Miscellaneous income	2,538	2,401	137	6
<b>Total</b>	<b>24,442</b>	<b>23,507</b>	<b>935</b>	<b>4</b>

## OPERATING EXPENDITURE

The Group's operating expenditure for the year was \$307.4 million. The 7% increase from last year's expenditure was mainly due to an increase in the maintenance of parks and general and administrative expenses.

### Operating Expenditure for FY 2018 & FY 2017



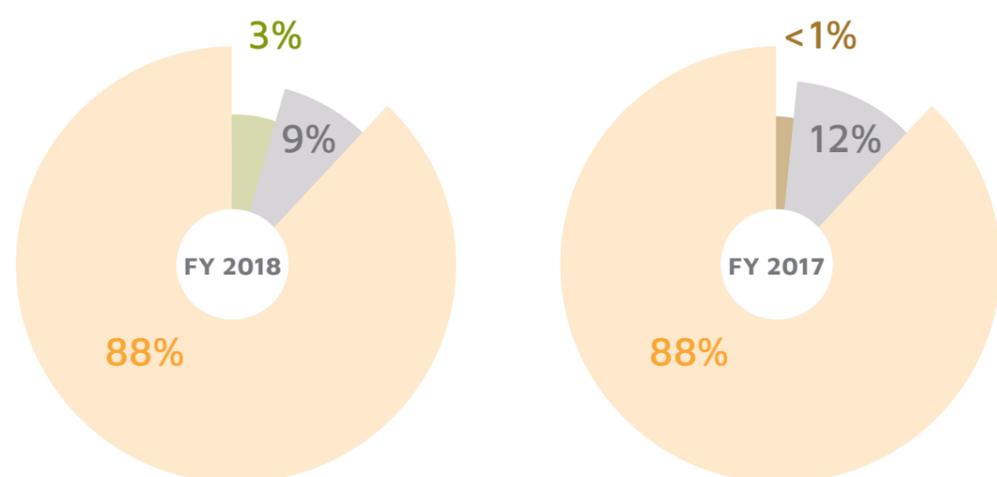
Operating Expenditure	FY 2018	FY 2017	Increase/(Decrease)	
	\$ '000	\$ '000	\$ '000	% Change
Staff costs	104,446	102,528	1,918	2
Maintenance of parks	141,820	134,246	7,574	6
General and administrative expenses	49,158	38,070	11,088	29
Depreciation	12,018	11,313	705	6
<b>Total</b>	<b>307,442</b>	<b>286,157</b>	<b>21,285</b>	<b>7</b>

## Financial Review

### CAPITAL EXPENDITURE

The Group's capital expenditure for the year was \$28.8 million. The increase in capital expenditure was mainly due to the improvement works carried out in Singapore Botanic Gardens and Fort Canning Park.

#### Capital Expenditure for FY 2018 & FY 2017



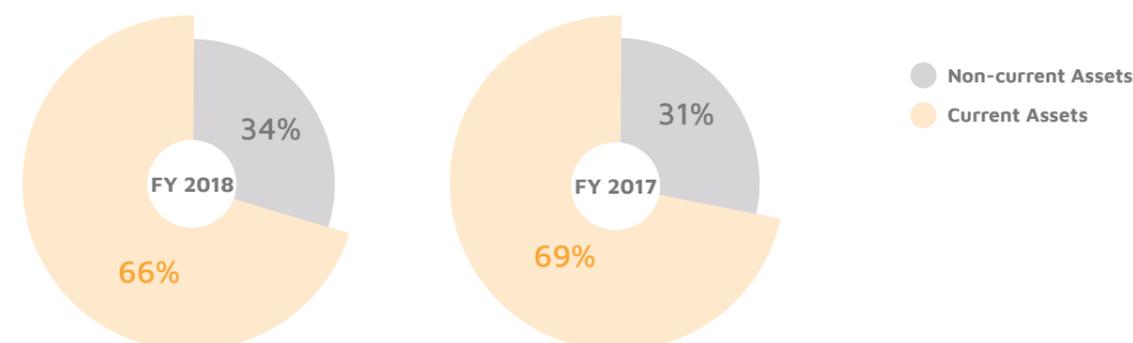
● Land and other improvements ● Equipment ● Motor Vehicles ● Development work-in-progress

Capital Expenditure	FY 2018	FY 2017	Increase/(Decrease)	
	\$ '000	\$ '000	\$ '000	% Change
Land and other improvements	851	0	851	100
Equipment	2,620	2,024	596	29
Motor vehicles	0	66	(66)	(100)
Development work-in-progress	25,310	14,691	10,619	72
	<b>28,781</b>	<b>16,781</b>	<b>12,000</b>	<b>72</b>

## FINANCIAL POSITION

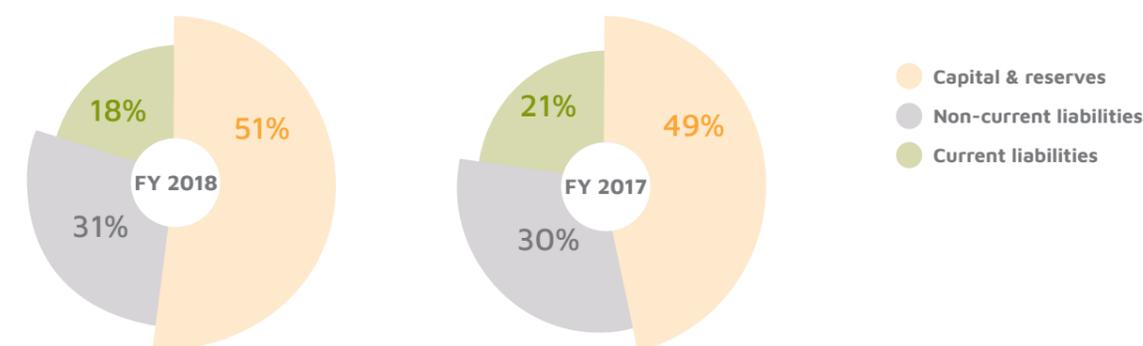
As at 31 March 2019, the Group's total assets stood at \$412 million, an increase of 5% over last year. Non-current assets and current assets represent 34% and 66% of total assets respectively. Non-current assets consisted mainly of leasehold land and buildings and structures at Singapore Botanic Gardens and Fort Canning Park. Capital and reserve stood at \$211.2 million, while current and non-current liabilities stood at \$75.1 million and \$125.7 million respectively.

### Total Assets



Assets	FY 2018	FY 2017	Increase/(Decrease)	
	\$ '000	\$ '000	\$ '000	% Change
Non-current assets	138,199	121,880	16,319	13
Current assets	273,849	269,282	4,567	2
	<b>412,048</b>	<b>391,162</b>	<b>20,886</b>	<b>5</b>

### Total Liabilities & Equity



Equity & Liabilities	FY 2018	FY 2017	Increase/(Decrease)	
	\$ '000	\$ '000	\$ '000	% Change
Capital & reserves	211,226	192,042	19,184	10
Non-current liabilities	125,688	115,496	10,192	9
Current liabilities	75,134	83,624	(8,490)	(10)
	<b>412,048</b>	<b>391,162</b>	<b>20,886</b>	<b>5</b>

# Financial statements

## Contents

### Index

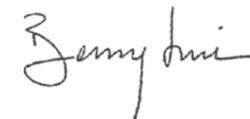
<b>71</b>	<b>STATEMENT BY NATIONAL PARKS BOARD</b>
<b>72</b>	<b>INDEPENDENT AUDITOR'S REPORT</b>
<b>76</b>	<b>STATEMENT OF FINANCIAL POSITION</b>
<b>78</b>	<b>STATEMENT OF COMPREHENSIVE INCOME</b>
<b>79</b>	<b>STATEMENT OF CHANGES IN EQUITY</b>
<b>81</b>	<b>CONSOLIDATED STATEMENT OF CASH FLOWS</b>
<b>82</b>	<b>NOTES TO THE FINANCIAL STATEMENTS</b>

# Statement by National Parks Board

In our opinion,

- (a) the accompanying financial statements of National Parks Board ("NParks") and its subsidiary (the "Group"), are properly drawn up in accordance with the provisions of the National Parks Board Act, Chapter 198A (the "Act"), the Public Sector (Governance) Act 2018, Act 5 of 2018 other relevant regulations (the "Parks and Trees Act and Regulations") and Statutory Board Financial Reporting Standards ("SB-FRS") so as to present fairly, in all material respects, the financial position of the Group and NParks as at 31 March 2019, and the financial performance, changes in equity of the Group and NParks and cash flows of the Group for the financial year ended on that date;
- (b) proper accounting and other records have been kept, including records of all assets of NParks whether purchased, donated or otherwise; and
- (c) the receipt, expenditure, investments of moneys and the acquisition and disposal of assets by NParks during the financial year have been in accordance with the provisions of the Act and the Public Sector (Governance) Act.

On behalf of the National Parks Board and its subsidiary:



Benny Lim  
Chairman



Kenneth Er Boon Hwee  
Chief Executive Officer

Singapore  
17 July 2019

# Independent auditor's report

For the financial year ended 31 MARCH 2019

## REPORT ON THE AUDIT OF THE FINANCIAL STATEMENTS

### Opinion

We have audited the financial statements of National Parks Board ("NParks") and its subsidiary (collectively, the "Group"), which comprise the statements of financial position of the Group and NParks as at 31 March 2019, the statements of comprehensive income, statements of changes in equity of the Group and NParks and the consolidated cash flow statement of the Group for the year then ended, and notes to the financial statements, including a summary of significant accounting policies.

In our opinion, the accompanying consolidated financial statements of the Group, the statement of financial position, statement of comprehensive income and statement of changes in equity of NParks are properly drawn up in accordance with the provisions of the National Parks Board Act, Chapter 198A (the "Act"), the Public Sector (Governance) Act 2018, Act 5 of 2018 (the "Public Sector (Governance) Act"), other relevant regulations (the "Parks and Trees Act and Regulations") and Statutory Board Financial Reporting Standards ("SB-FRS"), so as to present fairly, in all material respects, the state of affairs of the Group and NParks as at 31 March 2019 and the results and changes in equity of Group and NParks and cash flows of the Group for the year ended on that date.

### Basis for Opinion

We conducted our audit in accordance with Singapore Standards on Auditing ("SSAs"). Our responsibilities under those standards are further described in the Auditor's responsibilities for the audit of the financial statements section of our report. We are independent of the Group in accordance with the Accounting and Corporate Regulatory Authority ("ACRA") Code of Professional Conduct and Ethics for Public Accountants and Accounting Entities ("ACRA Code") together with the ethical requirements that are relevant to our audit of the financial statements in Singapore, and we have fulfilled our other ethical responsibilities in accordance with these requirements and the ACRA Code. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

### Other Information

Management is responsible for the other information. The other information comprises the information included in the annual report and the statement by National Parks Board, but does not include the financial statements and our auditor's report thereon.

Our opinion on the financial statements does not cover the other information and we do not express any form of assurance conclusion thereon.

In connection with our audit of the financial statements, our responsibility is to read the other information and, in doing so, consider whether the other information is materially inconsistent with the financial statements or our knowledge obtained in the audit or otherwise appears to be materially misstated. If, based on the work we have performed, we conclude that there is a material misstatement of this other information, we are required to report that fact. We have nothing to report in this regard.

# Independent auditor's report

For the financial year ended 31 MARCH 2019

## Responsibilities of management for the financial statements

Management is responsible for the preparation and fair presentation of the financial statements in accordance with the provisions of the Act, the Public Sector (Governance) Act, Parks and Trees Act and Regulations and SB-FRS, and for such internal control as management determines is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error.

A statutory board is constituted based on its Act and its dissolution requires Parliament's approval. In preparing the financial statements, management is responsible for assessing the Group's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless there is intention to wind up the Group or for the Group to cease operations.

Those charged with governance are responsible for overseeing the Group's financial reporting process.

## Auditor's responsibilities for the audit of the financial statements

Our objectives are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with SSAs will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these financial statements.

As part of an audit in accordance with SSAs, we exercise professional judgement and maintain professional scepticism throughout the audit. We also:

- Identify and assess the risks of material misstatement of the financial statements, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for our opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.
- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Group's internal control.
- Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by management.
- Conclude on the appropriateness of management's use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the Group's ability to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in our auditor's report to the related disclosures in the financial statements or, if such disclosures are inadequate, to modify our opinion. Our conclusions are based on the audit evidence obtained up to the date of our auditor's report. However, future events or conditions may cause the Group to cease to continue as a going concern.

- Evaluate the overall presentation, structure and content of the financial statements, including the disclosures, and whether the financial statements represent the underlying transactions and events in a manner that achieves fair presentation.
- Obtain sufficient appropriate audit evidence regarding the financial information of the entities or business activities within the Group to express an opinion on the consolidated financial statements. We are responsible for the direction, supervision and performance of the group audit. We remain solely responsible for our audit opinion.

We communicate with the management regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that we identify during our audit.

## REPORT ON OTHER LEGAL AND REGULATORY REQUIREMENTS

### Opinion

In our opinion:

- the receipts, expenditure, investments of moneys and the acquisition and disposal of assets by the Board during the year are, in all material respects, in accordance with the provisions of the Act, the Public Sector (Governance) Act and the requirements of any other written law applicable to moneys of or managed by NParks.
- proper accounting and other records have been kept, including records of all assets of NParks whether purchased, donated or otherwise.

### Basis for opinion

We concluded our audit in accordance with SSAs. Our responsibilities under those standards are further described in the Auditors' responsibilities for the compliance audit section of our report. We are independent of the Board in accordance with the ACRA Code together with the ethical requirements that are relevant to our audit of the financial statements in Singapore, and we have fulfilled our ethical responsibilities in accordance with these requirements and the ACRA Code. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion on management's compliance.

### Responsibilities of management for compliance with legal and regulatory requirements

Management is responsible for ensuring that the receipts, expenditure, investments of moneys and the acquisition and disposal of assets, are in accordance with the provisions of the Act, the Public Sector (Governance) Act and the requirements of any other written law applicable to moneys of or managed by NParks. This responsibility includes monitoring related compliance requirements relevant to NParks, and implementing internal controls as management determines are necessary to enable compliance with the requirements.

## Independent auditor's report

For the financial year ended 31 MARCH 2019

### Auditor's responsibilities for compliance audit

Our responsibility is to express an opinion on management's compliance based on our audit of the financial statements. We planned and performed the compliance audit to obtain reasonable assurance about whether the receipts, expenditure, investments of moneys and the acquisition and disposal of assets, are in accordance with the provisions of the Act, the Public Sector (Governance) Act and the requirements of any other written law applicable to moneys of or managed by NParks.

Our compliance audit includes obtaining an understanding of the internal control relevant to the receipts, expenditure, investments of moneys and the acquisition and disposal of assets; and assessing the risks of material misstatement of the financial statements from non-compliance, if any, but not for the purpose of expressing an opinion on the effectiveness of NParks' internal control. Because of the inherent limitations in any accounting and internal control system, non-compliances may nevertheless occur and not be detected.



**Ernst & Young LLP**

Public Accountants and Chartered Accountants

Singapore  
17 July 2019

## Statement of financial position

As at 31 MARCH 2019

	Note	Group		NParks	
		2018/2019 \$	2017/2018 \$	2018/2019 \$	2017/2018 \$
<b>ASSETS</b>					
<b>Current assets</b>					
Cash and cash equivalents	6	260,987,766	259,682,009	260,688,545	259,444,803
Trade receivables	7	3,068,256	1,977,871	3,068,256	1,973,491
Other receivables	8	6,224,433	4,167,660	6,237,136	4,190,963
Prepayments		3,568,130	3,454,601	3,566,780	3,451,910
<b>Total current assets</b>		<b>273,848,585</b>	<b>269,282,141</b>	<b>273,560,717</b>	<b>269,061,167</b>
<b>Non-current assets</b>					
Trade receivables	7	840,000	1,008,000	840,000	1,008,000
Property, plant and equipment	10	137,359,097	120,871,628	137,359,097	120,871,628
Investment in a subsidiary	9	–	–	2	2
<b>Total non-current assets</b>		<b>138,199,097</b>	<b>121,879,628</b>	<b>138,199,099</b>	<b>121,879,630</b>
<b>Total assets</b>		<b>412,047,682</b>	<b>391,161,769</b>	<b>411,759,816</b>	<b>390,940,797</b>
<b>LIABILITY AND EQUITY</b>					
<b>Current liabilities</b>					
Trade and other payables	12	60,521,882	63,600,055	60,517,092	63,594,975
Provision for pension costs	13	120,000	1,871,099	120,000	1,871,099
Government grants received in advance	11	8,565,513	14,062,331	8,565,513	14,062,331
Deferred revenue	14	2,538,374	2,746,762	2,538,374	2,746,762
Contribution to consolidated fund	15	3,388,055	1,344,069	3,388,055	1,344,069
<b>Total current liabilities</b>		<b>75,133,824</b>	<b>83,624,316</b>	<b>75,129,034</b>	<b>83,619,236</b>
<b>Non-current liabilities</b>					
Deferred capital grants	16	121,182,419	111,467,742	121,182,419	111,467,742
Deferred revenue	14	2,208,911	2,453,345	2,208,911	2,453,345
Provision for pension costs	13	2,296,137	1,574,789	2,296,137	1,574,789
<b>Total non-current liabilities</b>		<b>125,687,467</b>	<b>115,495,876</b>	<b>125,687,467</b>	<b>115,495,876</b>

## Statement of financial position

As at 31 MARCH 2019

	Note	Group		NParks	
		2018/2019 \$	2017/2018 \$	2018/2019 \$	2017/2018 \$
<b>Capital and other funds</b>					
Capital account	17	4,528,275	4,528,275	4,528,275	4,528,275
Share capital	18	6,436,238	2,958,095	6,436,238	2,958,095
Accumulated surplus		200,261,878	184,555,207	199,978,802	184,339,315
<b>Total capital and other funds</b>		<b>211,226,391</b>	<b>192,041,577</b>	<b>210,943,315</b>	<b>191,825,685</b>
<b>Total liabilities and equity</b>		<b>412,047,682</b>	<b>391,161,769</b>	<b>411,759,816</b>	<b>390,940,797</b>
<b>Net assets of Garden City Fund</b>					
	19	10,156,968	9,675,357	10,156,968	9,675,357
<b>Net assets of National Productivity Fund</b>					
	20	109,998	79,485	109,998	79,485

The accompanying notes form an integral part of the financial statements.

## Statement of comprehensive income

For the financial year ended 31 MARCH 2019

	Note	Group		NParks	
		2018/2019 \$	2017/2018 \$	2018/2019 \$	2017/2018 \$
<b>INCOME OR EXPENDITURE</b>					
<b>Operating income</b>					
Rental income	21	9,032,441	9,732,140	9,032,441	9,732,140
Admission charges	21	3,123,431	2,139,599	3,123,431	2,139,599
Plan fees	21	2,625,575	2,428,400	2,625,575	2,428,400
Course fees	21	1,455,664	1,455,048	1,455,664	1,455,048
Agency fees	21	748,364	1,514,300	748,364	1,514,300
Interest income	21	3,915,617	2,957,252	3,915,617	2,957,252
Carpark income	21	1,003,237	880,058	1,003,237	880,058
Miscellaneous income	21	2,537,503	2,400,452	2,440,806	2,352,092
		24,441,832	23,507,249	24,345,135	23,458,889
<b>Operating expenditure</b>					
Staff costs	22	(104,446,040)	(102,528,245)	(104,446,040)	(102,528,245)
Maintenance of parks		(141,819,602)	(134,245,722)	(141,819,602)	(134,245,722)
General and administrative expenses		(49,158,604)	(38,070,420)	(49,129,091)	(38,039,911)
Depreciation of property, plant and equipment	10	(12,018,250)	(11,312,999)	(12,018,250)	(11,312,999)
		(307,442,496)	(286,157,386)	(307,412,983)	(286,126,877)
<b>Deficit from operations</b>	23	(283,000,664)	(262,650,137)	(283,067,848)	(262,667,988)
Government operating grants	11	288,489,233	256,546,780	288,489,233	256,546,780
Other government grants	11	3,505,591	2,868,693	3,505,591	2,868,693
Deferred capital grants amortised	16	11,002,761	11,158,802	11,002,761	11,158,802
		302,997,585	270,574,275	302,997,585	270,574,275
<b>Surplus before contribution to consolidated fund</b>		19,996,921	7,924,138	19,929,737	7,906,287
Contribution to consolidated fund	15	(3,388,055)	(1,344,069)	(3,388,055)	(1,344,069)
<b>Surplus for the year, representing total comprehensive income for the year</b>		16,608,866	6,580,069	16,541,682	6,562,218

The accompanying notes form an integral part of the financial statements.

## Statements of changes in equity

For the financial year ended 31 MARCH 2019

	Capital account \$	Share capital \$	Accumulated Surplus <sup>(1)</sup> \$	Total \$
<b>Group</b>				
At 1 April 2017	4,528,275	1,032,800	185,875,155	191,436,230
<b>Surplus for the year, representing total comprehensive income for the year</b>	-	-	6,580,069	6,580,069
<b>Transactions with owners, recognised directly in equity</b>				
Equity injection (Note 18)	-	1,925,295	-	1,925,295
Funding for government projects (Note 24)	-	-	(7,900,017)	(7,900,017)
<b>Total transactions with owners, in their capacity as owners</b>	-	1,925,295	(7,900,017)	(5,974,722)
At 31 March 2018 and 1 April 2018	4,528,275	2,958,095	184,555,207	192,041,577
<b>Surplus for the year, representing total comprehensive income for the year</b>	-	-	16,608,866	16,608,868
<b>Transactions with owners, recognised directly in equity</b>				
Equity injection (Note 18)	-	3,478,143	-	3,478,143
Funding for government projects (Note 24)	-	-	(902,195)	(902,195)
<b>Total transactions with owners, in their capacity as owners</b>	-	3,478,143	(902,195)	2,575,948
At 31 March 2019	4,528,275	6,436,238	200,261,878	211,226,391

<sup>(1)</sup> Included in accumulated surplus is an amount of \$52,281,254 (2017/2018: \$50,357,044) which has been earmarked by the Group to fund future replacement and capital improvement of property, plant and equipment.

## Consolidated statement of cash flows

For the financial year ended 31 MARCH 2019

	Capital account \$	Share capital \$	Accumulated Surplus <sup>(1)</sup> \$	Total \$
<b>NParks</b>				
At 1 April 2017	4,528,275	1,032,800	185,677,114	191,238,189
<b>Surplus for the year, representing total comprehensive income for the year</b>	-	-	6,562,218	6,562,218
<b>Transactions with owners, recognised directly in equity</b>				
Equity injection (Note 18)	-	1,925,295	-	1,925,295
Funding for government projects (Note 24)	-	-	(7,900,017)	(7,900,017)
<b>Total transactions with owners, in their capacity as owners</b>	-	1,925,295	(7,900,017)	(5,974,722)
At 31 March 2018 and 1 April 2018	4,528,275	2,958,095	184,339,315	191,825,685
<b>Surplus for the year, representing total comprehensive income for the year</b>	-	-	16,541,682	16,541,682
<b>Transactions with owners, recognised directly in equity</b>				
Equity injection (Note 18)	-	3,478,143	-	3,478,143
Funding for government projects (Note 24)	-	-	(902,195)	(902,195)
<b>Total transactions with owners, in their capacity as owners</b>	-	3,478,143	(902,195)	2,575,948
At 31 March 2019	4,528,275	6,436,238	199,978,802	210,943,315

<sup>(1)</sup> Included in accumulated surplus is an amount of \$52,281,254 (2017/2018: \$50,357,044) which has been earmarked by NParks to fund future replacement and capital improvement of property, plant and equipment.

The accompanying notes form an integral part of the financial statements.

	Note	2018/2019 \$	2017/2018 \$
<b>Operating activities</b>			
Deficit from operations		(283,000,664)	(262,650,137)
Adjustments for:			
Depreciation of property, plant and equipment	10	12,018,250	11,312,999
Loss on disposal of property, plant and equipment	23	275,548	556,602
Provision for pension costs	13	107,011	126,216
Amortisation of lease premium received in advance		(83,333)	(83,333)
Interest income		(3,915,617)	(2,957,252)
<b>Operating cash flow before movement in working capital</b>		(274,598,805)	(253,694,905)
Trade and other receivables		(960,481)	647,802
Trade and other payables		(7,122,491)	8,592,033
Deferred revenue		(369,489)	158,880
Payment for pension costs	13	(1,136,762)	(120,000)
Amounts due from MND		32,891	2,519,904
Amounts due from Garden City Fund		(903,276)	1,428,191
<b>Cash used in operating activities</b>		(285,058,413)	(240,468,095)
Contribution to Consolidated Fund paid		(1,344,069)	(2,623,341)
<b>Net cash flows used in operating activities</b>		(286,402,482)	(243,091,436)
<b>Investing activities</b>			
Proceeds from disposal of property, plant and equipment		80	1,286
Purchase of property, plant and equipment	10	(28,781,347)	(16,781,286)
Interest received		2,775,796	3,500,436
<b>Net cash flows used in investing activities</b>		(26,005,471)	(13,279,564)
<b>Financing activities</b>			
Grants received (less payment on behalf)	11	308,487,862	278,856,816
Unutilised grants returned	11	(304,822)	(189,727)
Other funding	16	2,954,722	168,733
Equity injection	18	3,478,143	1,925,295
Funding for government projects	24	(902,195)	(7,900,017)
<b>Net cash flows from financing activities</b>		313,713,710	272,861,100
Net increase in cash and cash equivalents		1,305,757	16,490,100
Cash and cash equivalents at beginning of the year		259,682,009	243,191,909
<b>Cash and cash equivalents at end of the year (Note 6)</b>		260,987,766	259,682,009

The accompanying notes form an integral part of the financial statements.

# Notes to the financial statements

For the financial year ended 31 MARCH 2019

## 1. GENERAL

National Parks Board ("NParks") is a statutory board under the Ministry of National Development ("MND") established under the National Parks Board Act (Chapter 198A).

The Board has its registered office at Singapore Botanic Gardens, 1 Cluny Road, Singapore 259569.

The primary activities of NParks are to develop, manage and promote the National Parks and Nature Reserves as valuable reserves for recreation, conservation, research and education and to develop, upgrade, manage and maintain the public parks, open spaces on behalf of the Government.

There has been no significant changes in the nature of these activities during the financial year.

The principal activities of the subsidiary are described in Note 9 to the financial statements.

## 2. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

### 2.1 Basis of accounting

The financial statements have been prepared in accordance with the historical cost basis, except as disclosed in the accounting policies below, and are drawn up in accordance with the provisions of the Act, and SB-FRS, including Interpretation of SB-FRS ("INT SB-FRS") and SB-FRS Guidance Notes.

The financial statements are presented in Singapore Dollar (SGD or \$), which is the Group's functional currency, and rounded to the nearest dollar.

### 2.2 Adoption of new and revised standards

On 1 April 2018, the Group adopted all the new and revised SB-FRSs and INT SB-FRS and SB-FRS Guidance Notes that are effective from that date and are relevant to its operations. The adoption of these new/revised SB-FRSs, INT SB-FRSs and SB-FRS Guidance Notes did not result in changes to the Group's accounting policies and had no material effect on the results or position of the Group and NParks.

Description	Effective for annual periods beginning on or after
SB-FRS 116 <i>Leases</i>	1 January 2019
SB-FRS INT 123 <i>Uncertainty over Income Tax Treatments</i>	1 January 2019
Amendments to SB-FRS 109 <i>Prepayment Features with Negative Compensations</i>	1 January 2019
Annual improvement to SB-FRSs 2015-2017 Cycle	1 January 2019
SB-FRS 1002 <i>Impairment of Non-Cash-Generating Assets</i>	1 January 2019

### 2.2 Adoption of new and revised standards (continued)

Except for SB-FRS 116, the Group expects that the adoption of the other standards and interpretation above will have no material impact on the financial statements in the period of initial application. The nature of the impending changes in accounting period on adoption of SB-FRS 116 is described below:

#### SB-FRS 116 Leases

SB-FRS 116 requires lessees to recognise most leases on balance sheets. The standard includes two recognition exemptions for lessees – leases of 'low value' assets and short-term leases. SB-FRS 116 is effective for annual periods beginning on or after 1 April 2019. At commencement date of a lease, a lessee will recognise a liability to make a lease payment (i.e. the lease liability) and an asset representing the right to use the underlying asset during the lease term (i.e. the right-of-use asset). Lessees will be required to separately recognise the interest expense on the lease liability and the depreciation expense on the right-of-use asset.

The Group plans to adopt SB-FRS 116 retrospectively with the cumulative effect of initially applying the standard as an adjustment to the opening retained earnings at the date of initial application, 1 April 2019.

On the adoption of SB-FRS 116, the Group expects to choose, on a lease-by-lease basis, to measure the right-of-use asset at an amount equal to the lease liability, adjusted by the amount of any prepaid or accrued lease payments relating to that lease recognised in the statement of financial position immediately before 1 April 2019.

In addition, the Group plans to elect the following practical expedients:

- not to reassess whether a contract is, or contains a lease at the date of initial application and to apply SB-FRS 116 to all contracts that were previously identified as leases
- to apply the exemption not to recognise right-of-use asset and lease liabilities to leases for which the lease term ends within 12 months as of 1 April 2019
- to apply a single discount rate to a portfolio of leases with reasonably similar characteristics

The Group has performed a preliminary impact assessment based on currently available information and expects that the adoption of SB-FRS 116 will result in the increase in total assets and total liabilities with no significant impact to the profit or loss. The assessment may be subject to changes arising from ongoing analysis until the Group adopts SB-FRS 116 in 2019.

### 2.3 Basis of consolidation and subsidiary

The consolidated financial statements incorporate the financial statements of NParks and entities (including special purpose entities) controlled by NParks (its subsidiary). Control is achieved when NParks:

- Has power over the investee;
- Is exposed, or has rights, to variable returns from its involvement with the investee; and
- Has the ability to use its power to affect its returns.

In NParks's separate financial statements, investment in subsidiary is carried at cost less any impairment in net recoverable value that has been recognised in profit or loss.

NParks reassesses whether or not it controls an investee if facts and circumstances indicate that there are changes to one or more of the three elements of control listed above.

# Notes to the financial statements

For the financial year ended 31 March 2019

Consolidation of a subsidiary begins when NParks obtains control over the subsidiary and ceases when NParks loses control of the subsidiary. Specifically, income and expense of a subsidiary acquired or disposed of during the year are included in the consolidated statement of comprehensive income from the date NParks gains control until the date when NParks ceases to control the subsidiary.

Where necessary, adjustments are made to the financial statements of the subsidiary to bring its accounting policies into line with the Group's accounting policies. The financial statements of the subsidiary used in the preparation of the consolidated financial statements are prepared for the same reporting date as NParks.

All intra-group balances, income and expenses resulting from intra-group transactions and dividends are eliminated in full.

## 2.4 Financial instruments

### (a) Financial assets

#### *Initial recognition and measurement*

Financial assets are recognised when, and only when the entity becomes party to the contractual provisions of the instruments.

At initial recognition, the Group measures a financial asset at its fair value plus, in the case of a financial asset not at fair value through profit or loss, transaction costs that are directly attributable to the acquisition of the financial asset. Transaction costs of financial assets carried at fair value through profit or loss are expensed in profit or loss.

Trade receivables are measured at the amount of consideration to which the Group expects to be entitled in exchange for transferring promised goods or services to a customer, excluding amounts collected on behalf of third party, if the trade receivables do not contain a significant financing component at initial recognition

#### *Subsequent measurement*

#### Investments in debt instruments

Subsequent measurement of debt instruments depends on the Group's business model for managing the asset and the contractual cash flow characteristics of the asset.

#### Amortised cost

Financial assets that are held for the collection of contractual cash flows where those cash flows represent solely payments of principal and interest are measured at amortised cost. Financial assets are measured at amortised cost using the effective interest method, less impairment. Gains and losses are recognised in profit or loss when the assets are de-recognised or impaired, and through amortisation process.

#### *De-recognition*

A financial asset is de-recognised where the contractual right to receive cash flows from

the asset has expired. On derecognition of a financial asset in its entirety, the difference between the carrying amount and the sum of the consideration received and any cumulative gain or loss that had been recognised in other comprehensive income for debt instruments is recognised in profit or loss.

#### Impairment of financial assets

The Group recognises an allowance for expected credit losses (ECLs) for all debt instruments not held at fair value through profit or loss. ECLs are based on the difference between the contractual cash flows due in accordance with the contract and all the cash flows that the Group expects to receive, discounted at an approximation of the original effective interest rate. The expected cash flows will include cash flows from the sale of collateral held or other credit enhancements that are integral to the contractual terms.

ECLs are recognised in two stages. For credit exposures for which there has not been a significant increase in credit risk since initial recognition, ECLs are provided for credit losses that result from default events that are possible within the next 12-months (a 12-month ECL). For those credit exposures for which there has been a significant increase in credit risk since initial recognition, a loss allowance is recognised for credit losses expected over the remaining life of the exposure, irrespective of timing of the default (a lifetime ECL).

For trade receivables, the Group applies a simplified approach in calculating ECLs. Therefore, the Group does not track changes in credit risk, but instead recognises a loss allowance based on lifetime ECLs at each reporting date. The Group has established a provision matrix that is based on its historical credit loss experience, adjusted for forward-looking factors specific to the debtors and the economic environment.

The Group considers a financial asset in default when contractual payments are 90 days past due. However, in certain cases, the Group may also consider a financial asset to be in default when internal or external information indicates that the Group is unlikely to receive the outstanding contractual amounts in full before taking into account any credit enhancements held by the Group. A financial asset is written off when there is no reasonable expectation of recovering the contractual cash flows.

### (b) Financial liabilities and equity instruments

#### Classification as debt or equity

Financial liabilities and equity instruments issued by the Group are classified according to the substance of the contractual arrangements entered into and the definitions of a financial liability and an equity instrument.

#### *Initial recognition and measurement*

#### Equity instruments

An equity instrument is any contract that evidences a residual interest in the assets of the Group after deducting all of its liabilities. Equity instruments are recorded at the proceeds received, net of direct issue costs.

Pursuant to the Finance Circular Minute ("FCM") No. 26/2008 on Capital Management Framework ("CMF"), equity injection from the Government is recorded as share capital.

# Notes to the financial statements

For the financial year ended 31 March 2019

## Financial liabilities

Financial liabilities are recognised when, and only when, the Group becomes a party to the contractual provisions of the financial instrument. The Group determines the classification of its financial liabilities at initial recognition.

All financial liabilities are recognised initially at fair value plus in the case of financial liabilities not at fair value through profit or loss, directly attributable transaction costs.

### Subsequent measurement

After initial recognition, financial liabilities that are not carried at fair value through profit or loss are subsequently measured at amortised cost using the effective interest method. Gains and losses are recognised in profit or loss when the liabilities are de-recognised, and through the amortisation process.

### De-recognition

A financial liability is de-recognised when the obligation under the liability is discharged or cancelled or expires. On de-recognition, the difference between the carrying amounts and the consideration paid is recognised in profit or loss.

## 2.5 Leases

### The Group as lessor

Rental income from operating leases is recognised on a straight-line basis over the term of the relevant lease unless another systematic basis is more representative of the time pattern in which use benefit derived from the leased asset is diminished. Initial direct costs incurred in negotiating and arranging an operating lease are added to the carrying amount of the leased asset and recognised as an expense over the lease term on the same basis as the lease income. The accounting policy of rental income is set out in Note 2.11.

### The Group as lessee

Rentals payable under operating leases are charged to profit or loss on a straight-line basis over the term of the relevant lease unless another systematic basis is more representative of the time pattern in which economic benefits from the leased asset are consumed. Contingent rentals arising under operating leases are recognised as an expense in the period in which they are incurred.

In the event that lease incentives are received to enter into operating leases, such incentives are recognised as a liability. The aggregate benefit of incentives is recognised as a reduction of rental expense on a straight-line basis, except where another systematic basis is more representative of the time pattern in which economic benefits from the leased asset are consumed.

## 2.6 Property, plant and equipment

All items of property, plant and equipment are initially recorded at cost. Subsequent to recognition, property, plant and equipment are measured at cost less accumulated depreciation and any accumulated impairment losses.

Depreciation is computed on a straight-line basis over the estimated useful lives of the assets as follows:

Leasehold land	Over the lease periods of 87 to 99 years
Buildings, structures, capital and other improvements	20 years
Office equipment, furniture and fittings	5 to 10 years
Laboratory and gardening equipment	7 years
Motor vehicles	8 to 10 years

Construction-in-progress included in property, plant and equipment is not depreciated as these assets are not available for use. These are carried at cost, less any recognised impairment loss.

The carrying amount of property, plants and equipment are reviewed for impairment when events or changes in circumstances indicate that the carrying amount may not be recoverable.

The estimated useful lives, residual values and depreciation method are reviewed at the end of each reporting period, with the effect of any changes in estimates accounted for on a prospective basis.

An item of property, plant and equipment is de-recognised upon disposal or when no future economic benefits are expected from its use or disposal. The gain or loss arising on disposal or retirement of an item of property, plant and equipment is determined as the difference between the sales proceeds and the carrying amounts of the asset and is recognised in profit or loss.

## 2.7 Impairment of non-financial assets

The Group assesses at each reporting date whether there is an indication that an asset may be impaired. If any indication exists, or when an annual impairment testing for an asset is required, the Group makes an estimate of the asset's recoverable amount.

An asset's recoverable amount is the higher of an asset's or cash-generating unit's fair value less costs of disposal and its value in use and is determined for an individual asset, unless the asset does not generate cash inflows that are largely independent of those from other assets or groups of assets. Where the carrying amount of an asset or cash-generating unit exceeds its recoverable amount, the asset is considered impaired and is written down to its recoverable amount.

Impairment losses are recognised in profit or loss, except for assets that are previously revalued where the revaluation was taken to other comprehensive income. In this case, the impairment is also recognised in other comprehensive income up to the amount of any previous revaluation.

A previously recognised impairment loss is reversed only if there has been a change in the estimates used to determine the asset's recoverable amount since the last impairment loss was recognised. If that is the case, the carrying amount of the asset is increased to its recoverable amount. That increase cannot exceed the carrying amount that would have been determined, net of depreciation, had no impairment loss been recognised previously. Such reversal is recognised in profit or loss unless the asset is measured at revalued amount, in which case the reversal is treated as a revaluation increase. Impairment losses relating to goodwill cannot be reversed in future periods.

# Notes to the financial statements

For the financial year ended 31 March 2019

## 2.8 Provisions

Provisions are recognised when the Group has a present obligation (legal or constructive) as a result of a past event, it is probable that the Group will be required to settle the obligation, and a reliable estimate can be made of the amount of the obligation.

The amount recognised as a provision is the best estimate of the consideration required to settle the present obligation at the end of the reporting period, taking into account the risks and uncertainties surrounding the obligation. Where a provision is measured using the cash flows estimated to settle the present obligation, its carrying amount is the present value of those cash flows. If it is no longer probable that an outflow of economic resources will be required to settle the obligation, the provision is reversed. If the effect of the time value of money is material provisions and discounted using a current pre-tax rate that reflects, where appropriate, the risk specific to the liability when discounting is used, the increase in the provision due to the passage of time is recognised as a finance cost.

## 2.9 Government grants

Government grants are not recognised until there is reasonable assurance that the Group will comply with the conditions attaching to them and the grants will be received. Government grants whose primary condition is that the Group should purchase, construct or otherwise acquire non-current assets are recognised as deferred capital grant in the statement of financial position and transferred to income or expenditure on a systematic and rational basis over the useful lives of the related assets. This treatment also applies to assets transferred from other government organisations and other donated assets.

Other government grants are recognised as income over the periods necessary to match them with the costs for which they are intended to compensate, on a systematic basis. Government grants that are receivable as compensation for expenses or losses already incurred or for the purpose of giving immediate financial support to the Group with no future related costs are recognised in profit or loss in the period in which they become receivable.

The value of land at the Singapore Botanic Gardens and the Fort Canning Park that vested in NParks when it was established in June 1990 was taken to the deferred capital grants account. The value of all other assets net of liabilities transferred from the former Parks and Recreation Department of Ministry of National Development (PRD) to NParks in June 1990 and July 1996 amounting to \$4,528,275 was taken to the capital account.

## 2.10 Trust and agency funds

Trust and agency funds are set up to account for funds held in trust where NParks is not the owner and beneficiary of the funds received from the Government and other organisations. The receipts and expenditure in respect of agency funds are taken directly to the funds accounts and the net assets relating to the funds are shown as a separate line item in the statement of financial position. Trust and agency funds are accounted for on the accrual basis.

NParks administers the funds on behalf of the holders of these funds. Upon dissolution of these funds, the remaining moneys in these funds shall be returned to the owners of the funds.

## 2.11 Revenue recognition

Revenue is measured based on the consideration to which the Group expects to be entitled in exchange for transferring promised goods or services to a customer, excluding amount collected on behalf of third parties.

Revenue is recognised when the Group satisfies a performance obligation by transferring a promised good or service to the customer, which is when the customer obtains control of the good or service. A performance obligation may be satisfied at a point in time or over time. The amount of revenue recognised is the amount allocated to the satisfied performance obligation.

### Rental income

Rental income receivable under operating leases is recognised in profit or loss on a straight-line basis over the term of the lease. Lease incentives granted are recognised as an integral part of the total rental income, over the term of the lease.

### Admission charges

Admission charges in relation to the National Orchid Garden are recognised at a point in time upon the sale of admission tickets. For event admission tickets which are sold in advance, revenue is recognised on the date of event.

### Agency fees

Agency fees are recognised over the period in which the services are completed.

### Plan fees

Plan fees are recognised at a point in time when the services have been performed and rendered.

### Interest income

Interest income is accrued on a time basis, by reference to the principal outstanding and at the effective interest rate applicable.

### Course fees

Course fees are recognised over the duration of the course.

### Carpark income

Carpark income is recognised at a point in time when transacted.

### Miscellaneous income

Miscellaneous income comprising income derived from consultancy fees, sale of publications, souvenirs and orchid plantlets, and park usage and barbeque permit fees are recognised at a point in time in which they are earned. Liquidated damages are recognised as income when the right to claim such liquidated damages from contractors are established. Compensation collected from contractors whose work resulted in damage to trees and plants are recognised upon issuance of the notice of offence.

# Notes to the financial statements

For the financial year ended 31 March 2019

## 2.12 Retirement benefits costs

Payments to defined contribution plans are charged as an expense when employees have rendered the services entitling them to the contributions. Payments made to state-managed retirement benefit schemes, such as the Singapore Central Provident Fund, are dealt with as payments to defined contribution plans where the Group's obligations under the plans are equivalent to those arising in a defined contribution retirement benefit plan.

Defined benefit obligations due to pensionable officers are recognised in the statement of financial position in accordance with the Pensions Act (Cap. 225, 2004 Revised Edition). Provision for pension costs for eligible retired employees is estimated by management. For pension costs, the cost of providing benefits is determined using the projected unit credit method. Remeasurement, comprising actuarial gains and losses is reflected immediately in the statement of financial position with a charge or credit recognised in other comprehensive income in the period in which they occur.

Remeasurement recognised in other comprehensive income is reflected immediately in accumulated surplus and will not be reclassified to income or expenditure. Net interest is calculated by applying the discount rate at the beginning of the period to the net defined benefit liability or asset. Defined benefit costs are categorised as follows:

- Service cost (including current and past service cost);
- Net interest expense or income; and
- Remeasurement.

For all active members of the scheme, the "projected accrual benefit" is based on the scheme's accrual formula and upon service as of the valuation date, but using the employee's scheme salary, projected to the age at which the employee is assumed to leave active service. For inactive members, it is the total benefit. The defined benefit obligation/project benefit obligation/plan liability is the discounted present value of the "projected accrued benefits". The service cost is the corresponding value of benefits earned by active members over the year as a result of one more year of service.

## 2.13 Employee leave entitlement

Employee entitlements to annual leave are recognised when they are accrued to employees. A provision is made for the estimated liability for annual leave as a result of services rendered by employees up to the end of the reporting period.

## 2.14 Contribution to consolidated fund

Under Section 13(1)(e) and the First Schedule of the Singapore Income Tax Act, Chapter 134, the income of the Group is exempt from income tax.

In lieu of income tax, NParks is required to make contribution to the Government Consolidated Fund in accordance with the Statutory Corporations (Contributions to Consolidated Fund) Act, Chapter 319A. The provision is based on the guidelines specified by the Ministry of Finance and is computed based on the net surplus of the Group for each of the financial year at the prevailing corporate tax rate for the Year of Assessment. Contribution to consolidated fund is provided for on an accrual basis.

## 2.15 Cash and cash equivalents

Cash and cash equivalents comprise cash at bank and deposits placed with the Accountant-General's Department ("AGD") that are readily convertible to a known amount of cash and are subject to an insignificant risk of changes in value.

## 2.16 Deferred revenue

Income from rental and lease premium received in advance are stated at initial amount less accumulated amortisation. Amortisation is calculated on a straight-line basis to reduce the initial amount over the lease term and is recognised in profit or loss.

Income from plan fees received in advance is stated at initial amount collected and is recognised in profit or loss when services are performed and rendered.

## 2.17 Contingencies

A contingent liability is:

- a possible obligation that arises from past events and whose existence will be confirmed only by the occurrence or non-occurrence of one or more uncertain future events not wholly within the control of the Group; or
- a present obligation that arises from past events but is not recognised because:
  - It is not probable that an outflow of resources embodying economic benefits will be required to settle the obligation; or
  - The amount of the obligation cannot be measured with sufficient reliability.

A contingent asset is a possible asset that arises from past events and whose existence will be confirmed only by the occurrence or non-occurrence of one or more uncertain future events not wholly within the control of the Group.

Contingent liabilities and assets are not recognised on the statement of financial position of the Group.

## 2.18 Funding for government projects

Government projects funded using NParks's accumulated surplus are considered distribution to owners. Accordingly, the amount are recognised directly in the statement of changes in equity.

## 3. CRITICAL ACCOUNTING JUDGEMENTS AND KEY SOURCES OF ESTIMATION UNCERTAINTY

The preparation of the Group's consolidated financial statements requires management to make judgements, estimates and assumptions that affect the reported amounts of the revenues, expenses, assets and liabilities, and the disclosure of contingent liabilities at the end of reporting period. Uncertainty about these assumptions and estimates could result in outcomes that could require a material adjustment to the carrying amount of the asset or liability affected in the future periods. Management is of the opinion that there is no significant judgement made in applying accounting policies and no estimation uncertainty that have a significant risk of causing a material adjustment to the carrying amounts of assets and liabilities within the next financial period.

# Notes to the financial statements

For the financial year ended 31 March 2019

## 4. FINANCIAL INSTRUMENTS, FINANCIAL RISKS AND CAPITAL RISKS MANAGEMENT

### (a) Categories of financial instruments

The following table sets out the financial instruments as at the end of the reporting period:

	Group		NParks	
	2018/2019	2017/2018	2018/2019	2017/2018
	\$	\$	\$	\$
<b>Financial assets at amortised cost</b>				
Cash and cash equivalents (Note 6)	260,987,766	259,682,009	260,688,545	259,444,803
Trade receivables (Note 7)	3,908,256	2,985,871	3,908,256	2,981,491
Other receivables (Note 8)	6,224,433	4,167,660	6,237,136	4,190,963
	<u>271,120,455</u>	<u>266,835,540</u>	<u>270,833,937</u>	<u>266,617,257</u>
<b>Financial liabilities at amortised cost</b>				
Trade and other payables (Note 12)	57,800,149	60,418,819	57,795,359	60,413,739

Fair value of financial assets and financial liabilities that are not carried at fair value and whose carrying amounts are reasonable approximation of fair value

The carrying amounts of cash and cash equivalents, trade receivables (current), other receivables and trade and other payables, approximate their respective fair values due to the relatively short-term maturity of these financial instruments.

The carrying amount of long-term trade receivables approximates fair value as the interest rate approximates the market level at the end of the reporting period.

### (b) Financial risk management policies and objectives

The Group is exposed to financial risk arising from its operations which include interest rate risk, credit risk and liquidity risk. The Group has written policies and guidelines, which set out its general risk management framework as discussed below.

There has been no change to the Group's exposure to these financial risks or the manner in which it manages and measures the risk.

#### (i) Interest rate risk management

The Group's exposure to changes in interest rates relates primarily to fixed deposits and non-current trade receivables. Surplus funds in NParks are placed with Accountant-General's Department ("AGD") as disclosed in Note 6. Other than funds placed with AGD and non-current trade receivable with fixed interest rate as disclosed in Note 7, there are no other significant interest-bearing assets or interest-bearing liabilities as at the end of the reporting period.

Interest rate sensitivity analysis has not been presented as management does not expect any reasonable possible changes in interest rates to have a significant impact on the Group's operations and cash flows.

#### (ii) Credit risk management

Credit risk is the risk of loss that may arise on outstanding financial instruments should a counterparty defaults on its obligations.

The Group's credit risk is primarily attributable to its trade and other receivables. For cash at bank, the Group minimises credit risk by dealing exclusively with high credit rating counterparties.

The Group's objective is to minimise losses incurred due to increased credit risk exposure. The Group trades only with recognised and creditworthy third parties. It is the Group's policy that all customers who wish to trade on credit terms are subject to credit verification procedures. In addition, receivable balances are monitored on an ongoing basis with the result that the Company's exposure to bad debts is not significant.

The Group considers the probability of default upon initial recognition of asset and whether there has been a significant increase in credit risk on an ongoing basis throughout each reporting period

The Group has determined the default event on a financial asset to be when the counterparty fails to make contractual payments, within 90 days when they fall due, which are derived based on the Company's historical information.

To assess whether there is a significant increase in credit risk, the Group compares the risk of a default occurring on the asset as at reporting date with the risk of default as at the date of initial recognition. The Group considers available reasonable and supportive forwarding-looking information which includes the following indicator:

- Actual or expected adverse changes in business, financial or economic conditions that are expected to cause a significant change to the debtor's ability to meet its obligation

Regardless of the analysis above, a significant increase in credit risk is presumed if a debtor is more than 30 days past due in making contractual payment.

The Group determined that its financial assets are credit-impaired when:

- There is significant difficulty of the debtors
- A breach of contract, such as a default or past due event
- It is becoming probable that the debtor will enter bankruptcy or other financial reorganisation

Financial assets are written off when there is evidence indicating that the debtor is in severe financial difficulty and the debtor has no realistic prospect of recovery. Where receivables have been written off, the Group continues to engage enforcement activity to attempt to recover the receivable due. Where recoveries are made, these are recognised in profit or loss.

The following are credit risk management practices and quantitative and qualitative information about amounts arising from expected credit losses for each class of financial assets.

## Notes to the financial statements

For the financial year ended 31 March 2019

### Trade receivables

As at the end of the reporting period, the Group has recorded an impairment loss allowance of \$1,150,000 (2018: \$1,380,000) on its trade receivables. An agreement was made on 8 June 2009 between the Group and one of its debtors for the total principal sum to be repaid over 10 years starting from 1 November 2014 with an interest of 2% charge annually on the outstanding balance. No additional allowance has been made on the remaining principal amount of \$815,952 (FY2017/18: \$1,017,916) that is past due as management believes that there has not been significant change in credit quality as the debtor has been making repayments based on the agreement.

For the remaining trade receivables, the Group has applied the simplified approach in SB-FRS 109 to measure the allowance of lifetime ECL. The Group determines the ECL by using a provision matrix, estimated based on historical credit loss experience based on the past due status of the debtors, adjusted and apportioned to reflect current conditions and estimates of future economic conditions. Based on the Group's assessment, there is no additional loss allowance provision made as at 31 March 2019.

### Other receivables

The Group has credit policies and procedures in place to minimise and mitigate its credit risk exposure. The Group assessed the latest performance and financial position of the other counterparties, adjusted for the future outlook of the industry in which the counterparties operate in, and concluded that there has been no significant increase in the credit risk since initial recognition of the financial assets. Accordingly, the Group measured the impairment allowance using 12-month ECL and determine that the ECL is insignificant.

### Excessive risk concentration

Except for receivables due from MND and other government agencies, there is no significant concentration of credit risk.

### (iii) Liquidity risk management

Liquidity risk is the risk that the Group and the Board will not be able to meet their financial obligations as and when they fall due.

The Group and the Board receive its funds from the Government of Singapore which are drawn down on a regular basis to meet its funding requirements. All excess cash from the Group's bank accounts are aggregated and centrally managed by the AGD on a daily basis.

### Analysis of financial instruments by remaining contractual maturities

The table below summarises the maturity profile of the Group's and NParks's financial assets and liabilities at the end of the reporting period based on contractual undiscounted repayment obligations.

	2018/2019			Total
	Less than one year	One to five years	Over five years	
<b>GROUP</b>				
<b>Financial assets:</b>				
Cash and cash equivalents	260,987,766	-	-	260,987,766
Trade receivables	3,068,256	959,400	-	4,027,656
Other receivables	6,224,433	-	-	6,224,433
Total undiscounted financial assets	270,280,455	959,400	-	271,239,855
<b>Financial liabilities:</b>				
Trade and other payables	57,800,149	-	-	57,800,149
Total undiscounted financial liabilities	57,800,149	-	-	57,800,149
Total net undiscounted financial assets	212,480,306	959,400	-	213,439,706
<b>2017/2018</b>				
<b>\$</b>				
	Less than one year	One to five years	Over five years	Total
<b>GROUP</b>				
<b>Financial assets:</b>				
Cash and cash equivalents	259,682,009	-	-	259,682,009
Trade receivables	1,977,871	999,200	175,960	3,153,031
Other receivables	4,167,660	-	-	4,167,660
Total undiscounted financial assets	265,827,540	999,200	175,960	267,002,700
<b>Financial liabilities:</b>				
Trade and other payables	60,418,819	-	-	60,418,819
Total undiscounted financial liabilities	60,418,819	-	-	60,418,819
Total net undiscounted financial assets	205,408,721	999,200	175,960	206,583,881

# Notes to the financial statements

For the financial year ended 31 March 2019

	2018/2019			Total
	Less than one year	One to five years	Over five years	
\$				
<b>NPARKS</b>				
<b>Financial assets:</b>				
Cash and cash equivalents	260,688,545	-	-	260,688,545
Trade receivables	3,068,256	959,400	-	4,027,656
Other receivables	6,237,136	-	-	6,237,136
Total undiscounted financial assets	269,993,937	959,400	-	270,953,337
<b>Financial liabilities:</b>				
Trade and other payables	57,795,359	-	-	57,795,359
Total undiscounted financial liabilities	57,795,359	-	-	57,795,359
Total net undiscounted financial assets	212,198,578	959,400	-	213,157,978

	2017/2018			Total
	Less than one year	One to five years	Over five years	
\$				
<b>NPARKS</b>				
<b>Financial assets:</b>				
Cash and cash equivalents	259,444,803	-	-	259,444,803
Trade receivables	1,973,491	999,200	175,960	3,148,651
Other receivables	4,190,963	-	-	4,190,963
Total undiscounted financial assets	265,609,257	999,200	175,960	266,784,417
<b>Financial liabilities:</b>				
Trade and other payables	60,413,739	-	-	60,413,739
Total undiscounted financial liabilities	60,413,739	-	-	60,413,739
Total net undiscounted financial assets	205,195,518	999,200	175,960	206,370,678

## (c) Capital risk management policies and objectives

The Group manages its capital to ensure that it will be able to continue as a going concern while fulfilling its objective as a statutory board.

The capital structure of the Group consists of accumulated surplus, capital account, sinking fund and share capital. The overall strategy of the Group remains unchanged from the previous financial year.

## 5. RELATED PARTY TRANSACTIONS

Some of the Group's transactions and arrangements are with related parties and the effect of these on the basis determined between the parties is reflected in these financial statements. The balances are unsecured, interest-free and repayable on demand unless otherwise stated.

The Group and NParks entered into the following significant transactions with its parent Ministry, MND, and other related parties during the year, which are reimbursable in full:

	Group and NParks	
	2018/2019	2017/2018
	\$	\$
<b>MND</b>		
Revenue collected on behalf	31,115,919	33,496,785
Development expenditure paid on behalf		
- Gardens by the Bay	-	1,766,154
- Other state projects	140,946,136	134,139,517
<b>Other Ministries and Statutory Boards</b>		
Expenses paid on behalf of other statutory boards	9,670,614	15,880,742
<b>Garden City Fund</b>		
Expenses paid on behalf	4,739,700	2,592,004
<b>Gardens by the Bay</b>		
Expenses paid on behalf	69,448	159,777
<b>Compensation of key management personnel</b>		
The remuneration of key management personnel during the financial year were as follows:		
<b>Group and NParks</b>		
	2018/2019	2017/2018
	\$	\$
Salaries and other short-term employee benefits	2,026,526	1,936,956
Post-employment benefits	57,248	58,538

## Notes to the financial statements

For the financial year ended 31 March 2019

### 6. CASH AND CASH EQUIVALENTS

	Group		NParks	
	2018/2019 \$	2017/2018 \$	2018/2019 \$	2017/2018 \$
Cash at bank	299,221	237,206	-	-
Deposits with AGD <sup>(i)</sup>	260,688,545	259,444,803	260,688,545	259,444,803
	260,987,766	259,682,009	260,688,545	259,444,803

<sup>(i)</sup> With effect from financial year 2009/2010, Statutory Boards were to participate in the Centralised Liquidity Management by the Accountant General's Department ("AGD") under AGD Circular 4/2009. Deposits are centrally managed by AGD, available to the statutory board upon request and earns interest at the average rate of 1.76% (2017/2018: 1.23%) per annum.

### 7. TRADE RECEIVABLES

	Group		NParks	
	2018/2019 \$	2017/2018 \$	2018/2019 \$	2017/2018 \$
Not past due and not impaired	3,022,322	1,937,218	3,022,322	1,932,838
Past due but not impaired:	885,934	1,048,653	885,934	1,048,653
< 1 months	13,480	21,006	13,480	21,006
1 months to 4 months	20,502	9,731	20,502	9,731
> 4 months <sup>(i)</sup>	851,952	1,017,916	851,952	1,017,916
Impaired receivables	1,150,000	1,380,000	1,150,000	1,380,000
Less: Allowance for impairment	(1,150,000)	(1,380,000)	(1,150,000)	(1,380,000)
Total	3,908,256	2,985,871	3,908,256	2,981,491
Represented by:				
Current portion	3,068,256	1,977,871	3,068,256	1,973,491
Non-current portion	840,000	1,008,000	840,000	1,008,000
Total	3,908,256	2,985,871	3,908,256	2,981,491

The credit period on rendering of services is 30 days (2017/2018: 30 days). Other than non-current receivables which interest is charged at 2%, no interest is charged on the trade receivables and no collateral is held by the Group over the trade receivables.

<sup>(i)</sup> An agreement was made on 8 June 2009 between the Group and the debtor for the total principal sum to be repaid over 10 years starting from 1 November 2014 with an interest of 2% charge annually on the outstanding balance. No allowance has been made on these receivables as management believes that there has not been significant change in credit quality as the debtor has been making repayments based on the agreement.

#### Receivables that are impaired

The Group's trade receivables that are impaired at the end of the reporting period and the movement of the allowance accounts used to record the impairment are as follows:

	Group and NParks 2017/2018 \$
Trade receivables	2,388,000
Less: Allowance for impairment	(1,380,000)
	1,008,000
<b>Movement in allowance accounts:</b>	
At 1 April 2017	1,610,000
Write-back	(230,000)
At 31 March 2018	1,380,000

Trade receivables that are individually determined to be impaired at the end of the reporting period relate to a debtor that is in significant financial difficulties and has defaulted on payments. These receivables are not secured by any collateral or credit enhancements.

#### Expected credit losses

The movement in allowance for expected credit losses of trade receivables computed based on lifetime ECL are as follows:

	Group and NParks 2018/2019 \$
<b>Movement in allowance accounts:</b>	
At 1 April 2018	1,380,000
Write-back	(230,000)
At 31 March 2019	1,150,000

## Notes to the financial statements

For the financial year ended 31 March 2019

### 8. OTHER RECEIVABLES

	Group		NParks	
	2018/2019 \$	2017/2018 \$	2018/2019 \$	2017/2018 \$
Other receivables				
– MND <sup>(i)</sup>	1,382,775	1,467,445	1,382,775	1,467,445
– Garden City Fund <sup>(iii)</sup>	1,419,034	360,755	1,419,034	360,755
– Gardens by the Bay <sup>(iii)</sup>	8,375	12,295	8,375	12,295
– Other receivables	497,811	603,934	510,764	627,487
Interest receivable	2,634,858	1,476,261	2,634,858	1,476,261
Deposits	281,580	246,970	281,330	246,720
	<u>6,224,433</u>	<u>4,167,660</u>	<u>6,237,136</u>	<u>4,190,963</u>

#### Notes

<sup>(i)</sup> Receivables from MND comprise mainly direct development and operating grants receivable by NParks. These amounts are unsecured and interest-free, and are repayable on demand.

<sup>(iii)</sup> Non-trade amounts due from Garden City Fund and Gardens by the Bay are unsecured and interest-free, and are repayable on demand.

### 9. INVESTMENT IN SUBSIDIARY

	Group and NParks	
	2018/2019 \$	2017/2018 \$
Unquoted equity investment, at cost	2	2

Details of the subsidiary at the end of the reporting period are as follows:

Name of subsidiary	Principal activities	Place of Incorporation and business	Proportion of ownership interest and voting power held	
			2018/2019 %	2017/2018 %
Singapore Garden City Pte. Ltd. <sup>(a)</sup>	Landscape planning, advisory services and business consulting services	Singapore	100	100

<sup>(a)</sup> Audited by Kong, Lim & Partners LLP.

### 10. PROPERTY, PLANT AND EQUIPMENT

Group and NParks	Leasehold land \$	Building, structures, capital and other improvements \$	Office equipment, furniture and fittings \$	Motor vehicles \$	Laboratory and gardening equipment \$	Construction-in-progress \$	Total \$
<b>Cost</b>							
At 1 April 2017	65,458,754	153,404,410	49,778,476	1,404,225	1,440,442	2,193,454	273,679,761
Additions	–	–	1,924,220	65,594	100,053	14,691,419	16,781,286
Transfer	–	2,516,065	3,798,999	–	–	(6,315,064)	–
Disposals	–	(4,134,689)	(8,707,267)	(24,130)	(58,814)	–	(12,924,900)
At 31 March 2018 and 1 April 2018	65,458,754	151,785,786	46,794,428	1,445,689	1,481,681	10,569,809	277,536,147
Additions	814,414	36,647	2,488,779	–	131,546	25,309,961	28,781,347
Transfer	–	9,589,794	6,525,734	–	–	(16,115,528)	–
Disposals	–	(2,788,767)	(247,646)	(23,300)	(2,600)	–	(3,062,313)
At 31 March 2019	66,273,168	158,623,460	55,561,295	1,422,389	1,610,627	19,764,242	303,255,181
<b>Accumulated depreciation</b>							
At 1 April 2017	14,264,094	107,413,961	34,293,353	775,060	972,064	–	157,718,532
Depreciation	791,129	6,153,180	4,110,276	128,783	129,631	–	11,312,999
Disposals	–	(3,598,037)	(8,688,468)	(21,693)	(58,814)	–	(12,367,012)
At 31 March 2018 and 1 April 2018	15,055,223	109,969,104	29,715,161	882,150	1,042,881	–	156,664,519
Depreciation	800,526	5,582,478	5,366,367	132,122	136,757	–	12,018,250
Disposals	–	(2,541,625)	(222,047)	(20,413)	(2,600)	–	(2,786,685)
At 31 March 2019	15,855,749	113,009,957	34,859,481	993,859	1,177,038	–	165,896,084
<b>Carrying amount</b>							
At 31 March 2018	50,403,531	41,816,682	17,079,267	563,539	438,800	10,569,809	120,871,628
At 31 March 2019	50,417,419	45,613,503	20,701,814	428,530	433,589	19,764,242	137,359,097

# Notes to the financial statements

For the financial year ended 31 March 2019

## 11. GOVERNMENT GRANTS RECEIVED IN ADVANCE (RECEIVABLE)

Group and NParks	Operating grants <sup>(i)</sup> \$	Capital grants \$	Development grants <sup>(ii)</sup> \$	Other grants <sup>(iii)</sup> \$	Total \$
At 1 April 2017	8,147,158	519,556	1,530,807	(2,171,923)	8,025,598
Grants received during the financial year	271,741,546	1,645,044	135,568,636	5,807,261	414,762,487
Grants receivable	-	-	-	(176,155)	(176,155)
Interest income (adjusted) earned	-	(7,973)	18,229	-	10,256
Transfer to deferred capital grants (Note 16)	(11,006,349)	(1,945,510)	(75,274)	(21,851)	(13,048,984)
Unutilised grants returned	(104,156)	-	-	(85,571)	(189,727)
Payment on behalf	-	-	(135,905,671)	-	(135,905,671)
Transfer to statement of comprehensive income	(256,546,780)	-	-	(2,868,693)	(259,415,473)
At 31 March 2018 and 1 April 2018	12,231,419	211,117	1,136,727	483,068	14,062,331
Grants received during the financial year	302,363,966	3,927,940	140,223,666	3,411,777	449,927,349
Grants receivable	-	(211,124)	(3,678,391)	(51,579)	(3,941,094)
Interest income earned	-	-	18,776	-	18,776
Transfer to deferred capital grants (Note 16)	(13,834,783)	(3,927,933)	-	-	(17,762,716)
Unutilised grants returned	(294,155)	-	-	(10,667)	(304,822)
Payment on behalf	-	-	(140,946,136)	(493,351)	(141,439,487)
Transfer to statement of comprehensive income	(288,489,233)	-	-	(3,505,591)	(291,994,824)
At 31 March 2019	11,977,214	-	(3,245,358)	(166,343)	8,565,513

### Notes

<sup>(i)</sup> Total operating grants received/receivable less transferred to deferred capital grants since establishment are \$3,259,985,699 (2017/2018: \$2,971,456,516).

<sup>(ii)</sup> Development grants received from MND for State projects running by NParks on behalf of MND.

<sup>(iii)</sup> Other grants comprise grants received from other government agencies.

## 12. TRADE AND OTHER PAYABLES

	Group		NParks	
	2018/2019 \$	2017/2018 \$	2018/2019 \$	2017/2018 \$
Trade payables	11,219,970	12,283,292	11,219,970	12,283,292
Other payables				
- MND <sup>(i)</sup>	3,379,320	3,431,099	3,379,320	3,431,099
- Garden City Fund <sup>(ii)</sup>	208,580	53,577	208,580	53,577
- Others	20,210,651	16,586,721	20,209,761	16,586,721
GST payable	2,721,733	3,181,236	2,721,733	3,181,236
Rental and other deposits	6,681,919	12,958,497	6,681,919	12,958,497
Accrual expenses	16,099,709	15,105,633	16,095,809	15,100,553
	60,521,882	63,600,055	60,517,092	63,594,975

<sup>(i)</sup> Payables to MND comprise primarily state revenue collections received on behalf of the Ministry. The amounts are unsecured and interest-free, and are repayable in cash on demand.

<sup>(ii)</sup> Non-trade amounts due to Garden City Fund are unsecured and interest-free.

## 13. PROVISION FOR PENSION COSTS

	Group and NParks	
	2018/2019 \$	2017/2018 \$
At beginning of the year	3,445,888	3,439,672
Provision for the year	107,011	126,216
Payments during the year	(1,136,762)	(120,000)
At end of the year	2,416,137	3,445,888
Represented by:		
Current portion	120,000	1,871,099
Non-current portion	2,296,137	1,574,789
	2,416,137	3,445,888

There is currently 1 (2017/2018: 3) employee of NParks who is eligible under this pension schemes other than the Central Provident Fund.

## Notes to the financial statements

For the financial year ended 31 March 2019

Amounts recognised in income or expenditure in respect of the defined benefit plan are as follows:

	Group and NParks	
	2018/2019	2017/2018
	\$	\$
Interest cost	56,622	75,451
Service cost	50,389	50,765
Total	107,011	126,216

The principal assumptions used in determining the pension costs were as follows:

	2018/2019	2017/2018
Discount rate	2.2%	2.2%
Salary increase rate	3.0%	3.0%

Assumptions regarding future mortality are based on published statistics and mortality tables.

The sensitivity analysis below has been determined based on reasonably possible changes of each significant assumption on the defined benefit obligation as of the end of the reporting period, assuming if all other assumptions were held constant:

	Change in assumption	Impact on provision for pension costs	
		Increase in assumption	Decrease in assumption
Discount rate	0.25%	(25,670)	24,722
Salary increase rate	0.25%	8,674	(10,362)

## 14. DEFERRED REVENUE

	Group		NParks	
	2018/2019	2017/2018	2018/2019	2017/2018
	\$	\$	\$	\$
Lease premium received in advance	1,131,945	1,215,278	1,131,945	1,215,278
Deferred rental income	2,520,000	2,688,000	2,520,000	2,688,000
Plan fees received in advance	973,600	960,400	973,600	960,400
Other income received in advance	121,740	336,429	121,740	336,429
	4,747,285	5,200,107	4,747,285	5,200,107
Represented by:				
Current portion	2,538,374	2,746,762	2,538,374	2,746,762
Non-current portion	2,208,911	2,453,345	2,208,911	2,453,345
	4,747,285	5,200,107	4,747,285	5,200,107

The lease premium received in advance represents the unamortised balances of lease premium received in advance from a tenant.

## 15. CONTRIBUTION TO CONSOLIDATED FUND

With effect from 1 April 2003, NParks is required to make contribution to the Government Consolidated Fund in accordance with the Statutory Corporations (Contributions to Consolidated Fund) Act, Chapter 319A. The provision is based on the guidelines specified by the Ministry of Finance. It is computed based on the net surplus of NParks for each of the financial year at the prevailing corporate tax rate for the Year of Assessment. Contribution to consolidated fund is provided for on an accrual basis.

## 16. DEFERRED CAPITAL GRANTS

	Group and NParks	
	2018/2019	2017/2018
	\$	\$
Balance at the beginning of the financial year	111,467,742	109,408,827
Amounts transferred from Government grants (Note 11)	17,762,716	13,048,984
Amounts transferred from Garden City Fund	2,954,722	168,733
	132,185,180	122,626,544
Less: Amortisation of deferred capital grants	(11,002,761)	(11,158,802)
Balance at the end of the financial year	121,182,419	111,467,742
Total capital grants received (excluding donations-in-kind transferred from Garden City Fund) and utilised since establishment	278,125,932	260,363,216

## Notes to the financial statements

For the financial year ended 31 March 2019

### 17. CAPITAL ACCOUNT

Capital account represents the value of assets net of liabilities (excluding the leasehold land acquired via Government capital grants) transferred from the former Parks and Recreation Department ("PRD") of MND when NParks was established in June 1990 and when PRD merged with NParks in July 1996.

### 18. SHARE CAPITAL

	2018/2019	2017/2018	2018/2019	2017/2018
	Number of shares		\$	\$
<b>Issued and fully paid up:</b>				
At the beginning of the year	2,958,095	1,032,800	2,958,095	1,032,800
Equity injection <sup>(i)</sup>	3,478,143	1,925,295	3,478,143	1,925,295
At the end of the year	6,436,238	2,958,095	6,436,238	2,958,095

<sup>(i)</sup> Injection of capital is part of the Capital Management Framework for Statutory Boards under Finance Circular Minute M26/2008. The shares have been fully paid and are held by the Minister for Finance, a body corporate incorporated by the Minister for Finance (Incorporation) Act (Chapter 183). The holder of these shares, which has no par value, is entitled to receive dividends.

### 19. NET ASSETS OF GARDEN CITY FUND

National Parks Board ("NParks") is the trustee of Garden City Fund ("GCF"). GCF is managed and administered by the Garden City Fund Management Committee, comprising staff from NParks and members of the public appointed by NParks, in accordance with the provisions of the Garden City Fund Trust Deed dated 10 March 2016 (the "Deed").

The GCF comprises the Garden City Endowment Fund ("GCEF") and the Garden City Non-Endowment Fund ("GCNEF"). The GCNEF comprises all moneys transferred from the specific funds of NParks upon the formation of the Garden City Fund on 1 July 2002 and all other contributions to the GCNEF. There has been no contribution to the GCEF since establishment.

The GCNEF and the income from the GCEF will be used to further the objectives of the Garden City Fund.

The objectives of GCF are exclusively to enhance the enjoyment of the Garden City, for amenities and special features at the national parks, nature reserves and green areas in Singapore and also for community activities and programmes that promote awareness of nature, art and culture, conservation, research and education and, through involving the citizens to enhance ownership of the Garden City, facilitating a sense of rootedness to the nation.

Upon dissolution of the Garden City Fund, the remaining moneys in the fund shall be donated to charitable organisations which have been designated as Institutions of a Public Character under the Income Tax Act (Chapter 134) and registered under the Charities Act (Chapter 37).

GCF' accounts are prepared in accordance with Financial Reporting Standards in Singapore ("FRS").

The following financial information represents GCNEF. There has been no contribution to the GCEF since establishment.

	Group and NParks	
	2018/2019	2017/2018
	\$	\$
<b>Income:</b>		
Donations	9,185,631	2,933,224
Sales of publications/souvenirs/merchandise	89,269	67,158
Course/tour fees	105,735	95,306
Interest income	228,546	90,303
Other income	36,179	4,566
	9,645,360	3,190,557
<b>Amounts disbursed for:</b>		
Costs of charitable activities:		
Conservation projects	125,664	80,841
Enhancements of parks, gardens and facilities	5,301,839	3,168,016
Outreach, education and research programmes	3,602,314	2,177,160
Publication	21,922	8,708
Depreciation of property, plant and equipment	80,227	51,431
Loss on disposal of plant and equipment	-	11,712
Administrative costs	31,783	-
	9,163,749	5,497,868
Surplus/(Deficit) for the year	481,611	(2,307,311)
Surplus/(Deficit) for the year	481,611	(2,307,311)
Accumulated fund at beginning of the year	9,675,357	11,982,668
Accumulated fund at end of the year	10,156,968	9,675,357

## Notes to the financial statements

For the financial year ended 31 March 2019

	Group and NParks	
	2018/2019 \$	2017/2018 \$
Represented by:		
<b>Current assets</b>		
Cash and cash equivalents	23,506,739	23,236,516
Other receivables	441,308	80,270
	<u>23,948,047</u>	<u>23,316,786</u>
<b>Non-current asset</b>		
Plant and equipment	947,709	320,653
<b>Current liabilities</b>		
Trade payables	184,822	106,123
Other payables	1,770,322	883,495
Deferred donations	12,783,644	12,972,464
	<u>14,738,788</u>	<u>13,962,082</u>
<b>Net assets</b>	<u>10,156,968</u>	<u>9,675,357</u>

### 20. NET ASSETS OF NATIONAL PRODUCTIVITY FUND

NParks also administers the following fund on behalf of the Productivity Fund Administration Board.

	Group and NParks	
	2018/2019 \$	2017/2018 \$
Grants received	1,485,052	1,829,631
Interest income	349	35
Less: Expenditure	(1,454,888)	(1,966,356)
Staff related cost	(268,842)	(261,196)
General administration	(238,346)	(126,360)
Grant disbursement	(947,700)	(1,578,800)
Less: Return of funds	-	(166,591)
Surplus/(deficit) for the year	30,513	(303,281)
Accumulated fund at beginning of the year	79,485	382,766
Accumulated fund at end of the year	<u>109,998</u>	<u>79,485</u>
Represented by:		
Cash and bank balances	168,051	166,895
Accruals	(58,053)	(87,410)
Net assets	<u>109,998</u>	<u>79,485</u>

### 21. OPERATING INCOME

	Group		NParks	
	2018/2019 \$	2017/2018 \$	2018/2019 \$	2017/2018 \$
Rental income	9,032,441	9,732,140	9,032,441	9,732,140
Admission charges	3,123,431	2,139,599	3,123,431	2,139,599
Plan fees	2,625,575	2,428,400	2,625,575	2,428,400
Course fees	1,455,664	1,455,048	1,455,664	1,455,048
Agency fees	748,364	1,514,300	748,364	1,514,300
Interest income	3,915,617	2,957,252	3,915,617	2,957,252
Carpark income	1,003,237	880,058	1,003,237	880,058
Miscellaneous income comprises:				
Liquidated damages	385,335	179,246	385,335	179,246
Composition amount	-	23,695	-	23,695
Barbeque permit fees	403,298	382,853	403,298	382,853
Park usage fees	212,138	191,976	212,138	191,976
Consultancy fees	83,666	60,052	12,500	12,500
Tour fees	42,653	58,122	42,653	58,122
Events income	317,222	6,326	317,222	6,326
Merchandise	86,702	75,166	86,701	75,166
Publication and plant sales	156,410	133,904	156,410	133,904
Others	850,079	1,289,112	824,549	1,288,304
	<u>2,537,503</u>	<u>2,400,452</u>	<u>2,440,806</u>	<u>2,352,092</u>
	<u>24,441,832</u>	<u>23,507,249</u>	<u>24,345,135</u>	<u>23,458,889</u>
Timing of transfer of goods or services (excluding interest income):				
- At a point in time	9,289,746	7,848,509	9,193,049	7,800,149
- Overtime	11,236,469	12,701,488	11,236,469	12,701,488
	<u>20,526,215</u>	<u>20,549,997</u>	<u>20,429,518</u>	<u>20,501,637</u>

## Notes to the financial statements

For the financial year ended 31 March 2019

### 22. STAFF COSTS

	Group and NParks	
	2018/2019	2017/2018
	\$	\$
Wages and salaries	89,041,316	87,561,390
Contributions to defined contribution plans	13,834,361	13,191,036
Pension costs (Note 13)	107,011	126,216
Other staff benefits	1,463,352	1,649,603
	<u>104,446,040</u>	<u>102,528,245</u>

### 23. DEFICIT FROM OPERATIONS

The following item has been included in arriving at deficit from operations:

	Group and NParks	
	2018/2019	2017/2018
	\$	\$
Loss on disposal of property, plant and equipment	<u>275,548</u>	<u>556,602</u>

### 24. FUNDING FOR GOVERNMENT PROJECTS

During the financial year ended 31 March 2019, \$902,195 (2017/2018: \$7,900,017) was incurred to fund the capital expenditure for government projects, namely, the Kranji Marshes, Jacob Ballas Children Gardens Extension and Eco Link (2017/2018: Kranji Marshes, Jacob Ballas Children Gardens Extension and Gallop House projects).

As these projects were funded using NParks's accumulated surplus, they are considered distribution to owners. Accordingly, the amounts are recognised directly in the statement of changes in equity.

### 25. OPERATING LEASES ARRANGEMENTS

#### As lessee

	Group and NParks	
	2018/2019	2017/2018
	\$	\$
Minimum lease payments under operating lease included as an expense	<u>1,659,168</u>	<u>1,787,058</u>

The future aggregate minimum lease payments under non-cancellable operating leases contracted for at the reporting date but not recognised as liabilities as at 31 March 2019 with related parties are as follows:

	Group and NParks	
	2018/2019	2017/2018
	\$	\$
Within one year	1,659,168	1,659,168
In the second to fifth year inclusive	1,659,168	3,318,336
	<u>3,318,336</u>	<u>4,977,504</u>

#### As lessor

The Group rented out its properties under operating leases. Rental income earned during the year was \$9,032,441 (2017/2018: \$9,732,140).

The future aggregate minimum lease receivables under non-cancellable operating leases contracted for at the reporting date but not recognised as at 31 March 2019 are as follows:

	Group and NParks	
	2018/2019	2017/2018
	\$	\$
Within one year	5,090,952	6,599,487
In the second to fifth year inclusive	12,575,968	13,480,442
After five years	24,720,000	27,600,000
	<u>42,386,920</u>	<u>47,679,929</u>

The above amounts exclude operating lease premium received in advance of \$1,131,945 (2017/2018: \$1,215,278) (Note 14).

## Notes to the financial statements

For the financial year ended 31 March 2019

### 26. CAPITAL COMMITMENTS

	Group and NParks	
	2018/2019	2017/2018
	\$	\$
Contracted but not provided for	168,225,502	217,722,500
Less: Development expenditure on behalf of government	(150,223,100)	(192,445,933)
	18,002,402	25,276,567
Authorised but not contracted for	593,941,228	411,574,116
Less: Development expenditure on behalf of government	(563,239,128)	(374,559,449)
	30,702,100	37,014,667
	48,704,502	62,291,234

NParks is the agent to develop, upgrade, manage and maintain the public parks on behalf of the government. Amount contracted but not provided for comprise mainly work relating to parks development, park connector network and round island route and amount authorised but not contracted for comprise mainly work relating to parks development, park connector network and Jurong Lake Gardens.

### 27. CONTINGENT LIABILITIES

At the reporting date, there were the following contingent liabilities relating to various claims that have been made against the Group and NParks in respect of third parties damages. These claims have been referred to the insurers for their assessments.

	Group and NParks	
	2018/2019	2017/2018
	\$	\$
Claims not provided for	4,400,258	5,737,936

### 28. AUTHORISATION OF FINANCIAL STATEMENTS FOR ISSUE

The financial statements for the financial year ended 31 March 2019 were authorised for issue by the members of the Group on 17 July 2019.

## Photo Acknowledgement

### FRONT COVER

Johore Strangler Fig (*Ficus Kerkhovenii*) at the Singapore Botanic Gardens

### INTRODUCTION

Farquhar Garden, a node within the First Botanic Garden, at Fort Canning Park

### CHAPTER DIVIDERS

#### Page 12 – Thriving Greenery

The pretty blooms of the Trumpet Tree (*Tabebuia rosea*) and bougainvillea add colour and vibrancy to the busy Central Expressway.

#### Page 20 – A Biophilic Home

Although Singapore is an urbanised city-state, we are rich in biodiversity such as this Little Egret (*Egretta garzetta*), a common migratory bird in Sungei Buloh Wetland Reserve.

#### Page 44 – A Growing Interest

Early childhood educators guiding their students during the Singapore Garden Festival 2018. Such an immersive experience is a good way to inculcate a love for nature among the young.

#### Page 58 – Nurturing the Field

A visit to one of our therapeutic gardens can help stimulate your senses and provide health benefits such as relief from mental fatigue and an overall improvement to emotional well-being.

Visit [www.nparks.gov.sg](http://www.nparks.gov.sg), [www.facebook.com/nparksbuzz](https://www.facebook.com/nparksbuzz) and [www.facebook.com/SingaporeBotanicGardens](https://www.facebook.com/SingaporeBotanicGardens) to find out more about activities in the parks and gardens.

### WE THANK STAFF AND PARTNERS OF NPARKS WHO KINDLY CONTRIBUTED PHOTOS TO THIS ANNUAL REPORT

Liew Tong Leng: Page 2: photo extract

Andrew Tau: Page 10, photo of Trumpet Tree and bougainvillea at Central Expressway

Lim Leng Wee: Page 12, photo of Monkey Pot Tree (*Lecythis Pisonis*) in Singapore Botanic Gardens

Soh Chui Lian: Page 14, photo of Jurong Lake Gardens

Tee Swee Ping: Page 16, photo of colourful plantings next to a bus stop along Jalan Jurong Kechil

Amanda Leng: Page 17, photo of Sandpaper Vine (*Petrea volubilis*) on the trellis outside Sembawang MRT station

Anderson Wong: Page 19, photo of Bukit Batok Nature Park

Andrew Tan: Page 20, photo of Little Egret

David Li: Page 24, photo of Little Stint (*Calidris minuta*)

Chung Yi Fei: Page 24, photo of Long-winged Tomb Bat (*Taphozous longimanus*) and Big-eared Pipistrelle (*Hypsugo macrotis*)

Jacky Soh: Page 24, photo of Arrow Emperor (*Anax panybeus*)

Joseph K H Koh: Page 24, photo of Raccoon Pseudo-orb Weaver (*Fecenia ochracea*) spider

Cai Yixiong: Page 25, photo of Sunda Leaf Fish (*Nandus nebulosus*)

Karenne Tun: Page 25, photo of Green Turtle (*Chelonia mydas*)

LJCP Photography: Page 31: photo of NParks Concert Series in the Park – Rockestra®

Zestin Soh: Page 43, photo of Broad-headed Leafcutter Bee (*Megachile laticeps*)

Chris Ang: Page 57: photo of Sungei Buloh Wetland Reserve



**NATIONAL  
PARKS**

*NParks' Publication*

## **NATIONAL PARKS BOARD**

**Singapore Botanic Gardens**

1 Cluny Road

Singapore 259569

Tel (65) 6471 7808

Fax (65) 6472 3033

[nparks\\_mailbox@nparks.gov.sg](mailto:nparks_mailbox@nparks.gov.sg)

[www.nparks.gov.sg](http://www.nparks.gov.sg)



**nparksbuzz**

Share your love for nature with us at  
**#nparksbuzz**

