

CITY IN NATURE

ANNUAL REPORT 2019/2020

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CITY IN NATURE

NParks is restoring nature into our urban fabric, building on what we have been doing over the years. With even more nature integrated into our city, this not only strengthens Singapore's distinctiveness as a highly liveable country, but also helps mitigate the impacts of urbanisation and climate change.

With over 350 parks and gardens, four nature reserves, an extensive park connector network as well as verdant streetscapes and nature ways, all residents enjoy easier access to such open spaces while benefitting from lush greenery that creates cooler surroundings.

With the announcement of the One Million Trees movement in March 2020, NParks is partnering the community to plant a million trees across the island over the next decade. This not only strengthens our natural heritage but leaves a living legacy for future generations to enjoy in our City in Nature.

Scan QR code
to explore what
our City in
Nature holds:



CHAIRMAN'S MESSAGE



In April 2019, Singaporeans flocked to the newly-opened Lakeside Garden, part of Jurong Lake Gardens, to experience its many sights including natural flood-plains. It was arguably the largest turnout over a two-week period that we had ever seen on the opening of any new park or facility. Earlier this year we opened Sembawang Hot Spring Park and this was also very enthusiastically received by our people.

Singaporeans have shown a love for Nature and the outdoors which has grown only stronger and deeper with time. The drastic dislocations and impact from the COVID-19 pandemic therefore was significantly felt by all.

Since the start of 2020, Singapore and the world have been confronted with an existential pandemic threat. No one knows for sure when it will be over. In the months since, Singaporeans have all seen and experienced how the COVID-19 pandemic radically impacts the way we work, live and play.

As safety measures like social distancing meant that familiar and staple NParks outdoor activities and programmes involving physical engagement were suspended, our officers had to adapt or discover new ways to stay connected with our citizens. Our online platforms were quickly refreshed and enhanced so that we could actively engage the public during this period and mitigate as best we could what was lost in terms of physical outings and visits to our parks. Our

officers created multiple DIY videos, conducted courses online and hosted webinars and even electronic pet adoption drives.

It has been a year since the Animal & Veterinary Service (AVS) cluster was set up in NParks. As the main touchpoint for animal and veterinary-related issues, AVS stepped up engagement with the public and stakeholders to review and strengthen standards in the pet sector. During this difficult period of the pandemic, AVS has been working with many of these stakeholders to explore how it can support practicable initiatives to safeguard animal health and welfare.

And even as our different NParks officers stepped up their efforts to do all this, many of them had to also double-up to support the national response to manage the pandemic. Many were involved in supporting agencies in overseeing the management of holding centres. Even more stepped forward daily to be safety ambassadors on the ground, reminding people to wear their masks and to practise safe distancing. It was a task which required patience, tact and resilience because situations on the ground could sometimes be tense and testy as the psychological stress over the pandemic brewed.

While we, as a nation, focus collectively to combat COVID-19, NParks continues to also keep its eye on our vision to become a City in Nature. NParks plays a vital role in ensuring that Singapore's liveability and sustainability as a

“While we, as a nation, focus collectively to combat COVID-19, NParks continues to also keep its eye on our vision to become a City in Nature.”

City in Nature is about enhancing nature in the urban environment and applying nature-based solutions to achieve climate, ecological and social resilience for Singapore and Singaporeans. The benefit is not just cleaner water, fresher air and cooler temperatures but also, with time, a culture of empathy and care for all who are part of this shared living environment.

Although the pandemic may constrain the pace of what we can do for now, our commitment to stay on course and realise the vision remains unwavered. In March 2020, the One Million Trees movement was launched. Corporate bodies, groups and individuals have since responded generously to sponsor this programme, which targets to plant one million trees across Singapore over the next 10 years. NParks also launched the Gardening with Edibles programme where families could start their own food growing gardens and also introduce greenery into their homes. The response to this programme has been overwhelming and we had to increase the number of seed packets for distribution from 150,000 to over 400,000.

Singapore today has more than 350 hectares of nature parks which act as complementary habitats and buffers to our nature reserves (this was boosted with the opening of the 50-ha Thomson Nature Park in October 2019). We have planted 134,000 trees in the reporting year and we intend to grow the Nature Park network by another 200 hectares. We also plan to strengthen

connectivity between green spaces with 180 km of Nature Ways and the goal is to make “every road a Nature Way”. If we stay focused and subsequently push ourselves to catch up on whatever lost time the pandemic may have imposed, we will get back on schedule and hope to have most, if not all, of these done by 2030.

While it has certainly been a challenging year, Singaporeans have clearly taken it in their stride. Our efforts in NParks would not have been fruitful if not for the continuing and encouraging support of Singaporeans – members of public, members of the corporate and public sectors. To all of them, we in the NParks family – staff and volunteers – give our most grateful thanks.

Mr Benny Lim
Chairman, National Parks Board

MEMBERS OF THE BOARD

(AS OF SEPTEMBER 2020)



BENNY LIM
Chairman

Mr 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 and Chairman of Temasek Foundation Ltd.



ANDREAS SOHMEN-PAO
Board Member (Until 31 July 2020)

Mr Sohmen-Pao is Executive Chairman of BW Group. He is also Chairman of five publicly listed affiliates BW LPG, BW Offshore, BW Energy, Hafnia and Epic Gas, Chairman of the Singapore Maritime Foundation and a trustee of the Lloyd's Register Foundation. He has served as a non-executive director of The Hongkong and Shanghai Banking Corporation Ltd, The London P&I Club, The Esplanade Co Ltd, Sport Singapore and the Maritime and Port Authority of Singapore amongst others.



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 Planning Group in SkillsFuture Singapore (SSG) where he oversees the agency's strategic and resource planning efforts. He is currently a member of Nanyang Polytechnic's (NYP) Board of Governors, the Deputy Chairman of NYP's Education Fund Management Committee and a member of the Industrial Arbitration Court's Employer Panel. 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.



WARREN FERNANDEZ
Board Member (Until 31 July 2020)

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 the President of The World Editors Forum, a board member of SPH (Overseas) Ltd, National Arts Council and Singapore Symphony Group, and Chairman of the board for The Straits Times School Pocket Money Fund and Asia News Network.



DR SURIANI SURATMAN
Board Member (Until 31 July 2020)

Dr Suriani is Senior Lecturer and Deputy Head 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 and has conducted research in Singapore, Malaysia and the Philippines. She is a board member of the National Heritage Board and Tasek Jurong Limited. 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 the non-executive Chairman of HSBC Bank (Singapore) Limited, following his retirement as 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 is currently Chairman of the Capella Hotel Group Pte Ltd and a member of the boards of Surbana Jurong Private Limited, JTC Corporation, Mapletree Industrial Trust Management Ltd, M1 Limited and Wing Tai Holdings.



PROFESSOR DAVID CHAN
Board Member (from 1 August 2020)

Professor Chan is Director of the Behavioural Sciences Institute at Singapore Management University. His works have been cited over 12,000 times in various disciplines. He has received several international awards for his scientific and practice contributions, and is the first scientist to receive Elected Fellow status from all six international psychological organisations. Currently, he is a member of the Social Science Research Council, National Council on Problem Gambling, Diabetes Prevention and Care Taskforce, Singapore-Japan Joint Committee on Science and Technology, Board of the National Volunteer and Philanthropy Centre, and International Panel of Experts for the Urban Redevelopment Authority.



MS THAM LOKE KHENG
Board Member (from 1 August 2020)

Ms Tham is CEO and Board Director of Mediacorp. A media industry veteran, she has held leadership roles in broadcast, media and telecommunications services in leading Asian media companies. In September 2017, Ms Tham rejoined Mediacorp as its CEO, coming full circle to the organisation where she started her career. During her years away from Mediacorp, she was Head of Content and Marketing at StarHub, President of Taiwan Broadband Communications and Head of NOW TV, the largest Pay TV operator in Hong Kong.



GERALD TAN KWONG MING
Board Member (from 1 August 2020)

Mr Tan is a senior legal and banking professional with over 20 years of experience in legal private practice, international banking and risk management. He is a member of the Advisory Board of the National Museum of Singapore and a board member of Credit Counselling Singapore. He has previously served as a board member of Gardens by the Bay, and as Co-Chair of the Asia Pacific Commodities Committee of the International Swaps and Derivatives Association, Inc.



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. Prior to joining GuocoLand, he was with the Urban Redevelopment Authority and Centre for Liveable Cities. He is a member of the Urban Land Institute Singapore Executive Committee, co-chairman of Integrated Digital Delivery Steering Committee (IDDSC) and Central Procurers Panel (CPP) for Building and Construction Authority, as well as a member of the Urban Redevelopment Authority's Design Advisory Committee as well as Heritage and Identity Partnership. He holds a Bachelor of Architecture from Newcastle University, UK, and a Master in Design Studies from Harvard University.



MS NUR HIDAYAH ABU BAKAR
Board Member (from 1 August 2020)

Ms Nur Hidayah is Dean of the Faculty of Design at LASALLE College of the Arts, Singapore, and serves as an expert on various boards locally. She believes in the inter-connectedness of design aesthetics, education and industry/community, and has initiated several partnerships including developing design capability programmes with communities in Asia and investigating issues on social enterprise for a more inclusive design culture. She has led the research and study of design cultures in contemporary Asian cities such as Singapore, Seoul and Shanghai, and undertaken the Global Design Initiative involving five international universities. Under her leadership, the design programmes have achieved great success at regional and international competitions.



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.

ORGANISATION STRUCTURE

(AS OF SEPTEMBER 2020)



* Internal Audit reports functionally to the Audit Committee

** Mr Wong Tuan Wah is retiring in September 2020. Mr Ryan Lee is appointed Group Director/Fort Canning Park & Istana and Senior Curator, Istana, as of 1 October 2020.



A CITY TRANSFORMED BY NATURE

The extension of Singapore's green infrastructure continued in 2019 with the opening of new parks and gardens, enhancement of our streetscapes and introduction of features that bring people closer to nature.

SINGAPORE BOTANIC GARDENS CELEBRATES 160 YEARS

In October 2019, a high-tech arboretum was opened at the Singapore Botanic Gardens. Located at the Gallop Extension, it will house more than 2,000 specimens of over 200 species of Dipterocarps. The OCBC Arboretum is the first-of-its-kind in Southeast Asia, utilising an Internet of Things (IoT) system to remotely and continuously monitor the trees and their environment as they grow.

Complementing this is the Mingxin Foundation Rambler's Ridge, a trail which showcases plants such as Ant Plants (*Hydnophytum* spp. and *Myrmecodia* spp.) from habitats found in tropical hills of Southeast Asia that have adapted to harsh hillside conditions that include strong winds and poor soil.

Other features including a forest discovery centre, a botanical art gallery and a nature playgarden are expected to be ready in 2021 in the Gallop Extension. Apart from expanding its Nature Area, the Extension adds to the Gardens' significant work in research, conservation, education and recreation.

The first three volumes of the *Flora of Singapore* series were published this past year. More than 100 local and international plant experts are working tirelessly to put together a comprehensive catalogue and description of all families, genera and species of plants in Singapore.



Stroll through Mingxin Foundation Rambler's Ridge to spot critically endangered trees such as the Spoke Oak (*Lithocarpus elegans*) and Braided Chestnut (*Castanopsis inermis*) that line the path.

When completed, the remaining 11 volumes will strengthen the Gardens' standing as a premier botanical research institution.

The opening of Singapore's first Seed Bank in July 2019 further augmented the Gardens' role in safeguarding plant biodiversity in Southeast Asia. This facility is able to store seeds of up to 25,000 plant species, about half the total number of plant species in the region.

Orchids grown by the National Orchid Garden in Singapore Botanic Gardens garnered 12 awards from the Orchid Society of South East Asia (OSSEA) during a judging held on 22 February 2020. Of these, the Golden Tiger Orchid (*Grammatophyllum speciosum* var. *flava*) and *Dendrobium gouldii* were awarded the First Class Certificate, the top tier of OSSEA's certificates.

These are just some of the newest achievements in the Gardens' 160-year history. Visitors celebrated this milestone by enjoying exhibitions on the evolution of Singapore's landscapes over the past two centuries and the growth of birding within our community, as well as a Heritage Festival held in July 2019. In all, the Gardens conducted 650 runs of educational programmes that reached out to over 30,000 participants, and hosted nearly 80 events that attracted more than 283,000 visitors.



Dendrobium gouldii 'Nong' grown by the National Orchid Garden was awarded the First Class Certificate from the Orchid Society of South East Asia.



Rasau Walk at Lakeside Garden takes visitors right down to the water's edge and is the perfect place to welcome a brand new day.

JURONG LAKE GARDENS WELCOMES VISITORS

Lakeside Garden, the 53-ha western section of Jurong Lake Gardens, was opened in April 2019. In conjunction with this, it also welcomed guests to the inaugural Singapore Garden Festival Horticulture Show. An offshoot of the main Singapore Garden Festival, this biennial horticulture show is set to be a mainstay at Jurong Lake Gardens, our first national gardens in the heartlands.

Within the first fortnight of its opening, Lakeside Garden welcomed close to a million visitors. This is testament to its position as a people's garden, with landscapes and spaces created for families to come together. Lakeside Garden has gone on to host other programmes such as gardening masterclasses, festivals, a monthly bazaar, guided walks and workshops to further engage the community.

The other two segments of the 90-ha Jurong Lake Gardens – Chinese and Japanese Gardens as well as Garden Promenade – will open progressively from 2022.

Scan QR code to view what goes into the making of a People's Garden: Jurong Lake Gardens:



RECREATING HISTORICAL EXPERIENCES AT FORT CANNING PARK

Fort Canning Park hosted The Bicentennial Experience, the centrepiece of Singapore's bicentennial commemoration, from June to December 2019. In the lead-up to this, nine historical gardens – the Pancur Larangan, Artisan's Garden, Sang Nila Utama Garden, Jubilee Park, Raffles Garden, First Botanic Garden, Farquhar Garden, Spice Garden and Armenian Street Park – were opened, with refreshed wayfinding and trail guides for visitors to plan for their own exploration of the hill.

Visitors can also learn from a range of educational programmes such as simulated archaeological digs while enjoying easier access to the park, thanks to the installation of escalators and the pedestrianisation of Canning Rise and Armenian Street. Since these enhancements, over 760,000 people have visited, soaking in the rich historical and natural heritage of the hill.

There will also be more links between the park and nearby historic green and blue spaces in the city centre. In February 2020, NParks and the Urban Redevelopment Authority unveiled plans to transform Orchard Road into a lush green corridor, part of a 6km-long green connection from the Singapore Botanic Gardens to the Singapore River. The plan includes elevated and underground pedestrian links as well as sheltered linkways to bridge Istana Park at Orchard Road to Fort Canning Park and the Singapore River.

REJUVENATING EAST COAST PARK

There are now even more recreational facilities to enjoy in East Coast Park. Cyclist Park, a one-stop hub for cyclists, was opened in November for visitors to practise cycling techniques at two new circuits. Visitors can also enjoy a nature playgarden as well as F&B and retail outlets, while taking in the beautiful vistas of the nearby sea.

The opening of Cyclist Park, a stop along the Round Island Route, is part of the on-going rejuvenation of East Coast Park which will be completed in 2021 with the reopening of Big Splash.



Named after Singapore's first ancient king, the Sang Nila Utama Garden reimagines the Southeast Asian gardens of old, and is one of nine historical gardens in Fort Canning Park.



Hone your cycling technique by navigating the 500m long Advanced Circuit in Cyclist Park at East Coast Park that includes undulating tracks, sharp turns and a narrow bridge.

CAPTURING THE KAMPUNG SPIRIT IN SEMBAWANG HOT SPRING PARK

The rustic and natural Sembawang Hot Spring Park was reopened in January 2020 after multiple engagement sessions with the community. The feedback received resulted in features such as cascading pools and a water collection point to bring the geothermally heated groundwater closer to visitors.

Singapore's only hot spring park holds many collective memories for residents and NParks tapped on this "kampung-like" spirit while designing and building this unique site.



After a long day, everyone can appreciate soaking their tired feet at Sembawang Hot Spring Park that was reopened in January 2020.



Telok Blangah Hill Park's lush greenery envelops its Therapeutic Garden, creating a restorative environment that engages your senses and uplifts your overall well-being.



Nature playgardens (such as these in Jurong Lake Gardens and HortPark) comprise curated play features for children to engage in spontaneous play and are designed to be set in nature, for the young to come in contact with plants and observe fauna while they play.

HOLISTIC BENEFITS OF THERAPEUTIC GARDENS AND NATURE PLAYGARDENS

Singapore's newest therapeutic garden opened at Telok Blangah Hill in March 2020. It offers a mid-canopy view of the forest layer and leverages therapeutic elements of Telok Blangah Hill Park's natural forest setting. This is the fifth such garden in our growing network of therapeutic gardens, with the target to establish 30 such gardens by 2030. To date, over 120 Therapeutic Horticulture sessions have been conducted in these therapeutic gardens, benefitting 1,400 participants.

The therapeutic gardens are deliberately planned to facilitate people's interactions with nature and improve their mental well-being. Interim findings continue to indicate benefits of having such contemplative green spaces nestled within our communities.

Increased self-confidence, creativity and overall well-being are amongst some of the outcomes reported in children who play outdoors in specially curated nature-themed areas.

Encouraged by such positive feedback after the opening of our first Nature Playgarden in HortPark in early 2019, NParks has opened 13 more of such spaces, with plans to expand this network.

Nature Playgardens are set within nature and use natural materials to encourage creative play and decision making, allowing the young ones to explore a different form of play compared to a typical playground.



Can you spot the four layers of planting at the Kheam Hock Nature Way? The emergent, canopy, understorey and shrub layers facilitate the movement of birds and butterflies between green spaces.



Download the C2C Mobile App to accompany you along the 36 km Coast-to-Coast Trail. Use the app to enjoy games and pick up interactive information for a unique curated walking experience.



With pretty plantings like these Garlic Vine (*Mansoa hymenaea*) along covered linkways at Ang Mo Kio Avenue 8, everyone can enjoy nature even while they commute.

STRENGTHENING GREEN LINKS

NParks aspires to make every road a Nature Way with the objective of achieving 180 km by 2030. In 2019, we completed 30 km of Nature Ways along our streetscapes. New stretches were created in locations such as Woodlands, Toa Payoh and Jalan Jurong Kechil.

Nature Ways are designed to replicate the natural structure of forests. Trees, shrubs and groundcover are planted to re-create habitats similar to those found in the emergent, canopy, understorey and undergrowth layers in forests. Flowering plants in Nature Ways also attract butterflies and birds.

Another 10.7 km of park connectors were built in the reporting year, extending our Park Connector Network to more than 340 km.

These included park connectors at Old Upper Thomson Road, Dairy Farm and Seletar, enabling residents to access and enjoy nature while travelling between communities more readily.

Significant progress was made in the rollout of the Round Island Route with the opening of the Coast-to-Coast (C2C) Trail which stretches from Jurong Lake Gardens to Coney Island Park.

More than 26,000 users have registered to use the C2C mobile app with many completing challenges along the 36 km trail to win attractive prizes. More than 50 km out of the 60 km Round Island Route has been completed.

GREENING PUBLIC INFRASTRUCTURE

Singapore's landscape has been enhanced with the planting of about 134,000 trees. This includes about 8,750 native plants that replaced storm-vulnerable species.

The work to green up public infrastructure such as pedestrian walkways and bus shelters has also been intensified.

The latest additions to our 71 greened MRT stations are Woodlands North, Woodlands, Woodlands South and Springleaf stations. In addition, over 26 km of covered linkways have been planted with trellis climbers, making commuters' journeys even more pleasant.

NParks is also working with our counterparts to transform Singapore into a City in Nature. More than 110 community facilities managed by the Ministry of Education, Ministry of Health, People's Association, SportsSG and National Library Board were greened up with nearly 4,000 trees planted in schools, nursing homes, community centres, integrated developments and sports facilities.

ELEVATING OUR SKYRISE GREENERY

In 2019, another 5.7 ha of rooftop greenery was added, increasing the skyrise greenery across Singapore to 120 ha. At the same time, officers reached out to more than 220 buildings and facilities owners on horticulture maintenance matters, advising on mitigation measures for existing installations. NParks aims to have 200 ha of skyrise greenery by 2030.

Scan QR code to learn more about what goes into how NParks cares for trees and greenery in Singapore:



Plants with colourful foliage can now be found along our streets. These vibrant splashes of red, yellow, orange and green beautify our environment and bring natural colours into our everyday lives.



CONSERVING OUR CITY IN NATURE

An important part of NParks' work lies in protecting Singapore's rich biodiversity so as to conserve our natural legacy for future generations of Singaporeans.

ENHANCING HABITATS AND SPECIES RECOVERY

A notable highlight of our species recovery programme for native biodiversity in the past year was the successful captive brooding of the critically endangered and endemic Swamp Forest Crab (*Parathelphusa reticulata*). Over 300 crablets were produced in captivity, complementing earlier success with the captive brooding of the Singapore Freshwater Crab (*Johora singaporensis*).

NParks successfully translocated batches of the Harlequin butterfly (*Taxila haquinus*) to Pasir Ris Park and Sungei Buloh Wetland Reserve while new populations of the Cinnamon Bush Frog (*Nyctixalus pictus*) were successfully translocated to suitable sites outside nature reserves.

The Species Recovery Programme was updated with a current total of 67 plant species identified in the first volume of the *Flora of Singapore* published in October 2019. Over the past year, the Native Plant Centre and Singapore Botanic Gardens successfully propagated more than 6,000 plants. Over 2,000 of these were subsequently planted in more than 30 sites in our nature reserves, streetscapes, and parks.

Three orchid species were also reintroduced into the Central Catchment Nature Reserve, while seven orchid species had hundreds of individuals propagated. For the first time, seeds of rare species such as *Lophopetalum pallidum* were collected during the 2019 masting event. *Zingiber singaporense*, Singapore's endemic ginger species, was also made available to the public for the first

time in May 2019's edition of the Gardener's Day Out event. This species, along with three others, were propagated via tissue culture.

In conservation research, some 200 species new to Bukit Timah Nature Reserve were listed during a comprehensive survey conducted by NParks together with researchers from various institutions and enthusiasts. Amongst them were at least 30 species of spiders and 10 species of beetles that are potentially new to Singapore. These findings contribute to the increasing scientific value of the Reserve and emphasise how it should continue to be safeguarded.

Work has started on the Southern Islands Biodiversity Survey. To be carried out with the involvement of academia and nature interest groups, findings from this two-year long survey will help formulate biodiversity management plans for the southern waters. It will also provide opportunities to collect rare or endangered species for propagation and to engage in deeper outreach and education on Singapore's biodiversity.

Other conservation research efforts include the conclusion of a study on seagrass resilience and connectivity that has led to a better understanding of the interaction between pockets of biodiversity, as well as ongoing work to keep Singapore's coastal and marine habitat map updated. This will help in assessing habitat changes and preparing a shoreline type map suitable for oil spill response planning purposes.



Surveys of the Bukit Timah Nature Reserve uncovered around 200 species new to the Reserve, including the 15 cm long Brown-chested Jungle Flycatcher (*Cyornis brunneatus*) and the Yellow-striped Caecilian (*Ichthyophis paucrisulcus*) that has been recorded only a few times locally.

SCALING UP MARINE CONSERVATION

NParks is conducting trials on using satellite tagging technology in our efforts to conserve the Hawksbill Sea Turtle (*Eretmochelys imbricata*) and Green Turtle (*Chelonia mydas*). Over 400 staff and volunteers have been trained to spot the signs, monitor and even track movements of nesting turtles. A total of 32 nests were found, of which 16 were viable with about 1,200 hatchlings emerging from these. Results derived will give better insight into turtle nesting behaviour and migratory patterns.

In a related conservation project, some 70 corals have been outplanted at Sisters' Islands Marine Park, while another 25 coral nubbins are being cultured as part of the Plant-A-Coral, Seed-A-Reef programme at St John's Island. Upgraded aquarium facilities on the island also mean more coral species can be collected for species recovery.

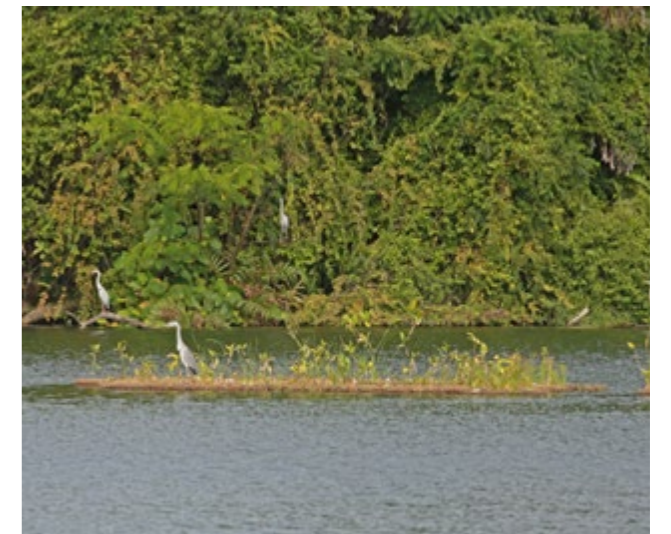
CARING FOR UBIN'S BIODIVERSITY

Pulau Ubin is an important sanctuary for flora and fauna and one of our last bastions of kampung life. To conserve this biodiversity, more floating wetlands have been introduced to give wildlife such as herons, cranes and kingfishers additional habitats to shelter and nest.

In the past year, students took part in pilot experiential learning journeys led by the Friends of Ubin Network (FUN) community and teachers. This will culminate with the inaugural learning symposium to be held in 2021,

where educators can develop ideas to deepen engagement and inspire students on Ubin's rich biodiversity and heritage.

A Community Liaison Team was also set up to keep in close contact with, gather feedback from and address the concerns of villagers. As part of revitalising and retaining Ubin's heritage, NParks has repaired two kampung houses and will follow up with another six. These plans were announced and celebrated at the eighth Ubin Day on 29 June 2019.



Then Minister for Social & Family Development and Second Minister for National Development Desmond Lee observes herons on the floating wetlands in Pekan Quarry on Pulau Ubin while NParks CEO Kenneth Er points out the biodiversity.

RECOVERING THE RAFFLES' BANDED LANGUR

Conservation efforts for the Raffles' Banded Langur (*Presbytis femoralis femoralis*) were boosted with the opening of the 50-ha Thomson Nature Park in October 2019. More than one third of the native trees planted are known to be food plants of the langurs while ecological connectivity across Old Upper Thomson Road, which buffers the site, was enhanced during the park's development.

NParks worked with the Raffles' Banded Langur Working Group to identify locations to situate rope bridges for the safe movement of the langur and other arboreal animals. In a first for Singapore, a Roadway Animal Detection System (RADS) that uses video analytics to detect animals when they are near the road and alerts oncoming motorists, is being tested along Old Upper Thomson Road.

Scan QR code to view a video of langurs crossing a rope bridge:



The Raffles' Banded Langur has a black coat, prominent white eye rings and a white stripe down its chest, belly and inner thighs. Research indicates there are only about 60 individuals living in the Central Catchment Nature Reserve.

PROTECTING OUR WETLANDS

The protection of wetlands and its ecosystems remains a core part of conservation work. In July 2019, Sungei Buloh Wetland Reserve hosted the Mangrove, Macrobenthos and Management Conference – a series of international meetings focused on the understanding, conservation and sustainable use of mangrove ecosystems worldwide. Held in Southeast Asia for the first time, the event attracted more than 320 participants from nearly 40 countries.

In the reporting year, Singapore was also the lead country for the ASEAN Flyway Network (AFN). NParks conducted surveys and a bird census under the network that serves to enhance cooperation in the conservation of wetlands and migratory waterbirds in Southeast Asia.



The Whimbrel (*Numenius phaeopus*) is a frequent visitor to Singapore, one of several thousand birds that fly from their breeding grounds in the Northern hemisphere to tide over the cold winter months in Sungei Buloh Wetland Reserve.



AVS works closely with the veterinary and animal-related industries with the aim of strengthening capacities and enhancing competencies in animal health and welfare.

SAFEGUARDING PUBLIC AND ANIMAL HEALTH, AND PROMOTING CO-EXISTENCE

To strengthen efforts in conserving Singapore's rich biodiversity, NParks adopts a science-based approach to manage the wildlife, and companion and community animals in our city, by employing ecological and social tools to minimise human-animal conflicts.

The transfer of animal-related and plant science functions to NParks coupled with the formation of the Animal & Veterinary Service (AVS) in April 2019 is a boost to Singapore's multi-disciplinary approach to conservation. Combined expertise from ecologists, conservationists, veterinarians and laboratory diagnosticians enables NParks to better manage increasingly complex challenges.

As human, animal and environmental health are intrinsically linked to one another, NParks participates actively in local interagency workgroups (One Health AMR Workgroup) and also represents Singapore at the World Organisation for Animal Health (OIE), where new international standards and guidelines on animal health and welfare are adopted.

At home, AVS ensures animal welfare, as well as public and animal health through efforts such as licensing and overseeing the management of pet shops, ornamental fish farms and captive bird farms. It also conducts surveillance of livestock like chickens, food fish at local farms and border checkpoints.

These inspections, including on poultry from Malaysia and pigs from Malaysia and Indonesia help ensure that the animals are healthy and meet Singapore's animal health import requirements.

To further safeguard public and animal health, some imported dogs and cats, which tend to be more susceptible to incur rabies, are quarantined upon arrival. For this FY, coastal fish farm dogs continued to benefit from AVS' annual free rabies vaccination exercise held together with veterinarians and volunteers from polytechnics.

Scan QR code to view how NParks manages wildlife in our City in Nature:



MANAGING HUMAN-ANIMAL INTERACTIONS THROUGH SCIENCE

The nationwide Trap-Neuter-Release-Manage programme for stray dogs, a collaboration with animal welfare groups, veterinarians and the community, is bearing fruit. From its launch in November 2018 up to January 2020, over 1,100 stray dogs have undergone the programme and more than half have found new homes, were fostered or sheltered. Through positive, evidence-based techniques, AVS was able to successfully rehome stray dogs that were initially unsocialised.

For the management of invasive bird species, NParks similarly takes a holistic science-based approach that incorporates removal of food sources from humans, habitat modification, population control strategies, and studies to understand the population ecology of the birds. To reduce pigeon populations, NParks is working with partner agencies and the community on proper waste management, surveillance, public education and enforcement against feeders and litterbugs.



Since June 2019, AVS has oversight of 10 equine establishments in Singapore, allowing for better surveillance for potential diseases to be detected, contained and treated early.

PROTECTING PLANTS AND ANIMALS THROUGH CITES

Singapore is a signatory to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and NParks is the national authority responsible for the implementation and enforcement of CITES in Singapore. We take a zero tolerance stance on illegal trade and keeping of CITES-listed species (including their parts and derivatives), as well as the use of Singapore as a conduit to smuggle or engage in illegal trade of CITES-listed species.

NParks works closely with the Singapore Customs and the Immigration & Checkpoints Authority in the global effort to stem illegal trade in CITES-listed species. Between April and July 2019, a record total of 37.5 tonnes of pangolin scales and nearly 9 tonnes of elephant ivory were seized to prevent them from re-entering the market. This position to protect endangered wildlife was strengthened with the announcement to ban domestic trade in elephant ivory.



AVS works with the ornamental fish industry by supporting companies as they sharpen their competitive edge in the global ornamental fish market.



To upkeep Singapore's status in being rabies-free since 1953, AVS oversees quarantine and vaccination requirements on imported dogs and cats and conducts annual rabies vaccination.

With effect from 1 September 2021, the sale of elephant ivory and ivory products and public display of elephant ivory and ivory products for the purpose of sale will be prohibited in Singapore.

To strengthen capacity in this area, NParks is building up our forensic capabilities. This science can determine the origin of seized species which in turn helps in the tracking of the source of the illegal trade. NParks researchers work with international counterparts in sampling seized consignments. We have also conducted forensics on wood smuggled illegally into Singapore to ascertain their species and origin.

Scan QR code to view what happens to seized ivory:



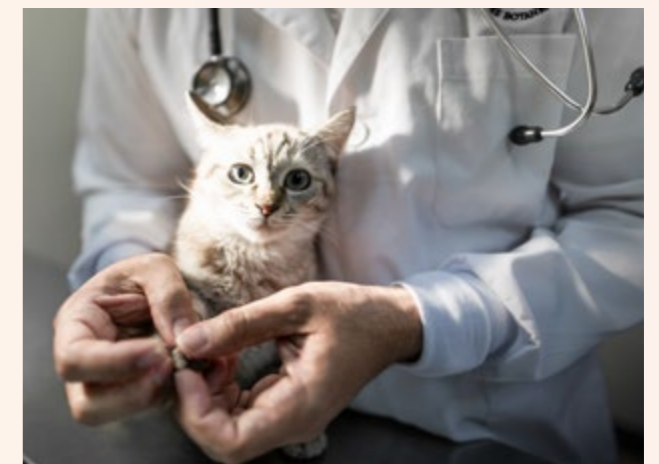
Some 8.8 tonnes of ivory, believed to have come from nearly 300 African Elephants, was seized in July 2019. Singapore is committed to the global effort to stem illegal trade in CITES-listed species, including their parts and derivatives.

COMBATING ANTIMICROBIAL RESISTANCE

Antimicrobial resistance (AMR) is a growing global health threat. As microbes become increasingly resistant to antimicrobial agents such as antibiotics, our ability to treat infections becomes compromised. Animals with antimicrobial-resistant bacteria can suffer from infections that are more serious and such bacteria may be transmitted between animals and humans.

To safeguard human and animal health, as well as animal welfare, AVS adopts a One Health approach and works with partners including the AMR Coordinating Office under the National Centre for Infectious Diseases, Ministry of Health, National Environment Agency, PUB, Singapore's national water agency and Singapore Food Agency to implement the core strategies under the National Strategic Action Plan on AMR.

To combat AMR, AVS licenses veterinarians, feed mills, and food farms in Singapore, and specifies the types of antimicrobials that cannot be used in animal feed and food-producing animals. In 2019, AVS also started working with the Singapore Veterinary Association on the inaugural National Vaccination Guidelines for Dogs and Cats, with the objective to improve vaccination rates and practices, promote preventative health and contribute to our efforts to tackle AMR.



What is AMR? It refers to the ability of microorganisms, such as bacteria, viruses, fungi and parasites, that hinders an antimicrobial, such as antibiotics, antivirals, antifungals and antiparasitics, from effectively preventing and treating the former.

While much of the work that AVS does (such as surveillance, risk assessment and research) is conducted behind laboratory doors, pet owners can also help play their part to mitigate AMR. Efforts to collectively combat AMR include ensuring the prudent usage of antibiotics, focusing more on preventative health strategies (e.g. vaccination, good hygiene) and encouraging pet owners to use only prescribed antibiotics and avoid using or sharing leftover medication with other pet owners. AVS has also been leveraging outreach initiatives such as surveys and exhibition panels at Pets' Day Out to heighten public awareness of AMR. These help to highlight the impact AMR can have on our daily lives.



NURTURING OUR CITY IN NATURE

Singapore's progress towards a City in Nature is driven in large part by the community – the volunteers, residents and partners who have come together as stewards of our green environment.

BUILDING A COMMUNITY OF NATURE LOVERS

Residents have more opportunities to partner NParks even more closely to co-create and develop parks. In January 2020, some 9 ha in the future Pasir Panjang Park was set aside for stakeholders to reimagine the park-going experience. This means the community will work hand-in-hand with NParks in the park's design, development and management, resulting in Singaporeans having a bigger stake in shaping our homes.

More than 50 parks over the next five years will be included in this effort with the engagement process tailored to each location, according to the park's history and the demographics of its surrounding residents. This is an extension of the existing NParks Friends of the Parks initiative and part of the Singapore Together movement.

The contributions of the Friends of the Parks communities continue to make a difference in the greening of our island. For instance, members of the Friends of TreesSg community worked with United World College of South East Asia to plant trees in Jurong Lake Gardens in June while members of the Friends of Park Connector Network community helped to green up the bare spaces along park connectors running underneath MRT viaducts.

In addition, the Friends of Marine Park community has been co-developing activities its members will help curate on St John's Island. These will include cultural, experiential and recreational programmes as well as research and experiments to study the surrounding marine life.



Eager to learn about conservation efforts? NParks is enhancing outreach and community-led initiatives to train and empower youth to exercise stewardship and share their knowledge with peers and the wider population.



Then Minister for National Development and Second Minister for Finance Lawrence Wong joins participants of an engagement activity, where they can contribute ideas and help design part of the future Pasir Panjang Park.



Participating in an intertidal watch to record creatures found in the intertidal zones is a great way for the community to be actively involved in conserving and studying our marine life.

To date, NParks has some 48,000 volunteers who assist in a wide range of activities including conducting guided walks, conservation programmes and biodiversity surveys. For example, in August, volunteers responded to a call to scour Bukit Timah Nature Reserve for the fruits of Dipterocarps. Many of the Dipterocarps from the *Shorea*, *Hopea* and *Dipterocarpus* genera form the emergent layer of our forests. A prolonged dry spell earlier in 2019 had triggered a mass fruiting and the seeds collected by volunteers were subsequently prepared for propagation at the nursery.

The artistic capabilities of volunteers were also activated. In October, several volunteers gathered at HortPark to paint logs and enhance the visitor experience at the Bee Trail there. In another hands-on activity led by volunteers, members of the mountain biking community came together to fix sections of the Bukit Timah mountain bike trail affected by erosion. Cycling enthusiasts including those from the Friends of Park Connector Network community also participated in islandwide rides as part of efforts to encourage residents to use the Park Connector Network in a responsible and safe manner.

The community has also been actively involved in conserving Singapore's natural heritage. In 2019, 4,900 citizen scientists participated in Community in Nature (CIN) biodiversity surveys including Bioblitz, Garden Bird Watch, Butterfly Watch, Dragonfly Watch and Heron Watch. Meanwhile, more than 115 volunteers also took part in Intertidal Watch, to help document and monitor the biodiversity of intertidal habitats along Singapore's coast.

Over the last few years, members of the business community have been increasingly working with NParks to green up Singapore. In October, JTC Corporation and NParks announced plans to intensify the greenery on Jurong Island, including the planting of 30,000 trees over three years. The additional greening of industrial estates will help cool temperatures, mitigate the Urban Heat Island effect, as well as enhance the site's attractiveness for business and talent.

Meanwhile up north in Seletar Aerospace Park, visitors can enjoy the first wetlands park in an industrial estate. Hampstead Wetlands Park was jointly developed by JTC Corporation and NParks, with a naturalistic habitat created from an existing pond through sensitive landscaping and the planting of many native tree species. This habitat enhancement project is part of the first community greening programme for an industrial estate. (Please refer to Garden City Fund on page 48 for more information.)



Whether you are a heritage buff or a nature lover, events like Remembering Rail Corridor attract a healthy number of participants, reflecting the various stakeholders within the community who work together in our conservation and greening efforts.

COMMUNITY TAKES THE LEAD IN CONSERVATION EFFORTS

Residents can look forward to more recreational spaces along the Rail Corridor (Central). On-going works such as trail improvement, habitat enhancement and restoration to infrastructure will create a lively community node for all to enjoy when ready.

Several stretches of the southern half of the Rail Corridor have been opened with the Friends of Rail Corridor community, part of NParks' Friends of the Parks initiative, leading the way in activating these spaces through events and community involvement. For example, nearby residents and students from schools in its vicinity gathered for the Remembering Rail Corridor event held at the Bukit Timah Railway Station. They took part in curated walks to learn about nature photography, as well as the birds and heritage of this unique green space.

The community is also leading the way in the development of the future Rifle Range Nature Park. Organisations as well as schools and neighbourhood groups such as Keppel Corporation, Ngee Ann Polytechnic and volunteers from Bukit Timah Community Club and Friends of Bukit Timah Forest community came together over the past 12 months to remove *Dioscorea sansibarensis*, an invasive climber that smothers other plants, from the nature park. Such activities help secondary forests to regenerate.

Similarly, the Friends of Chestnut Nature Park community worked with students from the National University of Singapore to plant 100 trees and taught enthusiastic residents in the neighbourhood how to conduct guided tours to educate even more people about the flora and fauna in the park.

CELEBRATING BIODIVERSITY

A series of events and activities was organised during Biodiversity Week for the community and schools to commemorate the International Day of Biological Diversity, observed globally on 22 May. Kickstarting the week was a Nationwide BioBlitz cum Habitat Enhancement programme held in Kent Ridge Park, where surveys of birds, bees and butterflies were conducted. Volunteers also led the way in planting some 100 trees in various locations such as Chestnut Nature Park and Coney Island Park.

This NParks Community in Nature (CIN) initiative drew 650 participants from schools and corporate groups. A total of 444 species was recorded in 22 sites and more than 90 species of plants were planted across 13 sites.

Biodiversity Week for Schools was celebrated by more than 38,000 students from over 360 schools, who participated in a series of fun and educational activities. These culminated in the 8th Festival of Biodiversity held on 25 and 26 May 2019 at HDB Toa Payoh Hub. It attracted more than 25,000 participants eager to learn about conservation efforts and to celebrate Singapore's natural heritage.

On the international front, NParks organised the ASEAN-India Workshop on Urban Biodiversity and Application of the City Biodiversity Index from 24 to 26 September 2019. Attended by participants from ASEAN countries and Indian cities, this workshop highlighted the importance and value of urban biodiversity and ecosystem services and was a platform for participants to share and learn from each other. It was also a means for NParks to share information about the City Biodiversity Index as a monitoring tool and encourage participants to apply it when evaluating their biodiversity conservation efforts.

NParks also hosted the 2nd Biophilic Cities Network Summit, organised by the Biophilic Cities Network, from 17 to 19 October 2019. Participants representing some 26 cities and organisations discussed biophilic solutions and their practical applications in cities, and visited some of our parks and nature areas to learn firsthand from staff there. Prior to this, participants attended a workshop to discuss the application of the Singapore Index on Cities' Biodiversity in light of emerging trends in urban biodiversity conservation.

Scan the QR code to view highlights of the Biodiversity Week for Schools:



President Halimah Yacob joins the young participants in an art and craft activity at the Festival of Biodiversity 2019. This annual event enables the community to learn more about the flora and fauna that inhabit our City in Nature.



CHIJ Kellock Primary School students join hands to plant trees in their school on the International Day of Biological Diversity. This is part of Green Wave, a worldwide biodiversity campaign that encourages the young to protect our natural environment.

IMPACTING THE YOUNGER GENERATION

NParks continued its collaboration with My First Skool, helping to set up more than 70 community gardens in its centres and conducting garden design workshops for over 150 of its educators during the year in review. This complements the "Every Child a Seed" programme that provides planting kits with seeds of edible plants for about 40,000 primary school children yearly.

Beyond gardening, over 19,000 children from 271 pre-schools learnt about marine biodiversity through a video and interactive activity book that follows a dugong in search of its octopus friend, under the 2019 NParks CIN Biodiversity Week for Schools programme.

To reach out to pre-school educators and parents, NParks promoted the value of outdoor learning at the annual Early Childhood Conference which attracted over 14,000 visitors over two days in September.

NParks also reinforced the importance of responsible pet ownership and civic-minded behaviours through talks and show-and-tell

sessions that reached out to about 1,500 pre-schoolers for the year in review. Two new plays – "Lost and Found" and "We Beelong Together" – were staged for over 700 pre- and primary school students from January to March 2020. New paper craft activities were also created for about 40,000 Primary 4 students to encourage hands-on play whilst teaching them about pet-care and animal ethology.

Under the CIN Citizen Science school programme, 405 schools and 58,000 students were mobilised for biodiversity outreach, with 803 students trained to be CIN Student Ambassadors, championing the conservation message among their peers.

NParks also engaged young adults through a second run of the Biodiversity Friends Forum Biodiversity Challenge for youth which was held from February to June 2019. Participants attended field trips and spearheaded conservation-related activities to promote coexistence with wildlife and a deeper appreciation for Singapore's biodiversity.

Scan QR code to view a video and learn more about the Every Child a Seed programme:



The young have an innate interest in the natural world, such as this little boy who spots a caterpillar at the NParks booth at the Early Childhood Conference. Throughout the year, we use interactive plays, activity books and field trips to continually pique children's curiosity about the plants and animals around them.

HORTICULTURE SHOW MAKES ITS DEBUT

Visitors were welcomed into a world of aquascapes and marveled at impressive displays of plants such as aroids, begonias, bromeliads and succulents in a horticulture competition. These were just some of the highlights of the inaugural Singapore Garden Festival (SGF) Horticulture Show held at Jurong Lake Gardens from 27 April to 5 May 2019.

To generate greater interest in skyrise greenery, the inaugural Vertical Greenery Competition was held in conjunction with the show.

Selected finalists from the landscape industry re-imagined vertical greenery installations in our city landscape, demonstrating again that anyone can incorporate greenery into their lives.

This biennial show, an offshoot of the popular SGF, is a showcase for tropical horticulture excellence and platform for local industry partners, students and the community to display their talent and creativity.



Children learn about aquascapes, also known as underwater gardens, at the SGF Horticulture Show. Adults also discovered how these can be seamlessly incorporated into interior design to create a biophilic environment in the home.



Have you "liked" the AnimalBuzzSG Facebook page yet? This platform provides useful care tips to busy pet owners who can also pose pet-related questions to our veterinarians and animal behaviourists.

EXTENDING OUR ONLINE REACH

NParks expanded its online presence this past year, launching the NParks Buzz Telegram channel in end-2019. It attracted about 2,000 subscribers in four months. This extends our reach to the e-community, where we now have some 123,010, 38,150 and 37,500 fans and followers on the NParks Facebook, Instagram and Twitter accounts respectively.

To connect with even more people, NParks started AnimalBuzzSG on Facebook to build an active animal-loving community and to raise awareness on animal ethology. Fans of this new group can also pose questions and receive advice on pet-related matters from NParks' veterinarians.



The NParks Concert Series in the Park: Rockestra® is a platform for local artistes to showcase their talents as well as an opportunity for the community to gather and enjoy time in our green spaces.

SOMETHING FOR EVERYONE

Whether you are a foodie, pet owner or adventure seeker, everyone can enjoy our green spaces. There were more than 3,300 events held this past year, attracting close to 1 million visitors in total.

The ever-popular NParks Concert Series in the Parks: Rockestra® was held on three occasions and attended by more than 15,000 music fans. It was a highlight of the Parks Festival which was held on 26 and 27 October at Esplanade Park and Empress Lawn. Close to 20,000 visitors to the Festival were treated to fun activities and good food set among verdant greenery in the heart of the city.

Heartlanders had the chance to enjoy green and sustainability-related activities at the Clean and Green Singapore Carnival held in Jurong in November 2019.

Grassroots leaders planted Small-leaved Nutmeg (*Knema globularia*) trees, an important local economic crop in Singapore's past, as part of the festivities. This annual event is organised by 11 government agencies and more than 20 non-governmental organisations, community partners and schools.

In another community activity, residents from Queenstown gathered in August to learn about the Heritage Trees in their neighbourhood.

Heritage buffs also had the chance to visit three scenic Heritage Roads – South Buona Vista Road, Mount Pleasant Road and Mandai Road – that are lined by majestic Heritage Trees. Organised by NParks, such learning journeys help reveal the stories of such trees to residents.

COMMUNITY GARDENING TAKES ROOT

Community gardening has truly taken root in the hearts of residents. Some 96 new outdoor and 41 indoor gardens were established in the past year, bringing the total number of Community in Bloom (CIB) gardens to more than 1,500 across Singapore.

Demand for the allotment gardening scheme continues to sprout. There are now more than 1,000 allotment gardening plots across 11 parks. Meanwhile, Evergreen Garden, the first community allotment garden, was opened in Jurong Spring constituency in December 2019, enabling residents to tend to their vegetables literally at their doorstep.

As part of the Edible Horticulture Masterplan, CIB organised a series of workshops on edibles growing for more than 1,000 allotment and

community gardeners. To meet the interest in this area, NParks collaborated with the Housing & Development Board to launch more plots including up to nine land parcels of 1,000 sqm each earmarked as allotment gardens in Tengah New Town.

A highlight for gardeners was the Community Garden Festival, with its third edition held at Jurong Lake Gardens in November 2019.

Themed Gardening through the Years, the three-day festival featured an outdoor centrepiece created by over 100 CIB gardeners and ambassadors while some 900 participants of the Community Garden Edibles Competition displayed their amazing vegetables and fruits, wowing close to 80,000 visitors.



Gardening is a great cross-generational activity to bring family members together. The young ones learn patience when tending to plants, while seniors can impart the values of care and consideration to them.

Scan QR code to start on your gardening journey by growing baby greens in a box:



Prime Minister Lee Hsien Loong waters a newly-planted tree, part of a long-held tradition of tree planting towards the greening of Singapore conducted during the annual Clean & Green Singapore carnival.



Deputy Prime Minister & Minister for Finance Heng Swee Keat meets with staff and visitors at the Community Garden Festival that aims to inspire visitors to pick up gardening.

CHAMPIONING ANIMAL WELFARE WITH STAKEHOLDERS

Working with stakeholders like veterinarians, animal welfare groups and pet businesses, the Animal & Veterinary Service (AVS) organised the inaugural Pets' Day Out on 17 August 2019. Visitors brought their pets for health checks conducted by NParks' veterinarians and private veterinarian volunteers while children learnt how to be responsible pet owners through role-play, games and activities at the Petzmania programme. This event served to bring the pet community together and is a regular platform for shelter animals to be rehomed.

Project ADORE (ADOption and REhoming of dogs) is another partnership where AVS has been working with animal welfare groups, with the purpose of rehoming medium-sized local mixed-breed dogs into HDB flats. This past March, this initiative was expanded to include larger dogs, allowing about 20 percent more local mixed-breed dogs to find homes in HDB flats. The expansion also allows more mixed-breed dogs from the Trap-Neuter-Release-Manage programme to be rehomed.

Since December 2019, NParks has been managing The Animal Lodge, a facility for animal welfare groups, independent shelters and pet farms.

Enhancements such as clearer navigation signs and the planting of shady trees have improved the facility's physical surroundings. The service and conservancy charges for tenants have also been reduced, benefitting the animal welfare groups and shelters housed in the compound. More development works are planned for 2020 and 2021.

And with more animals in our communities, pet owners need more areas to bring them out for exercise. There are now 13 dog runs across our island, including two that were opened this past year. With plans to add another six more dog runs over the next few years, both animals and their owners will have even more opportunities to enjoy our green spaces.

Scan QR code to see what happens when some people try dog-sitting for the first time:



LISTENING TO THE PET COMMUNITY

To gather feedback to further strengthen animal health and welfare standards, NParks engaged the public as well as stakeholders in the pet sector, including breeders, veterinarians, academia and animal welfare groups, over four months starting in August 2019.

More than 5,200 responses were received through five focus group discussions and an online public consultation, with a majority saying that a robust animal traceability system was necessary. This is critical for AVS to react quickly to protect public and animal health in the event of a disease outbreak, particularly one that can be transmitted to humans from animals.

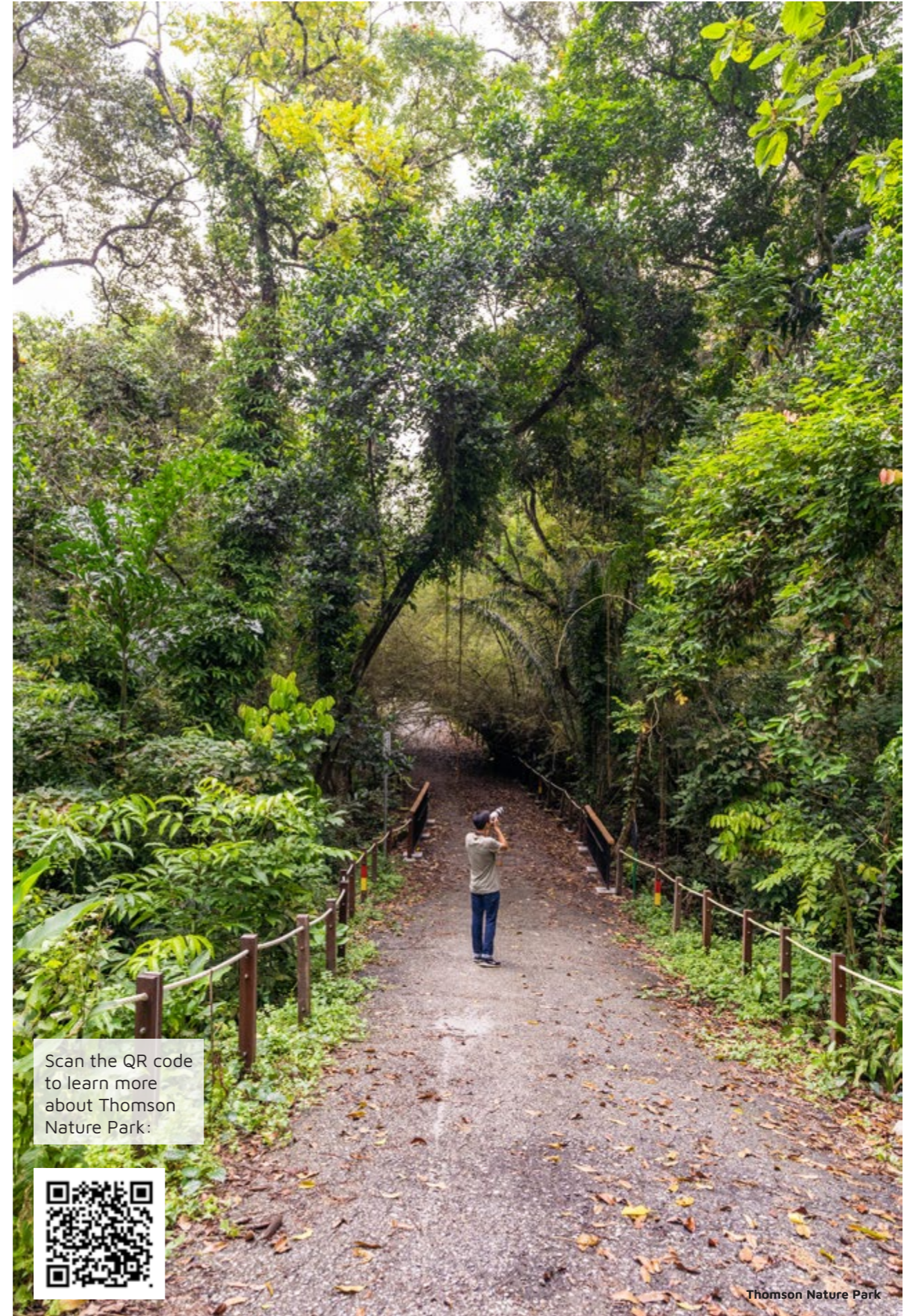
There was also agreement that improvements and higher standards were needed among pet breeders and boarders as well as in the veterinary industry. Currently, AVS is responsible for the regulation of more than 450 veterinarians and nearly 100 licensed veterinary centres in Singapore. With



AVS has been conducting focus group discussions and consultation with members of the pet sector. Issues raised and feedback provided will help shape policies that impact owners and animals.

a 10 percent increase in pet ownership over the last three years, veterinarians now have an even greater role in managing pet health and welfare.

The general public had the opportunity to have their voices heard as part of a public consultation conducted from October to December 2019. Together, such feedback will be used to shape pet-related policies.



Thomson Nature Park



GROWING OUR CITY IN NATURE

The development of industry capabilities and talent will be crucial in achieving Singapore's goal to restore nature back to the city and apply nature-based solutions to strengthen our resilience.

UPSKILLING THE INDUSTRY

As Singapore transforms into a City in Nature, higher-value skills necessary for greenery and landscape management become even more essential. To this end, NParks launched Singapore's Landscape Sector Transformation Plan (LSTP) in May 2019. This tripartite effort led by NParks with companies from the landscape industry, institutes of higher learning, government agencies and the labour movement will elevate and grow the industry through digitalisation, mechanisation and professionalisation.

Besides enhancing core skills in horticulture and arboriculture through science and technology, training will focus on equipping employees with ecological knowledge to better manage natural landscapes. In total, it will upskill the existing 12,000-strong workforce and groom a new generation of landscape talent to manage green spaces in Singapore, expected to grow by 1,000 ha over the next 10 to 15 years.

As part of LSTP, a Skills Framework for Landscape was launched to provide companies and professionals with information on career progression pathways and the emerging and existing skills required in the sector. It also highlights relevant training that facilitates

digitalisation and adoption of technology in the industry.

In other development initiatives, six landscape nursery and three orchid nursery land tenders were launched in the reporting year. To date, more than 18 plots have been awarded including the first orchid plot in the first quarter of 2020. This follows the announcement in January 2018 that NParks will have oversight of the whole orchid industry, so as to consolidate efforts and better develop policies to grow the sector.

Capability building and skills upgrading remain essential to grow the industry – CUGE offered more than 2,500 training and assessment places for Workforce Skills Qualifications (WSQ) programmes, and over 2,200 training places for non-WSQ programmes, in the year in review.

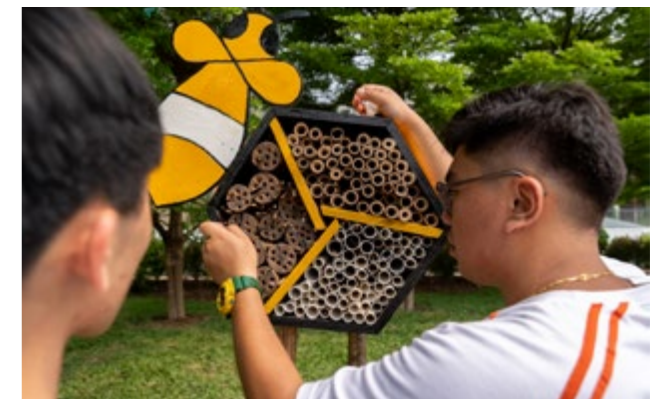
CUGE has also worked with the Animal & Veterinary Service (AVS) to co-develop training for those managing animals and wildlife in our City in Nature. The certification programmes, some to be conducted in 2020, will equip participants with skills and knowledge on animal welfare, health, ecology and behaviour, helping to uplift the capabilities of the industry overall.



The Landscape Sector Transformation Plan will equip the landscape workforce with higher-value skills so as to lift the sector to another level, necessary to transform Singapore into a City in Nature.



As part of plans to develop a pipeline of skilled youth for the landscape sector, NParks is working with ITE for their students to gain valuable hands-on experience in managing a park.



ITE students will learn about park and tree management technologies and gain higher value-added skills and ecological knowledge in a revised academic curriculum. Here, students learn how to fly a micro drone to help in tree inspections and how to build a bee hotel suitable for gardens.

NURTURING THE NEXT GENERATION

Youths play a pivotal role in rallying the community to be active participants in Singapore's greening journey to strengthen ecological and climate resistance.

To invigorate the industry with a pool of skilled younger talent, NParks signed a Memorandum of Understanding (MOU) with the Institute of Technical Education (ITE) in May 2019. The use of technology for arboriculture and horticulture management will be emphasised and students will learn about planting and reshaping landscapes to include native flora to support fauna. Taken together, students will gain higher value-added skills and ecological knowledge, necessary to grow our City in Nature.

As part of the MOU, students gain hands-on experience in managing a park. Since July 2019, selected ITE students have been managing

Bedok Town Park. This includes conducting lawn maintenance and tree inspections using technology such as drones and the micro drill. They can also access Maven, the NParks database, to get essential information on trees and parks while on the go. Following the success of this pilot, the Student-Run Park initiative has been expanded to Clementi Woods Park, led by students from Ngee Ann Polytechnic.

In a further boost for NParks' plans to nurture professionalism and stewardship among youth, the \$10 million NParks-Peter Lim Horticulture and Animal Science Scholarship was set up to support deserving youths from less-privileged backgrounds pursue their interest, support their skills development and build capability in the landscaping, horticulture, ecology, veterinary and animal science sectors.



Do you know what your pet is 'saying'? NParks has been working with specialists to study ethology, or the science of animal behaviour, to equip the public with a clearer understanding of their pets' actions for more harmonious human-animal interactions.

BROADENING KNOWLEDGE

NParks hosted NTUC Health staff from several nursing homes to impart design fundamentals of therapeutic gardens so that their residents can be more immersed in nature. Community in Bloom ambassadors were also trained in basic therapeutic horticulture skills while the third run of the Therapeutic Horticulture Facilitation Workshop was conducted in June 2019, attracting 40 staff participants.

Similar to therapeutic horticulture, NParks is studying the positive effects pets can have on human mental, physical and emotional health. Trials are ongoing in 2020 with selected community groups with plans for a more comprehensive review.

In the area of aquatic animal health, bacteriology, pathology and virology, NParks collaborated with local partners such as DSO National Laboratories and Duke-NUS Medical School and overseas organisations like the Irish Equine Centre and Animal Health Trust in the United Kingdom in areas contributing towards maintaining Singapore's animal disease-free status.

Plans are underway for the setup of a national facility for wildlife forensics to boost capability in this science. Apart from building physical and electronic reference libraries and developing diagnostic test kits for rapid identification, staff will collaborate with international experts to advance knowledge in wildlife forensics analysis.

And to raise standards in the veterinary and welfare needs of companion animals and wildlife, NParks is setting up an animal rehabilitation centre. Besides rescuing, reuniting, rehoming, and rehabilitating animals, the centre will also conduct research for knowledge sharing.

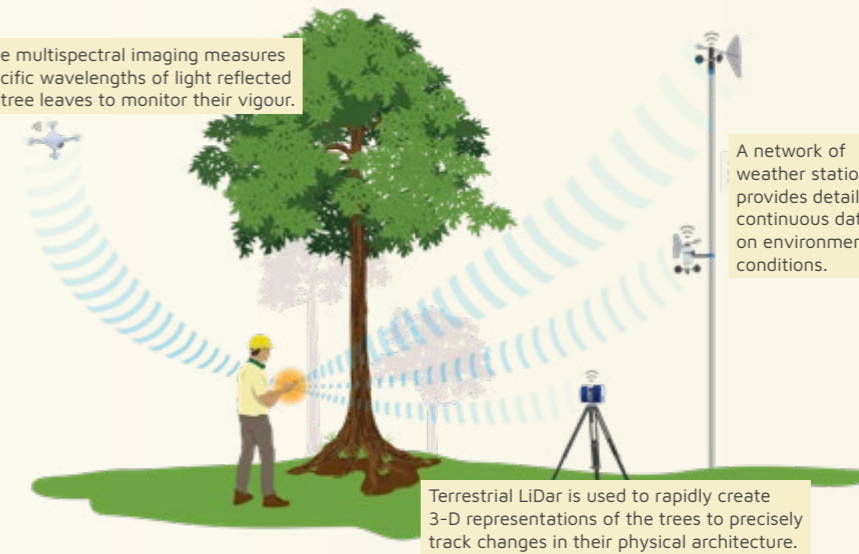
In the field of arboriculture, more than 200 practitioners also gathered to learn and share about current trends and challenges in urban tree management at the 9th Regional Arboriculture Seminar organised by CUGE in September.



Interest in therapeutic horticulture continues to gain traction, with staff and members of the public joining our customised programmes that promote healing and recovery through plant and nature-related activities.

HARNESSING TECHNOLOGY

Airborne multispectral imaging measures the specific wavelengths of light reflected off the tree leaves to monitor their vigour.



A network of weather stations provides detailed, continuous data on environmental conditions.

Terrestrial LiDar is used to rapidly create 3-D representations of the trees to precisely track changes in their physical architecture.

The OCBC Arboretum at the Singapore Botanic Gardens adopts the Ecological Network of Tree Sensors (ENTS) monitoring system. Three main parameters are tracked – the environment the trees are exposed to, their growth and their health – and employs the Internet of Things, environmental sensors and remote sensing (using LiDAR and multispectral imagery) to do so.

NParks continues to tap on technology and digitalisation as a booster for operational efficiency and effectiveness.

To safeguard our nature reserves, NParks is developing a Forest Fire Detection and Monitoring System. Officers can view surveillance information drawn from cameras installed at strategic locations to quickly identify fire conditions and its location. A drone is then activated to provide real-time information on the fire's progress. This prototype system can differentiate varying fire conditions to pre-empt changing weather patterns and reduce the need for staff to physically patrol the nature reserves.

On the water, NParks saw the operation of the Oil Spill Forecast and Decision Support System at Sisters' Islands Marine Park. This system provides an accurate prediction of oil spill trajectories and is complemented with a current and tidal forecast prediction, and a water quality monitoring station.

Over at the turtle hatchery on Sister's Island, smart technology such as Bluetooth water level data loggers and temperature sensors are used to increase hatching success. Turtle eggs are very sensitive to temperature changes: female turtles hatch in warmer temperatures whereas males hatch in cooler environments. Hence nest temperatures are monitored remotely and the sand is kept at about 29 degree Celsius, so that a mix of male and female turtles is more likely to hatch from the clutch.

For the safe movement of wildlife, NParks and the Land Transport Authority launched a pilot trial of a Roadway Animal Detection System (RADS) along Old Upper Thomson Road in October 2019.

The system uses cameras equipped with analytics technology that "recognises" animals to reduce the occurrence of false triggers. Upon detection, linked LED Advanced Warning Signs flash to alert motorists to slow down and look out for animals crossing.

Another tool to monitor wildlife for biodiversity research is thermal imaging equipment. Used to conduct surveys to study Singapore's nocturnal fauna's habits and populations, the equipment enables researchers to observe animals in their natural habitats with minimal disturbance.

Following a period of testing of an electronic tilt sensor placed on mature trees to detect lean, about 200 of such wireless sensors were installed across the island in 2019. This alerts officers to movements of trees so they can assess structural stability under strong wind conditions and take prompt mitigation measures if necessary.

The use of tree-centric analytic models also helps when assessing a tree's structural health as well as in large-scale city-level planning. The large amount of data required for such models normally takes much time and effort, but by using a light detection and ranging sensor (LiDAR), which uses light in the form of a pulsed laser to gather physical dimensions of each tree across the island, this process is shortened and efficiency is improved.

ACHIEVING EXCELLENCE

NParks' investment in staff development has been recognised nationally and globally, highlighting their expertise knowledge, hard work and creativity. NParks' digitalisation solutions in tree management were recognised with the Best Adoption (Public Sector) prize at the SG:D Techblazer Awards 2019. This is the nation's highest accolade for tech innovations and is jointly presented by the Infocomm Media Development Authority and SGTech.

Outside of Singapore, NParks picked up four awards at the International Federation of Landscape Architects Asia-Pacific Region Congress 2019 held in the Philippines. The event champions local and global issues related to landscape architecture such as climate change, cultural adaptation and community resilience.

And at the Beijing Expo 2019, held from April to October in China, NParks represented Singapore with an outdoor display that featured our orchid hybridisation programme and conservation efforts and showcased Singapore's strengths in horticulture as well as capabilities in smart city technologies, urban planning and ecological protection.



About 20 Hort Champs and staff gathered at Pang Sua Park Connector to reintroduce endangered native plants along this route in Choa Chu Kang. These activities enable staff to interact outside of the office and exchange knowledge with each other.

In November 2019, NParks received the third annual Stephen R. Kellert Biophilic Design Award under the Community and Urban Scale category. This international award considers the application of biophilic design principles to the built environment and highlights our success in enabling residents to have immersive experiences with nature while developing new green areas.



Community in Bloom Senior Manager Chai Weili reads a vertical wall display for the Orchid Extravaganza event at Longwood Gardens in the US. He was attached there for his six-month Professional Exchange Programme.



Parks Senior Manager Simon Soh explains to visitors at King's Park in Perth how bread was made by aboriginal tribes of the past. As part of his six-week attachment with the Botanic Gardens & Parks Authority in Western Australia, he assisted with the running of educational programmes for some 30,000 students.

NParks, as part of a multi-agency team, was also recognised with the United Nations Asia Environmental Enforcement Awards 2019 for the work in combating the illegal wildlife trade. Our officers shared intelligence information and carried out joint operations with their Singaporean and Chinese counterparts, leading to significant seizures of illegally-traded wildlife and the arrest and dismantling of cross-regional criminal networks.

Staff who deepen their professional expertise in core job areas by achieving certifications recognised under NParks' Vocational and Skills Allowance Framework are eligible for a monthly allowance. This revised allowance framework with enhanced quantum will begin in mid 2020 and is a boost to the organisation's continuous learning efforts. (Please refer to the Sustainability Report on page 50 for more information.)

NParks awarded seven undergraduate scholarships, three overseas merit awards and four postgraduate scholarships to in-service officers in 2019. Two officers commenced their professional exchange programme at Australia and the United States in August and September, respectively. Together, these will help to continually grow NParks' talent pool.

The exchange of knowledge by NParks' Hort Champs remains important to promote learning within the organisation. They conducted workshops on a wide range of topics such as the identification, management and conservation of native bees; mangrove ecology and management; managing pest and disease; and plant identification, effectively facilitating the flow of ideas. Hort Champs are staff who participate in such workshops and field trips and then share knowledge with staff and visitors to our parks and gardens.

The quarterly Hort Colloquiums continue to be a valuable platform for discussion and sharing. Over 350 staff attended the three seminars that were held during the reporting year. The themes included Learning Journeys and Developments, What's Trending in Landscape Industry, and Conservation and Biodiversity, reflecting the scope of work within the organisation.

The NParks Staff Conference in April 2019 saw a record turnout with over 1,000 staff gathering to celebrate NParks' achievements for FY2018, and gain insights into the strategic directions for the year ahead.



Visitors to the Beijing Expo held in China were greeted by over 5,500 orchids, comprising over 200 species, in the Singapore Garden display.

GARDEN CITY FUND

Message from the Chairman

Our natural and built environments have grown to be more conducive for living, working, playing and learning through the years, thanks to the active participation, donations and other forms of support from the community, corporates and civic agencies for the Garden City Fund's projects and initiatives. Our continued well-being is enhanced through these efforts.

As we look back at the projects that were completed in the past year, I would like to acknowledge the key role that our donors have played in making them happen.

The Mingxin Foundation Rambler's Ridge, OCBC Arboretum and Singapore's first Seed Bank at the Singapore Botanic Gardens would not have been possible without the generous donations from our partners. Their support also took our greenery efforts to new places such as the industrial areas under JTC.

The Plant-A-Tree (PAT) programme continues to be an excellent vehicle for the community to be actively involved in the greening of Singapore. It also supports our education and conservation programmes to connect people with nature.

Since PAT's establishment in 2007, over 37,000 trees have been pledged by more than 660 corporations and some 3,000 individuals.

I am especially encouraged by the support of corporations such as Shimano, Shimizu, Maybank and UPS, who have participated in the programme year after year. In addition, I would like to acknowledge the support of Keppel Corporation, which has committed \$3 million to plant 10,000 trees over 10 years as part of the One Million Trees movement.

Support from the public, private and people sector is also a key driver behind the development of Pasir Panjang Park, the first park in Singapore to be designed and built together with the community, for the community. I am encouraged by PSA's lead and contribution to the park's development.

Community support and engagement will become even more critical as we work towards our vision of a City in Nature, and the Garden City Fund will continue to be an important platform for driving this engagement.

Whether you are a public or private sector organisation or an individual, I invite you to join us in this effort and forge closer bonds with one another through active stewardship of the environment.

Prof Leo Tan Garden City Fund Chairman

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 Nature 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 Nature.

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

Between 1 April 2019 and 31 March 2020, the total amount of cash donation income through the GCF was about \$6.8 million.

The members of the 9th GCF Management Committee were appointed from 1 November 2018 to 31 October 2020.

The 9th GCF Management Committee for the Year in Review

Appointment	Name	Attendance at Management Committee Meeting
Chairman	Professor Leo Tan*	4/4
Treasurer	Mr Goh Kong Aik	2/4
Secretary	Dr Leong Chee Chiew*	4/4
Members	Mr Tan Khin Nguan*	3/4
	Mrs Kirtida Mekani*	3/4
	Mr Daren Shiau	3/4
	Mr Cheng Hsing Yao	1/4

*These members have continued to serve for more than 10 consecutive years. Their wealth of knowledge, services and expertise have guided the charity to reach out to corporates and individuals for funding support, and ensured sound governance of the charity. As professionals in their own right, they have also contributed to a balanced composition in the committee, with diverse mix of backgrounds and experience to meet the growing needs of the charity.

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.



(From left to right) Group CEO of OCBC Bank, Samuel Tsien, Minister Desmond Lee and GCF Chairman, Prof Leo Tan planting trees during the opening of the OCBC Arboretum.

CREATING A CITY IN NATURE

The creation of a City in Nature is a collaborative effort bolstered by support from private and public sector organisations and individuals through the Garden City Fund (GCF). The importance of these partnerships was showcased in an exhibition on "Singapore's Greening Journey: 200 Years and Beyond", which was sponsored by City Developments Limited (CDL), a long-time partner of GCF. The exhibition ran from June to November 2019 at the CDL Green Gallery, Singapore Botanic Gardens.

RESEARCH AND CONSERVATION

Corporate support played an important role in our research and conservation efforts to intensify nature. In October 2019, the OCBC Arboretum was opened at Singapore Botanic Gardens' Gallop Extension. The first-of-its-kind high-tech arboretum in Southeast Asia will house more than 2,000 specimens of over 200 species of Dipterocarps. OCBC Bank generously donated \$4 million to this undertaking, which will also include the transformation of one of Singapore's first black and white bungalows into a knowledge centre for conservation.

Another project is the Mingxin Foundation Rambler's Ridge at the Gallop Extension, which gives visitors a hiking trail inspired by unique forest habitats on the tropical hills of Southeast Asia.

Private sector organisations also played a significant role in the setting up of Singapore's first Seed Bank, which was opened at the Singapore Botanic Gardens in July 2019. Goh Foundation, HSBC, Goldbell Foundation, Yokogawa Engineering Asia Pte Ltd, Alfa Tech, Kirtida & Bharat Mekani, Britesparx Design Pte Ltd and Benel Singapore were amongst some of the key contributors to this project. Fundraising efforts will continue with the aim of raising another \$5 million to support the Seed Bank's work over the next 10 years.

In another conservation project, Panasonic Asia Pacific contributed to the NParks Firefly Species Recovery Programme, aimed at understanding the optimal living conditions for the mangrove firefly population and improving the firefly habitat in the Pasir Ris Park mangrove zone. Meanwhile, an anonymous contribution of \$250,000 helped support various initiatives at the newly-opened Thomson Nature Park including educational and conservation programmes and forest restoration projects.



Charity Registration Number/
Unique Entity Number:
T02CC1634C

Charity Registration Date:
19 November 2002

IPC Number:
IPC000104

Auditor:
Ernst & Young LLP

GARDEN CITY FUND

RESTORING NATURE

Working with like-minded partners has enabled the charity to reach out to more corporations. In partnership with JTC, more than 40 companies in the aerospace industry in Seletar have raised over \$125,000 to support the Greening our Workplace @ Seletar Aerospace Park (GROW@SAP) programme, which covers greening efforts in Seletar Aerospace Park and Hampstead Wetlands Park, a new park developed by JTC and NParks.

In 2019, the GCF's Plant-A-Tree (PAT) programme made significant inroads into industrial areas. Close to 70 percent of companies on Jurong Island pledged their support to plant more than 30,000 trees there and over half a million dollars were raised for this cause from more than 60 companies.

PAT gained further momentum with new organisations coming on board the One Million Trees movement. They included Keppel Corporation (Labrador Nature Reserve), Deloitte (Windsor Nature Park), Rhodium Resources (Punggol Park Connector) and Chanel (Changi Beach Park). Other notable PAT contributions included the planting of 140 trees at Dairy Farm Nature Park by OCBC Bank on 1 June 2019.



Hampstead Wetlands Park was developed by JTC and NParks, enhancing the biophilic work-live-learn-play environment of Seletar Aerospace Park.

ENGAGING COMMUNITY

Public and private sector organisations have also come together to support community initiatives like the upcoming Pasir Panjang Park. The project saw the onboarding of PSA as both a contributor through its funding of \$3.5 million and an active partner involved in co-creating the park.

The Community Garden Festival 2019, held at Jurong Lake Gardens, is another community initiative made possible in part through the generous support of Singapore Pools and Ikea.

CAPACITY BUILDING

GCF rallies donor support in efforts to build up capacity and skills in the landscape industry. A generous donation of \$10 million over 10 years will be used to fund the newly-established NParks-Peter Lim Horticulture and Animal Science Scholarship for deserving, less-privileged youth to pursue their interest in horticulture, landscape design, environmental sciences, ecology and animal science. This donation is the largest single contribution from an individual in the history of GCF.

FORGING AHEAD

Looking forward, GCF pledges to continue working alongside our stakeholders in furthering NParks' conservation, research and outreach initiatives so as to cultivate in the community the love and ownership in preserving Singapore's legacy as a City in Nature.

Visit www.gardencityfund.gov.sg for more information.

GARDEN CITY FUND DONORS' ACKNOWLEDGEMENT FY 2019

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

\$1 million and above

- PSA Corporation Limited
- Peter Lim Eng Hock

\$100,000 and above

- Hotel Properties Limited
- The Hongkong and Shanghai Banking Corporation Limited
- In The Estate Of Essery
- Leong Sou Fong Rosslyn
- Oversea-Chinese Banking Corporation Limited
- Mingxin Foundation
- Temasek Foundation
- Ecosperity CLG Ltd

\$10,000 and above

- Air Products Singapore Industrial Gases Pte Ltd
- Alfa Tech Vestasia Pte Ltd
- Asahi Kasei Plastics Singapore Pte Ltd
- Ascendas Land (Singapore) Pte Ltd
- Asia Projects Engineering Pte Ltd
- ASPRI Dormitory Pte Ltd
- Broad Peak Advisers Pte Ltd
- Centurion-Lan Beng
- Chanel Pte Ltd
- Chevron Oronite Pte Ltd
- Cuestar Industry (S) Pte Ltd
- Deloitte & Touche LLP
- Dymon Asia Capital (Singapore) Pte Ltd
- ExxonMobil Asia Pacific Pte Ltd
- FRP Products Co Pte Ltd
- Goldbell Foundation
- Horizon Singapore Terminals
- HSL Constructor Pte Ltd
- Huatong (Asia) Pte Ltd
- Infineum Singapore LLP
- Jurong Engineering
- Jurong Port Pte Ltd
- Keppel Care Foundation
- Kurt Wagner
- Linde Gas Singapore Pte Ltd
- L'Occitane Singapore Pte Ltd
- Low Keng Boon
- Maybank Singapore Ltd
- Nomanbhoy & Sons Pte Ltd
- Oiltanking Asia Pacific
- Panasonic Asia Pacific
- PB Tankers Ltd
- PEC Ltd
- Petrochina International (S) Pte Ltd
- Petrochemical Corporation of Singapore
- Poh Tiong Choon Logistics
- Priyadarshini Rath
- Rhodium Resources Pte Ltd
- Rotary Engineering Pte Ltd
- Sembcorp Industries Ltd
- Shell Eastern Trading Pte Ltd
- Shimano (S) Pte Ltd
- Singapore LNG Corporation Pte Ltd
- Singapore Press Holdings Foundation Limited
- Singapore Refining Company Private Limited
- Singapore Tourism Board
- Southern Ridges Capital Pte Ltd
- Sumito Corporation Asia
- Sumitomo Chemical Asia
- Tan Chin Tuan Foundation
- Tan Jiew Hoe
- Tan Kwang Hee
- Temasek Capital Management
- The Polyolefin Company (S) Pte Ltd
- The Tides Foundation
- Thekchen Choling (Singapore)
- U&P Pte Ltd
- UPS Foundation Inc
- WWF Singapore
- Yinson Production Offshore

Below \$10,000

- 1-Garden Pte Ltd
- Ad-Meth Mech-Field Pte Ltd
- Aetos Holdings Pte Ltd
- Agape Little Uni Pte Ltd
- Airbus Asia Training Centre Pte Ltd
- Amriteswari Society
- Ang Chun Gay
- APL Co Pte Ltd
- Ashish Saksena
- Australian International School
- Avimac Pte Ltd
- Benel Singapore Pte Ltd
- Bombardier Aerospace Services Singapore Pte Ltd
- Boustead Projects E&C Pte Ltd
- Britesparx Design Pte Ltd
- CapitalLand Singapore
- Carl Ward
- Cavat Fabienne
- CBRE Pte Ltd
- CCD (Singapore) Pte Ltd
- Celanese Singapore Pte Ltd
- Chang Chun (Singapore) Pte Ltd
- Changi Airport Group
- Chem-Trend Singapore Pte Ltd
- CHIJ Primary School (Toa Payoh)
- CHIJ Secondary School (Toa Payoh)
- Chow Kan Shun
- Coim Asia Pacific Pte Ltd
- Coway Engineering & Marketing Pte Ltd
- Cyclect Holdings Pte Ltd
- David Lam Choon Sen
- David Leong
- DBS Innovation Group
- Denka Singapore Pte Ltd
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- EMHA Diamond Pte Ltd
- Enny Wijaya
- Essence Global Media (S) Pte Ltd
- Evonik Methionine SEA Pte Ltd
- Faci Asia Pacific Pte Ltd
- Foo May Yee
- GE Aviation Engine Services Singapore Pte Ltd
- German European School Singapore
- Goh Siow Ying Diana
- Han Jok Kwang
- Hitachi Elevator Asia Pte Ltd
- Hwang Ming Chi
- Integer Alpha Pte Ltd
- James Cook University
- Jet Aviation (Asia Pacific) Pte Ltd
- Kang Wen Ling
- Khoo Ken Hui
- Kwa Kim Li
- Latham & Watkins LLP
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- Leaena Tambyah Nee Chelliah
- Lim Hoe Kee
- Lim Wen Wei Lenny
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- Linde Gas Singapore Pte Ltd
- Lo Man Yi
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- Marianne Marais
- Matthew Walter Friedman
- Neil Garry McGregor
- Merz Asia Pacific
- Metech Recycling (Singapore) Pte Ltd
- Ministry of Culture, Community & Youth
- Mohit Khurana
- Ms Associate Consultancy Pte Ltd
- Nagy Sebastien
- Novabay Pte Ltd
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- Ong U-Li
- Panasonic Avionics Corporation Singapore Branch
- Pattonair Asia Pte Ltd
- PEC Ltd
- Pei Hua Secondary School
- Pentagon Group
- Phua Siew Kheng
- Plant Electrical Instrumentation Pte Ltd
- Plant Engineering Services Pte Ltd
- Power Engineering & Controls
- Proponent S.E.A Pte Ltd
- Rec Solar Pte Ltd
- RLC Group (Singapore) Pte Ltd
- Rolls-Royce Singapore Pte Ltd
- Sato Asia Pacific Pte Ltd
- Scott Beaumont
- Seletar Hills Estate Residents
- Sharikat National (Pte) Limited
- Shing Leck Engineering Service Pte Ltd
- SIA Engineering Company
- Singapore Aero Engine Services Pte Ltd
- Singapore United Estates (Pte) Ltd
- ST Engineering Aerospace
- Sumitomo Rubber Asia (Tyre)
- Tan Eng Chong
- Teh Lai Yip Nee Foo
- Teo Yi-Ling
- TG (Banyan) Pte Ltd
- TPI Limited
- Tsai Yi-Chen
- TTJ Design and Engineering Pte Ltd
- Unimatec Singapore Pte Ltd
- Unit 33 Pte Ltd
- Vistra Corp Services (SEA) Pte Ltd
- Vopak Terminals (S) Pte Ltd
- W H Brennan & Co Pte Ltd
- Wee Sin Tho
- Wheeler's Estate Pte Ltd
- Windsor Airmotive Asia Pte Ltd
- Wong Ying Lei
- WSP Consultancy Pte Ltd

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

We thank all other individuals and organisations who have given to the charity, including in-kind donations.

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 provide a high-quality living environment for Singaporeans.

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 Nature.

OUR SUSTAINABILITY STRATEGIES ARE:



Sustaining our City in Nature

Creating the best possible living environment through excellence in nature conservation, greenery and recreation.



Nurturing Communities

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

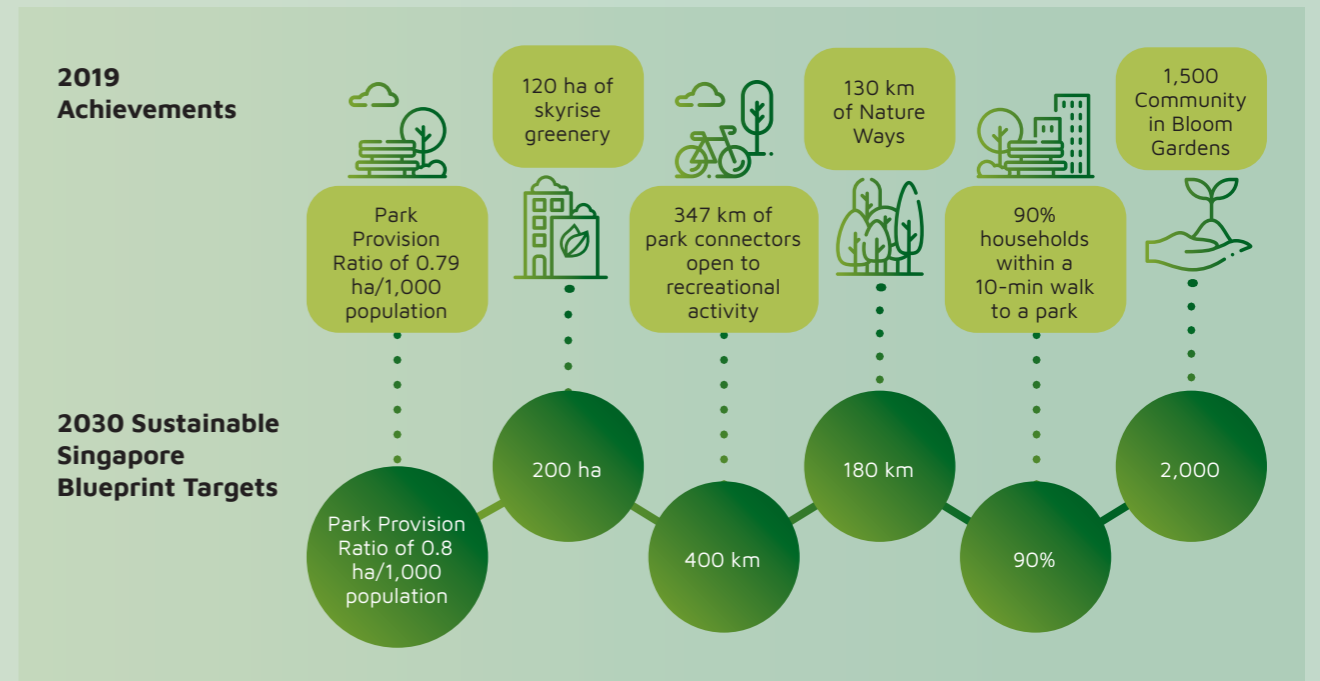


Creating a Great Workplace

Developing our staff and taking care of their well-being.



Lakeside Garden



Sustaining Our City in Nature

Extending Singapore's Natural Capital

NParks is responsible for maintaining and enhancing Singapore's greenery for future generations. Our nature reserves safeguard primary and secondary rainforests and are core habitats for native biodiversity. They are also primary providers of ecosystem services like clean air and water.

Nature parks have been established on the margins of the nature reserves, serving as complementary habitats and buffers. These buffers provide expanded habitats for Singapore's native flora and fauna beyond the nature reserves, and also provide spaces for nature-based recreation.

Intensifying Nature in Gardens and Parks

More than 40 percent of Singapore is covered in greenery, in the form of nature reserves, parks, gardens, roadside greenery, skyrise greenery and vacant lands. In FY2019, NParks planted about 134,000 trees. To curate the landscapes in our parks and gardens to make them more natural, we will incorporate natural designs and planting in new and redeveloped parks and gardens, recreating the look and feel of Singapore's natural forests.

The waterbodies within our gardens and parks will also be naturalised, contributing to Singapore's resilience in addressing the challenge of sea-level rise and inland flooding due to climate change. Beyond these, NParks will establish more therapeutic landscapes in gardens and parks,

which can be programmed for seniors as well as cater to diverse conditions such as dementia and mood disorders. Finally, NParks will also conserve over 70 more native plant and animal species over the next 10 years.

Restoring Nature into the Built Environment

NParks will intensify the greening of our streetscapes through the implementation of multi-tiered planting, which will create a forest-like structure along our roads. Roads with such planting are known as Nature Ways.

We will increase the implementation of skyrise greenery and focus on greening Singapore's industrial estates, which are currently among the hottest areas on the island. These efforts will mitigate the Urban Heat Island effect, resulting in cooler temperatures, while helping to improve air quality and beautify their surroundings.

Strengthening Connectivity Between Green Spaces

To sustain a healthy natural ecosystem, NParks will strengthen the ecological connectivity between our green spaces through the Park Connector Network and the Nature Ways. There are currently 347 kilometres of park connectors, and Singapore will have 400 kilometres of park connectors by 2030. This effectively means that 90% of households will be within a 10-minute walk of a park by 2030, making our gardens and parks even more accessible.

SUSTAINABILITY REPORT



Join in the One Million Trees movement to plant one million trees across Singapore over the next decade. This builds on what has been achieved, further integrating nature into our city to strengthen Singapore's distinctiveness as a highly liveable city.

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 islandwide yearly. Signature events include NParks Concert Series in the Park – Rockestra®, Parks Festival, Festival of Biodiversity, and Community Garden Festival.

As a City in Nature, we will enable the community to forge closer bonds through active stewardship of the environment. NParks will be expanding its outreach programmes to reach out to communities, schools, and individuals to encourage them to become stewards of greenery and biodiversity. Communities can participate in the design, building, management and programming of more than 50 parks in their estates over the next five years. This is an extension of NParks' Friends of the Parks initiative¹, which aims to promote greater community stewardship in the management of our green spaces.

Strengthening Community Stewardship

NParks has launched a new movement to plant a million trees across Singapore over the next 10 years. Led by the community, the One Million Trees movement will take place throughout the island, including streetscapes, gardens, parks and park connectors, nature reserves and nature parks. The community is key to the success of this movement.

Thus far, some 100 individuals and more than 100 groups and organisations have already pledged their support. This includes the Friends of the Parks communities, Community in Nature schools, Community in Bloom (CIB) gardening groups, NParks volunteers, and nature groups.

The nationwide CIB gardening movement aims to foster community spirit and bring residents together to make Singapore our City in Nature. Today, there are more than 1,500 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.

Getting Involved

To date, we have 48,000 volunteers who play an integral role in helping to achieve our vision of making Singapore a City in Nature. Our network of volunteers includes community gardeners from the CIB 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.

We will expand NParks' outreach programmes to grow our volunteer base from the existing 48,000 to 70,000 by 2030. NParks will build up its Community in Nature initiative by involving more schools and partners in reforestation efforts and citizen science projects, and expand the CIB programme through the provision of more allotment gardens and encouraging the planting of edibles.



Children enjoy being outdoors and exploring the natural world. Nature playgardens, like this one in HortPark, help to activate and nurture this interest in the young.



The Friends of the Parks community is an important part of our 48,000-strong volunteer pool, playing a key role in enabling people to take ownership of the parks and promoting safe and responsible behaviours in our green spaces. Here, members from the Friends of Rail Corridor community conduct a bird count survey while members of the Friends of Park Connector Network community help in habitat enhancement works.

¹ 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.

SUSTAINABILITY REPORT

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.

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 2019)

- 103 Certified Park Managers
- 231 ISA Certified Arborists
- 110 Certified Practising Horticulturists
- 36 Certified Playground Safety Inspectors

Enhanced Vocational & Skills Allowance Framework

To encourage officers to deepen their professional expertise in NParks' core job areas and facilitate greater deployability of staff, officers who possess certifications recognised under NParks' Vocational and Skills Allowance Framework are eligible for a monthly allowance. The revised allowance framework with enhanced quantum will take effect from 1 Jul 2020, in recognition of the specialised technical competencies that officers possess and demonstrate.

Additionally, the list of certifications that qualify officers for the allowance has also been expanded. This includes new certifications in Green Mark Professional, Tree Risk Assessment Qualification, Therapeutic Horticulture and Animal Welfare & Behaviour and Animal Health.

Competency-Based Remuneration

Moving forward in 2020, we will be looking to professionalise the role of an NParks officer and improve the attractiveness of a career in NParks. Progression and remuneration will recognise officers' skills and competencies and support and encourage continuous movement of officers (horizontal as well as vertical) throughout their career. Officers will be encouraged to pick up additional competencies relevant to NParks' work, which will be supported by the enhanced vocational and skills allowance framework.

Staff Well-Being

The Staff Well-Being Committee (SWBC) works with the Human Resource branch and Staff Union to organise activities that engage our workforce.

In FY2019, SWBC organised a specially curated range of events with a key focus to engage and bring together all staff in the NParks family.

Together with the three sub-committees – Social and Recreation, Healthy Lifestyle, and Kindness, over 50 events were organised, including several large-scale events for all staff such as Learning Journeys, Bicentennial Showcase@FCP, monthly lunch-time bus services, and health talks. Each sub-committee comprises some 20 members from various divisions who volunteer their time and effort to curate a calendar of events and activities for staff.

In FY2019, more than 300 staff members contributed over 2,400 hours of their time towards kindness-related activities. These included participation in a blood donation drive at Bloodbank@HSA, the packing of food donations for The Food Bank Singapore as well as taking up new volunteering opportunities at IMDA Digital Clinics and animal shelters.



Streetscape along East Coast Parkway

The Staff Well-Being Committee



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 also helped out at Food from the Heart, a charity that distributes food to sponsored schools, welfare homes and self-collection centres, and they took on "big brother" and "big sister" duties when they accompanied children from Child At Street 11 on an excursion to Pulau Ubin. This is a non-profit organisation dedicated to helping low-income and dysfunctional families provide quality early years of education for their children.

To mark Kindness Day SG which fell on 24 May 2019, staff volunteered time and effort to spruce up the gardens at the Handicaps Welfare Association, NParks' long-standing adopted charity. Such activities not only showcase the green fingers of staff, but also highlight their big hearts in giving back to the community.



Staff assisting with food preparation at Willing Hearts, a charity that operates a soup kitchen that cooks and distributes 5,000 meals daily. In the reporting year, some 300 staff members contributed over 2,400 hours towards kindness-related activities.

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 2019, 42 staff were commended for providing excellent service to internal and external customers.

This past year, 223 staff received their Long Service Award for their contributions towards building and caring for our City in Nature.

FACTS & FIGURES FY 2019

NATIONAL DAY AWARDS

Public Administration Medal (Silver)

Mr Wong Tuan Wah
Group Director/Fort Canning Park & Istana
and Senior Curator, Istana

Public Administration Medal (Bronze)

Mr Abdul Hamid bin Mohd
Director/Arboriculture
Streetscape

Mr Ryan Lee Yann Shian
Director/Smart District Division
Smart District Division

Dr Varughese Philip
Deputy Director/Plant Science & Health
(Soil Management Lab)
Horticulture and Community Gardening

Commendation Medal

Ms Chan Suet Heong Jolene
Senior Manager/Licensing & Compliance
Industry & Biosecurity Management

Ms Chin How Kien
Senior Manager/Development Management
Parks Development

Mr Goh Meng Yong Ron
Senior Manager/Prosecution (Prosecutor)
Corporate Services

Mr Hassan bin Ibrahim
Deputy Director/International Biodiversity
Conservation
International Biodiversity Conservation

Mr Lua Hock Keong
Deputy Director/Biodiversity (Terrestrial)
National Biodiversity Centre

Mr Ng Kian Wee Maxel
Deputy Director/Community Horticulture
Horticulture and Community Gardening

Mr Tan Yong Jun Mervyn
Deputy Director/Parks
Parks East

Commendation Medal (continued)

Mr Joshua Teoh
Director/Animal Welfare
Community Animal Management

Efficiency Medal

Ms Chee Yee Ping
Manager/Parks
Parks Central

Ms Koh Shu Yuen Jasmine
Senior Manager/Streetscape
Streetscape

Ms Too Sok Geok Carrie
Senior Executive/Corporate Strategy & Planning
Corporate Strategy and Planning

LONG SERVICE MEDAL

Ms G Shila Kumari
Officer/Conservation (Outreach)
Conservation

Dr Yap Him Hoo
Director-General/
Animal & Veterinary Service Cluster

AWARDS AND ACCOLADES

Excellent Service Award 2019

Attractions
4 STAR, 1 GOLD

Public Sector Transformation Awards 2020

Exemplary Innovator Award
Jurong Lake Gardens

Exemplary Innovator Award
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

Exemplary Service Excellence Award
Mr Sebastian Tan
Acting Director/Pet & Street Animal Management
Community Animal Management

MND Minister's Award (Team) 2019

Trees.sg

**Conservation of Mandai Mangrove and Mudflat –
Smarter and Better Tools**

**Formation of the New Singapore Food Agency
and Transfer of AVA's Non-food Functions
to NParks**

Share Bronze Award 2019

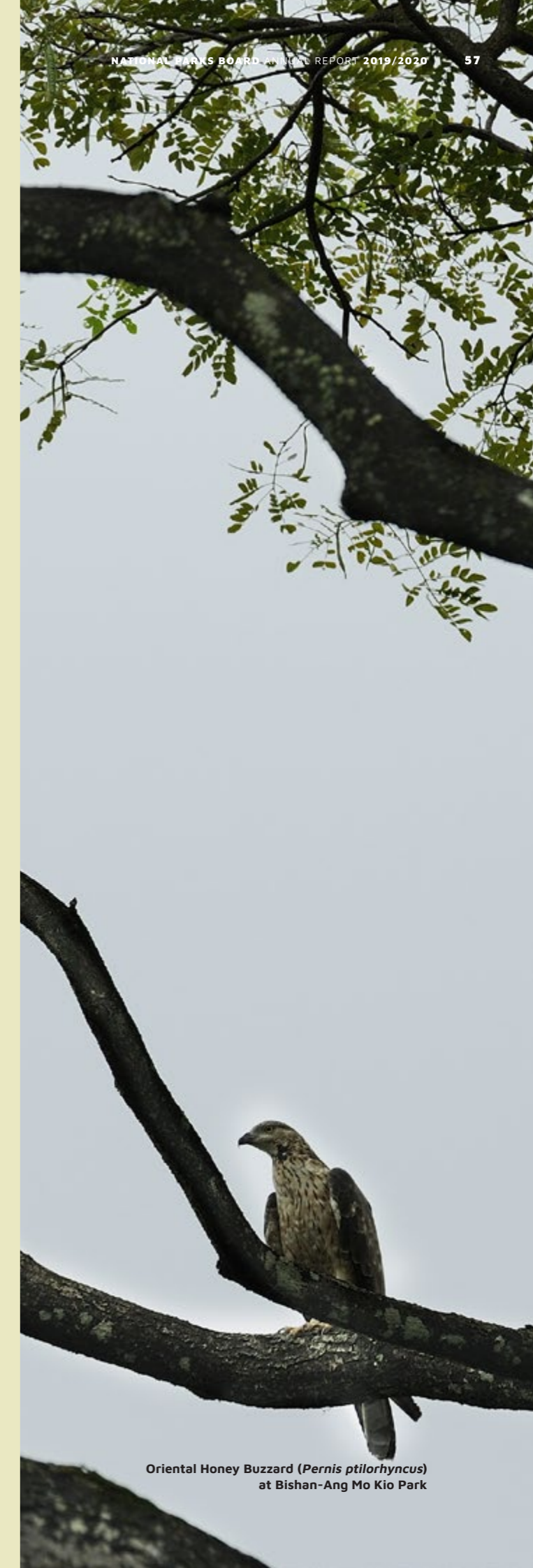
Singapore H.E.A.L.T.H Award 2019

Certificate of Recognition

IT Awards

SG:D Techblazer Awards 2019
Best Adoption (Public Sector)

**United Nations Asia Environmental
Enforcement Awards 2019
(Category: Collaboration)**

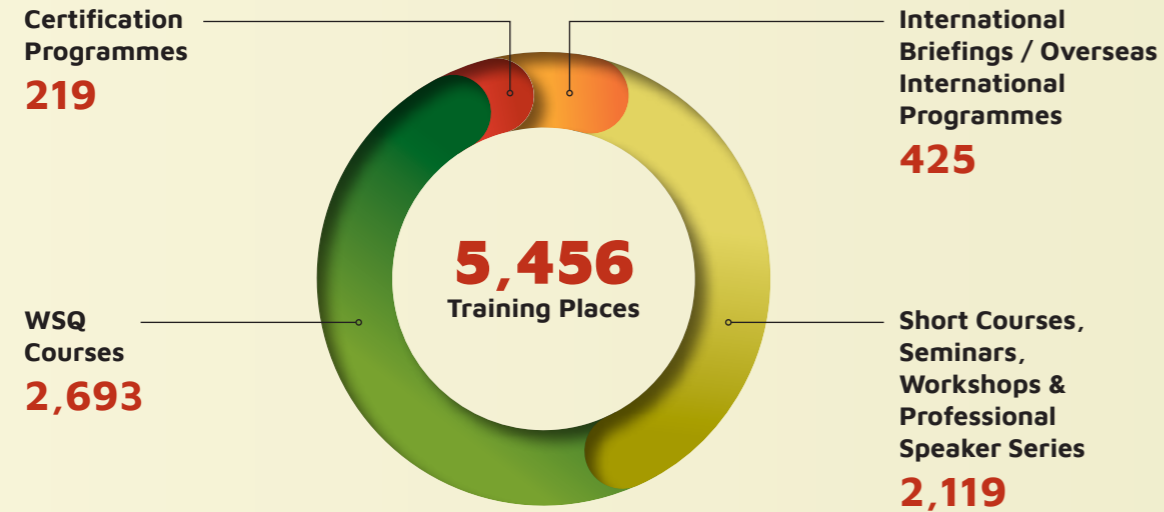


Oriental Honey Buzzard (*Pernis ptilorhyncus*)
at Bishan-Ang Mo Kio Park

FACTS & FIGURES FY 2019

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.



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 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

- 9th Regional Arboriculture Seminar – The Digital Journey in Urban Tree Management
- Basic Drone Operation
- Biodiversity, Conservation, Harmonising People and Nature
- Biophilic and Ecological Design
- Butterfly Gardens – Ecology to Practical Design
- Canine and Feline Seminar
- Canine and Feline Workshop
- Composing Tree Pruning Specifications
- CUGE Professional Speaker Series – Introduced Cavities as Nest Boxes
- CUGE Professional Speaker Series – New Ways of Seeing: New Ways of Knowing
- Client Management for Therapeutic Horticulture (Children & Teenagers with Development Disabilities)
- Edible Landscaping Using Permaculture Techniques
- Forensics for Urban Trees
- Formative Pruning for Young Trees
- Identifying System-Level Risk Exposure
- Introduction to Therapeutic Horticulture and Therapeutic Garden
- Landscape Safety Orientation Course
- Nature Play Programming
- Playground Maintenance Technician Course
- Resistance Drilling Equipment
- Ride-On Mower Operator Assessment
- Snake Handling Workshop
- Soils for Healthy Urban Trees
- Soils & Substrates for Green Infrastructure
- Sustainable Landscaping Design Principles & Evaluation
- Therapeutic Horticulture Programming (People with Disability)
- Traditional and Novel Ways of Estimating Tree Growth
- Tree Decay – The Fundamentals
- Tree Inspection – The Basics
- Tree Inspection – Advanced
- Tree Inspection – Failure Documentation and Analysis
- Tropical Tree Identification

FACTS & FIGURES FY 2019

REGIONAL PARKS MAINTAINED BY NPARKS

Area (ha)	Area (ha)
Admiralty Park	25.67
Armenian Street	0.35
Ang Mo Kio Linear Park	6.24
Ang Mo Kio Town Garden East	4.88
Ang Mo Kio Town Garden West	20.63
Bedok Reservoir Park	40.39
Bedok Town Park	13.66
Bishan-Ang Mo Kio Park	60.58
Bukit Batok Nature Park	35.74
Bukit Batok Town Park (Little Guilin)	41.60
Bukit Timah Nature Reserve	162.64
Central Catchment Nature Reserve	455.00
Changi Beach Park (including Changi Point Promenade)	29.15
Chestnut Nature Park	81.00
Choa Chu Kang Park	10.41
Clementi Woods Park	11.48
Coney Island Park	76.80
Dairy Farm Nature Park	63.00
Dhoby Ghuat Green	1.00
East Coast Park	243.28
Empress Place	1.52
Esplanade Park	2.40
Fort Canning Park	19.14
Hampstead Wetlands Park	3.32
Handy Road	0.27
Hindhede Nature Park	9.00
Hong Lim Park	1.28
HortPark	24.04
Istana Park	1.29
Jurong Central Park	7.98
Jurong Lake Gardens (Lakeside Garden)	53.00
Kallang Riverside Park	5.16
Kent Ridge Park	48.40
Kranji Marshes Park	56.29
Kranji Reservoir Park	3.78
Labrador Nature Reserve and Park	22.78
Lower Peirce Reservoir Park	10.00
Lower Seletar Reservoir Park	8.49
MacRitchie Reservoir Park	12.00
Marsiling Park	11.35
Mount Faber Park	58.80
My Waterway @ Punggol	12.30
one-north Park	3.39
Orchard Fountain Corner	0.06
Pasir Ris Park	73.39
Pasir Ris Town Park	12.36
Pearl's Hill City Park	8.50
Penang Rd Open Space	0.24
Pulau Ubin Recreation Area	692.18
Punggol Park	16.66
Sembawang Hot Spring Park	1.12
Sembawang Park	15.58
Sengkang Riverside Park	21.08
Singapore Botanic Gardens	82.00
Sisters' Islands Marine Park	47.68
Springleaf Nature Park	18.28
Stamford Green	0.56
Sun Plaza Park	9.60
Sungei Buloh Wetland Reserve	193.31
Tampines Eco-Green	36.61
Telok Blangah Hill Park	36.88
Thomson Nature Park	52.00
Tiong Bahru Park	3.33
Toa Payoh Town Park	4.91
Upper Peirce Reservoir Park	4.00
Upper Seletar Reservoir Park	15.00
Waterboat House Garden	0.07
War Memorial Park	1.74
West Coast Park	50.13
Windsor Nature Park	75.00
Woodlands Waterfront Park	11.22
Yishun Park	13.22
Youth Olympic Park	0.66
Zhenghua Nature Park	17.30
Total	3,274.15

Total Number of Parks	Area (ha)
Regional parks	74
Neighbourhood parks	315
Total	389

Total Area Maintained	Area (ha)
Parks, playgrounds, open spaces, fitness corners and park connectors*	2,774.35
Nature reserves	3,347
Istana and Parliament House grounds	42
Roadside greenery	2,108.71
Vacant state land	65.93
State land taken over as at Mar 2020**	4,228
Total	12,565.99

PLANT HEALTH

Import, Permits and Inspections	
Import permits issued	44,530
Post-entry inspections conducted	2,051

ANIMAL HEALTH AND WELFARE

Licences, Permits, and Health Certificates Issued for Animal Imports	
Animals (excluding livestock)	3,555
Biologics	265
Birds	166
Eggs for research	7
Products (blood, sera, urine, clinical specimens)	856
Ornamental fish (export health certificates)	4,931
Ornamental fish (import permits)	6,136
Total	15,916

Types of Animal Disease Surveyed in Local Farms	
Captive bird farms	3
• Bird flu	
• Newcastle Disease	
Ornamental fish farms	55
• Aeromonas Salmonicida	
• Chytrid Fungus	
• Epizootic Haematopoietic Necrosis Virus	
• Infectious Haematopoietic Necrosis Virus	
• Infectious Spleen and Kidney Necrosis Virus	
• Koi Herpes Virus	
• Megalocytivirus	
• Spring Viraemia Carp Virus	
• Viral Haemorrhagic Septicaemia	
• White Spot Syndrome Virus	

Licensing Veterinarians and Veterinary Centres	
Number of veterinarians	457
Number of veterinary centres	97

Grading of Pet Shops	
Grade A	200
Grade B	18
Grade C	1
Grade D	1
Not graded***	52

Dog Licensing and Enforcement	
Dog licences issued	~ 70,000
New licences	~ 12,000
Renewed licences (includes multi-year licences)	~ 58,000

* 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

*** Newly licensed pet shops that have not been graded yet

CORPORATE GOVERNANCE FY 2019

BOARD MEMBERS

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

The Board provides strategic direction and guidance on policies and strategies relating to NParks' achievement of its vision, mission, objectives, and performance of its functions. In addition, it oversees NParks' operating and financial performance taking into account NParks' budget, expenses, assets, transactions and projects.

In discharging its duties, the Board is supported by the following committees:

Audit Committee

The Audit Committee comprises three non-executive Board members. It plays a key role in ensuring 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 reviews the effectiveness of internal audit.

Chairman

Mr Guy Harvey-Samuel

Members

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.

Chairman

Mr Andreas Sohmen-Pao

Members

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 of 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.

Chairman

Mr Benny Lim

Members

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.

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



Sembawang Hot Spring Park

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 when they carry out their 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 2020 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.

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
BY CHUA EE KIAM
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
BY CHUA EE KIAM, CHOO MUI ENG AND WONG TUAN WAH
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.



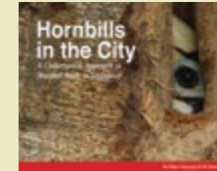
Gingers of Cambodia, Laos & Vietnam
BY JANA LEONG-SKORNIČKOVÁ AND MARK NEWMAN



A Walk Through History – A Guide to the Singapore Botanic Gardens
BY NIGEL TAYLOR AND ADA DAVIS



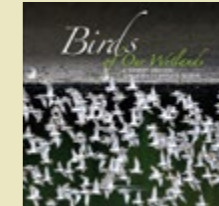
1001 Garden Plants in Singapore
BY LILY CHEN, ANG WEE FOONG, ARTHUR NG, JESSICA TEO AND JENNIE TANG



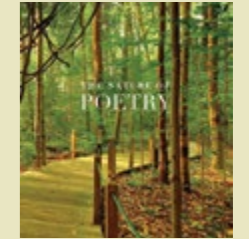
Hornbills in the City – A Conservation Approach to Hornbill Study in Singapore
BY MARC CREMADES AND NG SOON CHYE



Our Fragile Rainforest
BY LEONG TZI MING AND JAMES GAN



Birds of Our Wetlands – A Journey Through Sungei Buloh Wetland Reserve
EDITED BY WONG TUAN WAH, VICTORIA CHEONG, ADA DAVIS, HOW CHOON BENG, DAVID LI, LOW BING WEN, FLORENCE SIM AND YANG SHUFEN



The Nature of Poetry
EDITED BY EDWIN THUMBOO AND ERIC TINSAY VALLES



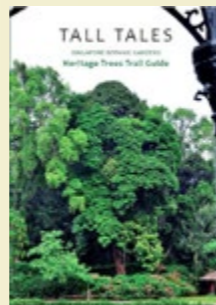
Migratory Birds of Sungei Buloh Wetland Reserve
BY JAMES GAN, MENDIS TAN AND DAVID LI



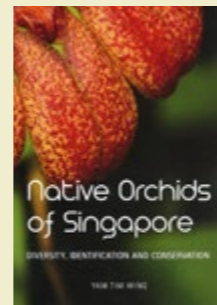
My Green Space: Indoor Gardening Made Simple
BY LILY CHEN, NG SHAN JUN, ANG WEE FOONG, ET AL.



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



Native Orchids of Singapore – Diversity, Identification and Conservation
BY YAM TIM WING



Flora of Singapore, Volume 1 (Introduction), Volume 7 (Poales), Volume 13 (Gentianales)
EDITED BY DAVID MIDDLETON, STUART LINDSAY AND JANA LEONG-SKORNIČKOVÁ



The Gardens Bulletin, May 2019 (Supplement), June 2019, Sept 2019 (Supplement) & Dec 2019



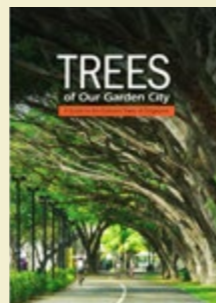
Dragonflies of Our Parks and Gardens
BY ROBIN NGIAM



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.



Trees of Our Garden City
EDITED BY TEE SWEE PING



Caterpillars of Singapore's Butterflies
BY HORACE TAN AND KHEW SIN KHOON

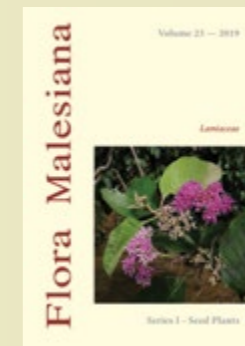


Gardenwise, Aug 2019 & Feb 2020



CITYGREEN, Issue 17 Ethnobotany Garden

The CUGE publication CITYGREEN won the APEX Awards 2020 and Hermes Creative Awards 2019.



Flora Malesiana, Lamiaceae

JOURNALS

BOOKS

PERIODICALS

STAFF PUBLICATIONS

APRIL 2019 – MARCH 2020

BOOKS

Middleton, D.J., Leong-Škorničková, J. & Lindsay, S. (eds) (2019). *Flora of Singapore*, vol. 1, Introduction. Singapore: National Parks Board. x + 133 pp.

Middleton, D.J., Leong-Škorničková, J. & Lindsay, S. (eds) (2019). *Flora of Singapore*, vol. 7, Poales. Singapore: National Parks Board. x + 525 pp.

Middleton, D.J., Leong-Škorničková, J. & Lindsay, S. (eds) (2019). *Flora of Singapore*, vol. 13, Gentianales. Singapore: National Parks Board. x + 654 pp.

Turner, I.M. (2019). *Annonaceae of Malesia: species lists for the floristic region and some related geopolitical units*. Singapore: Lee Kong Chian Natural History Museum. 65 pp. eBook.

BOOK CHAPTERS

Davison, G.W.H. (2019). Plant conservation in Singapore 1: Historical and legal background. In: **Middleton, D.J., Leong-Škorničková, J. & Lindsay, S.** (eds) *Flora of Singapore*, vol. 1, pp. 71–82. Singapore: National Parks Board.

Leong-Škorničková, J. (2019). Flagellariaceae. In: **Middleton, D.J., Leong-Škorničková, J. & Lindsay, S.** (eds) *Flora of Singapore*, vol. 7, pp. 213–218. Singapore: National Parks Board.

Leong-Škorničková, J. (2019). Typhaceae. In: **Middleton, D.J., Leong-Škorničková, J. & Lindsay, S.** (eds) *Flora of Singapore*, vol. 7, pp. 1–5. Singapore: National Parks Board.

Leong-Škorničková, J. (2019). Xyridaceae. In: **Middleton, D.J., Leong-Škorničková, J. & Lindsay, S.** (eds) *Flora of Singapore*, vol. 7, pp. 7–15. Singapore: National Parks Board.

Lim, R.C.J., Leong-Škorničková, J., Lindsay, S., Niissalo, M.A., Yam, T.W. & Middleton, D.J. (2019). Plant conservation in Singapore II: practical implementation. In: **Middleton, D.J., Leong-Škorničková, J. & Lindsay, S.** (eds) *Flora of Singapore*, vol. 1, pp. 83–106. Singapore: National Parks Board.

Lindsay, S. & Middleton, D.J. (2020). Adiantaceae. In: Parris, B., Kiew, R., Chung, R.C.K. & Cheah, Y.H. (eds.) *Flora of Peninsular Malaysia*, Series I: Ferns and Lycophytes, 3, pp. 113–156. Malayan Forest Records No. 48. Kepong: Forest Research Institute Malaysia.

Middleton, D.J. (2019). Gelsemiaceae. In: **Middleton, D.J., Leong-Škorničková, J. & Lindsay, S.** (eds) *Flora of Singapore*, vol. 13, pp. 415–419. Singapore: National Parks Board.

Middleton, D.J. (2019). Introduction. In: **Middleton, D.J., Leong-Škorničková, J. & Lindsay, S.** (eds) *Flora of Singapore*, vol. 1, pp. 1–4. Singapore: National Parks Board.

Middleton, D.J., Ho, B.C. & Lindsay, S. (2019). Taxonomic overview of the plants of Singapore. In: **Middleton, D.J., Leong-Škorničková, J. & Lindsay, S.** (eds) *Flora of Singapore*, vol. 1, pp. 5–14. Singapore: National Parks Board.

Middleton, D.J., Leong-Škorničková, J. & Lindsay, S. (2019). Introduction to Gentianales. In: **Middleton, D.J., Leong-Škorničková, J. & Lindsay, S.** (eds) *Flora of Singapore*, vol. 13, pp. ix–x. Singapore: National Parks Board.

Middleton, D.J., Leong-Škorničková, J. & Lindsay, S. (2019). Introduction to Poales. In: **Middleton, D.J., Leong-Škorničková, J. & Lindsay, S.** (eds) *Flora of Singapore*, vol. 7, pp. ix–x. Singapore: National Parks Board.

Middleton, D.J. & Rodda, M.L. (2019). Apocynaceae. In: **Middleton, D.J., Leong-Škorničková, J. & Lindsay, S.** (eds) *Flora of Singapore*, vol. 13, pp. 421–630. Singapore: National Parks Board.

Middleton, D.J. & Turner, I.M. (2019). History of taxonomic research in Singapore. In: **Middleton, D.J., Leong-Škorničková, J. & Lindsay, S.** (eds) *Flora of Singapore*, vol. 1, pp. 15–36. Singapore: National Parks Board.

Nash, H.C., Lee, P.B., Lim, N. T.-L., Luz, S., Li, C., Chung, Y.F., Olsson, A., Boopal, A., Ng Strange, B.C. & Rao, M. (2019). The Sunda pangolin in Singapore: a multi-stakeholder approach to research and conservation. In: Challender, D.W.S., Nash, H.C. & Waterman, C. (eds) *Pangolins: Science, Society and conservation*, pp. 412–426. U.K. and U.S.: Elsevier.

Niissalo, M.A. & Leong-Škorničková, J. (2019). Mayacaceae. In: **Middleton, D.J., Leong-Škorničková, J. & Lindsay, S.** (eds) *Flora of Singapore*, vol. 7, pp. 31–35. Singapore: National Parks Board.

Puglisi, C. (2019). Loganiaceae. In: **Middleton, D.J., Leong-Škorničková, J. & Lindsay, S.** (eds) *Flora of Singapore*, vol. 13, pp. 391–413. Singapore: National Parks Board.

Veldkamp, J.-F., Duistermaat, H., **Wong, K.M. & Middleton, D.J.** (2019). Poaceae (Gramineae). In: **Middleton, D.J., Leong-Škorničková, J. & Lindsay, S.** (eds) *Flora of Singapore*, vol. 7, pp. 219–501. Singapore: National Parks Board.

Wong, K.M. & Ganesan, S.K. (2019). Plant diversity in Singapore. In: **Middleton, D.J., Leong-Škorničková, J. & Lindsay, S.** (eds) *Flora of Singapore*, vol. 1, pp. 37–46. Singapore: National Parks Board.

Wong, K.M. & Sugumaran, M. (2019). Gentianaceae. In: **Middleton, D.J., Leong-Škorničková, J. & Lindsay, S.** (eds) *Flora of Singapore*, vol. 13, pp. 359–390. Singapore: National Parks Board.

Wong, K.M., Turner, I.M., Wang, R., Harwood, R., Seah, W.W., Ng, X.Y., Lim, R.C.J., Lua, H.K. & Mahyuni, R. (2019). Rubiaceae. In: **Middleton, D.J., Leong-Škorničková, J. & Lindsay, S.** (eds) *Flora of Singapore*, vol. 13, pp. 1–358. Singapore: National Parks Board.

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. & Arosemana, A.R. (eds), *Proceedings of the 22nd World Orchid Conference*, pp. 669–677. Guayaquil, Ecuador: Asociación Ecuatoriana de Orquideología.

Yee, A.T.K., Chong, K.Y., Seah, W.W., Lua, H.K. & Yang, S. (2019). Vegetation of Singapore. In: Middleton, D.J., Leong-Škorničková, J. & Lindsay, S. (eds) *Flora of Singapore*, vol. 1, pp. 47–70. Singapore: National Parks Board.

JOURNALS

Agnihotri, P., Husain, D., Katiyar, P., Sahoo, D., **Rodda, M.** & Husain, T. (2019). *Heterostemma bariikiana* (Apocynaceae, Asclepiadoideae), a new species from India, Myanmar and Thailand. *Phytotaxa* 419: 232–238.

Ardi, W.H., Muhammad, S.Z., Ramadanil & **Thomas, D.C.** (2019). *Begonia medicinalis* (Begoniaceae), a new species from Sulawesi, Indonesia. *Phytotaxa* 423(1): 41–45.

Ardi, W.H. & **Thomas, D.C.** (2019). A new species of *Begonia* (Begoniaceae) from South Sulawesi, Indonesia, and an augmented description of *Begonia bonthainensis*. *Reinwardtia* 18(1): 19–26.

Arshed, M.J.C., Agoo, E.M. & **Rodda, M.** (2019). The identity of *Marsdenia parasita* (Apocynaceae, Asclepiadoideae). *Gardens' Bulletin Singapore* 71(2): 429–433.

Arshed, M.J.C., Agoo, E.M. & **Rodda, M.** (2019). Nomenclatural notes on *Dischidiopsis* and *Conchophyllum* (Apocynaceae: Asclepiadoideae) in the Philippines. *Webbia* 74: 297–300.

Ascher, J.S., **Soh, Z.W.W.**, Ho, B.M., Lee, R.Y.Y., Leong, A.Q.E., Chui, S.X., Lai, J.J.L., Lee, J.X.Q., Foo, M.S. & Soh, E.J.Y. (2019). Bees of the Bukit Timah Nature Reserve and vicinity. *Gardens' Bulletin Singapore* 71(Suppl. 1): 245–271.

Baas, P., van Heuven, B.-J., **Ng, X.Y.** & Vander Velde, N. (2019). Biomechanical and hydraulic challenges for a tropical

swampforest and driftwood tree – *Alstonia spatulata* Blume (Apocynaceae). *Gardens' Bulletin Singapore* 71(Suppl. 2): 231–244.

Cai, Y. (2019). Hydrogeomorphic characteristics of streams in Bukit Timah Nature Reserve, Singapore. *Gardens' Bulletin Singapore* 71(Suppl. 1): 441–490.

Cai, Y., Nga, Y.P.Q. & Ngiam, R.W.J. (2019). Diversity and distribution of dragonflies in Bukit Timah Nature Reserve, Singapore. *Gardens' Bulletin Singapore* 71(Suppl. 1): 293–316.

Chan, L. & Davison, G.W.H. (2019). Introduction to the Comprehensive Biodiversity Survey of Bukit Timah Nature Reserve, Singapore, 2014–2018. *Gardens' Bulletin Singapore* 71(Suppl. 1): 3–17.

Chan, L. & Davison, G.W.H. (2019). Synthesis of results from the Comprehensive Biodiversity Survey of Bukit Timah Nature Reserve, Singapore, with recommendations for management. *Gardens' Bulletin Singapore* 71(Suppl. 1): 583–610.

Cheek, M., **Middleton, D.J.**, Kiew, R., Muhammad Mansur & Jebb, M.H.P. (2019). Proposal to conserve the name *Nepthes × hookeriana* (Nepenthaceae) with a conserved type. *Taxon* 68(4): 867–868.

Chen, C.-W., **Lindsay, S.**, Yong, K.T., Andi Maryani A. Mustapeng, Amoroso, V.B., Dang, V.D. & Huang, Y.-M. (2019). Clarification of two poorly known Vittarioid ferns (Pteridaceae): *Haplopteris angustissima* and *H. capillaris*. *Systematic Botany* 44(3): 483–493.

Chen, J., Thomas, D.C. & Saunders, R.M.K. (2019). Geographic range and habitat reconstructions shed light on palaeotropical intercontinental disjunction and regional diversification patterns in *Artabotrys* (Annonaceae). *Journal of Biogeography*: Early view.

Chen, J., Toh, X., Ong, J., Wang, Y., Teo, X.-H., Lee, B., Wong, P.-S., Khor, D., Chong, S.-M., Chee, D., Wee, A., Wang, Y., Ng, M.-K., Tan, B.-H. & Huangfu, T. (2019). Detection and characterization of a novel marine birnavirus isolated from Asian seabass in Singapore. *Virology Journal* 16, 71.

Chen, L.M.J., Duyfjes, B.E.E., Ali Ibrahim & de Wilde, W.J.J.O. (2019). Flora of Singapore precursors, 16: New records and notes on the plant diversity of Singapore. *Gardens' Bulletin Singapore* 71: 401–406.

Chen, L.M.J., Lai, J.T.K., Ali Ibrahim, Sim, P.P., Koh, S.L., Choo, L.M., Yeo, R.S.W., Lee, J.J.R. & Ho, B.C. (2019). *Piriqueta racemosa* (Jacq.) Sweet (Passifloraceae), a new record of naturalisation, and a new generic record for Singapore. *Hikobia* 18: 7–10.

Choo, L.M., Forest, F., Wieringa, J., Bruneau, A. & Estrella, M. (2020). Phylogeny, biogeography and conservation status of the Daniellia clade (Leguminosae: Detarioideae) in Africa and Madagascar. *Molecular Phylogenetics and Evolution* 46: 106752.

Coleman, J.L., Ascher, J.S., Bickford, D., Buchori, D., Cabanban, A., Chisholm, R.A., Chong, K.Y., Christie, P., Clements, G.R., dela Cruz, T.E.E., Dressler, W., Edwards, D.P., Francis, C.M., Friess, D.A., Giam, X., Gibson, L., Huang, D., Hughes, A.C., Jaafar, Z., Jain, A., Koh, L.P., Kudavidanage, E.P., **Lee, B.P.Y.-H.**, Lee, J., Lee, T.M., Legget, M., Leimona, B., Linkie, M., Luskin, M., Lynam, A., Meijaard, E., Nijman, V., Olsson, A., Page, S., Parolin, P., Peh, K.S.-H., Posa, M.R., Prescott, G.W., Rahman, S.A., Ramchunder, S.J., Rao, M., Reed, J., Richards, D.R., Slade, E.M., Steinmetz, R., **Tan, P.Y.**, Taylor, D., Todd, P.A., Vo, S.T., Webb, E.L., Ziegler, A.D. & Carrasco, L.R. (2019). Top 100 research questions for biodiversity conservation in Southeast Asia. *Biological Conservation* 234: 211–220.

Cullinane, A., Gahan, J., Walsh, C., Nemoto, M., Entenfellner, O., Olguin-Periglione, C., Garvey, M., **Huang Fu, T.Q.**, Venner, M., Yamanaka, T., Barrandeguy, M. & **Fernandez, C.J.** (2020). Evaluation of Current Equine Influenza Vaccination Protocols Prior to Shipment, Guided by OIE Standards. *Vaccines* 8, 107.

de Kok, R.P.J. (2019). A revision of *Cinnamomum* Schaeff. (Lauraceae) of Peninsular Malaysia. *Gardens' Bulletin Singapore* 71(1): 89–139.

de Kok, R.P.J. (2019). *Cinnamomum mabberleyi*, a new species from Vietnam and Laos. *Gardens' Bulletin Singapore* 71(Suppl. 2): 227–231.

de Kok, R.P.J. (2019). Three new taxa and new combinations and thirty-one lectotypifications in several Lauraceae genera from Peninsular Malaysia. *Gardens' Bulletin Singapore* 71 (1): 141–161.

de Kok, R.P.J. & Sengun, S. (2020). A revision of *Cinnadenia* Kosterm. (Lauraceae). *Adansonia* 42(4): 105–112.

Duangjai, S., Rueangrua, S., Phutthai, T., **Middleton, D.J.** & Suddee, S. (2020). *Diospyros phuuvuaensis* (Ebenaceae), a new species from North-Eastern Thailand. *Thai Forest Bulletin (Botany)* 48(1): 34–44.

Ganesan, S.K. (2019). Flora of Singapore precursors, 15. Nomenclatural novelties in Anacardiaceae. *Kew Bulletin* 74, 56.

Ganesan, S.K. & Middleton, D.J. (2019). Proposal to conserve *Dracontomelon* (Anacardiaceae) with a conserved type. *Taxon* 68(4): 861–862.

Ganesan, S.K., Middleton, D.J. & Wilkie, P. (2019). A Revision of *Pterospermum*

(Malvaceae: Dombeyoideae) in Malesia. *Edinburgh Journal of Botany*, e-published: 1–81.

Ho, B.C., Lua, H.K., Bazilah Ibrahim, Yeo, R.S.W., Athen, P., Leong, P.K.F., Ali Ibrahim, Koh, S.L., Hassan Ibrahim, Lindsay, S., Chin, L.L., Seah, W.W. & Middleton, D.J. (2019). The plant diversity in Bukit Timah Nature Reserve, Singapore. *Gardens' Bulletin Singapore* 71(Suppl. 1): 41–134.

Irving, A.T., Rozario, P., Kong, P.-S., Luko, K., Gorman, J.J., Hastie, M.L., Chia, W.N., Mani, S., **Lee, B.P.Y.-H.**, Smith, G.J.D., Mendenhall, I.H., Larman, H.B., Elledge, S.J. & Wang, L.-F. (2019). Robust dengue virus infection in bat cells and limited innate immune responses coupled with positive serology from bats in IndoMalaya and Australia. *Cellular and Molecular Life Sciences*. <https://doi.org/10.1007/s00018-019-03242-x>

Izuddin, M., Srivathsan, A., Lee, A.L., **Yam, T.W.** & Webb, E. (2019). Availability of orchid mycorrhizal fungi on roadside trees in a tropical urban landscape. *Scientific Reports* 9: 19528.

Izuddin, M., **Yam, T.W.** & Webb, E.L. (2019). Germination niches and seed persistence of tropical epiphytic orchids in an urban landscape. *Journal of Plant Research* 132: 383–394.

Kang, D.H., Cho, S.H., Ong, H.G., Ling, S.M., Kyaw, N.O., Kim, Y.D. & **Kurzweil, H.** (2019). Two new generic records in the orchid flora of Myanmar. *Korean Journal of Plant Taxonomy* 49(1): 96–99.

Khoo, M.D.Y., Tiong, N.J.L., Li, T., Lim, W., Ng, D.J.J., Nyanasengeran, M., Yeo, D.C.J. & Cai, Y. (2019). The freshwater decapod crustaceans of Bukit Timah Nature Reserve, Singapore. *Gardens' Bulletin Singapore* 71(Suppl. 1): 575–581.

Khor, D.X., Fernandez, C.J., Chee, D.M., Teo, X.H., Han, Z.Y., Jiang, J.H., Neo, H.S., Chang, S.F. & Yap, H.H. (2019). Food safety impacts of finfish and crustacean aquaculture on food security in Asia. *Revue Scientifique et Technique* 38(2): 629–639.

Kurzweil, H. & Ormerod, P. (2019). A review of the *Calanthe* group (Orchidaceae) in Myanmar. *Thai Forest Bulletin (Botany)* 47(2): 196–225.

Lee, S.M.L. (2019). Macro-fungal diversity of Bukit Timah Nature Reserve, Singapore. *Gardens' Bulletin Singapore* 71(Suppl. 1): 135–144.

Leong-Škorničková, J., Tran, H.D., Nguyen, Q.B., Hlavata, K., Truong, L.H., Nguyen, Q.D., Nguyen, T.T. & Newman, M. (2019). The identity of *Amomum trilobum* and *Amomum unifolium* (Zingiberaceae: Alpinioideae), and description of four new related species from Vietnam. *Phytotaxa* 401(3): 149–165.

STAFF PUBLICATIONS

APRIL 2019 – MARCH 2020 (CONTINUED)

Li, T., Loh, Y.X., Lim, W., Nyanasengeran, M., Low, B.W., Tan, H.H., Yeo, D.C.J. & **Cai, Y.** (2019). The fish fauna of Bukit Timah Nature Reserve, Singapore. *Gardens’ Bulletin Singapore* 71(Suppl. 1): 557–573.

Maslin, B.R., Ho, B.C., Sun, H. & Bai, L. (2019). Revision of *Senegalia* in China, and notes on introduced species of *Acacia*, *Acaciella*, *Senegalia* and *Vachellia* (Leguminosae: Mimosoideae). *Plant Diversity* 41: 353–480.

Middleton, D.J., Armstrong, K., Baba, Y., Balslev, H., Chayamarit, K., Chung, R.C.K., Conn, B.J., Fernando, E.S., Fujikawa, K., Kiew, R., Luu, H.T., MuMu Aung, Newman, M.F., Nobuyuki, T., Tagane, S., **Thomas, D.C.,** Tran, T.B., Utteridge, T.M.A., van Welzen, P., Widyatmoko, D., Yahara, T. & **Wong, K.M.** (2019). Progress on Southeast Asia’s Flora projects. *Gardens’ Bulletin Singapore* 71(2): 267–319.

Neo, L., Mahyuni, R. & **Wong, K.M.** (2020). *Perakanthus longipetalus* (Rubiaceae), a new combination, and the first record of the genus outside Peninsular Malaysia. *Phytotaxa* 436(3): 298–300.

Neo, L., Tan, H.T.W. & **Wong, K.M.** (2019). *Cyanoneuron* (Rubiaceae) in Sulawesi? Reaffirmation of a Bornean endemic genus as a cautionary example on the use and interpretation of natural history specimen data. *Nordic Journal of Botany* e02353: 1–4.

Neo, L., Tan, H.T.W. & **Wong, K.M.** (2020). Studies in Southeast Asian *Melastoma* (Melastomataceae), 4. Clarification of *Melastoma crinitum* in Southeast Asia and the reinstatement of *Melastoma molle*. *Phytotaxa* 436(2): 196–200.

Nguyen, C.T.T. & **Cai, Y.** (2019). Physicochemical characteristics of streams in Bukit Timah Nature Reserve, Singapore. *Gardens’ Bulletin Singapore* 71(Suppl. 1): 491–556.

Niissalo, M.A. & Leong-Škorničková, J. (2019). *Mayaca fluviatilis* Aubl. (Mayacaceae), a new record of an introduced naturalised aquatic monocotyledon in Singapore. *Nature in Singapore* 12: 7–9.

Ormerod, P. & **Kurzweil, H.** (2019). Notes on the identities of three Malesian *Dendrobium* (Orchidaceae: Dendrobiinae). *Harvard Papers in Botany* 24(2): 279–280.

Rahayu, S. & **Rodda, M.** (2019). *Hoya amicabile* sp. nov. (Apocynaceae, Asclepiadoideae), from Java discovered on Facebook. *Nordic Journal of Botany* 37(12), e-published online.

Rodda, M. (2019). A revision of *Jasminanthes* (Apocynaceae) with four new species from Borneo. *Phytotaxa* 405(3): 127–146.

Rodda, M. (2019). Two new species and two new records of *Marsdenia* (Apocynaceae) from Thailand. *Annales Botanici Fennici* 57: 9–15.

Rodda, M. (2020). Two new genera of Apocynaceae for Laos. *Thai Forest Bulletin* 48(1): 18–20.

Rodda, M., Aung, M.M. & Armstrong, K. (2019). A new species, a new subspecies, and new records of *Hoya* (Apocynaceae, Asclepiadoideae) from Myanmar and China. *Brittonia*, e-published online: 1–11.

Rodda, M. & Middleton, D.J. (2019). Flora of Singapore Precursors, 14. Notes on Apocynaceae. *Gardens’ Bulletin Singapore* 71: 69–80.

Rodda, M. & Poopath, M. (2019). A new species of *Telosma* (Apocynaceae, Asclepiadoideae) from Thailand. *Phytotaxa* 416: 238–242.

Rundel, P.W., Sharifi, M.R., King-Rundel, J. & **Middleton, D.J.** (2019). Leaf traits in the dwarf montane heathland of the Bokor Plateau, Cambodia. *Cambodian Journal of Natural History* 2019(2): 77–84.

Sangrattanakprasert, J., **Ho, B.C.,** Chantanaorrapint, S. & Zhu, R.-L. (2019). The genus *Colura* (Lejeuneaceae, Marchantiophyta), new to Singapore. *Gardens’ Bulletin Singapore* 71 (1): 81–85.

Seah, W.W. (2019). A new combination in *Gynochthodes* (Rubiaceae). *Gardens’ Bulletin Singapore* 71(1): 163–166.

Seah, W.W., Chong, K.Y., Neo, L., Tan, S.Y., Koh, C.Y., **Lim, R.C.J.,** Loh, J.W., Ng, W.Q., **Yee, A.T.K.** & Tan, H.T.W. (2019). Towards a field guide to the trees of the Nee Soon Swamp Forest (V): Burseraceae. *Nature in Singapore* 12: 15–36.

Seah, W.W., Hung, S.M.X. & Chong, K.Y. (2019). Flora of Singapore precursors, 17: Clarification of some names in the genus *Calophyllum* as known in Singapore. *Gardens’ Bulletin Singapore* 71(2): 407–414.

Shee, Z.Q., Frodin, D.G., Camara-Leret, R. & Pokorny, L. (2020). Reconstructing the complex evolutionary history of the Papuasian *Schefflera* radiation through herbariomics. *Frontiers in Plant Science* 11(258): 1–19.

Šida, O., Kuznetsov, A., Kuznetsova, S., Rybka, V., Rybkova, R., Truong, L.H., Nuraliev, M. & **Leong-Škorničková, J.** (2019). *Meistera caudata* and *Meistera sudae* (Zingiberaceae: Alpinieae), two new ginger species from Bidoup-Nui Ba National Park, southern Vietnam. *Phytotaxa* 419(2): 221–231.

Sirimongkol, S., Parnell, J.A.N., Hodgkinson, T., **Middleton, D.J.** & Puglisi, C. (2019). Five new species of *Henckelia* (Gesneriaceae)

from Myanmar and Thailand. *Thai Forest Bulletin (Botany)* 47: 38–54.

Shih, H.-T. & **Cai, Y.** (2019). *Neocaridina fonticulata*, a new land-locked freshwater shrimp from Hengchun Peninsula, Taiwan (Decapoda, Caridea, Atyidae). *ZooKeys* 817: 11–23

Soonthornkalump, S., Ongsakul, A., Dolaji, A. & **Leong-Škorničková, J.** (2020). *Curcuma papilionacea* (Zingiberaceae), an unusual new species from southern Thailand. *Phytotaxa* 432(1): 11–16.

Tan, B.C., Ochyra, R., **Ho, B.C.** & Bednarek-Ochyra, H. (2019). *Distichophyllum shevockii* (Daltoniaceae), a new moss species from the Philippines. *Annales Botanici Fennici* 56: 361–367.

Tang, Q.M., **Ho, B.C.** & Wei, Y.M. (2019). An IUCN threatened moss species, *Hypnodontopsis apiculata* (Rhachithecaceae, Bryophyta), new to China. *Herzogia* 31: 369–374.

Tay, S., He, J. & **Yam, T.W.** (2019). CAM plasticity in epiphytic tropical orchid species responding to environmental stress. *Botanical Studies* 60(7): 1–15.

Teo, R.C.H. & Thomas, N.J. (2019). Updated inventory of amphibians, reptiles and mammals of the Bukit Timah Nature Reserve, Singapore. *Gardens’ Bulletin Singapore* 71(Suppl. 1): 145–183.

Thomas, D.C. & Ardi, W.H. (2019). *Begonia mabberleyana* (Begoniaceae), a new species from Central Sulawesi, Indonesia. *Gardens’ Bulletin Singapore* 71(Suppl. 2): 219–225.

Thomas, D.C. & Ardi, W.H. (2020). Synopsis of *Begonia* (Begoniaceae) of southwest Sulawesi and the Selayar Islands, Indonesia, including one new species. *Phytotaxa* 436(2): 73–96.

Toh, X., Chong, S.M., Wang, Y., Soh, M.L., Chan, A., Teo, X.H., Lee, B., **Wong, Y.,** Hsu, C.-D., Oh, S., **Fernandez, C.J. & Huangfu, T.** (2019). Canine Parvovirus-2c (CPV-2c) Infection in Wild Asian Palm Civets (*Paradoxurus hermaphroditus*) in Singapore. *Journal of Wildlife Diseases* 55(4).

Toh, X., Soh, M.L., Ng, M.K., Yap, S.C., Harith, N., Fernandez, C.J. & Huangfu, T. (2019). Isolation and characterization of equine influenza virus (H3N8) from an equine influenza outbreak in Malaysia in 2015. *Transboundary and Emerging Diseases* 66(5).

Truong, L.H., Tran, H.D., Nguyen T.H. & **Leong-Škorničková, J.** (2019). *Alpinia vietnamica* (Zingiberaceae), a new species from Vietnam. *Annales Botanici Fennici* 56: 221–226.

Turner, I.M. (2019). Flora of Singapore precursors, 12. Notes on various Rubiaceae

genera. *Gardens’ Bulletin Singapore* 71: 45–59.

Turner, I.M. (2019). A new name for a species of *Psychotria* (Rubiaceae) from Papua New Guinea. *Annales Botanici Fennici* 56: 55.

Turner, I.M. (2019). *Warszewiczia* and sixteen other names in the Rubiaceae authored by J. C. Klotzsch: when and where were they published? *Willdenowia* 49: 151–154.

Turner, I.M., Middleton, D.J., Duistermaat, H. & Veldkamp, J.F. (2019). Flora of Singapore Precursors, 6: Typification of grass names relevant to the flora of Singapore. *Gardens’ Bulletin Singapore* 71: 1–44.

Wei, Y.M., **Ho, B.C.** & Tang, Q.M. (2019). *Eulejeunea crenulata* Schiffn., a new synonym of *Lejeunea umbilicata* (Lejeuneaceae, Marchantiophyta). *Phytotaxa* 406(1): 79–80.

Wong, K.M. (2019). Book review: Forest Trees of Southern Thailand. Volume 3, Monimiaceae to Ximeniaceae & Gymnosperms. Simon Gardner, Pindar Sidisunthorn & Kongkanda Chayamarit. *Gardens’ Bulletin Singapore* 71: 263–264.

Wong, K.M. & Neo, L. (2019). Species richness, lineages, geography and the forest matrix: Borneo’s ‘Middle Sarawak’ phenomenon. *Gardens’ Bulletin Singapore* 71(Suppl. 2): 463–496.

Xie, S., Hsu, C.-D., **Tan, B.Z.Y., Tay, Y.H. & Wong, W.K.** (2019). Erysipelothrix Septicaemia and Hepatitis in a Colony of Humboldt Penguins (*Spheniscus humboldti*). *Journal of Comparative Pathology* 172: 5–10.

Yam, T.W. (2020). Conservation Update. Conservation and reintroduction of Singapore’s native orchids. *Orchids*. February: 96–99.

Yee, A.T.K., Lai, H.R., Chong, K.Y., Neo, L., Koh, C.Y., Tan, S.Y., **Seah, W.W.,** Loh, J.W., Lim, R.C.J., van Breugel, M., & Tan, H.T.W. (2019). Short-term responses in a secondary tropical forest after a severe windstorm event. *Journal of Vegetation Science* 30(4): 720–731.

Yeo, G., **Wang, Y., Chong, S.M.,** Humaidi, M., Lim, X.F., Mailepessov, D., **Chan, S., How, C.B., Lin, Y.N., Huangfu, T., Fernandez, C.J.,** Hapuarachchi, H.C. & Yap, G. (2019). Characterization of Fowlpox virus in chickens and bird-biting mosquitoes: a molecular approach to investigating Avipoxvirus transmission. *Journal of General Virology* 100(5): 838–850.

Yueh, N.L., Fong, R., Leo, J., Wong, W.K., Ye, A., Chan, P.P., Chong, N., Lim, G., Octavia, S., Lin, M., Li, H., Manogaran,

V. & Kyaw Thu Aung (2019). Distribution of *Salmonella* spp. along the food chain in Singapore, 2008–2016. *Epidemiological News Bulletin Quarterly* 45(2): 44–54.

PERIODICALS

Ganesan, S.K. (2019). Book Review: Pictorial Guide to the Flora of Tasik Chini. *Gardenwise* 53: 40.

Ganesan, S.K. (2020). Around the Gardens: An exhibition on the ethnobotany of the Jackfruit tree family. *Gardenwise* 54: 34–35.

Ho, B.C. & Chen, L. (2019). Toxic ‘peas’ – the dark side of the legumes. *Gardenwise* 53: 19–21.

Khew, G. (2019). The life and legacy of David Lim Hock Lye, venerated orchid breeder and polymath. *Gardenwise* 53: 2–9.

Koh, T.S., Chin, L.L., Yong, C., Chen, L., Ho, B.C. & Lua, H.K. (2020). Conserving an enigmatic aroid for Singapore. *Gardenwise* 54: 9–12.

Lee, S. (2019). Collaborators in Research: International researchers on the Flora of Singapore project. *Gardenwise* 53: 31.

Lee, S. (2019). From the Earth: Fungus-termite partnerships. *Gardenwise* 53: 32–33.

Lee, S. (2020). From the Earth: Cups-o-Fungi. *Gardenwise* 54: 26–28.

Leong-Škorničková, J., Rodda, M., & Tan, S.T. (2019). Refurbishment of the Potting Yard for horticulture and botanical research. *Gardenwise* 53: 10–15.

Lim, J. & Koh, J. (2020). The Seed Dispersal Garden. *Gardenwise* 54: 15–17.

Lim, Q.S. (2020). Beyond the Gardens: Getting to know gingers – Zingiberales Workshop at the Dr Cecilia Koo Botanic Conservation Center. *Gardenwise* 54: 39–40.

Middleton, D. (2019). From the Taxonomy Corner: Herbarium collections. *Gardenwise* 53: 28–30.

Middleton, D.J. (2020). From the Taxonomy Corner: Herbarium collections – part 2. *Gardenwise* 54: 21–23.

Middleton, D.J., Leong-Škorničková, J. & Lindsay, S. (2020). Publication of the *Flora of Singapore*. *Gardenwise* 54: 6–9.

Niissalo, M. & Leong-Škorničková, J. (2019). Native *Dracaena* in Singapore – Part 2, Maingay’s *Dracaena*. *Gardenwise* 53: 16–18.

Nura Abdul Karim (2019). What’s Blooming: Heat wave and flowers... *Gardenwise* 53: 38–39.

Nura Abdul Karim (2020). Beyond the Gardens: The 7th Southeast Asia Botanic Gardens Network Conference. *Gardenwise* 54: 36–37.

Nura Abdul Karim (2020). Beyond the Gardens: Talking plant conservation in the city of the Giant Pandas. *Gardenwise* 54: 38.

Nura Abdul Karim (2020). What’s Blooming: A burst of fragrances under the sun. *Gardenwise* 54: 32–33.

Ooi, Z.Y. (2020). The Mingxin Foundation Rambler’s Ridge and OCBC Arboretum at the Gallop Extension. *Gardenwise* 54: 3–5.

Rodda, M. & Guglielmono, L. (2019). A meeting of two giants of botany – Beccari and Ridley. *Gardenwise* 53: 24–25.

Seah, W.W. & Lee, S. (2020). The characteristic ‘faces’ of *Canarium*. *Gardenwise* 54: 12–14.

Soh, C. (2019). From the Archives: From Third Lake to Eco-Lake. *Gardenwise* 53: Back cover.

Soh, C. & Ali Ibrahim (2020). From the Archives: The old Bonsai House. *Gardenwise* 54: Back cover.

Tan, H.M. & Loe, S. (2020). From Education Outreach: Fascinating Creatures of the Singapore Botanic Gardens for preschoolers. *Gardenwise* 54: 31.

Taylor, N. (2020). Singapore Botanic Gardens. In: Koh, T. *Fifty Secrets of Singapore’s Success*, pp. 198–203. Singapore: Straits Times Press.

Taylor, N.P. (2019). New to cultivation in Singapore. *Gardenwise* 53: 22–23.

Taylor, N.P. (2020). Living versus herbarium collections for research. *Gardenwise* 54: 18–20.

Wong, W. (2019). Edibles: Appreciating the colours of the Butterfly Pea’s flowers. *Gardenwise* 53: 34–35.

Wong, W. (2020). Edibles: Confusing common names of edibles. *Gardenwise* 54: 29–30.

Yam, T. W., Ang, P., Tay, F. & Teo, S. (2019). Conservation of a Critically Endangered native orchid, *Callostylis pulchella*. *Gardenwise* 53: 26–27.

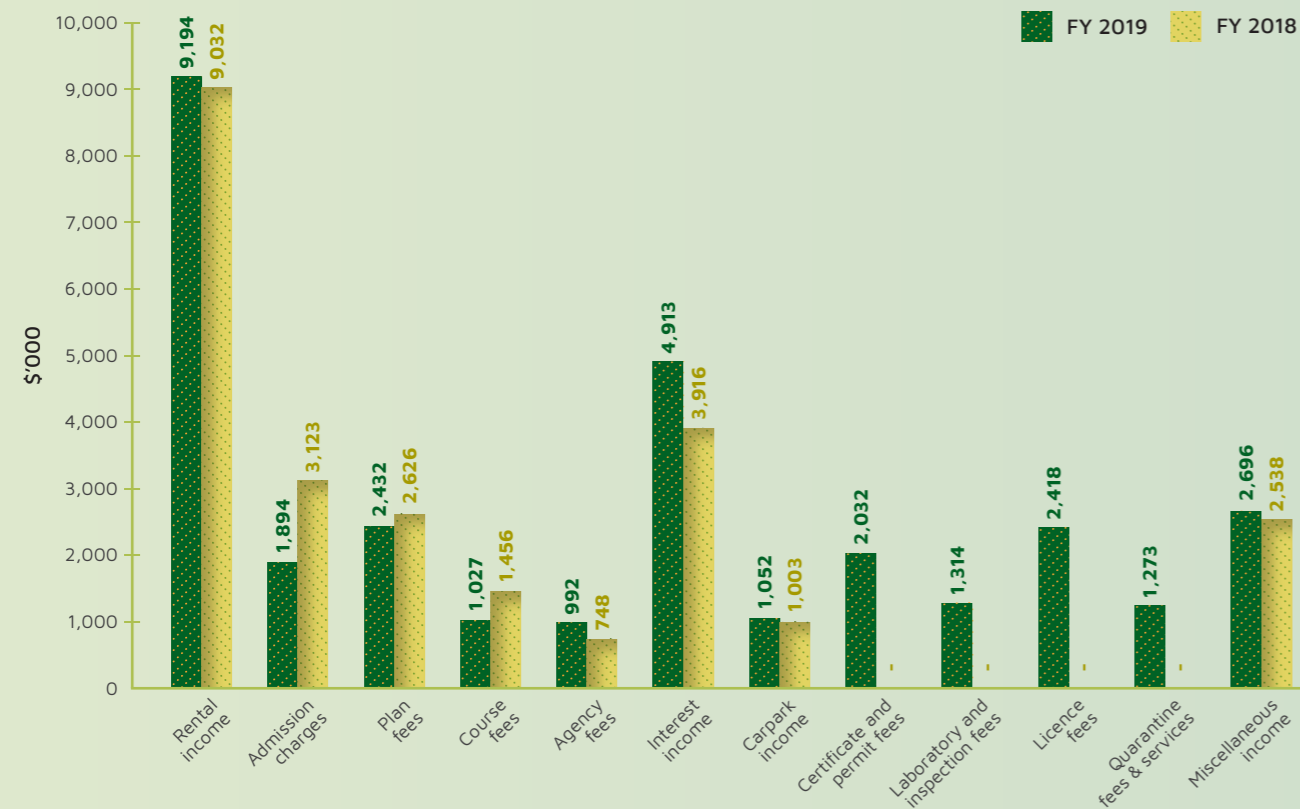
Yau, J., Wong, W., Tan, H.M. & Loe, S. (2019). From Education Outreach: Sharing with the community. *Gardenwise* 53: 36–37.

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 \$31.2 million. The increase from last year's income was mainly due to new income sources arising from taking over of non food functions from the former Agri-food and Veterinary Authority.

Income for FY 2019 & FY 2018

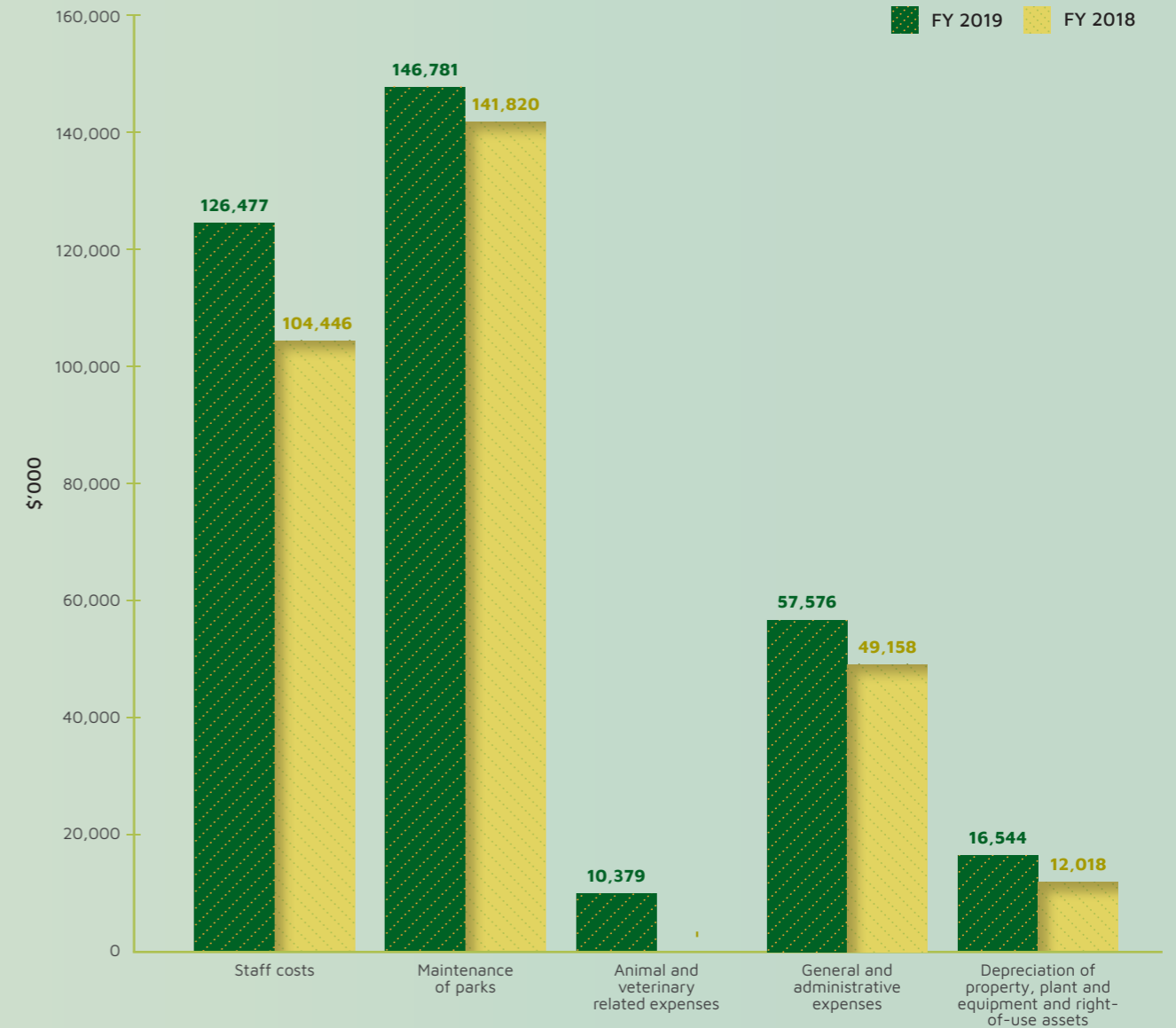


Income	FY 2019	FY 2018	Increase/(Decrease)	
	\$ '000	\$ '000	\$ '000	% Change
Rental income	9,194	9,032	162	2
Admission charges	1,894	3,123	(1,229)	(39)
Plan fees	2,432	2,626	(194)	(7)
Course fees	1,027	1,456	(429)	(29)
Agency fees	992	748	244	33
Interest income	4,913	3,916	997	25
Carpark income	1,052	1,003	49	5
Certificate and permit fees	2,032	-	2,032	100
Laboratory and inspection fees	1,314	-	1,314	100
Licence fees	2,418	-	2,418	100
Quarantine fees & services	1,273	-	1,273	100
Miscellaneous income	2,696	2,538	158	6
Total	31,237	24,442	6,795	28

OPERATING EXPENDITURE

The Group's operating expenditure for the year was \$357.8 million. The 16% increase from last year's expenditure was mainly due to the expenditures relating to the animal and plant related functions taken over from the former Agri-food and Veterinary Authority with effect from 1 April 2019.

Operating Expenditure for FY 2019 & FY 2018



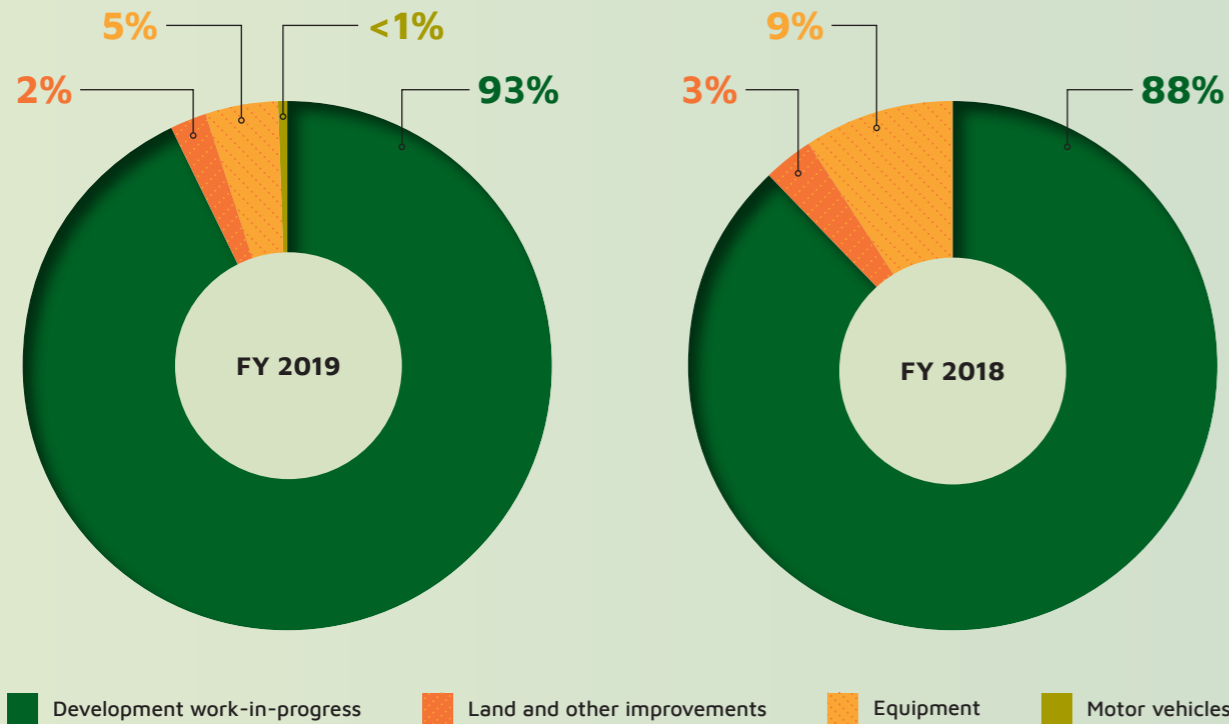
Operating Expenditure	FY 2019	FY 2018	Increase/(Decrease)	
	\$ '000	\$ '000	\$ '000	% Change
Staff costs	126,477	104,446	22,031	21
Maintenance of parks	146,781	141,820	4,961	3
Animal and veterinary related expenses	10,379	-	10,379	100
General and administrative expenses	57,576	49,158	8,418	17
Depreciation of property, plant and equipment and right-of-use assets	16,544	12,018	4,526	38
Total	357,757	307,442	50,315	16

FINANCIAL REVIEW

CAPITAL EXPENDITURE

The Group's capital expenditure for the year was \$43.6 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 2019 & FY 2018

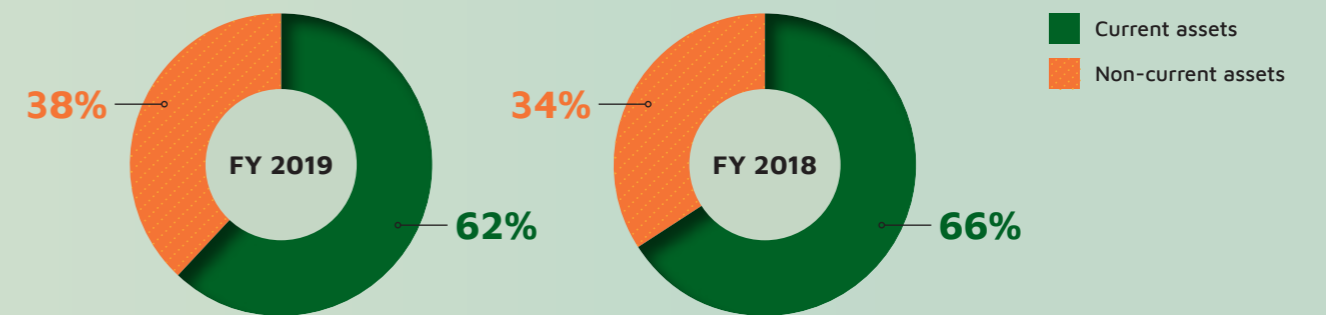


Capital Expenditure	FY 2019 \$ '000	FY 2018 \$ '000	Increase/(Decrease) \$ '000	% Change
Land and other improvements	940	851	89	10
Equipment	1,980	2,620	(640)	(24)
Motor vehicles	113	-	113	100
Development work-in-progress	40,555	25,310	15,245	60
Total	43,588	28,781	14,807	51

FINANCIAL POSITION

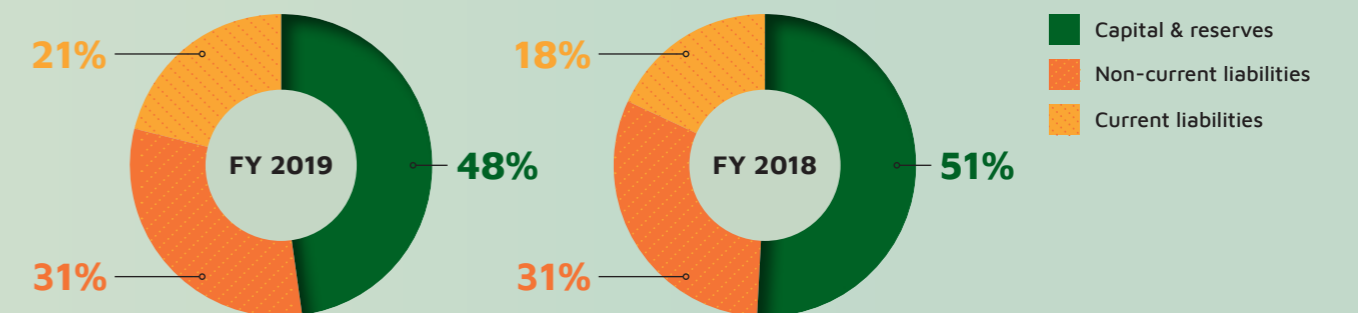
As at 31 March 2020, the Group's total assets stood at \$571.2 million, an increase of 39% over last year. Non-current assets and current assets represent 38% and 62% of total assets respectively. Non-current assets consisted mainly of leasehold land and buildings and structures at Singapore Botanic Gardens and Fort Canning Park as well as the assets taken over from the former Agri-food and Veterinary Authority. Capital and reserve stood at \$271.7 million, while non-current liabilities and current liabilities stood at \$178.4 million and \$121.1 million respectively.

Total Assets



Assets	FY 2019 \$ '000	FY 2018 \$ '000	Increase/(Decrease) \$ '000	% Change
Non-current assets	216,107	138,199	77,908	56
Current assets	355,141	273,849	81,292	30
Total	571,248	412,048	159,200	39

Total Liabilities & Equity



Equity & Liabilities	FY 2019 \$ '000	FY 2018 \$ '000	Increase/(Decrease) \$ '000	% Change
Capital & reserves	271,717	211,226	60,491	29
Non-current liabilities	178,441	125,688	52,753	42
Current liabilities	121,090	75,134	45,956	61
Total	571,248	412,048	159,200	39

FRONT COVER

Jurong Lake Gardens is Singapore's new national gardens in the heartlands.

INTRODUCTION

Situated east of Sungei Buloh Wetland Reserve, the Mandai Mangrove and Mudflat is home to threatened species of mangrove, seagrass and horseshoe crabs, as well as providing migratory shorebirds a rich feeding ground.

CHAPTER DIVIDERS

Page 10 – A City Transformed by Nature

The verdant greenery of Telok Blangah Hill Park in the foreground paired with the lush vegetation of Mount Faber Park in the background, perfectly illustrating our City in Nature.

Page 18 – Conserving Our City in Nature

The Straw-headed Bulbul (*Pycnonotus zeylanicus*) is highly threatened in neighbouring countries but there are positive signs that its population is growing in Singapore.

Page 26 – Nurturing Our City in Nature

From improving physical and mental well-being, to building bonds between the young and old, there are many benefits to joining in a Community in Bloom gardening activity.

Page 38 – Growing Our City in Nature

It is never too early to get the young interested in nature as many grow to become active stewards in our greening journey so as to strengthen Singapore's ecological resistance.

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

Yang Shufen: Page 2, photo of Mandai Mangrove and Mudflat

Tok Yin Xin: Page 10, photo of Mount Faber Park

Dr Emrys Chew: Page 12, photo of *Dendrobium gouldii* 'Nong'

Siti Zaharah Raman: Page 16, photo of Garlic Vine (*Mansoa hymenaea*) on the trellis along Ang Mo Kio Avenue 8

Andrew Tau: Page 17, photo of streetscape along Margaret Drive

Francis Yap: Page 18, photo of Straw-headed Bulbul (*Pycnonotus zeylanicus*) and page 20, photo of Brown-chested Jungle Flycatcher (*Cyornis brunneatus*)

Noel Thomas: Page 20, photo of Yellow-striped Caecilian (*Ichthyophis paucisulcus*) and page 21, photo of herons perched on the floating wetlands on Pulau Ubin

Jeanne Tan: Page 22, photo of Raffles' Banded Langur (*Presbytis femoralis femoralis*)

Cheo Pei Rong: Page 29, photo of participants of an intertidal watch

Ministry of Communications and Information: Page 31, photo of President Halimah Yacob at Festival of Biodiversity 2019.

Lam Cheng Wan: Page 31: photo of CHIJ Kellock Primary School students

LJCP Photography: Page 34: photo of NParks Concert Series in the Park – Rockestra ®

Ruth Foo: Page 53, photo of members of the Friends of Rail Corridor community

Ong Kim Liap: Page 55, photo of Bougainvillea planting along East Coast Parkway

NATIONAL PARKS BOARD

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