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NSS 70th Gala Celebrations

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Pangolins
in
Singapore

Birds of
Panti Bird
Sanctuary

The Wonderful
World of
Global Birding

Carefree
in the
Canopy



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FOREWORD

OUR VISION STATEMENT is “to be Singapore’s leading advocate of biodiversity and habitats”. In relation to this, one aspect of our mission statement is “we lead habitat and biodiversity conservation in Singapore, and with partners in the region.” I would like to highlight some of our more important international partnerships that have strengthened conservation in Singapore and Southeast Asia.

Malaysian Nature Society – Our closest partner is also our geographical neighbour. Historically, NSS began as the Singapore branch of the Malayan Nature Society in 1954. NSS become fully independent in 1991, but we continued to maintain close ties. At present, many of us are members of MNS (Johor), with some even holding committee positions. NSS members often take part in enriching and educational scientific surveys across the Causeway. MNSJ members have always participated in the Singapore Bird Race. When MNSJ held its inaugural Panti Bird Race in 2024, NSS birders were quick to contribute our long experience in organising bird races. We are grateful for MNSJ’s presence and kind support of NSS’s 70th anniversary gala luncheon and donation drive.

BirdLife International – NSS has been a partner of BirdLife International since 1996. BirdLife works closely with Southeast Asian nature organisations to advance conservation in the region. We have benefited from BirdLife’s assistance in the Singapore Bird Race, from their links in the corporate world, and from their ornithological expertise. BirdLife frequently invites NSS members and staff to join their regional conferences, meetings and training sessions on conservation topics. At the NSS 2024 AGM, BirdLife’s Regional Director for Asia Vina Dharmarajah spoke passionately about our long and mutually beneficial relationship.

eBird Cornell Lab of Ornithology – NSS signed a five-year collaboration agreement with eBird of Cornell University in 2021. The partnership requires our representatives to act as country administrators of the eBird platform for bird data submissions in Singapore. Over this period, eBird has become a popular application for local bird enthusiasts, as well as a major tool contributing to citizen science in Singapore. eBird is also used in the annual Singapore Bird Race for the submission of sightings.

International Union for the Conservation of Nature (IUCN) – NSS has been a member of the IUCN since 1992. In June 2024, we jointly organised the 5th International Horseshoe Crab Workshop together with the IUCN Species Survival Commission Horseshoe Crab Specialist Group. The workshop attracted some 100 international scientists, researchers, conservationists, and students to Singapore. Prior to this conference, the IUCN did not assign any conservation status for the two Asian horseshoe crab species found locally, namely the Mangrove and Coastal Horseshoe Crabs, with both listed as data deficient. Following discussions and data sharing at the workshop, the Red List Assessment (RLA) for the Mangrove Horseshoe Crab will be ready for submission to IUCN by early 2025. Similarly, a RLA for the Coastal Horseshoe Crab is set to follow. Both RLAs will eventually culminate in a Conservation Action Plan for the two species.

The IUCN Leaders Forum convenes global leaders from national and subnational governments, corporate executives, heads of international organisations, indigenous and youth leaders to discuss difficult issues pertaining to nature, conservation and climate, through dialogues, networking events, and other meetings. The 2024 edition of the forum was held in Geneva, Switzerland. Looking ahead, the Singapore Tourism Board together with NParks, Mandai Nature and NSS have submitted a joint bid to bring the 2026 IUCN Leaders Forum to Singapore.

NSS greatly treasures all our partnerships, both local and international. Together, we can truly aim to be Singapore’s leading advocate of biodiversity and habitats.

Sincerely yours,




Dr Yeo Seng Beng
President

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We welcome your articles, surveys, studies, observations, artworks and photo essays on biodiversity, natural history, conservation and related fields. Please email your story proposal to contact@nss.org.sg. Do include samples of your photographs (maximum 20 images per submission). We require high resolution JPEG images (ideally uncropped) in the largest size available, labelled with a descriptive file name.

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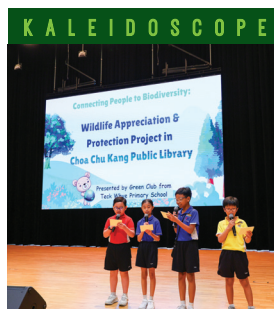
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ON THE COVER A toast to NSS's incredible donors whose support has been vital to protecting Singapore's natural heritage and making a lasting impact on conservation.



Commemorating



*of
Conservation
&
Outreach*

.....

Nature Society Singapore celebrated our 70th anniversary on 12 October 2024 with our first-ever Gala Conference and Luncheon at the Singapore Island Country Club. The conference attracted 110 attendees while the luncheon hosted 190 guests.

By

HUANG NINGXIN

Assistant Director and Head (Secretariat)

NSS

Over 110 participants attended the three-hour long NSS Gala Conference with a focus on nature conservation.



Conference

OUR CONFERENCE PARTICIPANTS comprised NSS members and supporters, school partners, corporate partners and government agencies. We were pleased that half the attendees came from schools new to the NSS Every Singaporean a Naturalist programme.

Keynote speaker and past President Dr Geh Min opened the event by addressing the three qualities that have enabled NSS to achieve past milestones and will be essential to ensure our future relevance. She reflected that successful conservation happens when there is love for nature, cooperation and collaboration, and trust between partners. She shed insights on having watched relationships and partnerships fall apart and her journey as President to mend them. The case of Chek Jawa in Pulau Ubin marked the change in how NSS

handled advocacy work, shifting from public protests to behind-the-scenes negotiations. Over time, the reputation of civil society has grown, with the build-up of trust and a good track record. On the conservation effort for Pulau Ubin, she said, "I realised what patriotism means – it's when you do something together and shape your shared destiny together, that's patriotism."

Immediate past president Dr Shawn Lum talked about navigating NSS into a new era for nature conservation, and the importance of good local and regional conservation groups. The dynamics between the Society and various agencies have morphed from enemies to partners, and these partnerships allow us to work closely for a common purpose. NSS plays a role in the larger civil society and global community, with esteemed partners such as Malaysian Nature Society and BirdLife International. In closing, he said, "Be partners, find common

Gala Conference & Luncheon

interests and remember that we are part of something bigger. We have a biodiversity crisis to solve, so let's do it!"

Assistant Director and Head (Secretariat) Huang Ningxin shared about the evolving roles of NSS and how we are creating a lasting impact. She spoke about the impact made by the Secretariat team, how success looks like when the team works with volunteers and how the team plans to create a larger pool of skilled volunteers. She has learnt much from the veterans of NSS, deriving value from discovering how conservation has been done and is being done in Singapore.

Tony O'Dempsey highlighted possible reclamation along the Singapore coastline, especially the Long Island Project, Chek Jawa and the smaller islands. These coastal habitats are important for migratory birds using the East Asia-Australasian Flyway. With the maps he created, Tony talked about the rise in sea levels, areas in Singapore that could become submerged and how mangrove forests could be affected.

He then envisioned that the Long Island Project should include artificial coral reefs, inland rivers for future planting of mangroves and rock bunds for coral reefs to establish themselves. Elevations and gradients have to be considered in new designs to cater for possible formation of rivers as sea levels rise, and in allowing mangroves to grow naturally. He touched on the reality that no nature area is guaranteed to be kept forever.

Kua Kay Yaw shared on the NSS Rewilding Project along the Rail Corridor. Covering the history of the corridor which left behind a lot of grasslands after the rails were removed, he said that there were not enough trees to allow fauna to

move through. The rewilding work focuses on planting pioneering native fruit trees tolerant to heat and low humidity. This will provide a canopy so that shade tolerant species can be included in the future.

Both Tony and Kay Yaw held a panel discussion moderated by Shawn, where attendees had their burning questions answered. Following this, Dr Vilma D'Rozario and Tan Beng Chiak shared on intergenerational engagement and global collaboration. Vilma spoke about how her conservation journey started with her involvement in Chek Jawa, which

planted a seed in her heart. She is now active in the conservation scenes of both Singapore and Malaysia, in her work with various organisations.

Beng Chiak shared her belief that capacity building and knowledge can transform people into naturalists, citing the importance of collaborations between stakeholders to make this happen. She highlighted the inspiring journeys of youth volunteers-turned-leaders and appealed to the audience to keep an open mind and learn from experienced NSS volunteers. Thereafter, both ladies had a panel discussion with Lester Tan.



Some of our conference speakers were (from left to right): Dr Shawn Lum, Tan Beng Chiak, Dr Geh Min, Dr Yeo Seng Beng, Tony O'Dempsey, Dr Vilma D'Rozario and Lester Tan with the book *Peace with Nature*.

Luncheon

THE GALA LUNCHEON marked the culmination of our 70th birthday celebration. We had two guests-of-honour, NSS Patron and Ambassador-at-large Prof Tommy Koh and Minister for National Development and Minister-in-Charge of Social Services Integration Desmond Lee. Amongst the distinguished guests were longtime members who have made a difference in nature conservation including Prof P N Avandhani who served as Chairman of Malayan Nature Society (Singapore Branch) and Richard Hale who discovered Sungei Buloh and campaigned for its conservation.

The luncheon kicked off with a rousing musical performance by Raffles Girls' School (Secondary) Angklung Ensemble RGShAKE. Conductor Faridah Jamal has been leading the ensemble since her school days. RGS has been one of our most active school partners beginning in the early 1990s. The school and its pupils have assisted in fund raising, volunteered at outreach events and participated in the Every Singaporean a Naturalist programme. A pivotal contribution took place in 2001 when RGS



Items and experiences were auctioned to raise money for the Society.



Opening the NSS Gala Luncheon was a rousing performance by Raffles Girls' School (Secondary) Angklung Ensemble RGShAKE conducted by Faridah Jamal.

helped raise awareness of the rich biodiversity in Chek Jawa with the publication of the picture book *No Worms for Dinner*.

NSS President Dr Yeo Seng Beng delivered his welcome speech and launched our 70th anniversary commemorative video featuring Patron Prof Tommy Koh, first NSS President Dr Wee Yeow Chin, our only female President Dr Geh Min, our longest-serving President Dr Shawn Lum and our Assistant Director and Head (Secretariat) Huang Ningxin. The video covered our history, our contributions to the local conservation scene and our direction moving forward.

Minister for National Development Desmond Lee delivered his keynote speech where he expressed appreciation towards the dedicated NSS volunteers and stakeholders who have closely collaborated with the Society. This was succeeded by a donor appreciation ceremony. Certificates and the book *Peace with Nature: 50 Inspiring Essays on Nature and the Environment* were presented to donor representatives in the Diamond Tier (Mapletree Investments Pte Ltd), Platinum Tier (Dr Geh Min), Gold Tier (DBS Bank Limited), and Silver Tier (JTC Corporation, Prof Ng Soon Chye, and Camphora Pte Ltd).

Award-winning local artiste iNCH enchanted us with her vocals, performing three songs from her album *Letters to Ubin*. The recording was inspired by Pulau Ubin's natural beauty and the sounds encountered during her residency there.

We held our inaugural Distinguished Conservation Service Honours award ceremony, commemorating four individuals who have made continuous and consistent contributions to nature conservation through NSS:



Our inaugural Distinguished Conservation Service Honours award ceremony commended four individuals who have made continuous and consistent contributions to nature conservation through NSS, namely (from left) Dr Geh Min, Leong Kwok Peng, Dr Ho Hua Chew and Dr Shawn Lum. They are with Patron Prof Tommy Koh (second from left) and NSS President Dr Yeo Seng Beng (first from right).



Guest-of-honour Desmond Lee and NSS President Dr Yeo Seng Beng recognising the contributions of Diamond Tier donor Mapletree Investments Pte Ltd represented by its Group Chief Corporate Officer Wan Kwong Weng (left) as well as Platinum Tier donor Dr Geh Min.



Prof Tommy Koh recognising the good work of our longest serving staff member Joseph Lim, who has been at the job for 30 years.

■ **Dr Ho Hua Chew:** As conservation coordinator and first Chair of the Conservation Committee, Hua Chew has played a key role in shaping the Master Plan for Nature Conservation in Singapore. His leadership in critical projects, including the preservation of Sungei Buloh and Kranji Marshes, has protected vital natural habitats for future generations. His unwavering dedication over the decades has inspired countless people.

■ **Dr Geh Min:** As the first female President, Geh Min's leadership was instrumental in preserving key sites such as Chek Jawa and Kranji Marshes, as well as in strengthening NSS's reputation and ties with NParks. As a Nominated Member of Parliament between 2005 and 2006, she gave nature a voice in politics. She spoke on a wide range of environmental issues, from wildlife protection to developing alternative energy sources and bolstering civil society, greatly influencing Singapore's environmental landscape.

■ **Dr Shawn Lum:** From being the first Chair of the Plant Group to becoming our longest-serving President, Shawn's leadership has been crucial to initiatives like the adoption of Lorong Halus Wetland as an educational site and the conservation of the Rail Corridor. He made NSS into a respected voice within BirdLife International, raising our regional and global profile.

■ **Leong Kwok Peng:** Since the 1980s, Kwok Peng has had a hand in many keystone projects including coordinating reef rescue efforts,

The NSS Gala was proudly presented by the NSS Secretariat team (from left to right): Joseph Lim, Michelle Simon Hariff, Huang Ningxin, Sung Mei Yee, Sylvia Tan and Kerry Pereira.



creating the Singapore Blue Plan and conserving the Rail Corridor. As a former Vice President and current Chair of the Conservation Committee, he has built strong relationships with external agencies and raised awareness of our coastal habitats by bringing important stakeholders on nature walks and kayaking trips, whilst engaging them in critical discussions on conservation. He has enriched the culture of the nature community both within and outside NSS.

In his speech, Prof Tommy Koh concluded the ceremony by honouring these longtime volunteers for their inestimable contributions. He specially highlighted our longest serving staff Joseph Lim. For 30 years, Joe has done a good job in finance and administration, but it is his personal connection with members that has built an irreplaceable camaraderie.

We then auctioned off various donated items and experiences to raise funds for the Society. They included a

kayaking trip to Sungei Khatib Bongsu, an autographed photo of Clementi Forest, a photo set of the Common Rose butterfly and Crimson Sunbird, Brittle Star fossils, a birdwatching tour at Kranji Marshes, a digital collage of our SIG (Special Interest Group) Representative Animals, and a painting of Bukit Timah and its environs.

Indeed, it is with the ongoing support of dedicated members and staff that will allow the Society to continue our mission in making a significant difference to nature conservation and in pushing our various projects and endeavours to the next level. The Secretariat would like to thank the advisors for the NSS Gala, namely Dr Geh Min, Prof Lye Lin Heng, Tay Kae Fong, Dr Yeo Seng Beng, Joel Leong and Tan Beng Chiak. We also appreciate the volunteers who have stepped up to make this event most memorable. Last but not least, a huge thank you to our corporate partners as well as to our partners in the government ministries and agencies. 🌿

BIODIVERSITY



BIRDS *of*





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PANTI BIRD SANCTUARY

By **VERONICA FOO**, Bird Group Chair

Singaporeans are fond of escaping across the Causeway for the weekend. Nature lovers are no different, especially with Panti Bird Sanctuary beckoning with its arresting array of birds and other wildlife. **Veronica Foo** shines a spotlight on this birding mecca.

1 The Scarlet-breasted Flowerpecker (*Prionochilus thoracicus*) is classified as Near Threatened. The male has brilliant red breast and crown patches whereas the female stands out less, clad in grey, yellow and olive.

Photo: Tan Gim Cheong.

2 The Black-and-Yellow Broadbill (*Eurylaimus ochromalus*) is a toy-like bird with a prominent yellow eye-ringing and a bright blue bill. It feeds mainly on insects.

Photo: Tan Gim Cheong.

3 In Singapore, the White-bellied Woodpecker (*Dryocopus javensis*) is a rare, non-breeding visitor. We can still catch sight of this large woodpecker in Panti, delighting us with its striking red crest boldly contrasted against its black head and body.

Photo: Alan Owyong.



5

4 The nocturnal Blyth's Frogmouth (*Batrachostomus affinis*) is typically only seen at night. By day, it spends most of its time roosting motionless up in trees. It is hard to spot, with its brown plumage providing excellent camouflage against predators.

Photo: Lim Kim Chuah.

5 Another former resident of Singapore, the Banded Kingfisher (*Lacedo pulchella*) is an insectivorous bird found in lowland forests. Being sexually dimorphic, males and females differ in looks. The male (shown here) is largely blue while the female is rufous with black bandings. Photo: Veronica Foo.

Panti is home to more than 380 bird species including colourful trogons, melodious babblers, drumming woodpeckers, majestic hornbills, secretive kingfishers and more. It is also prime habitat for mammals such as the endangered Malayan Tiger, Malayan Tapir and Asian Elephant. To top it off, the sanctuary hosts a rich assemblage of reptiles, amphibians, arthropods and tropical plant species.

A forestry permit is required for all visitors. The best launch-off point is Kota Tinggi town where there are hotels and good restaurants to support a multi-day trip.

Panti's famous Bunker Trail is an eight-kilometre long gravel and dirt track that traverses the sanctuary, accessible by car and on foot. It is where the magic happens. Early birds are greeted by an energetic dawn chorus of numerous bird species including babblers, bulbuls and leafbirds as well as the evocative calls of White-handed Gibbons.

One of the top experiences in forest birding has to be encountering a bird wave – a mixed species feeding flock that moves as a coordinated front through the forest to flush out and feed on insects. In an encounter, one can spot between six to 10 bird species at one go, making it both exhilarating and challenging when deciding which birds to focus on and in trying to identify them all.

There are a number of forest tracks branching out from the main Bunker Trail worth checking out. These shady and narrower paths can at times yield splendid views of understorey and ground birds. After many seasons of birding in Panti, one will start to become



6 The Rufous Piculet (*Sasia abnormis*) is a tiny woodpecker with a stumpy tail. It is not easily located, being well camouflaged in dense vegetation. The sexes differ in appearance with the male bearing a yellow patch on the forehead whereas the female spots a bronze patch. Photo: Lim Kim Chuah.



7 The Buff-necked Woodpecker (*Meiglyptes tukki*) used to be a resident of Singapore but is now extirpated. Often seen in Panti, this bird forages in the lower and mid tiers of the forest, going after ant and termite nests. Photo: Veronica Foo.



8 The colourful Malayan Banded Pitta (*Hydrornis irena*) subsists on worms and insects on the forest floor. Its population is on the decline due to habitat loss and poaching for the illegal cage-bird trade. Photo: Tan Gim Cheong.



9 The Blyth's Hawk-Eagle (*Nisaetus alboniger*) is an uncommon resident in Malaysia and a rare non-breeding visitor to Singapore. This handsome bird hunts arboreal mammals, bats, birds and lizards in the forest canopy from a concealed perch. Photo: Lim Kim Chuah.

10 **11** Trogons are one of the most colourful species in Panty and many are classified as Near Threatened. Despite their stunning appearance, they are difficult to spot. To locate and identify these birds, we listen out for their loud and distinctive calls. The Cinnamon-rumped Trogon (*Harpactes orrhophaeus*, left) is increasingly rare. Others like the Red-naped Trogon and Diard's Trogon (*Harpactes diardii*, right) are occasionally encountered. Photos: Tan Gim Cheong (left), Lim Kim Chuah.

12 The Chestnut-breasted Malkoha (*Phaenicophaeus curvirostris*) is a large colourful cuckoo that hunts small vertebrates. Unlike many cuckoos that are brood parasites, this species builds its own nest and raises its young without hiving off the duty to another bird species. Photo: Alan Owyong.



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11



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13 The delightful calls of babbler such as this Scaly-crowned Babbler (*Malacopteron cinereum*) are frequently heard resonating through the forest. Babblers are small and difficult to see as they tend to hide in thick foliage. Photo: Tan Gim Cheong.



14 The Blue-winged Leafbird (*Chloropsis cochinchinensis*) is frequently encountered feeding on insects and fruits on low vegetation and trees along Pantí's dirt track. This bird is an uncommon resident in Singapore. Photo: Alan Owyong.



15 Owing to deforestation, the frugivorous Wrinkled Hornbill (*Rhabdotorrhinus corrugatus*) has become endangered. The male (shown here) does not resemble the female. They are monogamous and pair off for life. Photo: Tan Gim Cheong.



16 One of the top target birds in Pantí, the Rail Babbler (*Eupetes macrocerus*), leads a reclusive lifestyle on the forest floor, feeding on insects and worms. It walks like a rail, jerking its head in the manner of a chicken. The species has a low and long monotonous whistle that is sure to set hearts aflutter. Photo: Lim Kim Chuah.



17 The Fluffy-backed Tit-babbler (*Macronous ptilosus*) is a former resident in Singapore but is now extinct. We regularly encounter this medium-sized babbler in Pantí. It has a rich brown plumage with blue lores and eye-ring, and is usually seen in pairs foraging for insects. Photo: Lim Kim Chuah.

18 The Great Argus (*Argusianus argus*) is an iconic bird of the lowland Sundaic forests on every birdwatcher's dream list. We were fortunate that its dancing ground was found in the northern foothills of Gunung Pantí in 1997. We heard its kow-wow calls a few metres behind us. We waited for it to circle around to its dancing ground 30 m away. Despite its lovelorn calls, no females showed up. The memory of the encounter has lingered on till today. Photo: Alan Owyong.

19 The shy Blue-banded Kingfisher (*Alcedo euryzona*) hangs out at slow-flowing forest streams and is less commonly encountered. It hunts small fish such as Rasbora as well as shrimps, reptiles and insects. Photo: Tan Gim Cheong.



17



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19

familiar with the calls and songs of target bird species. Tracing and tracking down these vocalisations can prove rewarding.

Do keep to the trails and avoid bashing as trampling on plants degrades the forest. During the rainy monsoon months from November to February, it would be prudent to stay home to avoid the deluge. Otherwise, Panti is an unmissable hotspot for people who enjoy birds and wildlife.

The Johor State Forestry Department has in recent years committed to improving and protecting this stupendous sanctuary. Pre-Covid biodiversity surveys from March 2019 to March 2020 conducted jointly between Malaysian Nature Society Johor (MNSJ) and Nature Society Singapore (NSS), in partnership with the Johor State Forestry Department, provided opportunities for dedicated nature enthusiasts to observe and document bird and fauna diversity. The year-long expedition recorded 234 species of birds while camera traps placed in the forest picked up 35 species of mammals.

To celebrate the birds of Panti, MNSJ together with the Johor State Forestry Department, supported by NSS and Birdlife International, organised the inaugural Panti Bird Race from 27 to 28 April 2024. There was a good turnout of over 140 birdwatchers and bird photographers forming 44 teams. The event drew attention to Panti's superb avian diversity and highlighted the importance of conserving this precious patch of lowland rainforest for generations to come.

The birds in this article were photographed in Panti by veteran Singapore birders over the years. They are but a fraction of the actual numbers. Be sure to make a trip soon and experience them for yourself! 🌿



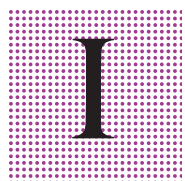
Veronica Foo has been with NSS for over a decade and is the current Chair of the Bird Group. As a nature lover who enjoys bird watching, she is actively involved in various nature conservation projects and activities.

CONSERVATION

Pangolins *in Singapore*

By BEE CHOO NG-STRANGE,
NORMAN T-L LIM & MARCUS CHUA

The Sunda Pangolin is elusive and understudied in Singapore. **Bee Choo Ng-Strange, Norman T-L Lim and Marcus Chua** shed light on this enigmatic creature and how the recent project to georeference its records in Singapore has immediate conservation applications.



It is amazing that pangolins, also known as scaly anteaters, are found in the highly urbanised city-state of Singapore. Pangolins are evolutionarily unique, belonging to the order Pholidota and its sole family Manidae. This nocturnal creature is mainly terrestrial in habits, but it can burrow and climb trees as well.

The species found in Singapore is the Sunda Pangolin (*Manis javanica*). Native to mainland Southeast Asia and its islands, it is heavily poached throughout its range for its scales and meat. The loss of its forested habitat is another factor for the steep decline in its population, leading to its categorisation as globally Critically Endangered (CR) on the IUCN Red List (Challender et al., 2019) and nationally CR in the Singapore Red Data Book (Davison et al., 2024).

Sunda Pangolins are myrmecophagous, feeding only on ants and termites. They have a conical head, toothless jaws, a long sticky tongue to lick up ants and termites, and feet armed with powerful claws for digging and breaking up ant nests and termite mounds.

The scales, unique to this group of mammals, are similar to nails and hair. Composed of keratin, they offer excellent protection against predators as well as the bites and stings of prey. When cornered, pangolins curl up to protect their non-scaly underparts and heads. The young is carried around by its mother, clinging to her back at the base of her tail. Adults weigh up to 12 kg and grow up to 1.2 m, with males tending to be larger than females.

Native to mainland Southeast Asia and its islands, the Sunda Pangolin is heavily poached throughout its range for its scales and meat. It is categorised as globally Critically Endangered.

Facing page: A Sunda Pangolin climbing a tree, possibly to look for ant or termite nests at the top. Such nests can also be on the ground or below ground. Photo: Norman Lim.

Sunda Pangolins live in the forest, but they are not confined to it. They also forage in plantations and scrublands. Individuals use urban structures such as drains and buildings for daytime retreat. Female pangolins with young are always found in dens associated with large trees (e.g. tree holes), suggesting that mature forest is required during the reproductive phase and is critical for the long-term survival of the species. Other than this, the breeding ecology of wild Sunda Pangolins is not known as the species is understudied.

Being insect predators, Sunda Pangolins help maintain the functional integrity of their environment. Ants and termites form the dominant constituent of biomass in many terrestrial ecosystems. They have a profound influence on nutrient-recycling dynamics. Hence, by eating them, pangolins play a role in regulating ecosystem functions.

Sunda Pangolins are hunted for their meat and scales. They are consumed on a subsistence basis by indigenous people in Southeast Asia. However, more importantly, they are heavily poached and sold as exotic meat in restaurants outside their native range. Their body parts, especially the scales, are used in traditional medicine. The processed scales are said



Sunda Pangolins can also scale fences to explore new areas. Photo: Roy Joseph.

to be good for activating blood circulation, stimulating lactation, dispersing swelling, and expelling pus. However, a recent scientific study found that pangolin scales have no special medicinal value. Yet, owing to the demand, pangolins are exceptionally vulnerable to over-exploitation, as they are not aggressive and have a very slow reproduction rate.

Apart from illegal harvesting and trade, Sunda Pangolins also face serious threats from habitat destruction and degradation. Forested lands in their native Indonesia and Malaysia have largely disappeared in the last four decades due to urbanisation and conversion to plantations. Pangolins cannot be farmed, so with deforestation and poaching, their populations have drastically reduced to critical levels. In Singapore, this species travels between patches of wooded areas, inevitably crossing roads. Pangolins

Pangolins are exceptionally vulnerable to over-exploitation, as they are not aggressive and have a very slow reproduction rate.

have poor vision and do not move fast. Many are knocked down by vehicles, leading to serious injuries or deaths.

In Singapore, the Sunda Pangolin is legally protected under the Wildlife Act, Wild Animals and Birds Act (Chapter 351) and in nature reserves and parks under the Parks and Trees Act (Cap. 216). It also receives protection under the Endangered Species (Import and Export) Act (Cap. 92A).

The Singapore Pangolin Working Group (SPWG), formed in August 2014, aims to improve awareness and ensure that the Sunda Pangolin receives adequate

local protection. The SPWG is composed of members representing various stakeholders: Mandai Wildlife Group (MWG), Animal Concerns Research and Education Society (ACRES), Nature Society Singapore (NSS), National Parks Board (NParks), National University of Singapore (NUS), Nanyang Technological University (NTU), and other local and international NGOs (see <https://singaporepangolinwg.wordpress.com/>).

To improve collaboration among the stakeholders, a Sunda Pangolin National Conservation Workshop was held in 2017. This ensured that efforts such as



Pangolins feed only on ants and termites. This individual is using its long sticky tongue to lick up Weaver Ants (*Oecophylla smaragdina*). Photo: Norman Lim.



Young pangolin being carried by its mother by clinging onto her back at the base of her tail. Photo: Norman Lim.

conservation and research projects, education and community outreach, as well as pangolin rescue and release were being worked on by SPWG members. Subsequently, a National Conservation Strategy and Action Plan report was produced in 2018 (Lee et al., 2018).

In June 2020, a donor approached NSS to fund a project specifically on the conservation and research of the Sunda Pangolin in Singapore. This kick-started discussions amongst members of NSS's Vertebrate Study Group (VSG), in particular Marcus Chua and Bee Choo Ng-Strange, on the possibility of collating and analysing georeferencing records of pangolin sightings and roadkill across Singapore, to fulfil one of the objectives in the Action Plan.

Female pangolins with young are always found in dens associated with large trees (e.g. tree holes), suggesting that mature forest is required during the reproductive phase and is critical for the long-term survival of the species.

In the final project iteration, we were able to deliver three of the objectives:

- 1) Establish population status, trends and viability of the Sunda Pangolin in Singapore
- 2) Consolidate and analyse sightings and roadkill databases to understand distribution patterns
- 3) Create distribution maps of pangolin roadkill and other records



During the day, pangolins sleep in the hollows of trees or in underground burrows. Female pangolins with young are always found in dens associated with large trees (e.g. tree holes), suggesting that mature forest is required during the reproductive phase. Photo: Norman Lim.

We obtained further funding support and approval from NSS's Exco and proceeded to hire a research assistant, Muhammad Khairuldin Aziz, to trawl through 30 years of data collected by NSS, NUS and other sources.

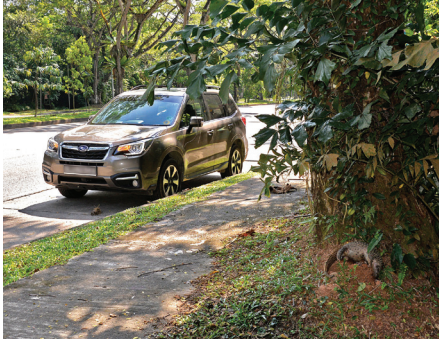
Kelvin Lim from NUS had been accumulating sighting and roadkill records since the early 1990s. He also had collated data from NSS's VSG records. We then obtained the records from other SPWG organisations including MWG, ACRES, and NParks. Next, our research assistant went through various social media sites and iNaturalist to extract their pangolin data. Samples of these records are shown in Table 1 below.

Many of the submitted records lacked GPS coordinates, making it a challenge to determine specific sighting, rescue or roadkill locations. We dealt with this by adapting georeferencing best practices outlined below. Anthony O'Dempsey, a mapping specialist and VSG member, trained Khairuldin to use specialised software for the georeferencing work.

Georeferencing Sunda Pangolin Records in Singapore

■ Data Collection

Pangolin sighting, roadkill, rescue and release data were extracted from the Singapore Pangolin Working Group's consolidated database and other publicly available data points in July 2021. Dates of the records ranged between 1996 to June 2021. Many came from public reports, wildlife surveys and rescues. Additionally, social media posts of pangolin sightings on Singapore-based Facebook nature groups



A Sunda Pangolin roadkill found on 6 January 2019 at Upper Thomson Road.
Photo: Nick Baker.



482 cases of pangolin rescues, roadkill and sightings were georeferenced, occurring between 1996 to end June 2021. Of these records, 220 were rescues, 96 were confirmed roadkill and 116 were sightings made by members of the public.

such as NSS and Singapore Wildlife Encounters were compiled. Certain posts had photographic or video evidence of the sightings, encounter dates, and locations, making it easier to do the georeferencing work. All records were compiled into a single database in preparation for the georeferencing process.

■ Data Preparation

Georeferencing work was performed in ArcMap 10.8.1, using OneMap Web Tile Map Service (WTMS) as the base map. We

ensured the quality of the georeferenced data based on record suitability and accuracy. Unsuitable records were identified and excluded using criteria such as the absence of location description, multiple submissions for a location description, and duplicates. Duplicates and triplicates were the most frequent disqualifiers, determined to be the result of multiple records. For example, a caller reports a pangolin in distress to ACRES for rescue. Thereafter, he/she files the sighting with VSG. The rescued pangolin is sent to MWG for treatment and rehabilitation. This hypothetical case results in three records of the same pangolin. To resolve the situation, we only took the record of the last party that handled the pangolin, merging the relevant details of the first two records into the surviving record in the new database.

Once georeference suitability was confirmed, the records were assigned unique identifying numbers. They were then categorised based on their locality descriptions. The occurrence data was classified into seven locality types: address, area, coordinates, lamppost, road, road junction, and road section.

Table 1: Sample Records of Pangolin Sightings & Roadkill

Quantity	General location	Specific location	Date	Month	Year
1 male	Pan Island Expressway	Centre divider between Thomson Road and Adam Road.	24	Sep	1996
1	Arcadia Road		13	Jan	1999
1 male	Jurong area			Mar	2000
1	Nanyang Avenue off Jalan Bahar	Outside entrance of Nanyang Technological University.	9	Nov	2001
1	Lower Peirce Reservoir	Near Rifle Range Road	2	Oct	2001
1 male	Central Catchment Nature Reserve			Aug	2001
1	Lim Chu Kang Road	Outside SAF Armour Centre, south of Neo Tiew Road junction	25	Nov	2003
2 female	Mandai Road		5	Oct	2003



When threatened, pangolins curl into a ball to protect their non-scaly vulnerable undersides and heads from predators. Photo: Norman Lim.

Conservation consultants have utilised the database as the basis for recommendations to developers in several construction projects. NSS also made use of it to recommend several actions including erecting barriers at road sides to prevent roadkill and creating wildlife corridors.

In total, 482 cases of pangolin rescues, roadkill and sightings were georeferenced, occurring between 1996 to end June 2021. Of these records, 220 were rescues, 96 were confirmed roadkill and 116 were sightings made by members of the public. The majority of the data was logged from 2011 onwards. We had to remove 65 records due to lack of detailed location information.

The end result of the project was the creation of the first georeferenced database of Sunda Pangolin records from Singapore. This important database has immediate use for conservation applications. Conservation consultants have utilised it as the basis for recommendations to developers in several construction projects. NSS also made use of it to recommend several actions including erecting barriers at road sides to prevent roadkill and creat-

ing wildlife corridors. Some of these measures have been implemented by the authorities and relevant parties.

For detailed information regarding the methodology, results and discussion of our study, please check out the paper 'Georeferencing Sunda Pangolin *Manis javanica* records in Singapore' published online by Cambridge University Press on 16 September 2024. It is freely available for download at <https://doi.org/10.1017/S0030605324000206>.

The data and maps from the georeference work are not shared publicly. They are available only to stakeholders and the authorities concerned who should be aware of the hotspots and roads that pose a danger to pangolins. Mitigation measures can then be put in place to ensure the safety and survival of pangolins in Singapore. 🌿

Report Your Pangolin Sighting



If you come across a pangolin sighting, roadkill or rescue, please submit your record to the Singapore Pangolin Working Group at <https://singaporepangolinwg.wordpress.com/record-a-pangolin/>. We recommend the use of GPS coordinates for record submission, which mobile applications like Google Maps or OneMap can provide.

ACKNOWLEDGEMENTS

We thank Muhammad Khairuldin Aziz and Anthony O'Dempsey who both contributed greatly to the pangolin georeferencing work. We are grateful to members of the public who sent their records to various organisations that went into the creation of the Sunda Pangolin database; to Kelvin Lim who has been keeping records for many years; and to Paige Lee and Frances Loke for managing the records of the Singapore Pangolin Working Group. The georeference project was funded by Nature Society Singapore, DBS LiveBetter, and public fundraising campaigns run by Lee Xiu Ping.

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Bee Choo Ng-Strange

loves all wildlife, particularly birds and mammals. She has been a member of NSS since 1987, chairing the Vertebrate Study Group

from 2012 to 2017. She has represented NSS at the Singapore Pangolin Working Group since its inception in 2014. In 2010, Bee Choo, Norman Lim and Kelvin Lim produced a 22-page booklet *Save the Pangolin: Our Scaly Anteater*. Photo: Divya Mudappa



Dr Norman Lim has an interest in understudied vertebrates, focusing on the ecology and conservation of terrestrial vertebrates (e.g. free-roaming dogs and

colugos). He has been a member of the IUCN Pangolin Specialist Group since 2012 and has served as Associate Editor for The Raffles Bulletin of Zoology since 2013.



Marcus Chua is interested in Southeast Asian mammal evolutionary history, and the ecology and conservation of mammals in threatened, human-modified, and

fragmented landscapes. He is currently the Curator of Mammals at the Lee Kong Chian Natural History Museum in the National University of Singapore.

Sungai Relau Treetop Walk is situated at the lesser-known western entrance of Taman Negara National Park. Since its opening on 1 April 2023, the state-of-the-art facility has made this neck of the woods more attractive to visit. Sturdily constructed in metal, the installation stretches 612 m through the teeming canopy of the Malaysian rainforest. A walk here is a colossal treat for the senses.

The first leg passes over the clear waters of Sungai Relau (Relau River), home to the rare Kelah or Malayan Mahseer fish (*Tor tambroides*). Also known as Empurau or 'wang bu liao' ('unforgettable' in Mandarin), the Kelah has the reputation of being the most expensive freshwater fish in Malaysia and Singapore. Even its scales are eaten, fried separately in spice to a crisp and served as a prelude to the main dish. This slow-growing piscine is said to have a sweet flesh purportedly derived from its diet of fallen forest fruits. Scarce in many rivers due to overfishing, pollution and dam building, the Kelah finds sanctuary at Sungai Relau where it is bred and reared in glass tanks and trained to suckle liquid food from feeding bottles. The species is then released to repopulate the wild. The presence of Kelah indicates that the river is ecologically healthy as the fish avoids silted water.

When our driver Juki dropped some pellets into the river, the Kelah shoal reacted with swift darting movements, demonstrating their vitality. This big fish comes in a variety of colours from pink to yellow brown.

As we moved along, the pathway gradually climbed into the airy canopy. Surrounded by foliage, birdlife was plentiful. We savoured confiding views of several Blue-crowned



An unidentified caterpillar partaking a leafy meal.
Photo: Gloria Seow.

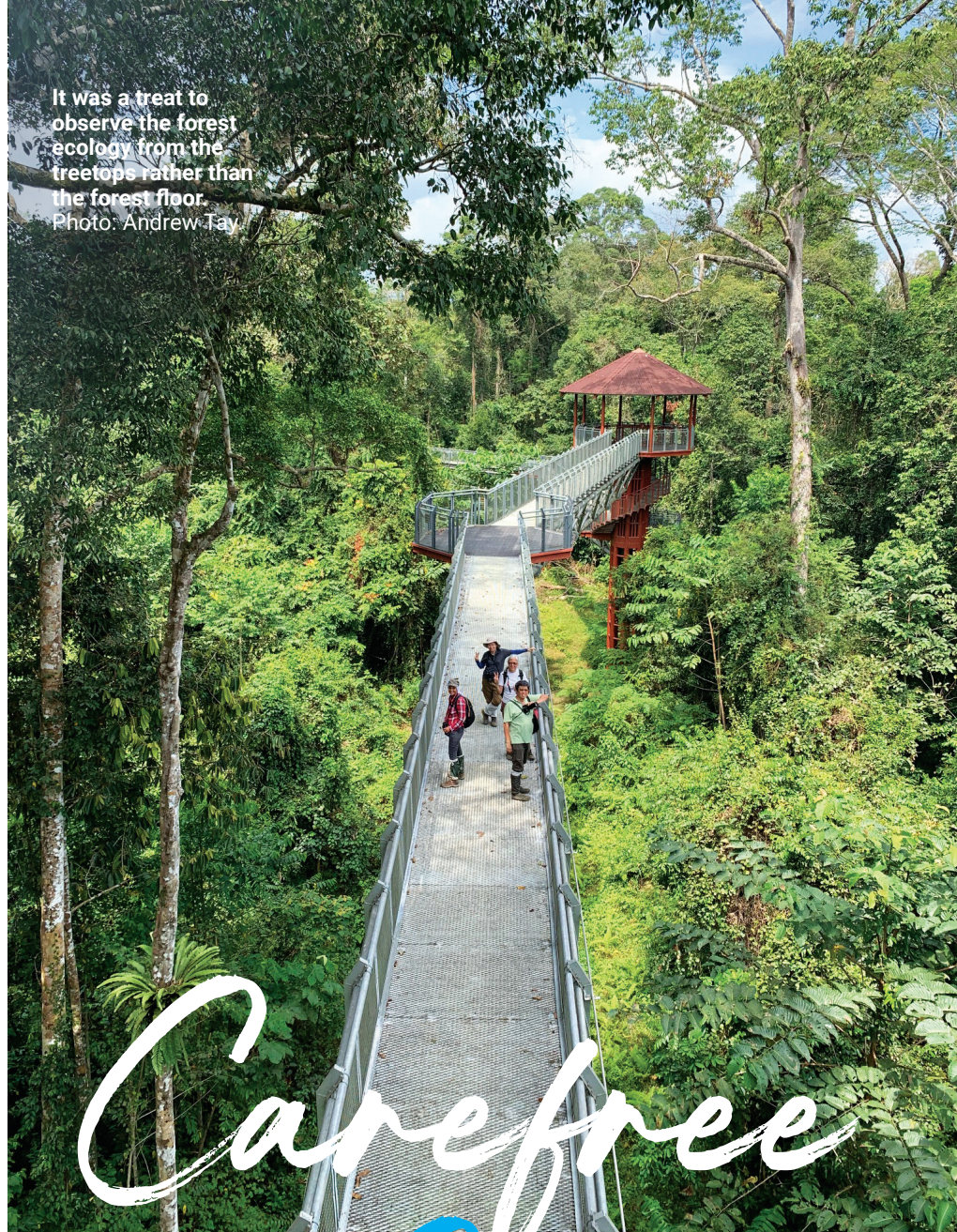


Several Blue-crowned Hanging Parrots amused us with their cute antics at almost eye level. Photo: Timothy Pwee.



Many birds including this Red-eyed Bulbul feasted on the fruits and flowers of the Syzygium tree. Photo: Gloria Seow.

It was a treat to observe the forest ecology from the treetops rather than the forest floor.
Photo: Andrew Tay



Carefree IN THE Canopy

By GLORIA SEOW

Sungai Relau Treetop Walk is a must-see destination, says **Gloria Seow**.

Hanging Parrots (*Loriculus galgulus*) flitting in to indulge in fruits and flowers. These tiny parrots tottered on the high branches like unbelievably cute toys come alive. They were joined by leafbirds, bulbuls, barbets, woodpeckers and the like, all drawn to the veritable feast in the sky. Our birdwatching rhythm amped up a notch when a Black-thighed Falconet (*Microhierax fringillarius*) swooped in and claimed a hapless cicada as its prize. The falconet then brought its catch to a high perch, taking small bites of the juicy snack.

Much of the elevated walkway is wheelchair accessible. There are 13 platforms and seven observation towers, each higher than before, culminating in the 32-m tall Menara Tahan tower. Here, we paused for a picnic lunch while enjoying the verdant vista all around. We could make out Peninsular Malaysia's tallest mountain Mount Tahan in the distance, enveloped by a sea of pleasing green. In fact, the western entrance of Taman Negara is primarily used by climbers to access the 2,187 m high massif. After a meditative lunch aided by the sound-surround hum of the forest, the tower had more than enough room for the five of us to lay down for a postprandial siesta. Refreshed, we continued our exploration, tracing the walkway as it sloped downwards and looped back to the start.

As earth-bound beings, it was a privilege to observe the forest ecology from the treetops rather than the forest floor. Hardly needing to crane our necks, we admired the stunning blooms of dipterocarps and climbers, the many epiphytes and ferns, and of course the denizens of the upper tiers. We found a young Malayan Water Monitor (*Varanus salvator*) sunbathing on the trunk of a forest giant. Another tree played host to striking black-and-yellow caterpillars busily chomping on leaves. Here and there, squirrels would frolick at close range. There were at least three species present including the handsome Black Giant



A juvenile Malayan Water Monitor sunbathing on the trunk of a forest giant. Photo: Gloria Seow.



We came across a few *Argiope* spiders and their orb webs with prominent stabilimentums. Photo: Timothy Pwee.

Hardly needing to crane our necks, we admired the stunning blooms of dipterocarps and climbers, the many epiphytes and ferns, and of course the denizens of the upper tiers.

Squirrel (*Ratufa bicolor*). Dusky Langurs (*Trachypithecus obscurus*) and Sunda Pig-tailed Macaques (*Macaca nemestrina*) also made their appearance, moving agilely through the branches.

We were intrigued by a species of Saint Andrew's Cross Spider (*Argiope* sp) which had a big and beautiful stabilimentum in the centre of its web. This spider was fairly common, with webs seen every so often on the railings of the treetop walk. While ascending the highest tower, I spotted the tunnel-like web belonging to another spider species. With so much to find and photograph, our progress was deliberately slow. We started at 9 am and stayed on till 4 pm when Juki came to pick us up for the seven kilometre drive back to the village of Merapoh.

Our treetop jaunt happened at the tail-end of our Merapoh stay from 17 to 21 February 2024. We were based here for CAT (Citizen Action for Tigers) Walk Plus*. We had extended two more days to explore the new canopy walk. Juki drove us around in a Hilux pick-

up truck decked out safari style with three rows of cushioned seats. As entering the forest at night is prohibited, all four of our night drives in Merapoh were through oil palm plantations and scrub to look for wildlife. We mostly encountered Common Palm Civets (*Paradoxurus musangus*), Leopard Cats (*Prionailurus bengalensis*), and once, a graceful Large Indian Civet (*Viverra zibetha*). Lucky CAT Walk Plus participants have even recorded the Sun Bear (*Helarctos malayanus*) and Malayan Tapir (*Tapirus indicus*) at these nocturnal drives. On our trip extension, we also followed the jeep track into the heart of Taman Negara during daylight hours where our best find was a Giant Asian Pond Turtle (*Heosemys grandis*) by a lovely forest stream. 🌿



Gloria Seow is a professional copywriter, editor and nature guide as well as a published author. She is the current Editor for *Nature Watch* magazine. Learn more at

<https://lorisowl.wordpress.com/>.

***CAT Walk Plus** is organised by the Malaysian Conservation Alliance for Tigers (MYCAT), a trip that exposes nature lovers to anti-poaching patrols at the Sungai Yu Ecological Corridor, camera trapping and habitat restoration. MYCAT's sister organisation, **Singapore Wildcat Action Group**, helps recruit Singapore-based trip participants every month. Do check out www.swagcat.org/cat-walk to learn more. Alternatively, read about CAT Walk Plus in *Nature Watch* Jan-Mar 2023 issue. Be sure to get your group to experience the additional night drives and extend your stay for a foray into Sungai Relau Treetop Walk.

Sungai Relau Treetop Walk
Taman Negara Pahang, Sungai Relau, Merapoh, 27210 Kuala Lipis, Pahang
Opening Hours: 9 am to 4.30 pm (closed on Thursdays)
R. A. Adventure Travel
Roslan Abdullah/Juki
r.aadventured@gmail.com

THE WONDERFUL WORLD OF

Global Birding

By TIM APPLETON & GEOFF LIM

Global Big Day and Global Bird Weekend are massive online events, where between 32,000 and 63,000 birders from around the world simultaneously clock in their bird sightings. **Tim Appleton** and **Geoff Lim** share the backstory of their origins and how the twin events have helped them and others cope with the pandemic.

GEOFF

On Global Bird Weekend held on 8 October 2022, at precisely 5:57 am, a cock crowed in the distance. And so, the Red Junglefowl was ticked. As the sun rose, more birds started calling. A Black-naped Oriole's flute-like notes rang out, while a pair of House Swifts trilled as they left their roost to hawk for insects. Over the course of five hours, I counted 14 species from my hospital bed. Similarly, my team members from across the East Asian Australasian Flyway began their race against time to add species to our joint list.

Despite the discomfort of having liquid fed into my veins while recovering from my first dose of chemotherapy, I was in contact with my far-flung team mates via WhatsApp and Facebook Messenger, cajoling them to share their eBird checklists. Being unable to leave the confines of the Singapore General Hospital, the NSS Bird Group helped me out by contributing their sightings from several locations, firming placing Singapore on the global birding map.



Far East Curlew landing on the shores of Darwin, Australia. Photo: Micha Jackson.



The Pangaeian Birders team has put the critically endangered Straw-headed Bulbul on the global birding list consecutively since the start of these global birding events. Photo: Geoff Lim.

Flashback to mid-2020, sometime after Singapore's Circuit Breaker to tackle the scourge of Covid-19 – I was having coffee with my pal Dr Yong Ding Li when he remarked that he had just chatted with Tim Appleton and encouraged Tim to go ahead with his idea

of a global birding event. Tim is the former reserve manager at Rutland Water in the UK, where he raised almost £40 million for conservation projects for BirdLife International. Tim had a hand in the reintroduction of Ospreys in England, and did early work in the conservation of the endangered Hawaiian Goose. Ever effervescent, Tim is not the type to sit still in retirement. Encouraged by friends, he went ahead to launch the first Global Bird Weekend jointly with BirdLife International, Cornell Lab of Ornithology and Swarovski Optics on 17 October 2020, and waited with bated breath to see if anybody would participate.

TIM

In 2020, two tumultuous events occurred in my life – the pandemic and my retirement from 50 years of conservation fieldwork. I began my work life with Sir Peter Scott who founded



Malayan Partridge from Fraser's Hill, Malaysia. Photo: Cheong Weng Chun.



Little Spiderhunter, Singapore. Photo: Geoff Lim.



Black-throated Sunbird from Fraser's Hill, Malaysia. Photo: Cheong Weng Chun.

the Wildfowl and Wetlands Trust. He took me under his wings for five years before I became reserve manager at Rutland Water, a company operating a reservoir that supplied freshwater to the east Midlands of England. My company had the foresight to conserve parts of the grounds for nature.

During my time there, I planted a few hundred thousand trees, kept the conservation areas around Rutland Water green, and ran the annual British Bird Fair which I started in 1989. From leading a busy life to having nothing on my hands was disconcerting. The pandemic also made having a physical bird fair an impossibility. By then, many in the UK and other parts of the world had taken to the outdoors to observe nature as a way of coping. Birds, with their flamboyant colours and songs, naturally caught their attention. So, why not organise something for these people? Many had access to nearby parks and woodlands, with social media and tools like eBird at their disposal. That was how the first Global Bird Weekend came into being on 17 October 2020.

I had my doubts and fears. But friends like Ding Li encouraged me to do it. He astutely highlighted that the world had become more connected than ever before. He felt that this event would lift the spirit during those grim months. And so, I plunged into the venture, working with Cornell, BirdLife, Swarovski and others. As a teaser, I had several overseas friends hook up their spotting scopes to broadcast live feeds of the birds appearing in their

In Singapore alone, we had a 58% jump in the number of eBirders participating this year.

backyards. This helped to whip up interest around the world.

I was heartened when I learnt about Geoff getting his friends from across one of the world's busiest migratory flyways to form the Pangaeian Birders team for that first race. To my immense relief, the inaugural Global Bird Weekend attracted more than 32,000 birders from 168 countries. Participants found an astounding 7,097 species in the 24-hour birding marathon. They broke the then world record for the most species reported in a single day. The success spurred me to run Global Big Days in May and Global Bird Weekends in October every year since.

GEOFF Despite the physical isolation of 2020, I kept in touch with birding friends across the East Asian Australasian Flyway including Sho, a conservationist from Canberra; Koji, a virologist from Tokyo; Weng Chung, a bird guide from Malaysia; Ton, a veterinarian from Bangkok; Nikolai, a conservationist working in the Russian Far East; and Alvin, my university mate who had become an expatriate in Beijing. It did not take much to convince them to

band together to form the Pangaeian Birders. We were in daily contact, sharing encouragement, memes, and the juiciest bird sightings.

From Singapore, I recruited my secondary school bestie Munz and my birding buddy Isabelle to join the team. Through five successive Global Big Days and Global Bird Weekends, we have visited our regular patch at Dairy Farm Nature Park. Without fail, we have put the critically endangered Straw-headed Bulbul on the global birding list, contributing our bit to this international bird conservation and education endeavour.

TIM Birds truly unite the world. I remember that the Pacific Golden Plover and Barn Owl were the first birds recorded in the 2020 race, contributed by a team from Vanuatu, while the last birds submitted were the White Tern and Tristram's Storm-Petrels from the Midway Atolls. We have grown from strength to strength. From achieving 7,097 species in October 2020, we have reached close to 8,000 species from across 201 countries in October 2024. In Singapore alone, we had a 58% jump in the number of eBirders participating this year.


Both yearly global birding events encourage people to enjoy their local patches, while being a part of an international movement. This was particularly important during the pandemic when people felt cut-off from their communities and many were overwhelmed by a sense of crushing helplessness. The events connected like-minded people from around the world. This intercon-



Mixed shorebirds at Lee Point in Darwin, Australia. Photo: Micha Jackson.

nectedness remains relevant today amidst uncertainties like climate change. Having the certainty of the dawn chorus is familiar and reassuring. Besides psychological comfort, both global birding events have produced significant scientific data. Observers on the ground contributing their many datapoints will help scientists stem the twin evils of biodiversity loss and climate change. I look forward to even more birders taking part in future editions.

GEOFF My team has benefited greatly from participating in the two annual events since their start. We have gone out to enjoy nature, swapping photos of birds, bugs, other animals, and beautiful scenery. In the first 2020 race, Alvin shared exciting clips of a Snow Leopard resting near a yak carcass in the highlands of China, along with the Himalayan Griffon and the enigmatic Ibisbill. In May 2024, Micha, our new member from Australia, happened to be visiting Costa Rica. She helped us clinch 12 species of hummingbirds and the Resplendent Quetzal. As of 2024, my team has collectively listed 945 species including the second largest bird in the world – the Australian Emu, both the Eastern and Western

 As of 2024, my team has collectively listed 945 species including the second largest bird in the world – the Australian Emu, both the Eastern and Western Cattle Egrets, and three Okinawan endemics – the Okinawa Rail, Okinawa Woodpecker and Okinawa Robin.

Cattle Egrets, and three Okinawan endemics – the Okinawa Rail, Okinawa Woodpecker and Okinawa Robin.

Birds have become a part of my rehabilitative journey since the harrowing days of 2022. In the May 2023 run, I pushed myself to visit Pulau Ubin for the White-crowned Hornbill after having just completed my chemotherapy. Although I had to contend with fatigue and bouts of diarrhoea, the hope of the hornbill sighting compelled me to make the trip and begin the process

of regaining my strength. Friends were surprised that I became energised when the hornbill was pointed out to me. In the October 2023 race, I returned to Dairy Farm Nature Park and managed to complete my circuit. By heeding the words in the Bible to “consider the birds” (Matthew 6:26), I had slowly but surely stepped out from cancer’s dark shadow.

I encourage you to sign up for the next Global Big Day or Global Bird Weekend with your family and friends. Count the birds by gazing out of the window, or record those in your school, park or favourite patch. Or even venture beyond our shores to chalk up new birds while contributing to science. Be sure to join this quest to celebrate the wonderful world of birds! 🌿



Tim Appleton MBE (right), founder of the British Birdwatching Fair, helped raise £44 million for conservation. As Reserve Manager at Rutland Water, he created the reserve and reintroduced ospreys there. Since 2020, he has led Global Birdfair and global birding events, including Global Big Day and Global Bird Weekend.

Geoff Lim (left) started birding at 10 years old, read zoology in the National University of Singapore, and has been a civil servant for close to 30 years. Possibly due to his influence, his wife now looks out for birds, while his daughter had two picture books on birds published when she was a child.

Event	Countries	eBirders	Species
Global Bird Weekend – 17 October 2020	168	32,239	7,097
Global Big Day – 8 May 2021	192	51,816	7,234
Global Bird Weekend – 9 October 2021	195	32,670	7,269
Global Big Day – 14 May 2022	201	51,455	7,673
Global Bird Weekend – 8 October 2022	185	34,670	7,453
Global Big Day – 13 May 2023	199	58,756	7,636
Global Bird Weekend – 14 October 2023	191	36,332	7,525
Global Big Day – 11 May 2024	203	63,220	7,725
Global Bird Weekend – 12 October 2024	201	44,044	7,849

Paving Pathways Towards Nature Advocacy

By **MICHELLE HARRIFF**, *NSS ESN Project Officer* & **JONATHAN OH ZHAN YANG**, *Intern*

NSS's flagship citizen science and nature education programme, Every Singaporean a Naturalist (ESN), believes in the importance of nature education as a means to advocacy. A naturalist's journey does not end with awareness. Being aware is merely the start. From walks, workshops and talks, to action, recognition and community building, NSS ESN has provided multiple avenues to engage and connect participants with nature, inspiring the taking of biophilic and interpersonal perspectives.

In the last six years of the programme's existence, it has empowered students and teachers to take their educational journeys as naturalists a step further. By sharing and engaging with each other, our participating schools have naturally become a tight-knit community. Many have launched initiatives to impact their campuses and neighbourhoods. In the second half of 2024, NSS ESN organised various opportunities for our participants to deepen their knowledge and put it into practice as highlighted below.

Naturalist Chatter

In line with this year's theme of marine conservation, Senior Research Fellow at NUS Tropical Marine Science Institute Dr Ow Yan Xiang delivered the final session of our online speaker series for this year on 19 July 2024. She shared on seagrass meadows, elaborating on their

ecological importance, threats faced and local conservation efforts. Attended by 20 participants from four schools, we hope that Naturalist Chatter will inspire students to advocate for the conservation of our coastal habitats.

We held two Naturalist Chatter sessions in 2024, including this one focusing on seagrass meadows.



Guided Night Walk for Teachers

NSS ESN held a night walk for teachers at Bukit Batok Nature Park on 5 September 2024. Led by long-time volunteer in the Conservation Committee Tony O'Dempsey, four teachers and five nature mentors enjoyed the two-hour romp.

Tony pointed out the nighttime flora and fauna and shed light on nature conservation in Singapore. It deepened our participants' connection with nature to in turn share this with their students.

Our guide Tony O'Dempsey showing participants the leaves of various dipterocarp species during the night walk.



NSS ESN 3rd Symposium 2024

The NSS ESN 3rd Symposium 2024 took place on 1 November 2024 at Raffles Girls' School (Secondary), concluding an enriching and meaningful year with participating schools. A record 187 students and teachers from 26 schools were at the event, which provided a

platform to celebrate their efforts and share best practices. As of 27 November 2024, we are proud that our participants have collectively recorded 8,552 observations of 463 species sighted in and around their schools on the iNaturalist platform. Amongst these, 1,266 observations were made in 2024 alone. The symposium kicked off with interactive booths showcasing a variety of project initiatives. They included NSS conservation stories and outreach, Horseshoe Crab Monitoring Pilot by Dunman Secondary School, as well as projects on green and brown issues by RGS. NSS Assistant Director and Head of Secretariat Huang Ningxin gave an opening address highlighting the success and future trajectory of NSS ESN. This was followed by Nature Journaling sharing by NSS Naturalist Educator Network member Norlinda Ishnin. She gave participating schools a



The School Initiative Sharing segment had students presenting their nature advocacy projects.





Paving Pathways Towards Nature Advocacy

copy of her publication on nature journaling *Winged Wonders of our Urban Neighbourhood*.

Next up was the School Initiative Sharing where four schools presented their nature advocacy projects for 2024: 1. Teck Whye Primary School had an outreach project at Choa Chu Kang Library to raise awareness on local and endangered wildlife; 2. Yu Neng Primary School collaborated with the school's Cub Scouts to monitor birds and promote biodiversity awareness in their neighbourhood; 3. CHIJ Secondary School has an ongoing development of an environment-themed card game on local conservation issues; 4. Yishun Town Secondary School's project featured educational tours in their newly-established butterfly garden.

Chair of the Education Committee Tan Beng Chiak facilitated the Q&A and reflection activity, encouraging students to share their feedback, exchange ideas and inspire one another, ultimately fostering collaboration and a sense of community.

The last segment was an Appreciation and Award Ceremony that recognised the contributions of schools to Urban Biodiversity Monitoring. The awards were presented by guest-of-honour and RGS Vice Principal May Tan as well as NSS President Dr Yeo Seng Beng. Three teachers won the inaugural Outstanding Nature Educator Award. Schools that completed the Skills Achievement Programme were also acknowledged.

2024 Teacher Training

This annual teacher training session on 19 and 20 November 2024 at RGS helped prepare our new and existing teachers for the upcoming year. Some 24 educators from 16

schools familiarised themselves with NSS ESN's content, building up their foundational knowledge and skills required to carry out the programme with their students. We equipped them with creative tools that would help their students forge stronger links with nature. Norlinda introduced the participants to nature journaling and visual note-taking. Our educators then selected flora or fauna found within the RGS campus to observe, draw and annotate.

A Sense of Place exercise and Nature Journaling were part of the 2024 Teacher Training.



The NSS ESN 3rd Symposium 2024 attracted a record 187 students and teachers from 26 schools.

Next, Beng Chiak facilitated 'A Sense of Place' activity to foster sensory connections with nature. The teachers were paired up, with one blindfolded and the other acting as guide. Each pair utilised different senses to observe their chosen plant before visually journaling and comparing their observations. A storytelling activity had participants narrating a day in the life of an animal or plant to cultivate empathy for the natural world. There were plenty of sharing and discussions where insights were exchanged and alternative ideas put forth to enhance student engagement.

Landscape Architect and Associate Professor from NUS College of Design Yun Hye Hwang talked about her collaborative campus rewilding project. She examined how biodiversity could thrive when nature was left alone and

Landscape Architect from NUS College of Design Yun Hye Hwang talking about her campus rewilding project.



how the project could contribute to nature education and research by involving students with their physical environment.

We truly appreciate the continuous support of Mandai Nature, without which the NSS ESN 3rd Symposium and 2024 Teacher Training would not have been possible. We also thank RGS for supporting and hosting both events. In 2025, NSS ESN looks forward to nurturing more hearts and minds for nature and continuing our quest of paving pathways towards nature advocacy.

NATURE SOCIETY SINGAPORE

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VISION To be Singapore's leading advocate of biodiversity and habitats.

MISSION With our evidence-based approach and partnerships with agencies, peers, and corporates, we lead habitat and biodiversity conservation in Singapore and with partners in the region. Through engagement, education, advocacy, and research, we inspire and enable people to take action towards a sustainable and biodiverse planet.

Why Join NSS?

Nature Society Singapore or NSS is dedicated to the study, conservation and enjoyment of the biodiversity and natural heritage of Singapore, our neighbouring countries and the wider world. The Society is a non-profit, non-government organisation. Our members work with commitment and altruism to conserve Singapore's remaining nature areas such as forests, mangroves, wetlands and reefs.

NSS was formerly known as the Singapore Branch of the Malayan Nature Society (MNS), formed in 1954. In 1991, we became independent as Nature Society Singapore. Both NSS and MNS continue to maintain strong links with each other.

NSS organises guided nature walks, horseshoe crab rescues, nature surveys, clean-ups, talks, exhibitions, and overseas nature trips. Going on an NSS outing allows you to meet people from all walks of life with a common passion!

Join NSS Today & Receive *Nature Watch* for Free!

The values that NSS upholds are a bulwark against the excesses of an ultra-materialistic society. If you too feel that protecting our biodiversity and natural heritage are important, join NSS today and support the Society in our work. Members will receive four issues of *Nature Watch* (NSS quarterly magazine) and a regular e-newsletter for free. Members also get to participate in fascinating nature-based activities and events which enable one to forge friendships with fellow nature lovers.

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ANNUAL SUBSCRIPTION

S\$40	Ordinary Member Age 18 and above
S\$75	Family Member Husband, Wife & Children under Age 18
S\$18	Junior & Student Members Age 12-18 & Full-time Students Age 18-35 enrolled in a Singapore-based institution
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S\$4,000	Corporate Member Nominal Fee of S\$200 + Annual Tax-Exempt Donation of S\$3,800

How to Join NSS

To join as a NSS member, please fill in this form <http://tinyurl.com/NSSmembershipform>. It allows you to settle the membership fees within the link. Once your membership is approved by the Executive Committee, you will receive *Nature Watch* and the e-newsletter for free, as well as be able to attend all member-only events.

How to Join NSS as a Volunteer or Intern

- To join as a NSS volunteer, please fill in this form <http://tinyurl.com/NSSvolunteerform>.
- To apply for internship, please fill in this form <https://tinyurl.com/NSSinternshipform>.

70th Anniversary Gala Donations

NSS has received Tote Board approval for the Enhanced Fundraising Grant (EFR) for the Society's 70th Gala Celebrations. Every \$1 donated will be matched by another \$1 up to \$250,000. This means that every dollar you give will be doubled. There are various ways to donate as detailed below.



- Scan the **PayNow QR code** for Nature Society Singapore's 70th Gala Donation account and enter your name, contact number or email address in the UEN/Bill Reference Number box.
- Fund transfers** can also be made via:
 - **NSS Giving.Sg**: <https://www.giving.sg/donate/campaign/celebrating-70-years-of-nature-society-singapore>
 - **NSS RayofHope**: <https://rayofhope.sg/campaign/nss70thanniversaryfundraising/>For donations via NSS Giving.sg and NSS RayofHope, please ensure that you copy the full link to paste into your browser.
- For other modes of payment, please get in touch with us via email contact@nss.org.sg.
- We also welcome individual and corporate donations to the Society. Please inform us via email contact@nss.org.sg of the amount you wish to donate, along with your name, title or organisation. Donations may be made by the payment methods mentioned above. Your generosity is much appreciated and all donations will receive a 250% tax-exemption receipt.



Singapore is the global stronghold for the charismatic Straw-headed Bulbul (*Pycnonotus zeylanicus*), like this parent and juvenile pair. NSS works to protect the last remaining natural habitat of this critically endangered species.

Photo: Alan OwYong



Let Singapore's Abundant Biodiversity Be Your Legacy

Have you loved nature all your life? Please consider helping our conservation work with a gift to Nature Society (Singapore) in your will.

How to make a gift to the Society in your will

You can choose to inform us if you have considered us in your will, but it is not strictly necessary. Please ensure that your solicitor writes in the full name of the Society. We suggest below suitable forms of words that can appear in your will:

*I give to Nature Society (Singapore) (hereinafter called NSS), **Unique Entity Number S61SS0142H**, _____ % of the residue of my estate*

OR

a specific gift of _____

and I direct that (i) the proceeds may be used for the general purposes of NSS and (ii) a receipt signed by a person for the time being authorised by the Executive Committee of NSS shall be a good and sufficient discharge to my executors.



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