



MANDAI WILDLIFE GROUP

# YEARBOOK

2022 – 2023



## About Mandai Wildlife Group

Mandai Wildlife Group is dedicated to caring for the planet and protecting animals and nature. Conservation education is intrinsic to all interactions with the Group, to inspire action for a healthier world.

Mandai Wildlife Group is the steward of Mandai Wildlife Reserve, a unique wildlife and nature destination in Singapore that is home to world-renowned wildlife parks which connect guests to the fascinating world of wildlife. The Group is driving an exciting rejuvenation plan at Mandai Wildlife Reserve, adjacent to Singapore's Central Catchment Nature Reserve, that will integrate five wildlife parks with distinctive nature-themed experiences, green public spaces and an eco-friendly resort.

The wildlife parks managed by the Group are accredited by two of the top international regional zoo associations, European Association of Zoos and Aquariums (EAZA), and Zoo and Aquarium Association of Australasia (ZAA), and the Group is an active member of the Southeast Asian Zoos and Aquariums Association (SEAZA) and the World Association of Zoos and Aquariums (WAZA).

Mandai Wildlife Group is committed to the vision of sustainable populations of wildlife and human communities thriving in functioning ecosystems. The Group will contribute by connecting people with wildlife, championing sustainable living, as well as participating in and supporting conservation efforts to safeguard wildlife and their habitats. The actions and contributions of the Mandai family of entities and brands are also aligned to the UN Sustainable Development Goals, in their focus to nurture a healthier world. The Group will work with our partners and like-minded collaborators to make a positive impact.

The Group provides funding and in-kind support to Mandai Nature for conservation work across Southeast Asia.

Mandai Global, an entity that is part of the Group, will establish and operate new lines of business anchored in creating positive outcomes for nature and wildlife.

**Mandai**  
WILDLIFE GROUP

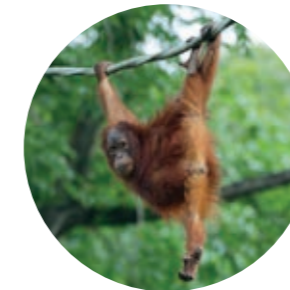
## Purpose

A World Where People and Wildlife Thrive Together.

## Vision

We create meaningful connections and experiences that inspire people to protect nature and wildlife.

## Values



### Excellence

We strive for the highest standards in all we do.



### Integrity

We are honest and fair in all our dealings.



### Teamwork

We achieve more together.



### Care for Wildlife

We protect wildlife and provide excellent care for our animals.



### Hospitality

We serve from the heart.




### Sustainability

We embrace sustainable best practices.



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# Message

## from Chairman & Group Chief Executive Officer



S Dhanabalan  
CHAIRMAN  
MANDAI WILDLIFE GROUP



Mike Barclay  
GROUP CEO  
MANDAI WILDLIFE GROUP

The past year was extraordinary and transformative for Mandai Wildlife Group. On 3<sup>rd</sup> January 2023 we closed our oldest and much-loved zoological park, Jurong Bird Park, and began preparations for the move to Bird Paradise in Mandai. In over five decades of operations, Jurong Bird Park created wonderful memories for some 41 million guests. This national icon will always occupy a special place in the heart for generations of Singaporeans and guests from from overseas. We invited the wider community to celebrate the park's rich heritage and legacy with us through our 'A Flight to Remember' campaign, and we were deeply touched by the overwhelming response.

Following the closure of Jurong Bird Park, we embarked on the mammoth task of safely translocating more than 3,500 birds to Mandai, while ensuring the highest animal welfare standards and observing strict disease surveillance protocols. The translocation epitomised the professionalism and team spirit of our staff and volunteers who worked tirelessly to plan and coordinate this highly complex 'bird migration', while taking steps to mitigate the associated risks every step of the way. Over at Bird Paradise, we have set our sights on achieving even higher welfare standards for the birds under our care, having a greater impact on avian conservation and

research, and offering meaningful experiences to inspire guests to protect nature and wildlife.

Our staunch commitment to a healthy, biodiverse planet is crystallised in our new purpose statement – **A World Where People and Wildlife Thrive Together.** We continue to grow the role we play in species conservation, linking up our research, animal rescue and breeding programmes at Mandai Wildlife Reserve with our direct support for field conservation work through Mandai Nature, our conservation arm. Mandai Nature has made good progress in building up alliances with like-minded organisations, while scaling up its support for conservation projects that are focused on averting extinction, restoring ecosystems, driving nature-based climate solutions and supporting local communities throughout Southeast Asia.

A healthy planet is crucial for people and wildlife to thrive together. In recent years we have witnessed a devastating biodiversity loss, which has been further exacerbated by the extreme weather events associated with global warming. Guided by our purpose, we strive to safeguard the environment and work towards a sustainable future. To this end, we strengthened our sustainability strategy and

have committed to the Science Based Targets Initiative's Net Zero standard as a basis for setting our emissions reduction targets. We will continue to seek out innovative ways to operate more sustainably to achieve our goal to be carbon neutral with effect from 2024.

As we believe that the vision of a healthier planet can only be realised through society's collective commitment, we have redoubled our advocacy for protecting wildlife and living sustainably through innovative programming, campaigns, outreach activities and a variety of communication channels. Working closely with preschool anchor operators, the Ministry of Education and Institutes of Higher Learning, we co-create curricula, work attachments and other learning opportunities to reach more students. Our aim is to nurture a new generation of eco-stewards committed to a biodiverse world and a sustainable future.

We are on a deliberate path to transform Mandai Wildlife Reserve and unlock its potential as an integrated nature and wildlife destination. To achieve this potential, we seek to nurture a strong, innovative culture to further elevate animal welfare standards, deliver exceptional guest experiences and uplift

our collective productivity. To help accelerate this process, we launched the Mandai Co-Innovation Programme on IMDA's Open Innovation Platform (OIP) to tap into Singapore's vibrant technology ecosystem for innovative solutions.

As our core business rode the recovery from the worst days of the Covid pandemic, we took conscious steps to further enhance our in-park guest engagement, rebuild ties with business partners and explore new customer segments and lines of business. While we were pleased to be rewarded with an annualised guest satisfaction score of 86%, we recognise the need to be relentless in seeking to delight our guests. As we look forward to the opening of the other features within the Mandai precinct, we will continue to engage and upskill our staff to support our transformation and growth.

Our team at Mandai depends on many stakeholders to achieve our goals. As such, we would like to thank our board, committee and advisory panel members for their guidance, and our partners, members, adopters, donors and volunteers for their unwavering support. Last but not least, we would like to express our appreciation to our staff for their extraordinary dedication and commitment.



# The Triple Bottom Line, Strategic Thrusts & Sustainable Development Goals (SDGs)



3Ps	STRATEGIC THRUSTS	SDGs
PLANET	Provide World-class Care For Our Living Collection	
	Be A Regional Leader In Environmental Sustainability & Conservation	
PEOPLE	Apply Leading Organisation & HR Practices	
	Forge A Strong National Love & Pride For Our Parks	
PERFORMANCE	Create Exceptional Guest Experiences	
	Ensure Long-term Commercial Viability	

## Our Commitment To Key Sustainable Development Goals (SDGs)



### QUALITY EDUCATION

Our parks are living classrooms that strengthen early childhood and multi-disciplinary learning, including the mother tongue languages, as well as 21st century competencies through volunteerism, work attachment and career guidance. Through our educational offerings, we empower guests, including those with special needs and from disadvantaged backgrounds, with the chance to learn about wildlife and connect with nature. Robust training for our staff facilitates lifelong learning and acquisition of specialist skills.



### CLIMATE ACTION

Our operation is guided by sustainable best practices in every possible way to reduce direct or indirect carbon emissions to mitigate climate change and to support our goal to be carbon neutral by 2024.



### LIFE BELOW WATER

Through River Wonders, we highlight the fragility of river ecosystems to our guests, and encourage them to take action to protect freshwater life forms, which are disappearing faster than those on land or in the sea. We support local and regional conservation projects to protect biodiversity in aquatic ecosystems. We repatriated the critically endangered Roti snake-necked turtles to Rote Island, their native range for reintroduction. We spread the message on plastic pollution and advocate for reduced usage or avoidance of single-use plastics.



### AFFORDABLE AND CLEAN ENERGY

We monitor energy consumption in our parks through a comprehensive energy metering network. We are converting to energy-saving electrical devices and solar panels. Our entire tram fleet runs on electricity. The principle of reducing energy consumption guides all development work in Mandai.



### LIFE ON LAND

We provide world-class care for our animals, many of whom serve as ambassadors to connect people with the natural world. Through conservation messaging with a strong call to action, we encourage people to do their part for wildlife. We work with other zoos through Managed Species Programmes to help save threatened species. We contribute to these global programmes as species coordinators for 14 threatened species. Through our conservation arm Mandai Nature, we support local and regional conservation work to reverse species loss, protect ecosystems, and engage local communities. We adopt IUCN's One Plan Approach to synergise our in-park conservation efforts with field work for species conservation in their native habitat.



### SUSTAINABLE CITIES AND COMMUNITIES

We galvanise the community to refuse single-use plastic and to choose sustainably sourced products. We have eliminated guest-facing single-use fossil-based plastics in our F&B outlets. We serve wildlife-friendly coffee and sustainable seafood at our F&B outlets and offer sustainable merchandise at retail outlets to advocate for sustainable living.



### RESPONSIBLE CONSUMPTION AND PRODUCTION

Our green procurement road map, with its clear targets, guides us to work with suppliers to procure sustainable goods and services. We diversify and source for more sustainable alternatives for our animal feed, supporting local produce where possible, to reduce our carbon footprint. Other than reducing energy and water consumption, we are working towards achieving zero waste through circularity.



### PARTNERSHIP FOR THE GOALS

We forge strong partnerships, locally and globally, with wildlife institutions, conservationists, NGOs, governmental agencies, businesses, sponsors, donors, schools, volunteers and various communities to achieve our goals.

# Board of Directors

MANDAI WILDLIFE GROUP

## CHAIRMAN

### Mr Suppiah DHANABALAN

Mr S Dhanabalan is a Member of Presidential Council for Minority Rights; Chairman of Temasek Trust Ltd and Chairman of Mandai Park Holdings Pte Ltd.

## DIRECTORS

### Mr Mike BARCLAY

Mr Barclay holds the position of the Group CEO of Mandai Park Holdings. He also serves as Chairman of Mandai Global, a wholly-owned subsidiary of Mandai Park Holdings and on the board of Mandai Nature, the conservation arm of the Mandai Wildlife Group. Mr Barclay acts as an Advisor to the Board of the Changi Airport Group.

### Ms CHONG Siak Ching

Ms Chong Siak Ching is the Chief Executive Officer of National Gallery Singapore and Head of the Visual Arts Cluster (VAC) Singapore comprising the Singapore Art Museum, Singapore Tyler Print Institute and the National Gallery Singapore. She is the Chair of Yong Siew Toh Conservatory of Music in NUS, a member of the Yale-NUS Governing Board, a member of the University of the Arts Singapore Ltd Board of Trustees and Singapore's Non-Resident Ambassador to the Republic of Chile.

### Mr KEE Teck Koon

He is the Chairman of NTUC Fairprice Co-operative Limited and Deputy Chairman of NTUC Enterprise Co-operative Limited, the holding company of Fairprice Group, NTUC First Campus, NTUC Health, Income Insurance Limited, NTUC LearningHub, Mercatus and MoneyOwl.

He also holds directorships in CapitalLand Investment Limited, Tangram Asia Capital LLP and Changi Airport Group. Ltd. He is a Board Advisor of Income Insurance Limited and a member of the Angsana Fund Investment Committee of the Singapore Labour Foundation.

Mr Kee was awarded the Public Service Star (BBM) by the Singapore Government and Meritorious Service Award by the National Trades Union Congress in 2021.

Mr Kee holds a Master of Arts in Engineering Science from Oxford University, UK

### Mr SIM Hwee Cher

Mr Sim is a Member of Duke-NUS Medical School Centre for Ageing, Research and Education (CARE) Advisory Board, Council Member of the National Youth Achievement Award Association, and Director of The Esplanade Co Ltd, UOL Group Ltd and Asia Capital Reinsurance Group Ltd.

### Mr NG Lang

Mr Ng Lang is CEO of the Land Transport Authority. Prior to this, he has served as CEO of the Jurong Town Corporation, the Urban Redevelopment Authority and the National Parks Board. He currently serves as a member of the Advisory Board for SMU Real Estate Programme.

### Professor Emeritus Leo TAN

Professor Tan chairs the National Park Board's Garden City Fund, is a Board member of Temasek Foundation and Temasek Foundation IPC, Governor of Asia-Europe Foundation (ASEF), Fellow of the Singapore National Academy of Science and Governing Member of the Singapore Environmental Council.

### Mr Stephen FORSHAW

Mr Forshaw is the Chief Representative for Airbus in Australia, New Zealand and the Pacific. He is also a Board Director of Perfection Fresh Pty Ltd, an Australian producer of fresh fruit and vegetables; the European Australian Business Council and of Airbus Australia Pacific Limited. He is a Graduate of Australia's University of New England with a Master's Degree in Business Administration. He has previously served in corporate affairs leadership roles with Singapore Airlines, Microsoft and Temasek.

### Mr Adrian CHUA

Mr Adrian Chua is Deputy Secretary (Industry) and Chief Sustainability Officer at the Ministry of Trade and Industry. In this role, he oversees industry and enterprise development, economic research and forecasting, and energy policy. Prior to this, he served as Deputy Secretary at the Ministry of Defence, on the Executive Board of the International Monetary Fund, and in senior roles in bank regulation and strategic planning at the Monetary Authority of Singapore. Mr Chua is currently Chairman of the Audit Committee and board member of DSO National Laboratories, and a board member of Sentosa Development Corporation and JTC Corporation. He graduated with a Master in Public Policy from the Harvard Kennedy School.

### Ms Claire CHIANG

Ms Claire Chiang is the co-founder of Banyan Tree Hotels & Resorts, Chair of China Business Development, and Global Head of Learning and Talent Development at Banyan Tree Management Academy. She Chairs Banyan Tree Global Foundation, and its Enterprise Environmental and Community Fund in partnership with the Chinese Environmental Protection Foundation. She is a member of the School of Hotel and Tourism Management of Hong Kong Polytechnic University. She chairs the Singapore Book Council and Shirin Fozdar Program at Singapore Management University.

In 2021, she was appointed the Advisory Board Member of the Conference Board Global Sustainability Centre, Europe and the Climate Governance Singapore Advisory Board.

### Er Dr LEE Bee Wah

Er Dr Lee is a Lead Independent Director of public listed Koh Brothers Group Limited and Independent Director of other public listed companies, the Amcorp Global Limited, Heeton Holdings Limited and HLH Group Limited. Er Dr Lee is also a Board Member of the Building and Construction Authority, a statutory board under the Ministry of National Development and also chairs the Nanyang Technological University School of Civil & Environmental Engineering Advisory Committee.

### Ms PEK Siok Lan

Ms Pek Siok Lan is General Counsel of Temasek International Pte Ltd, responsible for overseeing its legal, regulatory and compliance affairs. She also serves on the Investment Committee of ABC World Pte Ltd, a firm dedicated to impact investing.

### Mr Dilhan Pillay SANDRASEGARA

Mr Dilhan Pillay joined Temasek in September 2010. He was appointed Executive Director and CEO of Temasek Holdings on 1 October 2021 and is concurrently the CEO of Temasek International, a position he has held since April 2019.

Dilhan has held various leadership roles in Temasek, including Head of the Investment, the Portfolio Management and the Enterprise Development Groups. He has also led the Temasek market teams in Singapore and the Americas.

Dilhan serves on the boards of the National Research Foundation in Singapore, Enterprise Singapore, the Peterson Institute for International Economics and FCLTGLOBAL. He is also a member of the Financial Centre Advisory Panel of the Monetary Authority of Singapore, the Advisory Board of the Tsinghua University School of Economics and Management, the Singapore Judicial Service Commission, the Singapore Research, Innovation and Enterprise Council and the Integrity Council for the Voluntary Carbon Market.

He graduated from the National University of Singapore with a Bachelor of Laws and obtained a Master of Law from the University of Cambridge.

# Animal Welfare & Ethics Committee

CHAIRMAN:

**Professor Leo TAN**

SECRETARY:

**Dr CHENG Wen-Haur**

MEMBERS:

**Dr Adrian LOO**

**Prof Joseph CHUN**

**Dr Leslie RETNAM**

**Mr Mike BARCLAY**

**Mr Vinayagan DHARMARAJAH**

**Dr YAP Him Hoo**

# Education Advisory Panel

CHAIRMAN:

**Dr TAY Kim Seng**

MEMBERS:

**Mr Eric YUM**

**Mrs June THAM-TOH Syn Yuen**

**Ms LIM Siew Gek**

**Dr Shaireen SELAMAT**

# Environmental Advisory Panel

CHAIRMAN:

**Professor Peter NG**

DEPUTY CHAIRMAN:

**Er LIM Peng Hong**

MEMBERS:

**Professor Brenda YEOH**

**Professor Erwin VIRAY**

**Professor NG Soon Chye**

**Dr Shawn LUM**

## Corporate Functions

Corporate Services	Life Sciences & Operations	Transformation & Growth	Development
Brand & Communications	Animal Care	Asset Development	Attractions Development
•	•	•	•
Finance	Animal Behaviour & Programmes	Digital & Data	Cost, Contracts & Procurement
•	•	•	•
Human Resources	Veterinary Healthcare	Food & Beverage	Project Management (East Zone)
•	•	•	•
Information Technology	Education	Park & Attractions Marketing	Project Management (West Zone)
•	•	•	•
Internal Audit	Exhibit Design	Partnership Development	Strategic Planning
•	•	•	•
Legal	Facilities Management	Retail	
•	•	•	
Procurement	Horticulture	Sales & Experience Development	
	•	•	
	Park Operations	Emerging Products (B2B)	
	•	•	
	Sustainable Solutions	Emerging Products (Consumer)	
	•	•	
	Technical Services	Emerging Products (Creative & Content)	
	•	•	
	Safety & Security	Transformation Office	
		•	
		Guest Experience Management	
		•	
		Group Strategy & Development	
		•	
		Indoor Attraction	

Mandai Wildlife Group has a conservation arm in **Mandai Nature** and a growth accelerator and venture building arm in **Mandai Global**.

**Mandai**  
NATURE

**Mandai**  
GLOBAL

## Management

Mr Mike BARCLAY • Group Chief Executive Officer

### CORPORATE SERVICES

Mr Marcus HENG • Group Chief Human Resources Officer  
Ms Shirley LIM • Group Chief Financial Officer

Ms Sandra TSAO • General Counsel

Ms Suzanne HO • Senior Vice President, Brand & Communications  
Ms Liza CHANG • Vice President, People & Organisation Development  
Ms Karen TAN • Vice President, Internal Audit  
Mr Steven WONG • Vice President, Finance  
Ms LOW Min Hwee • Vice President, Finance  
Mr Thomas CHUA • Vice President, Information Technology  
Ms Kelly CHEW • Vice President, Procurement

### LIFE SCIENCES & OPERATIONS

Dr CHENG Wen-Haur • Deputy Chief Executive Officer (Life Sciences & Operations) & Chief Life Sciences Officer

Dr Sonja LUZ • Chief Executive Officer (Mandai Nature)

Mr Melvin TAN • Chief Estate & Property Officer  
Ms Sherri LIM • Chief Park Operations Officer

Dr Luis NEVES • Vice President, Animal Care  
Ms Gail LAULE • Vice President, Animal Behaviour & Programmes  
Dr XIE Shangzhe • Vice President, Veterinary Healthcare  
Ms May LOK • Vice President, Education  
Mr CHAM Tud Yinn • Vice President, Exhibit Design  
Mr Kumar PILLAI • Vice President, Special Projects  
Ms Rohaya SAHAROM • Vice President, Sustainability Solutions  
Mr George KYAW • Vice President, Horticulture  
Mr Donald TAN • Vice President, Facilities Management  
Mr Andrew CHAI • Vice President, Technical Services  
Ms Daisy LING • Vice President, Park Operations  
Mr Elisha TEO • Vice President, Safety & Security

### TRANSFORMATION & GROWTH

Ms Belina LEE • Deputy Chief Executive Officer (Transformation & Growth) & Chief Executive Officer (Mandai Global)

Ms Jean CHOI • Chief Sales & Marketing Officer

Ms Isabel CHENG • Senior Vice President, Partnership Development  
Ms Monet ALUQUIN • Vice President, Asset Development  
Mr Damon WEE • Vice President, Digital & Data  
Mr Steven TAN • Vice President, Food & Beverage  
Ms Daisy TAN • Vice President, Retail  
Mr Terrence TANG • Vice President, Emerging Products (B2B)  
Mr Anthony CHAN • Vice President, Emerging Products (Consumer)  
Mr Chris CHIU • Vice President, Emerging Products (Creative & Content)  
Mr Edmas NEO • Vice President, Transformation Office  
Ms Sandy LEE • Vice President, Park & Attractions Marketing  
Mr WONG Yu Hsiang • Head, New Business (Mandai Global)  
Ms SEAH Seow Ling • Head, Finance (Mandai Global)

### DEVELOPMENT

Mr LEONG Yue Kheong • Deputy Chief Executive Officer (Development)

Mr SIA Wee Long • Project Director (West Zone)  
Mr David GOH • Project Director (East Zone)

Mr Marc CREMADES • Vice President, Attractions Development  
Mr Colin CHEW • Vice President, Cost, Contracts & Procurement  
Mr Ivan WONG • Vice President, Strategic Planning

# Adopters & Sponsors

## Singapore Zoo

96 Capital Management Pte Ltd	Giant Tortoise, Belle
Advario Asia Pacific Pte Ltd	Giant Tortoise, Claude
Agrocorp International Pte Ltd	Pygmy Hippopotamus, Divo
Akribis Systems Pte Ltd	Chimpanzee, Nini
Capitaland Limited	Rainforest Fights Back Show
Chew's Agriculture Pte Ltd	Fancy Poultry Exhibit
Haw Par Corporation Ltd	Leopard Exhibit
Haw Par Healthcare Limited	Malayan Tiger Cubs, Arhaa and Sali
Henkel Singapore Pte Ltd	Chimpanzee, Gangga
Henkel Singapore Pte Ltd	Anoa Exhibit
HiArt Pte Ltd	Orangutan, Putra
Hong Leong Foundation	Fragile Forest Exhibit
Hotel Properties Limited	Orangutan, Adi
Humphrey Oei Foundation	Asian Elephant, Intan
Jason's Pet Relocation (Singapore)	Giant Tortoise, Astove
Kuok (Singapore) Limited	Giraffes, Adhil and Balaji
Lee Foundation Singapore	Garden With A View
MCC Singapore	Asian Elephant, Komali
Mdm Kay Kuok	Asian Elephant, Aprila
Mitsui & Co. (Asia Pacific) Pte Ltd	Elephant Presentation
Mr and Mrs Kenneth Goh Hoon Chuan	Dogs from Animal Friends Show
Mr Chew Shou Zi and Ms Vivian Kao	White Tiger, Pasha
Mrs Christina Ong	Orangutans, Binte & Saloma
Ms Carrie Wan Burke	Giant Tortoise, Kasey
Ms Goh Choi Fong	King Cobra Exhibit
Nikko Asset Management Asia Limited	Pygmy Hippopotamus, Miata
Nomanbhoy and Sons Pte Ltd	White Tiger, Keysa
Petrochina International (Singapore) Pte Ltd	Lion Exhibit
Saksoft Pte Limited	Chimpanzee, Bianca
Schroder Investment Management (Singapore) Ltd	Orangutans, Natu & Joko
SESAMi (Singapore) Pte Ltd	Naked Mole-Rat Exhibit
Starbucks Coffee Singapore Pte Ltd	Komodo Dragon Exhibit
Swee Heng Bakery Pte Ltd	Asian Elephant, Gambir
TAG Industrial Pte Ltd	Giant Tortoise, Casela
Tan Chong International	Giraffes, Marco and Jubilee
Tan Chong International	Grevy's Zebra Exhibit
The Shaw Foundation Pte	The Shaw Foundation Amphitheatre
Tradecom Services Pte Ltd	Chimpanzee, Asha
United Test and Assembly Center Ltd	Orangutan, Bino
Valour Pets Global Pte Ltd	African Painted Dog Exhibit
Wing Joo Loong Ginseng Hong (Singapore) Company Pte Ltd	Malayan Tiger, Sulong
Wuthelam Holdings Pte Ltd	Rabbit Exhibit
Yokogawa Engineering Asia Pte Ltd	Chimpanzee, Jengo
Yuvabharathu International School Pte Ltd	Asian Elephant, Jati

## Night Safari

Goodwood Park Hotel Pte Ltd	The Fishing Cat Trail
Haw Par Healthcare Limited	Malayan Tigers, Bongsu and Intan
JTB Pte Ltd	Elephant, Neha
JTB Pte Ltd	Asiatic Lion Exhibit
JTB Pte Ltd	Sambar Deer and Elephant Exhibit
Khoo Teck Puat Foundation	The Fishing Cat Trail
Mitsui & Co. (Asia Pacific) Pte Ltd	African White Lion Exhibit
Mr Martin Storey	Babirusa Exhibit
NEC Asia Pacific Pte Ltd	Indian Rhino Exhibit
Salaryman Private Limited	The Explorer Outpost
Singapore Refining Company Pte Ltd	Barasingha Exhibit
The Koh Family	Southern Three-banded Armadillo Exhibit
Thai Beverage Public Company Limited	Asian Elephant, Chawang
The Shaw Foundation Pte	Slow Loris Exhibit
Toppan Leefung Pte Ltd	Asian Elephant, Sang Wira

## River Wonders

Khoo Teck Puat Foundation	Red Panda Exhibit
Mitsui & Co. (Asia Pacific) Pte Ltd	Mekong Giant Catfish Exhibit
The Shaw Foundation Pte	Manatee Feeding Programme

## Jurong Bird Park

Goodwood Park Hotel Pte Ltd	Brahminy Kite, Ronnie II
Kidz Meadow Childcare & Development Centre	Blue-eyed Cockatoo Exhibit
Mrs Verena and Mr Sharad Desai	Straw-headed Bulbul Exhibit
The Shaw Foundation Pte.	Fly-Pass Macaws From High Flyer Show

## Contributions Towards Animal Care

Lee Foundation Singapore  
Standard Chartered (Singapore) Limited  
Ms Tan Hiang Lee

## Bench, Sculpture & Tree Adoptions

Arts Kidz Pre-School Pte Ltd	Butterfruit Tree at White Tiger Exhibit
Dr Chris Tan Kok Leong	Kapok Tree at Free-Ranging Orangutan Island
Dr Chris Tan Kok Leong	Bench at Free-Ranging Orangutan Island
Gaia Environment (S) Pte Ltd	Calophyllum inophyllum L Trees along Primate Kingdom
Moonday Studio	Bench at Free-Ranging Orangutan Island
Mr and Mrs Ong Seow Leong	Otter Sculptures at Otter Exhibit
Mr Andrew Ng Wai Hung	Bench at Giraffe Exhibit
Mr Felix Lim	Sandu Tree at Garden Pavillion
Mr Indra Widjaja	Rain Tree at African Painted Dog Exhibit
Mr Kelvin Chng	Sea Almond Tree near Ah Meng Memorial
Mr Morven Chin	Butterfruit Tree at White Tiger Exhibit
Mr Naresh Narasimhan	Rain Tree at Zebra Exhibit
Mr Ng Cheun Ser	Broad-leafed Mahogany Tree at Garden With A View
Mr Rik van Dijk	Rain Tree at Giraffe Exhibit
Ms Annette Brinch Jensen	Bench at Giraffe Exhibit
Ms Lee Whai Yih	Bench along Rainforest Walk
Ms Phyllis Wong	Rain Tree at Giraffe Feeding Exhibit
Ms Tan Keng Keng	Sentol Tree along Rainforest Walk
Ms Verena Poh	Broad-leafed Mahogany Tree at Garden With A View
Nippon Express (Singapore) Pte Ltd	Yellow Saraca Tree along Free-Ranging Orangutan Island
OHBOY! Pictures Pte Ltd	Bench at White Rhino Exhibit

## Mandai Boardwalk

OTS Holdings Limited	Trees
Schneider Electric South East Asia (HQ) Pte Ltd	Trees

## Event Sponsorships

Amazon Web Services	River Wonders Gives Back
Equinix Singapore Pte Ltd	River Wonders Gives Back
Meta	River Wonders Gives Back

## Sponsorships In-Kind

KARL STORZ Endoscopy





# Year In Review

FY 2022 – 2023

Introduced a new corporate purpose statement – **A World Where People And Wildlife Thrive Together**

Participated in **162** managed species programmes, up from 155, to help **sustain the populations of threatened species** under human care.

Provided **\$1.6million funding** to **Mandai Nature**, our conservation arm, in support of saving wildlife across 48 local and regional projects.

**Closure of Jurong Bird Park** on 3 January 2023, after 52 years of **creating memories** for **41 million** guests.

Officially opened the **Tasmanian Devil Exhibit** on 15 November 2022, after 5 years of planning.

Successfully **translocated 2,000 birds** from Jurong Bird Park to **Bird Paradise**, starting from 4 January 2023.

Launched the refreshed **Creatures of the Night** presentation in Night Safari's **brand-new amphitheatre**.

Engaged **253,000** people on **conservation** and **sustainability** messaging.

The **new Avian Hospital** in Bird Paradise started veterinary care for our resident birds on 4 January 2023.

Launched the **Mandai Co-Innovation Programme** on IMDA platform to tap into Singapore's vibrant technology ecosystem for **innovative solutions**.

# Goodbye Jurong, Hello Paradise!

Jurong Bird Park was officially opened on 3 January 1971. For over five decades, Singapore's oldest wildlife park had created wonderful memories for some 41 million guests, occupying a special place in the hearts of generations of Singaporeans and countless tourists. In August 2022, we announced Jurong Bird Park's closure on 3 January 2023 and subsequent move to Bird Paradise at Mandai.

## A Flight to Remember

To invite the community to celebrate the park's legacy and rich heritage with us, we launched 'A Flight to Remember' campaign in September 2022. School groups enjoyed 'turn back the clock first admission price' at \$2.50 per student from September 2022 to January 2023 while Singapore residents were accorded a special \$10 park admission from 19 November 2022.

Guests were invited to share their 'emu-tions' and favourite memories of Bird Park on our real-time digital platform or record their last visit at photo points featuring iconic landmarks of the park. The Heritage Trail and Nostalgic Signature Tour also allowed guests to soak in the park's rich history.

The community turned up in full force for the celebration. The four-month campaign attracted some 224,000 guests, far exceeding our target by 81%.

## Remembering Bird Park, Virtually

A virtual live show 'Sally and The Great Bird Search' was curated specially to take preschoolers on a virtual tour of Jurong Bird Park before its closure and to celebrate its rich diversity of birds. On 30 August 2022, over 15,000 preschoolers tuned in to participate in the live show, with most of them dressed up in bird costumes. The recorded version is available online and engagement continues to be high with many schools accessing it as a teaching resource.



## Last Day of Operations

3 January 2023 marked Jurong Bird Park's 52nd anniversary as well as its final day of operations. Some 2,600 guests turned up to bid an emotional goodbye to Singapore's first wildlife park. As the guests were enjoying the last Kings of the Sky show, the sky opened and showered blessings on all the birds for their new beginning in Mandai. Bird Park stalwarts shared about their career journeys and their fond memories of the park. Besides attracting over 190 pieces of local and international media coverage, we also garnered 4.6 million reach and an engagement of 63,000 on our social media platforms. A feature of the park's closure was aired on CNA On the Red Dot's Losing Landmarks series in March 2023.



## Preparing For The Great Migration

Translocating close to 3,800\* birds from Jurong Bird Park to Bird Paradise in Mandai was a mammoth task, to say the least. Planning for the great migration commenced in early 2019, involving multiple departments - Veterinary Healthcare, Avian, Animal Behaviour and Programme, Operations and Horticulture. Preparation work intensified in the FY with our shared goal of minimising transfer related mortalities, ensuring the highest animal welfare standards at all times when facilitating the transfers, and preventing the spread of infectious diseases.

The Avian team was kept extremely busy desensitising the birds to trap cages. For months, food was placed in these cages to encourage the birds to enter, and over time they were well habituated to moving in and out of the trap cages. When the time finally came for the trap doors to be activated, the birds were not stressed as they were familiar with the environment. The vets were also kept on their toes with disease screenings, comprehensive health assessments and running other diagnostics for the birds. For a few groups of birds, specific diagnostics had to be carried out, such as the viral testing of juvenile parrots, and salt tolerance monitoring of the penguins in preparation for the switch to a saltwater exhibit in Bird Paradise.

By December 2022, the Avian and Veterinary teams had completed much of the preparation work and advanced to conducting dry runs. With each dry run, refinements were made to perfect the coordinated processes required for the actual activation. Meanwhile, our Horticulture team added the finishing touches to the landscaping to create conducive homes for the birds.

\* Figure includes translocation beyond the FY; 2,000 birds were translocated during the FY.



## Making Ourselves Lean

Preparation for the translocation presented a great opportunity for our staff in Jurong Bird Park to review work processes in the face of the new challenges in a vastly different environment in Mandai. A series of Lean workshops were conducted for all functional teams to evaluate existing processes and identify areas for improvement.



Every bird had to undergo comprehensive health assessments and infectious disease screenings prior to the translocation.



**Above:** Several dry runs were carried out to familiarise staff with the translocation.

**Left:** Volunteers clearing construction debris in an aviary.

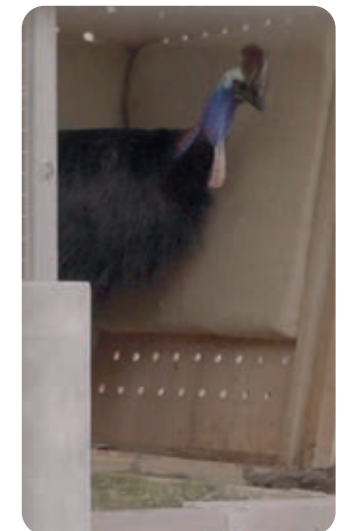
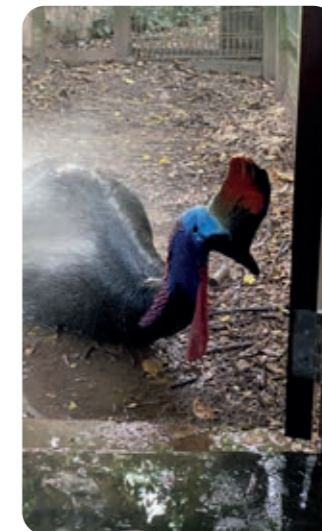


**Above:** A new home for the shoebills (left) and the roseate spoonbills.

## Off To Paradise!

4 January 2023 - the great migration from Jurong Bird Park to Bird Paradise in Mandai began. Daily transfers typically commenced at 7am, ending at Bird Paradise by 10am to take advantage of the cooler temperatures in the morning and allow for more time in the day to monitor the birds after they were released into the new aviaries. For some species such as the cassowaries, the transfers started at 3am for health and safety considerations.

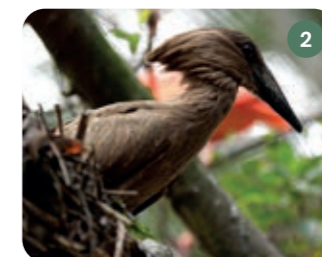
At the time of the transfers, all birds went through a health check, which included weight taking, body condition scoring and general physical assessment to ensure that they were physically fit to embark on the journey. The first birds to be translocated were the breeding pairs in small aviaries. This strategic approach allowed us to empty out these aviaries to hold the birds trapped from the large walk-through aviaries so that they could eventually be transferred safely to Bird Paradise. Hundreds of bird carriers needed to be disinfected before and after each transfer and we were grateful to the volunteers who lent us a helping hand.



To transfer the huge cassowaries to Bird Paradise, we had to use crates. But first, the Avian team had to habituate them to entering the crates by placing food inside or giving them long showers in the crates (yes, our cassowaries love showers!). When the time finally came for translocation, the team was able to usher the birds, with shields, into the crates where they stayed calm throughout the journey. Thanks to the desensitisation, the cassowaries arrived at Bird Paradise without incident.

## Settling In Well

Close monitoring of the birds after they were released into the new environment was crucial to the success of the translocation. Once again, our volunteers stepped up to support the Avian team. A total of 76 volunteers put in some 635 hours to observe the birds in their new homes. Happily, the birds acclimatised quickly and some, such as weaver birds and hammerkops started to nest within weeks after they moved in. The first weaver chick fledged in March 2023, just two months after the translocation!



1. A gigantic hammerkop nest
2. Hammerkop
3. Taveta golden weaver

A group of researchers in a forest, examining a bird specimen. The researchers are wearing grey shirts and dark pants, some with hats. They are gathered around a bird, with one person holding it. The background is a dense forest with many trees and green foliage.

# Caring For Our Planet

A healthy planet is crucial for people and wildlife to thrive together. In recent years, we have witnessed devastating biodiversity loss and extreme weather events and their impacts on ecosystems, people, and our planet. Yet, there are pockets of good news – the rediscovery of once-declared extinct species, success stories of wildlife reintroduction into their native habitats, and promising nature-based solutions for climate mitigation. There is hope and we will always remain hopeful as we double down on our efforts to conserve wildlife through global alliance with other zoos and conservation partners and to operate sustainably. Through education and advocacy, we inspire people to join us in protecting wildlife and living sustainably.

## FY22/23 HIGHLIGHTS

- Provided care for close to **22,000** animals representing **963** species, of which **27%** are threatened in the wild.
- Admitted **1,143** rescued native animals to our veterinary facilities for medical attention; of which **58%** were successfully released back into the wild.
- Translocated **2,000** birds from Jurong Bird Park to Bird Paradise in Mandai, starting from 4 January 2023.
- Started veterinary care for our resident birds in the **new Avian Hospital** on 4 January 2023.
- Invested **\$1.6 million** through Mandai Nature, in support of local and regional conservation projects and partnerships.
- Engaged **253,000** students, park guests and members of the public on conservation and sustainability messaging.
- Committed to **Science-Based Targets Initiative (SBTi)**'s Net Zero standard to set emissions reduction targets.

# New Mandai Precinct Taking Shape

Construction activities are in progress for all features across the Mandai Rejuvenation Project, which is into its sixth year of development. Piling works and tree surveys have commenced at the worksites for Rainforest Wild, East Arrival Node, Indoor Attractions and the eco-friendly resort.

## Bird Paradise Getting Ready To Soar

Bird Paradise is set to open in two phases, with the first phase on 8 May 2023. Construction of key features of Bird Paradise, including eight large walk-through aviaries reached significant milestones, gearing up for phase one opening in May.

The winged canopy at the entrance plaza was completed in June 2022, and theming works for the penguin habitat began in the same period.

Transition planning progressed well over the year, with representatives from Animal Care, Animal Behaviour & Programmes, Operations

and other departments working together to ensure smooth handover of sites and operationalisation of the new park.

The new Avian Hospital commenced veterinary care at Mandai and boasts state-of-the-art facilities and equipment to provide world-class care for our avian patients. It has 56 cages, intensive care units, brooders and ward enclosures custom designed for the wide variety of species and their specific needs. The new hospital building features the latest surgical, anesthetic and endoscopic equipment, a dedicated surgical suite and prep room. It has full computed tomography (CT), radiography



This CT diagnostic machine is one of the state-of-the-art equipment in the new Avian Hospital.

(X-ray), fluoroscopy, and ultrasound capabilities. These allow for precise identification, localisation, and 3D reconstruction of even small lesions within the body to address disorders of the head, lungs, spine, and gastrointestinal tract. The laboratory is equipped for in-house bloodwork, cytology, and faecal analysis, enabling rapid diagnosis and intervention. A well-designed isolation room is also available to contain birds if highly transmissible infectious diseases are detected. The air within the hospital is maintained to prevent the spread of infectious conditions.



As Asia's largest bird park, Bird Paradise spans 17 hectares and will become home to 3,500 birds from 400 species.



Mandai Wildlife West features a dramatic waterfall cavern, inspired by Madakaripura Falls in Java.

## Mandai Wildlife West

Development of Mandai Wildlife West, an ungated public node serving as the entryway to Bird Paradise and the upcoming Rainforest Wild, reached its final phase with theming works to be completed. This public node features a dramatic waterfall cavern, inspired by Madakaripura Falls, one of Java's tallest waterfalls. It also features F&B outlets offering varied menus using sustainably sourced and plant-based ingredients.

## The Forest Gateway Unveiled

The Forest Gateway, an 885m-long entry archway on Mandai Lake Road featuring rock carvings inspired by the animals in our wildlife parks was unveiled in November 2022 to welcome guests to Mandai Wildlife Reserve.

**1 & 2.** Unveiling of the Forest Gateway on 14 November 2022 by Mandai Wildlife Group's senior management, and project management team. They were joined by the management team of Obayashi Singapore and Henning Larsen.



## Rainforest Wild

Rainforest Wild is a new attraction designed to showcase the vertical layers of the forest, allowing guests to experience different elements of the natural world. The attraction consists of two parts: the north, featuring Southeast Asian wildlife, and the south, African and Madagascan rainforest inhabitants. The 250m long cavern is a key feature under construction, and installation of theming panels is underway.

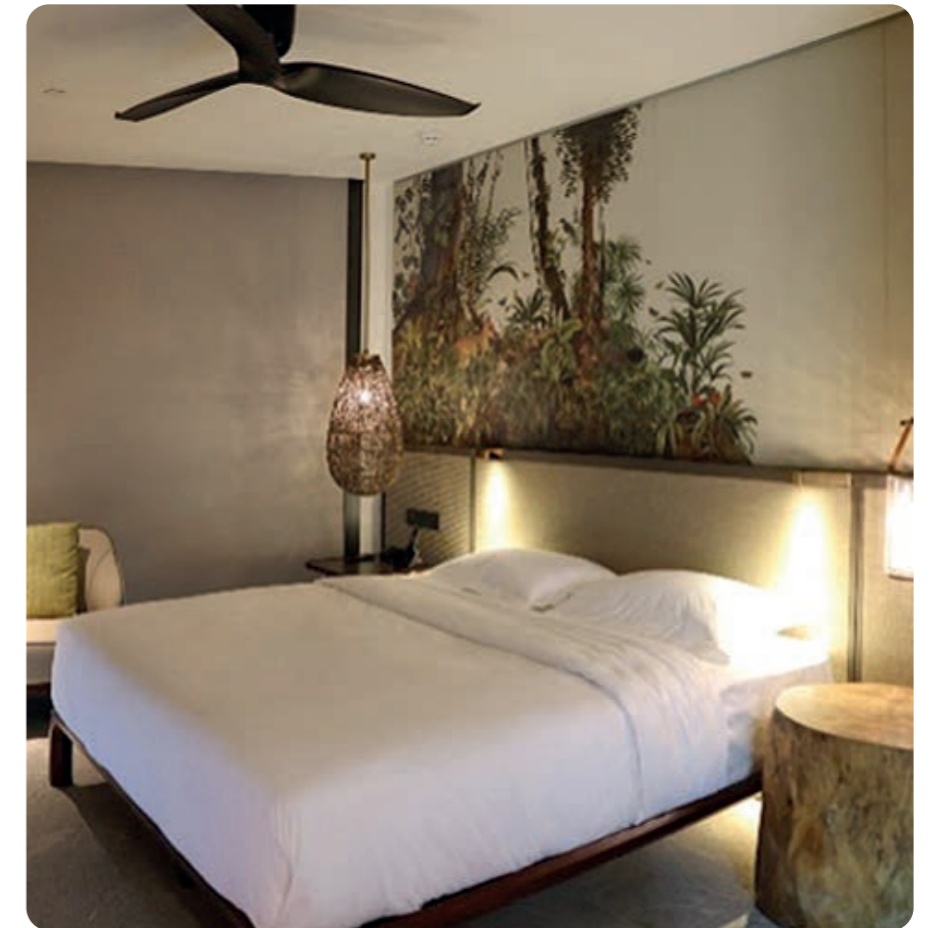
Installation of theming panels for the cavern at Rainforest Wild Asia



## Eco-friendly Resort

Offering a biophilic experience, the eco-friendly resort integrates its facilities with nature, and has already bagged the BCA Green Mark Platinum Award (Super Low Energy Building). It features three types of accommodation, including standard and family rooms, as well as 24 elevated treehouses. Work on the resort is ongoing.

Mock up of the standard rooms at the eco-friendly resort



## Nature-themed Attractions

Two nature-themed indoor attractions, located in the east of Mandai precinct, will complement the five gated wildlife parks. One will be a highly immersive play area designed to nurture the appreciation for nature amongst children. The other, aimed at all age groups, will use digital technologies to take people to spatial and temporal frontiers not easily accessible or recreated - from the polar regions, deserts, deep oceans and to the ancient world.



## Providing World-Class Animal Care

It has been an exceptionally busy year for Animal Care and Veterinary Teams as they prepared for and executed the great migration of birds from Jurong to Mandai. All preparation work and logistical arrangements were focused on minimising transfer related mortalities and preventing the spread of diseases. Meanwhile, we continued to elevate animal welfare standards, guided by our Animal Welfare Code and Behavioural Management Framework, for the animals under our care. Embracing technology for innovative solutions and equipping staff with subject matter expertise remain key priorities as we prepare the teams for the challenges of acclimatising the birds in Bird Paradise and caring for more diverse animal species when Rainforest Wild opens.

Over the FY, we

- Expanded our managed species programmes to **162** to save threatened species from extinction by sustaining their population under human care.
- Attended to **4,783** clinical cases, a jump of **24%** from the last FY due largely to the translocation of birds requiring park-wide, pre-departure health assessments and disease screenings.
- Translocated slightly over **2,000\*** birds from Jurong Bird Park to Bird Paradise
- Published **15** research papers in peer-reviewed journals; one research has translated into earlier diagnosis and intervention of a renal disease in flamingos, resulting in better healthcare outcomes for the species.

\*this number does not include translocation beyond the FY

# The Animals Under Our Care

In the FY, we cared for almost 22,000 animals across 963 species, of which 27% are threatened in the wild. By caring for these threatened species and breeding them according to plan, we contribute to sustaining their genetic diversity and population under human care. We have also identified 10 species for conservation breeding under IUCN's One Plan Approach synergising our efforts of protecting species in their native habitats and their reintroduction. Our animals also play a vital role as ambassadors of their wild counterparts, and through their unique stories we connect guests to wildlife and inspire positive actions.

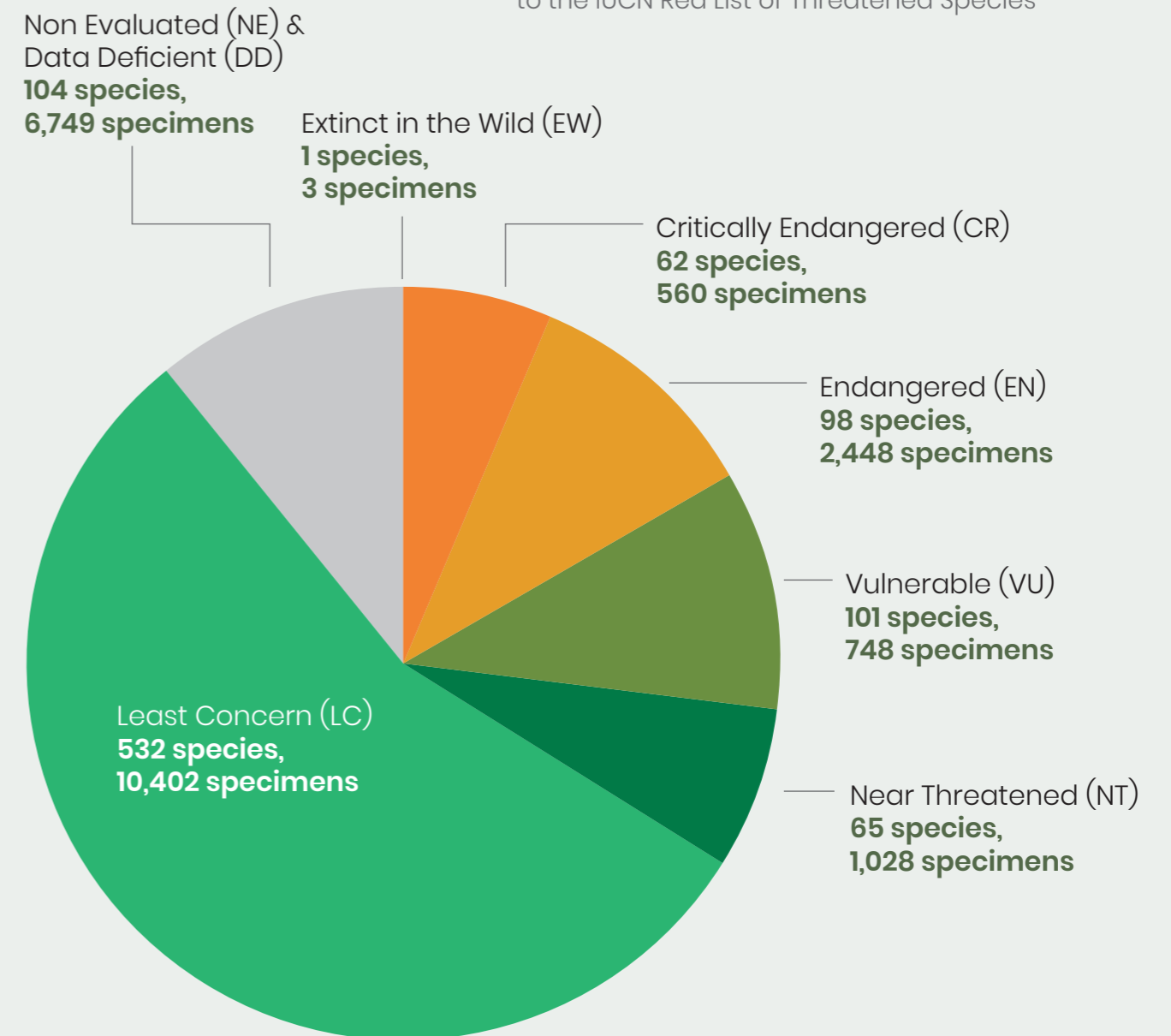


**As of 31 March 2023:**

Total number of animals in our care :

**21,938 specimens**  
**963 species** (27% are threatened)

\* Threatened Species include animals that are extinct in wild, critically endangered, endangered and vulnerable, according to the IUCN Red List of Threatened Species





# Notable Newcomers

In the FY, we organised 46 inter-zoo transfers involving 36 imports and 10 exports for a total of 491 animals. Some of the animals acquired will eventually find their home in our new attractions – Bird Paradise and Rainforest Wild. An enormous amount of work goes behind every transfer, and sometimes it is more than just coordination and logistical planning; acquiring certain high profile species hinges on close international cooperation and strong governmental support.

## The Fiesty Four From Tasmania

The plan to acquire Tasmanian devils for Night Safari started in early 2017. Preparation work was extremely extensive – apart from building a suitable exhibit for the animals, coordinating with our Australian counterparts on all related matters, and logistical planning, we had to put together political briefs and solicit governmental support. Travel restrictions during the Covid pandemic added another layer of complexity to the project, delaying the export of the animals. Finally, on 7 October 2022, after five years of planning and anticipation, four female Tasmanian devils arrived in Singapore, accompanied by Trowunna Wildlife Sanctuary

senior keeper Adrian Mifsud to ensure the animals' well-being during the transit. While the Night Safari Team had travelled to Tasmania in 2019 to learn to care for the Devils, Adrian Mifsud's guidance in familiarising the team with the care plan of the animals proved invaluable.

The four Tasmanian devils were part of the insurance population managed by the Save the Tasmanian Devil Programme (STDP), led by the Department of Natural Resources and Environment Tasmania. An exciting addition to Night Safari, they serve as ambassadors to raise awareness of the plight of their wild counterparts, which are endangered by Devil Facial Tumour Disease, a transmissible cancer.



**Left:** One of the Tasmanian devils Panini undergoing a pre-export dental check.

**Below:** Four female Tasmanian devils arrived in Singapore on 7 October 2022, after five long years of planning!



The expansive home of the Tasmanian devils comprising two climate-controlled indoor exhibits and two outdoor habitats was brought to fruition through many exhibit review discussions with our Australian counterparts. The exhibit was officially opened on 15 November 2022.

## Bornean Orangutan On Breeding Programme

Based on the analysis of genetic simulations and pairing options, SEAZA\* Species Coordinator for orangutans recommended that a young orangutan from Taipei Zoo be transferred to

Singapore Zoo as a future breeding female. Affectionately known as Niu-Li in Taipei Zoo, this female has been assimilated into our young female orangutan group for companionship while she awaits the arrival of her mate from Japan.

\* Southeast Asian Zoos and Aquariums Association



Orangutan Niu-Li serving pre-export quarantine in Taipei Zoo before travelling to Singapore.

## Socorro Doves (Extinct In The Wild)

We received three Socorro doves from Chester Zoo. This is a significant addition as the species is now extinct in its native home on Socorro Island, off the west coast of Mexico. Fortunately, the dove has not been completely wiped out as there are still some 150 of them in zoos around the world and a reintroduction plan is underway. This species is managed under the European Association of Zoos and Aquariums Ex-situ Programme (EEP) for which we are a participating member. We are privileged to care for this species and contribute to its conservation.



## Hornbills

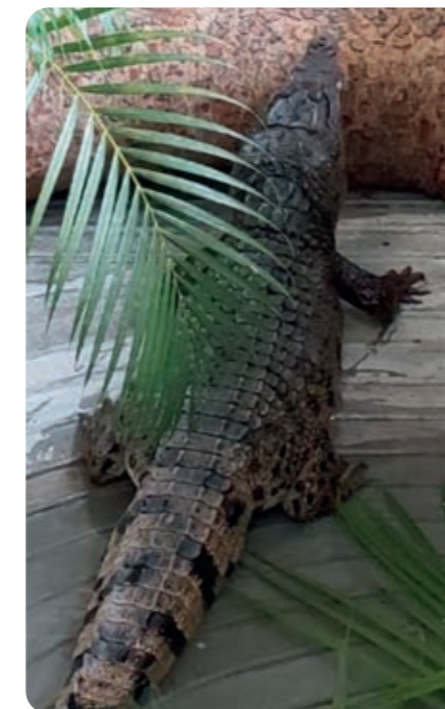
We continued to enhance the diversity as well as population of our hornbills, adding new species such as the wrinkled and Sulawesi hornbills while acquiring more numbers of knobbed, white crested, Papuan and other hornbills. By the end of the FY, we have over 20 species under our care, representing the world's largest genetic reserve for hornbills in a zoological institution.



1. A male wrinkled hornbill
2. A female knobbed hornbill
3. Male and Female Papuan hornbill

## New Arrivals For Rainforest Wild

As animal acquisitions can be a protracted process, the Animal Care Team started planning for Rainforest Wild months ago. Some of the acquisitions have materialised with the arrival of a bachelor group of five endangered Francois's langurs and a pair of critically endangered Philippine crocodiles.



Philippine crocodile



François's langurs

# Saving Species At Global Level

Modern zoos play a pivotal role in saving threatened species by breeding them through a science-based approach to sustain genetically healthy populations. Tapping on the alliance of an international network, zoos participate in managed species programmes that involve transfers of animals for breeding to protect the genetic integrity of the species.

We are actively involved in internationally managed species programmes; in the FY, we added six more such programmes to our list, which brought the total to 162 species (see Annex for full list).

The following are the new Managed Species Programmes for FY22/23:

Managed Species		Programme
Eastern Superb Fruit-Dove	<i>Ptilinopus superbus</i>	EEP*
François's Langur	<i>Trachypithecus francoisi</i>	EEP
L'Hoest's Monkey	<i>Allochrocebus lhoesti</i>	ESB*
Madagascar Teal	<i>Anas Bernier</i>	ESB
North Island Brown Kiwi	<i>Apteryx mantelli</i>	EEP
Tasmanian Devil	<i>Sarcophilus harrisi</i>	ASMP*

\* refer to Annex for details

Apart from participating in the managed species programmes, our Animal Care staff contribute by playing the role of the coordinator for 14 threatened species (see Annex for details). The species coordinator in charge of each species makes recommendations for inter-zoo transfers of genetically compatible individuals for the best conservation and welfare outcomes.



Eastern Superb Fruit-Dove



François's Langur



L'Hoest's Monkey



Madagascar Teal



North Island Brown Kiwi



Tasmanian Devil

# Elevating Animal Welfare Standards

In the FY, we launched MWG Animal Welfare Framework to empower the Animal Care Team to provide the highest possible animal welfare standards. The framework consolidated our efforts in animal welfare into four pillars for greater clarity to guide staff in carrying out their daily duties and developing new animal welfare initiatives. The pillars and key areas of focus are:

- Animal Welfare Policies and Guidelines**  
 Animal Welfare Ethics, Animal Presentations Training Policy, Geriatric Care Plan
- Assessments**  
 Animal Welfare Assessment, Quality of Life Assessment, Species Environmental Matrix Assessment
- Staff Development**  
 Animal Welfare Workshop and Animal Management Course
- Communication and Advocacy**  
 Partnerships with other zoological institutions and professional collaborations on research.

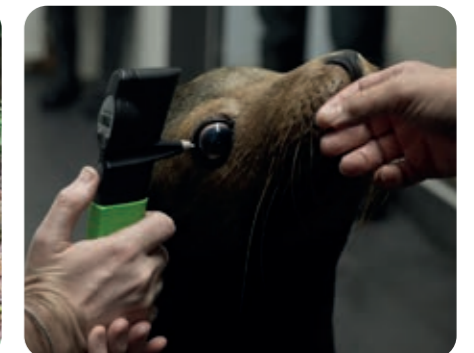
A notable addition to the framework is the assessment of back-of-house (BOH) facilities based on the Species Environmental Matrix. The matrix is a novel tool developed by the Animal Care Team to evaluate how well back-of-house facilities support the welfare of the animals and to identify gaps for improvement.



Animal presentations training adheres strictly to the training policy which is rooted in positive reinforcement.



The exhibit for pygmy hippos was upgraded in the FY to provide better welfare for the animals.



Pedro, the sealion, is one of the animals which has benefitted from our geriatric care plan.

# Animal Enrichment

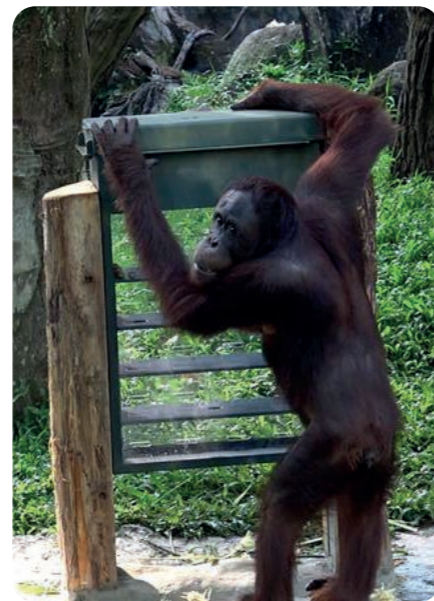
Enrichment activities are designed to enhance the well-being of our animals. They are carefully curated based on the biology of the species and even the character of individual animals. These activities elicit the natural behaviour of the animals and at the same time present opportunities for a mental and physical workout.

## Behavioural Management Framework

The Behavioural Management Framework (BMF) helps the Animal Care Team move from the traditional device-centric enrichment activities to a species-appropriate behavioural-centric approach. The BMF requires staff to determine the behaviours they seek to elicit and to observe the response of the animals to evaluate if the objectives are met. This change in focus has resulted in an increase in behavioural diversity for many species.



Malayan tiger leaping to reach an elevated chunk of meat gets to express hunting behaviour, maintain motor skills while strengthening its musculoskeletal system.



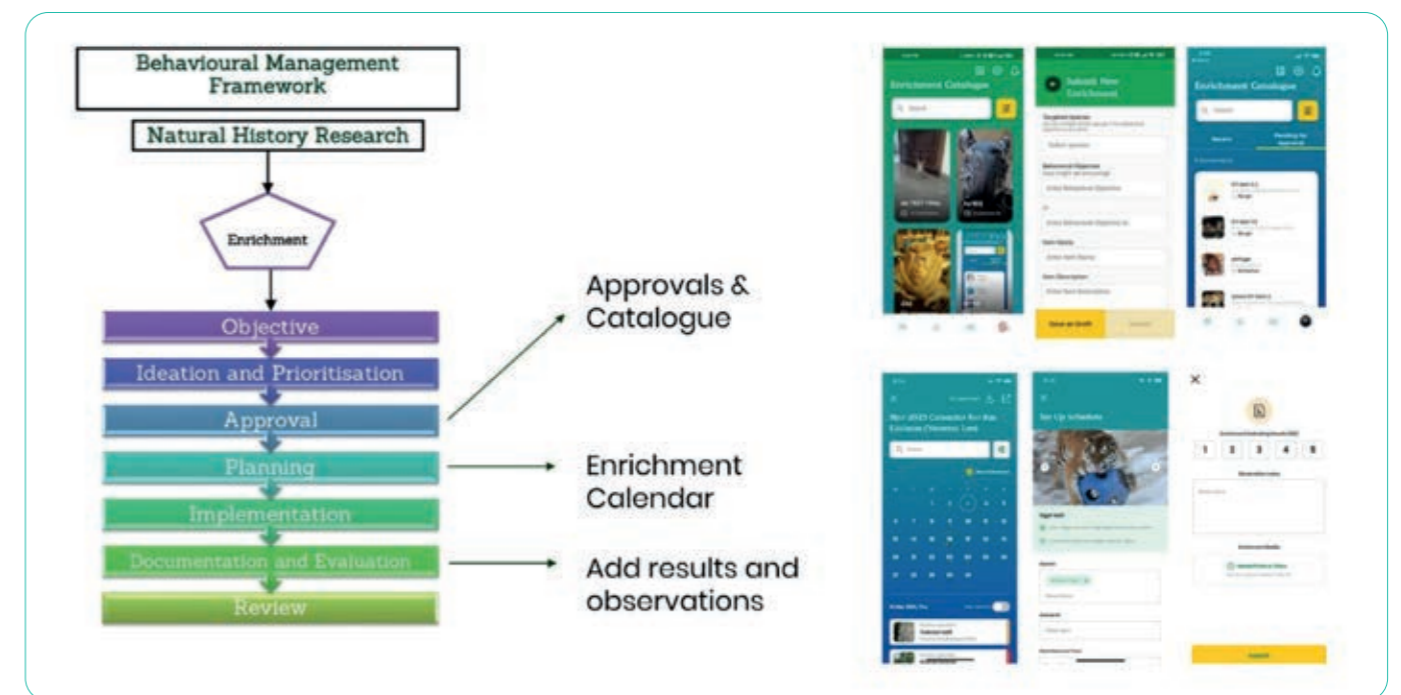
Solving food puzzles for yummy treats sharpens cognitive abilities and prevents boredom in highly intelligent primates such as orangutans.



A felled tree offers the ever-inquisitive hamadryas baboons opportunities to explore, forage and investigate - a rewarding multi-modal enrichment!

## Mandai Animal Care App – Using Technology To Improve Productivity and Enhance Welfare

The Mandai Animal Care App is a mobile application that empowers Animal Care Staff to plan and coordinate animal enrichment programmes, submit enrichment activities for approval, document observations, share enrichment ideas in the communal catalogue and loan or transfer materials. Fully integrated with the Behavioural Management Framework (BMF), the App enhances productivity, promotes cross pollination of ideas and consolidates documentation.



The Animal Care App is fully integrated with the Behavioural Management Framework (BMF) and is designed as a tool to facilitate approval, planning and documentation of enrichment activities.

# Bundles of Joy

In the FY, we welcomed over 800 births and hatchings, representing 126 species of which 21 were our firsts. Thirty-eight species bred are threatened and these bundles of joy are of great conservation significance. Some of these individuals will be transferred to other zoos for breeding as part of the global managed species programmes to enhance the gene pool of their species and sustain their population in human care. Others such as the critically endangered Negros bleeding-heart and Vietnam pheasant are part of our One Plan Approach (OPA) which aims to eventually reintroduce the species into their native habitats in the Philippines and Vietnam respectively.

## Negros Bleeding-heart

The bleeding-heart family expanded with 11 hatchlings in the FY. Bird Paradise is the only zoological institution in the world to care for this critically endangered species. Together with the Talarak Foundation and Mandai Nature, our conservation arm, we established the first conservation breeding programme for this species outside its native country of the Philippines. The goal is to repatriate the offspring to the Philippines for reintroduction.



## Vietnam Pheasant

Three chicks were successfully hand-raised after the mother abandoned her eggs during incubation. Our success in breeding this species is of great conservation significance. The Vietnam pheasant may be extinct in the wild as it has not been sighted since 2000. Globally, zoological institutions including Bird Paradise hold some 1,000 Vietnam pheasants, which present hope for reintroduction to save the species. Mandai Nature, our conservation arm, is supporting Viet Nature in setting up a conservation facility in Vietnam to facilitate the reintroduction of the species into its native habitat.



## Citron-crested Cockatoo

Two chicks were hatched and hand-raised at the Breeding and Research Centre in Jurong Bird Park. They are very precious additions as this critically endangered species is severely threatened in the wild by trapping for the illegal pet trade.



## Three Banded Armadillo

Our second successful birth since the parents arrived in Night Safari in 2019, from France's Beauval Zoo and Poland's Wroclaw Zoo. A welcome addition to the threatened species under our care!



### Titicaca Lake Frog

Our first success in breeding this critically endangered species, which is threatened by overharvesting, introduced species and climate change.



### Two-toed Sloth

Indigo, the two-toed sloth came to us from Taipei Zoo in 2020 as part of the exchange programme. Two years on, in September, she gave birth to a baby, the gender of which was subsequently confirmed to be male!



### Giant Anteater

The giant anteater is a threatened species. The birth of this pup contributes to the sustainability of the species' population under human care.

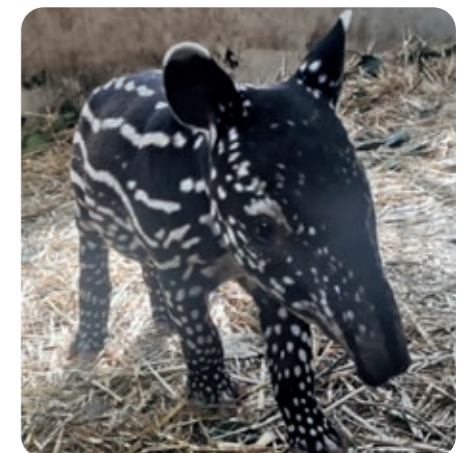
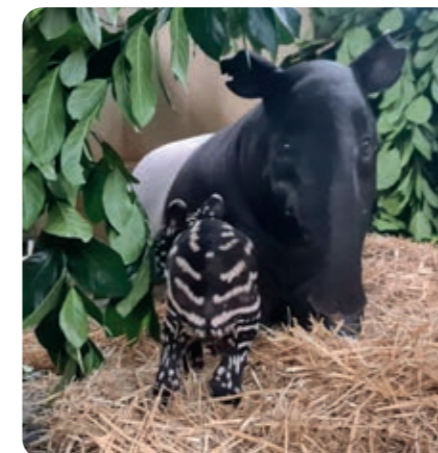
### Red-shanked Douc Langur

The birth aligns to our long-term managed plan to sustain the population of this critically endangered leaf monkey under our care.



### Malayan Tapir

Bumi, the female tapir from Night Safari gave birth to twin calves – the first calf on 3 June 2022 and the second calf 13 days later! Twin births for Malayan tapir are extremely rare and that for Bumi was only the second recorded under human care. It was indeed a joy twice over for this endangered species!



# Conditioning for Husbandry and Stress-Free Medical Procedures

Conditioning forms an integral part of husbandry and healthcare regimes of our animals. Large or small, most animals respond to conditioning through positive reinforcement such as food rewards. Regular training allows the Animal Care Team to carry out husbandry and visual and physical checks on their charges effectively. It also allows our Vets to perform certain medical procedures without sedation. With voluntary participation, we are able to monitor our animals' health on a regular basis and conduct routine medical procedures in a stress-free manner.

Animal Care Team uses targets and food rewards to condition our animals to elicit a certain behaviour such as moving from one place to another for weight taking or transfers and presenting body parts for visual and physical checks, toothbrushing or medical procedures. Getting the animals to participate voluntarily can take months to achieve, with different stages of desensitisation. Patience of the care team and the animals' trust in their keepers are key success factors to conditioning.

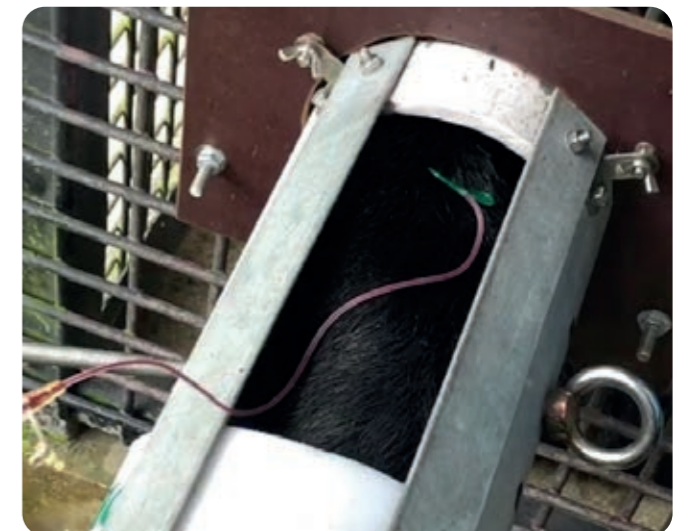
Medical procedures such as ultrasounds, injections and blood draws can also be performed by the Vets without the need for

physical restraint or sedation. For animals in our geriatric register, this is particularly crucial as they undergo more physical checks and medical procedures compared to their younger counterparts.

The number of animals responding positively to conditioning has increased steadily over the years. We are now able to hand-inject vaccines for 70% of our carnivores. Similarly, the geriatric Malayan tapirs were conditioned to be desensitised to the needle, voluntarily allowing blood draws to monitor their health without being sedated.



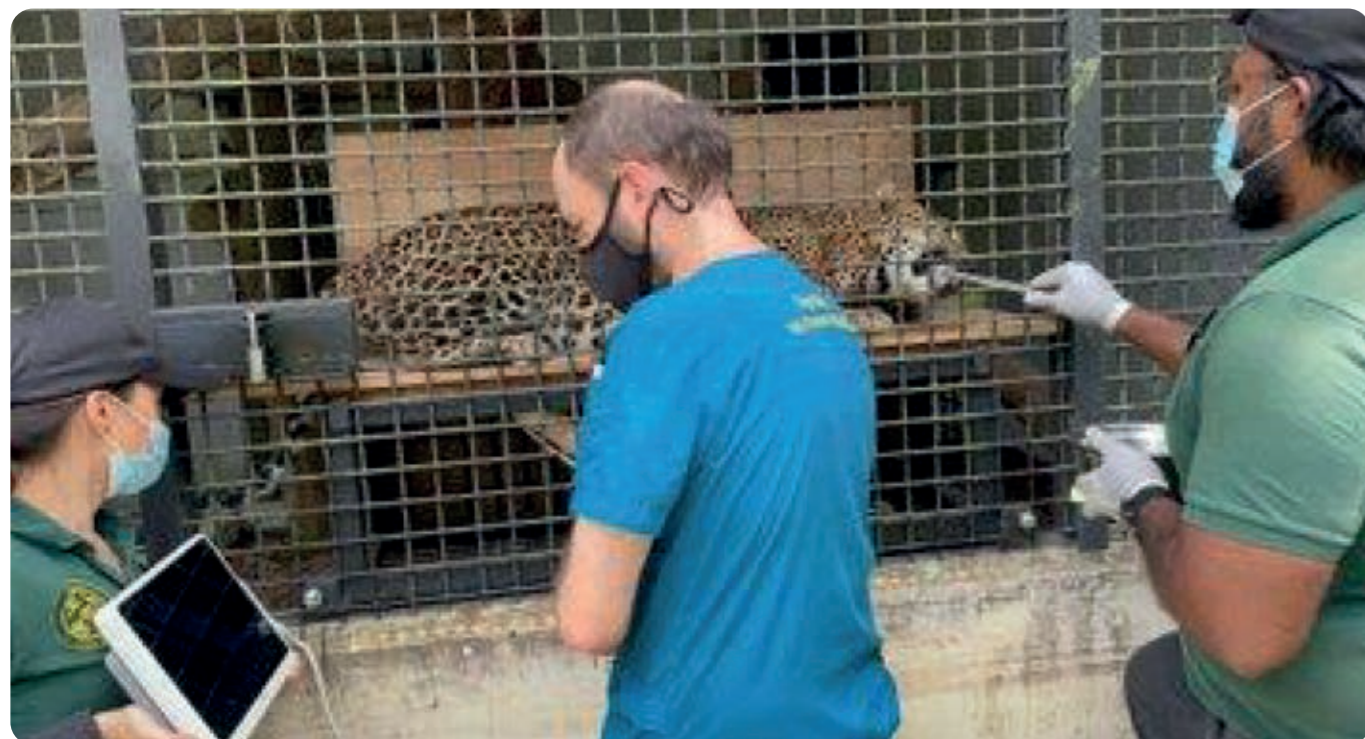
Sang Wira's care team positioning him in a customised structure to facilitate blood draw by the vets.



**Above:** Conditioning a bear for blood draw involves training it to place its limb into an arm sleeve and desensitising it to human touch, shaver, piercing (by using blunt needles) and even to the vets whom it is unfamiliar with. This process requires lots of patience by the care team as it can take weeks or months. The animal's trust in its care team is crucial to the success of any conditioning.



1 & 2. Conditioning our animals for weight taking is important as part of routine healthcare monitoring.



Ultrasound to monitor health and reproductive status of our Sri Lankan leopard.

Giant panda Le Le started positive reinforcement training in July 2022 when he was about 11 months old. By September 2022, his care team could perform visual checks, weight taking, rectal temperature taking, dental and toothbrushing. By early 2023, the vets were able to perform a successful blood draw and abdominal ultrasound as part of the routine health check.



Desensitising Le Le with a blunt needle to condition him for hand injection eventually.



# Veterinary Highlights

Our Veterinary Team provides a complete suite of healthcare services and medical solutions for some 22,000 animals under our care, from health surveillance, preventive medicine, geriatric animal care to pathology. They handle the diagnosis and treatment of diseases and injuries not only for the animals in our parks but also rescued wildlife admitted to our facilities.

## Vets On The Case

During the FY, our veterinarians handled a total of 4,783 clinical cases, a jump of 24% from the 3,846 cases in the last FY. The increase was due largely to the translocation of birds from Jurong to Mandai, which required park-wide pre-departure health assessments and disease screenings. Some 23% of the caseloads required close monitoring and treatments at dedicated facilities. We highlight four significant cases here.

### Kidney Treatment for New Giant Anteater Mum

Female giant anteater Beanie which had just given birth two months prior, was lethargic and off food. Examination under anaesthesia revealed severe bacterial infection of her kidneys.

Our vets aspirated pus accumulated under her kidney capsules and put her on antibiotics. Beanie made a remarkable recovery, enabling her to continue to nurse and care for her baby.



### Eye Surgery in Asian Elephant, Aprila

32-year-old Asian elephant Aprila showed signs of eye discomfort. A veterinary assessment uncovered a worrisome growth on her conjunctiva. Our vets suspected this could be a recurrence of squamous cell carcinoma and melanoma (i.e. skin cancers) which were surgically removed from Aprila's eyelids in 2016.

While the vets monitored the new growth closely, Aprila's care team wasted no time in conditioning her for certain behaviours that would facilitate veterinary care for her. The behaviours included the voluntary presentation of her eyes for inspection and various body parts for injections.

As the growth showed no response to conservative treatments, the vets decided to surgically remove the eye mass. In consultation with veterinary and human ophthalmologists, the team performed the procedure successfully. The eye mass turned out to be squamous cell carcinoma again. The follow-up treatment involved cryotherapy to freeze the cancer cells. Aprila's conditioning allowed the procedure to be conducted under a mild sedative which is much safer. It also allowed ongoing close monitoring which had seen no further sign of tumor regrowth.



Pre-surgery



Post-surgery



Post-surgery (current)

## Pre-Translocation Cataract Removal

In the lead up to the move from Jurong to Mandai, our vets conducted health assessments and stepped up disease screenings to prepare the birds for a safe translocation. Part of the comprehensive screening included eye checks, which flagged up 15 birds with cataracts. These included penguins, parrots, raptors, and hornbills.

The complex anatomy of the avian eye presented challenges. Our vets reached out to specialists in veterinary ophthalmology. Prior to surgery, the birds underwent physical

examination, pre-anesthetic bloodwork and X-ray imaging to ensure their fitness for the procedure and lengthy post-operative treatment. The cataract removal surgeries were performed at a specialist veterinary eye clinic.

Following the procedure, our veterinary and care teams had to administer eye drops, oral pain killers, and antibiotic medications two to four times a day for several months. Regular checks by an ophthalmologist were done to monitor the birds' healing progress. We are glad that their improved vision has helped these birds settle in well in their new home at Bird Paradise.

**1 & 2.** Prior to the cataract surgery, the birds went through health checks and a battery of tests to ensure that they were fit to go through the complex procedure and lengthy post-surgery treatment.



## Assisted Breeding for Orangutans and Leopards

Assisted Reproductive Technologies (ART) allow individual animals that cannot breed naturally to contribute valuable genetic diversity to their population under human care. We have successfully helped giant pandas and African lions become parents.

Sumatran orangutans are critically endangered, and every successful birth is precious. Attempts to get our genetically valuable male orangutan Charlie and female Chomel to mate naturally had been unsuccessful. We decided to proceed with assisted reproduction. After months of studying Chomel's hormone profiles, artificial insemination was attempted several times during oestrus but without success so far. The orangutan care team and the vets will persevere to help Chomel conceive.

Our Sri Lankan leopards Raja and Nuwa were paired for natural mating. However, Nuwa, the female had severe uterine infection following mating. After her infection was treated successfully, the vets attempted artificial insemination on her, using fresh semen from Raja. Even though Nuwa did not conceive, the team is undeterred. Reproductive hormone profiling and behaviour monitoring are ongoing to gather data on Nuwa's reproductive health before further artificial insemination attempts are made.



# Prevention Is Better Than Cure

Preventive healthcare is a very important aspect of providing the highest standard of care for our animals. It involves regular health checks, vaccinations, parasite management and more. Continuous vigilance and sound biosecurity practices underscore our safe operations. In the FY, we unveiled the purpose-built Mandai Animal Quarantine, which comes complete with top-of-the-range features to enhance biosecurity.

## Health Screenings, Vaccinations, Disease Surveillance and Quarantine

We have a robust preventive healthcare programme for our animals. On an annual basis, our birds undergo physical examination, parasite management, and infectious disease screening (e.g. avian influenza testing). Our veterinary team also performs species-specific disease management such as detecting and treating iron storage disease in hornbills and joint disease in penguins.

Likewise, the other animals in our care also benefit from ongoing surveillance programmes such as screening for hepatic lipidosis (fatty liver) in reptiles including turtles, lizards and giant tortoises. As part of the prevention plan, at-risk individuals are identified for weekly monitoring of body condition and weight, as well as further blood tests, imaging and biopsies.

In the FY, we performed 102 vaccinations and over 6,600 parasite checks on our animals. Many of the laboratory tests required in animal health screenings were done in-house for timely results and treatment.

## Yearly Health Check for Our Philippine Eagles

Our vets conducted an annual medical assessment for both our Philippine eagles Sam and Geo on 17 June 2022. They were restrained for blood draws and coping of Sam's beak. Coping is to trim a bird's overgrown beak to its natural shape. A healthy beak is required for efficient feeding, feather care, protection and even breeding success. While many bird species in human care need no intervention to keep their beaks in tip-top condition, some birds of prey require human-assisted beak care. Good coordination between our Avian, Animal Behaviour and Presentations as well as Conservation, Research and Veterinary teams ensured that the procedures were executed safely in under two hours.



## African Swine Fever Surveillance

Responding to the detection of African Swine Fever (ASF) in a local wild boar carcass by NParks in February 2023, we sedated 10 suids in our parks for testing. They included five babirusas, two red river hogs, two bearded pigs and one domestic pig. All of them returned negative for the ASF virus. ASF is a contagious disease that affects members of the pig family with high mortality rates but does not pose a danger to humans.

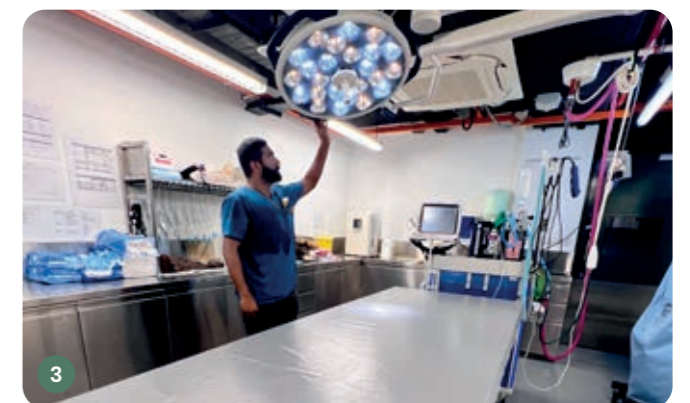


## Biosecurity & Dedicated Quarantine Facility

Biosecurity is the measures taken to lower the risk of introducing or spreading diseases and pests that could harm the animals under our care. It is the first line of defense in preventive healthcare. Apart from stringent biosecurity measures, we also have in place environmental and zoonotic pathogen monitoring measures to keep our animals, staff, guests, and the environment safe.

Quarantine is a key component of zoo biosecurity. On 12 December 2022, we unveiled a new quarantine facility, Mandai Animal Quarantine. Located away from our parks, the facility allows our veterinary quarantine staff to care for the new arrivals without risking the introduction of novel diseases to the rest of our animals. During quarantine, these animals are closely observed for any signs of illness and are given the highest quality of care to ensure that they transit safely to their new home. The facility comes equipped with a veterinary treatment room, necropsy room, negative pressure isolation facility, direct sewage flow to water treatment plant and well-spaced animal enclosures with sufficient buffer areas. In the FY, we quarantined 408 new animals comprising 66 mammals, 153 birds and 189 herptiles.

1, 2 & 3. As we expand to feature five wildlife parks in Mandai precinct, Mandai Animal Quarantine will serve us well in facilitating the safe transition of new arrivals to our parks.



# Geriatric Animal Care Plan

Once our senior animals reach 75% of their life span under human care, they are placed in the Geriatric Care Plan. We are proud to be one of the pioneering zoos employing a proactive management approach for geriatric animals since 2017.

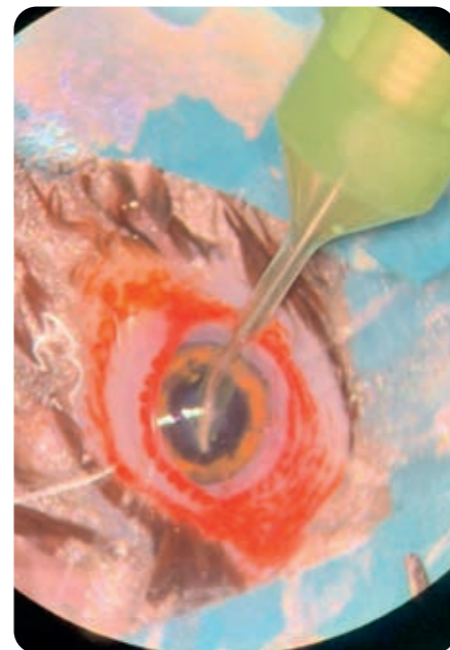
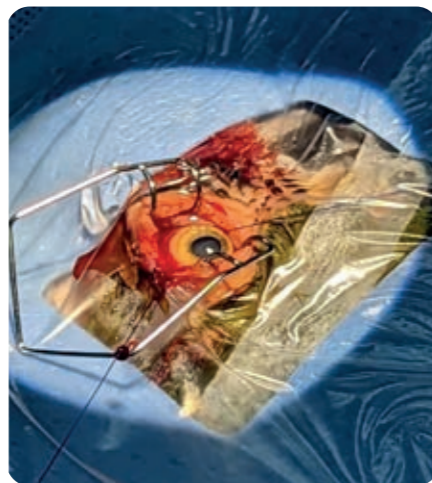
During the FY, 230 geriatric animals were inducted into the plan. We maintain a geriatric register with updated information on all health, husbandry, and welfare matters concerning these individuals.

Every geriatric animal is assigned a vet, who oversees its medical assessments and builds a customised care plan for it together with its caregivers. The care programme depends on the health status and needs of the individuals. For those in good health, it can be as simple as customised exercise regimes and annual medical assessments. For those with deteriorating health, they benefit from increased frequency of physical examinations, customised dietary plan with prescribed supplements, medical treatments, husbandry adaptations and Quality of Life assessments.

## World-First Eye Implants for Geriatric King Penguins

For three geriatric king penguins and three Humboldt penguins with cloudy lenses caused by cataracts, transferring them to the specialist veterinary eye clinic for cataract removal surgery posed a logistical challenge. To keep these birds cool, we transported them in buckets filled with ice, ensconced within air-conditioned vans.

In what is believed to be a world-first procedure, on top of cataract removal, all three king penguins received custom-made intraocular lens implants. These artificial lenses further improved the birds' depth perception and visual acuity, as well as overall quality of life. To aid post-surgery recovery, the penguins were kept out of water in a separate den from their colony, with application of eye drops twice daily. All six birds made a full recovery and returned to their colony two months later. Their care team reported an increase in responsiveness and activity levels in these geriatric penguins, a sure sign of improved vision.



## Treating An Anaemic Clouded Leopard

The care team observed that Wan Dee, a 16-year-old clouded leopard was not eating well. This geriatric animal was diagnosed with immune-mediated hemolytic anemia, in which red blood cells, responsible for transporting oxygen all over the body, are destroyed faster than they can be made. The animal was placed on immunosuppressive steroid therapy for a month at a progressively tapered dose. A post-treatment examination showed a significant improvement, with its blood tests within normal range. We are closely monitoring Wan Dee to ensure that it remains healthy.



## Red Ruffed Lemur with Tooth Root Abscess

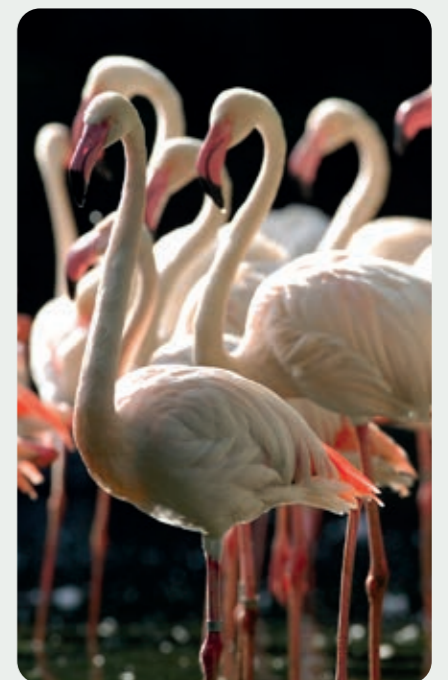
Piddy, our 23-year-old red ruffed lemur, had a sudden swelling on its chin and did not respond to anti-inflammatory drugs. Vets then examined this geriatric animal under sedation, revealing a severe tooth root infection with mandibular involvement. It was treated successfully with extraction of its lower incisors and doses of antibiotic.



## Scientific Publications

Fifteen peer-reviewed articles were published by staff in the FY, adding to the existing body of research on conservation, veterinary medicine, animal welfare and care. One of our research strengths lies in disease management. Notable publications were reviews of the use of antibiotics in birds and pain-relief drugs in reptiles. (Please refer to Annex for the list of published papers).

We also established a novel clinical diagnostic parameter with symmetric dimethylarginine (SDMA). SDMA is an amino acid produced when body cells break down proteins. It is primarily removed by the kidneys. Therefore, it can be used as a measurement of kidney function. Our SDMA research has resulted in the earlier diagnosis of a renal disease in flamingos and timely interventions for better healthcare outcomes for the species.





## Playing A Leading Role In Conserving Biodiversity

In line with the landmark UN Biodiversity Agreement which aims to halt and reverse biodiversity loss by 2030, we are putting our best foot forward to counter the rapid decline in wild animal species and habitat loss. We collaborate with zoos worldwide to sustain the population of threatened species under human care through the active participation in managed species programmes. We have also set our sight higher on expanding our conservation footprint and deepening impact beyond Mandai. Together with Mandai Nature, our conservation arm, we aspire to deliver field conservation projects at scale with partners and stakeholders to avert extinction of the most threatened species locally and regionally, restore ecosystems and support local communities.

In FY 22/23,

- We participated in **162** managed species programmes to sustain the population of threatened species under human care at global level.
- We sent **eight** Malayan sambar to Perhilitan, Malaysia to help in the repopulation of the deer species, which is the main prey of the Malayan Tiger.
- We provided **\$1.6 million** funding to our conservation arm, Mandai Nature to support **48** field conservation projects and partnerships locally and beyond our shores. More than half of the projects focus on the protection of critically endangered species in Southeast Asia.
- We intensified efforts to champion IUCN's **One Plan Approach**, an integrated strategy to synergise conservation and research work done in our wildlife parks with field conservation work in the wild habitats of specific threatened species.

# Sustaining Zoological Populations & Conservation Breeding

Wild places in every corner of the planet are shrinking fast. Zoos and aquariums become increasingly important gateways to wildlife experiences. Each year, over 700 million people visit zoos and aquariums around the world, presenting endless possibilities for zoological institutions to inspire and empower people to take positive actions for a healthier planet.

To connect people with nature and deliver meaningful wildlife experiences, zoos care for sustainable animal populations, which can be achieved through collaborative international efforts of the managed species programmes. Through a science-based approach, these programmes involve the transfer of animals among participating zoos for breeding to maintain the genetic diversity of the species by preventing breeding of closely related individuals. We participate in 162 of these programmes (refer to Annex for details).

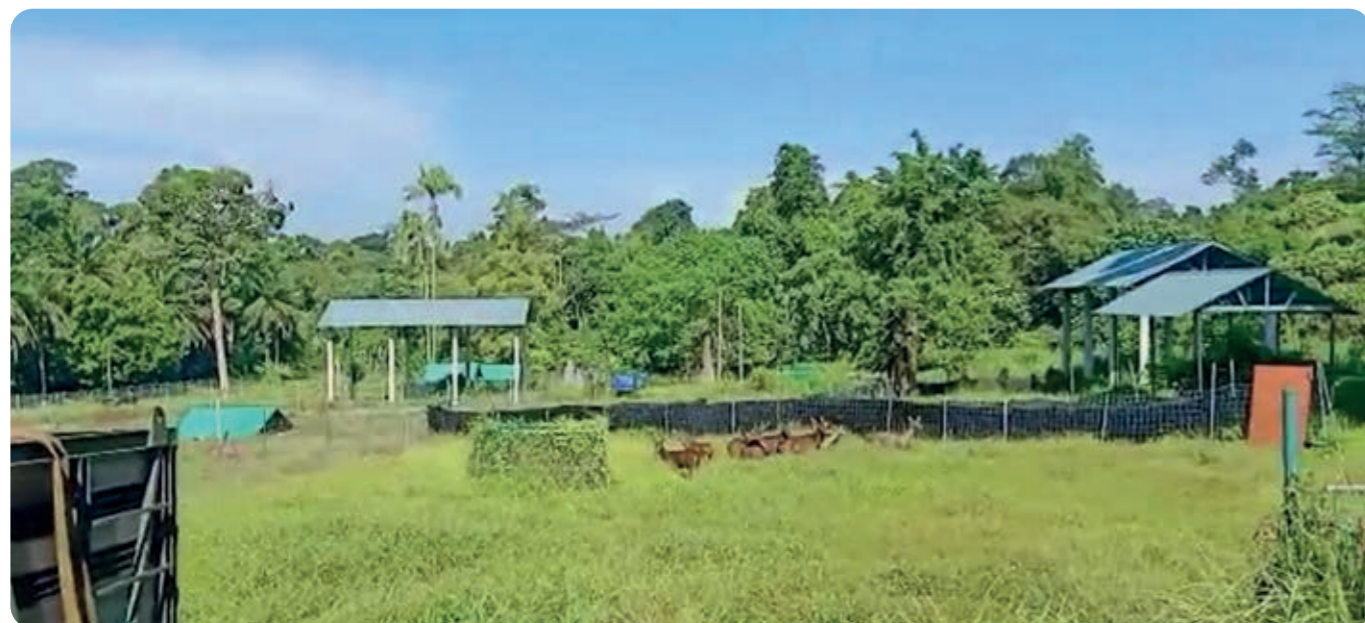
Specially managed populations can serve as insurance colonies to be released into their native habitats when safe, as in the case of our efforts in repopulating the Roti snake-necked turtle on Rote Island (refer to page 62 for details), and the Malayan sambar in Malaysia.

## Repopulation of Sambar in Malaysia

The Malayan sambar is the main prey of tigers. Unfortunately, the population of this deer species has been wiped out in some parts of Malaysia because of poaching for its meat, and deforestation. Without their main food source, tigers often turn to livestock, leading to human-tiger conflict. To help mitigate the situation, we worked with the Department of Wildlife and National Parks of Peninsular Malaysia (Perhilitan), in a repopulation project to replenish the number of Malayan sambar in the wild.

After months of crate conditioning for the animals and coordination of the road transfer, we finally sent five male and three female Malayan sambar back to their ancestral home on 20 September 2022. These deer would be held in the conservation breeding centre of Perhilitan to breed with Perhilitan's Sambar and their offspring will be released into the wild to increase the prey population of the Malayan tiger.

**Below:** Malayan sambar released out of their transport crate in the Malaysian conservation centre



**Above:** Crating of Malayan sambar in Night Safari

**Left:** Transport truck carrying the Malayan sambar departing Night Safari for Perhilitan, Malaysia.

# Averting Extinction Of Threatened Species Through Mandai Nature

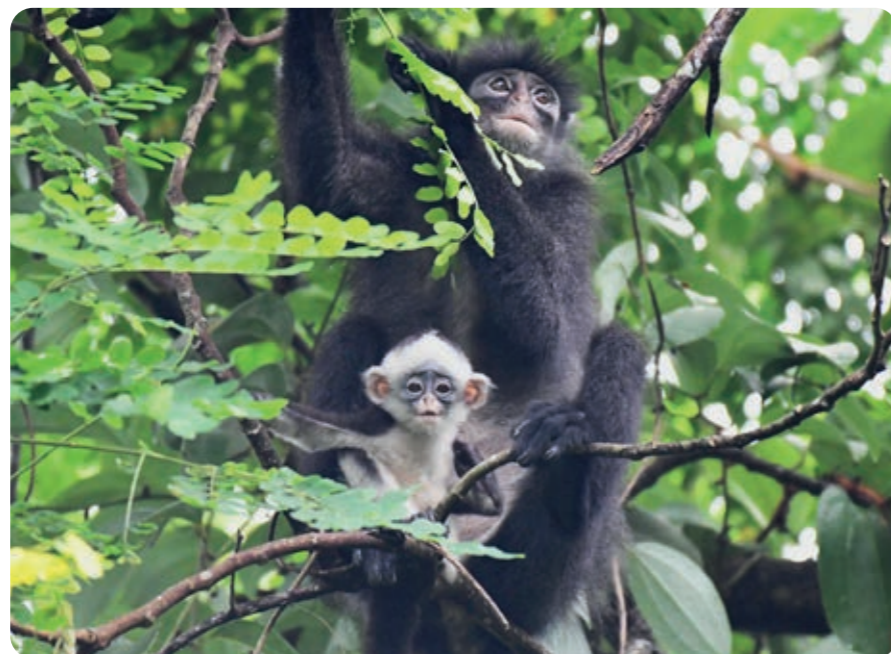
Together with our conservation arm Mandai Nature, we are constantly striving to reverse species loss by adopting a global outlook to protecting wildlife and finding solutions to conservation challenges. In the FY, Mandai Nature funded 48 projects and partnerships while continuing to support 15 ongoing projects in Singapore, Southeast Asia and beyond. Apart from field projects, resources were also allocated to promote citizen science and action for native wildlife within Mandai precinct and in Singapore, safeguard wildlife from illegal and unregulated trade and support networks for international collaboration.

Among the impactful work achieved by Mandai Nature in FY22/23, we highlight a local conservation project, and partnerships that resulted in big steps forward in promoting native wildlife awareness, tackling illegal wildlife trade, and driving climate mitigation.



## Saving The Raffles' Banded Langur

The Raffles' banded langur is critically endangered in Singapore and one of the 25 most endangered primates in the world. Our involvement in protecting this leaf-eating monkey started in 2008 when we supported scientific studies on this species by primatologist Dr Andie Ang. Conservation work, which we also support began in 2016. Today, our conservation arm Mandai Nature manages the project, and its representative Dr Andie Ang also chairs the Raffles' banded langur working group.



Population monitoring through field surveys by citizen scientists and camera trap recordings provide valuable data to inform conservation planning for the langur. In collaboration with NParks, two rope bridges were installed within Singapore's nature parks to facilitate the safe crossings of the monkeys between fragmented forests. The rope bridges proved to be useful in enhancing

connectivity – our camera traps recorded 293 successful crossings in a 19-month monitoring period!

Overall, conservation measures have led to improved habitat protection and public awareness of the species. However, the isolation of family groups in fragmented habitats continues to result in genetic inbreeding and deterioration,

threatening the langurs with extinction. To safeguard their long-term survival, cross-border conservation efforts between Singapore and Malaysia is a pressing requirement.

For details of conservation projects, refer to Mandai Nature Impact Report FY22/23 <https://www.mandainature.org/>

## Our Wild Neighbours (OWN)

Singapore's collective efforts in recent years to protect native wildlife have started to yield results. With this achievement comes the urgent need to foster human-wildlife relationships for co-existence on our densely populated tiny island. To this end, 'Our Wild Neighbours' (OWN) initiative was launched by the Urban Wildlife Working Group (UWG), which comprises various nature and conservation groups in Singapore, chaired by Mandai Nature.

Since its launch in April 2022, OWN has hired a Campaign Manager, largely funded by Mandai Nature, to plan and implement programmes to promote awareness and engage the community in local conservation efforts.

Learn more about OWN at <https://www.ourwildneighbours.sg/>



To mark the launch of OWN, Minister for National Development and Minister-in-charge of Social Services Integration Desmond Lee as well as OWN partners planted 20 native trees at Thomson Nature Park.

## Catalysing Change Through Partnerships

Apart from funding support for conservation projects and other related activities, Mandai Nature constantly strives to deepen existing partnerships and forge new ones. Collectively, changes are achieved to help preserve our biodiverse world:

### First Conservation Body for Asian Songbirds

Working with TRAFFIC Southeast Asia, Mandai Nature provided the institutional framework for establishing the IUCN Species Survival Commission (SSC) Asian Songbird Trade Specialist Group (ASTSG), the first conservation body dedicated to songbird conservation in the region. The goal of ASTSG is to prevent the imminent extinction of Asian songbirds threatened by unsustainable trapping. It maintains a priority list that identifies songbirds most threatened by the trade for future interventions, research and funding.

### Amendments To The Endangered Species Act

Mandai Nature was part of a coalition supporting NParks to amend the Endangered Species Act to curb the use of Singapore as a transit hub for the illegal wildlife trade. The Act was passed by Parliament on 4 July 2022 with stiffer fines and longer jail terms for illegal wildlife traffickers and stronger enforcement powers for NParks to tackle the illegal wildlife trade.

## Better Protection for Two Asian Songbirds

In November 2022, Mandai Nature joined the NParks-led Singapore delegation to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) COP19 in Panama. The delegation successfully lobbied for the uplisting of the critically endangered straw-headed bulbul from Appendix II to Appendix I, and the inclusion of the white-rumped shama in Appendix II. The tighter regulations accord greater protection to both Asian songbirds in global trade. To achieve this happy outcome, stakeholders from Singapore, Malaysia and United States had worked closely with various conservation groups, namely the IUCN SSC Asian Songbird Trade Specialist Group, Monitor Conservation Research Society, TRAFFIC and BirdLife International.

## Joining Forces in Climate Mitigation

In August 2022, Google.org, the philanthropic arm of Google, announced a grant of US\$1 million to Mandai Nature, in support of the Southeast Asia Climate and Nature-based Solutions (SCeNe) Coalition to deliver projects that drive investment into climate mitigation through nature-based solutions. The coalition has since developed several workstreams to be rolled out in the next year.

# One Plan Approach To Species Conservation

The IUCN's One Plan Approach (OPA) refers to an integrated strategy that unites conservation work and scientific research done in zoos with conservation work in the field. By combining resources, expertise, and public outreach towards the protection of species and their habitats, a powerful synergy between zoos and conservation organisations can be realised for the best possible outcomes.

Together with Mandai Nature, we have identified over 10 threatened Southeast Asian species for management under the integrated OPA (refer to Annex for full list). We align the conservation breeding programmes and other efforts in our wildlife parks with the fieldwork supported by Mandai Nature to achieve the goal of reintroducing these threatened species in their native habitats. We showcase below four species managed under the OPA.

## Roti Snake-necked Turtle

The Roti snake-necked turtle has been overharvested to the extent that it is believed to be extinct in the wild. We care for an insurance colony at the Singapore Zoo and run a conservation breeding programme for the species.

Since 2016, we have been working with Wildlife Conservation Society-Indonesia Programme (WCS-IP) on a plan to reintroduce the turtle into its native habitat on Rote Island. Over the years, our reptile care team and vets have visited the site to share best practices and medical protocols with the team. Mandai Nature also provides funding support towards habitat restoration, construction and maintenance of a turtle breeding facility, remuneration of key personnel as well as other operation costs.

We reached a significant milestone in September 2021 when 13 of the turtles from our insurance colony were successfully repatriated to their native country of Indonesia. The turtles have since settled in well at the breeding facility and will participate in a conservation breeding programme for repopulation of the species. In December 2022, the Indonesian team visited us for a week-long knowledge sharing session to enhance their skills in caring for the turtles in the breeding facility.

Meanwhile, we doubled down on our conservation breeding efforts – 36 turtles arrived from Bronx Zoo, USA to enhance the genetic diversity of our insurance colony as we continue to breed the species with the aim of repatriating more turtles to Rote Island.



**Above:** The Rote Island team visited us to enhance their skills in caring for the Roti snake-necked turtles in the breeding facility in Indonesia.

## Chrisangi Leaf Insect

The Chrisangi leaf insect is found only in Singapore. It is named after local nature photographer Chris Ang who discovered this unique insect in 2013. This charming leaf mimic feeds only on specific food plants. The loss of such food plants is a known threat to them. Of late, there has been a decline in its wild population locally.

At Mandai, we care for a sizeable insurance colony of the Chrisangi leaf insect. We have experienced success in rearing them, with about 600 individuals under our care. They can potentially be reintroduced into the forested areas of Singapore, and a structured plan to do so might be in place in the near future. These leaf insects have proven popular in our education programmes to raise awareness of native wildlife.







## Sunda Pangolin

Pangolins are the world's most trafficked mammals due to the high demand for their scales and meat in traditional medicine. In Singapore, the Sunda pangolin faces a different threat – traffic accidents. As our country continues to urbanise, it is imperative that we join hands with other stakeholders and the community to reduce roadkill incidences. We are also involved on many levels to save the pangolin from extinction:

### At Mandai

- We care for an insurance colony in Night Safari, which is the first facility in the world to have successfully bred the Sunda pangolin. In the FY, we absorbed a rescued wild female Sunda pangolin into our care to enhance genetic diversity for conservation breeding.
- We maintain a biobank of semen samples from local pangolin roadkills for use in future assisted reproduction.
- We provide medical treatment and rehabilitative support for some 20 injured and rescued pangolins each year.
- Our staff serves as the species coordinator for the Sunda pangolin Managed Species Programme. His role is to match genetically compatible Sunda pangolins for breeding and facilitate the transfers of individual pangolins among participating zoos.
- We have robust programming to engage, educate and empower the community to protect the Sunda pangolin.

### Mandai Nature

- Co-chairs the Singapore Pangolin Working Group with Mandai Wildlife Group and plays an instrumental role in implementing the Sunda Pangolin National Conservation Strategy and Action Plan together with NParks and various NGOs in Singapore.
- Funded research on the ecology of the Sunda pangolin in Singapore. The work provided insights into the species' interaction with roads and informed management options to prevent or minimise pangolin roadkill incidences.
- Collaborates with global and regional partners and stakeholders to strengthen synergies for Sunda pangolin conservation between zoos and field conservationists.



## Negros Bleeding-heart

The Negros Bleeding-heart is one of the rarest birds in the world, found only in the forests of Negros Island in the Philippines.

To prevent the species from slipping into extinction, Mandai Nature worked with Talarak Foundation to launch a conservation breeding programme in Jurong Bird Park in 2021. This pioneer breeding initiative outside the species' natural range saw successful hatchlings within three months of its inception.

As we welcome more hatchlings, we grow increasingly hopeful that the reintroduction of this species can be brought to fruition.

Importantly, Mandai Nature supports Talarak Foundation's work in combatting poaching of the species, conserving and enhancing Negros Island's lowland forest habitat, as well as engaging local communities to raise awareness of the bird – all to pave the way for future reintroductions.



# Providing Care & Rehabilitating Rescued Wildlife

Singapore is surprisingly rich in biodiversity, with wildlife thriving in our nature reserves, green spaces and even urban areas. Aside from providing the best possible care for our animals, we also play a vital role in protecting local biodiversity by providing medical care and rehabilitative support for rescued wildlife in Singapore.

Prior to November 2022, bird rescue cases were largely managed in Jurong Bird Park. With its move to Bird Paradise, all rescued wildlife cases are now admitted to Mandai Wildlife Health and Research Centre.

In the FY, a total of 1,143 rescued animals were admitted to our wildlife hospitals. Of these, 58% were nursed back to health and subsequently released by NParks. Forty-six individuals made a full recovery but were unfit for release. Some of them stayed on in our care while others were transferred to suitable facilities. Highlighted here are some noteworthy cases our Vets attended to.



## White-bellied Sea Eagle

As Singapore's largest bird of prey, the white-bellied sea eagle frequents inland reservoirs and coasts. An individual with severe lacerations on both feet sustained in a motor vehicle accident was brought to Jurong Bird Park. Surgery was done to debride, clean and close the wounds. Subsequently, it required daily bandage changes. The wounds healed well after several weeks. The sea eagle was then transferred to an aviary at Sungei Buloh Wetland Reserve. There, NParks staff closely observed its mobility and ability to capture prey on its own before it was released.



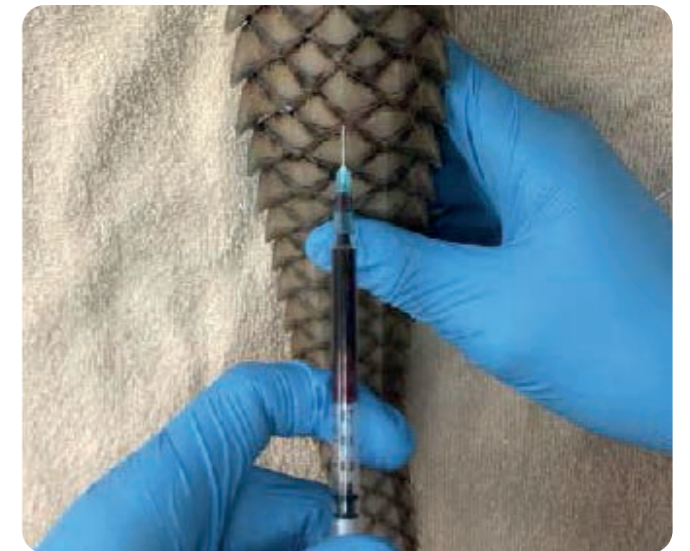
## Sunda Colugos

Found in most parts of Southeast Asia, these gliding mammals are nocturnal. In Singapore, they occur in the Central Nature Reserves, nature parks and secondary forests. In June 2022, an adult and two young colugos were found on the ground at Bukit Batok Nature Park. One young was dead upon arrival at our hospital. The adult had to be euthanised when its condition deteriorated despite intensive treatment. The sole survivor was bright and able to move well. It was warded for monitoring and supportive care. The youngster responded well to treatment and was later released at the rescue site by NParks.



## Pangolin Health Assessments

Sunda pangolins are among the most frequently admitted rescued wildlife. In the last decade, we received a total of 267 pangolins. Our veterinary team is highly skilled in pangolin health assessments, being able to perform in-house diagnostic imaging, orotracheal intubation and intravenous catheterisation. Pangolins that made a complete recovery were released into suitable nature areas while those that cannot be released due to various health conditions remain in our care.



## King Cobras

The king cobra is the world's longest venomous snake, and a native to Singapore. As a top predator that feeds on other snakes, it has an important ecological role in maintaining snake populations in its habitat. In July 2022, a young snake was found with an eye protruding from its socket and admitted to our facilities. The affected eye was surgically removed, and the cobra warded for treatment and monitoring. In October 2022, another individual, injured by a fishing line and hook, was admitted. It suffered multiple deep wounds. Our vets removed the hook and treated its lacerations. Both snakes responded well to treatment. They were microchipped for identification before being released in the wild by NParks.



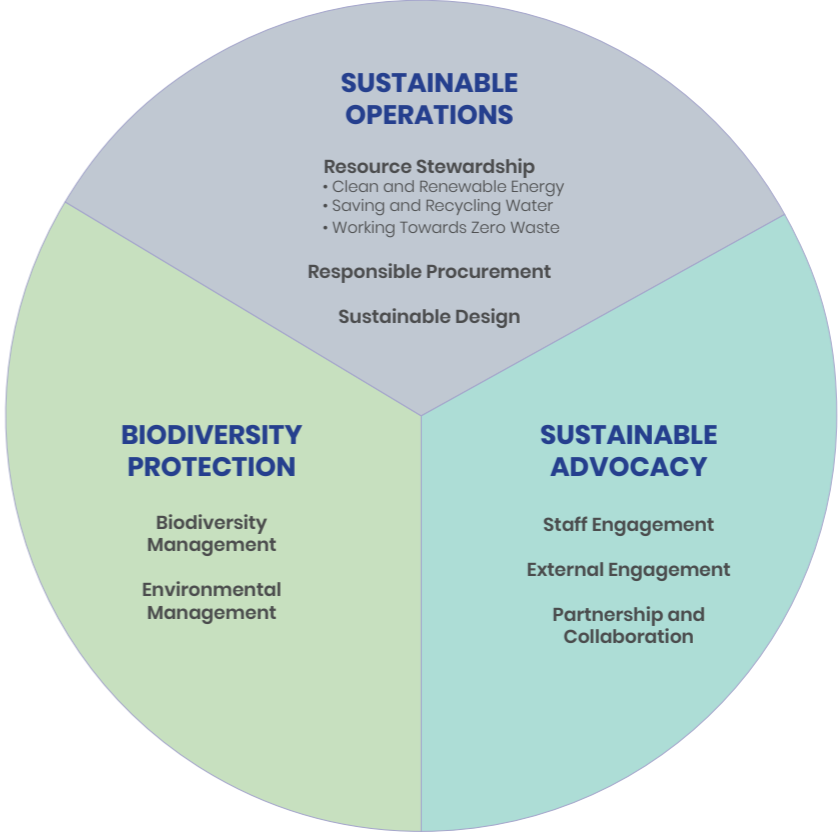


# Environmental Sustainability

Conscious of how human-induced climate change contributes to biodiversity loss and the inherent link between the two, we have focused on optimising and decarbonising our operations rapidly. This aligns to our purpose to create a world where people and wildlife thrive together.

During the FY, we:

- Achieved a **1%** year-on-year **decrease in energy consumption** for Singapore Zoo, River Wonders, Night Safari and Jurong Bird Park despite an increase of 42% in guest attendance, post Covid.
- Committed to **Science Based Targets Initiative (SBTi)**'s Net Zero standard to set emissions reduction targets.
- Strengthened our **Environmental Sustainability Strategy** to guide us towards carbon neutrality by 2024 and eventually, net zero. The strategy comprises three strategic pillars:
  - Sustainable Operations
  - Biodiversity Protection
  - Sustainability Advocacy



# Sustainable Operations

To deliver the highest quality of animal care and guest experience with the least ecological and climate impacts, we continued to develop and implement sustainability initiatives, in strategic alignment to our climate ambition.

In the FY, we also continued to make good progress on a range of environmental sustainability commitments (see Annex for details).

## Resource Stewardship

As an organisation dedicated to caring for the planet and protecting nature and animals, it is imperative that we exercise care and responsibility in managing resources. We achieve this by

- Using clean and renewable energy
- Saving and recycling water
- Working towards zero waste

### Clean And Renewable Energy

We aspire to power our parks using 100% renewable electricity by 2030 and the journey started since 2021 with on-site solar installation.

### Solar Energy

As of FY22/23, about 2% of our energy consumption is provided by on-site solar.

Additionally, we purchased and retired Renewable Energy Certificates (RECs) worth 12,000-megawatt hour. Together with our on-site solar and RECs purchased, 57% of our energy is from renewable sources. These RECs are from a solar facility from Vietnam and purchased in accordance with SS 673:2021 Code of Practice for renewable energy certificates.

### Green Transport

Since we embarked on the journey to electrify our internal fleet in 2018, we have made good progress. To date, we have electrified all our trams and buggies as well as 40% of vans used in our parks.

We target to switch our entire internal fleet to electric vehicles or vehicles with low carbon fuel by 2030. We are also working with transport providers to convert our shuttle buses to electric vehicles. More electric vehicle (EV) charging points will be made available at the upcoming developments, including six charging points in Mandai Wildlife West.

### Saving And Recycling Water

We aim to reduce potable water usage by 25% from 2020 baseline, by 2030.

### Leak Detection and Tracking

A key initiative to save water involved the use of leak detection devices and staff engagement to report leaks. The use of an application to activate prompt reporting and tracking further strengthens the efforts.

### Natural Substrate for Animal Bedding

Following the successful pilot to use horticultural residuals such as trimmed branches and leftovers from herbivore browse as animal bedding at back-of-house areas, more sections in Animal Care have embraced the practice. This not only reduces the need to clean the concrete flooring with water, but also improves animal welfare as natural substrate encourages animals to explore their environment.



More solar panels will be installed in Mandai Wildlife West.

### Towards Zero Waste

Our near-term target is to achieve a 60% waste diversion rate from incineration by 2030.

### Eliminating single-use fossil-based plastics

Since 2016, we have been progressively eliminating single-use fossil-based plastics in our parks, starting with bottled drinks, followed by single-use plastic carrier bags.

This FY, we started offering reusable cups for dine-in at our F&B outlets, resulting in waste reduction of some 2,000kg of single-use paper cups, that have plastic lining within.

With concerted efforts, we have eliminated all guest-facing single-use fossil-based plastics in our F&B outlets.

### Waste To Food

We are also doubling down on efforts to find means of giving waste streams a new lease of life.

Instead of discarding unused parts of vegetables such as broccoli and celery stems, the F&B team worked with the Wildlife Nutrition Centre team to repurpose these vegetables

as animal feed. Feeding trials to test the acceptance from our animals had produced encouraging results.

Our Wildlife Nutrition Centre team breeds mealworms and superworms using food scraps to optimise resources. The worms in turn become food for some of our animals. Apart from saving cost on animal feed, in-house production helps us become less reliant on external suppliers.



These pupae will grow into adult worms to serve as animal feed.



Broccoli stems repurposed as animal feed.

### Sustainable Design

Sustainable design is an important driver of our sustainable operations. The design of all new developments and upgrading projects in existing parks must adopt a low carbon and nature sensitive approach while taking into consideration the well-being of the occupants.

New parks under development will be certified by sustainability frameworks such as Green Mark (by BCA), LEAF (by NParks) and SITES (by U.S. Green Building Council). Our sustainable design guidelines also mandate construction of new developments and upgrading projects to be carried out in a sustainable and nature-sensitive manner.



Creating wildlife-friendly spaces with water bodies and native plants is one of our nature-sensitive approaches to our development.



### Responsible Procurement

Another effective strategy for reducing our carbon footprint is sustainable procurement. In 2019, we introduced a Green Procurement Policy (GPP) and established sustainability criteria for more than 20 product categories - from wood and paper products to food-related categories such as palm oil, seafood, and tea.

- **Sustainable Cooking Oil and Paper Products**  
Our kitchens have been using cooking oil that is 100% Certified Sustainable Palm Oil (CSPO) and we are on track to achieve 100% sustainably sourced products that contain palm oil derivatives by 2025. Similarly, we are on track to meet our target for 100% Forest Stewardship Council (FSC) certified or 100% recycled paper-based Mandai products by the same year.
- **Greener Menus – No Beef**  
In September 2022, we removed all beef items from our F&B menus. Beef has disproportionately high environmental impact compared with other types of meat and plant-based proteins. Agricultural greenhouse gases from cattle ranching and beef production contribute significantly to climate change which impacts all life on Earth. We choose not to serve beef in our F&B outlets as one of the ways to help our planet.
- **Sustainable Merchandise**  
To encourage guests to make sustainable choices, all our main retail stores feature 'Wildlife Sanctuary' - a dedicated space for sustainable merchandise ranging from reusable cutlery to plushies made of recycled plastic. We also partnered Soft Toy Hospital to upcycle pre-loved plushies donated by our guests and re-donate them to selected charities.



RSPO 1106250

**Right:** Our F&B outlets are featuring increasingly diverse menus with sustainably-sourced ingredients.



# Protecting Wildlife in Our Backyard - The Focal Species Approach

Mandai precinct is located in close proximity to the Central Catchment Nature Reserve and is therefore immensely biodiverse. It is home to many native animals. To protect the natural heritage in our backyard, we work tirelessly with Mandai Nature, our conservation arm, to enhance the eco-connectivity in and around Mandai precinct. We have also identified eight focal species found in this area to prioritise conservation and management efforts. Below, we highlight one of the focal species - the straw-headed bulbul.

## Saving The Last Straws

The straw-headed bulbul is native to Southeast Asia. It sings a beautiful complex song that has made it the target of extensive poaching for the songbird trade. Once common, it has been driven to extinction across much of its range. Worldwide, there are at most 1,700 birds left in the wild, making it critically endangered. Happily, Singapore is the global stronghold for the species with an estimated population of 500 birds. Mandai precinct is possibly supporting 5% of the global population. As custodian of the precinct and an organisation dedicated to protecting wildlife, we work with our partners on a multi-prong approach to ensure that the straw-headed bulbul continues to thrive in Mandai, Singapore and its remaining range in Southeast Asia.

### At Mandai

- We care for the straw-headed bulbul in Bird Paradise. To date, we have successfully bred eight chicks. Our aspiration is to reintroduce the species into its native range eventually and we will continue to work with partners and stakeholders towards achieving this goal.
- We developed best practice guidelines on the care requirements of the straw-headed bulbul to share with zoo professionals who are interested to work with the species.
- We work with Mandai Nature on an action plan to protect wild straw-headed bulbuls within Mandai precinct.

### Mandai Nature

- Funded a study by a Masters' student to establish the bulbul's wild population size within Mandai precinct. The study also gathered information on the bird's behaviour and determined its key habitats for feeding and nesting. This study sets the foundation for further research work to guide us in habitat enhancement to better protect the bulbul.
- Participates as a member of the Straw-headed Bulbul Working Group, which works with other stakeholders to develop and implement a Species Action Plan to ensure that the species continues to thrive in Singapore.
- Supports Planet Indonesia's ongoing efforts to combat the illegal songbird trade in West Kalimantan. The funding went towards the construction of the Wak Gatak Songbird Rescue Center which was officially opened in June 2022. This is the first such facility in Kalimantan to support the welfare, rehabilitation and release of rescued songbirds, including the straw-headed bulbul.
- Joined the NParks-led Singapore delegation to successfully lobby for the uplisting of the critically endangered straw-headed bulbul from Appendix II to Appendix I for better protection in the global songbird trade.



### An Ecologically Connected Mandai

Guided by the principle to develop the biodiverse Mandai precinct sensitively, we identified enhancing habitats for native wildlife and forging an ecologically connected Mandai as key priorities, which led to the completion of Mandai Wildlife Bridge as the first feature of the Mandai Precinct Development Project. We also set aside areas for buffers to ensure that the integrity of the CCNR's forest edge is not compromised. At the same time, we set our sights on restoring 2.7 hectares of degraded land in the precinct; to date over 0.33 hectares have been restored.



- 1 & 2. Mousedeer and civets are amongst the 70 vertebrate species that use Mandai Wildlife Bridge for safe crossing.
- 3. The vegetation on Mandai Wildlife Bridge is thriving with good canopy cover that enhances connectivity for arboreal animals.

### Mandai Wildlife Bridge

The Mandai Wildlife Bridge landscape was intentionally designed to transform into a multi-layered forest-like environment, facilitating wildlife movement across Mandai Lake Road. In April 2022, we celebrated the first sighting of a lesser mousedeer, followed by six more sightings during the FY. Our latest flora monitoring session in September 2022 confirmed that the trees are thriving, achieving an average canopy cover of 85% - exceeding our target of 80%.

Since the bridge opened in December 2019, we have observed almost 70 vertebrate species using it for inter-habitat movement, along with 14 bat and bird species flying over the vegetation.

### Rooting Out Zanzibar Yam

The Zanzibar Yam, a climber introduced into Singapore from Africa, has invaded our parks in great numbers. This invasive plant grows exponentially, smothering trees within its grasp with its "Batman" leaves, causing host trees to die from lack of sunlight. The yam's underground tubers must be removed whole, not mashed into pieces, as they can grow into new plants. With the help of staff and volunteers, the Horticulture team led the effort to weed out the yams in our parks. This helps to protect our native plants, which are important food sources for many native animals.



## Sustainability Advocacy

[Please refer to following chapter "Spreading the Message"]



## Spreading The Message

The ultimate goal of conservation education and communication is to inspire behaviour change for the benefit of people, wildlife and the planet. With the further easing of Safe Management Measures in Singapore, we were able to resume in-person engagement with educators for the multiplier effect to help spread the message. We also intensified efforts to explore more communication channels, develop innovative programmes and activate campaigns for all segments to advocate for wildlife conservation and sustainability as well as facilitate behaviour change. As an organisation dedicated to caring for the planet, we are keenly aware of the importance of staff engagement for collective action to protect wildlife and embrace sustainable operations. To this end, we ramped up advocacy efforts to engage our colleagues.

Over the FY, we:

- Reached out to **253,000** students, park guests and members of the public with conservation and sustainability messaging.
- Inspired over **15,000** positive actions by Ranger Buddies who completed the missions via the RB Web App.
- Engaged a record number of **450** volunteers, who put in a whopping **13,500** hours towards guest engagement, animal care, and research data collection. Additionally, over 110 volunteers contributed **860** hours helping us in translocating birds from Jurong Bird Park to Bird Paradise.
- Established the **Education Advisory Panel** to strengthen Mandai's Living Classroom positioning by providing guidance on alignment to education best practices, emerging trends, and innovative pedagogies.



# Inspiring Behaviour Change and Positive Actions

During the Covid pandemic, learning journeys and overnight camps at our parks came to a halt. We took the opportunity to refresh in-park offerings with greater emphasis on self-directed explorations that inspire positive actions for wildlife and behaviour change to embrace sustainable living. Guided by our Conservation Communication Framework (CCF), we curated an array of programmes that allowed participants with different levels of exposure to wildlife conservation and sustainability to explore and find the connection with nature.



**Above:** Our volunteers engage guests through station-based as well as roving modality to increase touch points.



## Fighting Deforestation (Season 2)

Building on the success of Fighting Deforestation Season 1, which generated tremendous awareness of the impact of deforestation on wildlife and people, we laddered up with a call to action for Season 2, encouraging our guests to make sustainable choices. At the 'supermart' created by staff and volunteers using recycled materials, guests learnt to recognise labels like Forest Stewardship Council (FSC), Rainforest Alliance and Roundtable of Sustainable Palm Oil (RSPO), which certify a product's adherence to sustainable standards. Many guests remarked that they had not noticed the logos before when grocery shopping or did not know what they meant. After the interactive session, they felt empowered to make sustainable choices to protect rainforest animals such as the orangutan.



## Overnight Camps

By January 2023, school overnight camps resumed with a refreshed programme to deliver various outcomes that scaffold from the basic level of creating awareness to encouraging participants to take positive actions on a sustained basis. Educators and students alike responded well to the refreshed camp programme with positive feedback that validated the desired outcomes.

## Love Your Locals

During the National Day month in August, our volunteers played the role of Roving Rangers, delighting guests with a card game to generate awareness of the rich local biodiversity and on how to live along native wildlife. Adopting a roving approach instead of the conventional station-based engagement allowed the volunteers much flexibility in reaching out to more guests at various touchpoints.

## Pet Responsibility – Caring for Rabbits 兔 (Tù)-gether

2023 is the Year of the Rabbit in the lunar calendar, the perfect opportunity to discuss responsible pet ownership. In-park activity booths were helped by a total of 65 volunteers who gave generously of their time during the festive Lunar New Year period. A five-part video series was also released on our social media platforms to educate existing and potential rabbit owners on the dietary and environmental specifics required to keep rabbits in the pink.





### A New Lease of Life For Plushies

One is never too young to take climate-positive action – this is our message for our initiative to give a new lease of life to pre-loved plushies. We activated a donation drive in December 2022 for plushies – those in good condition were re-distributed to under privileged children while damaged ones were repurposed by ‘surgeons’ at Soft Toy Hospital before re-distribution. The great response from members of the public inspired us to organise regular workshops for children and their families to try their hands at performing ‘surgeries’ to repair damaged plushies and give them a new lease of life.

### Encouraging Climate-positive Choices

With the impact of climate change affecting all life forms in an unprecedented manner, there is an urgent need for us to spread the message and advocate for collective actions to combat it. In the FY, we hosted sustainability talks and tours for corporate and community partners, schools and institutes of higher learning, inspiring over 1,300 guests to make climate-positive choices. To strengthen our advocacy efforts, we went beyond Mandai and shared our sustainable best practices at events hosted by industry partners such as Sustainable Changi Conference, HSBC Jade Dinner Event and IAAPA APAC Trade Summit 2022.

To inspire others to act, we shared our journey at a Singapore Alliance for Sustainable Palm Oil (SASPO) Event. By participating in such alliances, we can lead business initiatives towards a common goal.

## Animal-Inspired Mother Tongue Language Programmes



**Above:** Dr Mohamad Maliki Osman, Second Minister for Education and Chairperson of the MLLPC was the Guest of Honour at the launch of Kembara Nusantara.

Since 2016, our iconic panda-inspired mother tongue language programmes Wow Wild Learn (WWL) have connected thousands of preschoolers with wildlife while redefining their experience in learning Chinese, Malay or Tamil.

Driven by our aspirations to position Mandai as the go-to outdoor venue for preschoolers to learn the different mother tongue languages, we collaborated with our partner, the Malay Language Learning and Promotion Committee (MLLPC) to develop a new programme titled Kembara Nusantara. Unlike WWL, which focuses on giant pandas, this new offering features animals such as the orangutan, mousedeer and sun bear found in the Malay Archipelago

(Nusantara), allowing for a more relevant and stronger cultural narrative to enrich the learning experience of the Malay language. The programme design is rooted in our user journey mapping which covers in-park experiences as well as pre and post-visit engagement. The curriculum includes a specially designed resource pack, a one-day workshop to train preschool teachers to use the resource pack and to conduct learning journeys at the Zoo.

Kembara Nusantara was officially launched on 29 September 2022 by Dr Mohamad Maliki Osman, Second Minister for Education and Chairperson of the MLLPC.



# Educator Engagement

In the FY, we deepened existing partnerships and forged new ones to reach out to educators. Through sharing sessions and in-person workshops, we empowered them with the knowledge to design meaningful learning journeys to our parks as well as pre and post visit extended learning experiences.

## Integrated Programmes Incorporating STEM Education, Design Thinking and Sustainability

As a strategic approach to diversify our programmes with relevant learning outcomes for students, we curated workshops that integrate STEM Education, Design Thinking and Sustainability. This aligns well to Ministry of Education (MOE)'s goal to nurture eco stewards with 21<sup>st</sup> century competencies. In June 2022, we conducted a virtual sharing session for 93 educators to showcase our new offerings. Encouraged by the positive response from the sharing, we went on to partner MOE and co-hosted a teacher training session at the Zoo for 31 educators and curriculum planners to have a first-hand experience of the new offerings. The participants also gained insights into crafting

place-based sustainability programmes for self-guided experiences in our parks. Feedback obtained from the educators and curriculum planners guided us in refining the workshops before they were made available to students.

We also hope to inspire sustainable best practices in schools by sharing Mandai's sustainability journey with school leaders and their operations staff. Our first such engagement was with 25 staff from Fuchun Secondary School in November 2022, with many more similar sharings with other schools and Institutes of Higher Learning lined up.

“The focus on Design Thinking and STEM in sustainability is good. So many hidden gems and [so much] hard work by your team that we're not aware of. Thank you for sharing!”

*Teacher participant of our teacher training session*



## Outdoor Learning

The strong emphasis in outdoor learning for preschoolers is the impetus for us to intensify efforts to train educators in facilitating meaningful place-based learning. Arising from a new partnership with National Institute of Early Childhood Development (NIEC), we delivered a webinar for educators in preschools across Singapore, and outdoor learning workshops which were attended by 71 participants. In the FY, we continued to engage PAP Community Foundation (PCF), Singapore's largest preschool operator, to train their educators on Creative Facilitation in Outdoor Learning.



## Pilot Training Programme for Educators

Unlike preschool teachers, educators and educator aides support the learning and developmental needs of younger children (below three years of age). The dearth of training programmes for this segment prompted us to join hands with Presbyterian Preschool Services (PPS) in piloting a workshop to support these educators to design learning journeys for the little ones. The pilot will guide us well in curating user-centric content to train this underserved segment.



# Engagement With Institutes of Higher Learning

We constantly seek meaningful partnerships with Institutes of Higher Learning (IHL) to provide authentic learning opportunities for students through guest lectures, mentorship for problem-based projects, and internships. At the same time, we hope to excite these youths about the actions they can take to build a sustainable future for themselves. These interactions may encourage them to consider career options in Mandai Wildlife Group.

In the FY, we hosted students from Singapore Institute of Technology (SIT) and Singapore Management University (SMU) undertaking the SIT Social Innovation Project Module and SMUx Innovation Project Module respectively. Adding to our list of partners was James Cook University (JCU), which has disciplines in Environmental Sustainability and Psychology.

With the signing of a Memorandum of Understanding (MOU) in March 2023, we look forward to a fruitful collaboration and increased opportunities to engage students and academia in social science research to help us shape our campaigns and communication approaches to inspire behaviour change for sustainable living.



# Ranger Buddies (RB)

RB seeks to nurture every child into a future-ready global citizen and a responsible steward of our planet by embedding learning touchpoints throughout a child's environment. Since its launch in October 2020, Ranger Buddies programme has attracted 55,000 children to join us in protecting wildlife and the planet.

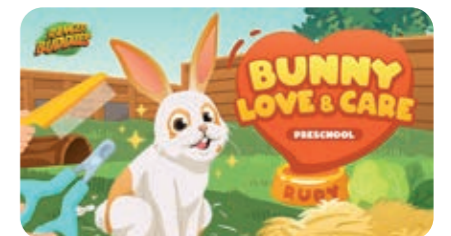
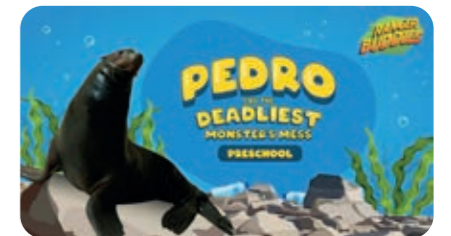


## Inspiring Daily Positive Actions

Over the FY, more than 15,000 missions were completed through the RB Mission Web App, which saw children committing to daily positive actions. On-ground activations at various malls rallied children to end deforestation. In the first ever RB beach clean-up co-organised with Friends of Marine Park, children rolled up their sleeves and took concrete action to protect aquatic ecosystems.

## Ranger Buddies Virtual Shows

The virtual shows continued to enjoy tremendous viewership, attracting an average of 20,000 children from over 500 preschools for each screening. To encourage active participation, we curated pre and post-show resources and activities to facilitate extended learning experiences that involved not only the preschoolers and their educators but also their parents. In the FY, we educated over 80,000 preschoolers on responsible pet ownership, marine pollution, biodiversity of birds, and the important ecological roles of invertebrates.



# Mandai Monopoly and Top Trump Cards

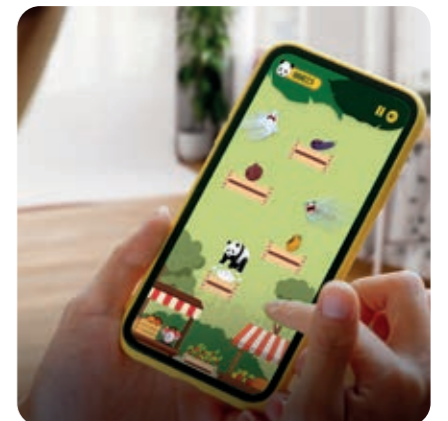
# Campaign - Choose Good With Mandai



We are constantly exploring novel ways to educate people on wildlife conservation. Play for wildlife is the concept that that guided the narrative of Mandai Monopoly. This special edition is an interactive way to learn about the threats faced by wildlife and the positive action one can take to protect threatened species. Released at the same time was a set of animal-inspired Top Trump Cards – a different game play but with the same objective of educating people on wildlife conservation in a fun way.



In October 2022, we launched Choose Good with Mandai campaign to highlight how making conscious choices such as rescuing 'ugly food' or choosing sustainably made products can go a long way in protecting wildlife and preserving natural resources for generations to come. Members of the public had the opportunity to participate in two activities: the Choose Good Food Trail and the Choose Good Game Challenge. The campaign also brought together 20 like-minded F&B brands to create exclusive food items and grocery bundles inspired by the diets of threatened animals such as the Celebes crested macaque and Malayan sun bear. A portion of the partners' earnings went to supporting our conservation efforts in Singapore and the region.



# Digital Engagement

The world is our oyster when it comes to engaging people digitally on wildlife conservation and sustainability. Not limited by physical spaces, digital platforms allow us to connect 'digital guests' worldwide with wildlife and inspire positive action.



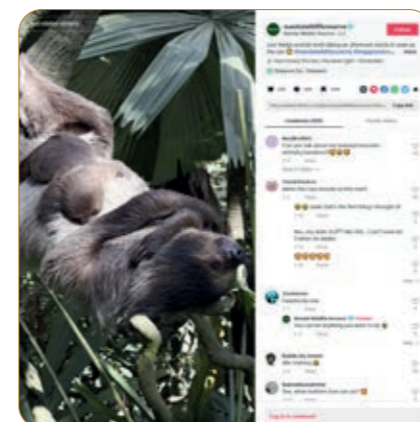
## Conservation Champions Webinar Series

Initiated in FY21/22, this webinar series continued to showcase Mandai's efforts in caring for threatened species while highlighting the conservation projects we support locally and regionally. Two webinars - Rehabilitating Rescued Wildlife and Protecting Pangolins attracted over a hundred participants in total and many provided encouraging feedback that through the sharing, they became aware of the actions they can take to help protect wildlife.



## Social Media

In the FY, the number of followers on our social media channels expanded to 1.1 million, with the highest growth for TikTok which added 58,000 followers. Our content garnered high engagement with 2.8 million reactions, comments, link clicks, shares and saves. By leveraging on the growth of Instagram Reels and tapping onto YouTube Shorts, we were able to push out high-performing videos more regularly to relevant online audiences. Video views ballooned to 53 million, allowing us to share Mandai stories with local and overseas 'digital guests' and inspire them to protect wildlife.



# Staff Training and Advocacy

We rally our staff to protect wildlife and embrace sustainable best practices so that we can harness the collective efforts to meet our goal in achieving carbon neutrality by 2024. Training for staff on environmental sustainability starts from induction level and progresses to compulsory e-training modules. Specially curated programmes are also made available to various departments with specific training needs. In addition, we organised two campaigns to motivate staff to learn more about sustainability and the actions they can take for wildlife, people and the planet.

## 7-Days Green Day Challenge

In support of the Ministry of Sustainability and Environment (MSE)'s Climate Action Week 2022, we organised a 7-Days Green Day Challenge to share simple actions that we can take to reduce our carbon footprint. We also held cleanups around Mandai Wildlife Reserve, with 150 kg of trash collected in forested areas of the parks as part of overall ecological restoration efforts.



## Out of The Blue

We rolled out an internal campaign 'Out of the Blue' in support of World Water Day, which included a digital trail, hackathon, and talks aimed at inspiring staff to take daily actions to save water at the workplace and at home.



Staff training empowers our colleagues to embrace sustainable best practices at the workplace and beyond.

# Our Volunteers

Year 2022 marked the 25th anniversary of our volunteer programme, which has grown from strength to strength since its launch in 1997. The number of volunteers has climbed steadily over the years, reaching a record high of 450 volunteers by the end of this FY. It is heartening to see a growing number of liked-minded individuals stepping forward to commit to our cause.

The dedication of our volunteers has been tremendous. In the FY, they contributed 14,360 hours helping us engage guest, care for our animals, translocate birds and conduct research.



Docents contributed 860 hours helping in the translocation and observation at Bird Paradise.

Our volunteers engage guests through station-based as well as roving modality to increase touch points.

## Our Longest Serving Volunteer

Ms Johanna Salim started her volunteering journey with us in 1997, the year when we initiated the programme. Twenty-five years on, as the most senior member of our volunteer community, she continues to inspire us with her dedication and commitment in spreading the conservation message. Over and above her regular duties in KidzWorld, Johanna actively volunteers in various campaigns and guides new docents. On behalf of all the animals, we would like to say a BIG thank you to Johanna for being an advocate for wildlife conservation and a role model for our volunteers!



“It has been a wonderful 25 years with the Zoo, working with the staff and fellow volunteers to care for our animals!”

*Johanna Salim, our longest serving volunteer*

## Student Research Volunteer Programme

We initiated this programme to offer students the opportunity to work with our Animal Care Team and gain hands-on experience in research-related tasks such as observing and recording animal behaviour. The programme also provides insights into the research work we carry out as a zoological institution. It is hoped that this programme will nurture a strong research culture and interest in animal care for capacity building.



## Volunteer Recruitment

We resumed recruitment for volunteers after a hiatus of two years because of the Covid pandemic. Over 200 applications from individuals from all walks of life were received. We had to manage the overwhelming response by training the new volunteers in phases. We welcomed the first batch of 55 Docents and 51 Conservation Ambassadors in the FY and the rest were invited to help out in ad-hoc campaigns while waiting to be inducted into the volunteer programme at a later date.



## Corporate Volunteer Programme

As our corporate sponsor, StanChart strengthened their support for us by involving their staff in caring for the animals. We piloted a 3-hour Upcycle for Wildlife Workshop for 100 StanChart employees during which they created animal enrichment devices using recyclable materials. The devices were presented to some animals for a good mental and physical workout. Animal enrichment

devices are often time consuming to create and having corporate volunteers to help create them will lighten the workload of the Animal Care team. The participants were very appreciative of the opportunity to do their part for wildlife while they bonded with their colleagues. With the success of the pilot, we will be offering this programme on a regular basis to our corporate sponsors.





# Building a People-focused Culture

In the FY, we added a corporate purpose statement - **A World Where People and Wildlife Thrive Together**. With this, we strengthened our People pillar by nurturing an even stronger people-focused culture not only for members of the Mandai family to achieve professional and personal growth but also to ensure that our parks are accessible to every segment of the community, especially those with special needs and from disadvantaged backgrounds.

We continually engender a lifelong learning mindset in our workforce, particularly with the advent of a mobile learning platform offering over 100,000 courses. Knowledge sharing events and peer-to-peer learning opportunities such as conferences allow our staff to upskill and keep abreast of the latest best practices in their field of expertise. Specially curated workshops and innovation platforms also equip them with the mindset and know-how to push the envelope to deliver exceptional guest experiences and the best possible animal care.

To cultivate an inclusive workplace culture and a safe space for all members of the Mandai family, we enhanced our Diversity, Equity and Inclusion policies to combat discrimination and harassment.

## FY22/23 HIGHLIGHTS

- Launched the **Mandai Co-Innovation Programme** on the IMDA platform to tap into Singapore's vibrant technology ecosystem for innovative solutions. This will propel us towards delivering smart, integrated wildlife park experiences and operations.
- Enhanced our Diversity, Equity and Inclusion policies; this initiative was brought to life through **Mandai FesDival** to promote awareness amongst staff members.
- Promoted a lifelong learning mindset amongst staff with the launch of **over 100,000 mobile learning courses** covering a vast array of topics.
- Rolled-out a series of **design thinking and service workshops** as well as specialist skills training.
- **Hosted 7,000 beneficiaries** from various social service agencies at our four parks with complimentary admission and tailored programming.



# Human Capital Management

Our staff members are integral to the operation of our wildlife parks in achieving the highest possible animal welfare standards as well as delivering meaningful wildlife experiences that inspire people to protect nature and wildlife. We take utmost care in the management of our human capital, to strategically attract, develop, engage, retain, and optimise the value of our workforce.

## Diversity, Equity and Inclusion

### Mandai FesDival

In line with the enhanced Diversity, Equity and Inclusion (DEI) policies, we organised Mandai FesDival for staff members to celebrate diversity and promote inclusion. At the event, they also made a commitment to value and respect individual differences. Additionally, a toolkit was created for management to conduct follow-up activities for team members and foster meaningful conversations around DEI.



### Combatting Workplace Discrimination and Harassment

Stemming from our Diversity, Equity and Inclusion initiatives, we have implemented a zero-tolerance policy for unlawful discrimination and harassment in the workplace. Employees can report any inappropriate behaviour through their supervisors, heads of department, HR business partners, or a whistle-blowing channel. These options create a safe space for staff to voice their concerns without fear of reprisal.



Our Mandai FesDival for staff members had activities celebrating diversity and promoting inclusion.



Staff members at Project Dignity to learn more about the social enterprise, which trains and places differently-abled and disadvantaged individuals in the F&B, hospitality and retail sectors. We actively support individuals with special needs through employment opportunities, internships, and work attachments.

### Special Needs Individuals in Our Workforce

Through collaboration with APSN Delta Senior School (DSS), APSN Centre for Adults, and Project Dignity, we were able to actively support individuals with special needs through employment opportunities, internships, and work attachments. Arising from these partnerships, we offered two permanent part-time F&B positions for special needs adults, with the support of an APSN job coach. Likewise, the second batch of DSS interns joined our F&B team on a two-day work week basis. We also provided work attachments at our retail store for students from Spectra Secondary School.





**Above:** The Experience and Innovation Hero Awards reward staff who embody outstanding characteristics of service and hospitality.

**Right:** Emmey Mohd Bin Nenpari from Night Safari operations was crowned Experience Hero of the Year.



## Staff Recognition

### Excellent Service Award

The Excellent Service Award 2022 is a national award that recognises individuals who have delivered quality service. Amongst our staff members, 24 were conferred the Gold Award, 219 the Silver Award, and two were honoured with the Star Award. Muhamad Fahmi from Night Safari operations won the prestigious Shining Star Award. These awards are a testament to our commitment in providing exceptional service. Indeed, our many role models and champions inspire our service staff to scale new heights.

### Experience and Innovation Hero Awards 2022

The Experience and Innovation Hero Awards reward staff who embody outstanding characteristics of service and hospitality. In 2022, we had 62 nominations across 16 departments, with 12 individual winners and two project wins. To top it off, Emmey Mohd Bin Nenpari from Night Safari operations was crowned Experience Hero of the Year.

### Honouring 50 Years of Dedicated Service

We are proud that two exceptional individuals, Kumar Pillai and Rahman Bin Yusoff, have both dedicated 50 years of service to Mandai. This milestone reflects their unwavering commitment and passion for our organisation.

As Vice President of Special Projects in Life Sciences, Kumar joined Singapore Zoo even before it was officially opened. Starting as a keeper, he steadily climbed the ranks, becoming assistant curator, curator, and director of zoology. Today, Kumar is an inspiring pioneer in the international zoological community and a respected leader.

Rahman Bin Yusoff is a Senior Executive in Horticulture. At the tender age of 16, he began working for us as a general worker. Over time, Rahman has acquired a diverse skill set and expert knowledge in horticulture. From managing mulberry distribution for primates to harvesting bamboo for pandas, he has done it all. Rahman also leads our waste management efforts today.



Both Rahman Bin Yusoff (left) and Kumar Pillai (right) have served in Mandai for half a century. They were honoured during our Dinner & Dance event for their dedicated service.

# Well-Trained Workforce

Staff training, conferences and study trips allow our employees to acquire new skills and knowledge and stay abreast of industry trends and best practices. This will translate to effectiveness, improved productivity, and innovation. Ultimately, an engaged workforce will enable us to provide better care for our animals, raise our conservation contributions, and outdo ourselves in delivering sterling guest experiences.

## Enhancing Guest Experience

Our Guest Satisfaction Survey helps us understand guest expectations and perceptions of our offerings, and identify gaps for improvement. In this FY, our Guest Satisfaction Score hit 86% which is 12% above the Customer Satisfaction Index for Singapore's tourism sector (2022). While we are delighted to have done well, we are not resting on our laurels. As we curate Mandai as integrated wildlife destination for guests to learn, play, dine, shop, stay and recharge, it is imperative that we deliver exceptional and differentiated experiences to serve different guest segments.

With our sights set on raising the bar for guest experiences, we rolled out Design Thinking and service training workshops to inspire our staff and upskill them with the know-how. The first workshop was a customised **'Design Thinking Foundational Course'** for Education Department to curate customer-centric programmes that are relevant to students while inspiring them to take action for wildlife.

The second workshop **'Using Data in Design Thinking'**, saw active participation from some 160 staff members from various



departments. The workshop empowered participants to adopt an evidence-based approach using data to design exceptional guest experiences and improve work processes.

The third workshop on **'Creating HEARTBEATS'** engaged some 450 service staff from F&B, Park Operations and Retail. The session challenged every service staff to create heart space for Mandai in all guests through providing an atmosphere of care, empathy and warmth.



## Embracing Mobile Learning

To nurture a lifelong learning mindset at organisational level, learning opportunities must be accessible. Since June 2022, we have made available over 100,000 online courses to our staff members. Covering a vast array of topics, the courses allow them to take ownership of their learning journey at their own pace. To kickstart this learning transformation, we organised roadshows during which we onboarded 500 staff members onto the mobile learning platform. Their positive experience and valuable feedback will pave the way for our next phase of implementation.



We have made available over 100,000 online courses to our staff members since June 2022 to promote mobile learning.



Early childhood specialist Beth Fredericks held a workshop for our Education team on intentional programme design that encourages preschoolers to practise social-emotional learning skills while learning about wildlife conservation and environmental sustainability.

## Facilitating Social-Emotional Learning for Preschoolers

We position our parks as living classrooms with specially curated learning journeys that incorporate multi-disciplinary exploration, and hone life skills. Guided by this strategic intent and aligning to Early Childhood Development Agency's emphasis on Social-Emotional Learning (SEL), we engaged early childhood specialist Beth Fredericks to facilitate a workshop for the Education team, bringing them up to speed on SEL concepts. The session focused on intentional programme design that adopts a holistic approach to connect children to the natural world while promoting self and social awareness, and responsible decision making.



Mandai staff presenting at the 30th SEAZA (Southeast Asian Zoos and Aquariums Association) Conference with the theme 'Stronger Together for Sustainable Conservation and Eco-Tourism'.

## Knowledge Sharing in the International Zoo Community

In the FY, our staff actively participated in numerous global conferences and workshops as part of staff development and capacity building. One major event was the EAZA (European Association of Zoos and Aquaria) Annual Conference 2022 which attracted 920 delegates of which four presenters were from Mandai. Similarly, we were at the 30th SEAZA (Southeast Asian Zoos and Aquariums Association) Conference with the theme '**Stronger Together for Sustainable Conservation and Eco-Tourism**'. This gathering had 199 attendees including our team of 22 staff who shared on various issues such as:

- 'Mate aggression in cockatoos and implications for captive populations',
- 'Positive reinforcement training to improve the welfare, husbandry, and medical management of avian inpatients',
- 'Enhancing the welfare of programme animals through free ranging opportunities at the Singapore Zoo'.

We also held an engagement trip with six of our Indonesian zoo partners to discuss collaborations on animal exchanges, capacity building and husbandry. Another highlight was the SEAZA Primates Integrated Collection Assessment and Planning Workshop. The event connected field conservationists and experts from zoological institutions to facilitate the development of a regional primates collection plan for SEAZA members to achieve the best possible conservation outcome.



## Upskilling in Animal Care



### Animal Management Course

The Animal Management Course (AMC) aims to help Animal Care staff understand the five domains of animal welfare, behavioural management and enrichment. Most importantly, the training allows staff to appreciate the important role they play in ensuring the highest standard of animal welfare and their contribution to protecting wildlife. A total of 32 Animal Care staff graduated from AMC this FY.

### Zookeeper Development Programme

The Zookeeper Development Programme (ZDP) equips our Animal Care staff on different competency levels that focus on hands-on and operational animal care skills. The coaching component ensures the flow of accumulated knowledge from senior to junior staff. During the FY, 44 Animal Care staff completed one level of ZDP. Since its launch in November 2019, 115 staff have attained a minimum of one level of ZDP out of which 66 staff have completed all modules assigned to their levels.

## Driving Ground-Up Initiatives

In the FY, we established a staff special interest group focusing on ground-up initiatives. The objective is to empower our staff to challenge the status quo and provide them with the knowledge and tools to design and implement creative solutions to improve work processes. To this end, we conducted training for staff to utilise technology - Microsoft Power Apps - as an enabler to drive community-based problem solving.

## Internships

We award internships to students from a range of institutes of higher learning to provide targeted learning experiences and expose them to our world-class operations. A total of 83 interns were deployed to various departments across our organisation.

INSTITUTES OF HIGHER LEARNING	NO. OF INTERNS
APSN Delta Senior School	1
Spectra Secondary School	2
<b>Institute Of Technical Education</b> College Central College West	22
<b>Polytechnic</b> Ngee Ann Polytechnic Republic Polytechnic Singapore Polytechnic Temasek Polytechnic	34
<b>University</b> Nanyang Technological University National University of Singapore Singapore University of Social Sciences University of Exeter University of Bristol University of Queensland	24
<b>TOTAL</b>	<b>83</b>

# Nurturing An Innovative Culture

As we position Mandai precinct as a wildlife destination for guests to learn, play, dine, shop, stay and recharge, layers of complexity are added to our operations. To face the challenges ahead, we recognise the tremendous potential to embark on a business transformation, tapping into the vibrant technology ecosystem for innovative solutions to deliver smart, integrated wildlife experiences. The technology-centric transformation will help us enhance animal welfare, meet the distinct challenges of zoo operations, and unlock creative ways for guests to experience our parks. The Mandai Open Innovation Lab was launched during the FY to drive this transformation, with a branded co-innovation programme, innovation forum and seminar, as well as partnerships and startups.

**Mandai Innovation Forum 2022 @ SWITCH**

**25,000 attendees**



**Left:** Building networks and forging partnerships to tap into the vibrant technology ecosystem is our strategic approach to transformation.



**146+ New partnerships**

In Partnership with  
**SWITCH**  
SINGAPORE WEEK OF INNOVATION & TECHNOLOGY



**Above:** Mr Heng Swee, Deputy Prime Minister and Coordinating Minister for Economic Policies (middle) visiting our showcase of innovation initiatives at SWITCH 2022, Resort World Singapore.

## Mandai Innovation Forum @ SWITCH 2022

The annual Mandai Innovation Forum was held on 28 October, in conjunction with the Singapore Week of Innovation and Technology (SWITCH) 2022. The half day virtual programme included a fireside chat, panel discussion with speakers from WWF and Standard Chartered amongst others, presentation by Amazon Web Services, and sharing of Mandai's innovation projects.

The forum promoted MWG as the thought leader in our deployment of emerging technologies to rejuvenate Mandai precinct as an integrated nature and wildlife destination. We also participated in SWITCH 2022 flagship event held over three days in Resorts World to showcase our innovation projects.

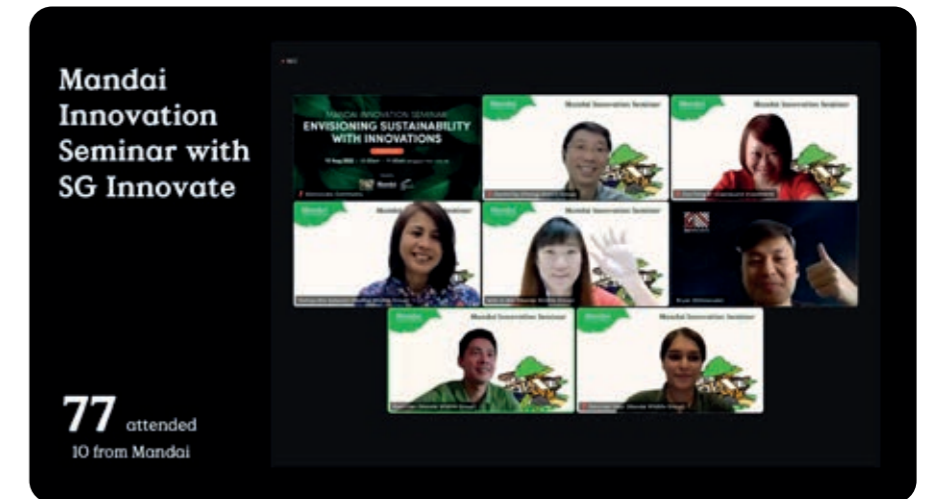
## Mandai Co-Innovation Programme

Riding on Infocomm Media Development Authority's (IMDA) Open Innovation Platform (OIP), we have leveraged innovative technology to improve our operations since June 2021 with eight projects to date. OIP matches tech companies with organisations to benefit from game-changing solutions. It provides consultancy support to diagnose business challenges, define problem statements, and crowdsource solutions from 12,000 technology providers.

This FY, we launched the Mandai Co-Innovation Programme hosted on OIP to accelerate the innovation process. The programme brings forth new tech solutions to address our unique problem statements around animal care, sustainable operations, and immersive wildlife experiences across our parks. We put up three problem statements and received 25 proposals that were evaluated for solution fit, applicability, and readiness. Three winners were subsequently announced. They secured \$150,000 in prize money and received support from Amazon Web Services cloud computing platform to work on our three problems and develop prototypes for the solutions.

## Mandai Innovation Seminar

Drawing on the theme 'Envisioning Sustainability with Innovations', the virtual Mandai Innovation Seminar brought together 77 attendees on 12 August 2022 for meaningful exchanges. Presenters and panelists hailed from Mandai Wildlife Group, Grand Hyatt Singapore, Changi Airport Group and CapitalLand Investment. Featuring a host of sustainability initiatives fueled by emerging technologies, the seminar was a great platform to forge partnerships and drive sustainable operations in our parks.



**77** attended  
10 from Mandai



# Social Sustainability

As an organisation that champions inclusivity, we continue to open our parks to all segments of our community. From those with special needs to the disadvantaged, from youths-at-risk to the elderly, we extend a warm welcome. Our initiatives run the gamut from free weekday admission, to sensitively curating the visits of children with autism and families impacted by incarceration. In the FY, we were delighted to host 7,000 beneficiaries from various social service agencies at our four parks with complimentary admission and tailored programming.

## Serving The Community

### Mandai Gives Back at River Wonders

For the third year running, we held the annual Mandai Gives Back community event in October 2022 across three days. Over 100 staff volunteers helped to provide guided tours and activities to ensure that the beneficiaries and caregivers from 10 Social Service Agencies (SSAs) serving the elderly, migrant workers, and young families had a great time at River Wonders. They also took home tote bags and other gifts, thanks to our corporate sponsors who went the extra mile in support of our community event. Through Mandai Gives Back, we are glad to strengthen our links with the community and ensure that our parks remain accessible to guests from all walks of life.



Over 100 staff volunteers, including Group CEO Mike Barclay (above), took care of the beneficiaries and caregivers from 10 Social Service Agencies when they visited River Wonders in our annual 'Mandai Gives Back' community event.

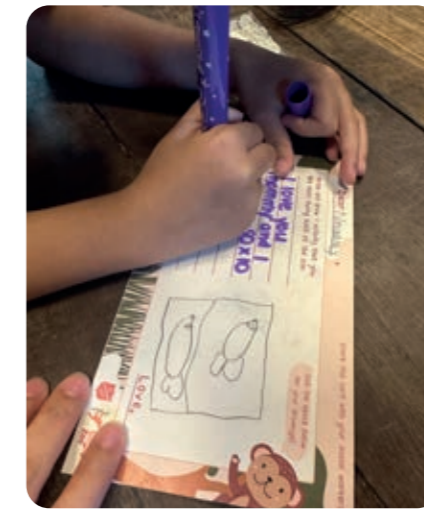


### Catering to Special Needs

#### Autism Awareness Weekend and Resources For Autistic Children

We hosted our fourth Autism Awareness Weekend on 2 and 3 April 2023 at River Wonders, opening the park earlier at 9am, for families with autistic children to enjoy a tranquil first hour. The visit was enhanced with an interactive digital trail specially curated to engage sensory sensitive children. The event also included efforts to promote awareness of autism to general guests at River Wonders.

Apart from Autism Awareness Weekend, we provide online social scripts to help parents and caregivers prepare for their visits to our parks. We also made available online sensory maps to highlight quiet corners and potential triggers.



### Career Guidance for Youths-at-Risk

#### Exploring Zoo Careers with Work Experience Opportunities

Fei Yue Zoo Career Workshops started in 2021 with the objective of exposing youths-at-risk to the career opportunities in Mandai. We are very heartened by the encouraging response from the participants and in this FY we expanded the programme to include work experience opportunities in Animal Care, Animal Behaviour and Programmes, Veterinary Health and Education.

The immersive experience allowed the youths to interact with staff, work with the animals and learn about the life skills needed to join the Mandai workforce.

### Reaching Out to the Disadvantaged

#### Salvation Army Wild Adventure

Since 2019, we have been partnering Salvation Army to bring 'Wild Adventure' to families impacted by parental incarceration. On a quarterly basis, we host children and their caregivers in our parks and organise activities to encourage inter-generation family bonding. Our young guests were invited to write a letter to their incarcerated loved one to share their exciting visit to our parks. In the FY, we hosted a total of 228 beneficiaries at Singapore Zoo and Night Safari.



Fei Yue Zoo Career Workshops started in 2021 to expose youths-at-risk to career opportunities in Mandai through a series of three workshops and a full-day work experience session.

# Sustaining Our Financial Performance

FY22/23 saw a time of transition out of Covid, with the gradual easing of local restrictions and the resumption of travel. We pulled out all stops to capitalise on the increasingly favourable conditions. From rejuvenating in-park experiences to courting overseas tourists, we built and will continue to build on the momentum to regain lost ground and emerge stronger than ever before.

## FY22/23 HIGHLIGHTS

- Attendance at our parks rebounded **43%** year on year to **2.86 million**, of which one million were tourists.
- Giant panda cub **Le Le turned one** in August 2022. We celebrated this milestone with a month-long, day-to-night Panda-stic Party.
- We relaunched Singapore Zoo's iconic breakfast programme as **Breakfast In The Wild**, featuring animal ambassadors such as orangutans and macaws.
- We finally opened the long-awaited **Tasmanian Devil exhibit** at Night Safari on 15 November 2022, and the Wallaby Trail was aptly renamed Tasmanian Devil Trail.
- We unveiled the world's first walk-in **Civet Exhibit** along Leopard Trail in Night Safari.
- In November 2022, we launched the refreshed **Creatures of the Night** presentation in Night Safari's brand new 1000-seater amphitheatre.



# Driving Footfall

In FY22/23, attendance at our parks rebounded 43% year on year to 2.86 million. Over the Labour Day weekend of 1 May 2022, the lifting of group size restrictions saw a record number of park visits since the onset of the pandemic. Large-scale events had likewise made a comeback, with our venues hosting 1,175 functions in the FY. The steady reopening of travel and tourism in Singapore culminated with the removal of all border measures on 13 February 2023. We were delighted to welcome one million overseas guests to our parks in the FY.

The resumption of overseas travel also meant that we had to double down on tactical activation of innovative campaigns to ensure that our parks remain top of the mind with the locals. At the same time, we also refreshed Friends of Wildlife membership with added perks such as priority access and preferential rates to events, as well as member-exclusive curated park experiences. Residents responded very positively with a record 35% membership renewal rate. During the FY, we attracted 76,400 Friends of Wildlife members.

## In-park Campaigns

### Easter Wonderland

To celebrate the last Easter at Jurong Bird Park, we transformed its grounds into a whimsical Easter Wonderland. From 1 April to 3 May 2022, guests made baskets and went on a treasure hunt for the elusive Golden Egg. They took on an eggs-traordinary challenge learning about eggs and painting Easter eggs for the community display. In the Easter Hat-ivity, participants had fun crafting Easter-themed hats.

### Playtime at Toybox

During the June school break, children with their parents in tow favoured to learn with their favourite Hasbro brands – My Little Pony, Monopoly, Play-Doh and NERF blasters – at the Singapore Zoo and River Wonders. The Toybox experience featuring 12 exciting activities created a good deal of buzz. Families also took home limited-edition Playtime at Toybox keychains and mini magnet sets.

### Panda-stic Party @ River Wonders

Our first giant panda cub Le Le turned one on 14 August 2022. We celebrated this milestone with a month-long Panda-stic Party. Guests at River Wonders enjoyed day-to-night panda-themed activities. While learning more about giant pandas through a digital trail, they were dazzled by the sparkly fireworks from Le Le's bamboo-inspired birthday cake and light displays. Many penned their well wishes for Le Le and brought home panda lanterns as mementos.

### Ultraman Pop-Up Experience

Ultraman lent his superpowers to Night Safari in fighting threats faced by wildlife. Teaming up with Merliger, Singapore's own Merlion-inspired kaiju, the pair 'protected' threatened animals against the kaijus representing habitat loss, pollution, and poaching. During the three-month activation, families revelled in this pop-up experience while learning how to do their part to save wildlife.

### Festive Wild-erland – A Black-and-White Celebration

Festive Wild-erland shines a spotlight on the striking black-and-white animals at the Singapore Zoo, Night Safari and River Wonders. The year-end festivities ran from 17 November 2022 to 2 January 2023, offering enchanting encounters with our black-and-white residents including the Tasmanian devil, African penguin, giant panda, and Malayan tapir. The augmented reality trail provided a diverse campaign experience, attracting guests with a preference for digital engagement.



Panda-stic Party



Easter Wonderland



Ultraman Pop-Up Experience



Playtime at Toybox



Festive Wild-erland



## Re-attracting Globetrotters

Singapore's international borders reopened on 1 April 2022 allowing quarantine-free travel without onerous testing protocols. Our Sales and Marketing team went full steam ahead to seize this opportunity to rebuild ties with our trade partners. Within the month of the reopening, we worked with Singapore Tourism Board and Singapore Airlines to participate in the first recovery campaign **'Singapore Welcomes You Back!'** This campaign offered attractive tripartite discounts to stimulate inbound demand from India. Our team also went on sales missions to key markets such as India, Indonesia, South Korea, Australia, and China. These efforts enabled us to reaffirm relationships with our in-market partners.

In addition, we inked important tie-ups with core partners such as Go-city serving the Australian market, Klook targeting bookings in the Southeast Asian market, as well as Thomas Cook and SOTC looking after the Indian market.

Various engagement sessions were held to reconnect with local travel agents, tourist guides and concierge members from renowned hotels in Singapore.



We inked important tie-ups with core partners such as Go-city serving the Australian market, Klook targeting bookings in the Southeast Asian market, as well as Thomas Cook and SOTC looking after the Indian market.



## An Iconic Dining Experience Relunched

Our iconic breakfast programme at Singapore Zoo was suspended as a result of the Covid pandemic. On 15 October 2022, we unveiled a refreshed breakfast programme – Breakfast in the Wild. Guests enjoy an all-new experience that includes a half-hour animal presentation featuring our orangutans, macaws, tamanduas, coatimundis, reptiles and more. Apart from learning about threatened wildlife, they get to savour wildlife-friendly shade-grown Owa coffee and discover more about sustainable living.



# Our Sponsors and Adopters

Throughout the pandemic, our stalwart supporters continued to show their commitment with us, while new sponsors and adopters came forward to lend their support. Post-pandemic, and with the impending opening of Bird Paradise, more supporters have joined our community. We deeply appreciate the generosity of all our sponsors and adopters. Their solidarity with our cause to protect wildlife is heartening. All the contributions will go a long way in advancing wildlife conservation and environmental protection.

In the FY, we welcomed 27 organisations and individuals to our community of adopters and sponsors. In addition, over 800 members of the public contributed to the Adopt an Animal Programme and other micro sponsorships.

At Bird Paradise, we are pleased to have secured key naming rights sponsorships for the penguin habitat and two of the eight aviaries. These included Hong Leong Foundation Crimson Wetlands featuring a spectacular waterfall as a tribute to the Waterfall Aviary of Jurong Bird Park; Kuok Group Wings of Asia which showcases Asian feathered jewels amongst bamboo groves

and rice terraces; and Ocean Network Express Penguin Cove, hailed as one of the world's largest salt-water exhibits for penguins.

To encourage native wildlife to thrive in our parks, we plant native species as food and shelter for the animals. Corporates including Corteva, Daikin Airconditioning Singapore, Schneider Electric and OTS Holdings not only sponsored the saplings of various native plant species but also mobilised their staff to participate in tree planting and contributed to enhancing habitats for native wildlife.

See pages 14 to 15 for a complete list of sponsors and adopters.



1. Managing Director of Daikin Airconditioning Singapore, Mr Donovan Chua, watering his freshly planted sapling

2. Schneider Electric employees observing the tree planting demonstration conducted by Horticulture Department staff before they planted their saplings



3. Forty employees from OTS Holdings participated in the tree planting event

# Rejuvenating In-Park Experiences

Rejuvenating our existing parks gained greater momentum post-Covid – the need for renewal is crucial to make certain that when the new parks open, existing attractions offer equally compelling experiences to our guests. We pride ourselves in pushing the boundaries of what is possible. We continually rejuvenate existing exhibits, welcome new animal species and upgrade back-of-house facilities. This strong ethos builds the foundation for repeat visits, ensures that guest pain points are duly addressed, and assures that our animals receive the best possible care.

## At Night Safari

### Tasmanian Devils Debut

Four female Tasmanian devils debuted at the Night Safari to much fanfare on 15 November 2022. The event was graced by the Australian High Commissioner to Singapore, the Honourable William Hodgman. This marked the first time the endangered species is presented in Singapore, in collaboration with **Save the Tasmanian Devil** Programme (STDP), led by the Department of Natural Resources and Environment Tasmania. Tasmanian devils are threatened by the devil facial tumour disease, a transmissible cancer that kills 95% of affected wild populations and may cause their extinction. Our new additions thus serve as an overseas insurance population towards their long-term conservation.

The exhibit boasts an outdoor area featuring an Australian sclerophyll forest landscape while the air-conditioned indoor area simulates Gustav Weindorfer's hut in Tasmania's Cradle Mountains, where legend has it that Gustav, who promoted Cradle Mountains as a national park, left his hut open for wild animals to shelter from the winter cold.

Tasmanian devils are threatened by the devil facial tumour disease, a contagious cancer that kills 95% of affected wild populations. Our four new additions thus serve as an overseas insurance population towards the species' long-term conservation.



### First-Ever Walk-In Civet Exhibit

On 6 June 2022, we launched the world's first walk-in civet exhibit along Leopard Trail. Amongst other things, we added 200 metres of artificial vines to the exhibit, allowing the common palm and small-toothed palm civets to move from tree to tree as civets would in the wild. Guests are able to enjoy an immersive experience of observing the arboreal behaviour of these creatures in a naturalistic habitat without barriers.



### Refreshed Creatures of the Night Presentation

We refreshed our popular Creatures of the Night presentation and launched it at Night Safari's brand-new 1,000-seat amphitheatre on 29 November 2022. This fully sheltered space has a seating capacity that is 33% larger than the old premises. The crowd-pleasing narrative is presented by a refreshed and stronger cast of nocturnal creatures, with a dramatic backdrop and state-of-the-art audio, video, and lighting systems.

## At River Wonders

### Upgrading of Amazon River Quest Ride

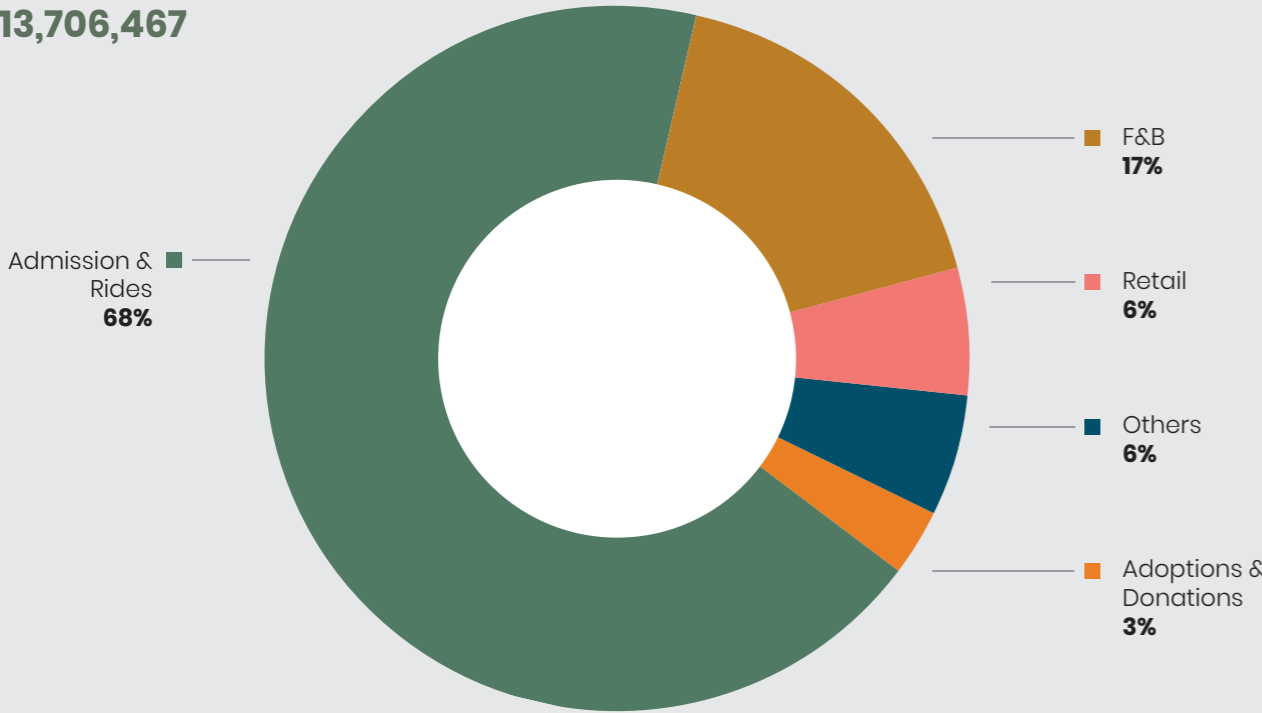
Amazon River Quest simulates a boat adventure on the Amazon River. To enhance animal visibility for better guest experience, we modified six island exhibits, linking them with artificial vines and tree branches to provide connectivity for four species of South American monkeys. This allows for expanded space for them to roam, forage and interact, creating an increased level of activity.

The Scarlet Ibis Aviary, the last exhibit of Amazon River Quest, was upgraded and more species such as macaws and toucans were added to better reflect the diversity of wildlife in South American rainforests, ending the ride on a high note.



# Financial & Attendance Highlights

REVENUE FOR FY22/23  
**\$113,706,467**



TOTAL GUESTS FOR FY22/23  
**2,879,849**



# The Year Ahead

We look forward to an exciting and extraordinary year ahead as we gear up for the opening of Asia's largest bird park on 8 May 2023. Amidst all the excitement, we remain focused on our key priorities:

## Take Bird Paradise To New Heights

We will work towards completing the safe translocation of the birds from Jurong to Mandai and helping them acclimatise to their new environment in Bird Paradise. We set our sights on achieving even higher standards of care for birds, delivering greater impact on avian conservation and research and offering profound experiences with greater depth to inspire guests to appreciate and protect birdlife.

## Innovate, Digitalise and Automate

To elevate animal welfare standards, deliver exceptional guest experiences and increase productivity, we will continuously seek innovative solutions, automate, and tap on technology. We will explore the use of generative AI to redefine the way we work. Through transformation, we can grow our 3Ps – Planet, People and Performance, taking them to greater heights.

## Protect Wildlife and Operate Sustainably

While we continue to support Mandai Nature, we will ramp up efforts on the 10 threatened species under the One Plan Approach through conservation breeding, research, knowledge sharing and capacity building. As 2024, our target year to achieve carbon neutrality, draws closer, we will double down on seeking innovative ways to operate sustainably.



## Conservation Projects supported in FY22/23

NO	PROJECT NAME	COUNTRY	SPECIES	TAXON
1	Critical law enforcement support for Cambodia's Cardamom Rainforest	Cambodia	Multi taxa	Multi taxa
2	Conservation of the Critically Endangered Southern River Terrapin ( <i>Batagur affinis</i> ) in the Sre Ambel River System in Cambodia	Cambodia	Southern River Terrapin	Reptile
3	Restoring a viable population of Siamese Crocodile within the Sre Ambel River system, Cambodia	Cambodia	Siamese Crocodile	Reptile
4	Guidance on responsible conservation translocation of displaced organisms	Global	Multi taxa	Multi taxa
5	Species Conservation Toolkit Initiative	Global	Multi taxa	Multi taxa
6	Species360 Conservation Science Alliance Support	Global	Multi taxa	Multi taxa
7	IUCN Membership	Global	Multi taxa	Multi taxa
8	IUCN SSC Chair Support	Global	Multi taxa	Multi taxa
9	Amphibian Ark	Global	Multiple amphibian species	Amphibian
10	Save the Tasmanian Devil - Veterinary expenses to contribute to the goal of creating a resilient wild devil population	Global	Tasmanian Devil	Mammal
11	Addressing Human Orangutan Conflict in Leuser and Batang Toru Landscapes	Indonesia	Sumatran Orangutan, Tapanuli Orangutan	Mammal
12	Sustainable Operation Of The ERU as part of the Way Kambas National Park ERU Program for Habitat Protection and HEC Mitigation	Indonesia	Sumatran Elephant	Mammal
13	Conservation of Rote Island Snake-necked Turtle ( <i>Chelodina mccordi</i> )	Indonesia	Rote Island Snake-necked Turtle	Reptile
14	Human-wildlife co-existence strategy and outreach campaign to reduce the immediate threats to Sulawesi crested black macaques ( <i>Macaca nigra</i> ) and protect the community livelihoods	Indonesia	Celebes Crested Macaque	Mammal
15	Project Kapi Owa: Javan Gibbon Conservation in Central Java, Indonesia	Indonesia	Multiple primate species	Mammal
16	Saving Sulawesi's Endemic Biodiversity at the Nantu Rainforest, Indonesia	Indonesia	Multi taxa	Multi taxa
17	EAZA Komodo EEP conservation programme: Wae Wuul Reserve Protection Programme 2020	Indonesia	Komodo Dragon	Reptile
18	Conservation of the Bali Starling within the Melinggih Kelod village through Community Activities	Indonesia	Bali Starling	Bird
19	Kembali Bebas Avian Rescue, Rehabilitation and Release Centre	Indonesia	Multiple bird species	Bird
20	Saving the Wild Bird Populations of Sumatra, Lombok and Bali	Indonesia	Multiple bird species	Bird
21	Asian Songbird Crisis Barusan Shama Breeding Facility - Simeulue Island	Indonesia	Barusan Shama	Bird
22	Core funding for the ex-situ programs at Yayasan Cikananga Konservasi Terpadu	Indonesia	Multi taxa	Multi taxa
23	Conserving ASAP and Priority Species through an Integrated Approach in West Kalimantan, Indonesia	Indonesia	Multi taxa	Multi taxa
24	Assessment and conservation of primates on the Mentawai Islands, Indonesia	Indonesia	Multiple primate species	Mammal
25	Ending the practice of bear bile farming in Lao PDR	Lao PDR	Multiple bear species	Mammal
26	Biodiversity conservation in Nakai - Nam Theun National Park in the Annamite Mountains of Lao PDR	Lao PDR	Multi taxa	Multi taxa
27	Rediscovering Saola and securing a future for the Annamite Mountains	Lao PDR	Saola	Mammal
28	Citizen Action for Tigers: engaging people to value and protect tigers and their habitat in Malaysia	Malaysia	Malayan Tiger	Mammal
29	Anti-poaching strategies to protect Sunda pangolins and other threatened species Deramakot Forest Complex, Sabah, Malaysia	Malaysia	Multi taxa	Multi taxa
30	Combating the illegal and unsustainable trade in songbirds in Sarawak, Malaysia	Malaysia	Multiple bird species	Bird
31	Translocating Burmese Star Tortoises ( <i>Geochelone platynota</i> ) at Shwe Settaw Wildlife Sanctuary: Reinforcing Success	Myanmar	Burmese Star Tortoise	Reptile
32	Safeguarding critically endangered endemics in Palawan	Philippines	Palawan Pangolin, Palawan Forest Turtle	Mammal Reptile
33	Tamaraw: One Plan Approach Conservation Project	Philippines	Tamaraw	Mammal
34	Project Palaka - Emergency Support	Philippines	Gigante Wrinkled Ground Frog	Amphibian
35	West Visayan Species Recovery Project	Philippines	Multi taxa	Multi taxa
36	Assessing the feasibility of Conservation Translocation for the Great Philippine Eagles	Philippines	Philippine Eagle	Bird
37	Community-based conservation of the Philippine Cockatoo ( <i>Cacatua haematurpygia</i> ) and its habitats	Philippines	Philippine Cockatoo	Bird
38	Creating positive change for animals in Southeast Asia through humane education	Regional	Multi taxa	Multi taxa
39	Safeguarding Southeast Asia's wildlife from illegal and unregulated trade	Regional	Multi taxa	Multi taxa
40	Conservation planning for terrestrial vertebrates of the Philippines	Regional	Multi taxa	Multi taxa
41	Publication support for 'Gajah' Journal	Regional	Asian Elephant	Mammal
42	4th Himalayan Otter Network Workshop	Regional	Multiple otter species	Mammal
43	IUCN Hornbill Specialist Group	Regional	Multiple hornbill species	Bird
44	Arboreal camera trapping and citizen science management of Raffles' banded langurs in Singapore	Regional	Raffles' Banded Langurs	Bird
45	Biology and distribution patterns of 'near threatened' sharks (Phase 2)	Singapore	Bamboo Shark and other native species	Multi taxa
46	Novel techniques for the conservation of the Cave Nectar Bat ( <i>Eonycteris spelaea</i> ) in Singapore	Singapore	Cave Nectar Bat	Mammal
47	An investigation into sharks and rays imported to Singapore ports to uncover characteristics of this fishery and understand shark and ray biodiversity in the region	Singapore	Multi taxa	Multi taxa
48	Phenology of Singapore's resident avifauna	Singapore	Multiple bird species	Bird
49	Scaling up implementation of the Sunda Pangolin National Conservation Strategy and Action Plan	Singapore	Sunda Pangolin	Mammal
50	Conservation biology of the Singapore freshwater crab: understanding drought and acidification impacts	Singapore	Singapore Freshwater Crab	Crustacean
51	Understanding the mechanisms underlying diversity patterns in rocky intertidal systems for creating sustainable coastal eco-engineering solutions in Singapore	Singapore	Multi taxa	Multi taxa
52	Every Singaporean A Naturalist	Singapore	Local biodiversity	Multi taxa
53	Using genomic data to elucidate transmission dynamics of blood parasites across bird hosts, mosquito vectors and endosymbionts in Singapore	Singapore	Multiple bird species	Bird
54	Genome sequencing and population genetic studies of the hawksbill turtles nesting around Singapore to protect the species	Singapore	Hawksbill Turtle	Reptile
55	Integrating genetic data to construct dung beetle-mammal trophic networks in Southeast Asian forest canopies	Singapore	Multi taxa	Multi taxa
56	World Wildlife Day Regional Youth Symposium 2023: Partnerships for wildlife conservation in Southeast Asia	Singapore	Multi taxa	Multi taxa
57	In Search of Vietnam Pheasant ( <i>Lophura edwardsi</i> ) in the wild	Vietnam	Vietnam Pheasant	Bird
58	An integrated project to combat climate change and songbird trade in West Kalimantan, Indonesia	Indonesia	Multi taxa	Multi taxa
59	Nantu Forest Conservation Programme, Sulawesi, Indonesia	Indonesia	Multi taxa	Multi taxa
60	Advancing conservation of lower Mekong wetlands at Anlung Pring, Cambodia: towards a Sarus Crane safe landscape	Cambodia	Sarus Crane	Bird
61	Climate-resilient sustainable agriculture to improve livelihoods and biodiversity habitat quality at Anlung Pring Protected Landscape	Cambodia	Sarus Crane	Bird
62	An Opportunity to Save Simeulue's Critically Endangered Songbirds from the Brink of Extinction Through Community Conservation, Regenerative Agriculture and Eco-tourism	Indonesia	Barusan Shama and Simeulue Hill Myna	Bird
63	Collaborative Grass-roots Conservation of a Landscape of Hope: The Leuser Ecosystem	Indonesia	Multi taxa	Multi taxa

## Publications in FY22/23

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## Species Managed Under One Plan Approach

Synergizing the conservation efforts in our parks with field conservation work to achieve eventual reintroduction of these species into their native habitat.

NO	OPA Species
1	Chrisangi leaf insect
2	Sunda pangolin
3	Roti snake-necked turtle
4	Negros bleeding-heart
5	Visayan tarictic hornbill
6	Philippine cockatoo
7	Vietnam pheasant
8	Philippine eagle
9	Black-winged starling
10	Burmese roofed turtle

## Focal Species

Native species In Mandai Precinct prioritised for conservation and management.

NO	Focal Species
1	Sunda pangolin
2	Sunda colugo
3	Long-tailed macaque
4	Bamboo bats
5	Straw-headed bulbul
6	Fireflies
7	Green tree snail
8	Stingless bee

## Staff As Species Co-ordinators For Managed Species Programmes

NO	SPECIES COORDINATOR	SPECIES	PROGRAMME*
1	<b>Mark Rusil</b> , Junior Avian Care Officer	Black Hornbill	EEP
2	<b>Anais Tritto</b> , Curator, Birds	Black-winged Myna	EEP
3	<b>Wendy Chua</b> , Curator, Animal Data Management & Transactions	Bornean Orangutan	SSMP
4	<b>Luis Neves</b> , Vice President, Animal Care	Knobbed Hornbill	EEP
5	<b>Mark Rusil</b> , Junior Avian Care Officer	Moluccan Cockatoo	EEP
6	<b>Luis Neves</b> , Vice President, Animal Care	Santa Cruz Ground-dove	EEP
7	<b>Anand Kumar</b> , Assistant Curator, Carnivores & Small Mammals	Sloth Bear	ISB
8	<b>Rachel Lee</b> , Junior Keeper	Straw-headed Bulbul	EEP
9	<b>Wendy Chua</b> , Curator, Animal Data Management & Transactions	Sumatran Orangutan	SSMP
10	<b>Anand Kumar</b> , Assistant Curator, Carnivores & Small Mammals	Sun Bear	SSMP
11	<b>Cecilia Tang</b> , Assistant Curator, Carnivores & Small Mammals	Sunda Clouded Leopard	EEP
12	<b>Ade Kurniawan</b> , Animal Care Officer	Sunda Pangolin	SSMP
13	<b>Cecilia Tang</b> , Assistant Curator, Carnivores & Small Mammals	Sunda Slow Loris	EEP
14	<b>Anais Tritto</b> , Curator, Birds	Victoria Crowned Pigeon	ESB

\*PROGRAMME

EEP - EAZA (European Association of Zoos and Aquaria) Ex-situ Programme

ESB - European Studbook

ISB - International Studbook

SSMP - SEAZA (Southeast Asian Zoos and Aquariums) Species Management Programme





## Awards & Accreditations

### **Global Water Awards 2023 (Distinction)**

Water Reuse Project of the Year

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### **LIAS Award (Bronze) by Landscape Industry Association of Singapore**

Indian Rhinoceros Exhibit @ Night Safari

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### **Singapore Tourism Awards 2022**

Finalist for Outstanding Leisure Event  
– Discover Asia's First Brickosaurs World

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### **Marketing Excellence Awards 2022**

Excellence in Event Marketing (Silver)  
– Rainforest Lumina Season 3

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