



# Mandai

WILDLIFE GROUP



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Mandai Park Holdings (MPH) is the parent company for Wildlife Reserves Singapore (WRS) and Mandai Park Development (MPD).

WRS is the operating arm of MPH, and is responsible for Jurong Bird Park, Night Safari, Singapore Zoo and River Safari. WRS is dedicated to the management of world-class leisure attractions that foster conservation and research, while educating guests about animals and their habitats.

A self-funded organisation, WRS also collaborates with various partners, organisations and institutions aimed at protecting local and global biodiversity. In this pandemic-impacted financial year, we welcomed 1.9 million guests, with Jurong Bird Park contributing 0.3 million, Night Safari 0.3 million, Singapore Zoo 0.8 million and River Safari 0.5 million.

MPD works on refreshing the Mandai district to become a world-leading nature and wildlife district. Once the project is completed, Mandai will feature five zoological parks, two indoor nature-themed attractions, a variety of accommodation options, an array of new restaurants, extensive public spaces and a wildlife bridge to allow animals safe passage across Mandai Lake Road.



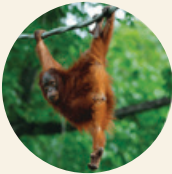
# Vision

To be a world-leading zoological institution that inspires people to value and conserve biodiversity.

# Mission

We provide meaningful and memorable wildlife experiences with a focus on protecting biodiversity in Singapore and the region.

# 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 living collection.



**Hospitality**  
We serve from the heart.



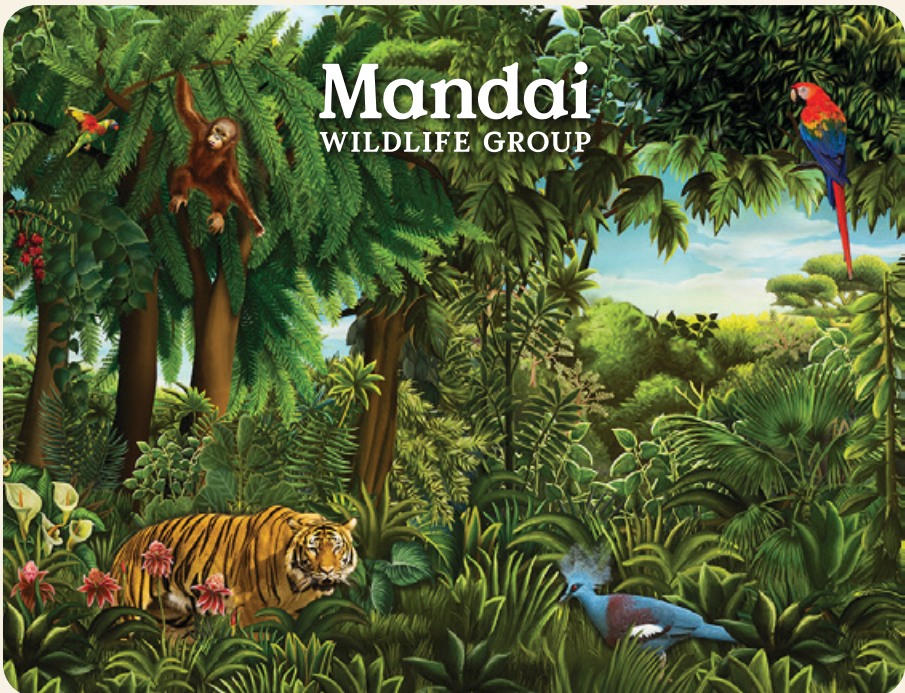
**Sustainability**  
We embrace sustainable best practices.

# NEW MANDAI PRECINCT TAKING SHAPE

The Mandai Rejuvenation Project continues into its fourth year of construction, but work came to a virtual standstill for four months due to disruptions from Covid-19 global pandemic. During this time, a team was deployed to manage essential services including site security, wildlife responses and rescue, maintenance of earth control measures and stability of temporary structures in the various work sites.

Despite the challenges, we have made progress across most of the remaining features, including Boardwalk, Rainforest Park, East Node, Indoor Attractions and the Mandai Resort.

To enhance efficiency, drone technology is deployed to survey the worksites, monitor construction progress and to inform planning for better site utilisation.



# NEW BIRD PARK

Development works for the new Bird Park, including the mesh and cable installation for the aviaries, are in full swing. Six massive acrylic sheets, each weighing between 4.7 and 10 tons, have been delivered for installation at Penguin Cove. A key highlight of the new bird park, the exhibit will allow guests to observe the intriguing underwater behaviours of different penguin species through two elliptical tanks.

On-site theming and landscaping works have begun, with the first 1,000 trees planted.



At 12m tall with a girth of 2.7m, this tailpot palm is the largest palm to be planted in the new Bird Park.



# YEAR IN REVIEW

Worked with other wildlife institutions on **136 Managed Species Programmes** (up from 104 last FY) to save threatened species. 11 staff (up from eight last FY) stepped up as coordinators for these species.



Launched **Micro Sponsorship** and **Adopt An Animal** programmes and garnered tremendous community support.



Despite the historical park closure for three months, managed to engage 120,000 people through conservation and sustainability education. Launched **My Animal Buddy** programme for children to explore our parks virtually.



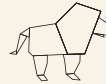
Supported 61 (up from 53 last FY) local and regional conservation projects. Formation of **Mandai Nature** to expand our conservation footprint and mitigate climate change in Singapore and Asia.



Singapore Zoo topped the **Customer Satisfaction Index (CSISG) 2020** for attractions.



Commercial start-up **Mandai Global** to pursue growth initiatives and to harness new sources of income.



Jurong Bird Park celebrated its **golden jubilee**: over the past five decades, it has connected 30 million guests to the colourful world of birds.



All major packages of work for the Mandai development project are now underway. **New quarantine facilities** has received TOP, and final preparations are underway to operate the facility.



As part of a loan agreement between Jurong Bird Park, A'Vilon Zoo and the Department of Environment and Natural Resources of the Philippines, 10 **Luzon-bleeding hearts** bred at the Bird Park were repatriated back to the Philippines and successfully released to their native habitats.



**Transformation 2.0** efforts to enhance our digital capabilities to rapidly adapt to business disruptions, reimagine product offerings, operations and animal care.



# THE TRIPLE BOTTOM LINE

## 3Ps

## STRATEGIC THRUSTS

### PLANET



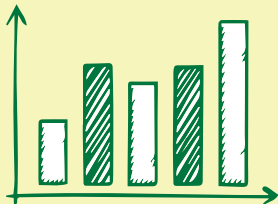
- Provide World-class Care For Our Living Collection
- Be A Regional Leader In Environmental Sustainability & Conservation

### PEOPLE

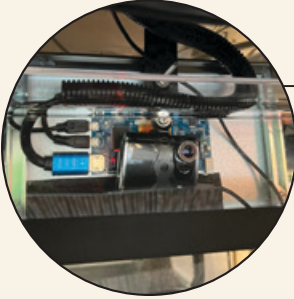


- Apply Leading Organisation & HR Practices
- Forge A Strong National Love & Pride For Our Parks

### PERFORMANCE



- Create Exceptional Guest Experiences
- Ensure Long-term Commercial Viability



Two HD cameras allow for detection of small animals present near the vehicle



Two LIDAR sensors to pinpoint object's proximity and exact location

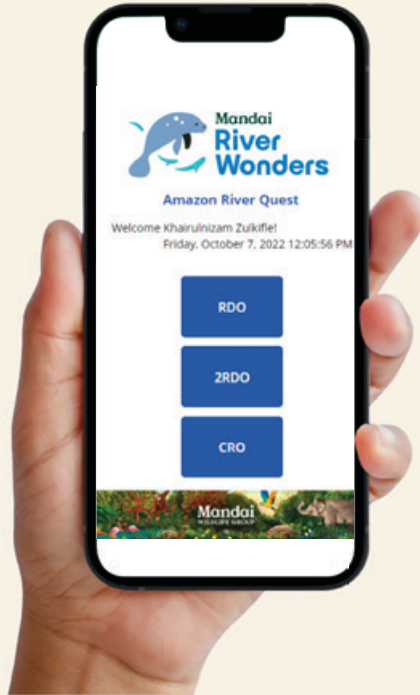


# BEEP BEEP, EXCUSE ME!

## Autonomous Staff Meal Delivery Vehicle

Operational staff are stationed around the parks and must travel long distances to collect their lunch boxes. Having the self-driving vehicle deliver their meals saves them time to focus their energy on productive work. It also frees up the use of buggies for other essential tasks.



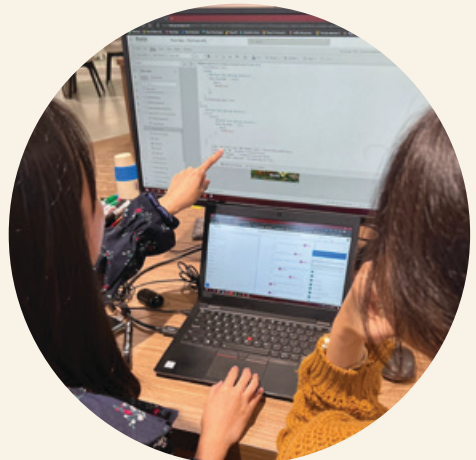


# LOW-CODE, NO-CODE REVOLUTION

## Mandai Citizen Developer Programme

In developing an innovative workforce, non-IT-trained staff are introduced and trained to use low-code and no-code platforms to create applications, Robotic Process Automation (RPA) bots and dashboards. This initiative helped improve the work efficiency and productivity of each team.

These platforms also significantly reduce development time and allow rapid prototyping and testing.



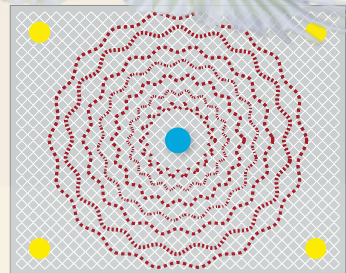


# BREACH ALERT!

## Bird Mesh Aviary Inspection System

Manual inspections are time-consuming, resource intensive, and are a safety risk for our keepers at elevated heights.

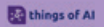
This force-displacement and vibration sensor network conducts automated inspections for detection of possible breaches.



- Vibration actuators generate pulses on the mesh at specific time intervals.
- Sensors detect vibrations via a Gateway system
- The system manages the data securely over the network grid.
- The Artificial Intelligence (AI) server analyses the vibration signatures in real time to report/flag any anomalies.



Mandai Smart Environment Real-time Monitoring | Panel



Location ● Chameleon

Location

Lake Tanganyika Tank
  Reptopia Aviary
  Reptopia Parson's Chameleon Exhibit

Metric

Select all	Humidity	Temperature (Chameleon)	UVB
Air Flow	Light Colour	UVA	UVB Index

Timestamp (from GW)	Location	Metric	M. ID	Reading (Converted)	Unit	No. of Decimals	Normal Range	Message	Location Muted?	Metric Muted?	Source
10/7/2022 3:44:47 PM	Chameleon	Air Flow	205	191.880	CFM	2	(No range)		False	False	Gateway9
10/7/2022 3:36:39 PM	Chameleon	UVB	202	8.000	$\mu\text{W}/\text{cm}^2$	0	(No range)		False	False	Gateway9
10/7/2022 3:36:39 PM	Chameleon	UVB Index	203	3.200	UV Index	1	0.7-4		False	False	Gateway9
10/7/2022 3:36:39 PM	Chameleon	UVA	201	56.000	$\mu\text{W}/\text{cm}^2$	0	(No range)		False	False	Gateway9
10/7/2022 3:36:39 PM	Chameleon	Light Colour	204	5.795.000	Kelvin	2	(No range)		False	False	Gateway9
10/7/2022 3:29:47 PM	Chameleon	Air Flow	205	193.400	CFM	1	(No range)		False	False	Gateway9
10/7/2022 3:25:53 PM	Chameleon	Temperature (Chameleon)	206	23.800	$^{\circ}\text{C}$	1	20-27		False	False	Gateway9
10/7/2022 3:25:53 PM	Chameleon	Humidity	207	90.600	%	1	70-100		False	False	Gateway9
10/7/2022 3:21:39 PM	Chameleon	UVB	202	8.000	$\mu\text{W}/\text{cm}^2$	0	(No range)		False	False	Gateway9
10/7/2022 3:21:39 PM	Chameleon	UVB Index	203	3.200	UV Index	1	0.7-4		False	False	Gateway9

(c) 2021-2022 (last 80 records)

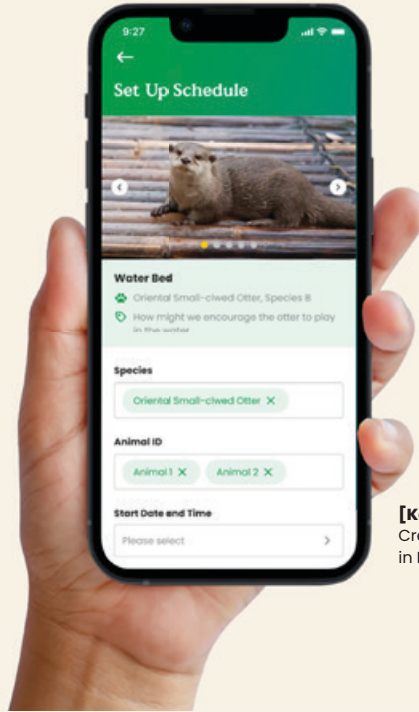


# EYE SEE YOU

## Smart Environment Real-time Monitoring System

Our parks have many enclosures over a large physical space, and therefore planning, measuring and collecting data takes a lot of time.

With this system, our animal care team and veterinarian team are able to monitor all the habitats and collect data efficiently so that vital information can be quickly passed on to curators and veterinarians for immediate action.



**[Keepers' App Set up Schedule]**  
Creating an Enrichment Schedule  
in Keepers' App

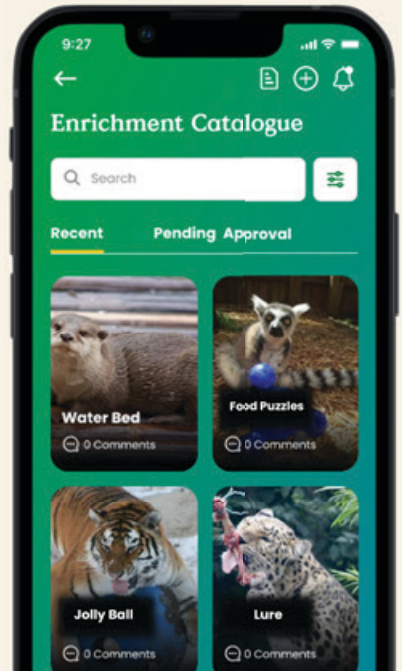
# CONNECT AND EMPOWER

## Keepers' App

The app connects every member of the Life Sciences team to improve productivity and automate current process.

They will have access to operating procedures, daily briefing checklists, animal welfare assessments, and opportunities for enriching themselves – all at the tips of their fingers!

**[Keepers' App Enrichment Catalogue]**





Phasmids (Stick insects): Young Red-Wing Green Giant (1), Jungle Nymph (2), Giant Prickly (3)  
Isopods: Clown Armadillidium Klugii (4), Little Sea Pillbug (5)

	BREEDING 1	BREEDING 2	BREEDING 3
MAINTENANCE 3	3	6	9
MAINTENANCE 2	2	4	6
MAINTENANCE 1	1	2	3

1 = EASY

2 = MEDIUM

3 = DIFFICULT

NOTE: Do-not-breed species have a Breeding Score of "1" as well

Feasibility Score = Maintenance x Breeding

Having the sustainability of the collection in mind, as a guideline, the breakdown of species according to their FI targets the following breakdown:

**Score 1-2**

Highly Recommended

Recommended : 70% of collection

**Score 3-4**

May present some challenges

Recommended : 25% of collection

**Score 5-6**

Difficult Species

Try to limit to 5% of collection

For **AMBER** and **RED** species, careful research in ways to mitigate challenges and a structured breeding / maintenance program are required before acquisition.

**Feasibility Index (F-Index)**, assesses the viability of sustainably keeping an invertebrate species based on ease to maintain and breed.

- **Sustainability Index (S-Index)** uses five data points: no. of individuals in a collection, births, deaths, acquisitions and dispositions.

**Credit:** Colleen Lynch, Curator of birds at Riverbanks Zoo & Garden in Columbia/consulting population biologist with AZA Population Management Centre

Feasibility Index (F-Index) and Sustainability Index (S-Index) as a supporting tool in assessments with supporting database



Sustainable Invertebrate Feeders – Most invertebrates consume constitutional food waste

# FLY FARMING

## Sustainability of Invertebrates in Mandai Wildlife Reserve

The Invertebrate Collection Plan aims to effectively and sustainably maintain and breed quality insects as animal feed and to identify crucial windows for introducing new populations and developing essential knowledge of specimens bred under human care.



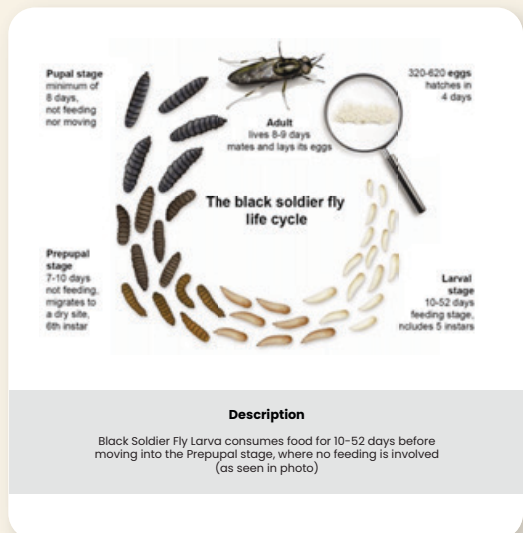
Black Soldier Larvae picked up from a pile of broken-down food waste

# DOUBLE DUTY

## Black Soldier Flies

These flies feed on the food waste generated within the parks and the larvae double up as animal feed.

Their larvae and pupae are a rich source of protein for animals of Mandai Wildlife Reserve such as reptiles, birds and fishes.





Coffee and Primates Conservation Project (CPCP) - Family of Javan Gibbons © SwaraOwa

# COFFEE CALLING!

## **OWA Coffee – Protecting the endangered Javan Gibbon**

Named after the gibbons' hooting call, this Owa Coffee project empowers and supports farmers to grow coffee under the forest canopy – creating a win-win scenario where both the gibbons' home and farmers' livelihoods are protected in Java, Indonesia.



Locals roast coffee in a pan over a charcoal fire in Java, Indonesia. ©SwaraOra

# THE YEAR AHEAD

The uneven recovery from the Covid-19 outbreak presents both challenges and opportunities for us. By accelerating digital transformation across the organisation and maximising opportunities in the market, we shall persist in our commitment to improve productivity, deliver exceptional guest experience, uphold world-class animal care and stay true to our conservation cause.



## **DELIVERING ON THE PLAN**

Physical rejuvenation of the Mandai precinct will help us grow our impact as world-leading centres of wildlife conservation, education, and research. We will commence construction of Rainforest Park South – our fifth attraction in the precinct. Works around the Zoo entrance and construction of a new amphitheatre at Night Safari are taking shape and we will proceed with the plans of other key enhancement projects, albeit at a slower speed, to continue to refresh our existing parks. We will also roll out the Technology Master Plan focused on delivering personalised experiences across ticketing, payment and feedback platforms in anticipation of the opening of our new attractions. These infrastructural and systemic investments are crucial in our bid to be an outstanding integrated nature and wildlife hub at Mandai.

## **LONG TERM VIABILITY AND SUSTAINABILITY**

The very shape of tourism has been changed by the pandemic. Singapore is perceived as a safe destination but travel restrictions mean that tourists will not be back in force in the near future. Fortunately, we remained a top-of-mind destination for many residents and we intend to intensify focus on driving affinity amongst Singaporeans. We will enhance our product offerings by prototyping and piloting new features, experimenting on monetisation opportunities and enhancing tech platforms. To do so, we will continue to empower our staff to become agile brand ambassadors. By deepening a culture of innovation and 3D-readiness in our workforce, we hope to build affinity and engagement beyond our parks through digital and virtual offerings.

## **SCALE CONSERVATION WORK, AMPLIFY 'VOICE FOR GOOD'**

With the establishment of Mandai Nature, we look forward to expanding as well as deepening our conservation footprint locally and in the region. Besides championing nature-based solutions to address climate change, we also aspire to play a pivotal role in capacity building in conservation and sustainability by deepening our engagement with various institutes of higher learning.

# Mandai Innovation Forum Catalysing Change and Inspiring Action Through Innovation

Taking Sustainability, conservation, and animal care to new heights and creating opportunities for global participation

28th October 2022 | 9am to 12pm

## Fireside Chat

Mandai Wildlife Group's vision is to be a world-leading zoological institution that inspires people to value and conserve biodiversity. Find out how the organisation's emphasis on an innovation mindset and sustainable practices help to propel us towards our strategic goals and progress for a greener future.

## Panel Discussion

Be inspired by subject matter experts from various companies as they share experiences and insights on their innovation processes, partnerships and collaborations and the pioneering of breakthrough technology to help achieve their sustainability goals.

## Mandai Innovation Showcase

Take a sneak peek at Mandai Wildlife Reserve's various innovation projects launched across all the parks. Understand how these initiatives transform our business operations on all levels and ensure the organisation is future-ready.

## Mandai Co-Innovation Programme

This programme has been a key enabler in building a community of innovators outside of the organisation. Learn how the programme has grown since its inaugural launch in 2021 and provided various opportunities for startups to reimagine, inspire and create the future of innovation for Mandai Wildlife Reserve.

## Featured Speaker with

Discover how Mandai Nature endeavours to create a future where nature, wildlife and people can co-exist harmoniously and thrive. Also hear from Amazon web services on how to harness new technology as solutions for existing market problems.

In Partnership with:





Date: 28th Oct 2022 | Time: 9am to 12pm |

Location: Zoom

Scan to Register

### Emcee



**Chandra Mohan**  
Manager, Animal Behaviour  
and Programmes,  
Jurong Bird Park

### Fireside Chat



**Belina Lee**  
CEO, Mandai Global and  
Deputy CEO, Transformation & Growth,  
Mandai Wildlife Group



**Patrick Pang**  
Chief Technologist for ASEAN,  
Worldwide Public Sector at  
Amazon Web Services (AWS)

### Mandai Innovation Showcase



**Claudia Tay**  
Manager (Animal Welfare), Animal Care,  
Mandai Wildlife Group



**Salam Marikan**  
Animal Care Officer, Animal Care,  
Mandai Wildlife Group



**Khairulnizam Zulkifle**  
Senior Manager,  
Group Transformation Office,  
Mandai Wildlife Group



**Elisha Teo**  
Vice President,  
Park Operations,  
Mandai Wildlife Group



**Vinita**  
Manager, Education,  
Mandai Wildlife Group

### Panel Discussion



**Nick Goh**  
Head of Strategy, BlackBear Digital  
and Exco, Sustainable Innovation and  
Investment Global Network (SIIGN)



**Rohaya Saharom**  
Vice President, Sustainable Solutions,  
Mandai Wildlife Group



**Lynette Lee**  
Venture Lead, Sustainability,  
Standard Chartered



**Benjamin Lai**  
Director, Strategy and Transformation  
KAER



**Jayasri**  
Head, Education and Outreach,  
WWF (Singapore)

### Featured Speaker



**Richard Goh**  
Singapore Public Sector Business Development  
Leader and Cloud Innovation Centre Manager,  
Amazon Web Services (AWS)



**Dr Jessica Lee**  
Head (Avian Species Programmes and  
Partnerships), Mandai Nature

### Mandai Co-Innovation Programme



**Edmas Neo**  
Vice President,  
Group Transformation Office,  
Mandai Wildlife Group



Contact us at [transformation@mandai.com](mailto:transformation@mandai.com)



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