

Science

Sambar deer staging a comeback in Singapore

Their resurgence may be beneficial for ecosystems, in ways such as seed dispersal

Ang Qing and Josiah Teo

Sambar deer, believed to have been wiped out in Singapore as at 1950, are making a comeback after several escaped from public and private local zoos in the 1970s, a recent study has found.

The report, published on Feb 16 in the journal *Conservation Science and Practice*, said the mammal's numbers are estimated to be growing in various forested areas, including parts of the Central

Catchment Nature Reserve near MacRitchie and Bukit Timah.

In 1997, the Nature Society (Singapore) estimated in a report that there were three deer in the wild.

In a separate 2021 study, the National Parks Board put the number at around 15. The animal is currently listed as a vulnerable species on the International Union for Conservation of Nature's Red List of Threatened Species.

The recent study by 24 researchers around the world, from institutions including the University of Queensland and Nanyang Techno-



A sambar stag waiting by the side of a road in the Central Catchment Nature Reserve on Feb 5. While the sambar deer population may be growing, it still remains small and fluctuates over time PHOTO: COURTESY OF TAN YONG LIN

logical University, looked at the unassisted spread of wild boars and sambar deer in Singapore over time.

It drew on a variety of sources, including interviews with wildlife experts and data from motion-activated cameras between 2009 and 2020, making it the most comprehensive camera trap study to date.

Researchers found that the deer likely recolonised parts of the forests here after escaping from en-

closures, including those in the Singapore Zoo, in the 1970s.

In part, this was deduced from pictures of the deer having artificially notched ears, which suggested that they were once in captivity, since the technique is commonly used by humans to identify animals.

The resurgence of sambar deer might be beneficial for Singapore's ecosystems in ways such as seed dispersal, it added.

These findings were welcomed

by local wildlife photographer Tan Yong Lin, who has been photographing the creatures since 2022.

He said: "It's a good thing that we are able to sustain a large animal species such as sambar deer in Singapore."

"To coexist, we need to consider educating people about their presence in the areas where they may be seen, and how to behave when we encounter them. These animals are extremely shy, and we do not want to do anything that may scare

them onto roads with heavier traffic."

In 2022, a sambar stag was killed after getting struck by oncoming traffic as it tried to cross the Bukit Timah Expressway.

The researchers also found that sambar deer have suffered from human development.

In 2016, the population in Mandai dropped sharply after the clearing of 64ha of land for an eco-tourism hub which is set to house the relocated Bird Park and a new Rainforest Park when completed.

Increased sightings in MacRitchie and Bukit Timah suggested that the deer had moved to these habitats, the report said.

While the population may be growing, it still remains small and fluctuates over time, it added.

This means that there are unlikely to be any risks posed by overpopulation despite the absence of natural predators and hunting.

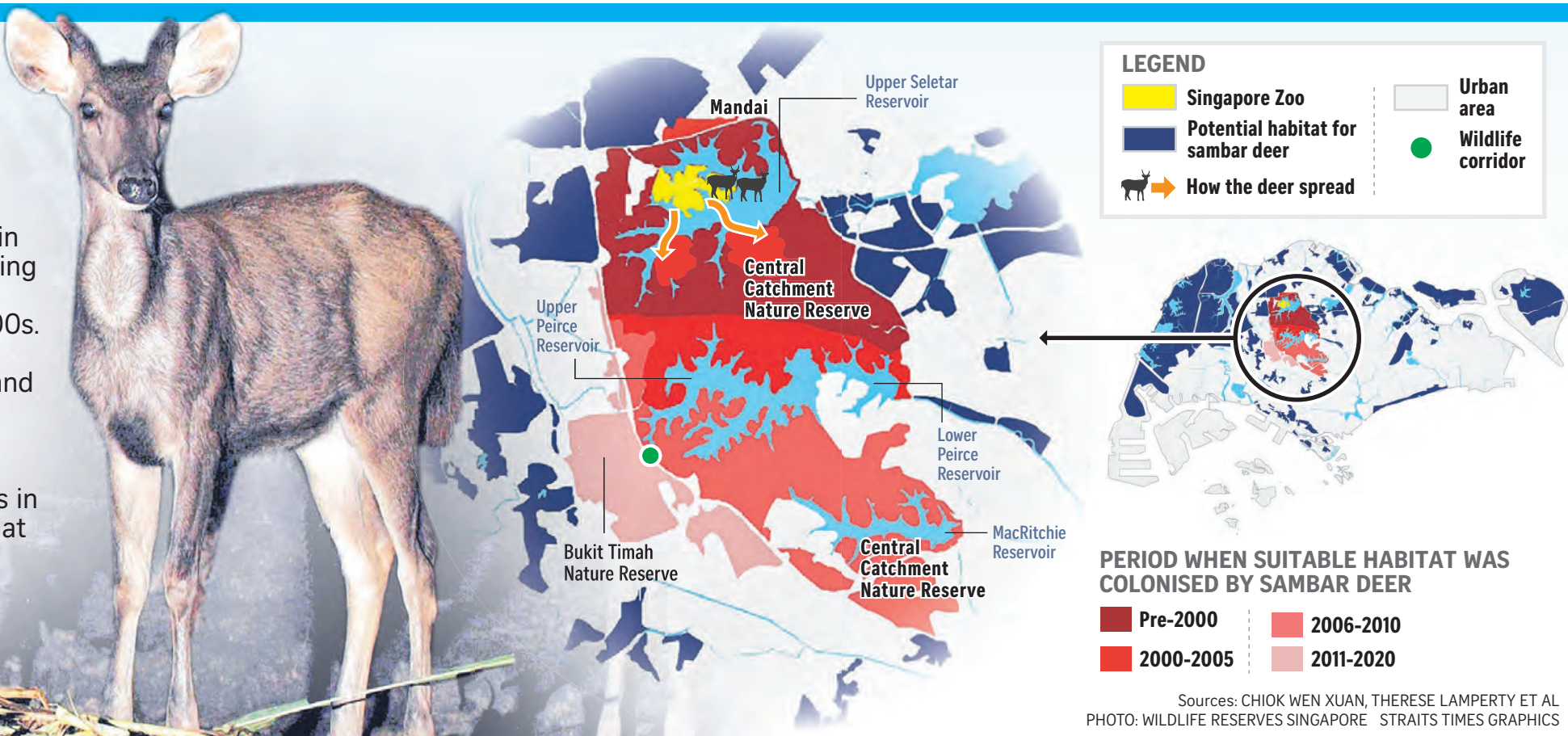
Going forward, Mr Marcus Chua, a co-author of the paper, called for a standardised long-term monitoring study to derive a clearer picture of the state of wildlife in Singapore's forests and other green spaces.

Mr Chua, a mammal scientist at the National University of Singapore's Lee Kong Chian Natural History Museum, said: "This allows us to predict what is likely to happen to the population of wildlife in Singapore, and make appropriate management decisions."

aqing@sph.com.sg
josiahteo@sph.com.sg

Deer sightings in more areas

The sambar deer (*Rusa unicolor*), believed to have been decimated in Singapore by hunting and tree felling by the 1950s, has been sighted in more forested areas since the 2000s. In 2021, NParks estimated their population to be at 15. **Ang Qing** and **Josiah Teo** trace how the native species spread, with the help of those that escaped into Mandai forest from private and public zoos in the 1970s. Researchers suggest that the clearing of 60ha of the deer's habitat for the construction of an eco-tourism hub in Mandai since 2017 has sparked many of the species' gradual move elsewhere.



Meet the wildlife that call S'pore home

The existence of myriad wildlife on an island that is almost entirely urbanised has captivated many.

From sambar deer roaming the forests of Mandai to otters frolick-

ing around Marina Bay, The Straits Times looks at some creatures that call the Republic home, based on the latest data available from the National Parks Board (NParks).

1. MONKEYS

There are two species of monkeys native to Singapore. The first is the critically endangered Raffles' banded langur, which has a population of 73 as at 2022, and the second is its more pesky relative, the long-tailed macaque, which numbers around 2,000, according to a 2012 study conducted by NParks.

The macaques can be found in the Bukit Timah and Central Catch-

ment Nature Reserves. Though their presence may seem overwhelming, their current numbers are considered to be healthy by NParks.

To manage potential conflicts with humans, NParks uses strategies such as "monkey guarding" – blocking the creatures from approaching and redirecting them to forests instead – and relocation if their behaviour is more aggressive.

2. WILD BOAR

There are around 150 to 200 of these creatures in the nature reserves, based on a study conducted by NParks from 2019 to 2020. A sep-

arate report published on Feb 16 by the agency, in collaboration with researchers from local and overseas universities, suggested they may have swum from Malaysia in the 1990s. Wild boar are normally found near the edges of forests due to the availability of human food and natural resources for reproduction.

NParks is actively managing wild boar numbers to prevent overpopulation through the removal of oil palm (a favoured food source), feeding prohibitions, and culling as a last resort.

3. DEER

Singapore's sambar deer currently

number around 15 in the island's nature reserves, as reported in a 2021 study by NParks. They can be found around the Bukit Timah and Central Catchment Nature Reserves, and probably re-established their population after escaping from zoos in the 1970s.

Their presence is expected to benefit Singapore's ecosystems as they perform important functions like seed dispersal.

4. OTTERS

There are two species of otters in Singapore: the Asian small-clawed otter, which is classified as critically endangered locally, and the more

commonly seen smooth-coated otters, which number around 150.

There are 10 families of smooth-coated otters here, with the Bishan, Marina and Zouk groups being more prominent. Though they seem to be all over, from Bishan-Ang Mo Kio Park to Pulau Ubin, NParks said in 2022 that their population remains at a healthy level, and that further growth in numbers will be limited by the availability of space to feed and rest.

An Otter Working Group involving the public and wildlife experts was set up in 2014 to regularly monitor the creatures and manage conflict with humans.

Ang Qing and Josiah Teo

New way of preserving kidneys for transplant trialled successfully at NUH

Lee Li Ying

A new way of preserving kidneys before they are implanted in kidney transplant patients has been trialled successfully on three patients at National University Hospital (NUH).

Called hypothermic machine perfusion, the procedure involves using a specialised machine to pump cold preservation fluid below 4 deg C into the donor kidneys to optimise them for implantation. The process reduces the risk of the renal transplant failing to function immediately.

The team of doctors from NUH's National University Centre for Organ Transplantation (Nucot) involved in piloting the method in Singapore is working with the National Organ Transplant Unit under the Health Ministry to nationalise the technique.

Kidney transplants are consi-

dered the best treatment for patients suffering from end-stage kidney disease, as it brings better clinical outcomes, in terms of patient survival, cost-effectiveness and allowing the patient to resume a normal life post-transplantation.

About 30 per cent of deceased donor kidney transplants in Singapore are at risk of a complication called delayed graft function, where the renal transplant fails to function immediately and dialysis is needed in the first post-transplantation week.

Patients with delayed graft function would have to be hospitalised longer, have a longer road to recovery, and face larger medical bills.

But using hypothermic machine perfusion, the risk of delayed graft function can be reduced by 43 per cent, said Assistant Professor Benjamin Goh, a consultant with Nucot's adult kidney transplantation programme, citing a study published in the *New England Journal of Medicine* in 2009.



Assistant Professor Benjamin Goh with Madam Saphia Isnin, 66, who "feels like a free bird" after her kidney transplant. ST PHOTO: GAVIN FOQ

Prof Goh first came across this method in 2019 when he was doing his fellowship in London.

He said that compared with the traditional way of preserving an or-

gan on ice before transplantation, hypothermic machine perfusion simulates the body's way of pumping liquid into the kidney, improving the washout of micro blood

clots and toxins.

"It will seek to keep all the little blood vessels open as it pumps and stops. By the time you implant it into the patient, the kidney is ready to take the (human body) blood flow, because it has already been simulated for three to four hours."

In order to shorten the waiting times for transplants, kidneys are sometimes accepted from older and higher-risk deceased donors with multiple comorbidities.

The quality of these kidneys can be improved with hypothermic machine perfusion, said Associate Professor Tiong Ho Yee, surgical director at Nucot's adult kidney transplantation programme.

"In the longer term, what we are hoping for is that all patients, or at least the deceased donor kidney cases, will be put on hypothermic machine perfusion... And for kidneys on the borderline, it can help to tell us which ones we can use and which ones maybe we shouldn't use," added Prof Tiong.

NUH currently has two of the machines, which cost US\$20,000 (S\$27,000) each. Subsidised patients will pay about \$1,500 if they opt for the procedure, to cover the cost of the sterile consumables.

Madam Saphia Isnin, 66, was the first patient to have hypothermic machine perfusion for her kidney transplant procedure on Oct 6, 2022. She was diagnosed with cysts in her kidneys that caused reduced renal function in 2008, and she required thrice-weekly dialysis from 2013.

"After my dialysis sessions, I would feel very weak and my shoulders would feel heavy. I would also be in a bad mood," she said.

After undergoing the kidney transplant, Madam Saphia did not have delayed graft function and made a full recovery. She no longer has to endure frequent dialysis.

"I feel like a free bird now!" she said.

liyinglee@sph.com.sg