



# A NATURAL TRANSFORMATION

ANNUAL REPORT 2022 - 2023

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# A NATURAL TRANSFORMATION

Nature is constantly evolving, shaping our city, ecosystems, and community. And we, in turn, are inspired to transform Singapore into a City in Nature.

Guided by scientific principles, our latest green spaces employ nature-based solutions and biophilic landscapes, enhancing the well-being of all who visit them. We have intensified research and embraced digitalisation to break new ground in park operations, conservation strategies and animal management. Empowered by technology, we have also raised industry standards, bolstered biosurveillance efforts, and taken significant strides against illegal wildlife trade. Supported by the community, we hit the halfway mark in the OneMillionTrees movement and enjoyed more in-person events in our green spaces as we eased out of the pandemic.

All these efforts are key to ensuring sustainability and enhancing liveability in Singapore. As our city undergoes a natural transformation, we too are transformed by the many benefits of nature.



## CHAIRMAN'S MESSAGE



After three years of the Covid-19 pandemic, Singapore exited its acute phase and entered an endemic phase in February 2023. What this meant for all of us in practical and simple terms is that we could now finally catch up with old friends, attend public events and travel overseas again freely.

Even though life returned to normal or near normal, things are not completely the same. For instance, our workplace and daily work routine are not the same as before. Working out of necessity from home during the pandemic demonstrated that in fact it was actually not only doable and productive but also personally valued by staff. And so, hybrid flexible work arrangements have become the new norm.

In the case of NParks, one of the positive things that grew out of the pandemic is the substantially increased number of visitors to our green spaces. To cope with the challenges of living largely isolated and physically restrictive lives during the pandemic years, Singaporeans sought and found relief in our green spaces.

While the pandemic may have up-ended many things, it taught many of us to appreciate first-hand the therapeutic effects of greenery in boosting our mental well-being and resilience. It has amplified and reinforced the Singaporean's love for Nature. Our attachment to and value for Nature is growing strongly to become a staple part of our society's culture. This is key to our truly becoming a City in Nature and what it means in terms of a genuine and distinctive Singaporean way of life.

NParks has invested much over many years and will continue to invest in deepening its research and application of science and technology.

**While the pandemic may have up-ended many things, it taught many of us to appreciate first-hand the therapeutic effects of greenery in boosting our mental well-being and resilience. It has amplified and reinforced the Singaporean's love for Nature.**

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Today our officers oversee multiple ongoing research, operations technology and digitalisation projects under our Science and Technology workstreams. NParks' Centre for Wildlife Forensics, for instance, is now a CITES-listed lab, making it one of the few facilities in Asia to achieve this distinction. In species recovery efforts, we have made headway with the first captive breeding of the Swamp Forest Crab (*Parathelphusa reticulata*), an endemic species that is highly secretive in the wild. Its successful ex-situ breeding has helped researchers better understand its mating characteristics and resulted in the release of its second generation back to Nee Soon Swamp Forest.

Scholarship and research constantly help inform the way we do and improve on our work. For instance, our collaboration with the National University of Singapore and the Singapore Institute for Clinical Sciences have led to findings suggesting that urban green spaces which offer views of far-away scenery and those that adopt more naturalistic planting amongst other design elements, add the most value to a visitor's well-being. Such features have now been incorporated into new green spaces such as the Therapeutic Garden at Bedok Reservoir Park and Nature Playgarden at Pasir Ris Park.

To support a balanced and informed approach to urban planning for development and protection of our natural heritage at the same time, we completed the island-wide Ecological Profiling Exercises for terrestrial and marine environments. This has provided crucial insights into long-term ecological connectivity to ensure the persistence of biodiversity.

Another key research track is the Long-Term Socio-Ecological Research Programme, which emphasises the long-term monitoring of socio-ecological impacts in our City in Nature efforts. The findings will help shape future conservation work, use of recreational spaces and programmes.

This year, NParks is commemorating 60 years of Singapore's greening journey. We are especially happy to be able to resume public events such as tree planting, NParks Concert Series in the Park: Rockestra, as well as Gardeners' and Pets' Day Out activities. We have also opened more green spaces for visitors to explore, such as Rifle Range Nature Park, along with the completion of the Tyersall-Gallop Core of the Singapore Botanic Gardens and 21 km of seamless connectivity along the Rail Corridor.

The enthusiastic public support received for our various programmes and our new green spaces is gratifying. Noteworthy is the OneMillionTrees movement which saw over 575,000 trees planted by some 75,000 members of public, schools, agencies, and corporate entities, since its launch in 2020. This in fact puts us ahead of schedule to reach our goal of planting a million more trees by 2027, three years ahead of the original 2030 target.

We remain ever grateful for the support of Singaporeans for the work NParks does. We look forward with confidence that we will work and grow together strongly to achieve the vision of a Singapore that is truly a City in Nature.

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

# MEMBERS OF THE BOARD

(As of September 2023)



**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. He retired from the Civil Service in 2016. He is presently Chairman of Temasek Foundation, Temasek Life Sciences Laboratory and Housing and Development Board. He also serves as a special advisor to the Centre for Liveable Cities (MND) and to the National Security Studies Programme, RSIS (NTU). He was awarded the Meritorious Service Medal in 2010 and the Distinguished Service Order in 2021.

*Mr Loh Khum Yean is appointed as Chairman of the National Parks Board with effect from 1 October 2023. He succeeds Mr Benny Lim who stepped down from the Board on 30 September 2023.*



**Cheng Hsing Yao**  
BOARD MEMBER

Mr Cheng is the Group Chief Executive Officer of GuocoLand. Prior to that, he held leadership positions at the Centre for Liveable Cities (CLC) and Urban Redevelopment Authority. He is a member of URA's International Panel of Experts, Design Advisory Committee as well as Heritage and Identity Partnership, and is a member of the CLC Advisory Panel. He also co-chairs the Building and Construction Authority's Central Procurers Panel, and sits on the board of the Institute of Real Estate and Urban Studies, National University of Singapore.



**Ms Shantini Ramachandra**  
BOARD MEMBER

Ms Ramachandra was formerly a Business Tax Partner of Deloitte. She also held the role of Tax Leader of Deloitte Private and led the Deloitte Law Firm Services Singapore tax practice. 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 Chartered Tax Professionals. She practised law in the area of commercial and corporate law before joining a Big Four accounting firm and has about 25 years of international tax experience.



**Musa Fazal**  
BOARD MEMBER

Mr Musa is a Senior Director of the Futures, Strategy and Plans Division in the Ministry of Trade & Industry where he oversees strategic planning activities, from sensing and sense-making, to strategy development, work planning, strategic resourcing, and inter-agency coordination to transform Singapore's economy. Prior to this, he served in various agencies in the public service, including SkillsFutureSG, Ministry of Manpower, Ministry of Finance and Monetary Authority of Singapore.



**Professor David Chan**  
BOARD MEMBER

Prof Chan is Lee Kong Chian Professor of Psychology and Director of the Behavioural Sciences Initiative at the Singapore Management University as well as Adjunct Principal Scientist and Scientific Advisor at A\*STAR. To date, his works have been cited over 15,000 times in various disciplines. A 2020 study by Stanford University on researcher impact among all scientists across all disciplines named him in the top one percent worldwide. He is Elected Fellow of six international psychological associations. He has received numerous international achievement awards and he is the first Asian to receive the prestigious Raymond Katzell Award from the Society for Industrial and Organizational Psychology. He has served on numerous national councils and boards, and is currently a member of the Social Science Research Council.



**Ms Tham Loke Kheng**  
BOARD MEMBER

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 companies. In September 2017, she returned to Mediacorp as CEO, coming full circle to the organisation where she started her career. Prior to that, 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. She is also a Board Director of the Singapore Chinese Cultural Centre, a member of the SG Cares Steering Committee, and a member of the Yellow Ribbon Singapore Board.



**Lee Chee Koon**  
BOARD MEMBER

Mr Lee is Group CEO of CapitaLand Investment, one of Asia's largest listed real estate investment managers with a global presence across over 30 countries. Prior to this, Mr Lee was President and Group CEO of CapitaLand Group from 2018. His previous appointments since he joined CapitaLand Group in 2007 include Group Chief Investment Officer and CEO of The Ascott Limited.



**Ms Nur Hidayah Abu Bakar**  
BOARD MEMBER

Ms Nur Hidayah is Dean of the Faculty of Design at LASALLE College of the Arts, Singapore. She is a member of the Museum Education Advisory Panel at National Gallery Singapore, the Monetary Authority of Singapore's Singapore Note and Coin Advisory Committee, the Design Education Review Committee Workgroup and DesignSingapore Council (Ministry of Communications and Information). She believes in the interconnectedness of design aesthetics, education and industry/community, and has initiated several partnerships with Asian communities to develop design capability programmes and support social enterprises that promote a more inclusive design culture. She has also led the research and study of design cultures in contemporary Asian cities such as Singapore, Seoul and Shanghai.



**Gerald Tan Kwong Ming**  
BOARD MEMBER

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



**Ms Eu Chin Fen**  
BOARD MEMBER

As the CEO of Frasers Hospitality, Ms Eu leads the global hospitality and lodging business, leveraging her extensive experience within the Frasers Property Group. With a background rooted in finance, she previously served as the CEO of the Managers of Frasers Hospitality Trust and later as the Chief Investment Officer of Frasers Hospitality International, where she collaborated closely with the CEO of the hospitality strategic business unit of Frasers Property Limited. Before her tenure with Frasers, she held a key role at DBS Bank, contributing significantly to the finance industry. Armed with a Bachelor of Business degree in Financial Analysis from Nanyang Technological University, Singapore, and the esteemed Chartered Financial Analyst (CFA) designation, she is dedicated to driving innovation and excellence within Frasers Hospitality, ensuring unparalleled experiences for guests across the global properties.



**Ms Hwang Yu-Ning**  
BOARD MEMBER AND CHIEF  
EXECUTIVE OFFICER  
(FROM 1 JUNE 2023)

Ms Hwang is CEO of the National Parks Board. She has over 20 years of experience in public service including with the Urban Redevelopment Authority as Singapore's Chief Planner and stints in the Strategy Group of the Prime Minister's Office and the Ministry of National Development. She is a board member of the Land Transport Authority, the Science Centre Board, Gardens by the Bay and IJ Board of Management. She currently serves on the Scientific Advisory Committee of the Singapore-ETH Centre's Future Cities Lab Global Research Programme and the Asia-Pacific Executive Committee of the Urban Land Institute.

# MANAGEMENT TEAM

(As of September 2023)



<b>Dr Chang Siow Foong</b> GROUP DIRECTOR Professional & Scientific Services and Community Animal Management	<b>Dr Kiat W Tan</b> ADVISOR TO NPARKS	<b>Ms Hwang Yu-Ning</b> CHIEF EXECUTIVE OFFICER	<b>Dr Leong Chee Chiew</b> EXECUTIVE DIRECTOR National Parks, Gardens & Nature Reserves Cluster and Commissioner of Parks & Recreation	<b>Ryan Lee</b> GROUP DIRECTOR National Biodiversity Centre and Wildlife Management <b>SENIOR CURATOR</b> Istana	<b>*Dr Lena Chan</b> SENIOR DIRECTOR International Biodiversity Conservation	<b>Ms Kartini Omar</b> GROUP DIRECTOR Parks Development and Jurong Lake Gardens <b>SENIOR DIRECTOR (COVERING)</b> Design
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<b>Ms Ang Wei Ping</b> GROUP DIRECTOR Policy & Planning	<b>Bin Hee Jum</b> GROUP DIRECTOR Finance & Procurement	<b>Dr Yap Him Hoo</b> DEPUTY CHIEF EXECUTIVE OFFICER Professional Development & Services Cluster <b>DIRECTOR-GENERAL</b> Animal & Veterinary Service Cluster	<b>Lim Teck Lee</b> GROUP DIRECTOR Industry/CUGE	<b>Kong Yit San</b> EXECUTIVE DIRECTOR Jurong Lake Gardens	<b>*Lim Liang Jim</b> GROUP DIRECTOR Conservation	<b>Ms Lee Pin Pin</b> GROUP DIRECTOR Communications & Community Engagement
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<b>Ms Tan Lai Kheng</b> SENIOR DIRECTOR Lifestyle Business	<b>Dr Chua Tze Hoong</b> GROUP DIRECTOR Veterinary Health	<b>Tan Chong Lee</b> ASSISTANT CHIEF EXECUTIVE OFFICER Corporate Development & Services Cluster	<b>Ms Sophianne Mohd Araib</b> GROUP DIRECTOR Parks Central and Horticulture & Community	<b>Dr Tan Puay Yok</b> GROUP DIRECTOR Singapore Botanic Gardens	<b>Oh Cheow Sheng</b> GROUP DIRECTOR Streetscape
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<b>Yeo Meng Tong</b> SENIOR DIRECTOR Design Research & Development <b>ASSOCIATE DIRECTOR</b> CUGE	<b>Ms Chua Yen Ling</b> GROUP DIRECTOR Corporate Strategy & Planning and Parks West	<b>Ng Boon Gee</b> GROUP DIRECTOR Fort Canning Park & Istana	<b>Tang Tuck Weng</b> ASSISTANT CHIEF EXECUTIVE OFFICER Park Management & Lifestyle Cluster	<b>Chia Seng Jiang</b> GROUP DIRECTOR Parks East	<b>Ms Jessica Kwok</b> GROUP DIRECTOR Industry Standards & Regulatory	<b>Francis Lim</b> GROUP DIRECTOR Corporate Services
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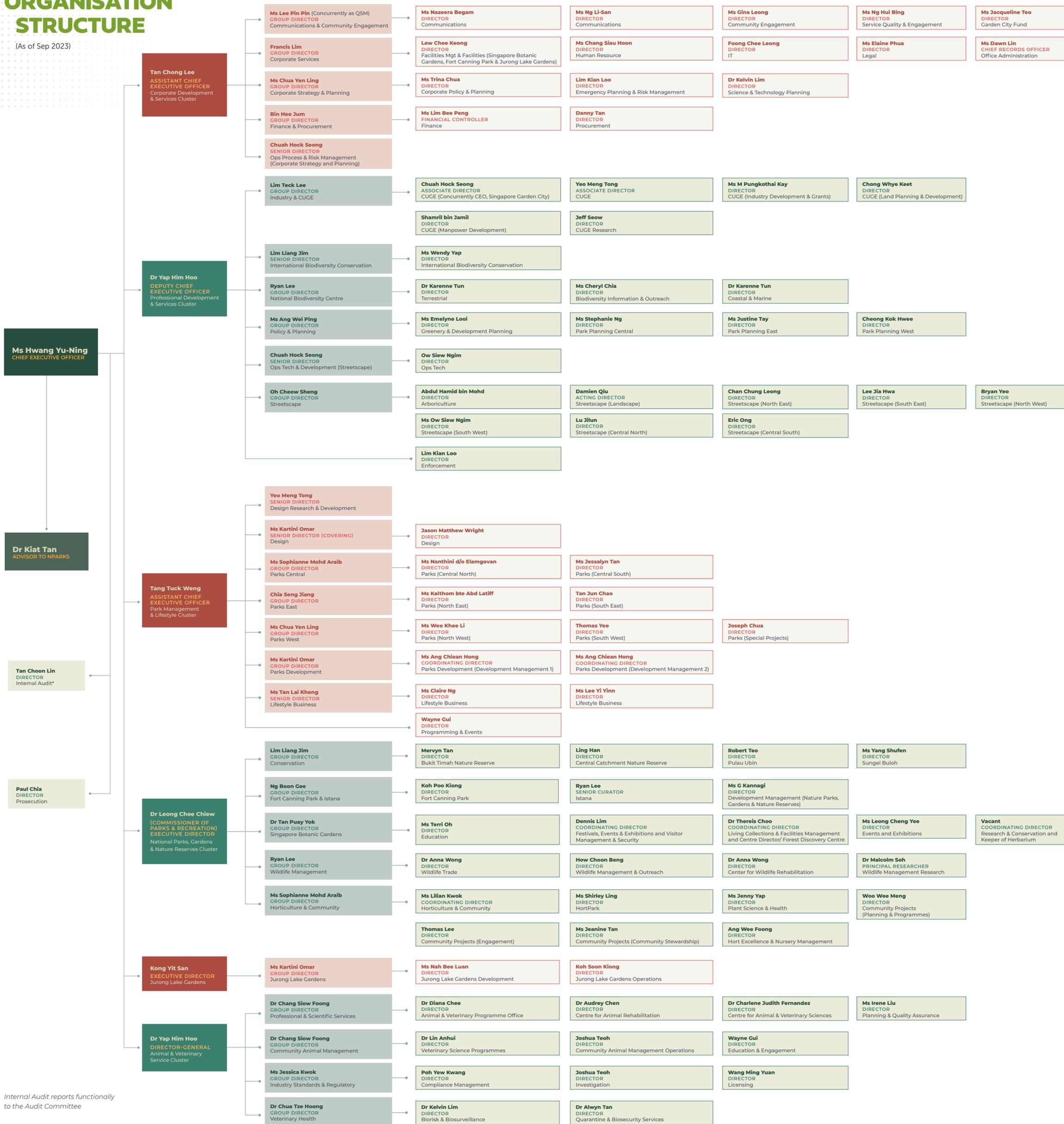
The Management Team photos were taken at Jurong Lake Gardens.

Not in picture: Mr Chuah Hock Seong, Senior Director, Ops Process & Risk Management and Ops Tech & Development; Associate Director, CUGE

\*Dr Lena Chan is retiring in September 2023. Lim Liang Jim is appointed Group Director/International Biodiversity Conservation as of 11 September 2023.

# ORGANISATION STRUCTURE

(As of Sep 2023)



Internal Audit reports functionally to the Audit Committee



## TRANSFORMING INTO A CITY IN NATURE

Greenery is essential in strengthening Singapore's environmental resilience and mitigating the effects of climate change. Backed by science, empowered by technology and supported by the community, NParks' greening effort is key to providing a quality living environment for all in Singapore.

## OneMillionTrees movement stands strong

The benefits of trees are well documented – they improve the physical, mental and social aspects of community well-being while enhancing our resilience towards climate change. The OneMillionTrees movement that began in 2020 achieved a milestone in April 2023 with more than 500,000 trees planted throughout Singapore, thanks to the efforts of some 75,000 members of the community. At this pace, the initiative is on track to achieve its goal of planting one million additional trees by 2027, three years ahead of schedule.



Scan to learn more about the OneMillionTrees movement



A

## THE SCIENCE BEHIND PLANTING TREES

Greenery not only improves air quality by absorbing carbon dioxide and releasing oxygen during photosynthesis, but also brings about other benefits. The planting of trees and shrubs provides habitats and food for native wildlife, enhances the ecological connectivity of green spaces and creates conditions for native species to survive.



The native *Cratoxylum maingayi* planted along streetscapes attracts butterflies and other insects into our urban areas.

## Enabling access across the Tyersall-Gallop Core

The opening of the 200 m HPL Canopy Link on 17 November 2022 marked the completion of the Tyersall-Gallop Core of the Singapore Botanic Gardens, extending its forest habitats and plant collections while buffering the UNESCO World Heritage Site from urban development. Visitors can now use the 2.4 m wide barrier-free pedestrian bridge that crosses Tyersall Avenue to move easily to all parts of the Gardens including the ridgetop forest habitats at Mingxin Foundation Rambler's Ridge.

Over at the Gallop Extension, the Botanical Art Gallery hosted an exclusive exhibition on "Flower Obsession: Plant Collecting in East Asia, 1600s–1900s". This was the first time the Gallery featured artwork from overseas institutions. Many books, manuscripts and photographs dating as far back as the late 1600s from the

Higashiyama Botanical Gardens and the private Soukaen Bunko in Nagoya, Japan, were exhibited outside Japan for the first time.

The latest exhibition at the Gallery, "Tropical Forest Sceneries: Singapore & Beyond" encapsulates the changing forest landscapes in the region and showcases for the first time, the stunning

photographs of Edred John Henry Corner, a botanist and former Assistant Director of the Singapore Botanic Gardens.

These exhibitions gave visitors insight into the importance of plant documentation and botanical art to the Gardens' research collection



B

## Naturalising the Istana Landscape

In the heart of the city, President Halimah Yacob officially opened the enhanced Swan Pond at the Istana. Originally constructed in 1968, sensitive enhancements made around the Swan Pond include the naturalisation of its drainage channel into a garden stream that acts as a bioswale.



C

A | In the year since its launch in March 2022, more than 450 families have participated in the FamilyTrees initiative.

B | The HPL Canopy Link connects the Gallop Extension to rest of the Singapore Botanic Gardens via a scenic elevated walkway that weaves through trees that can be found in the lowland deciduous forests of continental Southeast Asia.

C | Enhancements to the swan pond in the Istana include naturalising the landscape and the addition of a new viewing deck.

## Creating park experiences for all

NParks has completed the development of the 60 ha Lakeside Garden, one of three gardens within Jurong Lake Gardens which will also include the upcoming Chinese and Japanese Gardens. The community can now enjoy the new northern section of Lakeside Garden, an active zone with youth-oriented amenities that expand the range of experiences for visitors.

Advancing its reputation as a people's garden, Jurong Lake Gardens hosted several family-centric events in 2022. The Lights by the Lake festival made a strong comeback after two years of pandemic restrictions, drawing more than 400,000 visitors with its lantern displays.



Gardening enthusiasts also returned to the Gardens for SustainableFest SG, enjoying gardening workshops, musical performances, guided walks and craft sessions for children over two weekends in May and June 2022.



Scan to discover new attractions in the Lakeside Garden



B

## JURONG LAKE GARDENS PIONEERS NEW TECHNOLOGIES

Jurong Lake Gardens provides a platform for partners to test-bed smart solutions that support sustainable park operations, with a view to scaling their deployment if they prove to be successful.

An example is the Integrated Garden Management System to which various environmental and facilities monitoring sensors are integrated, allowing for enhanced

situational awareness, faster operational response, and improved visitor experience.

Another project is the deployment of autonomous robot "JuLee" to assist visitors with directions and essential information. JuLee is also equipped with advanced video analytics capabilities and alerts officers to prohibited activities in the Gardens.



Curious park users can 'talk' to JuLee about what to do in Jurong Lake Gardens or even where to find the nearest toilet.

## Digging into the history of Fort Canning Park

200 years on, landscaping and greening works continue to revitalise Fort Canning Hill. Two new attractions were launched at Fort Canning Park to highlight the park's historical and natural heritage. The Fort Canning Heritage Gallery, which opened in August 2022, allows visitors to explore the 700-year history of Fort Canning Hill. Highlights include archaeological artefacts such as glass shards, ceramic fragments and coins excavated from sites within Fort Canning Park.

Park goers can also expand their botanical knowledge with a visit to the enhanced Spice Garden, which sits on the site of Singapore's first botanical and experimental garden established in 1822.



C



D

A | President Halimah Yacob (left) greets visitors at Lights by the Lake 2022. The festival was organised in conjunction with the President's Challenge to celebrate the nation's strength and resilience against diversity.

B | Designed in consultation with the community, SkatePark @ Lakeside Garden features the largest outdoor skate park in Singapore as well as a parkour park and bouldering wall set within nature.

C | Animated stories and games on interactive screens around the Fort Canning Heritage Gallery bring history to life for young visitors.

D | Visitors to the Spice Garden at Fort Canning Park can appreciate botanical artwork and dried specimens of select spices through the interpretive panels in the garden.

## Orchard Road goes green

Plans are underway to transform the Orchard Road shopping belt into a verdant urban corridor. As part of plans to “Bring Back the Orchard”, greenery along Orchard Road will be enhanced to feature pocket parks, gardens, and multi-layered planting of shrubs and trees. The 1.3 ha Istana Park will be expanded to thrice its current size, incorporating existing green spaces such as Dhoby Ghaut Green and the Penang Road Open Space.

ION Orchard and Ngee Ann City, together with the Singapore Botanic Gardens, also served as the venue for the 8th Singapore Garden Festival which took place from 30 July to 9 August 2022. An event highlight was the Community Garden Edibles Competition at ION Orchard, which featured more than 400 fruit and vegetable entries submitted by gardening enthusiasts.



As part of the Festival, the Singapore Gardeners’ Cup 2022 was held at the Eco-Garden at the Singapore Botanic Gardens. Community in Bloom (CIB) gardening groups from public and private estates, schools, and organisations came together to create garden showcases with the theme Gardeners’ Fantasia.



## Community gardening flourishes

Strong community involvement is vital for Singapore’s transformation into a City in Nature. It is also a core pillar of the Singapore Green Plan 2030, the national movement to advance sustainable development and combat climate change.

The CIB movement aims to promote a gardening culture and cultivate community spirit among Singaporeans of all ages. Its gardening framework includes allotment gardening, gardening with edibles and corridor gardening which targets households.

In 2022, the CIB Awards were introduced to recognise the efforts of gardeners in enhancing the living environment, horticultural excellence and social outreach. A total of 373 community gardens from private and public housing estates participated in the competition, and 10 were recognised as Gardens of the Year.

To date, more than 1,900 community gardens have been established, including 80 that were launched in 2022. Some 110 new allotment plots were also built and offered at Ang Mo Kio Town



Scan to virtually visit the ActiveSG Woodlands Sports Centre Community Garden

Garden West, Kent Ridge Park and Sembawang Park, bringing the total to 2,200 allotment plots in 25 parks islandwide.

NParks continues to work with the Housing & Development Board (HDB), town councils and grassroots organisations to scale up the construction of allotment gardens in heartland areas, and facilitate community-led initiatives such as the development of the West Coast and East Coast Greenery Plans, as well as the Boon Lay and Taman Jurong Allotment Garden Masterplans, among others.

## Skyrise greenery reaches new heights

In other greening efforts, more than 12 ha of skyrise greenery were incorporated into buildings in the past year, expanding the total footprint to 155 ha.

Under the Skyrise Greenery Incentive Scheme which seeks to encourage the installation of vertical greenery on existing buildings, a multi-storey carpark rooftop at Bishan was converted into a thriving rooftop community garden with 350 gardening plots for residents. Another notable project was the building of an over 910 sqm green wall facade at Keppel Infrastructure @ Changi, which demonstrates the co-location of green walls and vertical photovoltaic panels.



### USING NATURE TO IMPROVE CLIMATE RESILIENCE

Skyrise greenery is a nature-based strategy aimed at mitigating urban heat and noise through the greening of facades, balconies, as well as mid-level and roof spaces. Vertical greenery on building facades can lower surface temperatures by up to 11°C and reduce noise levels in the building by up to 10dB by absorbing sound. With rooftop gardens and sky terraces also acting as community spaces, skyrise greenery has the potential to enhance our climate, social and ecological resilience.



Studies have shown that green roofs, such as those found at select bus stops in Singapore, can reduce ambient temperatures by about 2°C.



A | A miniature fruit orchard was the theme of one of the Gardeners’ Cup displays for the Singapore Garden Festival held at the Singapore Botanic Gardens.  
 B | Minister in the Prime Minister’s Office, and Second Minister for Finance and Second Minister for National Development Indranee Rajah (left) visits the Orchid Competition at the National Orchid Garden as part of the 8th Singapore Garden Festival, where the region’s best orchid varieties and hybrids were put on display by dedicated hobbyists and professional growers.  
 C | Community gardens like this one in Bishan have been sprouting up on carpark rooftops, expanding Singapore’s skyrise greenery coverage.

## Greening industrial zones

To mitigate the urban heat island effect, particularly in the warmer industrial zones, NParks planted over 22,000 trees in industrial estates over the past year and completed the greening of Jurong Island by planting an additional 8,200 trees in collaboration with Jurong Town Corporation (JTC). This brought the total number of trees in industrial estates to over 100,000, including 34,000 trees on Jurong Island.

Such greening efforts extend beyond the industrial zones. NParks implemented landscape enhancements of nine newly-constructed MRT stations along the Thomson-East Coast Line. Together with the Land Transport Authority, over 5 km of new covered linkways were also greened up, expanding the coverage of Singapore's sheltered walkway network. Green roofs have been installed on 29 bus shelters in neighbourhoods like Ang Mo Kio and Pasir Ris and will be progressively rolled out to more bus shelters islandwide over the next two years.

## Connecting people and parks

In 2022, 10 km of Park Connector Network (PCN) routes were completed at Pang Sua North Bank, Tampines Avenue 10 and Simpang Kanan among other locations, bringing the total length of park connectors to 380 km. The PCN links up housing estates with parks, bringing nature closer to Singaporeans' doorstep.



## THE SCIENCE OF PLAY

Nature playgardens encourage experiential learning and unstructured play among children. They are based on the biophilia hypothesis that humans possess an innate tendency to seek connections with nature. To date, there are 26 nature playgardens islandwide, including the latest ones in Pasir Ris Park and Pasir Panjang Park.



Built with natural materials and nestled among greenery, Nature Playgardens provide children with a closer experience with nature.

## Greening for wellness

As of March 2023, there are now 10 therapeutic gardens across Singapore. NParks is also collaborating with grassroots organisations, agencies like HDB and healthcare institutions to co-create therapeutic horticulture nodes in public community spaces. In the past year, 24 such nodes were added, bringing the total number across the island to 56. These nodes provide easier access to greenery and nature for more in the community.

Within these spaces, healthcare professionals and caretakers can conduct horticultural therapy, a nature-based therapy specially designed to promote low intensity exercise, improve motor skills and foster positive social interactions amongst the elderly in particular.



Scan to try your hand at a simple horticultural therapy project.

A | Prime Minister Lee Hsien Loong plants a tree during Clean and Green Singapore 2022, contributing to the OneMillionTrees movement.  
 B | After periods of intense rain, the Trumpet Tree (*Tabebuia rosea*) also known as Singapore's version of the 'Sakura', grace our Park Connectors and streetscapes.  
 C | Therapeutic Gardens are outdoor gardens designed to meet the physical, psychological, and social needs of park users, incorporating design principles derived from scientific evidence. Visiting therapeutic gardens and participating in therapeutic horticulture programmes boast many benefits, from reducing depression to improving immunity and forging social connectedness.

## Planting seeds of nature stewardship in youth

Youth and children also have a part to play in greening Singapore. The Every Child A Seed programme has been going strong for a decade, providing a platform for students as young as seven to appreciate the challenges of the planting process while experiencing the joy of seeing their plants grow, contributing in their small way to Singapore's greening journey. 42,000 Primary 3 students received a plant starter kit consisting of a pack of seeds, soil, a pot and learning resources. To celebrate the programme's 10th anniversary, students also received an additional seed pack of native herbaceous plant species.

For the young adults, the Youth Stewards for Nature (YSN) initiative gives them the opportunity to work in groups on real-world projects related to horticulture, landscape architecture and environmental studies, amongst others. A total of 16 projects were undertaken by 120 youths in YSN 2023. Both NParks staff and YSN alumni provided guidance and support by serving

as mentors. Since 2021, more than 300 youths have worked on over 60 projects.

Stemming from a YSN project, a group of passionate youths went on to lead the World Wildlife Day Regional Youth Symposium in Singapore, in March 2023, coinciding with World Wildlife Day. In line with the symposium's theme of 'Partnerships for Wildlife Conservation', the symposium brought together some 170 like-minded participants from around the region to learn from one another and share their aspirations for youths in the nature and biodiversity conservation realm. A panel of experts were invited to share on wildlife management, policy development and other pressing wildlife related issues.

On the local front, youths who took part in the Green Friends Forum had the opportunity to interact with a horticulturist, an arborist and a landscape architect and took part in various

hands-on activities. Within the span of the forum, participants were able to learn about the core skills and sciences that form the guiding principles to grow and sustain our verdant gardens, parks and streets.

With the lifting of most Covid-19 related restrictions, NParks resumed face-to-face learning journeys, school talks and teachers' training sessions, reaching out to over 10,000 students, educators and teacher trainees in the past year. Through these engagements, NParks staff were able to reach out to the younger generation on a range of topics from responsible pet ownership to marine biodiversity, and welcomed many more students into our green spaces.



Scan to meet one of NYParks' Youth Stewards for Nature alumni



## Making 'friends' that support greenery

An important community initiative is Friends of the Parks. In 2022, NParks completed 11 engagement projects under this programme for the design or redevelopment of parks such as Clementi Woods Park, Compassvale Park and Mount Faber Park.

The Friends of Clementi-Ulu Pandan Nature Corridor group was formed in 2021 to work on forest restoration and habitat enhancement works to strengthen the ecological resilience of two new recreational trails along the corridor. The group also developed walks to introduce residents to the area's flora and fauna.

In other engagement efforts, the third in a series of City in Nature Conversations was held in January 2023. The workshops provided a platform for action groups to suggest ideas and co-create projects with NParks to restore nature into the urban environment.

Apart from in-person interactions, NParks also extended its digital reach, amassing a strong social media following across various social media channels such as LinkedIn (over 10,000 followers), TikTok (more than 11,000 followers and over 1.1 million views), Instagram Reels (61,700 followers and over 1.2 million views) and YouTube (more than 2 million views since April 2020).



Scan to listen to Park Beats playlist

- A | Young students show off the fruits of their labour, having tended to their plants for several weeks. The Every Child A Seed programme enables all students to experience growing a plant from the seed stage.
- B | Minister for National Development and Minister-in-charge of Social Services Integration Desmond Lee (left) joins volunteers to examine results from a biodiversity survey, part of programmes where youths can actively contribute towards biodiversity conservation efforts.
- C | The Friends of Clementi-Ulu Pandan Nature Corridor group together with other volunteers carry out a BioBlitz along the Clementi Forest Stream, part of the upcoming Clementi Nature Trail. Results from the survey will guide sensitive habitat enhancements in the area.
- D | To raise awareness of City in Nature, recycled wooden Spotify 'codes' were installed in five parks in early 2023. Visitors can scan the code to enjoy our specially curated Park Beats playlist as they spend time in our green spaces.

An aerial photograph of Rifle Range Nature Park in Singapore. The image shows a vast, dense green forest covering a hillside. In the center, a rocky cliff face is visible, with a small wooden structure perched on top. Below the cliff, a pond with greenish water is surrounded by lush vegetation. A paved walkway with a railing winds through the forest, leading towards the pond. In the background, a residential area with buildings and a tower is visible under a clear sky.

## CONSERVATION IN TRANSFORMATION

NParks harnesses scientific advancements and technology for biodiversity and nature conservation. The opening of Rifle Range Nature Park, Singapore's first net positive energy nature park, is testament to its push for sustainability in line with the Singapore Green Plan 2030.

## Strengthening ecological connectivity



Scan to learn more about ecological connectivity

An important aspect of biodiversity conservation is the strengthening of islandwide ecological connectivity. NParks' work in this area is undergirded by scientific studies such as the Ecological Profiling Exercise (EPE) which helps identify ecological corridors used by wildlife as they move between green spaces. The results of the EPE helps NParks in planning our Nature Park Networks and integrating nature into our urban landscape.



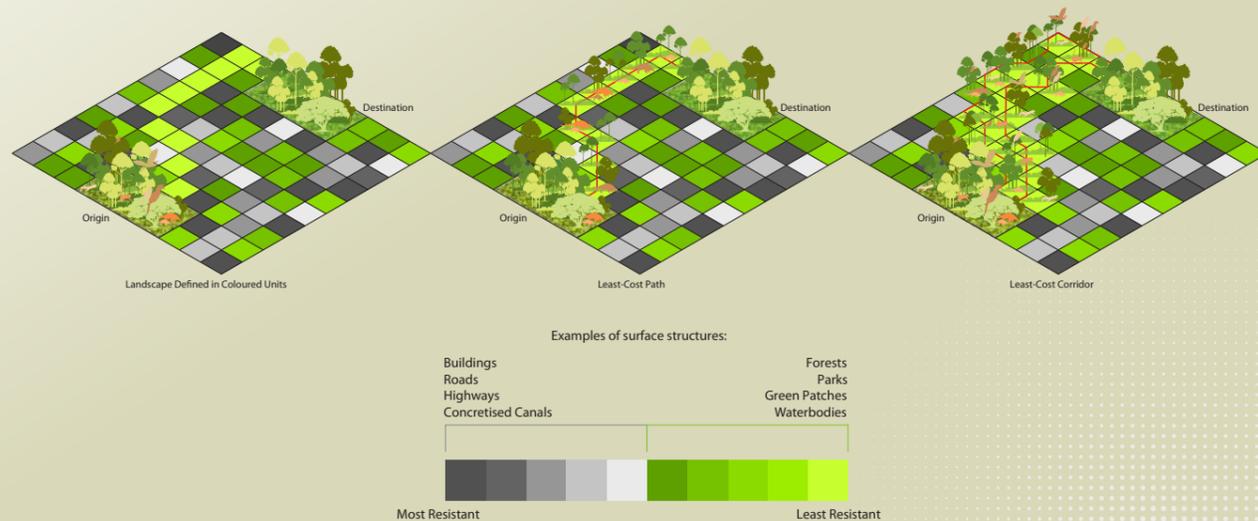
A

## ECOLOGICAL PROFILING TO IDENTIFY LEAST-RESISTANCE PATHWAYS

The Ecological Profiling Exercise uses least-resistance pathway modelling to identify and assign a numerical value to each surface structure (for example, a forest or a building) between core habitats. The lower the value, the less resistance an animal encounters in moving across it. By linking up structures of the lowest value, the model projects

the least-resistance pathway that an animal is likely to use to travel between core habitats.

The model was applied to six target species that are under threat, and their pathways of least resistance were combined to produce an overall map of Singapore's islandwide ecological connectivity.



B

### Nature Corridors

Four new nature corridors in northern, north-western and north-eastern Singapore were identified based on the EPE findings. Among them is the Khatib Nature Corridor which will comprise forested sites at Springleaf, Tagore and Miltonia Close and along Lower Seletar Reservoir, and at the existing Springleaf Nature Park. Three new parks – Nee Soon Nature Park, Miltonia Nature Park and a park extension along Lower Seletar Reservoir – will be designated as stepping-stone habitats for the nature corridor.

### Nature Ways

As part of its ongoing efforts to enhance ecological connectivity, NParks has completed 20 km of Nature Ways at Simei and Pandan, bringing the total coverage of Nature Ways to approximately 185 km. Rewilding work was also carried out at 10 sites across the island including the Upper Thomson Nature Way, South Buona Vista Road, and slopes along the Pan-Island Expressway (PIE) and Kranji Expressway (KJE).

### Rail Corridor

With the opening of Rail Corridor (North), which stretches to Kranji MRT station, the Rail Corridor now provides over 21 km of continuous connectivity with over 30 access paths. Amenities were also enhanced with the opening of the Bukit Timah Railway Station community node which features a heritage gallery and a café housed in the restored railway station and Railway Staff Quarters

The Rail Corridor runs along the length of the former KTM rail line

from Kranji MRT station to Spooner Road where sections of the train track have been preserved.

To monitor species diversity, participants from NParks' Youth Stewards for Nature programme conducted biodiversity surveys along the Rail Corridor in early 2023. Their findings will be shared on the NParks website and incorporated into educational signs along the Rail Corridor to highlight the rich biodiversity in the area.

## TACKLING AIR POLLUTION WITH NATURE

Closely-planted small trees and shrubs with overlapping canopies such as those found along Nature Ways can help reduce pedestrian exposure to airborne traffic pollution by up to 15%.



Multi-tiered plantings, such as these found along Tengah Nature Way have been found to improve air quality for pedestrians.

A | Night vision camera traps enable conservation officers to record and keep track of nocturnal species within our forests.

B | The Bukit Timah Railway Station community node, found along the Rail Corridor, retains the site's built and natural heritage. Interactive exhibits are housed within several preserved heritage buildings, giving visitors a glimpse into the history of the Station.

## Restoring natural ecosystems

As part of its ongoing biodiversity conservation efforts, NParks restored over 30 ha of forest, coastal and marine habitats as of March 2023, exceeding the initial target to do so by 2030. NParks announced in March 2023 that it will increase its target to 80 ha, which will contribute further to biodiversity conservation efforts.

In November 2022, NParks opened the new Rifle Range Nature Park, completing more than 370 ha of nature parks and 30 km of walking trails within the Central Nature Park Network around Bukit Timah Nature Reserve.

Nature parks aid in conservation efforts by offering alternative nature-based recreation options, reducing visitorship pressure on the Nature Reserves and providing complementary habitats for wildlife.

The secondary forests within Rifle Range Nature Park have also been sensitively enhanced as part of the Forest Restoration Action Plan. To guide these restoration efforts and the design of the nature park, a biodiversity baseline study was carried out to identify areas and species of conservation significance.

As part of NParks' efforts to naturalise urban gardens and parks, habitat enhancement works were also carried out in 28 parks and gardens in 2022, including neighbourhood parks such as Yishun Pond Park and Lorong Tanggam Park.



## SINGAPORE'S FIRST NET POSITIVE ENERGY NATURE PARK

The 66 ha Rifle Range Nature Park is Singapore's first net positive energy nature park. Energy harvested from the photovoltaic solar panels installed around the nature park exceeds the expected annual operational energy consumption of the site. The harvested energy also powers camera traps which have recorded rare fauna such as the Leopard Cat (*Prionailurus bengalensis*).



Developing energy-efficient parks are part of NParks' push for sustainability, in line with the Singapore Green Plan 2030 that guides the country's sustainable development.



Scan to watch a virtual tour of Rifle Range Nature Park

## Conservation efforts fly high

Local conservation efforts to strengthen the ecological resilience of biodiversity-rich habitats are bearing fruit.

Since April 2022, there have been increased sightings of several rare species of birds such as the Black-winged Flycatcher Shrike (*Hemipus hirundinaceus*),

Lesser Green Leafbird (*Chloropsis cyanopogon*), Red Knot (*Calidris canutus*), Ruby-cheeked Sunbird (*Chalcoparia singalensis*) and Scarlet-breasted Flowerpecker (*Prionochilus thoracicus*) on Pulau Ubin.

The year also saw the first documented sighting of a wild

Black-headed Ibis (*Threskiornis melanocephalus*) in Singapore, at the Sungei Buloh Wetland Reserve last November.

Such sightings highlight the Reserve's significance as a stopover and wintering ground for migratory shorebirds along the East Asian-Australasian Flyway.



## IMPROVING UBIN WITH TECHNOLOGY

NParks is harnessing technology to improve the lives of villagers on Pulau Ubin. An example is the pilot deployment of personal alert buttons for elderly villagers who live alone. The project, a collaboration with the Government Technology Agency, makes it easier for these villagers to call for assistance in an emergency.

More villagers and businesses on Pulau Ubin will benefit from cleaner and more reliable electricity supply with an upgraded and expanded Pulau Ubin Micro-Grid. Supported by the Energy Market Authority (EMA), the micro-grid will feature a Solar Green Roof which can potentially meet 90% of the daily electricity demand in the Main Village using solar power. The system will also be extended to Kampong Sungei Durian, to benefit more villagers on the island.

- A | Deputy Prime Minister and Minister for Finance Lawrence Wong meets students from CHIJ Our Lady Queen of Peace to learn more about their project on 'Operation No Release', an educational campaign that aims to raise awareness of the dangers of releasing animals into the wild.
- B-C | Bird watching remains highly popular, with enthusiasts spotting the Ruby-cheeked Sunbird (*Chalcoparia singalensis*) at least four times in the past year. The native and Critically Endangered Lesser Green Leafbird (*Chloropsis cyanopogon*) was recorded on Pulau Ubin for the first time since its last sighting in 2019.
- D | In Pulau Ubin, 21 successful occurrences of the Blue-throated Bee-eater (*Merops viridis*) nesting were recorded after the disused Ketam Quarry was converted into a bird nesting area in 2016. The project was carried out together with Friends of Ubin Network members and the community and is part of efforts under NParks' Nature Conservation Masterplan.

## Documenting local biodiversity

In 2022, intact flowering specimens from the *Sindora velutina* tree were collected for the first time in Singapore. This is a critically endangered tree species that was presumed to be extinct on the island until it was rediscovered in 2019, and six mature tree specimens have since been recorded. The collection of fresh flowering specimens will help further research to support conservation efforts for the species.

NParks has also completed the red listing for birds for the third edition of the Singapore Data Book which will guide its conservation efforts. A total of 413 bird species were recorded, with 24 species downlisted in terms of their threat status when compared to the previous edition.



A



B



C

## CITIZEN SCIENCE GUIDES URBAN GREENING STRATEGY

Equipped with simple scientific data collection methods and wildlife observation etiquette, citizen scientists under NParks' Community in Nature programme conduct biodiversity surveys throughout the year, documenting species of dragonflies, butterflies, garden birds and more. Data on garden bird populations around Singapore from five years of the Garden Bird Watch Programme were collated and analysed. The findings will guide NParks in their landscape design and rewilding strategies to attract a greater diversity of birds.

## Community contributes to conservation efforts

A BioBlitz was organised from 27 to 28 August 2022 to survey the flora and fauna along Clementi Forest stream. This freshwater stream, which will be part of the upcoming Clementi Nature Trail, provides habitats for a variety of native odonates, freshwater fish and amphibians. The data collected will guide habitat enhancement efforts in the area, such as the choice of plant species to support aquatic biodiversity along its banks. BioBlitz is a Community in Nature initiative to involve citizen scientists in collecting information on Singapore's biodiversity.

At the opening of the 11th edition of the Festival of Biodiversity in May 2022, NParks also announced

new initiatives to strengthen conservation efforts. These included the publication of a new plant checklist and bibliography, setting up long-term study plots in the Central Catchment Nature Reserve, and an enhanced wildlife management framework to strengthen nature research while encouraging greater community stewardship.

This enhanced wildlife management framework, anchored by the community and backed by science, will focus efforts on cultivating greater public awareness and understanding of native biodiversity to better manage the community's encounters with nature.



## SOUND SOLUTIONS

NParks is working with the Tropical Marine Science Institute's Acoustic Research Laboratory to develop an acoustic system for detecting both terrestrial and marine animals.

To date, several Dugong-like vocalisations have been recorded near Chek Jawa at Pulau Ubin. The system enables the collection of baseline data on marine megafauna such as local population sizes, visiting patterns, their activities in habitats and foraging behaviour. On the terrestrial front, the system is trained to recognise bird calls. By analysing the audio recordings, researchers will be able to estimate the locations and numbers of vocalising birds.

The system uses a novel technique to capture sounds from the environment and apply machine learning to process and identify the audio recordings, which helps in the formulation of conservation approaches.



The nationally Vulnerable Short-tailed Babbler (*Pellorneum malaccensis*) is one of the birds whose call can be identified through the sound detection system.

## Managing local wildlife populations

Technology plays an important role in wildlife management. NParks monitors the local macaque population to study their behaviour and track their movement and activity patterns. Individual macaques are microchipped and sterilised as part of efforts to manage their population islandwide.

NParks also works with the Otter Working Group and the community to monitor the otter population and movement patterns, and takes action to mitigate conflict especially in areas where the public may come into



Scan to take a look at some wildlife movements monitored by camera traps

closer contact with otters. Some of these actions include raising awareness through outreach and signage, and erecting physical barriers.

In April 2022, "Our Wild Neighbours", a multiple stakeholder initiative including NParks, Mandai Nature, ACRES, and the Otter Working Group was launched. The initiative aims to foster a better understanding of Singapore's wildlife and strengthen the science-based approach to wildlife conservation and management.

A-B | The Grenadier (*Agrionoptera insignis*) and Striped Albatross (*Appias libythea alferna*) are some of the resident biodiversity spotted in Singapore over the past year.

C | Specimens of the *Sindora velutina* were collected for researchers to observe and record its characteristics. Its DNA will also be extracted for genetic and taxonomic research. The specimen will then be preserved and stored in the Singapore Botanic Gardens Herbarium.

## Curbing illegal wildlife trade

On the global front, NParks is tackling the issue of illegal wildlife trade in partnership with the international community under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). In June 2022, the Centre for Wildlife Forensics was recognised as a CITES-listed laboratory, a testament to Singapore's expertise in wildlife forensic science and supporting the enforcement of CITES.

Later in the year, at the CITES Conference of Parties (CoP19) in Panama, Singapore partnered

with Malaysia to spearhead proposals to uplist two songbird species – the Straw-headed Bulbul (*Pycnonotus zeylanicus*) and White-rumped Shama (*Copsychus malabaricus*) – which have been heavily poached and illegally traded in Southeast Asia. The proposals were subsequently adopted, with higher penalties on the illegal trade of these two species implemented.

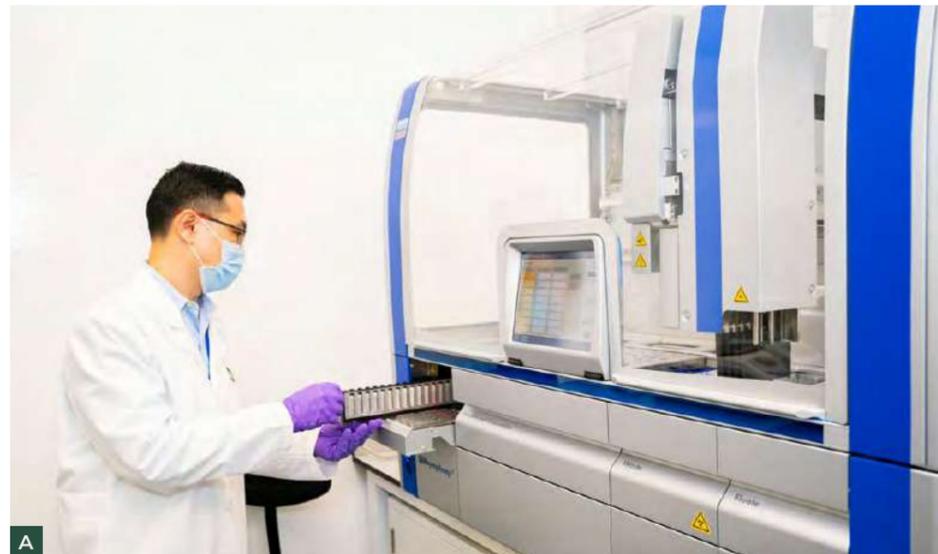
NParks also advocated for amendments to Singapore's Endangered Species (Import and Export) Act to include stiffer penalties for the illegal trade of

endangered species, stronger enforcement powers for its officers, and greater clarity on the regulations.

As part of its enforcement efforts, NParks seized 34 kg of rhinoceros horns in October 2022. The 20 pieces of rhinoceros horns, valued at about S\$1.2 million, were found in baggage bound for Laos, and was Singapore's largest seizure of rhinoceros horns to date. As a major trading hub, Singapore plays a key role in intercepting such illegal movement of wildlife products.

## USING TECH TO ENHANCE ROAD SAFETY FOR WILDLIFE

Another aspect of wildlife management is facilitating their safe movement. NParks' Roadway Animal Detection System (RADS) helps enhance road safety for wildlife by detecting animals crossing the road and flashing warning signs, alerting motorists to slow down. The system is being deployed at Old Upper Thomson Road and Rifle Range Road



A

## 'FIN'-TECH TACKLES ILLEGAL TRADE

Fin Finder is Asia's first mobile application to visually identify illegally-traded shark and ray species using artificial intelligence. Launched by NParks, Microsoft and Conservation International, the app enables officers to take photos of fins and match them against a database of over 15,000 fin images via an AI-driven algorithm in the app to provide a visual identification within seconds. This empowers officers on site to flag suspicious fin shipments for further DNA testing.



Scan to take a closer look at how NParks and partners come together to tackle illegal wildlife trade

## Biosurveillance for biosecurity

Illegal wildlife and pet trade are possible sources of introduction of exotic animal diseases such as rabies, which pose a danger to public and animal health in Singapore. NParks carries out biosurveillance to detect these threats and enforces strict biosecurity standards to prevent them from entering and spreading within the country.

In FY22, under the National Biosurveillance Framework, NParks detected, and subsequently investigated and responded to

outbreaks of diseases including African Swine Fever in wild boars and imported pigs, and lumpy skin disease in a local cattle farm, and conducted vector surveys in pet establishments and parks to understand the ecology of vector-borne diseases.

Horizon scans of global and regional disease events were conducted together with risk assessments for early disease threat detection. To bolster knowledge building and research in biosecurity, NParks is

collaborating with the National University of Singapore Saw Swee Hock School of Public Health on disease modelling and transmission studies.

The Animal and Veterinary Service (AVS) a cluster of NParks also plays a part in Singapore's whole-of-government response to global health threats. It is co-lead for the Situational and Risk Assessment Report under the One Health framework, an internationally-recognised approach to achieving optimal health outcomes across the community, from people to animals and plants.

At the World One Health Congress, AVS presented on the topics of biosurveillance and programmes to combat rabies. AVS also conducted a rabies tabletop exercise as part of contingency preparedness. Maintaining high levels of biosecurity is key to safeguarding animal and public health. Singapore's rabies-free status since 1953 is a testament to these efforts.



B

A | A scientist loads a batch of samples into the automated DNA extractor, QIASymphony, which is designed to perform fully automated purification and extraction of DNA in an enclosed environment with minimal human intervention. This process allows the detection of illegally traded species from just a sample of its body part.

B | By analysing x-rays of animals, doctors can detect medical conditions such as pneumonia in wild animals. The process enables our vets to treat and rehabilitate these animals to prevent the spread of diseases.

## BUILDING EXPERTISE IN eDNA

NParks has been refining its capabilities in the use of environmental DNA (eDNA) technology for the early detection of diseases. Scientists can detect both animal and their pathogen DNA signals through the collection of environmental samples such as air or water. At the 1st Australian and New Zealand Environmental DNA conference in February 2023, NParks gave a presentation on the successful utility of eDNA for the detection of Chelonid Herpesvirus 5, a disease-causing agent that infects all sea turtle species globally and was recently found in Singapore's turtles as well.

Singapore's expertise in global biosurveillance technology was recognised when an NParks study on optimising eDNA and eRNA (environmental Ribonucleic Acid) protocols for the simultaneous

detection of several types of fish viruses from seawater was published in the Environmental DNA journal, a global comprehensive journal for environmental DNA research.



Technological advancements enable scientists to track potential environmental and disease threats to our critically endangered sea turtles, such as this Hawksbill Turtle (*Eretmochelys imbricata*).

## Science drives management of pets & community animals

Proper management of Singapore's pet and community animal population is important in ensuring biosecurity and safeguarding public health while better protecting the well-being and welfare of these animals.

An area that AVS is actively working on is the enforcement of strict breeding standards for dogs. From 1 April 2022, pet breeders and boarders will be required to abide by an improved set of licensing conditions that includes the prohibition of breeders from breeding pets with known harmful heritable conditions or



carrying out in-breeding practices. To monitor this, genotyping identification is carried out during compliance inspection for parentage verification.

In September 2022, AVS launched a public consultation on its proposed framework to improve the

management and welfare of cats. The proposed framework includes strategies for cat management, such as expanding the existing pet dog licensing and microchipping scheme to include pet cats, and extending the Trap-Neuter-Rehome/Release-Manage (TNRM) programme to community cats.

Another strategy in the management of pet and community animals is rehoming. In 2012, Project ADORE (Project on ADOption and REhoming of dogs) was launched to pave the way for local mixed-breed dogs to be rehomed in HDB flats. The criteria for the programme was expanded in June 2022 to include larger local mixed-breed dogs and K9 sniffer dogs. As of April 2022, the 10th anniversary of Project ADORE, more than 2,000 dogs have been rehomed under the programme.

Separately, the AVS volunteer programme is also gaining traction with members of the community getting involved in various pet-related programmes such as caring for rescued animals in the Jacob Ballas

Animal Classroom and conducting talks and programmes for students on responsible pet ownership.

These opportunities empower the community in raising awareness and educating the young on the importance of responsibility to animals.



## ADOPTING TNRM TO MANAGE COMMUNITY ANIMALS

The TNRM programme is a holistic, humane, and science-based approach to community animal population management that is recognised by the World Organisation for Animal Health. Under AVS' TNRM initiative, community animals are sterilised to lower their reproduction rates before being released or rehabilitated and rehomed as pets.



Scan to learn more about animal rehabilitation under the TNRM programme

- A | Responsible pet owners are pivotal to upholding Singapore's biosecurity through simple actions such as ensuring their pet's vaccinations are kept up to date.
- B | Senior Minister of State, Ministry of Communications and Information & Ministry of National Development Tan Kiat How taking part in the online public survey for AVS' proposed cat management framework at Pets' Day Out.
- C | The public consultation on AVS' proposed cat management framework is part of the larger Forward Singapore movement that aims to refresh our social compact and build a more endearing home.



## EMPOWERING TRANSFORMATION

The development of science and technology capabilities plays a key role in uplifting industry standards and advancing Singapore's City in Nature vision.

## Tackling challenges with science and tech

NParks' Science & Technology (S&T) Masterplan guides overall organisational efforts in harnessing science and technology to advance our City in Nature vision. These efforts are strategically directed and overseen through distinct workstreams that represent key S&T domains integral to NParks' mission, including arboriculture, botany, conservation biology & planning, and animal health & management.

In tandem, NParks' Digitalisation Masterplan provides a roadmap for the use of technology to strengthen professionalism and to address existing and emerging challenges such as a declining labour force, rising public expectations, and the increasing scope and complexity of its work. The masterplan emphasises an ecosystem approach to developing operational technology capabilities in core areas of NParks' work such as tree and park management, conservation and biodiversity management, and park planning and development.

Multiple research, operations technology and digitalisation projects have been rolled out in the reporting year or are currently ongoing. These includes a new greenery management model for the Bishan-Ang Mo Kio district, which will leverage a suite of technological tools to transform NParks' greenery management processes, enhance work productivity and elevate the capabilities of staff and the wider landscape industry.

In line with NParks' focus on science and technology, a new Branch was set up in 2022 to enhance oversight of organisational science and technology planning, and to synergise and support efforts. Other initiatives such as a quarterly Research Colloquium and regular newsletters were introduced to keep staff updated on the latest scientific studies that NParks is involved in.

## MAPPING DATA WITH MAVEN II

As part of NParks' digitalisation roadmap to transform processes and enhance productivity, NParks developed Maven II, a centralised, intuitive geospatial platform for NParks operations such as greenery management. The map-based work platform interfaces information from various digital tools and integrates information from sensors such as bin and ammonia sensors, into a centralised dashboard.

A Contractors' Portal allows contractors to receive works order information and update photographic evidence of work done on-the-go. Officers may also carry out remote certification of work done based on data received from sensors. The system also has a self-billing function, resulting in an automated seamless end-to-end process for NParks and its contractors.

These digital tools, including the Contractor Fleet Management System and Grass Height Sensor, were piloted in the Bishan-Ang Mo Kio district together with landscape contractors as part of the Landscape Sector Transformation Plan to upskill the landscape sector.



The launch of Maven 2 will enhance our operations including greenery management and park facilities management.

## Advancing our research

NParks currently leads the City in Nature research vertical of the Ministry of National Development's Cities of Tomorrow Research and Development Programme, funded under the Research, Innovation and Enterprise (RIE) 2025 Plan. This research vertical seeks to deepen the scientific foundation for our City in Nature vision, by leveraging scientific expertise, technical capabilities and practitioner experience from various local research institutes, agencies, and companies to enhance ecological and climate resilience and inform nature-based solutions. The first grant call has been launched for research topics in urban greenery, nature-based solutions for inland climate change adaptation and managing human-nature relationships.

Under the RIE2025-funded Marine Climate Change Science programme, NParks has also started to award its first research projects. These upcoming studies aim to advance the scientific understanding of Singapore's blue carbon habitats and dynamics, by undertaking national blue carbon accounting, mapping and predictive modelling, and to also strengthen the ecological resilience of Singapore's urban coral reefs by examining the viability of potential ecological and microbial solutions.

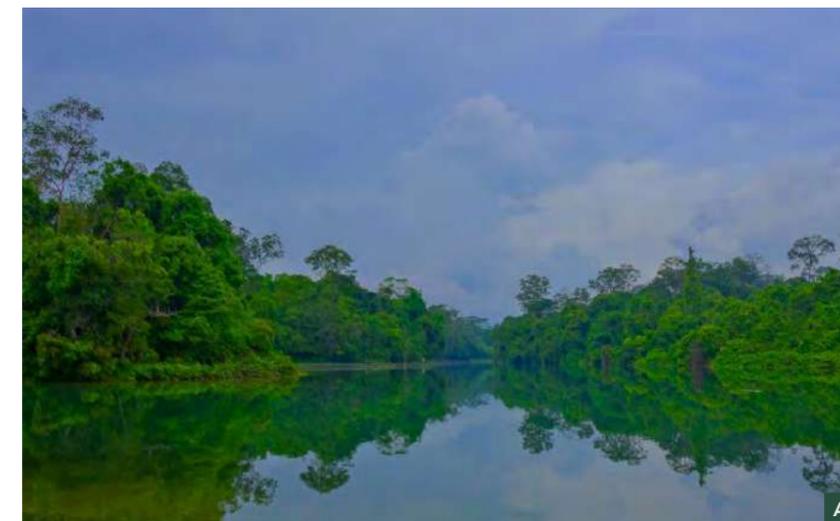
NParks' Long-Term Socio-Ecological Research programme brings together a suite of ongoing and upcoming projects and research activities that will collectively enable NParks to monitor the long-term socio-ecological impacts of our City in Nature strategies. Efforts under the programme will leverage dedicated long-term study sites, repeated studies and integrated and interdisciplinary efforts, in order to generate new scientific insights to advance our City in Nature.

One of the programme's latest research projects seeks to better understand the values, beliefs, and norms of Singaporeans towards nature, and how City in Nature efforts can influence their physical, mental and social well-being.

## Understanding tropical forest ecology

In the past year, significant progress was made in ecology research at the Central Catchment Nature Reserve with the establishment of the Long-Term Forest Ecological Monitoring (LTFEM) plot network. This involved restoring and resurveying 62 historical plots which were originally surveyed in 1992 by Mr Wong Yew Kwan, Singapore's first Commissioner of Parks and Recreation. Bird surveys and full deployment of camera traps were also carried out across these plots to track the movement of wildlife.

A subset of the LTFEM plots was further surveyed for aboveground biomass assessment of forests at the nature reserve. The findings of this research project emphasised



A | The Central Catchment Nature Reserve occupies over 2,000 hectares of forest cover and is home to some of the richest forests in terms of biodiversity, which includes the endemic Swamp Forest Crab (*Parathelphusa reticulata*) and Critically Endangered Raffles Banded Langur (*Presbytis femoralis*).

## MANAGING TREES REMOTELY

NParks has implemented a Remote Tree Management System which uses machine learning models to automatically extract the geospatial location and physical parameters of trees, such as their height and girth from Light Detection and Ranging (LiDAR) point cloud data.

The extracted tree parameters also update the Tree Structural Model which predicts the structural condition of trees under different wind load conditions. The digital twin, including the panoramic images collected, enable arborists to inspect the tree visually and undertake virtual inspection.

the importance of conserving mature trees for their ability to sequester carbon effectively.

Resurveys of seedlings and saplings were also conducted at 40 previously established plots at the Nee Soon catchment area.

All the studies enhanced our understanding of changes in Singapore's forest ecosystems over the past three decades and contributed to our efforts in improving forest conservation and resilience.

## USING TECH IN BIODIVERSITY SURVEYS

In recognition of its efforts in biodiversity conservation, Singapore was chosen to host the semi-finals of the international XPRIZE Rainforest competition which took place at the Central Catchment Nature Reserve. The competition, organised by the XPrize Foundation, showcased how technologies such as autonomous vehicles and drones could be used to help conduct comprehensive biodiversity surveys in remote forest areas. The findings from the competition will be analysed for new discoveries.

## Predicting plant responses to climate change

Another breakthrough study confirmed the evolutionary relationships and speciation patterns of *Syzygium*, the world's largest tree genus. *Syzygium* features the greatest diversity of species in Singapore as well as other Southeast Asian forests. The two-year study, led by the Singapore Botanic Gardens in collaboration with 26 research institutions, provided valuable insights into plant species evolution amid environmental changes.

The ability to predict plant responses to climate change will guide conservation and management efforts for plant communities. The findings from the study were published in the Nature Communication, a leading scientific journal, in September 2022.



## UNCOVERING THE EVOLUTIONARY HISTORY OF PLANTS

As part of the Flora of Singapore project, baseline genomic data for some 1,300 species of native plants was generated. This sheds light on the evolutionary history of plants, enabling researchers to gain a better understanding of species relationships, genetic diversity, ancient population dynamics and even predict the impact of ecological changes on plant survival for effective intervention in plant conservation.

## Launching the definitive guide to plants in Singapore

A definitive reference guide to the native, naturalised and casual plants in Singapore was launched on 21 May 2022. Extensive research was put into producing the "Flora of Singapore: Checklist and Bibliography" which includes records of over 3,000 species from the region.

The guide accounts for all the names ever used for wild plants here, as well as their bibliographic references and conservation assessments. This was clarified from over 7,500 names used in almost 50,000 literature citations from plant research in Singapore over the last 200 years. The publishing of this guide affirms the Singapore Botanic Gardens' global position as a leading tropical botanical institute.

## Making the connection between health and nature

To substantiate the health and well-being benefits of people-nature interactions, NParks conducted five research studies to explore the relationship between time spent in nature and people's well-being. The findings from these studies were published in several scientific papers.

NParks' Centre for Urban Greenery and Ecology (CUGE) has also published "Design Guidelines for Contemplative Landscapes" to facilitate the implementation of landscapes that enhance mental well-being. The guidelines are based on a study into the effects of landscapes on brain activity.

## Uplifting the landscape industry

The adoption of a science-based approach, backed by research and the effective use of technology, enables NParks to push industry standards to a higher level.

For example, the Landscape Excellence Assessment Framework (LEAF), which recognises organisations' efforts to restore nature into the built environment, is backed by studies which show how greenery can mitigate urban heat island effect and have a therapeutic effect on people.



In 2022, 10 projects were recognised for outstanding greenery under LEAF. They included six parks and gardens as well as four developments. Two projects – the Gallop Extension at Singapore Botanic Gardens and Thomson Nature Park – received the platinum certification, which is the highest level under LEAF. In all, 90 projects have been certified since the framework was launched in 2013.

A | A flowering branch of the Sea Apple (*Syzygium grande*), one of the pioneering tree species planted along the roadside when Singapore's nationwide greening campaign was initiated in 1963.

B | The native, Critically Endangered *Shorea bracteolata* is one of the 3,000 species featured in the Flora of Singapore catalogue that describes the diversity of all families, genera and species of bryophytes, lycophytes, ferns, gymnosperms and angiosperms that are native, naturalised or casual in Singapore.

C | One of the "Design Guidelines for Contemplative Landscapes" includes incorporating views of a body of water to encourage calmness and bring a sense of freshness and energy to the space. The site of the Therapeutic Garden at Bedok Reservoir Park was thus chosen for its scenic views of the reservoir.

D | Awarded the platinum certification under the Landscape Excellence Assessment Framework, the Gallop Extension is distinguished by the sensitive restoration and conservation of the site's natural and cultural heritage.

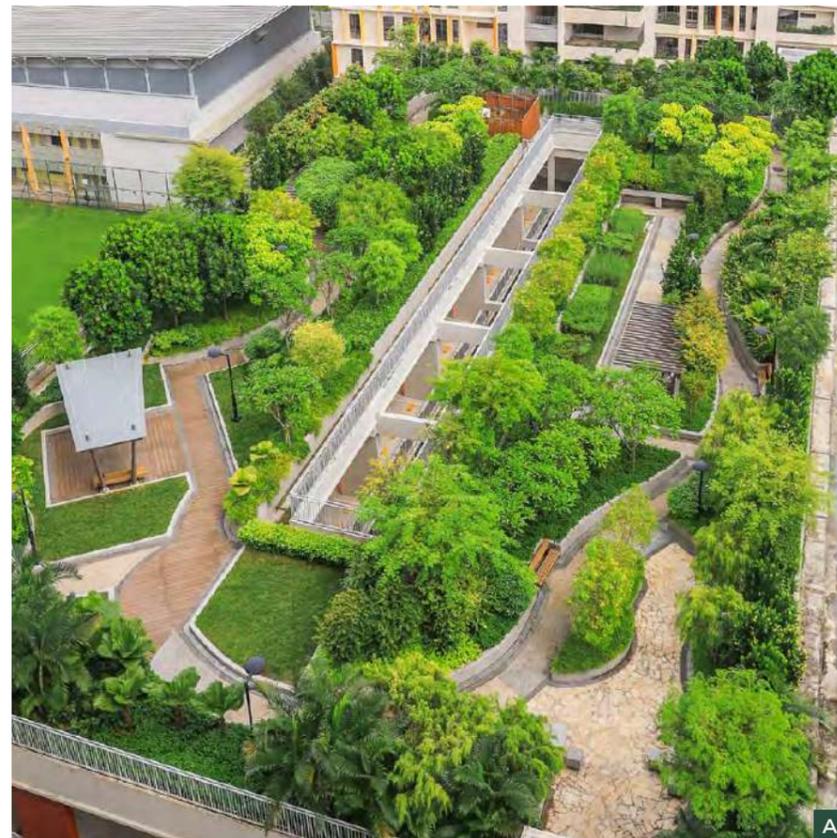
## Promoting skyrise greenery

NParks is stepping up efforts to work with building developers, industry players and building sector professionals to raise technical know-how and standards in skyrise greenery. This will help promote multi-functional skyrise greenery and their sustainable operations and maintenance.

Skyrise greenery technical guides will be updated and translated into micro-learning courses to raise landscape and building sector professional competencies, and a skyrise greenery technical tour has been introduced at HortPark to impart sustainable greening practices.

NParks' Centre for Urban Greenery and Ecology (CUGE) has also launched a skyrise greenery certification course while its research arm embarked on a study into the energy efficiency and thermal benefits of co-locating green roofs and solar panels.

In 2022, NParks released the third edition of its Skyrise Greenery Showcase e-booklet which highlighted exemplary skyrise greenery projects across building typologies in Singapore. A total of 15 projects were featured including CapitaSpring, Parkroyal Collection Marina Bay, Eunos Polyclinic, Pathlight School and Ang Mo Kio Court.



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## Raising standards in environmental impact assessment

To improve the quality and rigour of environmental impact assessment (EIA) work in Singapore, the engagement of EIA consultants will be carried out under a centralised NParks tender instead of standalone contracts by individual agencies. This not only minimises duplication of time and effort in the tender process but also enables NParks to work more closely with the consultants to standardise survey methodologies and develop best practice guidelines for the industry.

## AVS launches accreditation for dog trainer certification

A Certified Dog Trainer Scheme accredited by NParks' Animal & Veterinary Service (AVS) was launched as part of efforts to raise the standards and professionalism in the dog training industry. It serves as a competency benchmark for dog trainers and signals a clear shift towards safe and effective training methods that are grounded in science, ensuring that the welfare of dogs is safeguarded during the training.

Accredited trainers will be required to comply with codes of conduct set by their certifying bodies. Launched in December 2022, the new certification scheme replaces the Panel for the Accreditation of Dog Trainers scheme

## Licensing of dog breeders and pet boarders

Revised licensing conditions for dog breeding and pet boarding took effect from 1 April 2022 with the aim of improving the health and welfare of animals. Amongst the new conditions is the prohibition of in-breeding and the breeding of dogs with known harmful heritable conditions. They also stipulate the maximum age for breeding dogs and the maximum frequency for breeding to protect the dogs' welfare.

## Engaging stakeholders in the veterinary sector

AVS has been engaging stakeholders to raise professional standards in the veterinary sector. Following a survey of the veterinary profession in 2021, AVS conducted focus group discussions with members of the industry and users of veterinary services to identify areas to work on, including upholding professional standards for the veterinary sector and the importance of promoting lifelong education in the profession. In conjunction with World Veterinary Day on 30 April 2022, the book "Vets at Work" was launched and highlights the history of the Singapore Veterinary Association and the significant contributions that Singapore's veterinary professionals have made to society over the years.

## Sharing our expertise

NParks is actively involved in the sharing of expertise on the global stage, on topics ranging from biodiversity to climate change and wildlife management.

NParks participated in the fifteenth meeting of the Conference of the Parties to the Convention on Biological Diversity (COP15), held in Montreal, Canada in December 2022. At COP15, the parties present adopted the Kunming-Montreal Global Biodiversity Framework, which aims to catalyse and enable urgent transformative action by nations to halt and reverse biodiversity loss.

NParks was also invited to present at the City Summit Pavilion on the Singapore Index

on Cities' Biodiversity (SI), a self-assessment tool that helps cities measure and benchmark their biodiversity conservation efforts, that is critical for parties to fulfil the implementation of the Framework, in particular Target 12 on urban green and blue spaces enhanced for human well-being.

NParks also hosted a series of international webinars in collaboration with partners and experts. Held between July and September 2022, the webinars were aimed at raising awareness and understanding of wildlife to allow communities to safely share spaces and enjoy the benefits of living close to nature. Speakers included several international subject matter experts from distinguished educational institutions and agencies.



B

A | The rooftop carpark of Ang Mo Kio Court has been transformed into a lush garden complete with over 37,000 shrubs and trees for residents to enjoy a spot of greenery and recreation.

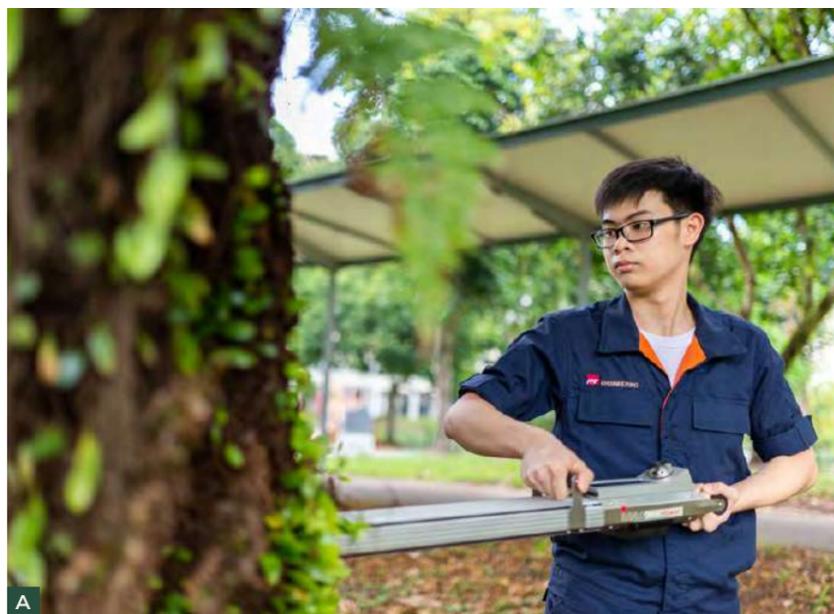
B | The veterinary community plays a critical role in safeguarding both public health and animal health. Vets help with the early detection of viruses in our companion animals, safeguard Singapore against zoonotic diseases as well as educate pet owners on responsible pet ownership.

## Upskilling the industry

In June 2022, CUGE launched a new Training Management System to streamline and enhance training administration processes for its courses, workshops and certification programmes. To date, NParks has offered about 2,300 training and assessment places for Workforce Skills Qualifications (WSQ) courses and close to 2,750 for non-WSQ courses. New CUGE courses introduced in 2022 include those on developing nature play programming as well as advanced tree decay assessment. These training modules play a crucial role in ensuring high quality work by the industry as they support our City in Nature vision.

NParks also continued to collaborate with institutes of higher learning, supporting the

Student-Run Park programme with the Institute of Technical Education (ITE) and Ngee Ann Polytechnic, as well as internships, immersion programmes and learning journeys. These covered topics such as the use of digital tools, playground safety inspection, nursery practices and biodiversity management.



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## Providing guidance in staff training and development

NParks has refreshed the competency framework that guides its officers in the training and development programmes that they may wish to undertake.

Collaborative learning continued to be an important aspect of staff development at NParks. Under the Hort Champs programme which facilitates the exchange of knowledge amongst staff, 12 workshops were conducted in 2022. They covered topics such as plant identification, new or uncommon plants for landscaping as well as pest and disease management. The workshops attracted about 100 participants on average, helping staff to keep their skills updated and relevant.

The quarterly Hort Colloquium also serves as a platform for staff and industry experts to share and exchange horticultural know-how. The 46th to 49th editions saw an average of 220 participants attending talks on topics such as waterlily care by Mr Danny Cox from Longwood Gardens in the United States, and Tropical Freshwater Swamp Forests by Dr Chong Kwek Yen from the Singapore Botanic Gardens.

## NPARKS RECOGNISED FOR DIGITALISATION STRATEGY

NParks was presented with the International Data Corporation (IDC) Future Enterprise Award (Future of Work) for its digitalisation strategy that involves the use of a science-based approach to develop digital tools and analytics to enhance efficiency in park and horticulture

management, and to strengthen the conservation and management of nature and biodiversity. An example is the automatic extraction of tree measurements to build accurate digital twins that help enhance field operations and improve tree risk management.



The Remote Tree Management System uses artificial intelligence to extract dimensions from the digital twins of trees, allowing for automatic tree inventory updates with LiDAR technology. NParks is also able to run some of our applications remotely, such as the Tree Structural Model, aiding work in managing our trees.

## Creating a family-friendly work culture

NParks received a commendation for the Great Companies for Dads Awards 2023, in support of the Made For Families initiative. To support staff in taking care of their families and strengthening family ties, it put in place family-friendly initiatives such as flexible work arrangements, "Back to School with Mom and Dad" to give staff with school-going children time-off during the first week of school, and "Eat With

Your Family Day" to allow staff to leave work earlier to join their families for dinner.

Staff were also given "NParks Family Day" tickets to bring their families to recreational attractions such as Universal Studios and Night Safari, and a "Bring Your Family to Work Day" was organised for staff to bring their children to the workplace for fun-filled activities and to show their children what they do at work.

A | Through the NParks-ITE collaboration on curriculum enhancements, students can build up their capabilities in arboriculture tools such as the Tree Structural Model, sonic tomography, resistance drilling, laser rangefinders, drones and greenery management tools commonly used in the landscape industry.

B-C | Participants in one of CUGE's courses learnt about developing therapeutic horticultural experiences through a hands-on workshop.

# GARDEN CITY FUND

## Message from the Chairman

2022 saw renewed growth in collective efforts to achieve Singapore's City in Nature vision as Singapore eased out of Covid-19 restrictions.

Corporate and community partners intensified their involvement in projects that sought to leverage nature-based solutions to mitigate climate change. An example was the collaboration with OCBC at the OCBC Mangrove Park, where NParks is piloting the Ecological Mangrove Restoration method to enhance the long-term resilience of mangrove habitats, and would be ready in 2026.

There was also strong interest in marine conservation with new partners such as KLA Foundation and PSA contributing generously to the research and restoration of corals under the Plant-A-Coral, Seed-A-Reef programme.

Support for the Plant-A-Tree programme continued to grow, putting us on course to achieve our target for the OneMillionTrees movement. To date, more than 500,000 trees have been planted since the start of the movement in 2020 – a milestone achieved with the help of over 75,000 members of the community. Of these trees, more than 14,000 were donated and planted by some 70 corporations and 1,100 individuals during this reporting period.

Our reach was greatly expanded through partnerships with both organisations and individuals. They not only raised financial capital but also engaged with their stakeholders through various platforms like events, online fundraisers and marketing collaborations that helped share our City in Nature vision and encouraged them to donate to the cause and embark on their journey to play a part for our natural heritage.

Our outreach to the young, to enable our future generation to connect with nature and our natural heritage, was another area that resonated with many of our corporate partners. The Mind the Gap 200 Fund committed its support to Every Child A Seed for 2023 and 2024 while Microsoft Singapore contributed to Green Wave 2023 and Mandai Nature enabled the World Wildlife Day Regional Youth Symposium.

It was also encouraging to see individuals coming forward to support our City in Nature vision. A legacy gift from the late Mr Gerry Essery and Mrs Jo Essery went to the Singapore Botanic Gardens' Give to the Gardens programme to fund conservation, research, education and outreach efforts. Long-time friends like Dr Rosslyn Leong and Mr Tan Jiew Hoe have continued with their generous support, as well as new friends like Mrs Tina Ou who



contributed to the Gardens' Herbarium Digitisation project, and Ms Tan Poh Joo who donated towards the conservation of rare plant seedlings at Pasir Panjang Nursery.

We are thankful and humbled by the support that we have received.

In the coming year, we will be stepping up our work on nature-based projects to mitigate the effects of climate change and plant species conservation leveraging the Singapore Botanic Gardens Seed Bank. We will also continue to drive outreach and education efforts to connect people with nature in our green spaces. We look forward to the continued support of the community and corporate partners as we embark on these efforts to realise our shared vision.



**Professor Emeritus Leo Tan**

## About the Garden City Fund

**Charity Registration Number/  
Unique Entity Number:**  
T02CC1634C

**Charity Registration Date:**  
19 November 2002

**IPC Number:**  
IPC000104

**Auditor:**  
Foo Kon Tan LLP

The Garden City Fund (GCF) is a registered charity and an Institution of a 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 and enhance nature and ecology, art and culture, landscape and horticulture, animal and greenery management, animal health and welfare, 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 of National Parks, Gardens & Nature Reserves and Commissioner of Parks & Recreation.

Between 1 April 2022 and 31 March 2023, the total amount of cash donations through the GCF was about \$12.3 million.

### The 10<sup>th</sup> and 11<sup>th</sup> GCF Management Committee for the Year in Review

NAME	CURRENT APPOINTMENT	PAST APPOINTMENTS	OCCUPATION	ATTENDANCE AT MANAGEMENT COMMITTEE MEETINGS IN FY 2022
Professor Emeritus Leo Tan*	Chairman 1 November 2022	Chairman since 1 November 2006	Retired	4/4
Mr Daren Shiau	Treasurer 1 November 2022	Member since 1 November 2016	Partner, Allen & Gledhill LLP	4/4
Dr Leong Chee Chiew*	Secretary 1 November 2022	Member since 1 November 2012	Executive Director of National Parks, Gardens & Nature Reserves and Commissioner of Parks & Recreation, NParks	3/4
Mr Gerald Tan	Member 1 November 2022	Member since 1 November 2020	Head of Reputational Risk for Asia, Credit Suisse Singapore	4/4
Mr Goh Kong Aik	Member 1 November 2022	Member since 1 November 2014	Retired	4/4
Mr Han Jok Kwang	Member 1 November 2022	Member since 1 November 2020	Business Development Advisor, Schneider Electric	4/4
Mrs Kirtida Mekani*	Member 1 November 2022	Member since 1 May 2005	Director, CISTECH International Pte Ltd	4/4
Mr Guy Harvey-Samuel#	Member 1 November 2022		Retired	1/1

\* 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.

# Mr Guy Harvey-Samuel was appointed to the 11th GCF Management Committee on 1 November 2022.

**Conflict of interest policy**

The GCF Management Committee members are required to comply with the charity's conflict of interest policy. The charity has put in place documented procedures for committee members to declare

actual or potential conflicts of interests on a regular and need-to-basis. Committee members also abstain and do not participate in discussion or decision-making on matters where they have a conflict of interest.

**Whistle-blowing policy**

GCF follows NParks' whistle-blowing policy for reporting improper conduct and to address concerns about possible wrong-doing or improprieties in financial or other matters within the charity.

**All on board for the City in Nature**

The transformation of Singapore into a City in Nature gained momentum with strong support from corporates and individuals in the past year.

**Enhancing our parks and gardens**

UNESCO World Heritage site Singapore Botanic Gardens continued to strengthen its conservation, research and outreach efforts with the help of contributions received through its Give to the Gardens programme.

This has enabled programmes like Singapore Botanic Gardens' annual fundraiser, Trees of the World, where individuals, corporations and embassies donated and decorated native trees in the Gardens, some of which were in partnership with schools, hospitals and non-profit organisations to spread messages of hope and inspiration. This created a festive display for visitors to enjoy from 4 December 2022 to 2 January 2023. Collectively, more than S\$265,000 was raised from 52 corporate donors and 71 individual donors. This included



a contribution from Equinix and its strategic alliance partners that contributed S\$60,000 to support the Gardens.

A S\$9,000 donation also came from EZ-Link through a collaboration to produce four

limited-edition EZ-Link cards featuring botanical illustrations inspired by the flora in the Gardens; and the launch of a limited-edition sustainable bamboo charm featuring a *Dipterocarpus* species seed.

In other park enhancement projects, the Spice Gallery at Fort Canning Park was developed with generous support from Nomanbhoy & Sons, one of Singapore's oldest spice companies. The gallery showcases the history of spice trade, various spice plants that were traded and their importance to Singapore's economic and social development. Together with an experiential trail, the newly-refreshed space provided visitors with an opportunity to connect with plants.



**The Greening of Singapore**

The Plant-A-Tree (PAT) programme continued to make strong progress in the past year, contributing to the growth of the OneMillionTrees movement. More than 70,000 trees were donated and planted by more than 800 corporations and 5,000 individuals.

Microsoft Singapore pledged to plant 1,700 trees as part of a US\$150,000 donation to the GCF. The donation also supported Trees of the World and the Green Wave campaign, a programme for students to have greater appreciation and awareness of the local biodiversity that is shared with the international and local community in commemoration of the International Day for Biodiversity.

Several other organisations marked their anniversaries by supporting the PAT programme. They include Huttons Asia which pledged to raise funds to plant 500 trees to commemorate its 20th year; Energy Market Company that made a generous donation to plant 200 trees to mark the National Electricity Market of Singapore's 20th anniversary; and Schenker Singapore which pledged to contribute to the planting of 150 trees to celebrate its 150th year.

New supporters who came on board in the past year included Singlife and SAC Capital which donated S\$30,000 each towards the PAT programme, and SCDA

Architects which pledged to raise S\$300,000 for 1,000 trees.

They joined regular contributors such as Geneco which has supported PAT since 2021 and donated another S\$10,000 to the Singapore Botanic Gardens Seed Bank in 2023 in celebration of its 5th anniversary.

A fundraiser for PAT was also organised by Mediacorp in partnership with Daikin Industries. It was supported by advertisements on all nine Mediacorp radio stations and a post-event video broadcast on mainstream media in mid-November 2022.



A | The new Spice Gallery in Fort Canning Park is planted with herbs and spices that were commonly traded in Singapore's past. Visitors can get up close to smell and observe these plants.  
 B | Over 120 corporate and individual donors came together to deck out the trees around the Singapore Botanic Gardens in festive decoration, as part of Trees of the World, its annual fundraiser event. The proceeds will go towards supporting research, conservation and outreach in the Gardens.  
 C-D | Plant-A-Tree remains a hallmark programme of the Garden City Fund, enabling organisations and individuals to green up Singapore and provide new habitats for native flora and fauna.

### Boosting conservation efforts

OCBC, in its commitment to champion sustainability and mitigate climate change, has pledged to donate S\$3 million towards Singapore's first large-scale project to enhance long-term resilience of mangrove habitats; and increase Singapore's capacity for carbon storage using the Ecological Mangrove Restoration method. This is part of the bank's 90th anniversary gift to Singapore, that will enable the development of the OCBC Mangrove Park at Pulau Ubin

to create additional habitats for Singapore's native biodiversity.

In other conservation efforts, PSA donated proceeds from its annual golf event to support NParks' Plant-A-Coral, Seed-A-Reef programme. A total of S\$50,000 was raised from the PSA Golf Invitational 2022, which would go towards improving Singapore's marine habitat through the transplanting of coral nubbins to Reef Enhancement Units at the Sisters' Islands Marine Park.

### Strengthening outreach and education

After a four-year hiatus, the Singapore Garden Festival returned in 2022 to a new location at the Orchard shopping belt and Singapore Botanic Gardens. Supporting the event were platinum sponsors ION Orchard and Ngee Ann City, bronze sponsor Natural GRO, Shopee as official e-commerce partner, as well as partners Kayakasia Paddlesports Pte Ltd and Sprout Lab.



A

Another outreach and education programme, the 2nd World Wildlife Day Regional Youth Symposium 2023, was held in March with Mandai Nature, a non-profit wildlife conservation organisation, contributing S\$140,000 towards it. The event, organised by members of NParks' Youth Stewards for Nature Programme, brought together over 170 youth attendees from 15 countries, including all 10 ASEAN member states, to share their aspirations and discuss how youths can play a part in nature and biodiversity conservation in Southeast Asia.



B

CITES Management Authority of Singapore, has adopted to create wildlife conservation awareness and further engage a younger generation to provide platforms for them to come together to participate and discuss wildlife conservation and sustainable use issues.

This programme is one way that NParks, as the appointed



C



D

### Individuals step forward

Besides the corporates, GCF also received support from many individuals. A sum of S\$983,000 was received from the estate of Jo and Gerry Essery to support the Singapore Botanic Gardens' Give to the Gardens programme. Other donors included Ms Tan Poh Joo who contributed S\$30,000 to support the conservation of rare plant seedlings at Pasir Panjang Nursery; Mrs Tina Ou who donated S\$50,000 to the Singapore Botanic Gardens Herbarium Digitisation project; and Mr Bhavesh Shukla who pledged to donate all proceeds from the sales of his photobook "God's Own Design – A Photographic Journey Through Nature" to the PAT programme.

Mr Bhavesh has also started a fundraiser "Book-A-Tree" on the giving.sg platform to raise funds for PAT.

Mr Tow Heng Tan, through his foundation Mind the Gap 200 Fund, also made a generous gift of S\$250,000 to support a range of projects that included Give to the Gardens, Orchid Conservation programme and Every Child A Seed, an NParks outreach programme to cultivate the appreciation of gardening amongst primary three students.

### The year ahead

GCF will continue to work closely with corporate partners and individuals and to seek community support for various projects in the coming year. Among these will be nature-based initiatives in the Mandai Mangrove Mudflat area to mitigate the effects of climate change and improve Singapore's long-term climate resilience, and the Singapore Botanic Gardens Seed Bank which will play an increasingly important role in plant species conservation.

GCF will also continue to focus on outreach and education through projects such as NParks Concert Series in the Park: Rockestra®, botanical art exhibitions and the use of the Therapeutic Gardens to demonstrate the healing powers of nature.

Through these efforts, GCF aims to strengthen corporate and community involvement in its work and connect people more closely with nature. Visit [www.gardencityfund.gov.sg](http://www.gardencityfund.gov.sg) for more information.

- A | Situated outside Ngee Ann City, one of the Singapore Garden Festival's show gardens themed 'In the far, far away future' immersed visitors in a world of towering vegetation and insects overtaking the space. A total of six show gardens transformed Orchard Road into a lively garden oasis.
- B | Alongside the World Wildlife Day Regional Youth Symposium, the youths also organised a complementary suite of learning journeys, workshops, invasive species management and a crash-course on spotting illegally traded wildlife products online.
- C | The upcoming Mandai Mangrove and Mudflat is one of the richest wetlands in Singapore and a rich feeding ground for migratory shorebirds. It will be conserved as a Nature Park, adding to the existing Nature Park Network around Sungei Buloh Wetland Reserve.
- D | NParks' Concert Series in the Park: Rockestra® made a strong post-pandemic comeback. Designed to bring visitors into our parks, the event held on 23 February 2023 attracted a 10,000 strong audience to Bishan-Ang Mo Kio Park.

# GARDEN CITY FUND DONOR'S ACKNOWLEDGEMENT FY2022

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

- Keppel Care Foundation
- Magical Bridge Foundation
- Peter Lim

## |\$100,000 and above

- AIA Singapore
- Aramco Asia Singapore Pte Ltd
- City Developments Limited
- Estate of Essery Gerald Stephen
- Goh Foundation Limited
- Hotel Properties Limited
- Leong Sou Fong Rosslyn
- LU Foundation
- Mandai Nature
- Microsoft
- Ocean Network Express Pte Ltd
- Oversea-Chinese Banking Corporation Limited
- Schenker Singapore (Pte) Limited

## |\$10,000 and above

- AECOM Singapore Pte Ltd
- AIA Investment Management Pte Ltd
- AirTrunk Singapore Pte Ltd
- Akiko Shaw
- Alfa Tech Vestasia Pte Ltd
- Allen & Gledhill LLP
- Allianz SE Reinsurance Branch Asia Pte Ltd
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- Lim Kim Hoe
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- Ng Chin Siao
- NTUC Income Insurance Co-Operative Limited
- OCP Asia (Singapore) Pte Ltd
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- Onn Wah Precision Machining Pte Ltd
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- Sanchoon Builders Pte Ltd
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- SP Group Pte Ltd

- Singapore Telecommunications Limited
- Sompoo Insurance Singapore Pte Ltd
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- Virtuos Holdings Pte Ltd
- WWF Singapore
- Yap Soo Jin
- Yong Kon Yoon Eugene
- ZIM Singapore Pte Ltd

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- Activecool Fashion
- Afterhurst Limited
- Ajinkya Kunal Arvind
- Alexander Shalen
- Alexey Rummyantsev
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- Ang Chi Hoe
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- Chong Ik Wei
- Chong Lo Lan Pearlyn
- Christopher Quek
- Chua Choong Tze
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- Chua Yuaw Hong Edwin
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- Curie Holdings Pte Ltd
- Daryl Lim
- Dell Global B.V. (Singapore Branch)
- Digital Core Reit Management Pte Ltd
- DPEX Worldwide Express (S) Pte Ltd
- DTCC Data Repository (Singapore) Pte Ltd
- EIG Dermal Wellness (S) Pte Ltd
- EisnerAmper PAC
- Emerson Asia Pacific Pte Ltd
- Eng Leong Medalllic Industries Pte Ltd
- Envista Forensics Pte Ltd
- Epam Systems Pte Ltd
- Eurokars Habitat Pte Ltd
- Evan Tan
- EZ-Link Pte Ltd
- Fairfield Chemical Carriers Pte Ltd
- Fendy Lee
- First REIT Management Limited
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- Foo Siang Keng
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- Four Seasons Asia Investment Pte Ltd
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- Fu Mao Holdings Pte Ltd
- Fu Yuan International Holdings Pte Ltd
- Fung Yuit Leng Juanna-Gaby
- Gan Wen-Jian
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- Goh Eck Meng
- Goh Liu-Ying (Wu Liying)
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- Grab Taxi Holdings Pte Ltd
- Grand Venture Technology Limited
- Green Forest Landscape Pte Ltd
- Gwee Lay Peng Anna
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- Lingaraj Krishna
- Liu Fenghua
- Luba Marine Survey Pte Ltd
- Mandom Corporation (Singapore) Pte Ltd
- Marcellinus Simon Hendrikus
- Mary Tan
- Maximilian Ajit Singh Shau
- Melita Teo More May
- Mettler-Toledo (S) Pte Ltd
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- Miranda Clark
- Moo Yi Sin Jason
- Muhammad Fadhli Bin Borhan
- N&E Innovations Pte Ltd
- National University of Singapore
- Neo Huey Wen
- Neo Soh Kheng Florence
- Neu Ming Wei Kelvin
- Ng Ee Han Ivan
- Ng Wei Yong
- Ogilvy Singapore Pte Ltd
- Oh Kim Yeow
- Ong Liyi
- Oo Kian Kwan Kenneth
- Optiver Singapore Trading Pte Ltd
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- Quek Hong Hui Richard
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- Stuart Chng
- Students of BW Monastery
- Sumitomo Rubber Asia (Tyre) Pte Ltd
- Summit Power International Limited
- Tan Boon Hui
- Tan Kay Jin
- Tan Kian Loy
- Tan Suat Hua
- Tan Toh Hui Leonard
- Tan Yee Tiong
- Tang Chuan Ann
- Tay Hui Hian Kenny
- Tay Mui Hoon
- Telstra Singapore
- Teo Lok Tsong Terence
- Tern Yuh Sheng Joseph
- Tony Teo
- Too Chien Kuoh Elvin
- T. Rowe Price Singapore Pte Ltd
- Tuas South Avenue Pte Ltd
- Tuas West Drive Pte Ltd
- Unison Construction Pte Ltd
- Vance Chemicals Pte Ltd
- Wan Chee Foong
- Wee Kia Wah Daisy
- William Heng
- Wilmar International Limited
- Winnie Cheah
- Wolfgang Josef Neeser
- Wong Tan & Molly Lim LLC
- Xia Yiren
- Yap Chien Ting Livia
- Yap Wee Ling
- Yee Ming Innes Bridges
- Yeo Boon Pian
- Yeung Leung Ming @ Thomas
- Yong Shao Fung
- Yong Shao Onn
- Zedra Trust Company (Singapore) Limited
- Zurich Foundation

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 Commitment

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 we transform into a City in Nature. In February 2021, the Government unveiled the Singapore Green Plan 2030, a whole-of-nation movement to advance the national agenda on sustainable development. City in Nature, as one of the five key pillars of the Green Plan, will create a green, liveable and sustainable home for Singaporeans.

### 2022 Achievements

2022 Achievements	Key Sustainability Targets by 2030
 Park Provision Ratio of 0.81 ha/1,000 population	<b>Park Provision Ratio of 0.8 ha/1,000 population</b>
 155 ha of skysrise greenery	<b>200 ha</b>
 380 km of park connectors	<b>500 km</b>
 190 km of Nature Ways	<b>300 km</b>
 94% households within a 10 min walk to a park	<b>100%</b>
 1,900 Community in Bloom Gardens	<b>3,000</b>
 540,000 trees planted	<b>1 million more trees</b>

## Our Sustainability Strategies

### Sustaining our City in Nature



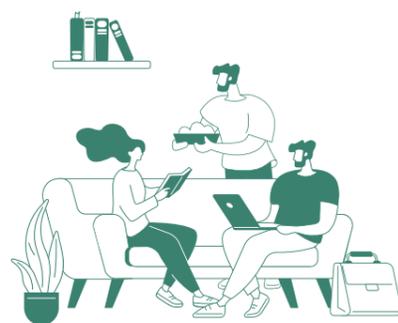
Creating the best possible living environment through excellence in nature conservation, greenery and recreation.

### 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.

## Sustaining Our City in Nature

### Conserving and 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 which 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.

In April 2022, the establishment of a new Labrador Nature Park Network was announced. The network will comprise more than 200 ha of green spaces, or almost 1.5 times the size of Bukit Timah Nature Reserve. In November 2022, NParks opened Rifle Range Nature Park which serves as a green buffer to protect Bukit Timah Nature Reserve from edge effects and abutting developments. Its opening completes the Central Nature Park Network around the nature reserve. NParks will continue to grow its network of nature parks, which will help conserve and enhance natural carbon sinks across the island.

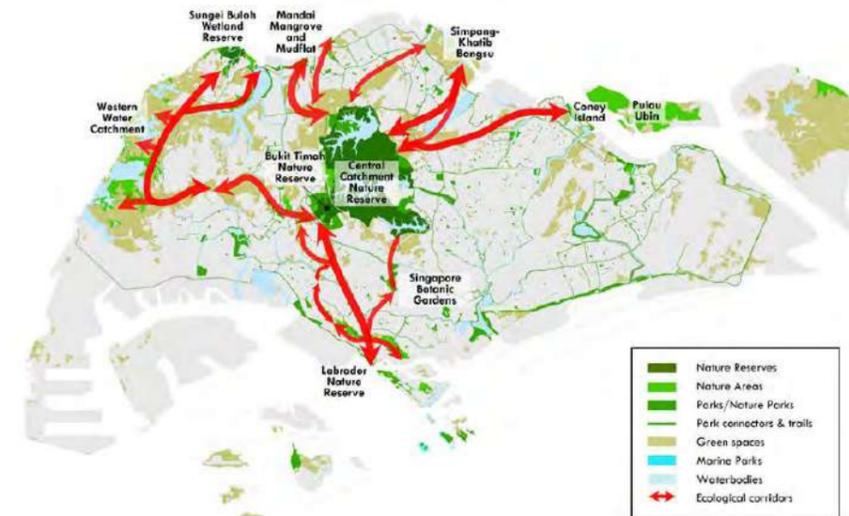


Figure 1: Map showing islandwide ecological connections, as identified through NParks' EPE.

### Strengthening Connectivity between Green Spaces

NParks will continue to expand our islandwide connectivity networks so that Singaporeans will have greater access to green spaces near their homes. Today, over 380 km of park connectors have been established – more than seven times the length of Singapore from East to West. The Rail Corridor (North) was opened in February 2023, and is part of overall plans to curate a 360 km islandwide network of recreational routes, which will contribute towards enabling every household to live within a 10-minute walk to a park by 2030.

The Ecological Profiling Exercise (EPE) was launched in 2021 to study the ecological profile of green spaces in Singapore, and to better understand their role in strengthening ecological connectivity. Through the EPE, NParks has identified four new ecological corridors around northern, northwestern and northeastern Singapore at Khatib, Kranji, Lim Chu Kang and Seletar (see Figure 1). With the identification of these new ecological corridors, NParks will

ensure that key biodiversity areas, as well as ecological connectivity, will be maintained when development is needed at existing green spaces within the ecological corridors. This is done by implementing measures to support the ecological connectivity, including retaining key existing forested patches, or by incorporating nature parks, park connectors or Nature Ways within the development to facilitate ecological connectivity. NParks has completed 190 km of Nature Ways, which mimic the multi-tiered structure of a natural forest, to better connect our green spaces for animals like birds and butterflies and also beautify our city, provide shade, cool our surroundings, and improve air quality.

NParks will also be establishing a new Khatib Nature Corridor. This allows ecological connectivity to be maintained and enhanced between the Central Catchment Nature Reserve and Khatib Bongsu Nature Park.

## 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 statelands. NParks will be developing and redeveloping more than 300 ha of new and redeveloped parks which will feature more lush vegetation and natural landscapes by 2026, allowing Singaporeans to benefit from greater access to nature and its associated benefits on health and well-being.

The waterbodies within our gardens and parks will also be naturalised where possible, like how we have done so in Bishan-Ang Mo Kio Park and Jurong Lake Gardens. In addition, NParks is restoring mangroves in parks along Singapore's coasts, such as Kranji Coastal Nature Park. These mangroves will function in tandem with engineering solutions to serve as coastal protection measures, to mitigate the effects of erosion brought about by storm surges

and rising sea levels. NParks will continue to incorporate nature-based solutions in its coastal and riverine parks, to help build resilience against sea-level rise and inland flooding.

Beyond these, NParks will establish more contemplative landscapes in gardens and parks, which can be programmed for seniors and children as well as cater to diverse conditions such as dementia and mood disorders. In addition, more Nature Playgardens with biophilic elements and natural materials will be introduced, for the young to engage in child-directed spontaneous play.

To allow more people to reap the benefits of nature, we will also create more contemplative landscapes within our urban spaces.



A concrete drain leading from Yuan Ching Road to Jurong Lake has been naturalised into a series of streams known as Neram Streams that channel stormwater runoff from the surrounding area.

## Restoring Nature into the Urban Landscape

We have also pressed on with efforts to restore nature into our urban landscape. In FY2022, we restored and enhanced over 30 ha of forest, coastal, and marine habitats, well ahead of the target to do so by 2030. Ongoing habitat restoration and species recovery efforts have enabled Singaporeans to encounter and enjoy once-rare species of plants and animals in our green spaces, such as the Singapore Ginger (*Zingiber singaporense*) and the Sunda Slow Loris (*Nycticebus coucang*).

Under NParks' Species Recovery Programme, we will continue to increase recovery efforts for 160 species by 2030 as a key part of NParks' efforts to strengthen the conservation of Singapore's native flora and fauna.

We will also continue to promote the implementation of skyrise greenery (including vertical green walls, green roofs, and rooftop gardens) to building owners and continue to green up covered linkways with trellis plantings,

while enhancing landscape plantings at MRT stations. We will continue to intensify our greening efforts in Singapore's industrial estates as well, which are currently among the hotter areas on the island. NParks is working with various stakeholders to increase the total number of trees in industrial estates, including Jurong Island, to almost three times as many, from nearly 90,000 trees to about 260,000 trees by 2030.

## Nurturing Communities

### Strengthening Community Stewardship

The support and involvement of the community are key to the success of our City in Nature vision. With the relaxation of Covid-19 measures, we have resumed many of our physical events to engage the community. Singapore Garden Festival 2022 was held along Orchard Road at ION Orchard and Ngee Ann City as well as Singapore Botanic Gardens

As part of the Singapore Green Plan conversations to engage Singaporeans on sustainable development, five webinars and three workshops under the City in Nature Conversations initiative were organised between November 2021 to January 2023. Covering a variety of topics, the webinars have garnered over 7,000 views to date. Through the workshops, close to 50 members of the public, including youths, came together to brainstorm and work on projects to transform Singapore into a City in Nature.

Since the launch of the OneMillionTrees movement in 2020 to plant a million more trees across Singapore by 2030, NParks has worked closely with its key partners including NParks volunteers in the Friends of the Parks communities, Community in Bloom (CIB) gardeners, nature groups, corporate partners, other organisations, as well as members of the public to champion initiatives surrounding the tree planting efforts. More than 75,000 members of the community have joined us in tree-planting activities across the island, some of whom have also been involved



Senior Minister of State, Ministry of Foreign Affairs & Ministry of National Development Sim Ann (right) admires the floral displays at ION Orchard, part of the Singapore Garden Festival that returned after a four-year hiatus.

in the processes leading up to and following tree planting. For instance, over 600 native tree saplings and 1,500 native seeds have been delivered to community nurseries in 43 schools. These plants will be nurtured within the school compounds and planted across Singapore when matured.

The nationwide CIB gardening movement aims to bring residents together to foster community spirit and active stewardship of our City in Nature. Today, there are more than 1,900 community gardens across Singapore, set up and managed by our community gardeners. NParks will continue to facilitate the set-up of CIB gardens across Singapore to meet the target of 3,000 CIB gardens by 2030.

Social Enterprise Community Urban Farms (SECUFs) aim to further promote edibles gardening in the community, and also provide micro-employment and volunteering opportunities to residents, especially seniors and the less privileged. In October 2022,

NParks awarded the tender for the first SECUF site at West Coast Park to City Sprouts.

To extend our reach and engagement touchpoints further into the community to grow a network of nature-centric volunteers at the grassroots level, NParks launched the Nature Kakis Network in January 2023. The Nature Kakis Network is a new touchpoint centred at the heart of local communities that brings together passionate like-minded individuals to become stewards of nature. This follows the first group of Nature Kakis established in April 2022, which comprises volunteers from the Boon Lay area. Between January and March 2023, NParks intensively engaged various grassroots organisations and volunteers to encourage new Nature Kakis Chapters to be formed. Interested constituencies included Bukit Gombak, Moulmein-Cairnhill, Nee Soon South, Pasir Ris Central and Punggol. NParks will continue to facilitate the interests from the community and work towards establishing new Nature Kakis Chapters.

# 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 (HR) Professionals.

HR has also rolled out the refreshed NParks Competency Framework to guide staff in identifying suitable development opportunities for upskilling and reskilling.

### Staff with Professional Operational Certifications (as of March 2023):

**105** Certified Park Managers

**126** Certified Practising Horticulturists

**248** ISA Certified Arborists

**33** Certified Playground Safety Inspectors

**16** Project Management Professionals

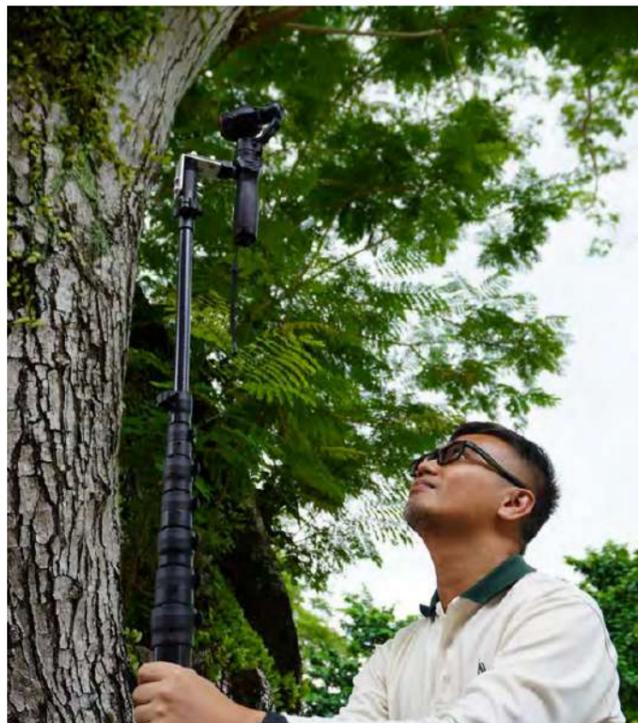
## Expanded Vocational and Skills Allowance Framework

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 list of certifications that qualify officers for the allowance also includes certifications such as those in Field Epidemiology (Veterinary & Animal Health) and Advanced Animal Welfare & Behaviour (Cat and Dog).

## Competency-Based Remuneration

We will continue to professionalise the role of an NParks officer and improve the attractiveness of a career in NParks. Officers' skills and competencies will be recognised by appropriate progression opportunities and remuneration. We will also continue to 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 allowance framework.



Staff are encouraged to pick up new skills or earn professional certification to build up capabilities and better themselves for new work challenges.

## 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. There are three sub-committees:



**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.

In FY2022, as Covid-19 Safe Management Measures started to ease up, more in-person activities were organised for staff to bond. These include holding our first Year-End-Get-Together after a three-year hiatus where staff bonded over food, games and activities.

About 30 events were carried out in FY2022. Some of the events that were organised aimed to encourage across the board participation, including sports interest groups, Round Island Challenge Virtual Cycle 2022, health screening, food collection drive, and lunch food trucks.

As staff can telecommute on certain days each week, the committee continued to deliver some of these programmes and activities on e-platforms as well, which helped to engage staff while they worked from home. Some of these activities planned were related to ensuring staff mental and physical well-being.



As staff can telecommute on certain days of the week, they can also enjoy more time with their family, allowing for a stronger worklife balance.

## Recognition and Awards

Each year, deserving staff are recognised for their exemplary service and work via the Excellent Service Award and Divisional Star Award presented at the annual Y.E.O.P! Service Excellence Forum organised by the Y.E.O.P! Committee, a cross-divisional team that engages our officers to contribute to NParks' service vision. In 2022, 36 staff were commended for providing excellent service to internal and external customers.

This past year, 200 staff received their Long Service Award at the Staff Appreciation Award Ceremony held in March 2023 for their contributions towards building and caring for our City in Nature.

# FACTS & FIGURES FY2022

## National Day Awards

Note: Staff appointments indicated on this page are accurate as of when the Awards were announced.

### Public Administration Medal (Silver)

**Ms Sophianne Mohamad Araib**  
Group Director / Parks Central & Horticulture and Community Gardening  
Parks Central

### Public Administration Medal (Bronze)

**Ms Jacqueline Teo**  
Director / Garden City Fund  
Communications and Community Engagement

### Dr Thereis Choo

Coordinating Director / Living Collections and Facilities Management & Centre Director / Forest Discovery Centre  
Singapore Botanic Gardens

### Dr Lim Zhi Jian, Kelvin

Director / Biorisk and Biosurveillance & Quarantine and Biosecurity Services & Science and Technology Planning  
Veterinary Health

### Ms Ow Siew Ngim

Director / Streetscape (South West) & Ops Tech  
Streetscape

### Commendation Medal

#### Mr Choo Guoping Mark

Assistant Curator / National Orchid Garden  
Singapore Botanic Gardens

#### Mr Hong Zhongzhi

Senior Manager / Community in Bloom  
Horticulture and Community Gardening

#### Ms Lai Simin

Deputy Director / Horticulture  
Singapore Botanic Gardens

#### Mr Matthias Ang

Deputy Director / Investigations Enforcement

#### Mr Seah Hong Meng

Deputy Director / Development Management  
Parks Development

#### Ms Wendy Sng Beng Guat

Deputy Director  
Veterinary Health

#### Mr Xia Yixuan

Senior Manager / Emergency Planning & Risk Management  
Corporate Strategy and Planning Division

#### Ms Xie Renhui

Deputy Director / International Relations  
Wildlife Management

### Efficiency Medal

#### Mr Azlin bin Mohd Noor @Yazid bin Mohd Noor

Senior Executive / Jurong Lake Gardens Development  
Jurong Lake Gardens

#### Mr Goh Sze Pu Joshua

Senior Officer / Facilities  
Corporate Services

#### Mr Izzul Haq bin Abdullah

Manager / Nursery Management  
Horticulture and Community Gardening

#### Ms Lim Mui Hiang Pamela

Senior Manager  
Community Animal Management

#### Ms Seri Hayuni binte Hadi

Senior Executive / Education  
Singapore Botanic Gardens

#### Ms Sheralee binte Mohamed Saniff

Manager / Greenery and Development Planning  
Policy & Planning

## Long Service Medal

**Mr Aminurashid bin Eksan**  
Manager / CUGE  
Industry & CUGE

#### Ms Chan Yang Sun

Senior Executive / Communications  
Communications and Community Engagement

#### Ms Koh Seok Lan Jeanette

Senior Executive / Development Management  
Parks Development

#### Mr Mishak bin Shunari

Senior Officer / Conservation  
Conservation

#### Mr Mohamad Ali bin Amat

Senior Executive / Park Planning  
Policy & Planning

#### Mr Mohamad Idrus bin Mohamad Noor

Senior Officer / Streetscape  
Streetscape

#### Mr Mohammad Budiman bin Jamail

Acting Deputy Director / Facilities  
Corporate Services

#### Mr Shahrizal bin Sidi

Principal Ranger / Tactical  
Enforcement

#### Mr Shamril bin Jamil

Director / CUGE (Manpower Development)  
Industry & CUGE

#### Mr Soh Swee Meng

Senior Officer / Conservation  
Conservation

## Awards and Accolades

### Excellent Service Award 2022

Attractions  
4 Star, 1 Gold and 1 Silver

### May Day Awards 2023

#### Model Worker

**Mr Peter Tan Poh Tai**  
Executive / Security Management  
Singapore Botanic Gardens

### IT Awards

**Recognition of Excellence Award Singapore Recognition of Excellence (Public Sector) 2022**

Use of Sensors for Safe Distancing Operations

#### Special Achievement in GIS (SAG) Award

Awarded in recognition for the development of the SafeDist@ Parks portal in response to Covid-19

### IDC Future Enterprise Awards 2022

#### Best in Future of Work (Singapore)

Digitalisation of Parks, Greenery & Biodiversity and Conservation Management

### Commendation for the Great Companies for Dads Awards 2023

### MND Minister's Award Ecological Profiling Exercise

Development of Round Island Route (Phase 1)

Leveraging Technologies to Enhance Singapore's Border Biosurveillance

Animal Quarantine Centre, Home Quarantine Technology and Border Inspection

### Municipal Services Awards 2022

#### Community Category

Developing Bukit Gombak Park with the Community

#### Individual Category

**Cheryl Wong Yoke Keng**  
Manager / Community Animal Management Operations  
Community Animal Management

# FACTS & FIGURES FY2022

## 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 Courses for Landscape Workers (Level 1)

- Plant Health Management and Disease Control
- Plant Identification
- Plant Pruning

#### WSQ Courses for Landscape Technicians (Level 2)

- Chainsaw Operation and Maintenance
- Hazards and Risk Control, and Policy Management\*
- Horticultural Chemical Usage\*
- Plant Health Management and Disease Control\*
- Plant Propagation and Production
- Plant Pruning \*
- Soil and Media Assessment and Remediation
- Tree Health Management
- Tree Pruning
- Tree Climbing and Aerial Rescues
- Turf Maintenance\*

#### WSQ Courses for Landscape Supervisors (Level 3)

- Hazards and Risk Control, and Policy Management
- Plant Health Management and Disease Control
- Plant Identification
- Soil and Media Assessment and Remediation

#### WSQ Courses for Landscape Managers (Level 4)

- Budgeting
- Environmental Management in Landscape Operations
- Hazards and Risk Control, and Policy Management
- Horticultural Chemical Usage
- Horticultural Maintenance Programme
- Plant Health Management and Disease Control
- Project Management

### Workshops

- Animal Population Density Modelling using the Random Encounter Model (REM)
- Canine Training and Behaviour Workshop (for Private Trainers)
- Chainsaw Operations and Maintenance (Refresher)
- Developing and Adapting Therapeutic Horticulture Activities for Multiple Client Groups
- Formative Pruning for Young Trees
- Handling Public Feedback with Poise (for NParks officers)
- How to Develop Inclusive Nature Play Programmes
- Landscape Safety Orientation Programme (Bengali)
- Landscape Safety Orientation Programme (English)
- Landscape Safety Orientation Programme (Tamil)
- Mountain Bike Trail Workshop
- Odonata Species of Singapore — Ecology
- Resistance Drilling Equipment
- Therapeutic Horticulture for Seniors
- Tree Climbing and Aerial Rescue (Refresher)
- Tree Failure Profiling for Common Wayside Trees in Singapore
- Tree Felling
- Tree Inspection — Advanced
- Tree Inspection — The Basics
- Trees & Construction — Understanding The Arboriculture Impact



### Certification Programmes

- Animal Management Professional Certification Programme (Basic Module)
- Animal Health Professional Certification Programme
- Animal Management Intermediate Elective (Dog Module)
- Animal Management PCP Intermediate Elective (Mammal Module)
- Animal Welfare and Behaviour
- Certificate for Basic Plant Recognition (Module 1 to 6)
- Certificate in Field Epidemiology (Veterinary & Animal Health)
- Certified Playground Safety Inspector Examination
- Certified Practising Horticulturist (CPH)\*
- Dog Welfare Assessment Skills Cert
- ISA Certified Arborist Preparatory Programme
- ISA Tree Risk Assessment Qualification (TRAQ) Renewal programme
- Skyrise Greenery Certification Programme Part 1

### Seminar/Webinar & International Programmes

- Animal Management PCP Intermediate Elective — Wildlife Management in Development
- City EXCEL Programme (CLC-CUGE)
- Managing Nature in Developments
- SMU-Pakistani Programme
- Tree Decay — The Fundamentals
- Tree Inspection — Failure Documentation & Analysis
- Tropical Tree Identification, Biology & Physiology
- URA-Integrated Land Use Planning Course (ILUP)

\* Programmes with Assessment Only Pathway (AOP) option

# FACTS & FIGURES FY2022

(As of 31 Mar 2023)

## Regional Parks Maintained by NParks

REGIONAL PARK NAME	MAINTAINED AREA (HA)
Admiralty Park	25.67
Ang Mo Kio Linear Park	6.24
Ang Mo Kio Town Garden East	4.88
Ang Mo Kio Town Garden West	20.63
Ann Siang Hill Park	0.32
Armenian Street	0.35
Bedok Reservoir Park	36.14
Bedok Town Park	13.66
Bishan-Ang Mo Kio Park	62.00
Bukit Batok Nature Park	35.74
Bukit Batok Town Park	41.60
Bukit Timah Nature Reserve	162.64
Central Catchment Nature Reserve	455.00
Changi Beach Park	28.85
Chestnut Nature Park	81.00
Choa Chu Kang Park	10.41
Clementi Woods Park	11.48
Coney Island Interim Park	33.30
Coney Island Park	43.50
Dairy Farm Nature Park	75.32
Dhoby Ghaut Green	1.00
Duxton Plain Park	1.28
East Coast Park	179.21
Empress Place	1.52
Esplanade Park	2.62
Fort Canning Park	22.61
Hampstead Wetlands Park	3.23
Handy Road Open Space	0.27
Hindhede Nature Park	9.90
Hong Lim Park	1.28
HortPark (including Pasir Panjang Nursury)	24.04
Istana Park	1.29
Jurong Central Park	7.98
Jurong Lake Gardens	84.69
Kallang Riverside Park	5.16
Kent Ridge Park	48.40
Kranji Marshes Park	56.29
Kranji Reservoir Park	4.13

REGIONAL PARK NAME	MAINTAINED AREA (HA)
Labrador Nature Reserve and Park	23.26
Lower Peirce Reservoir Park	10.00
Lower Seletar Reservoir Park	6.98
MacRitchie Reservoir	15.00
Marsiling Park	11.35
Mount Faber Park	58.80
one-north Park	8.90
Orchard Fountain Corner	0.06
Pasir Panjang Park	1.07
Pasir Ris Park	73.39
Pasir Ris Town Park	12.06
Pearl's Hill City Park	8.50
Penang Rd Open Space	0.49
Pulau Ubin	1005.91
Punggol Park	16.86
Punggol Waterway Park	12.25
Raffles Place Park	0.88
Rail Corridor	75.37
Rifle Range Nature Park	65.70
Sembawang Hot Spring Park	1.12
Sembawang Park	15.58
Sengkang Riverside Park	20.98
Singapore Botanic Gardens	82.00
Sisters' Islands Marine Park	47.68
Springleaf Nature Park	18.28
Sun Plaza Park	9.60
Sungei Buloh Wetland Reserve	193.31
Tampines Eco-Green	36.61
Telok Ayer Green Park	0.11
Telok Ayer Park	0.49
Telok Blangah Hill Park	36.88
Tiong Bahru Park	3.33
Thomson Nature Park	51.17
Toa Payoh Town Park	4.91
Tras Link Park	0.47
Upper Peirce Reservoir Park	4.00
Upper Seletar Reservoir Park	15.00
War Memorial Park	1.74
Waterboat House Garden	0.07
West Coast Park	50.13
Windsor Nature Park	60.00
Woodlands Town Park East	5.04
Woodlands Waterfront Park	11.22
Yishun Park	13.22
Youth Olympic Park	0.66
Zhenghua Park	17.30
<b>TOTAL</b>	<b>3,711.10*</b>

\* Subject to rounding adjustments

NUMBER OF REGIONAL PARKS MANAGED BY NPARKS	
	84
NUMBER OF NEIGHBOURHOOD PARKS MANAGED BY NPARKS	
	320

TOTAL AREA MAINTAINED	AREA (HA)
Parks, playgrounds, open spaces, fitness corners and park connectors**	3235.62
Nature reserves (Gazetted)	3347
Istana and Parliament House Grounds	42
Roadside Greenery	2,102.35
State land taken over as at Mar 2023***	4,330.14

**TOTAL MILEAGE OF THE PARK CONNECTORS MAINTAINED IS 380KM**

## Plant Health

IMPORT, PERMITS AND INSPECTIONS	
Import permits issued	50,334
Post-entry inspections conducted	850

## Animal Health & Welfare

LICENCES, PERMITS, AND HEALTH CERTIFICATES ISSUED FOR ANIMAL IMPORTS	
Animals (excluding livestock)	5,534
Biologics	306
Birds	148
Eggs for research	0
Products (blood, sera, urine, clinical specimens)	1,388
Ornamental fish (export health certificates)	3,621
Ornamental fish (import permits)	5,522
<b>TOTAL</b>	<b>16,892</b>

LICENSING VETERINARIANS AND VETERINARY CENTRES	
Number of veterinarians	540
Number of veterinary centres	115

GRADING OF PET SHOPS	
Grade A	291
Grade B	9
Grade C	3
Grade D	0
Not graded****	63

DOG LICENSING AND ENFORCEMENT	
Dog licences issued	~88,000
New licences	~15,500
Renewed licences (includes multi-year licences)	~72,500

TYPES OF ANIMAL DISEASE SURVEYED IN LOCAL FARMS	
Captive bird farms surveyed	3
<ul style="list-style-type: none"> <li>Bird flu</li> <li>Newcastle disease</li> </ul>	
Ornamental fish farms surveyed	48
<ul style="list-style-type: none"> <li><i>Aeromonas salmonicida</i></li> <li>Chytrid fungus</li> <li>Epizootic haematopoietic necrosis virus</li> <li>Infectious haematopoietic necrosis virus</li> <li>Infectious spleen and kidney necrosis virus</li> <li>Koi herpes virus</li> <li>Megalocytivirus</li> <li>Spring viraemia carp virus</li> <li>Viral haemorrhagic septicaemia</li> <li>White spot disease</li> </ul>	

## ANIMAL DISEASES UNDER NPARKS BIOSURVEILLANCE PROGRAMMES

- Aeromonas salmonicida*
- African swine fever
- Anaplasmosis
- Antimicrobial resistance
- Avian influenza
- Babesiosis
- Bluetongue
- Bovine tuberculosis
- Brucellosis
- Campylobacteriosis
- Canine distemper
- Chytridiomycosis
- Classical swine fever
- Contagious bovine pleuropneumonia
- Coronaviruses
- Cryptococcosis
- Cryptosporidiosis
- Escherichia coli* O157:H7
- Ehrlichiosis
- Epizootic ulcerative syndrome
- Foot-and-mouth disease
- Heartworm
- Koi herpes virus
- Leishmaniosis
- Leptospirosis
- Lyme disease
- Newcastle disease
- Nipah virus disease
- Parvovirus
- Plasmodium knowlesi*
- Psittacosis
- Rabies
- Rickettsial disease
- Salmonella* Enteritidis
- Spring viraemia of carp virus
- Swine influenza
- Toxoplasmosis
- White spot disease

\*\* 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 FY2022

## Board Members

NParks is overseen by a Board comprising 11 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' 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 four 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**  
Ms Shantini Ramachandra

**Members**  
Mr Musa Fazal  
Mr Gerald Tan  
Ms Eu Chin Fen

### 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**  
Ms Tham Loke Kheng  
Mr Lee Chee Koo

### 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 Cheng Hsing Yao

**Members**  
Prof David Chan  
Ms Nur Hidayah Abu Bakar

### 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.

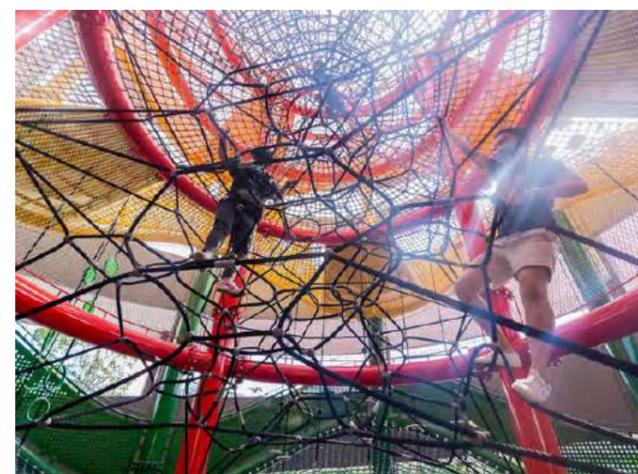
Please refer to pg 46 for the work of Garden City Fund in the year in review.

### 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).



Coastal PlayGrove, East Coast Park

### 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 2023 was Foo Kon Tan 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

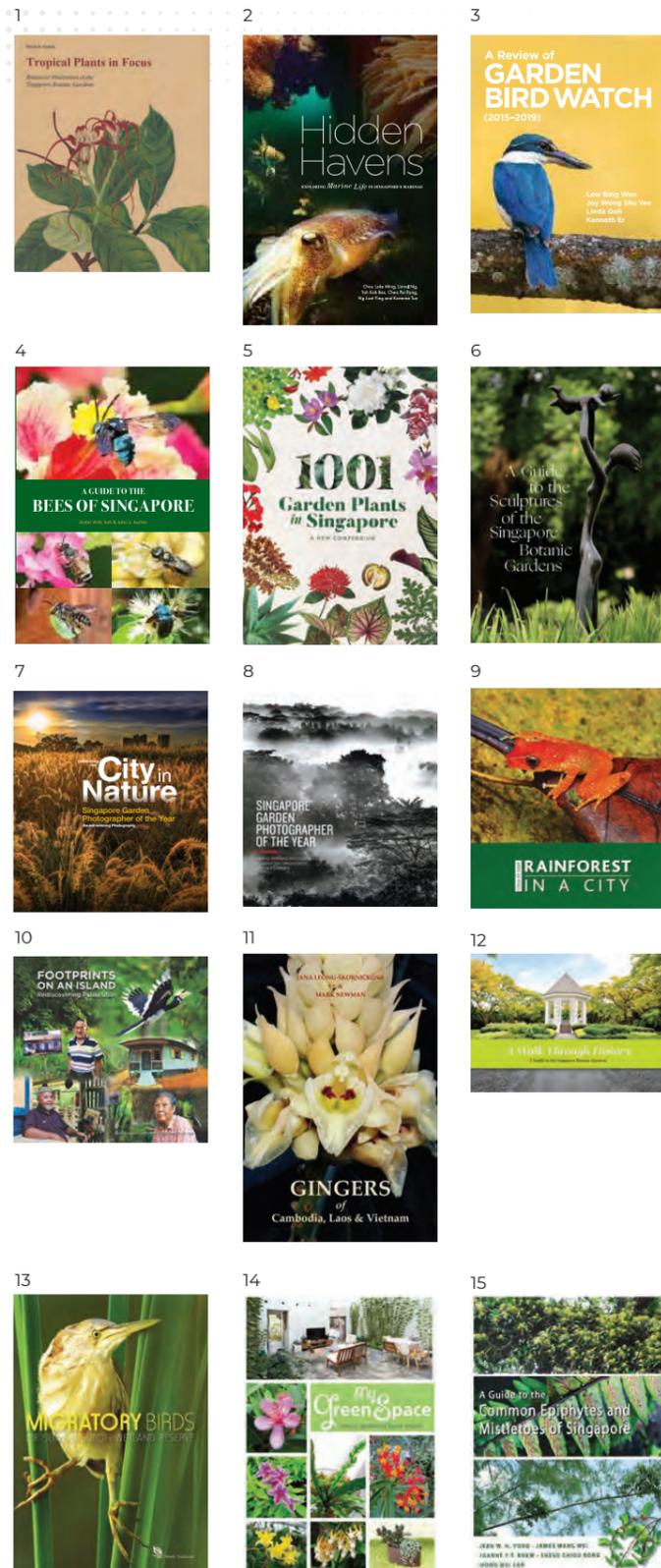
NParks' internal control system ensures that assets are safeguarded, proper accounting records are maintained, and financial information is reliable. The overall control framework includes:

- 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



SCAN QR CODE TO VIEW FULL LIST OF PUBLICATIONS



## BOOKS

- 1 Tropical Plants in Focus – Botanical Illustration at the Singapore Botanic Gardens**  
By Michele Rodda
- 2 Hidden Havens – Exploring Marine Life in Singapore's Marinas**  
By Chou Lok Ming, Lionel Ng, Toh Kok Ben, Cheo Pei Rong, Ng Juat Ying and Karenne Tun
- 3 A Review of Garden Bird Watch (2015–2019)**  
By Low Bing Wen, Joy Wong Shu Yee, Linda Goh and Kenneth Er
- 4 A Guide to the Bees of Singapore**  
By Zestin W.W. Soh and John S. Ascher  
Published in collaboration with NUS.
- 5 1001 Garden Plants in Singapore – A New Compendium**  
By Soh Weijing, Tamako Kobayashi, Dr Jennie Tang, Jessica Teo, Pauline Tay and Low Wei Teng
- 6 A Guide to the Sculptures of the Singapore Botanic Gardens**  
By Grace Lee, Ada Davis, Tan Miao Yuan and Tan Wan Xin
- 7 Celebrating Our City in Nature – Singapore Garden Photographer of the Year**  
Edited by Wong Tuan Wah, Linda Goh, Ada Davis and Victoria Cheong
- 8 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).
- 9 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.
- 10 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.
- 11 Gingers of Cambodia, Laos & Vietnam**  
By Jana Leong-Škorničková and Mark Newman
- 12 A Walk Through History – A Guide to the Singapore Botanic Gardens**  
By Nigel Taylor and Ada Davis
- 13 Migratory Birds of Sungei Buloh Wetland Reserve**  
By James Gan, Mendis Tan and David Li
- 14 My Green Space: Indoor Gardening**  
By Lily Chen, Ng Shan Jun, Ang Wee Foong, et al.
- 15 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



## Journals



- 16 Native Orchids of Singapore – Diversity, Identification and Conservation**  
By Yam Tim Wing
- 17 Dragonflies of Our Parks and Gardens**  
By Robin Ngiam
- 18 Trees of Our Garden City**  
Edited by Tee Swee Ping
- 19 Caterpillars of Singapore's Butterflies**  
By Horace Tan and Khew Sin Khoun
- 20 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
- 21 The Nature of Poetry**  
Edited by Edwin Thumboo and Eric Tinsay Valles
- 22 Flora of Singapore, Volume 1 (Introduction), Volume 7 (Poales), Volume 13 (Gentianales)**  
Edited by David Middleton, Stuart Lindsay and Jana Leong-Škorničková
- 23 Designing a City in Nature**  
By Jason Wright and Audrey Xu
- 24 Fort Canning Park: Heritage and Gardens**  
By Chng Mun Wye and Sara-Ann Ang
- 25 A Photographic Guide to Singapore Spiders**  
By Joseph KH Koh, David K Court, Chris SP Ang and Parul YC Ng
- 26 Design Guidelines for Contemplative Landscapes**  
By Agnieszka Olszewska-Guizzo, Alicia Soh, Dr Angelia Sia, Jason Wright and Jeff Seow
- 27 The Hunt for the Green Boomerang, 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.
- 28 A Present for Ginger, My Dog is Not from a Pet Shop, Journey to the Animal Classroom**  
By Jill Lim and illustrated by Patrick Yee

## JOURNALS

The Gardens' Bulletin, May 2022 (Supplement), Jun 2022 & Dec 2022

Timonius in Borneo, Jan 2023

## PERIODICALS

Gardenwise, Aug 2022 & Mar 2023

CITYGREEN, Issue 20

The CUGE publication CITYGREEN won APEX Awards for Publication Excellence for 11 consecutive years (2012–2022).

## Periodicals



## STAFF PUBLICATIONS

### Books and Reports

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**Lai, S., Tan, J.**, Deng, M., & Tan, C. (2022). *A Guide to Implementing Coastal Nature-based Solutions for Singapore*. CLC Publications.

Ngiam, T.T., Chua, T., **Lim, K.**, & Yew, T.K.B. (2022). *Vets at work: Tracing the progress of veterinarians in Singapore*. Singapore Veterinary Association.

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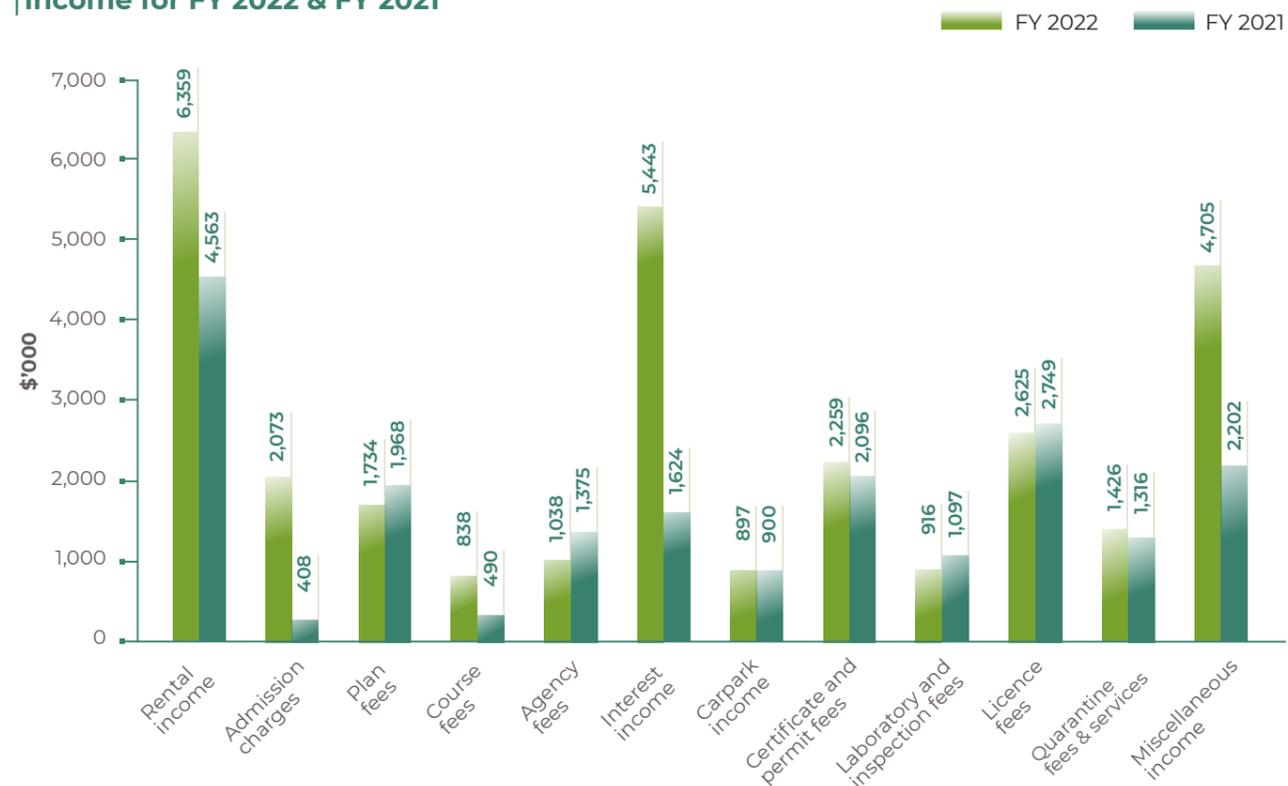
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# FINANCIAL REVIEW

## 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 \$30.3 million. The increase from last year's income was mainly due to increase in rental income, admission fees, interest income and other income.

Income for FY 2022 & FY 2021

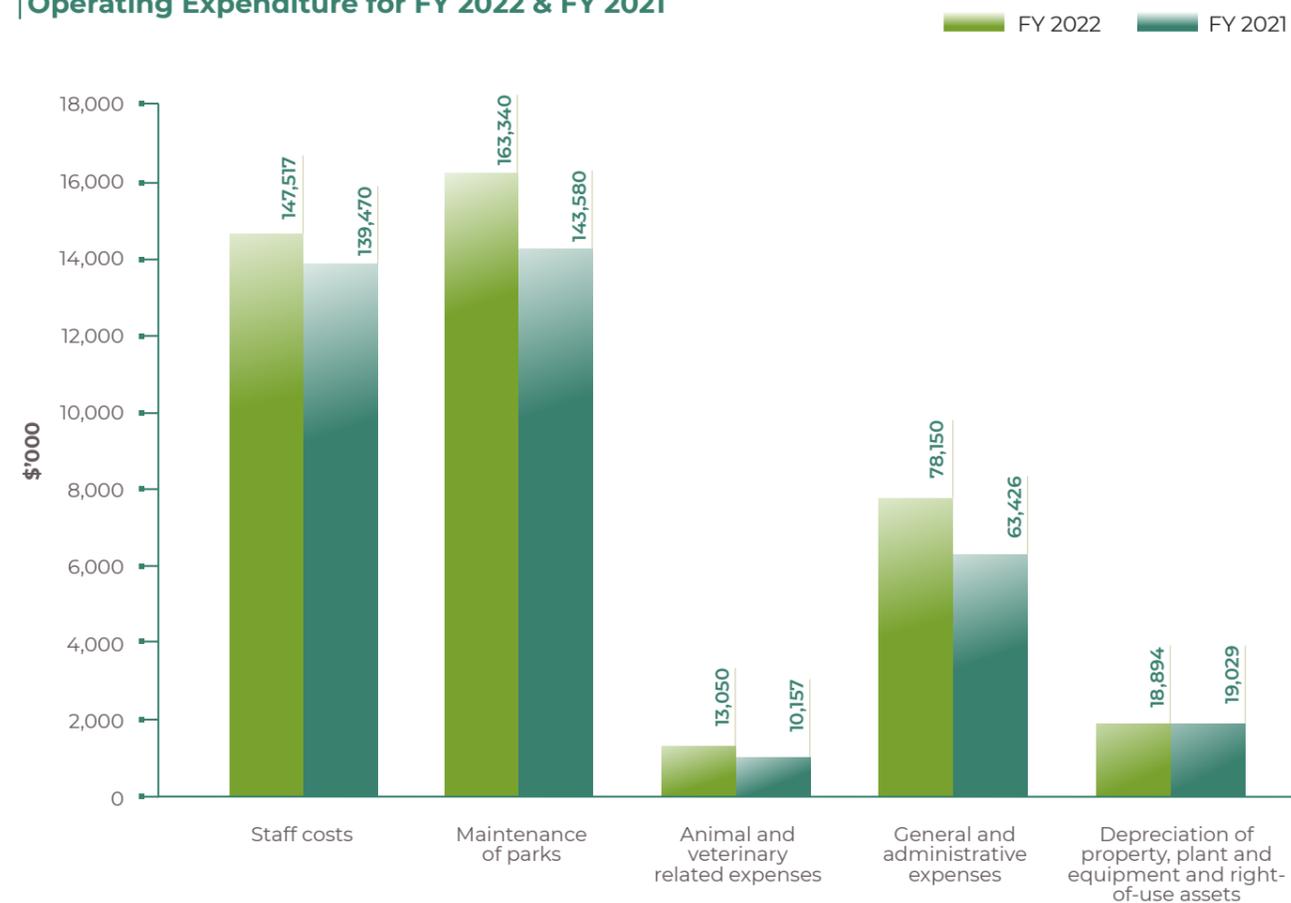


INCOME	FY 2022	FY 2021	INCREASE/(DECREASE)	
	\$ '000	\$ '000	\$ '000	% CHANGE
Rental income	6,359	4,563	1,796	39
Admission charges	2,073	408	1,665	> 100
Plan fees	1,734	1,968	(234)	(12)
Course fees	838	490	348	71
Agency fees	1,038	1,375	(337)	(25)
Interest income	5,443	1,624	3,819	235
Carpark income	897	900	(3)	< 1
Certificate and permit fees	2,259	2,096	163	8
Laboratory and inspection fees	916	1,097	(181)	(16)
Licence fees	2,625	2,749	(124)	(5)
Quarantine fees and services	1,426	1,316	110	8
Miscellaneous income	4,705	2,202	2,503	114
<b>Total</b>	<b>30,313</b>	<b>20,788</b>	<b>9,525</b>	<b>46</b>

## Operating Expenditure

The Group's operating expenditure for the year was \$420.9 million. The 12% increase from last year's expenditure was due to the increase in staff costs, maintenance of parks, animal and veterinary related expenses and general and administrative expenses.

Operating Expenditure for FY 2022 & FY 2021

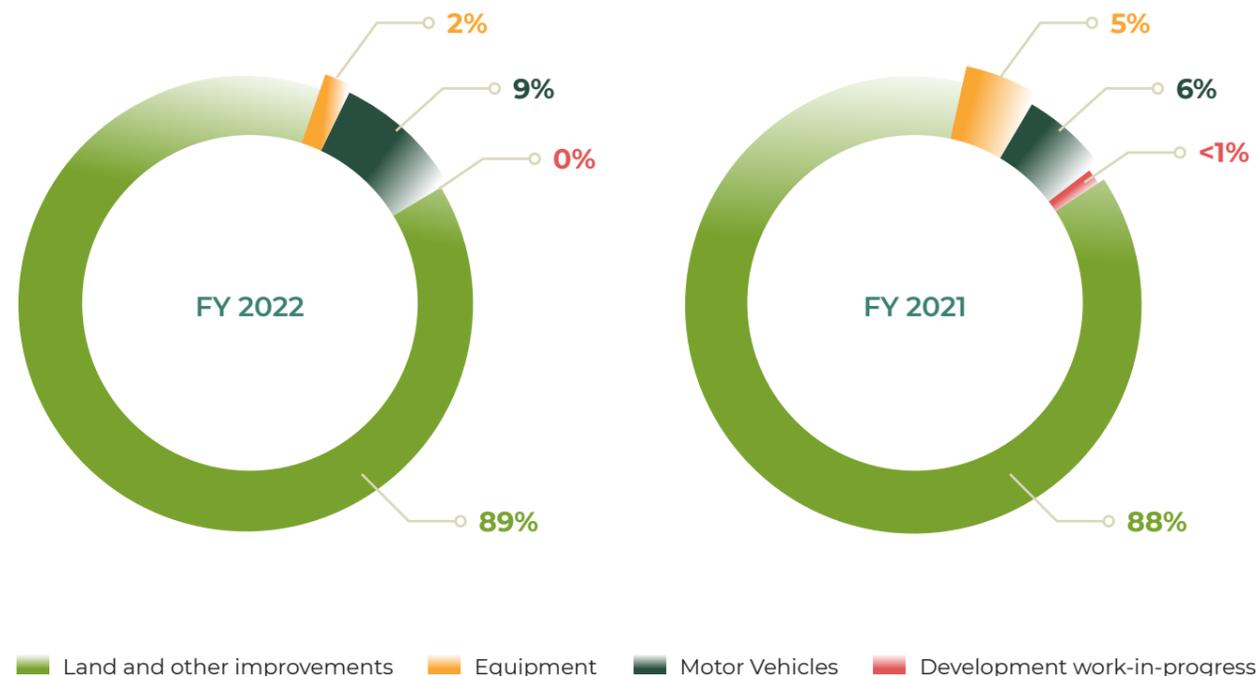


OPERATING EXPENDITURE	FY 2022	FY 2021	INCREASE/(DECREASE)	
	\$ '000	\$ '000	\$ '000	% CHANGE
Staff costs	147,517	139,470	8,047	6
Maintenance of parks	163,340	143,580	19,760	14
Animal and veterinary related expenses	13,050	10,157	2,893	28
General and administrative expenses	78,150	63,426	14,724	23
Depreciation of property, plant and equipment and right-of-use assets	18,894	19,029	(135)	(1)
<b>Total</b>	<b>420,951</b>	<b>375,662</b>	<b>45,289</b>	<b>12</b>

## Capital Expenditure

The Group's capital expenditure for the year was \$14.3 million. The decrease in capital expenditure was mainly due to the completion of most of construction works at Native Plant Nursery and Animal Quarantine Centre in FY2021.

### Capital Expenditure for FY 2022 & FY 2021



	FY 2022	FY 2021	INCREASE/(DECREASE)	
	\$ '000	\$ '000	\$ '000	% CHANGE
<b>CAPITAL EXPENDITURE</b>				
Land and other improvements	246	1,227	(981)	(80)
Equipment	1,309	1,255	54	4
Motor Vehicles	-	117	(117)	(100)
Development work-in-progress	12,731	19,867	(7,136)	(36)
	<b>14,286</b>	<b>22,466</b>	<b>(8,180)</b>	<b>(36)</b>

## Financial Position

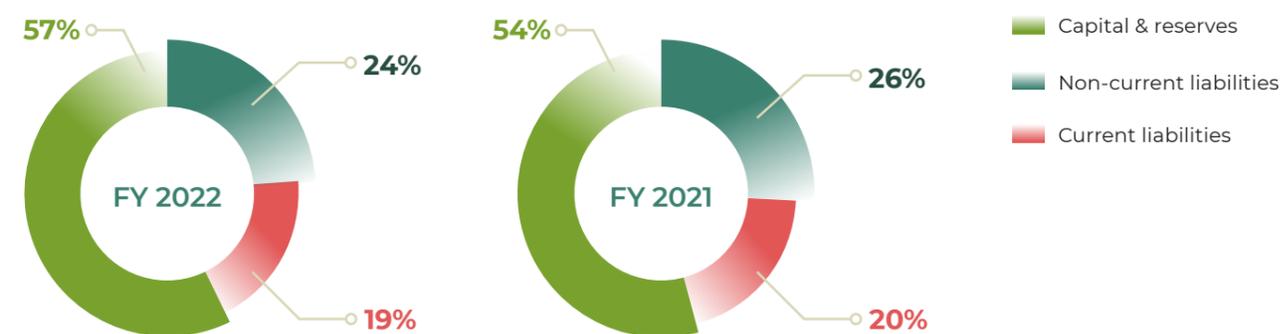
As at 31 March 2023, the Group's total assets stood at \$629.4 million, an increase of 5% over last year. Non-current assets and current assets represent 33% and 67% of total assets respectively. Non-current assets consisted mainly of leasehold land and buildings and structures at Singapore Botanic Gardens and Fort Canning Park as well as the structures at Animal & Plant Health Centre, Animal Quarantine Centre and Animal Management Centre. Capital and reserve stood at \$362.1 million, while non-current liabilities and current liabilities stood at \$149.7 million and \$117.6 million respectively.

### Total Assets



	FY 2022	FY 2021	INCREASE/(DECREASE)	
	\$ '000	\$ '000	\$ '000	% CHANGE
<b>ASSETS</b>				
Non-current assets	209,211	214,216	(5,005)	(2)
Current assets	420,173	385,246	34,927	9
	<b>629,384</b>	<b>599,462</b>	<b>29,922</b>	<b>5</b>

### Total Liabilities & Equity



	FY 2022	FY 2021	INCREASE/(DECREASE)	
	\$ '000	\$ '000	\$ '000	% CHANGE
<b>EQUITY &amp; LIABILITIES</b>				
Capital & reserves	362,074	323,719	38,355	12
Non-current liabilities	149,687	158,025	(8,338)	(5)
Current liabilities	117,623	117,717	(94)	< 1
	<b>629,384</b>	<b>599,461</b>	<b>29,923</b>	<b>5</b>

## 26. Financial instruments

### Fair values

The carrying amounts of the financial assets and liabilities with a maturity of less than one year are assumed to approximate their fair values.

However, the Group does not anticipate that the carrying amounts recorded at end of the reporting period would be significantly different from the values that would eventually be received or settled.

### Accounting classification of financial assets and financial liabilities

The carrying amounts of financial assets and financial liabilities at the reporting date by categories are as follows:

	Group		NParks	
	2022/2023	2021/2022	2022/2023	2021/2022
	\$	\$	\$	\$
<b>Financial assets at amortised cost</b>				
Lease receivables (Note 5(b))	8,199,805	7,678,043	8,199,805	7,678,043
Trade receivables (Note 6)	6,465,254	5,533,460	6,465,254	5,533,460
Other receivables (Note 7)	16,111,701	9,557,822	16,111,203	9,566,709
Cash and cash equivalents (Note 8)	394,811,854	368,237,278	394,417,291	367,882,350
	425,588,614	391,006,603	425,193,553	390,660,562
<b>Financial liabilities at amortised cost</b>				
Lease liabilities (Note 5(c))	12,823,172	16,414,644	12,823,172	16,414,644
Trade and other payables (Note 15)	76,359,091	76,485,878	76,353,308	76,477,392
	89,182,263	92,900,522	89,176,480	92,892,036

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

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

## 27. Capital management

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

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

## 28. Dividend

In the previous financial year ended 31 March 2022, NParks paid dividend of \$832,000 on the ordinary shares issued to the Minister for Finance in respect of the financial year ended 31 March 2021.

# We thank staff and partners of NParks who kindly contributed photos to this annual report

### Koh Soon Kiong

Page 14: Photo of *Cratogeomys merriami*

### Jacqueline Chua

Page 17: Photo of community garden in Bishan

### Ang Mo Kio Town Council

Page 18: Photo of Prime Minister Lee Hsien Loong planting a tree

### Francis Yap

Page 29: Photos of Ruby-cheeked Sunbird (*Chalcoparia singalensis*) and Lesser Green Leafbird (*Chloropsis cyanopogon*)

Page 31: Photo of Short-tailed Babbler (*Pellorneum malaccensis*)

### Choo Le Min

Page 31: Photo of *Sindora velutina*

### Dr Karenne Tun

Page 34: Photo of Hawksbill Turtle (*Eretmochelys imbricata*)

### Ang Wee Foong

Page 40: Photo of *Shorea bracteolata*

### Paul Leong

Page 40: Photo of Sea Apple (*Syzygium grande*)

### Nature Landscapes

Page 42: Photo of rooftop garden at Ang Mo Kio Court

### Energy Market Company

Page 49: Photo of Energy Market Company planting trees under the PAT programme

### LJCP Photography

Page 51: Photo of NParks Concert Series in the Park: Rockestra

### Front Cover

NParks is introducing a new model of greenery management for parks and streetscapes, starting at Bishan-Ang Mo Kio Park and its surrounding district. This model will use a suite of digital tools and sensors made possible by NParks' research and development efforts as well as partnerships with the industry.

### Introduction

Located in the Tyersall-Gallop Core of the Singapore Botanic Gardens, the Learning Forest is an extensive restoration of the lowland forest and wetland habitats that used to surround the Gardens. It serves as an important reference for ongoing research work of restoration ecology around the region.

### Chapter Dividers

#### Pg 10 – Transforming into a City in Nature

Visit the enhanced Spice Garden in Fort Canning Park to discover over 180 varieties of plants, including Gambier and Pepper, which were among the earliest commercial crops in Singapore.

#### Page 24 – Conservation in Transformation

Rifle Range Nature Park, the eighth of its kind in the Central Nature Park Network, serves as a green buffer to protect Bukit Timah Nature Reserve from edge effects and abutting developments.

#### Page 36 – Empowering Transformation

The dedicated effort to highlight and conserve existing trees in Thomson Nature Park was a key highlight that resulted in it receiving a platinum certification under the Landscape Excellence Assessment Framework.



**NATIONAL PARKS BOARD**

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