



ACRES

# COEXISTENCE

## Handbook

A guide for everyone in Singapore  
to live in harmony with our wildlife



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**A WORLD WHERE ANIMALS ARE TREATED  
WITH COMPASSION AND RESPECT.**

ACRES is an animal protection organisation in Singapore, driven by our concern for animals. We believe that all animals have biological needs and experience pain, stress and discomfort. Many are intelligent and feel complex emotions like joy, happiness, depression and distress. But what they can't do is speak for themselves. So it is easier for people to not understand their plight or ignore their suffering. It is up to us human beings to give them a voice, speak up on their behalf and end their abuse. Our approach is Scientific, Creative, Practical and Positive.

We strongly believe in promoting community involvement in addressing animal protection issues and in building partnerships with all related bodies to improve animal welfare.



## TACKLING THE ILLEGAL WILDLIFE TRADE

Investigating and monitoring to end the cruel wildlife trade



## HUMANE EDUCATION

Sowing seeds of compassion in young minds and hearts



## WILDLIFE RESCUE & REHABILITATION

For wildlife in distress  
24 hours a day,  
365 days a year

# OUR FOCUS AREAS



## PROMOTING CRUELTY-FREE LIFESTYLE

Empowering YOU to make animal-friendly choices in daily lives



## COMMUNITY OUTREACH

Inspiring action for animals through volunteer programmes



Credit: Sabrina Jabbar

## PROMOTING CO-EXISTENCE

Instill wildlife etiquette to coexist with Singapore's wildlife in our City in Nature

# FOREWORD

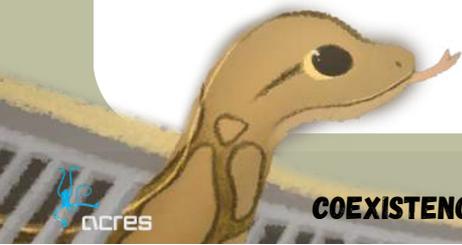
*Louis Ng*

**ACRES Founder**

Living on this biodiversity rich tiny island, we are fortunate to share this space with wildlife, ranging from snakes and crocodiles to the critically endangered Sunda pangolins and long-tailed macaques. In addition to having their ecological roles, without them, we will have a city which will just be a city. Not a City in Nature, which is our dream and vision.

This vision takes all of us to play our part - the government, the people and the private sector. These efforts come in the form of ensuring sustainable development, how we react when we see wildlife and what we do to make sure that coexistence is possible here in Singapore. Everyone can do one little thing. We can start with small changes in our actions such as not feeding them, learning about wildlife encounters in your own estate and to learn more about wildlife etiquette. We can strive to move towards a progressive society where we learn to co-exist and live in harmony with these animals, by practicing measures listed in this exhaustive handbook from ACRES.

I founded ACRES to achieve positive change for animals and I am glad that ACRES continues to help all kinds of animals, both individuals and on a wider scale. This handbook provides comprehensive tips on living alongside otters and macaques, even geckos, bees, and rodents. All animals matter. Interest in animal welfare and nature conservation is growing and many regard the humane treatment of animals as a matter of critical importance. There are others who may be less comfortable with wildlife or who are primarily concerned about wildlife matters only as they relate to public health and safety. Regardless of whether one is interested in contributing to animal protection efforts or simply concerned about wildlife encounters, this handbook will be a useful reference. With increased habitat loss and fragmentation for humane needs, it is now our responsibility to live harmoniously with our wildlife in our City in Nature.



# FOREWORD

**Sivasothi N**

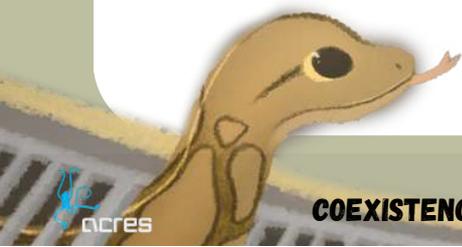
**Senior Lecturer,  
National University of Singapore**



ACRES' Coexistence handbook is the culmination of the charity's 20 years of experience in rescuing animals, understanding and assisting people, collaborating with other stakeholders and contributing constructively to policy. Singapore has matured to the point where ACRES' aspirational objectives of "A world where animals are treated with compassion and respect" are in keeping with the Singapore Green Plan 2030. In Pillar 1, A City in Nature aspires to "work with communities and non-governmental organisations (NGOs) to develop programmes to allow humans and wildlife to live in harmony."

Singapore's remarkable transformation also included the retention and creation of more than 7,800 hectares of green spaces linked by some 370km of park connectors. That's plenty of space in which the more adaptable species of wildlife will meet people, very few of whom grew up immersed in nature. As such, plenty of advice about coexistence is needed. Indeed, during the Covid-19 pandemic years, calls to the ACRES Hotline about human-wildlife matters almost doubled from 9,811 calls in 2019 to 18,528 calls in 2022.

ACRES works closely and tirelessly with stakeholders in various wildlife Working Groups, which include interest groups, NGOs, university researchers, NParks and other government agencies. All of us realise that empowerment is needed of the individual, property manager, designer, developer, student, and policy maker alike.



# FOREWORD

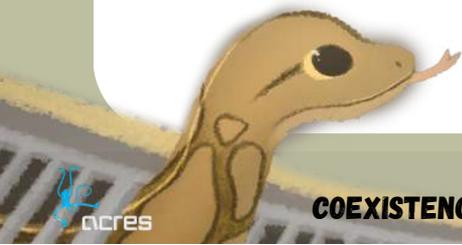
**Sivasothi N**

**Senior Lecturer,  
National University of Singapore**



It is most gratifying that ACRES has responded to this demand with this comprehensive Coexistence handbook. It is a searchable electronic compilation vividly enriched with images and graphics to quickly enlighten readers of all backgrounds. Behind it is two decades of providing empathetic and practical solutions anchored in the science of animal ecology and behaviour. All of us will find it useful to share relevant pages with those in need, just as I will with friends, residents, and my undergraduate classes!

I thank and congratulate ACRES for providing Singapore with this invaluable resource. Let us persist in our efforts to empower everyone in society, so that we can all experience the joy of human-wildlife coexistence in Singapore.



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Credit: Tan Chuan Kai

**"It's surely our responsibility  
to do everything within our  
power to create a planet that  
provides a home not just for  
us, but for all life on Earth."  
- Sir David Attenborough**



# MEET THE ACRES TEAM



## HEAR FROM OUR CURRENT AND PREVIOUS STAFF AND VOLUNTEERS

### COEXISTENCE IS...

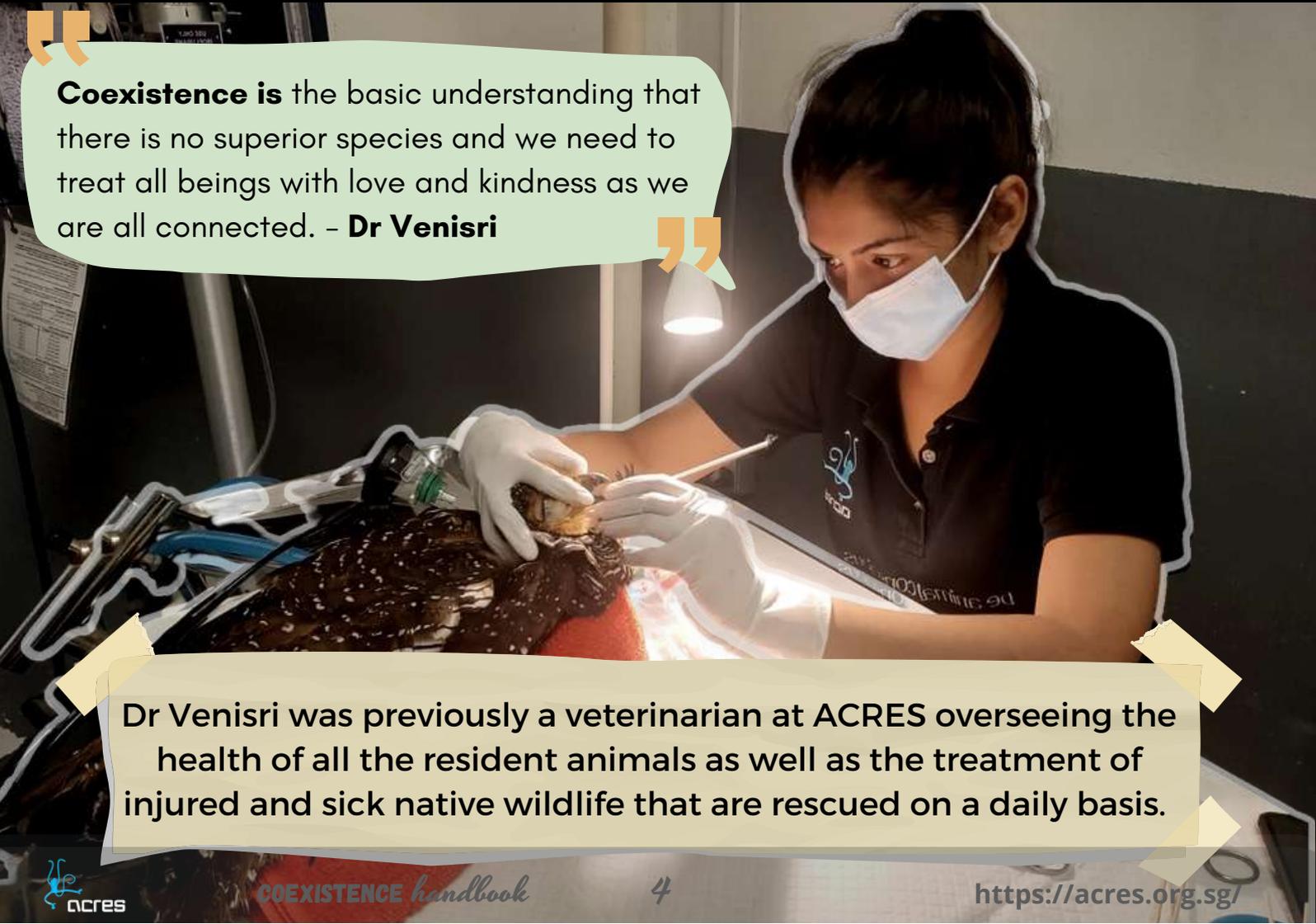


Credit: Dan Ng

**Coexistence** is not about them versus us. It is not merely about learning to understand their unique antics, where they live, what they eat, what we should do and what we shouldn't. Coexistence is about appreciation. Appreciating the diversity of species of the world around us. Appreciating that the otters and hornbills have come back to Singapore. Appreciating the role of the snakes in population control. Appreciating that we have jungle fowls to wake us up to watch the sunrise. It is not about Them versus Us. What would the world look like if humans are the only beings that walk its surface?

- **ACRES Education executive**

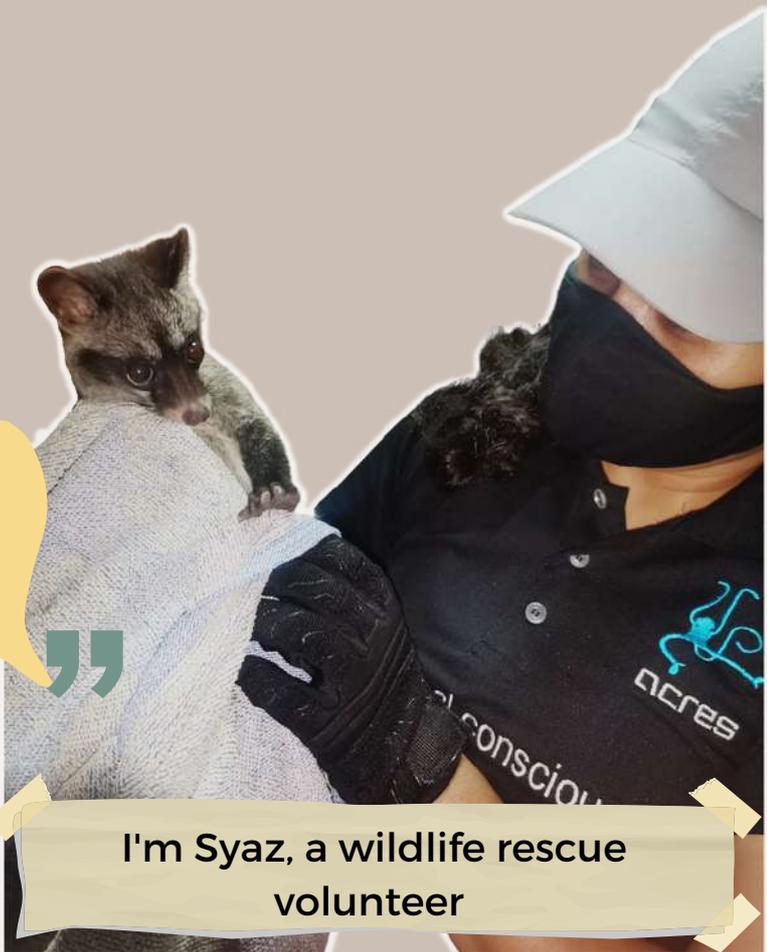
**Coexistence** is the basic understanding that there is no superior species and we need to treat all beings with love and kindness as we are all connected. - **Dr Venisri**



Dr Venisri was previously a veterinarian at ACRES overseeing the health of all the resident animals as well as the treatment of injured and sick native wildlife that are rescued on a daily basis.

## COEXISTENCE IS...

**Coexistence is** when people are able to understand and be at peace knowing that there are wildlife living around us just like having a next door neighbour.



I'm Syaz, a wildlife rescue volunteer

We get calls for a tree snake up on a tree, for nests on aircon ledges outside their unit removed because the baby birds chirp and monitor lizards minding their own business in an open field. These are just few of the countless calls we get on a daily basis. With a little bit of understanding and tolerance towards our wildlife, I believe that the whole city in nature concept would be a blissful achievement for both Singaporeans and our native wildlife.



I've attended a case for a baby civet and I was explaining to the owner of the property why we need to attempt a reunion and why the civets are in her area. I also mentioned that I wish that all the callers we had were as understanding as her which the owner then said, 'like that you all got no work what?'. If having no cases to go for means an animal does not need my help, able to be free and aren't harmed then I think it isn't so bad not having work I guess?

- **Syaz, wildlife rescue volunteer**

## COEXISTENCE IS...

Hi! I am Yolanda, a Life Science Major studying at NUS. I interned at ACRES under the Wildlife Management Team (WMT). I have always enjoyed working with animals and I'm excited to continue learning more about wildlife in Singapore and around the world, and spread the knowledge to those around me!



**Coexistence means** that humans and wildlife can live in tandem and in harmony; people no longer get scared when they see wildlife near us, and instead learn to accept it as something normal. It's also that we know what to do and act accordingly when we meet these animals around us. When we see wildlife outside/in our estates, many people would request for a removal, but really that might not be the best solution sometimes. As our country becomes more urbanised, the boundaries between nature and our urban areas become more blurred, so we need to learn how to act when we encounter wildlife. Of course, coexistence will need to start with education! - **Yolanda, WMT intern**

If you don't like it, it doesn't give you the right to kill it. Just walk away.  
- **Julia, rescue volunteer**



“ Recognising that all living things share the same earth – just as we are trying our best to survive, so are our animal friends. Be kind, it doesn't cost much. - **Jocelyn, ACRES Volunteer** ”



“ Gaining a willingness to understand the plight of animals living in Singapore and making the effort to live in harmony with them. - **Shirlene, ACRES volunteer** ”

**Wild Pigs**

Wild pigs are native animals who are most active during dusk hours when foraging for food. Their omnivorous diet includes insect larvae, seeds and tubers.

Increasing urbanisation in Singapore means that areas with vegetation suitable for wild pig grazing are now found near urban areas. However, they are shy animals and will usually retreat into the safety of the forest when they see people.

The only reason a wild pig may approach you is because someone has left that pig before. As wild pigs learn to associate people with food, serious human-wildlife conflict situations have resulted, for example in Pung and Choo Chu Kang.

If you see a wild pig, move away quietly as any sudden and loud movements may startle them. For dog owners, keep your dog on a leash and if your usual walking route is adjacent to a wild pig habitat consider an alternative route for regular dog walks.

**Long-tailed Macaques**

As the only native macaques in Singapore, long-tailed macaques are social creatures just like us humans and live in troops usually consisting of a dominant male, female and other individuals. Our Wildlife Act prohibits killing, trapping, taking, or keeping of all wildlife including long-tailed macaques, who are also classified as Vulnerable on the IUCN Red List.

Macaques are often sighted in residential areas next to forests or park connectors. Contrary to some beliefs, they have sufficient food in the wild. If you see a lone macaque, he/she is likely to be a transient individual. As their habitats have become increasingly fragmented due to urban development, transients often end up in urban/residential areas when they move from one forest patch to another.

If you need to pass by a troop of macaques, calmly walk by, and do not maintain eye contact, which might be interpreted as a threat. Do not carry any food or drinks in your hand or in plastic bags – keep them well-packed inside your bag. Never approach a family with babies to take photos and do not use flash photography.

**Macaque Coexistence Tips**

- Manage food waste properly
- Wild piglets have stripes that run down their backs
- Apply as if you are them to...



# Living in a City in Nature. Coexistence, Conservation, Compassion.

With an area of merely 728.6 km<sup>2</sup>, Singapore is an extremely special place. Upon landing in one of the world's busiest airports, you can easily reach a primary rainforest at Singapore Botanical Gardens within a 25-minute drive. A day out in Singapore could include a restaurant, a nature reserve and a cinema, all within easy reach of one another. Many visitors to Singapore are drawn by the number of amenities at our fingertips, and the unique mix of urban and nature that characterises our home.

Credit: Jocelyn Chng

Being a small island nation with a rapidly increasing population, Singapore has always been at a battle between development and preserving our natural spaces. Despite being listed as the greenest city in Asia,<sup>1</sup> catering to an increasing human population has led to a smaller and fragmented natural habitat of wildlife.

Growing up in a highly urbanised city, most Singaporeans have limited opportunities to observe and interact responsibly with wildlife. A common misconception is that wild animals belong only in a nature reserve. However, in a biophilic city that we are growing into, we are drawing wildlife closer into our midst. ACRES strongly believes that coexistence is possible. Very careful urban planning, appropriate waste management, open conversations with different stakeholders, and etiquette from humans when encountering wildlife are all needed to make coexistence possible.

## WHY ARE THESE ANIMALS SIGHTED IN URBAN SPACES?

Many urban wild animals – certain species of birds, small mammals and reptiles – have adapted to the urban environment and the greenery in built-up environments. Other wild animals are often forced to use man-made barriers such as roads, concrete canals, pathways and even highways to cross from one green pocket to another, in search of food, water or potential mates.

Our "City In Nature" brings people closer to nature, and the greenery continues to draw wild animals. From cleaner waters to greener gardens, the flowers, insects and fruits provide perfect foraging opportunities to wildlife. Once insects and smaller animals flourish, the animals who prey upon these (e.g birds, garden snakes, lizards) will also be attracted to the green grounds.

*Living with nature includes lizards, snakes and macaques, not just flowers and butterflies.*

*- Anbu, Co-CEO, ACRES*

Credit: Tan Yong Lin

## WHO IS THIS BOOK FOR?

Essentially, everyone residing in Singapore.

Whether you are a homeowner, park-goer, property manager, developer, architect, security guard, construction manager, educator, reporter/journalist or a research student, there is something for everyone in this book.



**PART 1:  
SINGAPORE'S  
COMMONLY  
SIGHTED WILD  
ANIMALS**

Credit: Sabrina Jabbar

### MACAQUE FACT!

Newborn long-tailed macaques have black colouration, which gradually changes as they mature

# LONG-TAILED MACAQUES



## WHY AM I SUDDENLY SEEING A MACAQUE IN MY NEIGHBOURHOOD ?

The monkey is likely a transient individual (sometimes 2-3) moving through the area. Transients leave their troop to join another or form a new troop when they reach maturity. As their habitats become increasingly fragmented due to rapid urban development, these animals use park connectors, green corridors, residential and industrial areas to travel through, which may take up to 2 weeks.



Credit: Lim Yi Zhen

## ARE THEY MOVING OUT OF THE FOREST BECAUSE THEY DON'T HAVE ENOUGH FOOD ?

The forests provide ample food for the macaques.



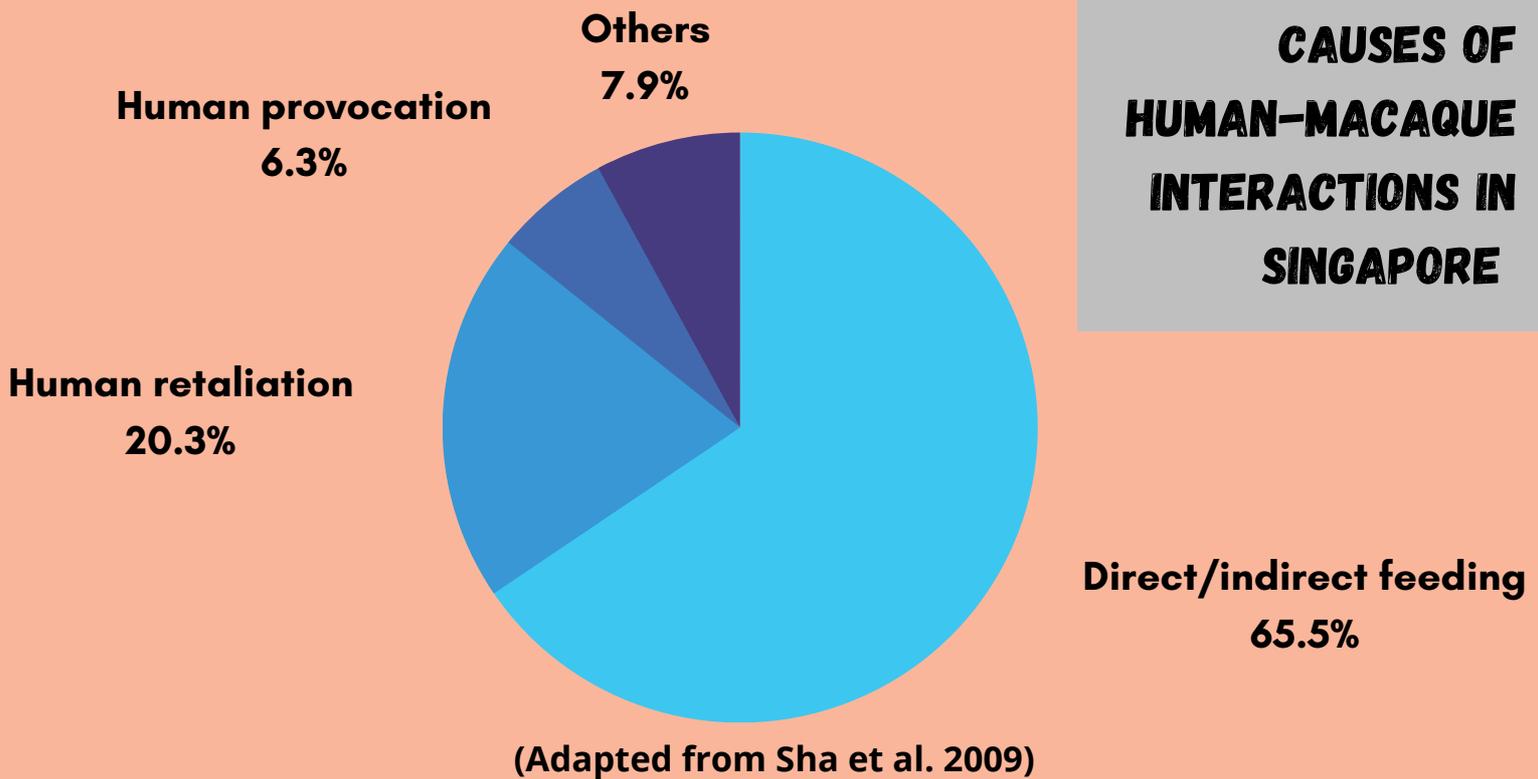
Their natural diet is widely varied, including insects, fruits, flowers and even lizards, snakes and crabs.



Since the monkeys' diet consists of fruits, during fruiting season, you may see more macaques foraging near fruit trees. In addition, monkeys are forest-edge dwellers. So if you live at the edge of a nature reserve or forested area, it is normal to encounter monkeys.

## CAN I FEED THE MACAQUES ?

Please do not feed monkeys or allow any access to human food sources as it will encourage them to stay longer in the area. According to the Wildlife Act, feeding of wildlife is an offence that carries a fine of up to S\$10,000.<sup>2</sup> Based on a research study in 2009, 65.5% of human-macaque interactions are triggered by food provision.<sup>3</sup>



Human food also contains high levels of sugar, salt, and artificial flavours that are harmful to animals, causing addiction, obesity, and other illnesses. What we might regard as a kind act actually does them **more harm than good**.



Obese monkey named "Uncle Fat" from Thailand due to constant feeding of junk food and soda drinks left by tourists.<sup>4</sup>

## WHAT CAN I DO WHEN I ENCOUNTER MACAQUES ?



2-3m



**1**

Appreciate from a distance.

**2**

Remain calm, do not make sudden movements and eye contact.

**3**

Do not take photos with flash.

## WHEN A TROOP OF MACAQUES ARE...

Credit: Sabrina Jabbar

### SITTING ON THE GROUND IN THE OPEN

**1**

If you are confident, walk past them slowly (keeping a distance of at least 2-3 metres), without eye contact. Do not block paths of macaques, especially between mother and baby. You can clap your hands strongly to clear the way.

**2**

If you are afraid, take an alternative route.

# WHEN A MACAQUE IS...

## OUTSIDE YOUR HOUSE



**1** Keep windows and doors closed for this short period to prevent intrusions.

**2** Draw the curtains to prevent the macaque from looking in.

**3** If the monkey is interacting with your property (eg. playing with your clothes, plants) and you want to chase them away, you can clap loudly or use water sprays, aiming at the hind portion of their body (not the front).



Wait for the monkeys to leave and take the proper long-term mitigation measures to minimise such occurrences.

## WHEN A MACAQUE IS...

### INSIDE YOUR HOUSE

- 1 Open as many doors and windows as possible so that the monkey has multiple exit points from your house.
- 2 You can hit the ground with a stick or make loud clapping noises from a distance. Make sure this is only done when there is an open space for the monkeys to move away. Never corner them in narrow spaces.
- 3 If you are not comfortable with being in the same room as the monkey, move to another room and close the door behind you while waiting for the monkey to leave.

Wait for the monkeys to leave and take the proper long-term mitigation measures to minimise such occurrences.



Credit: Sabrina Jabbar

### MACAQUE FACT!

Much like KPO Singaporeans, macaques are curious creatures. They will explore any object that sparks their attention. They also learn from one another. In this photo, an alpha male is showing interest in what an elder male is up to.

## WHEN A MACAQUE...

### APPROACHES YOU IN THE OPEN

1



The monkey might be attracted to an object/plastic bag that you are carrying. Keep this out of sight immediately. It helps to keep your bag's side pockets empty if you are entering a monkey hotspot.

2

Do not turn your back away from the monkeys and run. The monkey might run after you. You can walk away slowly.

3



You can hit the ground with a stick or make loud clapping noises from a distance. Make sure this is only done when there is an open space for the monkeys to move away. Never corner them in narrow spaces.



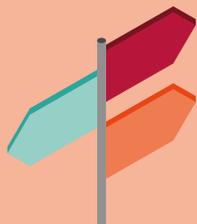
If a monkey is still following you and making attempts to grab at your bag, hug your bag to your chest. This deters them as it will be at a higher level and more intimidating for them.



# WHAT CAN I DO IF I ENCOUNTER MACAQUES WHEN I WALK MY DOG?



## Change your usual route



When a monkey is commonly sighted during your usual walk, there might be some fruiting trees in the area that are attracting the monkey/s there. Avoiding the route during the fruiting season can help.

## Change the timing at which you walk your dogs

Most monkeys have a regular travel pattern and timing. If you notice the monkeys are out at a certain timing, you could change the timing at which you walk your dog.



## When encountering monkeys during your walks

Hold on tightly to your dog's leash and make sure the dog doesn't lunge towards the monkey. Monkeys, like any wild animal, will be scared by the sudden movement and could react in self defense. Increase the distance between you and the monkey if the monkey seems interested in your dog, and take an alternate path. It also helps to position yourself between the monkey and your dog. Calmly managing the situation minimises stress for your dog too.



# "I'VE KNOWN THIS MONKEY FOR YEARS! HE IS MY FRIEND AND HE LOVES PEOPLE.."



Monkeys are curious creatures and may approach you if you are carrying food and/or an object that attracts their attention. This does not mean that you should approach and interact with them. If a monkey is used to being in the company of humans, they will approach other people and this could result in negative human-macaque encounters for others. Do note that different people have different levels of tolerance for monkeys.



## WILDLIFE RESCUE



## PAYAH'S STORY...



Payah was an example of why close interactions with wildlife are not encouraged. He was a transient macaque, passing by the areas of Punggol, Sengkang and Hougang. Well loved by some residents, they encouraged close interactions with him by feeding him and allowing him to groom them. These interactions, however, altered his wild behaviour and he got too comfortable with humans.

Unlike his close human friends, his playful behaviour was not welcomed by others. Apart from approaching people for food, he would also interact with baby prams, and shoes outside residential units.



## Direct feeding

## Injuries before & after



Soon after, Payah was found with a large gaping wound requiring rescue. It was suspected to be inflicted by a human. ACRES' vet team conducted a surgery and thankfully it was a success! He recovered soon after and was released back into the wild.



Scan for full video of Payah's story!

## "MONKEYS ARE AGGRESSIVE! THEY ATTACK PEOPLE."

Monkeys are not out to attack anyone. Often what we see as an "attack" is a warning sign from the monkey. It takes a lot for monkeys to even touch us as we are bigger than them, which puts them at a disadvantage. What people often interpret as "aggressive behaviour" is a reaction to a human's action. We can actually learn to understand monkey cues to avoid negative interactions.

### YOU MEAN I CAN UNDERSTAND MONKEYS?

Yes! Monkeys use facial expressions and body language to communicate their emotions to others. When feeling threatened, they will use a combination of actions - an intense stare, teeth baring, grinning with exposed teeth or raising their eyebrows. If you ignore all their prompts asking you to stay away from them, they may lunge toward you as their last line of defence.



### EXPRESSION 1: FEAR GRIN

The monkey is not smiling at you. They are feeling anxious and fearful. Please do not smile back. Step away instead.

### EXPRESSION 2: RAISED EYEBROWS

The monkey is feeling threatened and displaying defensive behaviour. This is a warning sign to stay away. Do not raise your eyebrows back at them.





### EXPRESSION 3: "O" SHAPED MOUTH

The monkey is giving you a warning. This is usually accompanied by raised eyebrows and an arched back. Please stay away.

### EXPRESSION 4 : LIP SMACKING

This is a sign of submission, usually done by juveniles or females. Even though they might look adorable, please do not reciprocate the action.



### EXPRESSION 5 : WARNING YAWN

**Eyes fixed on a target.**

The monkey is giving you a warning. Please stay away.



### EXPRESSION 6 : SLEEPY YAWN

**Eyes closed, body sluggish.**

The monkey is tired and yawning.

# IS THE POPULATION OF MACAQUES IN SINGAPORE GROWING OUT OF CONTROL?

Credit: Steph Leow

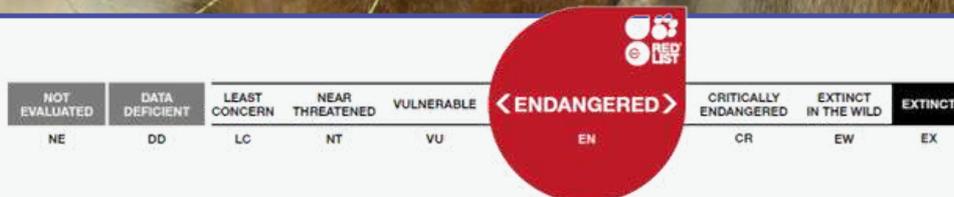
Long-tailed macaques are a native species, with a population estimate of 1,810-2,166 in Singapore in 2012.<sup>5</sup> NParks is monitoring the population in Singapore and should there be a need to manage their population, the LTMWG (long-tailed macaque working group) members will come together to assess.

Their population is naturally managed through food availability in the wild, predation by reticulated pythons and fights between troops. Moreover, half the infants often may not survive to adulthood.<sup>6</sup> They also face other threats in Singapore such as becoming roadkill, with over 20 individuals per year becoming victims of road accidents, according to ACRES records.

## MACAQUE FACT!

The global population status of long-tailed macaques has been uplisted from 'least concern' to 'vulnerable' and to 'endangered' in 2022.<sup>7</sup> Macaques are exploited for many reasons all over the world - research, wildlife trade (kept as pets) and food.

Credit: Jocelyn Chng



# CAN WE JUST RELOCATE OR CULL MACAQUES?

IN CASE YOU MISSED IT

## Monkey complaints up, so culling rises too

This story was originally published in the Straits Times on July 28, 2013

Feng Zengkun  
Environment Correspondent

PUBLISHED JUL 30, 2013, 8:38 AM SGT



Almost 360 macaques were killed by the Agri-Food and Veterinary Authority (AVA) in the first half of this year, more than the combined total for the past two years and estimated to be one-fifth of the total population of not more than 2,000.



As demonstrated in other countries – Japan<sup>8</sup>, India<sup>9</sup> and Malaysia<sup>10</sup> – culling individuals is not effective in reducing human-macaque conflict. Similarly to Singapore, these countries are undergoing or have undergone rapid deforestation and urbanisation. Therefore, we can expect similar outcomes in Singapore regarding the impact of culling macaques.

In 2013, it is estimated that 570 macaques (1/3 of their population), were culled by the AVA (the then animal management authority).<sup>11</sup> In 2014 and 2015, around 440 and close to 630 macaques were culled by AVA respectively, while the problem of conflict still remains.<sup>12</sup> Culling of monkeys does not reduce conflict cases due to the pervasiveness of readily available human food sources in urban areas. Improper food waste management and illegal feeding practices continue to attract monkeys to venture into our residential areas.

### MACAQUE FACT!

Macaques are usually active early in the morning and late afternoon. Check out these two macaques enjoying their food!



Credit: Sabrina Jabbar



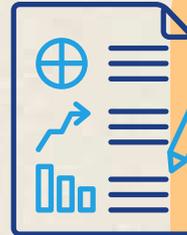
Credit: Sabrina Jabbar

# WHAT IS BEING DONE ABOUT MACAQUES IN SINGAPORE?

## ACRES' SOP

### Macaque sighting by member of public

Call ACRES/NParks' 24-hr hotline or report via Oneservice app



### Gather case information

Find out number of macaques, frequency of sightings, behaviour, and obtain photos/videos. Intervention for injured macaques based on animal welfare, recoverability in captivity and presence of troop.

### For non-rescue related sightings

SOP differs based on location of sighting (residential area with and without connectivity to a viable habitat).

### Sightings in residential area

- Conduct site visit if needed
- Update property manager/Town council and follow up on actions after.
- Disseminate advisories and engage public, People's Association and Member of Parliament.

### If macaque caused injury to humans

Investigation by the NParks, consultation with the LTMWG\*.



\*LTMWG - long-tailed macaque working group. The LTMWG was formed in September 2017 comprising members from the Animal Concerns Research and Education Society (ACRES), Jane Goodall Institute (Singapore), National Parks Board, Mandai Nature, and National University of Singapore. Each member plays an active role in outreach and management to help mitigate human-macaque conflict in Singapore.

# HOW DO I PREVENT MACAQUES FROM ENTERING MY HOUSE?



Install screen/mesh/grills on windows

\*Meshes require high maintenance as they need to be cleaned regularly due to the collection of dust or even spider webs.



Keep doors and windows closed when monkeys are spotted nearby or when no one is at home.



Ensure pet entrances are latched and secured when not in use as these can be used by monkeys to enter your house.

\*Monkeys tend to stay in an area for only a short period of time if they are unable to find food there. Most of them also have a regular travelling pattern and timing so it will be helpful to you to note down those timings and ensure that all access points to your premises are secured during those periods.

**1****TREE PRUNING**

## HOW TO DETER MACAQUES FROM COMING TO MY HOUSE?

Unpruned trees can assist macaques in entering your ceiling or building via the tree branches. Hence, your trees should be pruned periodically to prevent access to the building for wild animals in general.

**2****WRAP/HARVEST YOUR  
FRUITS**

Monkeys are attracted to fruits as they are their natural food sources in the wild.

- If you own fruit trees, harvest the fruits regularly and/or wrap them up with an opaque material (eg. gunny sack/cloth bags).



Why is it  
harder to get  
to the fruits...



- Plastic bags may not be a suitable alternative as they are not environmentally-friendly, and may not be able to support the weight of the fruits.



Please do not cover the entire tree with netting because bats and other animals may be trapped and eventually die from dehydration.



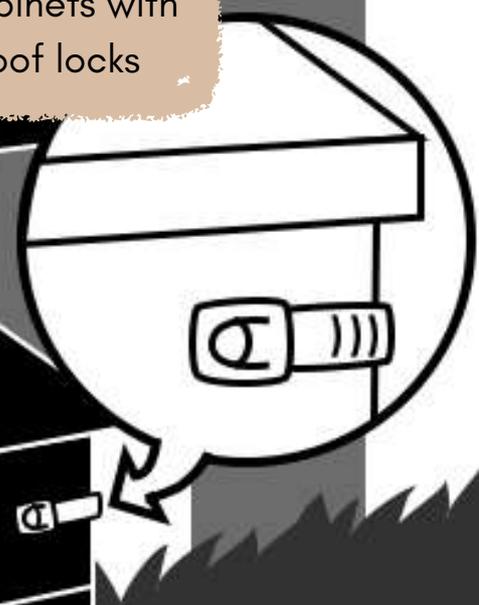
Rescue officer rescuing a bat trapped in netting

### 3 KEEP FOOD OUT OF SIGHT

Store food in cupboards, refrigerators or opaque containers, as visible food sources are attractive to monkeys.



Secure outdoor kitchen cabinets with child-proof locks



If you have pet food, keep it out of sight.



Keep prayer offerings within your house.



### WHAT IF I AM RETURNING HOME WITH GROCERIES...

Use recyclable cloth bags to do your grocery shopping as monkeys recognise plastic grocery bags as sources of food and will want to snatch them.

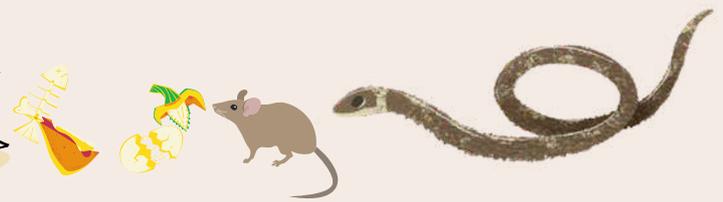
Cloth bags and backpacks are less attractive to them. However, if you still notice that your cloth bag or backpack is attracting a monkey's attention, hug the bag to the front of your chest instead of carrying it at your side or back.

Plastic bag = food...



# 4

## MANAGE YOUR REFUSE



Proper food waste management is an important deterrent measure. Food waste not thrown properly into secure bins or trash bags will attract wild animals like macaques to feed on them, as seen from the following pictures. Food waste that is not stored properly will also attract rodents, which are prey to snakes, thus attracting snakes as well.

Secure your dustbins, for example by tying a bungee cord or elastic strap across the lid.

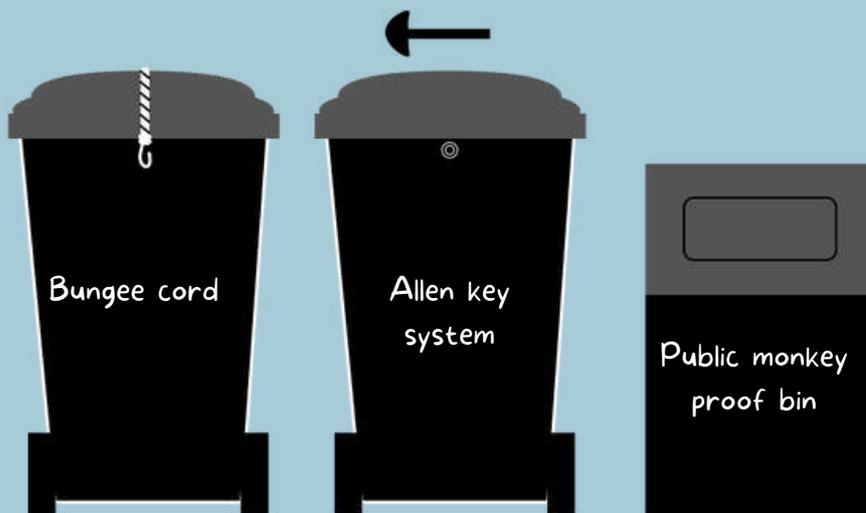


Double-knot garbage bags before disposing them into bins. This will prevent spills and make food waste less accessible to the monkeys.

Keep your surroundings clean and free of litter as monkeys are innately curious and drawn to litter such as food containers and drink cans.



### TYPES OF MONKEY-PROOF BINS



5

## ACTIVELY GUIDE MACAQUES AWAY



Scan for video demonstration of how to get a macaque to move.



Do this **only if** you are confident and not afraid of macaques. If you see macaques approaching your property, stand firm and clap your hands to make a loud noise. You can also bang pots and pans or anything available that can create a noise to deter the monkeys. When doing so, ensure that you are not blocking a path of exit for the monkeys. A gentle reminder not to taunt or hit a macaque, as that can provoke a defensive reaction.

## WHAT CAN I DO IF I NEED MORE ADVICE?



If you would like more information or advice, please send an email with details (e.g. number of macaques, frequency of sightings, observed behaviours) and photos to

 [wildlifemanagement@acres.org.sg](mailto:wildlifemanagement@acres.org.sg).



Credit: Sabrina Jabbar

Credit: Sabrina Jabbar

### WILD PIG FACT!

I am most active during dusk hours when foraging for food such as shoots, tubers, insects, earthworms and seeds, among others

## WILD PIGS



### WHY AM I SEEING WILD PIGS IN MY NEIGHBOURHOOD?

As their habitats have become increasingly fragmented due to rapid urban development and additional food provision, they are commonly sighted near residential and industrial areas.



### CAN I FEED THEM?



Please do not feed wild pigs or allow them any access to human food sources. Such actions will encourage them to revisit the area and associate humans with food. According to the Wildlife Act, feeding of wildlife is an offence that carries a fine of up to **S\$10,000**.

Proper food waste management must also be practiced by binning waste properly to discourage wild pigs from scavenging near bins. Due to wild pigs' well-developed sense of smell, if traveling in parks or other areas frequented by wild pigs, ensure any food is securely stored.

# WHAT CAN I DO WHEN I ENCOUNTER WILD PIGS?



at least 5-10m



**1** Appreciate from a distance.

**2** Remain calm, do not make sudden movements or noises.

**3** Do not take photos with flash

## WHEN I SEE A WILD PIG...

### IN GREEN SPACES/NEAR RESIDENTIAL AREAS

Credit: Brenda Yeo



**1** Walk away calmly and slowly. Do not block their way.

**2** Avoid any action that will cause the wild pig to feel threatened (eg. loud noises, sudden movements). These could trigger a wild pig to charge blindly through anything in their path.

**3** Leave them be. They are also very protective of their young. Do not approach piglets no matter how cute they look.



## WHEN I SEE A WILD PIG...

## OUTSIDE MY HOUSE/WITHIN OUTDOOR COMPOUND (GARDEN ETC.)

Credit: Joe Kam



**1** Keep your doors closed and keep your pets indoors for the time being, to prevent any potential conflict.



**2** Avoid any action that will cause the wild pig to feel threatened (eg. loud noises, sudden movements). Do not attempt to chase the wild pig away. Sudden movements could trigger a wild pig to charge blindly through anything in their path.

**3** Leave them be for the time being and look into taking the proper long term mitigation methods after. Wild pigs are excellent diggers. If holes are found in existing fencing, make sure to repair them. Refer to the end of this chapter for an idea of fencing specifications.

! Uprooted grass and hoof prints on mud are common signs of their presence.



# Food waste left outside rubbish bins attracting wild boars to Bukit Panjang, says animal group



For full story



A wild boar rummaging through rubbish at Bukit Panjang (Screengrab: Facebook/Animal Concerns Research and Education Society)



Ahmad Zhaki Abdullah

@ZhakiCNA

17 Feb 2022 06:31PM

(Updated: 22 Feb 2022 03:44PM)



**WHEN A WILD PIG IS GOING THROUGH TRASH FROM THE BIN AREA**

**1** Walk away calmly and slowly. Sudden movements/loud noises could scare them and cause them to charge blindly. Do not block their way.

**2** Take photos/videos without flash, from a distance.

**3** Encourage your neighbours to properly dispose of food waste. Write in to your Town Council on this. Improper disposal of garbage attracts wild pigs, who scavenge for food. If the bin belongs to you, wait for the wild pig to leave and take the proper long term mitigation methods after to minimise such occurrence.

## INDIRECT FEEDING LEADS TO UNTIMELY DEATHS OF CHOA CHU KANG WILD PIGS

In 2021, there was a case of wild pig feeding at the bin refuse centers around Choa Chu Kang. ACRES worked together with the Town Council who increased the frequency of clearing the bins. However, due to **continued improper trash disposal** by residents, the pig continued to be sighted at the HDB areas and was eventually captured and euthanised by authorities over public safety concerns. We thus appeal to residents to please manage their trash properly. Proper waste management could go a long way for the animals.



## WHEN I SEE A WILD PIG...

### APPROACHING ME

- 1** The wild pig is approaching you as they might be conditioned to see humans as their food suppliers. They are not being aggressive.
- 2** Immediately keep any food out of sight. Walk away calmly and slowly. Do not block their way.
- 3** Do not run or attempt to hit the wild pig.



Wild pigs have very poor eyesight and are easily scared by loud noises or sudden movements. They will charge blindly in self defense.

### RUNNING IN YOUR DIRECTION

In the rare instance that a wild boar has already been triggered by something and you happen to be in their path when they are running – try to back away from them as far as possible. Keep your footing and try sidestepping quickly as wild pigs are not able to change their direction as quickly! Get to higher ground such as a car or climb a tree.

If you are injured, call for medical help immediately. If you happen to witness an event, call 995 if the victim is hurt.

# WHAT CAN I DO IF I ENCOUNTER WILD PIGS WHEN I WALK MY DOG?



## Hold on tightly to the dog's leash.

Hold on tightly to your dog's leash and make sure the dog does not lunge towards the wild pig(s). Wild pigs, like any wild animal, will be scared by the sudden movement and could react in self defense. Increase the distance between you and the wild pig. Distract your dog and prevent him/her from confronting the pig. If your dog is light enough, you can carry him/her.



## Change your route

Change your route calmly and slowly. Calmly managing the situation minimises stress for your dog too.

## Change the timing at which you walk your dogs

Avoid routes/timings at where the wild pigs routinely forage. Uprooted grass and hoof prints on mud are common signs of their presence.



## WHEN I SEE A WILD PIG...

## TRAPPED IN A CANAL

Most of our canals do have steps in them. In most cases, the wild pigs may be able to find their way out of the canal using these steps.

**1** If the pig is immobile or visibly injured – Please contact the NParks Animal Response Centre at 1800-476-1600 or the ACRES Wildlife Rescue Hotline at 9783 7782 for assistance (both 24 hours).

**2** Do not attempt to climb into the drains and save the wild pigs especially if piglets are present.

Adult wild pigs are very protective of their young and you could be seen as a threat by approaching their young even though your intentions are good. They could react in self defence by charging at you in an effort to protect their young.

Wild pigs are also excellent swimmers!

Piglets trapped in canal on Aug 2021  
Credit: Singapore wildlife sightings/Facebook

# IS SINGAPORE FACING AN OVERPOPULATION OF WILD PIGS?



According to a 2018 study, in the Central Catchment Nature Reserve (CCNR), the estimated population size of wild pigs is 163 pigs and the density is 1.63 pigs/sq km.<sup>13</sup> As of June 2022, a comprehensive population study is yet to be done to conclude that wild pigs are overpopulated, or on strategies/methods to manage Singapore's wild pig population.

The wild pig population is also regulated through the predation of young pigs by reticulated pythons,<sup>14</sup> and road accidents.

ACRES is aware that wild pigs at certain locations are trapped to be euthanised due to public safety concerns. ACRES strongly believes that a science-based approach should also include humane methods and habitat/structural modifications to minimise threats to public safety. Feeding by humans and improper food waste management continue to draw these pigs closer to people, as ACRES has witnessed from several incidents. As listed in IUCN's position statement on human-wildlife conflict management, adopting a landscape and development-scale change along with intensive behavioural change in residents is required for mitigating potential conflict situations.<sup>15</sup> If the root causes are not addressed and human behaviour is not modified, intervention at the animal level alone is not only partial, but also not science-based.

# 5

## WILD PIGS TRAPPED IN A CAGE, RESCUED

WILDLIFE RESCUE



On 7th October 2018, five wild pigs were found trapped in a cage off Sime Road near the Central Catchment Nature Reserve (CCNR) by a member of public. ACRES was notified and found that there were 2 adult wild pigs and 3 piglets inside.



The ACRES' rescue team worked to release the pigs, by first covering the cage completely to minimise stress for them. They were then safely released. It was suspected that these wild pigs had already been trapped for several hours.

**According to the Wildlife Act, anyone found guilty of trapping wildlife (without required permits) can be fined up to \$20,000.**

Removal of wildlife involves a stressful capture for the animals. Even if the intention is to relocate them, they go through a lot of stress from capture and introduction to a new area. This can be prevented and minimised, if every one of us can make adjustments in the way we manage our food waste and practice wildlife etiquette when encountering our wild neighbours.

### WILD PIG FACT!

Wild pigs have been found to exhibit "rescue behaviour" where an individual acts to help another who is in a stressful/dangerous situation. In 2021, researchers observed an adult female trying to save young wild pigs that were trapped in a cage by moving the wooden log securing the door.<sup>16</sup>

I can do rescues too!



# HOW DO I PREVENT WILD PIGS FROM ENTERING MY HOUSE?



## PERIMETER FENCING

Fencing can deter wild pigs from entering your premises. For existing fencing, check for any gaps where they can enter and ensure that they are repaired.

Wild boar proof fences!<sup>17</sup>

High-tensile netting with 17 horizontal wires, 190cm high, 15cm between vertical stay wires

Mesh of the fence has holes that are no larger than 200mm x 200mm, and have locked joints

Bury depth of 0.2 to 0.3m



Please conduct regular checks on fencing to ensure that there is no breach in the fences. You can also refer to [NParks' wild boar brochure](#) for wild pig-proofing tips.<sup>18</sup>

**HOW DO I DETER WILD PIGS FROM COMING INTO MY RESIDENTIAL NEIGHBOURHOOD?**



Credit: Wenyang Hong

## **1** ESTATE MAINTENANCE



Maintaining the tidiness and cleanliness of your premises is important in deterring wild animals like wild pigs.

# 2

## PROPER FOOD WASTE MANAGEMENT



Proper food waste management is an important deterrent measure. Food waste not thrown properly into secure bins or trash bags will attract wild animals like wild boars to feed on them. Food waste that is not stored properly will attract rodents, which are prey to snakes, thus attracting snakes as well.

Secure dustbins by tying a bungee cord or elastic strap across the lid. To prevent wild pigs from toppling bins like these, you may need to secure them to a wall or post if possible, by using bungee cords or ropes.



Double-knot garbage bags before disposing them into bins. This will prevent spills and make food waste less accessible to the wild pigs.

Keep your surroundings clean and free of litter, as litter such as food containers and drink cans could draw wild pigs into the area.



Please ensure that food waste and trash in general are thrown properly into bins and/or trash bags.

Do clear your trays and clean up after yourself upon finishing your meal in eateries (especially outdoor food establishments) as well, as leftover food wrappings can also attract the wild animals to the area to search for food.

## WHAT CAN I DO IF I NEED MORE ADVICE?



If you would like more information or advice, please send an email with details (e.g. number of wild pigs sighted, frequency of sightings, observed behaviours) and photos to  [wildlifemanagement@acres.org.sg](mailto:wildlifemanagement@acres.org.sg).

Credit: Sylvia Loh



# COMMON PALM CIVETS



## WHY AM I SUDDENLY SEEING CIVETS IN MY FALSE CEILING?

Common Palm Civets are native nocturnal animals who feed mainly on fruits, followed by insects, snakes and seeds.



Civets are well adapted to urban spaces with fruiting trees. Due to their fragmented natural habitats, civets are sighted in certain residential areas, which provide suitable food and nesting areas.

At times, we have observed civets using attic spaces in roofs/ceilings to nest. This happens due to the availability of gaps for access and civets' preference for a warm, quiet and sheltered nesting space for their babies.



# THE MANY (WRONG) NAMES FOR CIVETS...



FOSSA?

RACCOON?



CAT?

BADGER?



Many a time, the civet gets mistaken for other creatures by residents - some are not even found in Singapore!

Credit: Jayaprakash Bojan



Though commonly known as "Civet cats", civets are not cats. They are more related to mongooses who are also known to roost in roofs/attics of houses in their native ranges.



They are also known as the Toddy cat as they are fond of palm tree sap, which is also used to make the hot alcoholic drink Toddy.



Civets are called "Luwak" in Indonesia. They are heavily exploited to create Kopi Luwak - one of the most expensive coffees in the world. This cruel practice of farming civets involves force feeding civets coffee cherries before collecting their faeces to be processed for the coffee beans.

# WHAT CAN I DO WHEN I ENCOUNTER CIVETS?



2-3m



**1** Do not feed

**2** Appreciate from a distance.

**3** Remain calm, do not make sudden movements.

## WHEN I SEE CIVETS...

### IN THE OPEN/ ALONG THE BORDERS OF MY HOUSE



Credit: Ken Ng

**1** Keep a distance and let the civet pass. Do not approach as they may defend themselves if cornered.

**2** If the civet is eating your fruits, leave them alone till they have finished eating before taking any exclusion measures.



**3** If you happen to have a pet dog around, please keep the dog indoors till the civet has passed to minimise any negative animal encounters.



Wait for the civets to leave and take the proper long-term mitigation measures to minimise negative encounters.

# WHEN I SEE CIVETS...

## IN MY FALSE CEILING/ROOF



Locate the entry and exit points of the civets. You could utilize a NannyCam in the roof space to aid in locating them. It is also useful to confirm whether the animal is a civet.



Call a contractor to inspect your house to identify entry and exit places. Ask them to make sure that there are no civets trapped in the roof when they mesh up the entrances.



If baby civets are present, do wait for a few months for the family to move out before taking exclusion measures.



Please do not trap me!

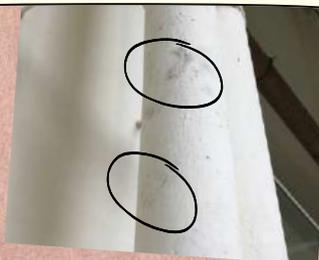
Wait for the civets to leave and take the proper long-term mitigation measures to minimise such occurrences.

## HOW TO IDENTIFY IF CIVETS ARE PRESENT IN MY ESTATE?

**1** Civet droppings



**2** Pawprint marks (usually on water pipes)



Look out for their eye-shine!

## WHEN I SEE A...

### BABY CIVET ALONE

#### CIVET FACT!

Civets are excellent climbers, they can even balance on electric cables!



1



Young civets (about 25 cm in length) are usually guarded by parents. Keep your distance from them as staying in close proximity might deter the parents from retrieving their baby.

2



If you see one unattended for longer than 24 hours, the civet may be abandoned. Call the 24-hr ACRES wildlife rescue hotline at 9783 7782 or the 24-hour NParks Animal Response Centre at 1800-476-1600 for assistance.





On January 2020, ACRES took in two baby civets - PB and J. They were suspected to have fallen out of the nest during a thunderstorm and PB had accidentally been ran over by a cyclist. They were soon joined by two baby civets - Penny and Lenny who were stranded after a thunderstorm.



From requiring constant care throughout the night, the babies recovered and were all transferred to our outdoor rehabilitation facility once they could eat on their own. Thankfully, the four babies made it and were released back into the wild. We were so happy to see them run for the trees!



**For full story**



## "WHY CAN'T ACRES HELP TO TRAP THE CIVETS?"

Trapping, relocation or culling are not sustainable solutions. Doing so leaves a void for another civet to move in. You will continue to face the problem, as long as the habitat remains suitable for them to feed or nest. Hence addressing the root cause is the key to resolving your issue long-term. Moreover, it is not recommended to attempt to trap a family, as this usually results in young civets being separated from their mothers, which is not ideal.



## DO CIVETS SPREAD DISEASES/PARASITES TO MY PET?

In Singapore, our local civet population is monitored by NParks.<sup>19</sup> Regular biosurveillance is conducted to monitor potential zoonotic threats caused by civets. There is so far no known concern of disease transmission from civets to humans or pets.

Click to watch:  
NParks Webinar Series: Human-Wildlife Encounters -  
 [Small Mammals in Our City in Nature](#)

## WILL CIVETS ATTACK MY PET?

Civets are shy creatures and will generally stay out of sight. Hence, they do not attack your pet dogs or cats. They will defend themselves if they are threatened (you can tell by their hissing). Therefore, keep your pets on a tight leash while walking them if you ever encounter a civet.



## CIVET FACT!

When threatened, civets will hiss, snarl, spit or use their anal scent glands to emit a pungent smelling secretion to mark territory.

Credit: Jayaprakash Bojan

# HOW DO I PREVENT CIVETS FROM ENTERING MY FALSE CEILING?



Identify their entry and exit points to the roof and search for any gaps in the false ceiling/attic that serve as a potential entry/exit.

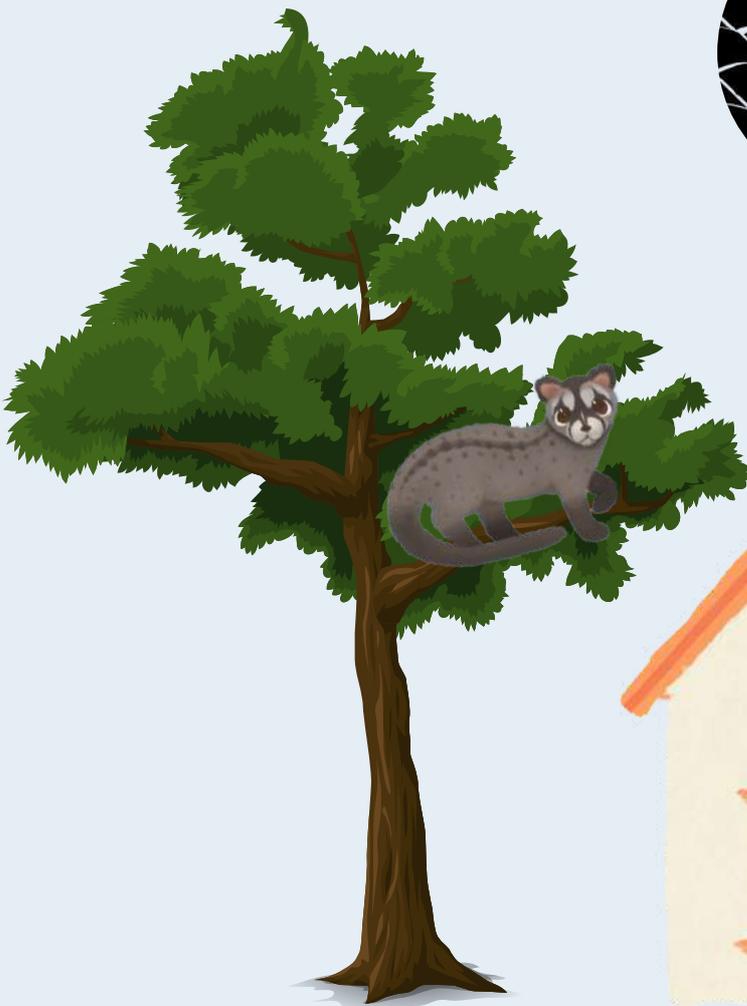
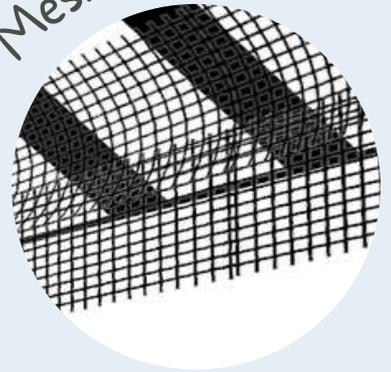
**1**

## MESHES/GAPS IN ROOFS

Fix tiles



Mesh up gaps



Mesh up gaps to prevent any future visits. However, please ensure that this is done only when no civets are trapped inside the roof. A good contractor will be able to check that this is done properly.

## 2

## SPOTLIGHTS



Civets roost in dark environments so installing lights at potential roosting spots and leaving them switched on at night will discourage them from coming back.

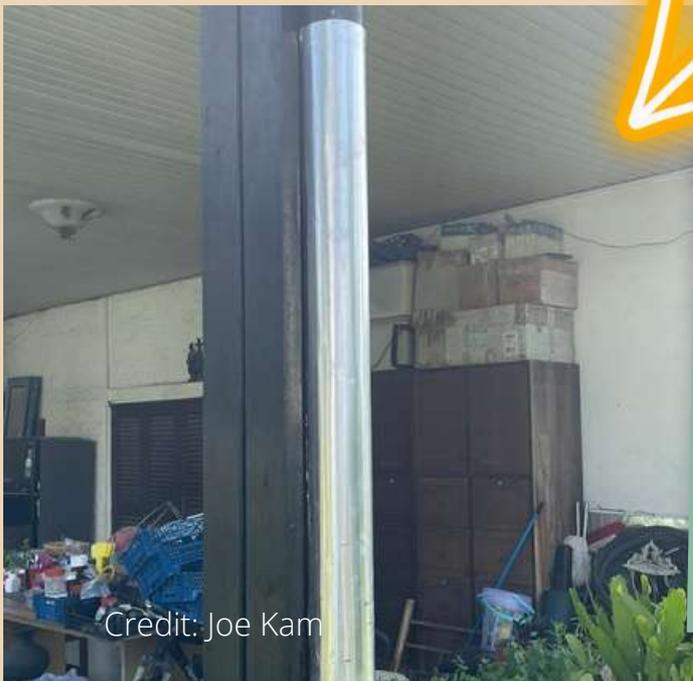
Alternatively, you can obtain solar powered outdoor animal motion sensors, which are only activated when movement is detected. You would need to place enough lights depending on the position and number of entry/exit points identified.



# 3

## SMOOTH BARRIER

Civets are good at climbing up pipes. Adding a slippery or smooth barrier prevents them from doing so.



Credit: Joe Kam

Wrap external pipes with a smooth and durable surface (aluminium or acrylic) for at least a length of 60cm (i.e. you can cover a section of the pipe instead of the whole length of the pipe). Such a surface will prevent climbing access as the civet will not be able to get a foothold. These wrappings need to be maintained and changed if rusty.



Credit: Ken Ng

**WHAT CAN I DO TO  
MINIMISE CIVET SIGHTINGS  
WITHIN MY PREMISES?**

## **1** ESTATE MAINTENANCE

Ensure your estate is clean with no improper food waste disposal. Clear surrounding areas of excess leaf litter to minimise food availability (such as invertebrates) for civets. Consistent maintenance of the environment is crucial if the aim is to reduce encounters with wild animals.



## **2** TREE PRUNING

Civets are arboreal and they travel via trees/roofs. They are able to jump from tree to tree/roofs. Trim all branches that overhang into your property or over your house to cut off an access route to the building.



# 3

## HARVESTING FRUITS EARLY/COVERING FRUITS

- Harvest the fruits from fruiting trees immediately after they have ripened or wrap unripe fruits with a cloth/opaque/mesh bag. Covering fruits removes the civets' access to this food source and discourages them from visiting to feed.



Why is it harder to get to the fruits...



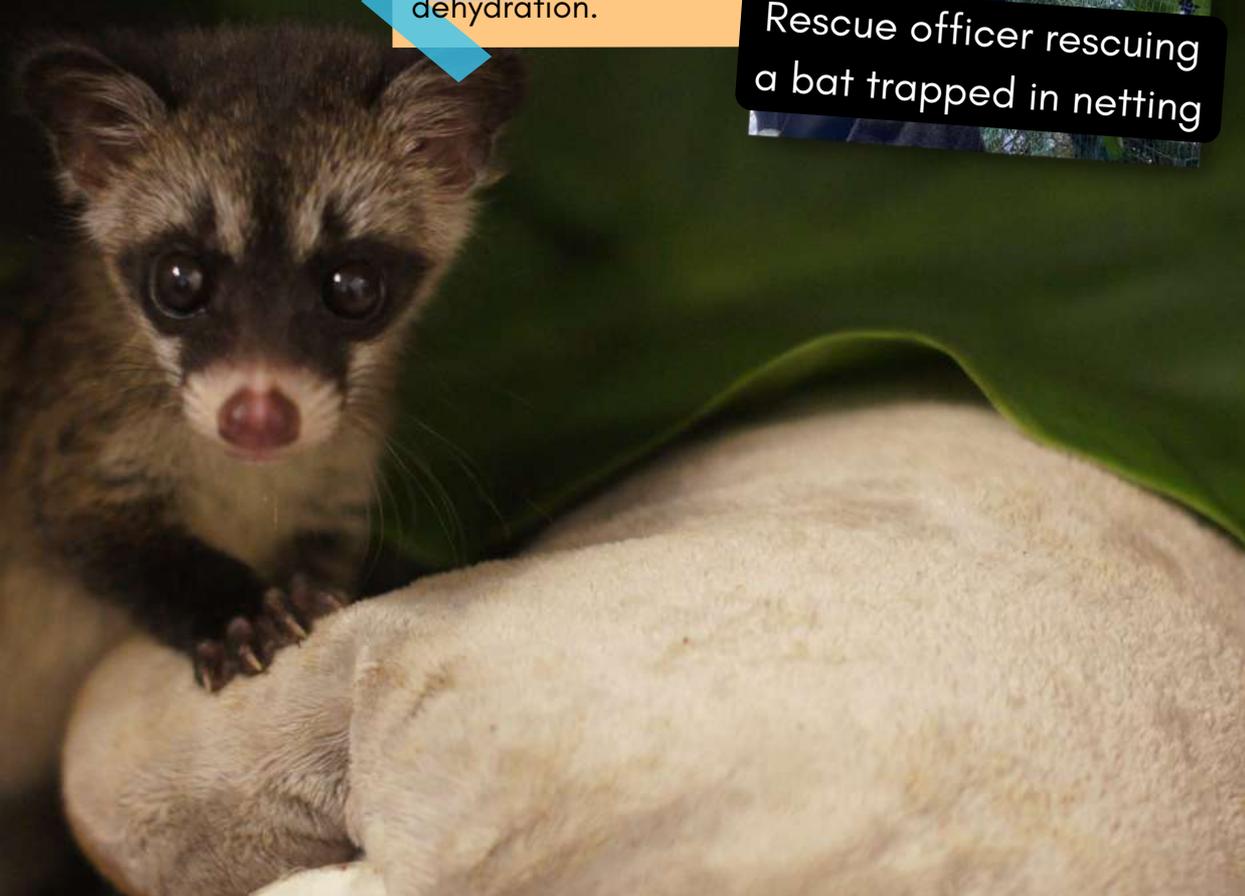
- Plastic bags may not be a suitable alternative as they are not environmentally-friendly, and may not be able to support the weight of the fruits.



Please do not cover the entire tree with netting because bats and other animals may be trapped and eventually die from dehydration.



Rescue officer rescuing a bat trapped in netting



## WHAT CAN I DO IF I NEED MORE ADVICE?

If you would like more information or advice, please send an email with details (e.g. number of civets sighted, frequency of sightings, observed behaviours) and photos of the roof space to

✉ [wildlifemanagement@acres.org.sg](mailto:wildlifemanagement@acres.org.sg).

### **CIVET FACT!**

Did you know that civets give off a musky scent that is similar to that of a pandan? They communicate largely through scent markings!



Credit: Kannan Raja

## WHY AM I SEEING BATS ON MY ROOF/AROUND MY NEIGHBOURHOOD?

If there are conducive roosting spots on your roof/around your neighbourhood that provide shelter and the appropriate temperature, bats might like to roost there after a night of feeding.

There are more than 20 species of bats who live in Singapore.<sup>20</sup>

I have a large pouch below my chin!



Pouched tomb bat

Insectivorous bats feed mainly on insects, helping with our mosquito population.

**BAT FACT!**  
At times, you might see a bat scooping water from a pond/pool. They are actually scooping the insects that have fallen into the water.<sup>21</sup>



Fruit-eating bats like the lesser dog-faced bats are attracted to fruit trees, especially those with strong-smelling fruits like mangoes, chikus, bananas and even a Singapore favourite - durian!



They feed largely on fruit, nectar, and even flowers. The presence of fruit trees might invite these bats to feed around the area.

# WHAT CAN I DO WHEN I ENCOUNTER BATS?



**1** Do not feed



**2** Appreciate from a distance.



**3** Remain calm, do not make sudden movements.

## WHEN I SEE BATS...



## IN THE OPEN/ ON A TREE

**1** Do not approach and appreciate from a distance.

**2** If the bat is eating your fruits, leave them alone till they have finished eating before implementing exclusion measures.

### **BAT FACT!**

When bats feel threatened, they may bite to defend themselves. As a defense mechanism, some bats may make a hissing or screeching sound or flap about trying to get away from the danger.



## WHEN I SEE BATS...

### IN MY HOUSE

Credit: Wong Weijian

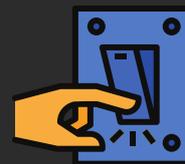
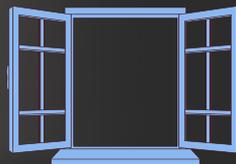
1

The bat could be disoriented in your house. Remain calm and do not use tools to disturb the bat.



2

Open all windows. Turn off all interior lights and any ceiling/wall fans. Give some time for the bat to fly out.



3

Do not handle the bat with your bare hands. Bats are not out to bite you, but may do so in self defense if they feel threatened.



Take a photo/video and call 24-hour ACRES Wildlife Rescue Hotline at 9783 7782 for advice.

## WHEN I SEE...

### A GROUNDED BAT



#### BAT FACT!



- Many bats cannot take flight from the ground. They have to be at a height before they fall into flight.

1



Use a towel to place the bat in a box. Please do not handle with bare hands as the bat may react in self defense.

2



Find a tall tree with a rough surface so that the bat can cling onto. Wait till nightfall to bring outdoors to release them on the tree.

3



Hold the box aloft and tilt it gently to the side against a tree until the bat clings onto the bark.

If you are unsure of what to do, please take a photo/video and call 24-hour ACRES Wildlife Rescue Hotline at 9783 7782 for advice.

## WHEN I SEE BATS...

### ROOSTING IN ROOFS/ CEILINGS OF BUILDINGS

Credit: Shirlene Chiam



1



Credit: Daniel Neo

The bats are there as it is a conducive roosting spot. We understand that this could cause some inconvenience due to their droppings in the building. Please do not use tools to poke at the bats.



2

Do not trap them, instead implement the proper long-term mitigation methods to minimise such occurrences. Often, modifying the structure to have a smooth and slippery surface will prevent the bats from being able to cling on and roost in that area of your home.

## WHY CAN'T ACRES HELP ME TO TRAP AND REMOVE THE BATS?

Trapping/removal is not a sustainable solution as other bats may simply move in to take advantage of the conducive roosting spot, especially if there are attractants such as fruit trees in the area. Trapping bats using nets is also a stressful process for them. Relocation of a large roost of bats affects the health of the colony due to the unnecessary stress they are put under. Coexistence is possible with our native biodiversity when proper exclusion methods are followed.



### BAT FACT !

According to a US source, "bats consume their body weight in insects every night, helping keep bug populations in check."<sup>22</sup>

## DO BATS CARRY DISEASES?

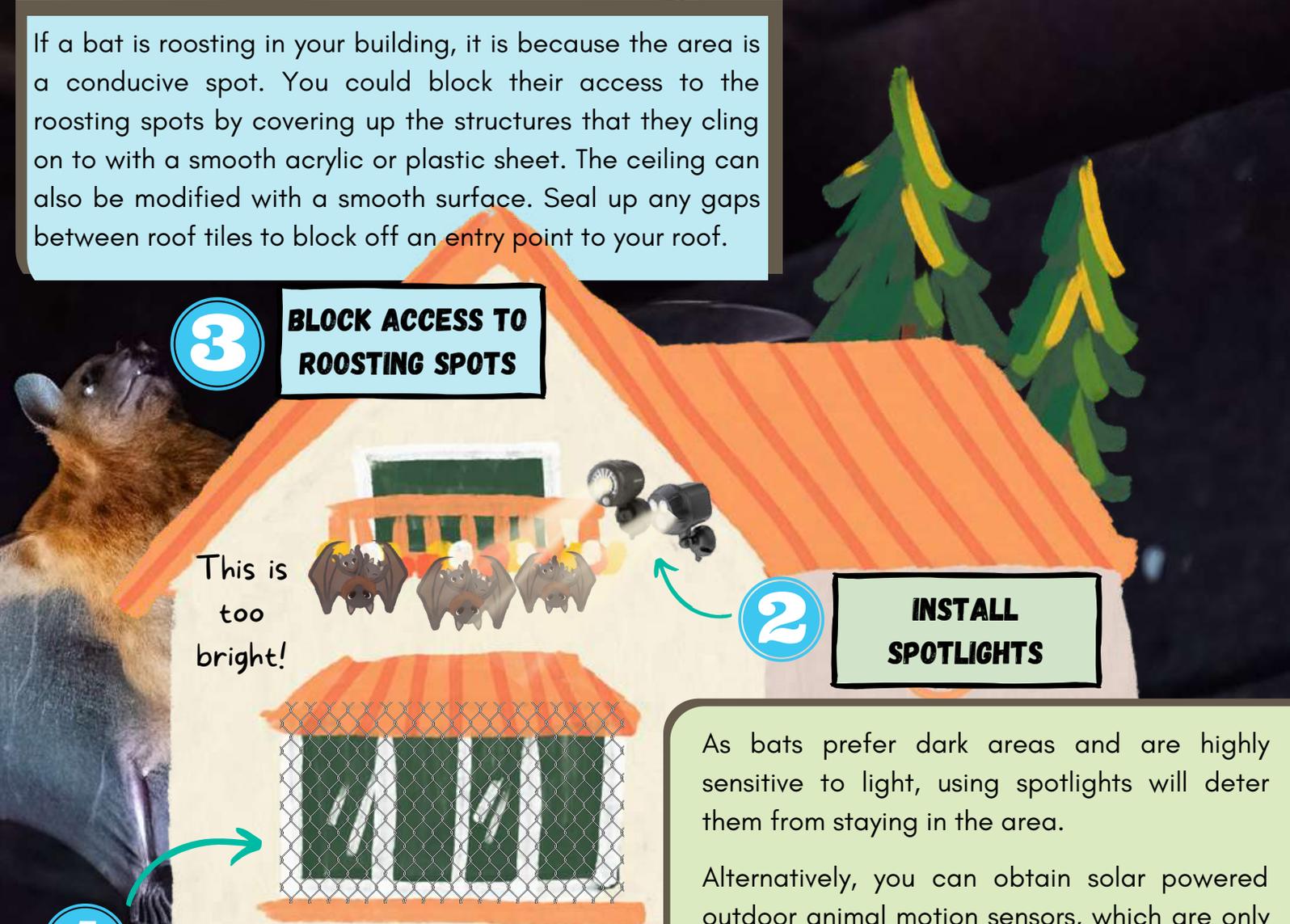


While it is true that bats could carry a number of viruses such as Ebola, Nipah, rabies<sup>23</sup> and even coronavirus,<sup>24, 25</sup> the risk of viral transmission from a bat to a human is very low.<sup>26, 27</sup> However, evidence shows that when wild bat populations are disturbed by human-induced landscape change e.g. fragmentation of forests, hunting for food and agricultural activities, or when placed in stressful situations (in markets in close proximity with other animals) their immune systems are suppressed, allowing the pathogens they may carry to express, hence favouring disease transmission.<sup>28</sup> Thus, it is important to maintain healthy wild bat populations and avoid disturbance to them. In Singapore, NParks periodically monitors the local bat population for any transmissible zoonotic diseases. To date, there have been no incidences of bat-to-human viral transmissions.<sup>29</sup>



## HOW DO I PREVENT BATS FROM ENTERING MY HOUSE?

If a bat is roosting in your building, it is because the area is a conducive spot. You could block their access to the roosting spots by covering up the structures that they cling on to with a smooth acrylic or plastic sheet. The ceiling can also be modified with a smooth surface. Seal up any gaps between roof tiles to block off an entry point to your roof.



**3**

**BLOCK ACCESS TO ROOSTING SPOTS**

This is too bright!

**2**

**INSTALL SPOTLIGHTS**

As bats prefer dark areas and are highly sensitive to light, using spotlights will deter them from staying in the area.

Alternatively, you can obtain solar powered outdoor animal motion sensors, which are only activated when movement is detected. You would need to place enough lights depending on the position and number of entry/exit points identified.

**1**

**INSTALL SCREEN/MESH/GRILLS ON WINDOWS**

\*Meshes require maintenance as they need to be cleaned regularly due to the collection of dust or spider webs.

Credit: Ken Ng



Credit: Daniel Neo

## WHAT CAN I DO TO MINIMISE BAT SIGHTINGS IN MY PREMISES?

# 1

### TREE PRUNING

Bats roost in trees. Regular pruning of trees helps minimise roosting encounters as there will be fewer shady/cooling spaces for bats to roost in. However, this should only be done as a last resort, as trees are also their natural roost sites.



# 2

### HARVESTING FRUITS EARLY/COVERING FRUITS

To prevent bats from feeding on your fruits, harvest fruits from trees immediately when they start to ripen.

- If you own fruit trees, harvest the fruits regularly and/or wrap them up with an opaque material (eg. gunny sack/cloth bags).
- Plastic bags may not be a suitable alternative as they are not environmentally-friendly, and may not be able to support the weight of the fruits.



Please do not cover the entire tree with netting because bats and other animals may be trapped and eventually die from dehydration.



Rescue officer rescuing a bat trapped in netting.

## WHAT CAN I DO IF I NEED MORE ADVICE?



If you would like more information or advice, please send an email with details (e.g. number of bats sighted, frequency of sightings, observed behaviours) and photos to

✉ [wildlifemanagement@acres.org.sg](mailto:wildlifemanagement@acres.org.sg).



Credit: Tracy Pah



Credit: Jocelyn Chng

**SINGAPORE IS HOME TO TWO NATIVE OTTER SPECIES.**



Credit: Jocelyn Chng



Credit: Peter Swee

**Smooth-coated otters**

Mainland Singapore

Found where?

Bigger and more elongated bodies, bigger claws and longer tails

Description

(Can grow up to 1.2m including tail)<sup>30</sup>

IUCN status

Vulnerable<sup>31</sup>

**Asian small-clawed otters**

Pulau Ubin and Tekong

Smaller and more rounded bodies, smaller claws and shorter tails

(Can grow up to 0.9m including tail)<sup>32</sup>

Vulnerable<sup>33</sup>

Smooth-coated otters, the species seen along our urban waterways, feed on mostly fish and prawns.<sup>34</sup> Our clean urban waterways contain plentiful invasive fish species that otters eat.



Otter eating a Midas Cichlid.  
Credit: Samuel Foo

## WHY AM I SEEING OTTERS AROUND MY NEIGHBOURHOOD?

Our well-connected urban waterways enable the otters to navigate from one waterway to another, and infrastructure such as bridges provides them shelter.



Credit: Jocelyn Chng

## WERE OTTERS ALWAYS AROUND IN SINGAPORE?

Otters were suspected to have gone extinct in Singapore by the 1970s due to the filthy state of the rivers; however, the Singapore River clean-up in 1977 was a success, and our waterways have become ideal for supporting the otters.<sup>35</sup> The first breeding pair of otters was seen returning to Sungei Buloh Wetland Reserve in the late 1990s. They are considered an indicator species that require clean water habitats to survive. The healthy population numbers in Singapore would thus suggest the pristine condition of our local waters.

# WHAT CAN I DO WHEN I ENCOUNTER OTTERS?



> 5m



**1**

Appreciate from a distance.

**2**

Remain calm, do not make sudden movements and eye contact.

**3**

Do not take photos with flash

## WHEN I SEE OTTERS...

### IN THE OPEN



Credit: Tan Yong Lin

**1**

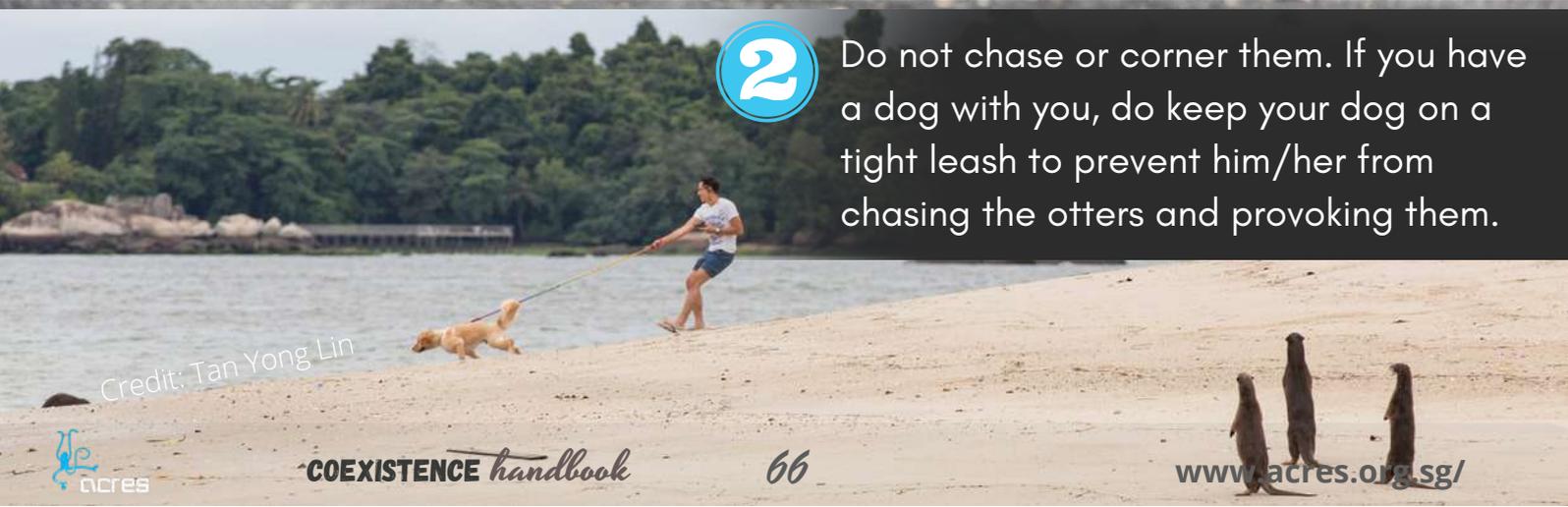
Appreciate them from a distance of several metres away. Like us, otter families are very protective of their young; please increase your distance if pups are present.



Credit: Jocelyn Chng

**2**

Do not chase or corner them. If you have a dog with you, do keep your dog on a tight leash to prevent him/her from chasing the otters and provoking them.



Credit: Tan Yong Lin

## WHEN I SEE OTTERS...

### APPROACHING ME



Credit: Sylvia Loh

1

Move away slowly or stand quietly to one side and let them pass. If you are jogging, pause for awhile or take a route around the otters; do not run through a group of otters or jump over them! Like us, otter families are very protective of their young and will react defensively if they perceive your approach as a threat.

2

Do not attempt to touch/pet them no matter how cute they look, even if they come close to you on their own accord. Please keep our otters wild.



Credit: Ottercity

3

Do not chase or corner them. If you have a dog with you, do keep your dog on a tight leash to prevent him/her from chasing the otters and provoking them.



Credit: Jocelyn Chng

## WHEN I SEE OTTERS...

## IN MY RESIDENCE

**1** Remain calm and wait for them to leave. Please do not approach close as they might react in self defense. Like us, otter families are very protective of their young; please increase your distance if pups are present.

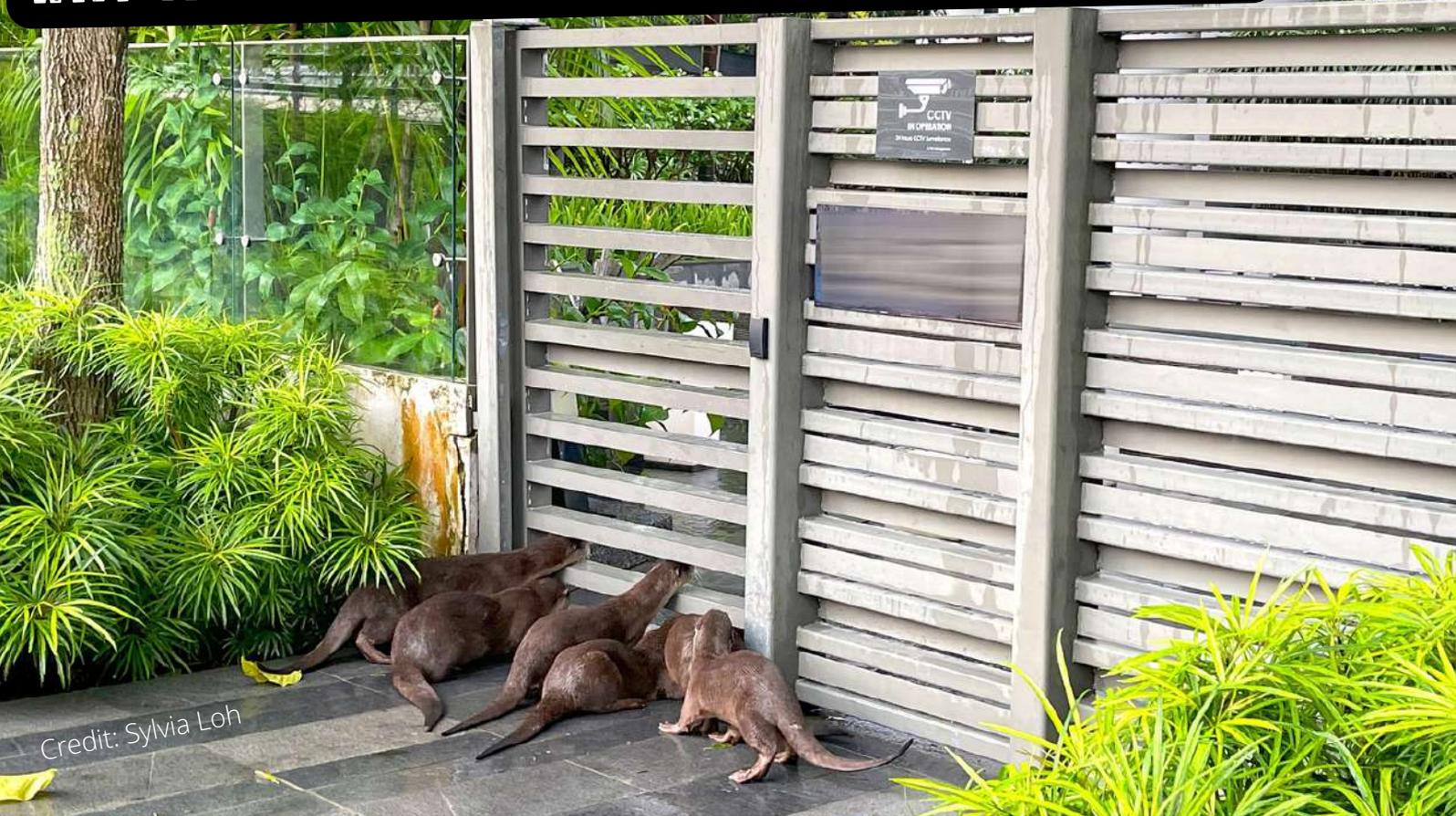
**2** Do not chase them into a corner. Please be patient and the otters will leave after a while. You could implement the proper long term mitigation methods to minimise such occurrence after.

Credit: Sylvia Loh

### **I SPOTTED A LONE OTTER! IS HE/SHE LOST?**

No, the otter is not lost! It is common to encounter a lone otter as he/she could be an otter hunting alone or a male otter in search of a new group.<sup>36</sup>

## WHY ARE OTTERS COMING INTO MY RESIDENCE?



Credit: Sylvia Loh

Otters are curious creatures and are drawn to bodies of water. If the pond has fish, it is even more likely that otters will be attracted, as fish in ponds are an easy source of prey for them. Moreover, otters look for a long-term place that is unoccupied by any competing families to settle down.<sup>37</sup> Therefore, while searching for a new suitable location, they may sometimes wander into your residence.

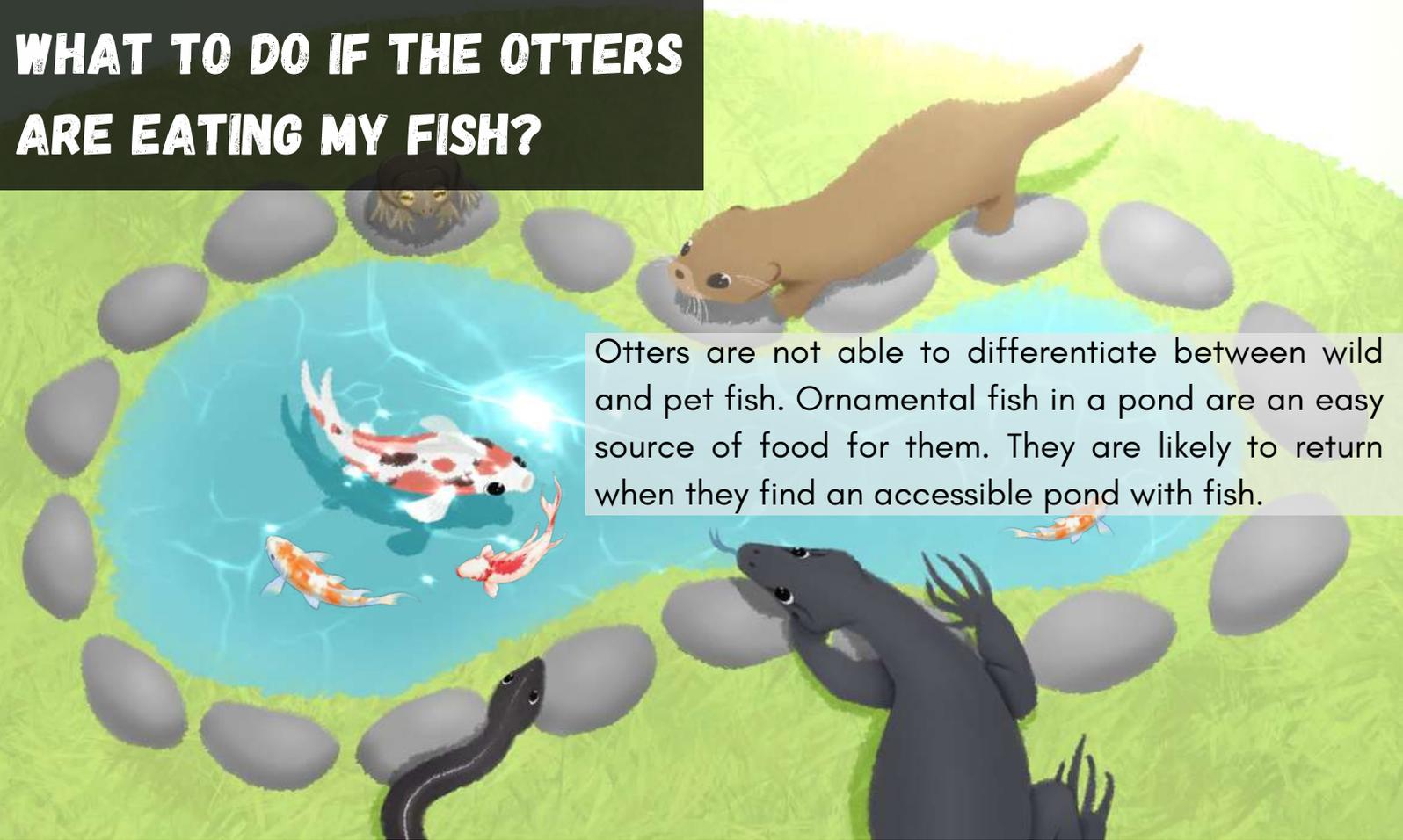
## WHAT TO DO IN AN OTTER FIGHT?



As otters are territorial animals, fights between different families are common. However, do call the 24-hr ACRES Wildlife Rescue Hotline at 9783 7782 or the 24-hr NParks Animal Response Centre at 1800-476-1600 if the otter is in distress or has sustained injuries.

Credit: Jocelyn Chng

# WHAT TO DO IF THE OTTERS ARE EATING MY FISH?



Otters are not able to differentiate between wild and pet fish. Ornamental fish in a pond are an easy source of food for them. They are likely to return when they find an accessible pond with fish.

It is best for your safety to leave them alone. Trying to corner them or moving in on them too quickly may cause them to feel threatened and be defensive towards you, especially if they are still consuming your fish.

To deter otters from eating your fish in the future, you may implement long-term solutions such as setting up strong and slippery barricades or fences.

Please refer to the end of this section for specifications and more information on humane exclusion methods to deter otters from entering your house.

## WHY DON'T I SEE THE OTTERS IN SINGAPORE HOLDING EACH OTHER?

See these otters holding hands while sleeping in water? These are sea otters! They hold hands while sleeping to prevent them from floating apart from each other. Sea otters are native to the coasts of the north Pacific ocean, and are not found in Singapore!



Credit: John Vargas,  
Source: Dailymail.com

## IS THE POPULATION OF OTTERS IN SINGAPORE GROWING OUT OF CONTROL?



Credit: Tan Chuan Kai

Like with other carnivorous wildlife, otter numbers are naturally managed by territorial competition and prey availability. Otter families can occupy a large area as their territory and will defend their territory fiercely against other families. Competition is tough and fights often result in casualties. The low survival rate of newborn pups and road traffic accidents are further limits to the population.<sup>38</sup>

It may seem like there are more otters now, given the high-profile media coverage. However, this may simply mean otters are learning to be more adaptable to using our man-made infrastructure to travel around. Given their cute and charismatic appearances, people like to take photos and showcase otters on social media, thereby directing more public attention to the presence of otters.



## RELOCATING OTTERS IS NOT A SOLUTION FOR EVERY SIGHTING

Otters are extremely smart and well-adapted to using our extensive river and canal system in Singapore. They are also very good at sensing the presence of fish. Therefore, even if otters were relocated from one place to another, other otters will come and visit if the root cause of fish availability/access is not addressed.

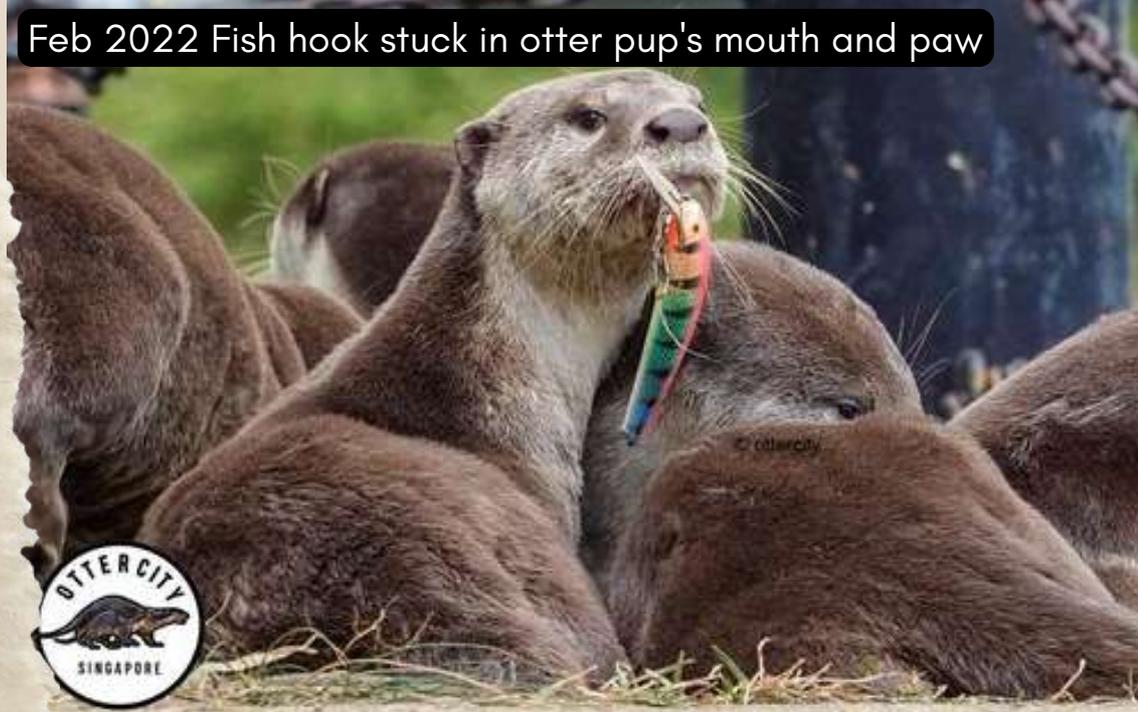
## DO OTTERS ATTACK PEOPLE, ESPECIALLY CHILDREN?

Credit: Jocelyn Chng



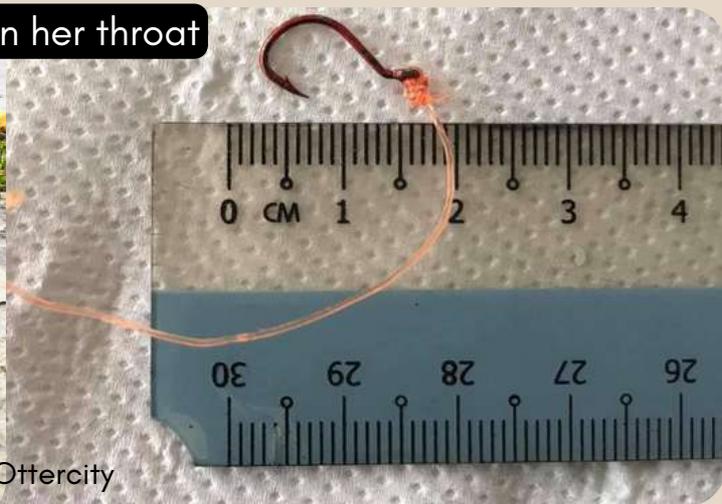
Like with most animals, otters are not out to attack people. They will only be defensive when provoked, taunted, or cornered. Try to take a route around the otters rather than walk through their path especially when there are pups around. Remind your children not to scream or run towards otters.

# THE PLIGHT OF OTTER PUPS AND ABANDONED FISHING GEAR



The irresponsible discarding of fishing equipment is one of the most common threats to otters, and other wildlife who live and hunt in canals or coastal areas, such as monitor lizards and birds of prey. As seen in some of the cases highlighted here, hooks thrown on the ground can be swallowed by wildlife, or get hooked onto their bodies. Otters have also been trapped and drowned in discarded fishing traps left in the water by the beach.<sup>39</sup>

## Sept 2020 Otter pup died from fish hook lodged in her throat



Credit: Ottercity

## IF YOU FISH, OR KNOW OTHERS WHO DO, HELP PROTECT OUR OTTERS AND OTHER WILDLIFE BY:



1

Fishing outside designated areas is illegal

2

Not leaving any equipment or trash in the waters

3

Ensuring that you throw away all used hooks properly, in bins, especially in the ones provided by PUB.



Credit: TNP  
Source: AsiaOne

# SINGAPORE'S OTTER COMMUNITY

Singapore's Otter working group comprises members from various agencies, including volunteer members of the public. The working group has a specific workflow to address sightings, movements, conflict situations and other threats that the otters may face such as fishing debris and becoming roadkill.<sup>40</sup>

"Co-existence means being gracious; it means humility, not having the mindset that I have sole right to use the space around me. Co-existence is about looking beyond yourself, and caring about the needs of others, whether humans or creatures. We are all stronger together. How to co-exist? That comes with study and education.

But it all starts with humility." - **Marjorie Chong, OWG**



"Protection of red listed and declining species is the civil responsibility of every citizen, so that our next generations get to appreciate and decide the Singapore they like to create and live in the future." - **Jeffery Teo, OWG**





Credit: Jocelyn Chng

## **DO NOT SUPPORT THE ILLEGAL WILDLIFE TRADE!**

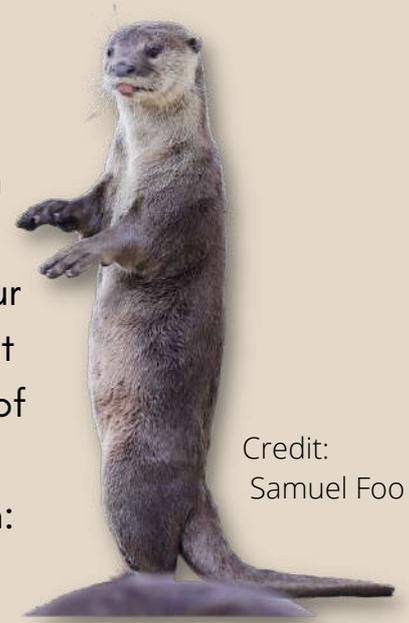
The illegal trade in otters for the pet and fur industry has not only decimated their global populations, but also led to more suffering. Cute otter videos online have a dark side to them, from poaching of pups to keeping them in horrible conditions purely for monetisation from clicks and likes.<sup>41</sup> Play your part by not interacting with such videos – do not like, share, react or comment on them.



Credit: Jocelyn Chng

## WHAT CAN I DO TO STOP OTTERS FROM ENTERING MY PREMISES?

To prevent otters from going into your residence or eating your fish, you can implement the following methods of exclusion which are humane and long-term:



Credit:  
Samuel Foo

# 1

## FENCING/MESHING

Identify otters' entry and exit points and block their access routes by meshing up gaps in gates or fences.

- Otters can climb or jump over heights of up to 1.5m if the attraction beyond the fence is strong. Ensure that there are no ledges, containers, dustbins etc. on which otters can step to get a foothold over the fence.
- Otters can squeeze through gaps of 15cm or more, and under gaps of 8cm or more.
- To mesh up such gaps, the material used **must be sturdy** (preferably metal); plastic will not suffice!

Credit: Otter Working Group

Do conduct regular checks on fencing to ensure that there is no breach in the fences.

## 2

## SMOOTH BARRIERS

To prevent otters from entering your pond, a glass barrier or slippery acrylic barrier can be installed around your pond. Make sure the barriers are sturdy, slippery and tall enough (at least 1.5m) to prevent climbing access.

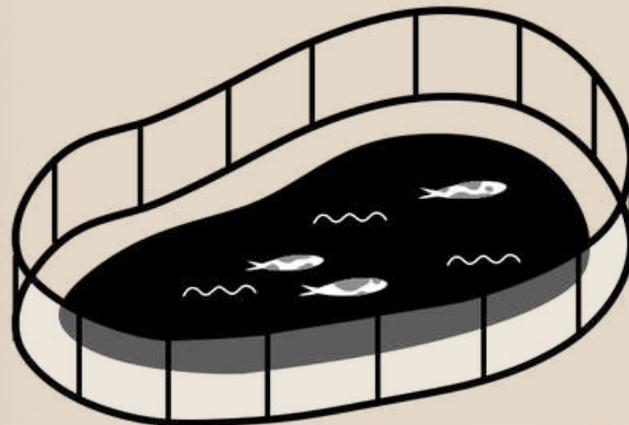


Credit: Trade Betustrade



Credit: VistaGlassSystems

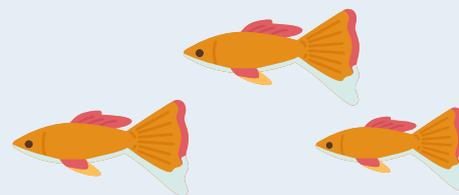
Alternatively, you can also get a contractor to install sturdy meshing or grating to cover the surface of the pond.



I can't get through...

## 3

## REMOVE OR CHANGE FISH



If you are a pet fish owner, it will naturally be a disappointment to learn that your pet fish are an attractant to otters. However, please understand that otters cannot tell the difference between free-roaming fish in canals/rivers, and privately-owned fish in a pond.

The main reason for repeated otter visits to a property is the presence of fish; hence, to prevent such visits, the most effective course of action is to remove the attractant completely. If you would still prefer to keep fish, you can consider changing the fish to small, colourful species such as barb or guppies. These are still pretty to look at but will be less of an attractant to otters.

# WHAT CAN I DO IF I NEED MORE ADVICE?



If you would like more information or advice, please send an email with details (e.g. number of otters sighted, frequency of sightings, observed behaviours) and photos to  [wildlifemanagement@acres.org.sg](mailto:wildlifemanagement@acres.org.sg).



Did you know that both Smooth-coated and Asian Small-clawed Otters can juggle rocks? Although it is thought that these otters juggle more when they are hungry, rock juggling appears to be unrelated to foraging skills.<sup>42</sup> There are several theories for otters' juggling behaviour.<sup>43</sup>



# ROCK PIGEONS



COO.



Credit: Jocelyn Chng

## WHY AM I SEEING SO MANY ROCK PIGEONS IN MY NEIGHBOURHOOD?

I am native to Europe, North Africa and Southwest Asia where I live on rocky cliffs!

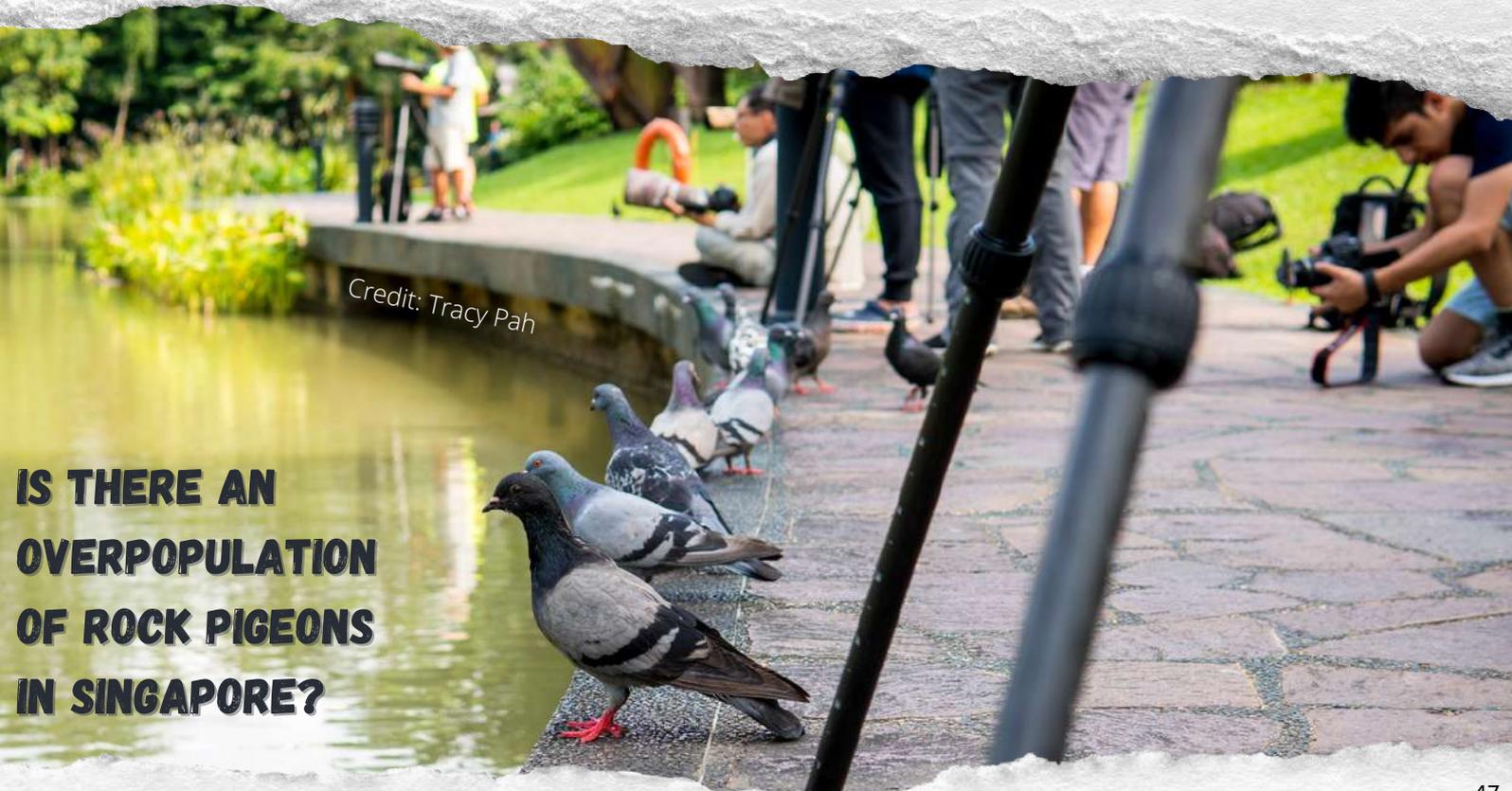
Rock pigeons are one of the most successful urban bird species in the world because of their high adaptability to urban environments. Thus, our highly urbanised environment supports the growth of their population and they can be seen around many of our residential areas, despite not being native birds.<sup>44</sup> Rock pigeons are able to utilise man-made infrastructure such as ledges and building cracks as roosting and nesting sites, possibly owing to their preference to nest on cliff edges in the wild.<sup>45</sup>

Often enough, feeding of pigeons by scattering food scraps on the ground can attract large flocks of them to congregate in one area. This results in higher occurrences of pigeons in areas where there are regular feeders.<sup>46</sup>



Credit: Annie Chew

Improper food waste management and direct food provision coupled with a high reproduction rate have resulted in the proliferation of Singapore's pigeon population.



Credit: Tracy Pah

## IS THERE AN OVERPOPULATION OF ROCK PIGEONS IN SINGAPORE?

As of 2018, the average rock pigeon density in Singapore is ~2-4 individuals per hectare.<sup>47</sup> Our local pigeon population has grown tremendously due to easy accessibility to food (through feeding and food waste), the suitability of our urban landscape for roosting and nesting, and high reproduction rates. Hence, pigeons are often regarded as pests. Even though pigeons in Singapore are predated upon by animals such as snakes and eagles, the ample availability of food sources still play a vital role in their proliferation.

**I HAVE SOME LEFTOVER FOOD, CAN I FEED THEM TO THE ROCK PIGEONS?**

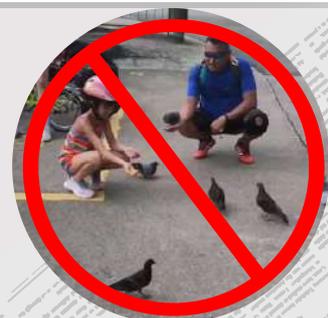
Please do not feed the pigeons as this will increase their reliance on food sources from humans. Feeding them also results in congregations which may spur even more annoyance and complaints among the public. Actively providing food to these birds as well as the presence of anthropogenic food litter (as a result of improper food waste disposal or not clearing leftover food in hawker centres) have been significantly driving up the pigeon population in Singapore.<sup>48</sup> Moreover, feeding of wildlife including pigeons is an offence under the Wildlife Act, for which one can be fined up to S\$10,000.

yahoo/news | Yahoo News Singapore

## Parliament: 682 enforcement notices issued for pigeon feeding offences in past 3 years

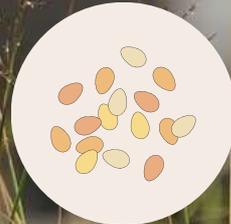


In efforts to reduce food availability to pigeons, different stakeholders have come together to decrease pigeon feeding. By increasing surveillance efforts at hotspots, there were **682 enforcement notices** issued for pigeon feeding offences from 2016-2018. Engagements between NParks, NEA and Town Councils are also ongoing to help educate residents on pigeon feeding.<sup>49</sup>



**IF WE DON'T PROVIDE  
FOOD WHAT WILL  
PIGEONS EAT IN  
SINGAPORE?**

Pigeons have enough food in their natural habitat. They feed on fruits, berries and seeds/grains in the wild.



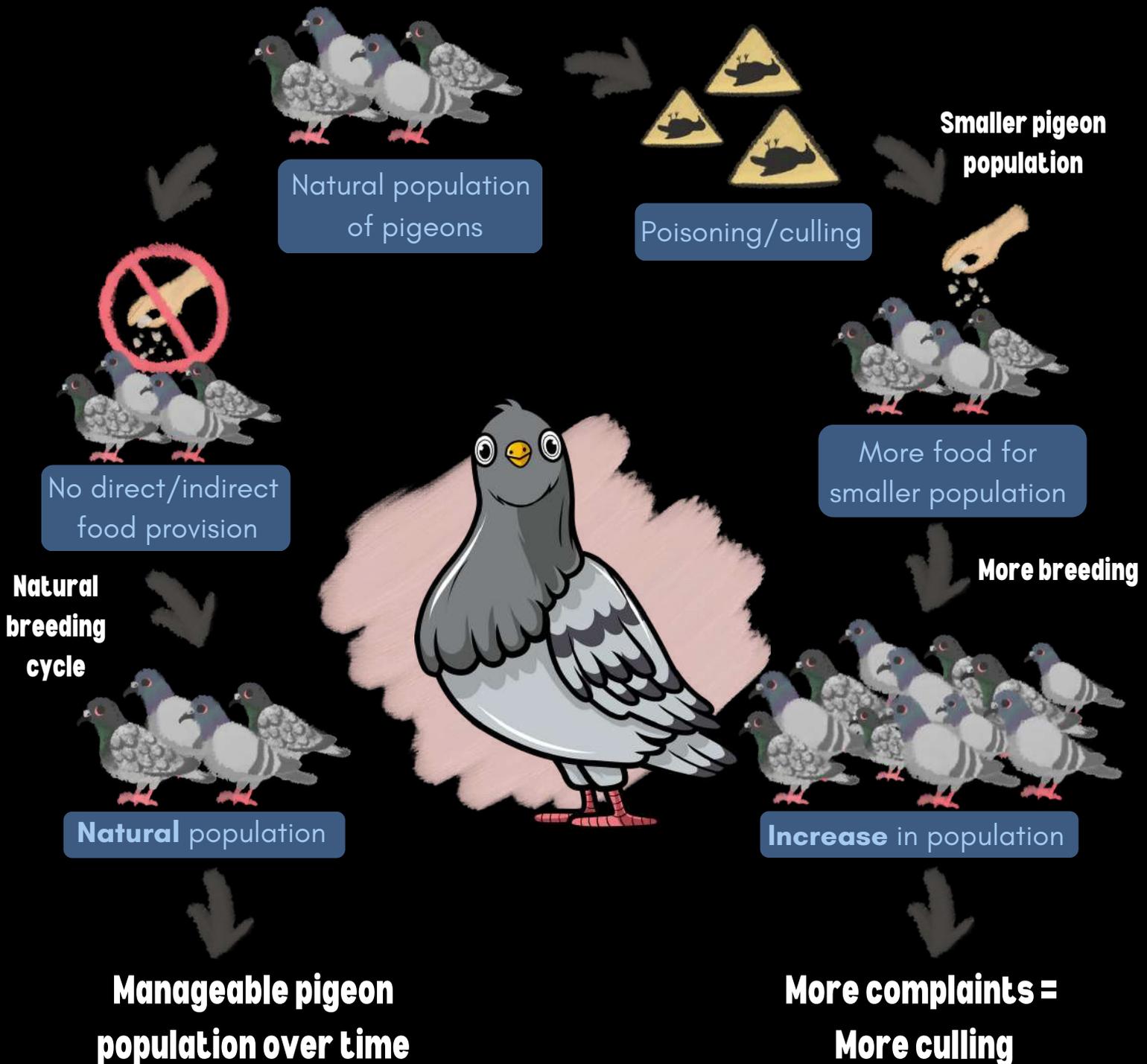
Credit: Ken Ng

**DID YOU KNOW?**

Pigeons mate for life. Both males and females share the responsibility of caring for their young by taking turns to incubate and feed the chick crop milk.



# SHOULD ROCK PIGEONS BE CULLED SINCE THEY ARE REGARDED AS PESTS IN SINGAPORE?



Culling pigeons has been carried out in several countries, but research has shown that culling alone is not an effective method of population control.<sup>50, 51</sup> It is only a **short-term** solution to controlling the pigeon population and is an unsustainable method to coexist with these birds; migrating pigeons will quickly fill the population gap.<sup>52</sup>

# AN APPEAL TO END INHUMANE PIGEON POISONING.

Click [here](#) to read our letter to Town Councils.



Culling pigeons is not only ineffective but also an inhumane practice. Poisoning is carried out using food bait laced with a drug, alpha-chloralose. After ingesting the drug, pigeons do not die immediately and are still able to fly, thus not all victims get retrieved. For those who are retrieved – live and struggling pigeons are collected and contained in trash bags for the killing process using carbon dioxide. Birds can regain consciousness during this period, resulting in even more suffering. In light of this, ACRES and SPCA have reached out to all Town Councils to end the practice of pigeon poisoning.



WILDLIFE RESCUE

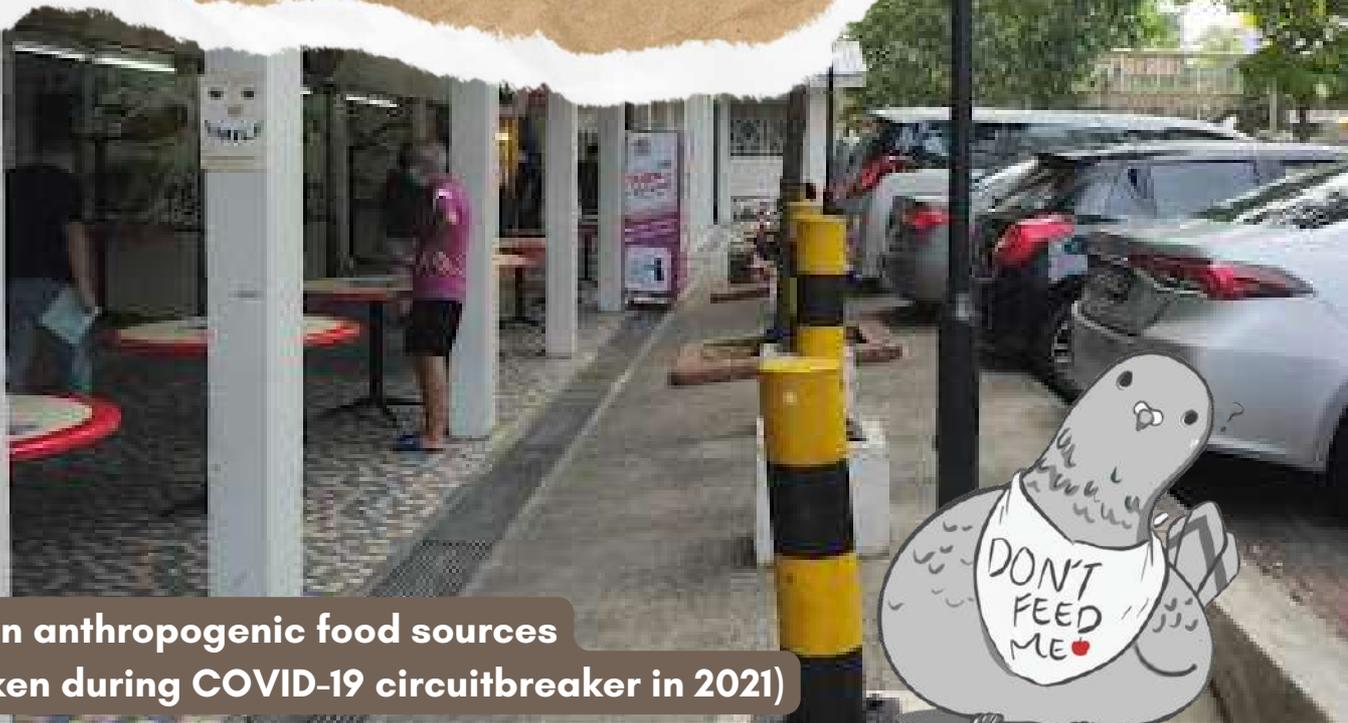


Scan for the white bellied sea eagle story!.



The poison used for pigeons is not species-specific and can harm other animals too. The poisoned birds can be ingested by other species such as predatory birds<sup>53</sup> and community cats; poisoned bait has also killed a pet dog.<sup>54</sup>

# FOOD REDUCTION APPROACH TO MANAGING PIGEON POPULATION.



**Reduction in anthropogenic food sources  
(Picture taken during COVID-19 circuitbreaker in 2021)**

A study done by NParks<sup>55</sup> during the circuit breaker period in 2021 showed that there was a significant drop in the number of pigeons at feeding hotspots due to the lack of food available. More pigeons were observed to be foraging while fewer were observed to be resting. This could mean a drop in their reproductive capacity since more energy was spent on foraging, in turn leading to a potential reduction in population size.

Thus, for a long term solution, it is advisable to implement a multifaceted approach that can tackle the main contributing factors to having a high pigeon population. These measures should aim to reduce the availability of food from human sources, and modify our urban infrastructure to decrease the pigeons' reliance on it. Refer to the sections on preventing birds from coming to your house and your residential neighbourhood (after "Mynas") for more details.

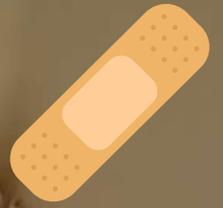
## DO ROCK PIGEONS SPREAD DISEASES?



Credit: Tracy Pah

Pigeons can potentially spread diseases through their droppings. Inhaling particles from their droppings may cause lung, brain and fungal infection. These infections may develop into diseases, and induce symptoms such as nausea, vision disruptions and even seizures.<sup>56</sup> Therefore, hygiene is key to preventing issues from bird droppings.

# WHAT SHOULD I DO IF I SEE AN INJURED ROCK PIGEON?



Pigeons are hardy animals who cope well with minor and old healed injuries, such as broken wings and legs. Without the need to fly, they are still able to forage food from the ground and they fare well in a familiar environment. If you spot a pigeon with fresh/bleeding injuries, please take a photo, observe the pigeon's behaviour and call ACRES' 24-hour Wildlife Rescue hotline at 9783 7782 for assistance.

## CHER AMI, THE STORY OF A HEROIC PIGEON <sup>57</sup>



Cher Ami was one of the homing pigeons used by the U.S. Army Signal Corps during WWI. On October 4th, 1918, Cher Ami was sent out on his last mission. While flying, he took a hit to the chest by German forces. Despite his injury, he got up and still proceeded with his task, braving the gunfire around him. He managed to complete his complete his mission, saving the lives of 194 U.S. soldiers that day. Cher Ami was heavily wounded when he arrived and thankfully the medics were able to save his life. He was awarded the Croix de Guerre, one of France's highest military honors.

# WHAT CAN I DO IF I NEED MORE ADVICE?



Credit: Jocelyn Chng



If you would like more information or advice, please send an email with details (e.g. number of pigeons sighted, frequency of sightings, observed behaviours) and photos to

 [wildlifemanagement@acres.org.sg](mailto:wildlifemanagement@acres.org.sg).

If you witness anyone feeding pigeons, you can help by submitting a report via OneService ([www.oneservice.gov.sg](http://www.oneservice.gov.sg)).

# HOUSE CROW



Credit: Steven Cheong

## WHY AM I SEEING CROWS IN MY NEIGHBOURHOOD?

Singapore is home to two species of crows, the house crow, which is present island-wide and the species most people are familiar with; and the large-billed crow, which dwells in the forest.<sup>58</sup> House crows are highly adapted to our urban environment. Their diet consists of invertebrates, fruits and young birds; but also, being primarily scavengers in urban areas, human food waste serves as an important food source for crows.<sup>59</sup> They roost in large numbers, and prefer trees with dense crowns and located close to food sources.<sup>60</sup>

# IS THE POPULATION OF CROWS IN SINGAPORE GROWING OUT OF CONTROL?

The house crow is capable of breeding throughout the year. According to a 2012 study, the occurrence of house crows dropped significantly by 21% over a decade from 2001 to 2011.<sup>61</sup> More recent research in 2020 stated that the population density of crows in Singapore had been reduced by more than 92% since 2003.<sup>62</sup> Culling by shooting has been practiced for at least a decade in Singapore. However, no reports on the number of crows culled are available.



Credit: Tracy Pah

## DID YOU KNOW?

Crows have been found to exhibit courtship feeding, where the male offers food to his mate. In some species of birds, this occurs after courtship, during the egg laying or incubation period which provides a source of nutrients for females.<sup>63, 64</sup>



# WHY CAN'T THE CROWS BE REMOVED BY TRAPPING OR CULLING?

Trapping and culling are not sustainable solutions as migrating crows (and mynas) can congregate and reproduce so long as there are attractants (such as food from feeding or food waste) in the area.



A study conducted in Malaysia concluded that urban areas with a higher number of food sources, such as food scraps and open bins, saw a greater abundance of house crows, as compared to cleaner areas with less open food sources for the crows.<sup>65</sup>

Moreover, a large population of house crows reside in Johor Bahru, and coastal surveys have implied intermixing of Singapore's and Malaysia's crow populations.<sup>66</sup> Therefore, if attractants are still present, re-invasions of house crows into Singapore are likely to happen.

## CROW TRAPS

In response to complaints about house crows, the authorities often engage contractors to set up traps. This practice is not only ineffective but also inhumane, as the crows caught are collected and contained in trash bags for the killing process using carbon dioxide, as of Jun 2023.



**Culling alone makes the problem worse, as with more food available for fewer birds, they will breed more, resulting in an increased population. Targetting the root causes by managing food availability and habitat modification will be more effective long-term.**

# DO CROWS ATTACK PEOPLE, ESPECIALLY CHILDREN?

I PROTECT



Credit: J.M. Garg  
Licensed under CC BY-SA 3.0.

House crows are protective of their nesting site and can be defensive when they believe that you have 'invaded' their territory and are threatening to their offspring. They have facial recognition abilities and can recognise and swoop at you if you have previously offended them unintentionally. During fledgling season (May to June) when young crows are learning to fly, parents are very protective and could react in defense if you are close to their young. [Click here](#) for a joint advisory on crows.

## WHAT SHOULD I DO DURING AN ENCOUNTER WITH CROWS?



Credit: Lim Yi Zhen

If you are being or have been swooped at by crows at a certain location, take an alternate route where the crows are not seen. Use an umbrella if you frequent the crows' roosting sites or if an alternate route is not possible. The umbrella will provide a visible barrier between you and the crows, and shield you from potential swooping.<sup>67</sup>



# WHAT TO DO WHEN A CROW KEEPS COMING BACK FOR FOOD?



Credit: Hong Wenyang

Wild bird hotspots are usually areas where the birds have easy access to food. Do not feed them as feeding provides a regular source of food which attracts them to congregate. Moreover, according to the Wildlife Act, feeding of wildlife is an offence that carries a fine of up to \$10,000. With proper deterrence and exclusion methods, unnecessary conflict would be kept to a minimum. Refer to the sections on preventing birds from coming to your house and your residential neighbourhood (after "Mynas") for more details.

## DID YOU KNOW?

Crows' eyes and beak change colour as they mature!



Credit: Carl T. Bergstrom

Source: Twitter (@CT\_Bergstrom)

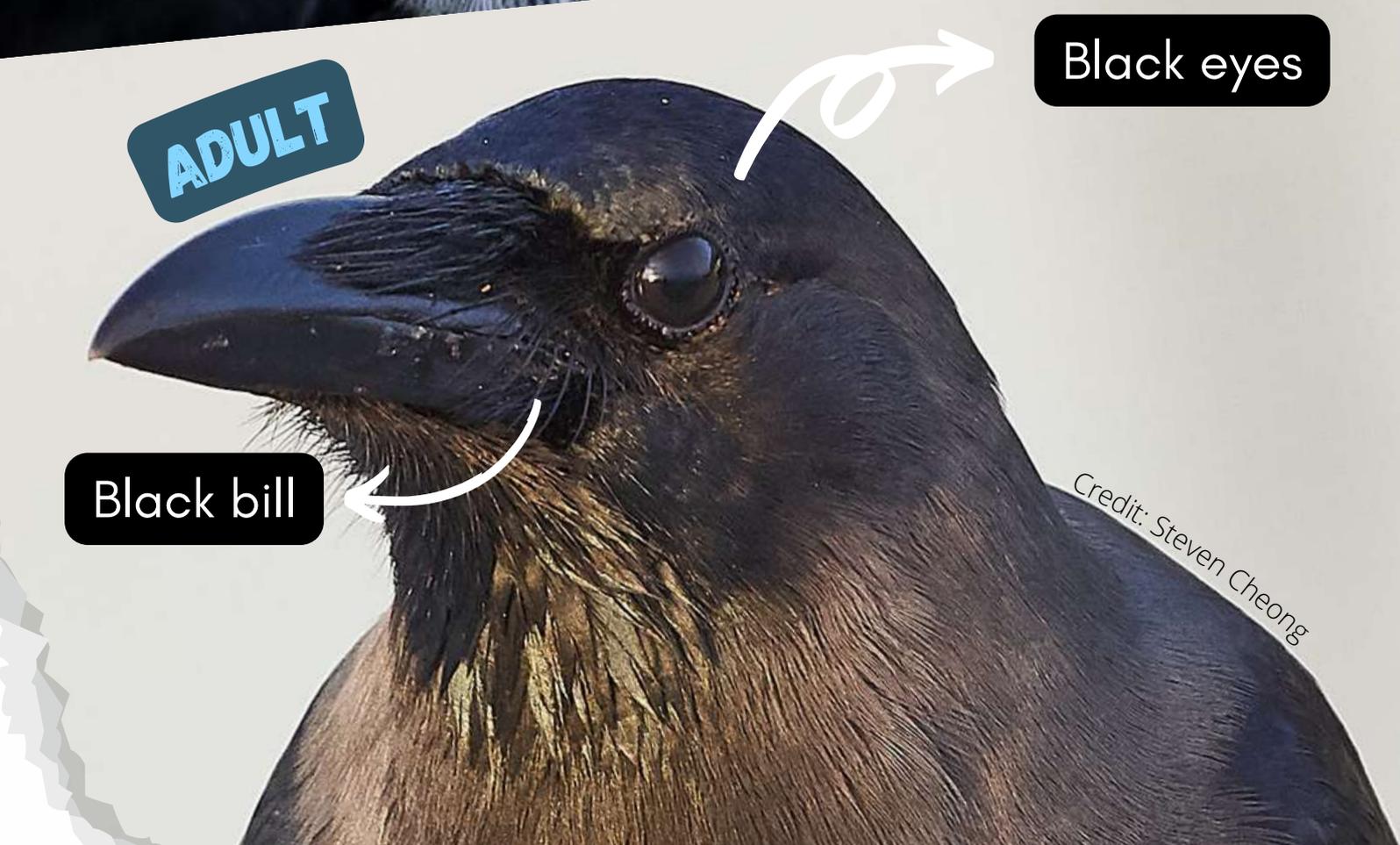
**JUVENILE**



Light blue eyes

Inner bill light pink

**ADULT**



Black eyes

Black bill

Credit: Steven Cheong

# MYNAS



## JAVAN MYNA



Credit: Matthew Lim

Although this is a commonly encountered urban bird in Singapore, the Javan myna is ironically a victim of the illegal wildlife trade in their native Java.

Javan mynas were introduced to Singapore via the pet bird trade in the 1920s.<sup>68</sup>



## COMMON MYNA



Credit: Tracy Peh

The common myna is native to Singapore. They can be distinguished from the Javan myna by yellow skin around their eyes and their brown body.<sup>69</sup>

Both species of mynas roost in large communal flocks in trees.<sup>70</sup>

## HILL MYNA

The hill myna is native to Singapore and they live in our forests as opposed to the common myna and Javan myna which are commonly sighted in our urban areas.



Credit: Tan Chuan Kai

# IS THE POPULATION OF MYNAS IN SINGAPORE GROWING OUT OF CONTROL?



Credit: Hong Wenyang

Contrary to their name, the common myna is not so common in Singapore anymore. Due to the loss of agricultural land (the common myna's preferred habitat),<sup>71</sup> competition with the Javan myna,<sup>72</sup> and a slower reproduction rate, there are significantly fewer common mynas than Javan mynas in Singapore today.



According to research done in 2012, the common myna's population significantly decreased over the decade from 2001 to 2011. Their abundance dropped by **10%**.<sup>73</sup>

On the other hand, the Javan myna population is estimated to be more than 100,000 from research in the last 2 decades.<sup>74,75</sup> The Javan myna is capable of breeding throughout the year. With a higher reproductive rate and availability of urban food attractants, they have a similar population size as the house crows.

# DO MYNAS ATTACK PEOPLE, ESPECIALLY CHILDREN?

Credit: Ken Ng



Javan mynas usually flee when being approached and are less likely to swoop at humans than house crows. However, parents can be protective of their young. If you don't pose a threat to their young, there should not be any concerns of Javan mynas approaching you.

# DO CROWS AND MYNAS CARRY DISEASES?



Credit: Kannan Raja

Like other wild animals (and even humans ourselves), droppings from crows and mynas can spread diseases such as *Salmonella* to humans.<sup>76</sup> However, the risk of disease transmission from their feces to our food/water is low, if proper hygiene is practiced.

## DID YOU KNOW?

The scientific name of Javan myna is Acridotheres javanicus. The genus Acridotheres is derived from the Greek words akrida (= grasshopper) and theres (= a hunter), owing to the fact that mynas would scavenge the grass for insects such as grasshoppers. The species name javanicus is in reference to their native range in Java!<sup>77</sup>



Credit: Clifford Lee

## DID I SEE A MYNA RUBBING ANTS ON HIS/HER BODY?<sup>78, 79</sup>

Mynas have been seen to exhibit anting behaviour where he/she will rub insects on their body, such as ants. Below are some theories as to why birds partake in anting behaviour. (1) To get rid of formic acid in ants before eating them. (2) Rubbing of ants on their body releases chemicals such as formic acid which could help get rid of ectoparasites in their feathers. (3) Minimises skin irritation during moulting.



# WHAT CAN I DO IF I NEED MORE ADVICE?



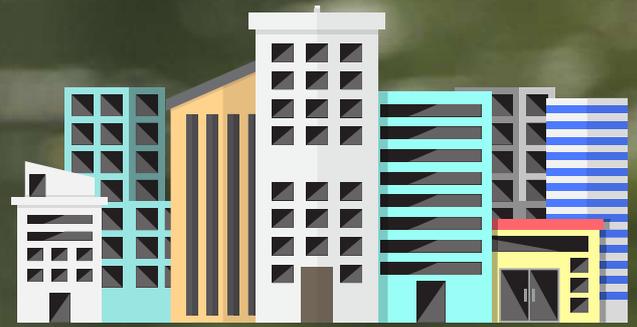
Credit: Jocelyn Chng

If you would like more information or advice, please send an email with details (e.g. number of crows/mynas sighted, frequency of sightings, observed behaviours) and photos to



[wildlifemanagement@acres.org.sg](mailto:wildlifemanagement@acres.org.sg).

# HOW DO I PREVENT BIRDS FROM COMING INTO MY HOUSE?



Credit: Jocelyn Chng

1

## MESHING

Identify gaps or corners potentially suitable for roosting. Install meshes to prevent birds from entering these areas.



Bird netting needs to be maintained regularly

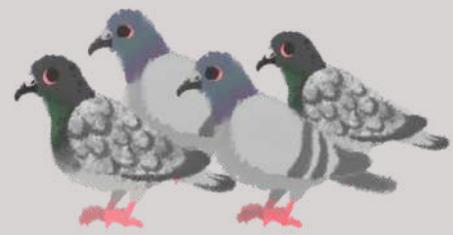
Bird netting is a type of physical barrier for birds. The netting should be installed rigidly such that it **acts as a barrier to birds rather than trapping them**. Depending on the type of bird you are trying to keep out, different sizes of netting should be used. A good contractor will be able to advise and install it correctly.



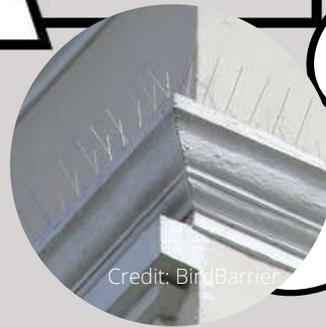
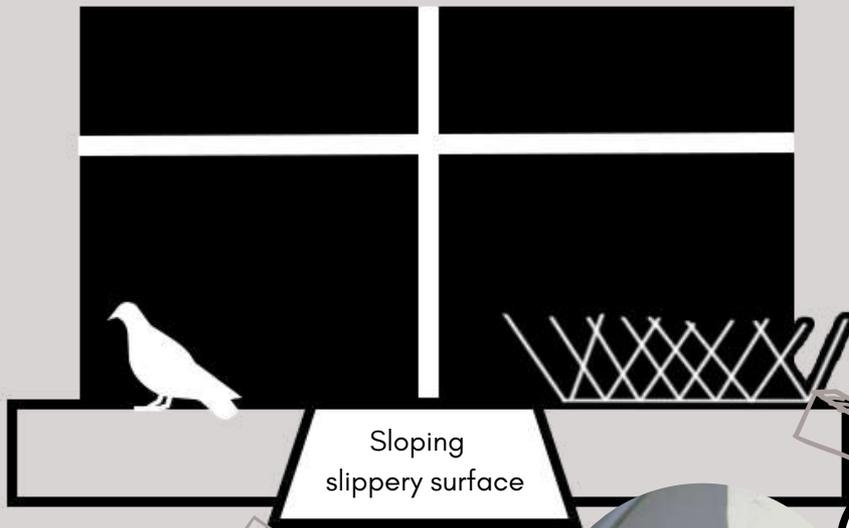
Credit: Lim Yi Zhen

Credit: Bird Barrier

## 2 LEDGE MODIFICATION



To deter birds from sitting on your ledge,<sup>80</sup> make roosting surfaces sloped/slippery or narrow, or install bird spikes.



Bird spikes are a type of physical barrier to prevent pigeons (and other similarly sized birds) from landing or roosting on ledges.

Bird spikes do require maintenance as the spikes can gather feathers, droppings and nesting materials, and hence need to be cleaned regularly. They are easily obtainable from hardware shops or online, and have some variation in the length and space between the spikes, depending on the size of the bird you are trying to deter.<sup>81</sup>



## HOW DO I DETER BIRDS FROM COMING TO MY RESIDENTIAL NEIGHBOURHOOD?



### 1 TREE PRUNING

Urban birds (crows, mynas) prefer roosting in trees with dense crowns. To deter birds from roosting in your area, periodical pruning can be considered. If you live in a HDB estate, you can refer to your town council for tree pruning matters.

### 2 HARVESTING FRUITS EARLY/COVERING FRUITS

- Harvesting fruits on your fruit trees early can prevent birds from being attracted and entering your premises to consume the fruits.
- Covering fruits with an opaque material (cloth/mesh bags) prevents birds from seeing the fruits and removes the birds' access to this food source. This discourages them from visiting to feed.
- Plastic bags may not be a suitable alternative as they are not environmentally-friendly, and may not be able to support the weight of the fruits.

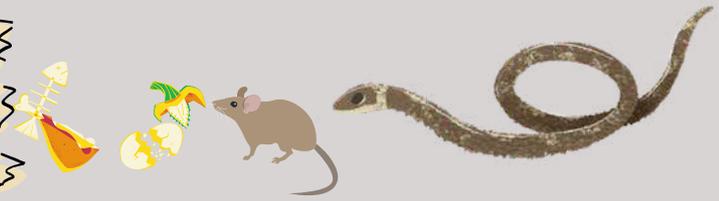


Also, you should not cover the entire tree with netting because bats and other animals may be trapped and eventually die from dehydration.



Rescue officer rescuing a bat trapped in netting

# 3 PROPER FOOD WASTE MANAGEMENT



Proper food waste management is an important deterrent measure. Food waste not thrown properly into secure bins or trash bags will attract birds like pigeons and crows to feed on them, as seen from the following pictures. Food waste that is not stored properly will attract rodents, which are prey to snakes, thus attracting snakes as well.



Credit: Annie Chew

Clear your trays and clean up after yourself upon finishing your meal in eateries (especially outdoor food establishments), as leftover food and wrappings are key sources of attraction for birds to come to the area.



Double-knot garbage bags before disposing them in bins. This will prevent spills and make food waste less accessible to birds.

Do not leave trash bags outside waste bins as crows can easily tear open trash bags. Please ensure proper disposal of trash bags into waste bins.



Credit: Wenyang Hong

Female



Male

Credit: Daniel Neo

Credit: Kannan Raja

# ASIAN KOEL

## DID YOU KNOW?

The high-pitched sound "ku-oo" is a mating call done by the male in an attempt to attract a female and establish his territory!



# ECOLOGICAL ROLE OF THE ASIAN KOEL



The Asian koel, as a brood parasite,<sup>82</sup> helps to keep crow populations in check. This is because when they lay their eggs in the nest of a house crow, they sometimes remove one of the crow's eggs. Furthermore, when the koel's egg hatches first, the koel chick may force the crow's egg or chick out of the nest.<sup>83</sup>



## WHY AM I HEARING/SEEING THE ASIAN KOEL?



As a large cuckoo bird, the Asian koel is often heard rather than seen. They make various calls, with the most distinct one being the high-pitched 'ku-oo' mating call from dawn and sometimes till dusk. They are brood parasites. This means that they do not build their own nest, but lay their eggs in the nests of other birds. In Singapore, their main host species is the house crow. You may encounter or hear koels more frequently during their breeding season, which corresponds to that of their host. The Asian koel breeds about every 3 months, throughout the year.

## WHAT TO DO IF YOU ARE AFFECTED BY THE ASIAN KOEL?

If you often hear the calls of the Asian koel, we hope that their presence is welcomed, like with many other birds in the neighbourhood.

Credit: Daniel Neo

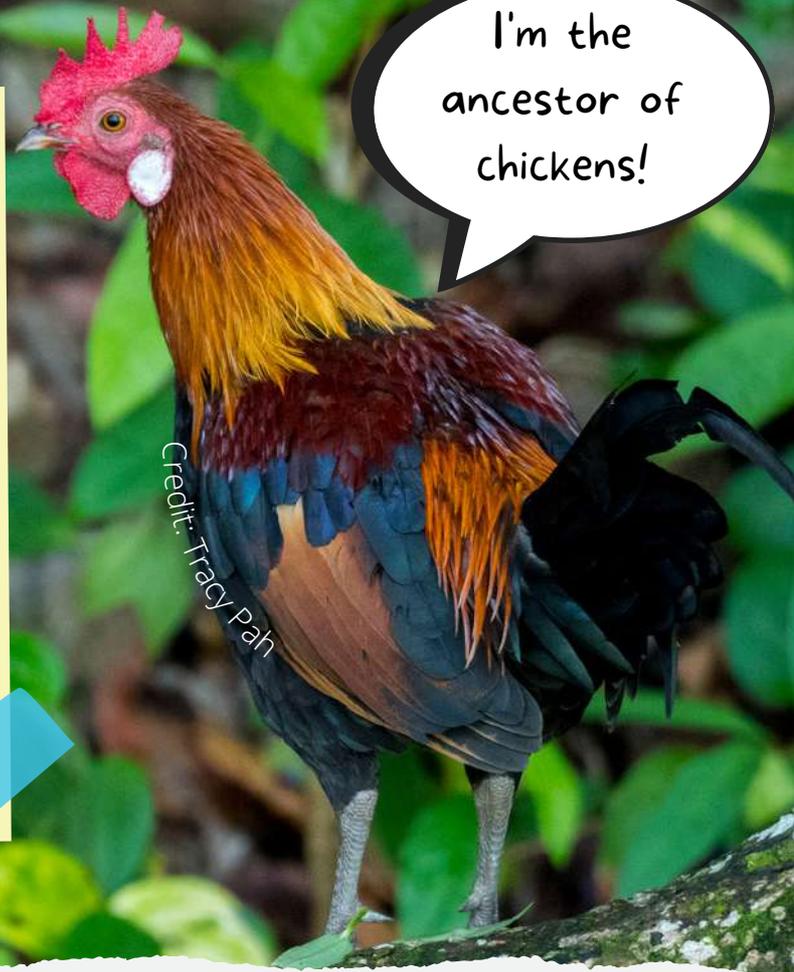
Individuals who may work or study late might find high-pitched continuous koel calls a disturbance in the wee hours. Loss of or disturbed sleep can be an aggravating stress factor. While we acknowledge this, it is almost impossible to stop the presence of bird calls by relocating koels. A new individual will simply take over the territory.

To address feedback on koel calls, current measures include the pruning of tree branches close to residential units.<sup>84</sup> However, like dealing with most unavoidable sounds that we come across in urban Singapore - expressway noise, construction and so on - we seek your understanding to try to block out sounds that you find bothersome, by means such as noise cancelling earphones or ear plugs.



## RED JUNGLEFOWL

The red junglefowl is the wild ancestor of domestic chickens.<sup>85</sup> Red junglefowl were thought to be extinct in Singapore until they were sighted in the 1970s on Pulau Ubin and on the mainland in 1999.<sup>86, 87</sup> The first red junglefowl who was sighted on Pulau Ubin had migrated from Johor, Malaysia. In 2008, the national status of the red junglefowl in Singapore was endangered. In recent years, there has been an increase in their population and they are present throughout Singapore.



I'm the ancestor of chickens!

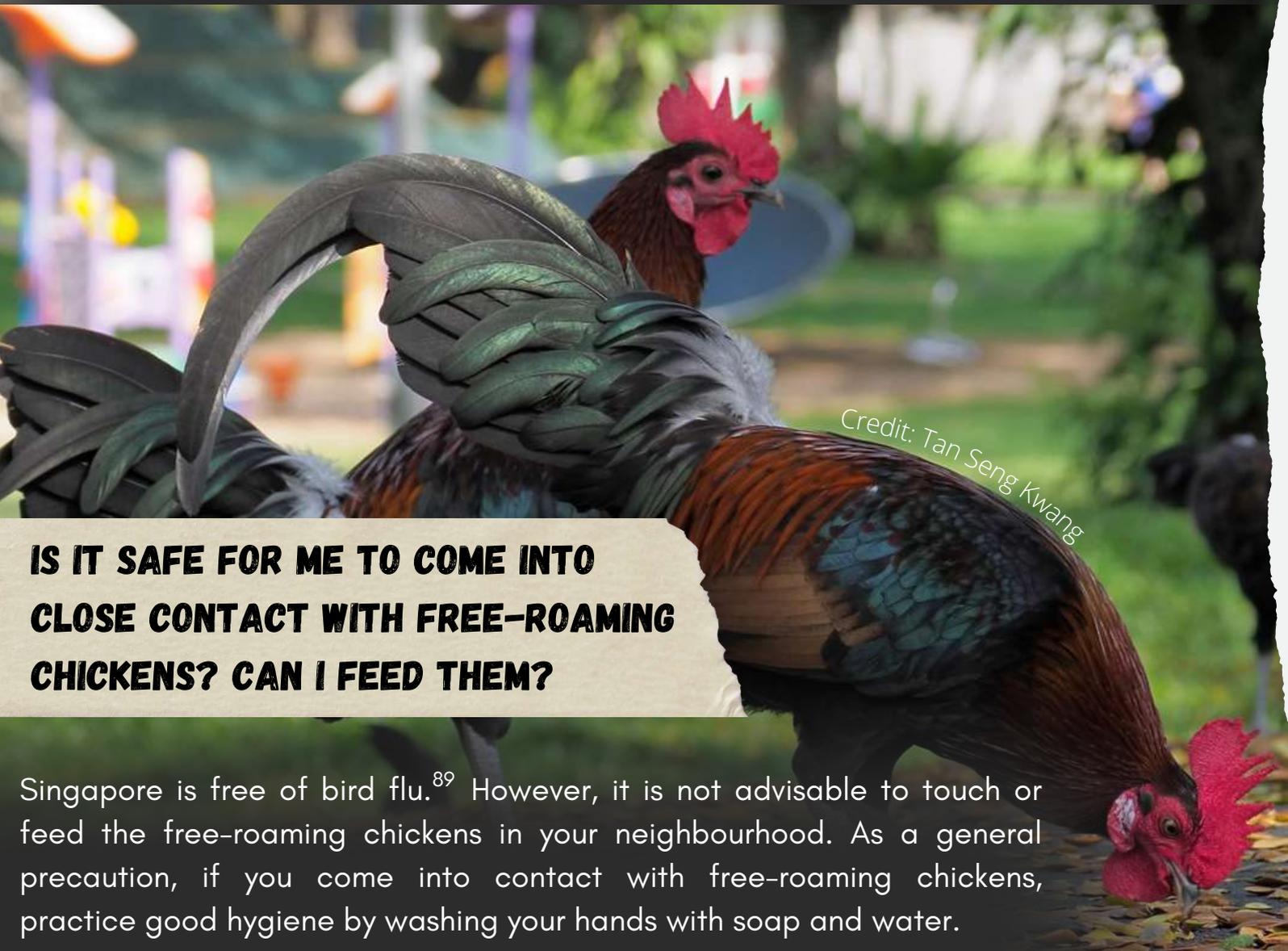
## DOMESTICATED CHICKEN

The red junglefowl is believed to have been domesticated since over 4,000 years ago. Initially, they were raised for cockfighting and religious purposes. These days, they are raised for their meat and eggs. Although red junglefowl are wild ancestors of domestic chickens, the free ranging red junglefowl in Singapore may not be purely wild. Due to the hybridisation between wild red junglefowl and feral domesticated chickens, there are varying levels of domestic-wild genes in our red junglefowl in Singapore.<sup>88</sup>



## WHAT SHOULD I DO WHEN I ENCOUNTER A RED JUNGLEFOWL OR FREE ROAMING FOWL?

Appreciate from a distance. Do not attempt to feed, chase, catch or pet them.



### IS IT SAFE FOR ME TO COME INTO CLOSE CONTACT WITH FREE-ROAMING CHICKENS? CAN I FEED THEM?

Singapore is free of bird flu.<sup>89</sup> However, it is not advisable to touch or feed the free-roaming chickens in your neighbourhood. As a general precaution, if you come into contact with free-roaming chickens, practice good hygiene by washing your hands with soap and water.

Free-roaming chickens rely on a natural diet of grains, seeds, grasses and insects in the wild. With this diet, their population is naturally managed. Feeding them additional food expands their natural pool of food sources and increases breeding – increasing their population size. Feeding the chickens may lead to them associating people with food, and they may persistently return to the area for more. Any leftover food may attract other animals (pigeons and rats), which can result in increases in complaints from residents.



**SHOULD I ALLOW MY DOMESTICATED PET CHICKEN TO ROAM FREELY?**

The red junglefowl is a wild species. Domesticated chickens that have been selectively bred may not have traits that are suitable for living in the wild. Hence, it is crucial to minimise mixing of domestic chickens with their wild counterpart, the red junglefowl. The general public should not abandon or 'release' their pet chickens in the wild. There are regulations to ensure proper welfare for pet chickens in a bird proof enclosure.<sup>90</sup>

Credit: Jocelyn Chng



**WHAT TO DO IF YOU ARE AFFECTED BY THE CALLS OF THE ROOSTERS?**

Like dealing with most unavoidable sounds that we come across in urban Singapore - expressway noise, construction and so on - we seek your understanding to try to block out sounds that you find bothersome, by means such as noise cancelling earphones or ear plugs.

**WHY CAN'T THEY JUST BE REMOVED/RELOCATED OR RE-HOMED?**

Roosters guard their territory. As long as the habitat remains suitable, if one rooster is removed, another will simply move in.



This is my home

Credit: Matthew Lim

# IF I FIND CHICKS, CAN I BRING THEM HOME?

Please don't bring me home. I need my mommy!

Credit: Hong Wenyang



Please do not attempt to bring chicks home. Precocial chicks (chicks who are able to feed on their own soon after hatching, but follow their parent) will repeatedly chirp for their mother as a call to reunite. The chicks' mother is usually around. Removing them disrupts their reunion process with their mother.



## DID YOU KNOW?

The red junglefowl can produce more than 20 different vocal signals to communicate with each other? They have special calls that indicate well-being, attraction, disturbance, <sup>91</sup>frustration, threats etc.

Credit: Tan Chuan Kai



# WHAT CAN I DO IF I NEED MORE ADVICE?



Credit: Hong Wenyang

If you need site-specific advice, please send an email with details (e.g. number of chickens sighted, frequency of sightings, observed behaviours) and photos of the location/surroundings to

 [wildlifemanagement@acres.org.sg](mailto:wildlifemanagement@acres.org.sg).

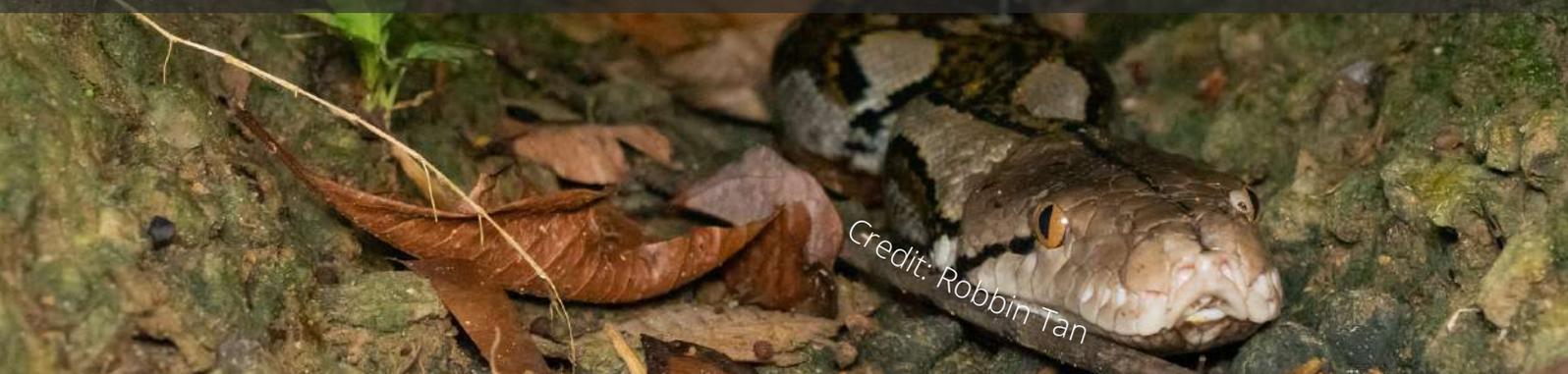


Credit: Robbin Tan

# SNAKES

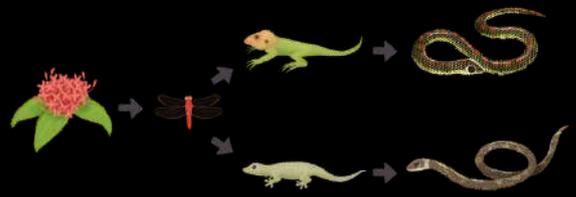
## ARE SNAKES FOUND ONLY IN FORESTED AREAS?

While many snakes in Singapore do reside in nature reserves like Bukit Timah Nature Reserve and Central Catchment Nature Reserve, they appear in parks, canals and urban areas too. Thanks to Singapore's Green Plan "City in Nature",<sup>92</sup> more green spaces have been set aside for nature parks, creating more suitable habitats for snakes to live in. Snakes can also appear in urban areas when tracking their prey. Species like the reticulated python make use of drains to travel around and the equatorial spitting cobra may seek respite in pavement cavities and behind clutter in gardens.

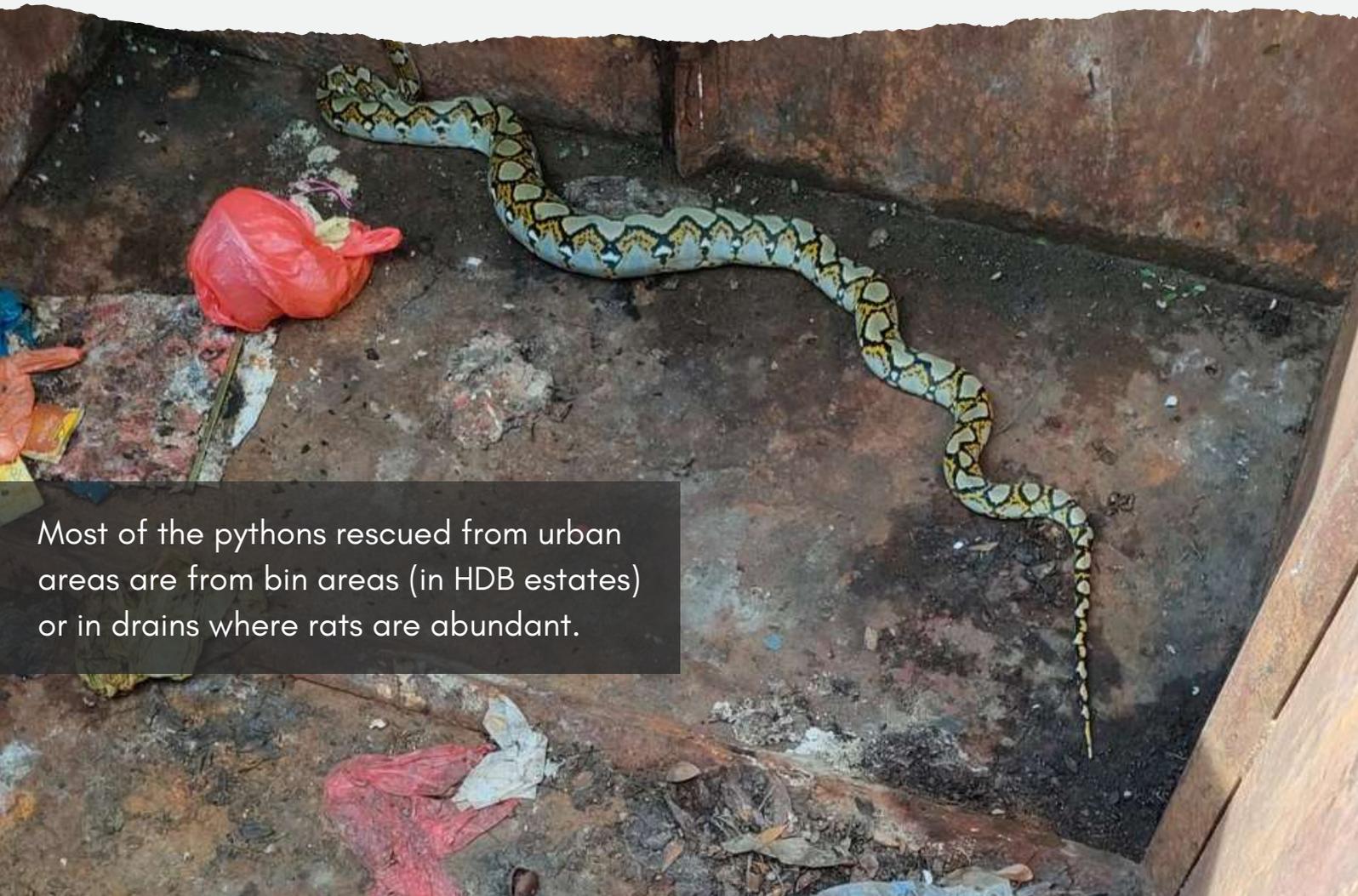


Credit: Robbin Tan

## WHY ARE SNAKES IMPORTANT?



The diet of snakes in Singapore consists of animals such as geckos and rodents. Thus, snakes help to keep these prey populations at bay. Often misunderstood out of fear and ignorance, snakes are living beings too, who deserve a safe life in our City in Nature.



Most of the pythons rescued from urban areas are from bin areas (in HDB estates) or in drains where rats are abundant.

# SNAKES IN SINGAPORE

There are over **60 species** of snakes that can be found in Singapore.<sup>93</sup> Some of the more commonly sighted ones include the common wolf snake (*Lycodon capucinus*), reticulated python (*Malayopython reticulatus*), paradise tree snake (*Chrysopelea paradisi*), equatorial spitting cobra (*Naja sumatrana*), oriental whip snake (*Ahaetulla prasina*) and the painted bronzeback (*Dendrelaphis pictus*).



Credit: Josh Harwood

## COMMON WOLF SNAKE

Adults 15–40cm in length

Non-venomous

Diet: House geckos

## RETICULATED PYTHON

Avg. length in Singapore: 2–3m

Non-venomous

Diet: Mainly small mammals like rodents, also hunts birds and civets



Credit: Robbin Tan



Credit: Mervyn Soon

## ORIENTAL WHIP SNAKE

Length: 2m max

Mildly venomous, enough to immobilise their small prey

Diet: Geckos and lizards



Credit: Daniel Neo



Credit: Steven Cheong

## PARADISE TREE SNAKE

Length: Maximum 1.2m; Width: As thick as your index finger

Mildly venomous, enough to immobilise their small prey

Diet: Geckos and lizards



Credit: Matthew Lim



Credit: Serin Subaraj

## **EQUATORIAL SPITTING COBRA**

Average length 1-1.5max

Venomous, hisses before spitting  
when threatened/cornered

Diet: Mainly frogs and small rodentss



Credit: Tracy Pah

## **PAINTED BRONZEBACK**

1.5m length; small head with large eyes

Non-venomous

Diet: Frogs & lizards

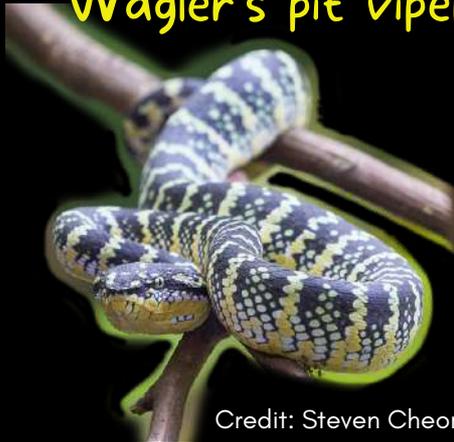


## ALL BRIGHTLY COLOURED SNAKES HAVE VENOMOUS BITES

In general, a snake's body colour does not determine whether the species is venomous or not.

Only some brightly coloured snakes are venomous, such as these:

Wagler's pit viper



Credit: Steven Cheong

Blue malayan coral snake



Credit: Kenneth Chin

Striped kukri snake



Credit: Serin Subaraj

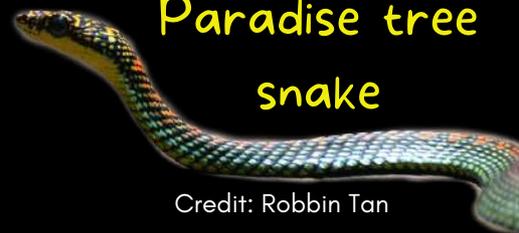
However, the brightly coloured striped kukri snake is non-venomous.

Oriental whip snake



These species are mildly venomous. Their venom is sufficient to only immobilise their prey and is too weak to affect the human body.

Paradise tree snake



Credit: Robbin Tan

Conversely, some venomous snakes, such as the solid black equatorial spitting cobra, lighter coloured king cobra and the black coloured mangrove pit viper, do not have a brightly coloured body.

Mangrove/shore pit viper



Credit: Mervyn Soon



## SNAKES STAY AROUND URBAN SPACES TO ATTACK PEOPLE

Snakes are generally elusive animals around humans and will only try to defend themselves when cornered, threatened or handled inappropriately.

Snakes might end up in our houses/residential areas occasionally due to several reasons.

1

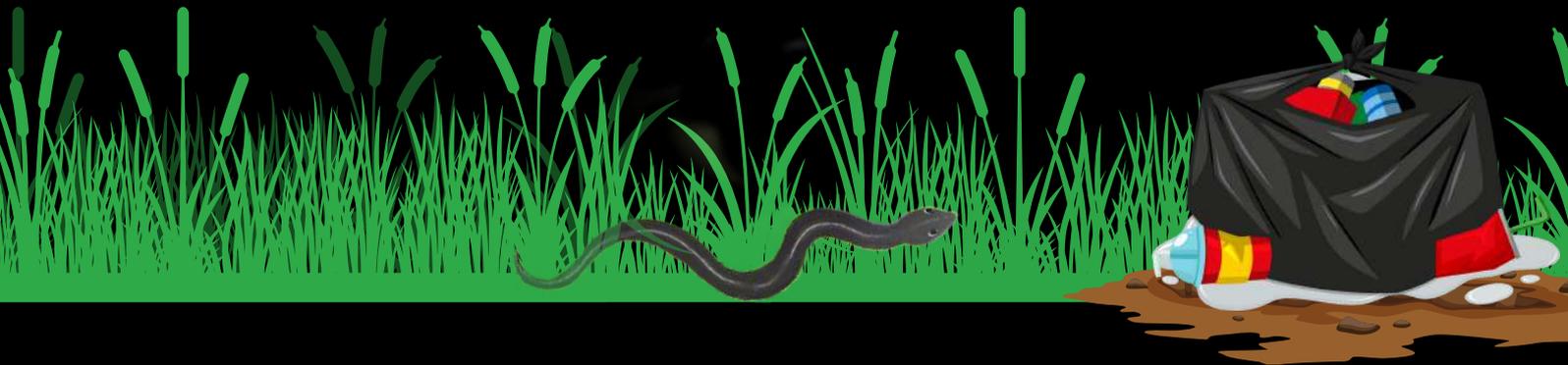
There could be an availability of food such as geckos and rodents.



Credit: Lim Yi Zhen

2

The area is a suitable habitat for them to seek shelter in eg. dark crevices/areas with dense & tall grass/cluttered areas.



3

The residential area you are living in could be next to a canal or a green space, or there is a tree with overhanging branches near your window.



I USE THE LONGKANG TO TRAVEL AROUND!



# HOW DO SNAKES DEFEND THEMSELVES?

King cobras and Black spitting cobras will expand their hood to make themselves look bigger.

Generally hiss when they feel threatened



Black spitting cobras spit at your eyes as a chemical defence, causing your eyes to have a burning sensation.

If they continue to feel threatened, they may bite as a warning for you to stay away. This is a last resort for the snake.

Snakes are not out to attack humans. They are generally timid creatures and only strike in defense if they are cornered, threatened or handled inappropriately. Please do not wave a stick or object in front of the snake, as it can be perceived as a threat.

## WHEN I SEE A...



## SNAKE IN MY HOUSE

1

Do not attack the snake with a stick or broom and **maintain a distance**. Monitor the snake's movement; the snake may search for a cool, dark area to hide.

2

Ensure that young children and/or pets are kept away from the snake as they may be curious and approach or try to touch the snake.

3

**Open windows and exit points** that lead outdoors (balcony, patio or front doors) as the snake may search for an escape route.



Credit: Easan Sathiyalingam

4

If the snake is in your pool, you can bring them out of the water with a **long handled leaf skimmer** as they may not be able to get back onto land on their own if they are small or tired from swimming.



5

If the snake is in a drawer, behind furniture or in a location that is difficult to access, **do not try to confront or handle** them and maintain a safe distance. Call either of the 24-hour numbers below for advice/assistance. Wait for them to leave your residential compound, or once they are rescued, you can take the proper mitigation methods to minimise such occurrences.



ACRES WILDLIFE  
RESCUE HOTLINE:  
9783 7782



NPARKS ANIMAL  
RESPONSE CENTRE:  
1800-476-1600

## WHEN I SEE A...

## SNAKE IN A CANAL, ON A TREE, IN A GREEN SPACE

**1** Leave them alone as these are the snakes' natural habitats.

**THIS IS MY  
HOME!**

**2** If the snake is cornered, move away slowly to allow the snake to escape.

**3** Remain calm and just observe them from a distance (at least 2 metres away). If you spot a snake, it is highly unlikely that other snakes are nearby as they are solitary creatures, unless a nesting ground is discovered.

Credit: Matthew Lim

# CAN SNAKES SLITHER UP FROM MY TOILET BOWL?

**No**, snakes are unable to do so as the sewage pipes in Singapore are in a **closed system**. This means that snakes do not have access to this. They are only able to **access the storm water drain**. There have been instances where snakes are found in the toilets. In such cases, these snakes have **entered the toilet beforehand** and sought refuge in the toilet bowl. Therefore it may seem like the snake has entered the toilets using the sewage system, however this is not true.



# WHAT SHOULD I DO IF I GET BITTEN BY A SNAKE?

In the unlikely event of a snake bite and there is a chance for it to be a dry bite (i.e., no venom is released), follow these steps:



- Call 995 and proceed to the nearest hospital
- Do not panic
- Try to take note of the length, thickness, colour and markings or a photo of the snake
- Never try to suck out the venom
- Do not apply a tight bandage or tourniquet



# WHAT SHOULD I DO IF THERE IS AN ENCOUNTER BETWEEN MY PET AND A SNAKE?



Pythons constrict and kill prey by suffocation.

While negative encounters are **rare**, we are living in a city where nature is increasingly integrated into our lives, making wildlife encounters inevitable. The number one rule if you have pets (chickens, cats, other birds) is to ensure their spaces are **wildlife-proof**, and always keep **dogs on a tight leash** when out walking. If you see a snake, **increase the distance** between your pet and the snake immediately.

Unfortunately, if your pet is already killed/swallowed, there is not much you can do to save him or her. Please do not poke, chase or attack the snake.



Credit: Robbin Tan

In the event that your pet is spat at by a spitting cobra in the eyes, they will feel a burning sensation. Please bring him/her to the nearest vet clinic immediately.

## WHAT SHOULD I DO IF MY PET GETS BITTEN BY A SNAKE?



What exactly happened? For example, did it bite or spit venom?

What colour is the snake?

How big is the snake?

Identify the snake, remember prominent features such as size, colour and details, take pictures of the snake if you can.



You can call the following hotlines for **advice**:



**ACRES WILDLIFE  
RESCUE HOTLINE:  
9783 7782**



**NPARKS ANIMAL  
RESPONSE CENTRE:  
1800-476-1600**

Bring your pet to see an emergency vet immediately.



# DOES SULPHUR WORK AS A SNAKE REPELLENT?



We discourage the use of sulphur powder as:<sup>94</sup>

- It is **not scientifically proven** to be effective at deterring snakes.
- It can **cause irritation** to snakes or pets who come in contact with it.
- Sulphur is **toxic**. When it rains, it may be washed into our drains and mixed with the water inside. This causes **water pollution** that may harm both people and our environment.
- When used in gardens or grassy areas, sulphur will harm and **kill plants**.

# CAN GLUE TRAPS OR ANY OTHER TRAPS BE USED TO CATCH SNAKES, MONITOR LIZARDS OR CIVETS?



**Glue traps are extremely cruel to any animal caught on them.**

Glue traps do not kill the animal instantly. Instead, the animal will be **tortured and suffer needlessly** trying to escape. When a wild animal becomes stuck on a glue trap, they will **struggle hard**, in turn ripping off their own hair and skin. Out of desperation, some animals have also chewed off and fractured their own limbs. The animal eventually **becomes exhausted**, and will continue to **starve, suffocate** and **become dehydrated** until they eventually die.

There are more humane methods that can be used. According to the Wildlife Act, trapping a native wild animal would require a permit. It is illegal for you to do so on your own. You may choose to contact NParks or ACRES for humane relocation of the snake, when the animal is in view.

## WHAT CAN I DO TO MINIMISE SNAKE SIGHTINGS IN MY HOUSE?

Installing meshes can deter snakes from entering your homes or premises.

\*Meshes require high maintenance as they need to be cleaned regularly due to the collection of dust or even spider webs.



## HOW DO I DETER SNAKES FROM COMING TO MY RESIDENTIAL AREA?

### 1 ESTATE MAINTENANCE

Maintaining the tidiness and cleanliness of your premises is important in deterring wild animals like snakes from entering. For example, leaf litter and cluttered areas are good hiding and resting spots for snakes, so such areas should be cleared regularly. Untidy and dirty areas may also attract rodents, who in turn attract snakes to prey on them.

## 2

### TREE PRUNING

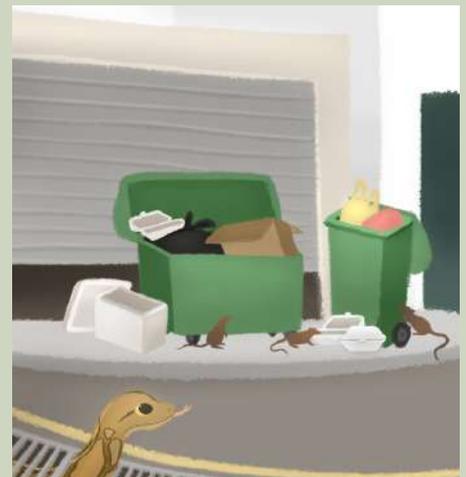
Unpruned trees can assist tree snakes in entering your ceiling or building via the tree branches. Hence, your trees should be pruned periodically to prevent access to the building for these wild animals in general.

Credit: Easan Sathiyalingam

## 3

### PROPER FOOD WASTE MANAGEMENT

Proper food waste management is an important deterrent measure. Food waste not thrown properly into secure bins/trash bags and/or not stored properly will attract rodents. These rodents will, in turn, attract snakes to prey on them.



Ensure that food waste and trash in general are thrown properly into bins and/or trash bags. Double-knot garbage bags to prevent spillage.



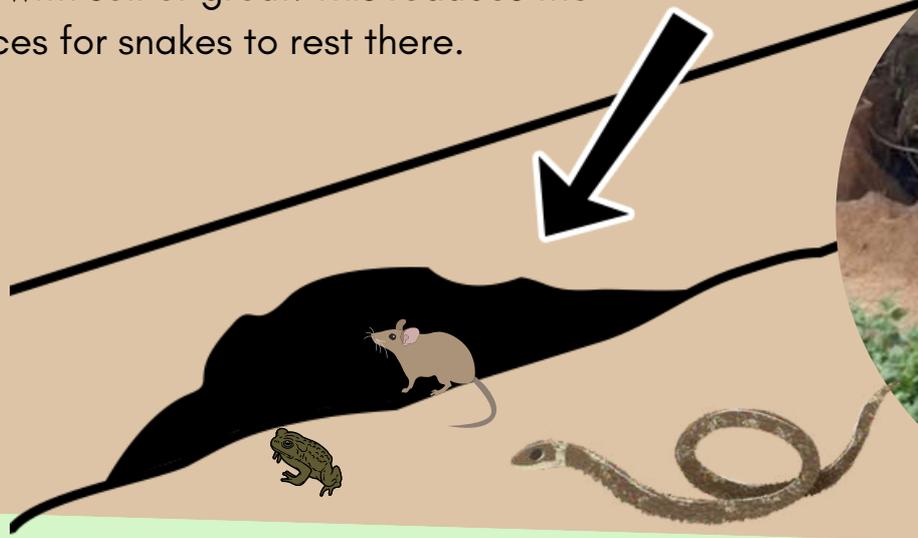
Clear your trays and clean up after yourself upon finishing your meal in eateries (especially outdoor food establishments) as well, as leftover food wrappings can also attract rodents to the area to search for food.



To minimise snakes coming to your garden, keep grass trimmed to discourage prey animals such as frogs, toads and rats. Fill any potholes/gaps under concrete pathways or stairs with soil or grout. This reduces the chances for snakes to rest there.

# 4

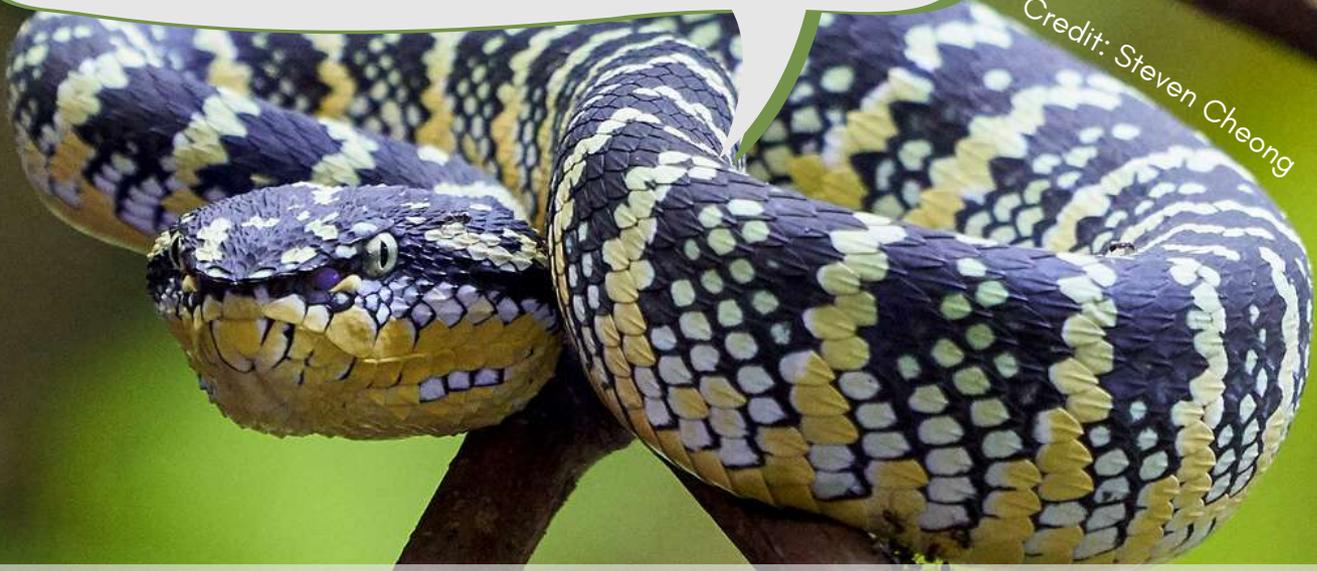
## CLEARING POTHOLÉS AND GAPS



### WHAT CAN I DO IF I NEED MORE ADVICE?

If you would like more information or advice, please send an email with details (e.g. description of snake, frequency of sightings, observed behaviours) and photos of snake to  [wildlifemanagement@acres.org.sg](mailto:wildlifemanagement@acres.org.sg).

Did you know not all snakes lay eggs? About 70% of snake species worldwide lay eggs, while the remaining 30% give birth to live young. The latter group is usually found in colder climates, where the eggs are not able to survive in the cold.<sup>95</sup> In Singapore, there are native species who give birth to live young (by hatching eggs in the body) such as the Wagler's pit viper and the Oriental whip snake.



Credit: Steven Cheong

# MONITOR LIZARDS



Credit: Jayaprakash Bojan

In Singapore, there are 3 species of monitor lizards. The most common monitor lizard is the Malayan water monitor (*Varanus salvator*), which can grow up to 3m long. The other two species are the clouded monitor (*Varanus nebulosus*) and Dumeril's monitor (*Varanus dumerilii*), the rarest species in Singapore. Both the latter two species can grow up to 1-1.5m locally.<sup>96</sup>

Credit: Jayaprakash Bojan



# MALAYAN WATER MONITOR

I am a very good swimmer! When I swim, I keep my limbs to the side of my body and propel myself with my tail! You might see me dive occasionally! I am able to remain underwater for up to 30 minutes!

You might see me clinging high up on tree trunks!



Credit: Daniel Neo

Credit: Genevieve Fong



# CLOUDED MONITOR

Guess who's back!

water monitor lizard. Credit: Steven Cheong



# DUMERIL'S MONITOR

believed to be extinct in Singapore but was rediscovered in 2008!<sup>97</sup>

# IMPORTANCE OF MONITOR LIZARDS IN OUR ECOSYSTEM.

## 1. Control prey populations

Monitor lizards' diets include a myriad of food such as insects, snakes, frogs, fish and many more. They thus control the population size of their prey species.



## 2. Source of food for other predators

Monitor lizards are a source of food for other predators including crocodiles and reticulated pythons.



## 3. Help with nutrient recycling

Monitor lizards are scavengers, who feed on animal carrion. This is crucial in the decomposition of dead animals, thereby returning nutrients to the environment.



Credit: Matthew Lim

**DEBUNKING**



**S ON MONITORS!**

Myth  
**1**

**Monitor lizards are dangerous.**

Credit: Tracy Pah

Monitor lizards are shy creatures and usually stay away from humans. Like other wild animals, they will only act in defense if provoked.

# Myth 2

**Monitor lizards show affection by hugging each other.**



Credit: Samuel Foo

Monitor lizards do not hug each other as a sign of affection. They are actually wrestling against each other as part of territorial fights or ritual combat.<sup>98</sup>

Myth

3

**Monitor lizards spit venom to defend themselves.**

I get afraid when you come too close to me!

Credit: Jocelyn Chng

Monitor lizards do not spit venom. When threatened, they:

- A** Hiss.
- B** Whip their tail from side to side.
- C** Puff up their neck to look bigger. They do so by standing upright on all legs and flattening their backs.

## MONITOR LIZARD ON THE PATH

Credit: Jocelyn Chng

### WHEN I SEE A...

1

Leave them alone. Do not touch, chase or corner them as they may react in defense. However, you can observe them from a distance.



Appreciate from a distance.

at least 2-3m



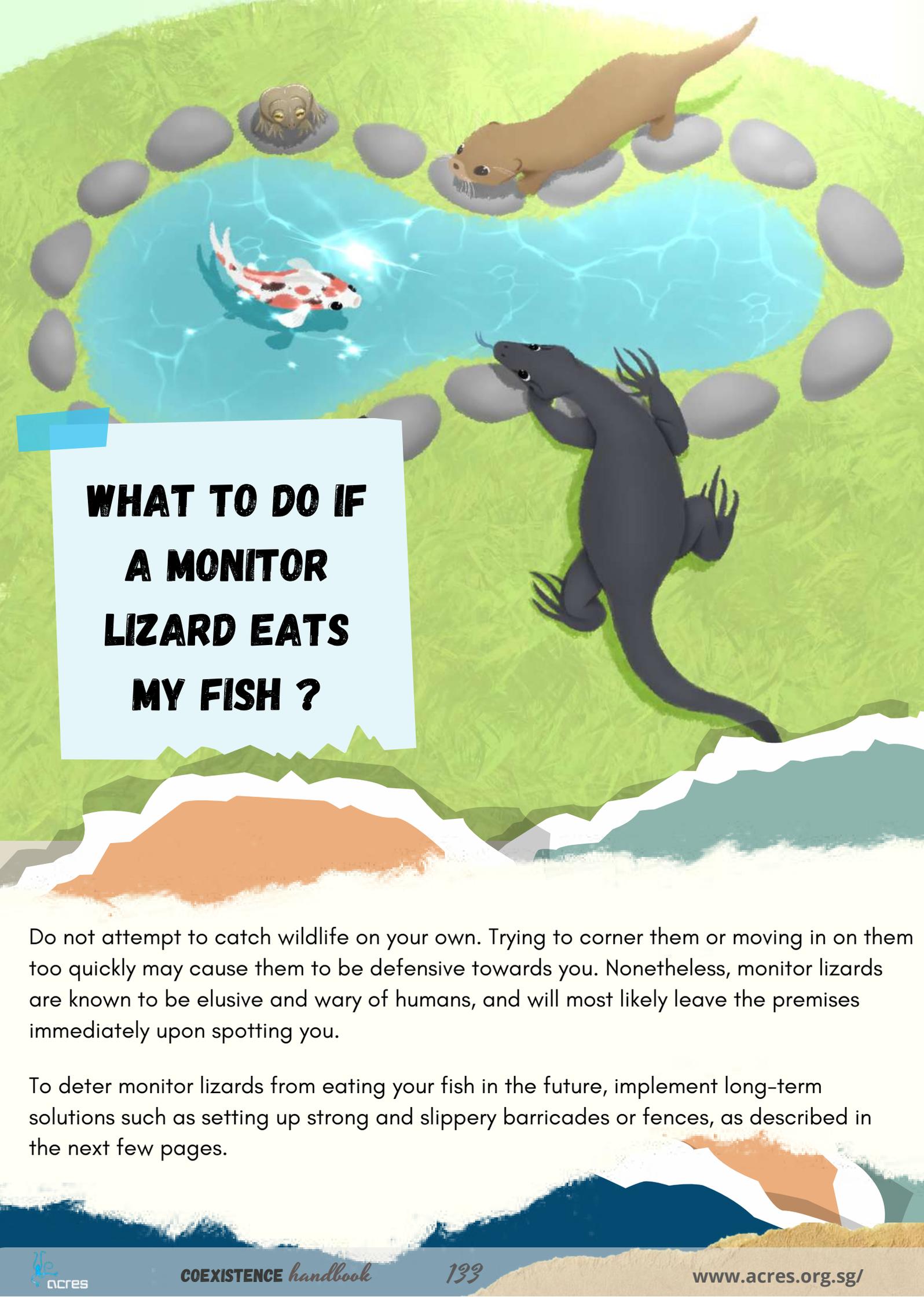
Remain calm, do not make sudden movements.

2

In the unlikely event that you are bitten, seek medical attention immediately as you can get a bacterial infection from the bite (just like any animal bite).

I use my tongue to pick up the scent molecules in the air to "smell" the environment!

Credit: Jocelyn Chng

An illustration of a pond surrounded by green grass and grey rocks. A monitor lizard is on the grass to the right, looking towards a pond. Inside the pond, a colorful koi fish is swimming. A frog is on the grass to the left of the pond. The scene is brightly lit, suggesting a sunny day.

## WHAT TO DO IF A MONITOR LIZARD EATS MY FISH ?

Do not attempt to catch wildlife on your own. Trying to corner them or moving in on them too quickly may cause them to be defensive towards you. Nonetheless, monitor lizards are known to be elusive and wary of humans, and will most likely leave the premises immediately upon spotting you.

To deter monitor lizards from eating your fish in the future, implement long-term solutions such as setting up strong and slippery barricades or fences, as described in the next few pages.

# HOW DO I PREVENT MONITOR LIZARDS FROM ENTERING MY HOUSE OR POND?



Credit: Jayaprakash Bojan

## 1 FENCING

Fencing can deter monitor lizards from entering your premises. For existing fencing, ensure that any gaps where they can enter are repaired.

Please conduct regular checks on fencing to ensure that there is no breach in the fences.

## 2 SMOOTH BARRIER

To prevent monitor lizards from entering your pond, a glass/slippy acrylic barrier can be installed around your pond. Make sure the barriers are sturdy, slippery and tall enough (at least 1.5m tall) to prevent climbing access, and any gaps are dense enough to prevent them from squeezing through. The barricades also need to be sunken at least 50cm into the ground to prevent them from digging through.



Acrylic barriers require high maintenance to ensure that they are clean. Please conduct regular checks to ensure that the barrier joints are secure and not loose.



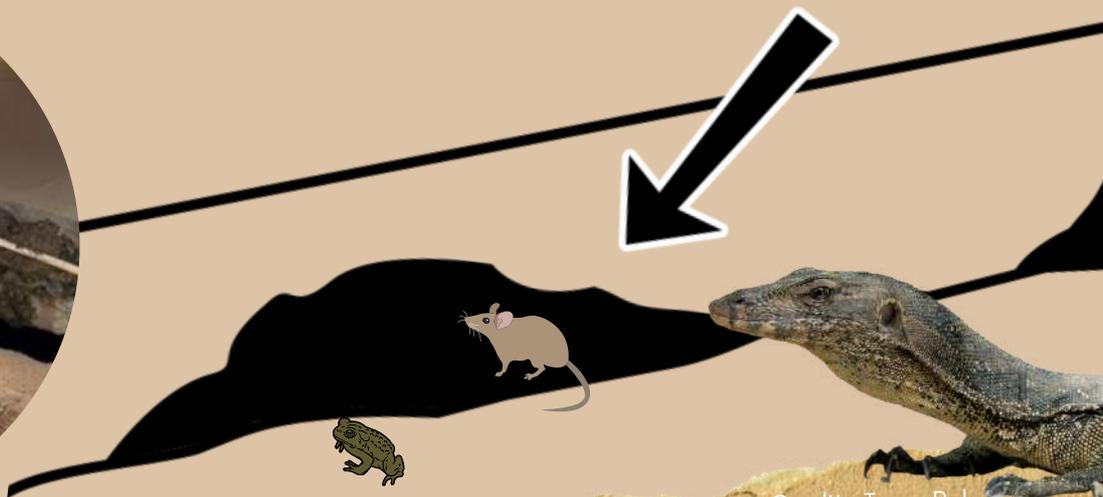
## HOW DO I DETER MONITOR LIZARDS FROM COMING TO MY RESIDENTIAL AREA?

### 1 ESTATE MAINTENANCE

Maintaining the tidiness and cleanliness of your premises is important in deterring wild animals like monitor lizards from entering. For example, leaf litter and cluttered areas are good hiding and resting spots for monitor lizards, so such areas should be cleared regularly. Untidy and dirty areas may also attract rodents, who in turn attract snakes and monitor lizards to prey on them.

### 2 CLEARING POTHOLE'S AND GAPS

To minimise monitor lizards coming to your garden, keep grass trimmed to discourage prey animals such as frogs, toads and rats. Fill any potholes/gaps under concrete pathways or stairs with soil or grout. This reduces the chances for monitor lizards to rest there.



# WHAT CAN I DO IF I NEED MORE ADVICE?

Credit: Lim Yi Zhen

If you would like site-specific information or advice, please send an email with details (e.g. frequency of sightings, observed behaviours) and photos of the monitor lizard and the surroundings to

 [wildlifemanagement@acres.org.sg](mailto:wildlifemanagement@acres.org.sg)

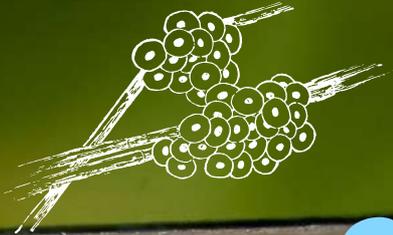
# FROGS

Singapore is home to about **30 species** of amphibians, namely frogs, toads and caecilians. <sup>99, 100</sup>

Thin, wet and smooth skin

Usually more colourful than toads

Lay eggs in clusters



Common Greenback. Credit: Ken Ng



# TOADS

Thick and dry skin with bumps

Usually brown

Lay eggs in chains



Asian Toad. Credit: Robbin Tan

**COMMONLY ENCOUNTERED  
AMPHIBIANS**

**ASIAN COMMON TOAD**

This is the most common native terrestrial amphibian in Singapore. They are very abundant and widespread in Singapore and across Asia.<sup>101</sup>

Usually brown but come in a variety of colours from brick red to almost fully black.

Habitat:  
Variety of habitats such as forests, ponds and urban spaces.



Credit: Hong Wenyang



Credit: Robbin Tan

Other characteristics: They have dry and warty skin which releases toxins as a defence mechanism against predators, a stumped body and short legs. Unlike frogs, they cannot jump very high. Being nocturnal amphibians, you can find them at night or after heavy rain as they come out to feed on insects.



## COMMONLY ENCOUNTERED AMPHIBIANS

# BANDED BULLFROG

Credit: Robbin Tan

I love to eat ants  
and termites!



In Singapore, they are considered a highly successful introduced species, partly because they can climb well.<sup>102</sup> They have light brown to orange bands which extend from the head along each side of the body.

Being nocturnal, they usually hide in holes underground, under leaf litter or in crevices of walls during the day.

Credit: Ken Ng

You will find (or hear!)  
us in roadside puddles &  
storm drains especially  
after a heavy rain!

When threatened, they will inflate and secrete a sticky mucus.

# WHY ARE FROGS & TOADS IMPORTANT IN SINGAPORE?

# 1

**Frogs and toads serve as an indicator species for the health of a particular habitat.**

They have a permeable skin that absorbs water and facilitates gaseous exchange between the animal and their environment. They can live both in water and on land, thus being exposed to two kinds of habitats. If either habitat is polluted, their health will be adversely affected. Therefore, studying their populations will allow us to determine the health of their habitats.

# 2

**They are important to the food chain, as predators to insects and prey to animals such as snakes and birds.**

Adult frogs and toads feed on mosquitoes.<sup>103</sup> Hence, they are natural predators that may allow us to control our mosquito populations effectively. Moreover, when they are tadpoles, they feed on algae in the water, thus reducing the chances of algae blooms that can be detrimental to aquatic life. In other countries, they are being studied as potential biological controls for algae.<sup>104</sup>



Credit: Tan Chuan Kai

## IS IT DANGEROUS TO TOUCH A WILD FROG?

It can be detrimental for both people and frogs should we choose to touch them. For frogs, since their skin is so permeable, the skin will absorb the oil and organic acids from our human hands, which may cause them to be in distress.<sup>105</sup> Frogs produce toxins in their skin glands as a defense mechanism against their predators. Touching such secretions could result in skin irritation while ingestion can cause humans to be severely ill or even result in death.<sup>106</sup> Thus, it is best to leave wild frogs alone.



## WHY ARE FROGS SO LOUD AT NIGHT?

Male frogs will call at night to attract female frogs. This is especially prevalent after heavy rain. Since female frogs require water to lay their eggs, frogs will gather around ponds and other water sources to mate. Due to Singapore's wet climate with abundant rainfall throughout the year, native frog species are able to breed all year round. You can listen to various frog calls on [Herpetological Society of Singapore's frog call library](#).

Frogs are likely to be present if you have ponds with vegetation. Removing frogs and tadpoles from ponds is not a sustainable method as the pond is a suitable habitat and will continue to attract frogs from elsewhere.



Don't touch me please!

Credit: Tan Chuan Kai

Did you know that frogs do not need to physically drink water? They are able to absorb water through their skin!<sup>107</sup>



# GECKOS

Credit: Lim Yi Zhen

Common House geckos are solely terrestrial and highly adapted to thrive in urban areas such as houses and buildings. They are attracted to artificial light sources.

Their diet includes a variety of insects (ants, cockroaches, moths etc.) and spiders.<sup>108</sup>



As nocturnal creatures, they are active in the night. As many of you would know, they are non-venomous and are harmless to people. Also, they lose their tail as a defense mechanism in order to escape predators.

Be distracted  
by my fallen  
tail!



WHY

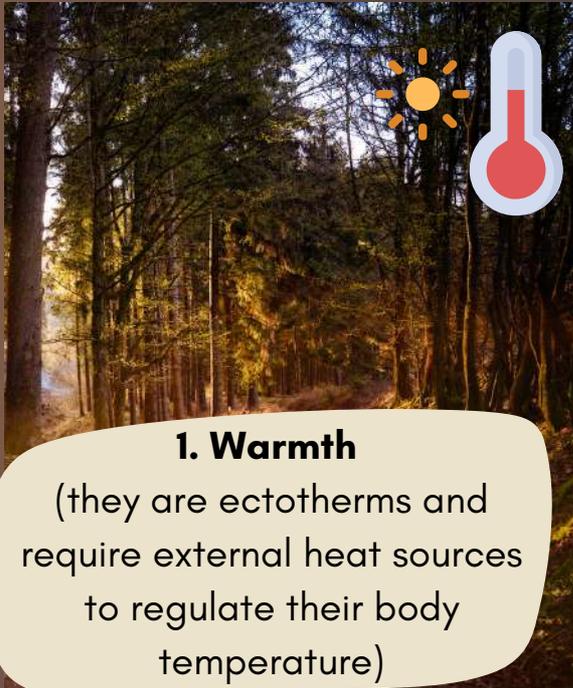
ARE

THERE

LIZARDS IN

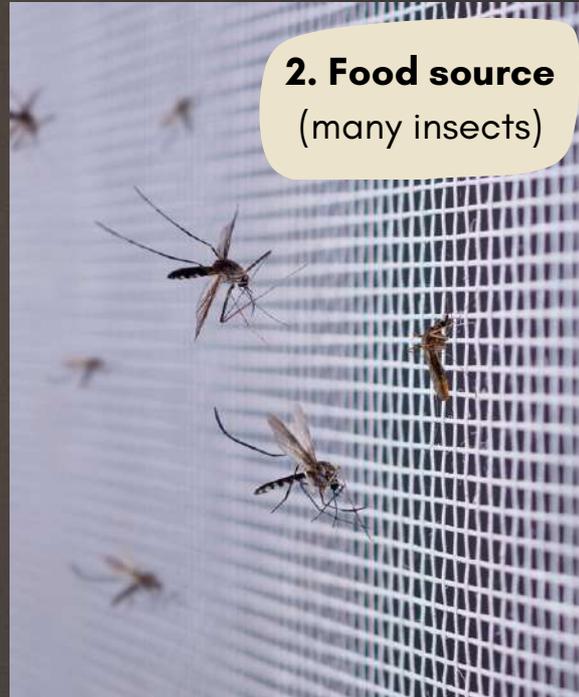
MY

HOUSE?



### 1. Warmth

(they are ectotherms and require external heat sources to regulate their body temperature)



### 2. Food source (many insects)



Since Singapore is naturally warm and humid, our climate is ideal for these lizards to thrive, thus more lizards will seek shelter in our homes.



### 3. Hiding spots (messy & cluttered, cracks in the wall)



### 4. Moisture (leaky taps, pipes, wet toilet and kitchen as a water source)

# SHOULD I GET RID OF LIZARDS IN MY HOUSE?



It is not necessary to get rid of lizards since they are harmless to humans and pets. House lizards are neither poisonous nor venomous. If there are insects in our house, they even help us manage the insect problem by eating them. Generally, they are shy and will choose to avoid humans by running away.



If a house lizard comes into contact with your food, you may want to toss the contaminated food away. Lizards may carry salmonella and other pathogens, which are spread through contact with their droppings.<sup>109</sup> Hence, as a precaution, wash your hands with soap after handling anything that has come into contact with their faeces, or if you happen to touch a lizard.<sup>110</sup> To prevent contamination of food, do not leave food exposed on tables/countertops for long periods of time.



# HOW TO MINIMISE LIZARD SIGHTINGS IN MY HOUSE?

It is important to remove uneaten food and dispose of garbage regularly so as not to attract insects. This in turn will not attract lizards into your home. You could also tidy your house by removing unwanted items thus discouraging lizards from hiding in between clutter. Lastly, wipe kitchen counters and dining tables immediately after use.



*Please do not use glue traps! They are extremely cruel and do not address the root cause of the problem. Other lizards will simply return. You can try humane ways to deter lizards, such as using vinegar, coffee powder, garlic, onion or essential oils. Place these in areas that lizards frequent or along their route if you know the route that they usually take.*



Glue is non-toxic and will not kill the animal instantly. The animal will be tortured and suffer needlessly trying to escape. The animal eventually becomes exhausted, and will continue to starve, suffocate and become dehydrated until they eventually die. ACRES has also rescued snakes trapped together with geckos on glue boards.

Did you know that most species of geckos do not have eyelids? Since they cannot blink, they lick their eyes with their tongues to keep them clean and moist.<sup>111</sup>



Credit: Ian Schofield/Shutterstock

# RODENTS



'Rodents' are a diverse group of mammals consisting not only of the familiar rats and mice we know, but also animals such as porcupines, beavers, squirrels and chinchillas.



Sewer rat



Roof rat

Credit: National Environment Agency

Rats and mice are the rodent species that people are usually concerned about in housing estates, as they are highly associated with human activities.

In Singapore, there are three common nocturnal rat/mouse species living within housing estates, namely the Brown Rat or Sewer Rat which lives underground, the Black Rat or Roof Rat which lives in upper parts of dwellings such as houses or shopping malls, and the House Mouse.<sup>112, 113</sup>



House mouse

Credit: Heidi Snell, darwinfoundation.org

Urban attractants such as poorly-managed bin refuse chutes and waste bins, and uncleared/improper disposal of food waste, provide thriving conditions for rodents to feed and nest. The sewer rat, roof rat and house mouse are capable of producing four to twelve pups per litter.<sup>114</sup>



# RATS, MICE OR SHREWS?

Shorter, thicker tail

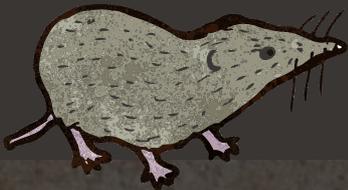
Smaller eyes

Pointed snout

I am not a rodent!

Credit: Bernard Photojournals/Facebook

Asian house shrews are nocturnal animals who can be found in urban areas such as housing estates. They are often mistaken for rats or mice due to their similar appearance. Shrews are not rodents and can be distinguished from a rat or a mouse by its pointed snout, shorter thicker tail and smaller eyes. Unlike urban rats and mice, a shrew's diet consists mostly of insects, worms and seeds.<sup>115</sup> Being insectivores, shrews can help to control insect pest populations, such as cockroaches.



## DID YOU KNOW?

Shrew caravan?

You might come across a mother shrew leading her babies in a train. The mother is bringing her babies to safety as her nest is disturbed. Read more [here](#).

Credit:Alamy

## DO RODENTS CARRY DISEASES?

Like droppings from most animals, including ours, rat droppings can carry diseases that can spread harmful infections to humans. Rat-transmitted diseases can also spread via a flea bite from an infected rat. Similarly, shrews can harbour harmful pathogens and thus are regarded as potential carriers of diseases.<sup>116</sup> Practising basic hygiene, like frequent washing of hands, cleaning of surfaces, and keeping food covered, can minimise the spread of diseases from faeces.



Like with most animals, rats, mice and shrews generally run away from humans. However, they can be defensive when cornered or handled.

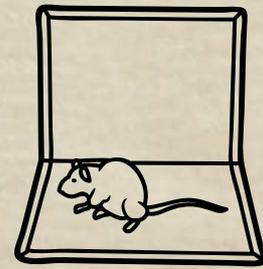
## DO RODENTS ATTACK PEOPLE, ESPECIALLY CHILDREN?

## WHAT SHOULD I DO IF I FIND A RAT NEST WITH BABIES?



Removing the babies alone will allow the mother rat to enter her next cycle of reproduction. As such, it does not resolve the problem of the resident rats. ACRES strongly suggests putting preventive measures in place for a humane and sustainable approach. Most of the time, residents engage licensed operators/contractors to remove rat nests. However, do note that currently there are no guidelines for operators to humanely kill removed rats, so they are often stepped on to death.

## WHY NOT TRAP OR POISON?



*Trapping and killing are short-term solutions to controlling rodent populations and hence are not sustainable solutions, as long as there is an abundance of what they need to reproduce: food, shelter and water. Rats can give birth to as many as 6 litters a year, with sufficient food. So by removing some rats and not addressing the food sources, you will end up having more rats in a few weeks' time.*

Glue traps are inhumane because trapped rodents are usually left alone and suffer enormously before they die of starvation, dehydration or stress.

Glue traps are also indiscriminate - other animals such as snakes, monitor lizards, owls, eagles and even cats have been affected. Click to read about [birds](#) and [cats](#) being stuck in glue traps in Singapore. ACRES also [rescues many glue-trapped animals](#) on an ongoing basis.

Glue traps can rip patches of skin and fur off rodents' bodies as they struggle to escape. Rodents can also self-mutilate, such as biting off their limbs, as they try to free themselves. Rodents who get their faces stuck on the glue can die from suffocation. Glue traps also pose disease risks to humans. There is a risk of hantaviruses posed when terrified animals lose control of their bodily functions. <sup>117</sup>

Rat poison is extremely inhumane as the rats die from a painful death. Causes of death from the most commonly used rat poisons available in the market include internal bleeding, kidney failure and seizures.<sup>118</sup> Rats do not die immediately after poison consumption. Rather, they will suffer the effects for several days before they eventually pass away.



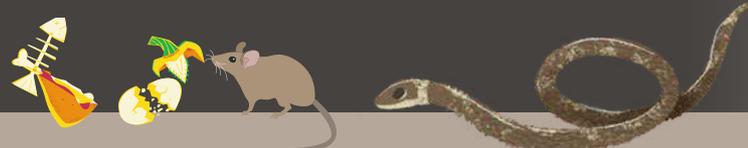
Rat poison can also cause secondary poisoning to non-target predators. Should predators, such as snakes and raptors, prey on a poisoned rat that is still alive or recently deceased, these animals will likewise suffer the damaging effects of the poison.<sup>119</sup>

Rat poison is indiscriminate. Rat bait is created to taste and smell good.<sup>120</sup> This attracts rats and other non-targeted animals, such as community or pet cats and dogs, to ingest it. Non-targeted animals can similarly become very ill and possibly die from eating poison.



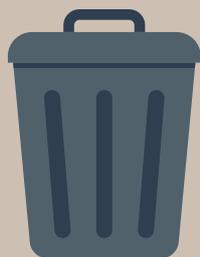
Did you know that rats laugh, just like humans do, when you tickle them?<sup>121</sup>

It is advisable to invest on more **long-term measures** that can effectively tackle the main contributing factors to rodents' unwanted presence. The most important measure is proper food waste management. Removal of food attractants will deter rodents from living around the area.



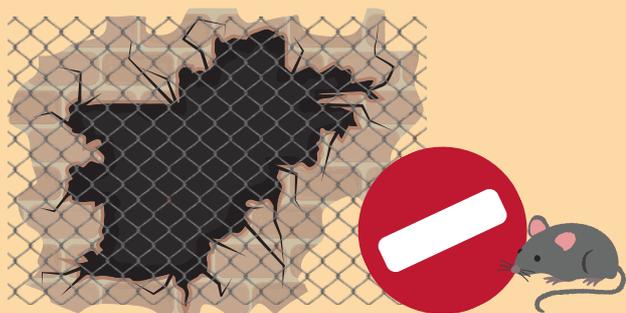
# WHAT CAN I DO TO MINIMISE RATS IN MY PREMISES?

## 01 CLEAR IT & BIN IT



Ensure proper food disposal and clean-up, and cover waste bins properly to prevent access to food waste. Do not leave trash bags outside waste bins as rodents can easily gnaw through trash bags.

## 02 PREVENT ENTRY



Identify rodents' entry and exit points and block their access routes by meshing up gaps in gates, fences, walls, false ceilings. Cover up drains.

## FEED COMMUNITY ANIMALS RESPONSIBLY

03



If you feed community animals, do remember to supervise the cat/dog while feeding, and ensure that any remnant food is completely cleared up after, so that it does not become an attractant for rodents.



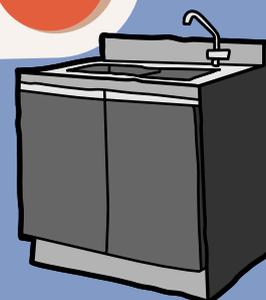
## 04 DECREASE HABITAT SUITABILITY



Regular mowing of the lawn and removal of leaf litter to decrease habitat suitability.

## RAT-PROOF YOUR FOOD

05



Store food in metal containers/change cupboards to those of metal material because rodents can chew through wood.

# BEEES!

Hello! There are more than 130 species of bees in Singapore.<sup>122</sup> We are important pollinators in our ecosystems, where each one of us can visit up to 2,000 flowers a day. We can be found in urban parks, gardens and other green spaces. You can learn more about us and honey from local outreach programmes such as Bee Amazed Garden and Nutrinest.

Koroton blue-banded digger bee

Credit: Emmanuel Goh

I am docile when foraging among flowers, and am shy around humans. It is generally safe to be around me. As long as you don't disturb my hive, I will not sting!

# ASIAN HONEY BEE



Credit: Tan Seng Kwang

Credit: Daniel Neo



## **SOCIALITY**

The Asian Honey Bee lives in large colonies.

## **HIVE CONSTRUCTION**

They make hives in tree holes, but in urban spaces may use upturned pots, eaves of roofs, other buildings and manmade objects that provide safe shelter.

# SOLITARY BEES

## SOCIALITY

These bees live independently or in smaller groups.

## HIVE CONSTRUCTION

They do not construct hives. Instead, they make their nest in dead and decaying wood, under the soil.

### DO WE STING?

Solitary bees are docile and peaceful, even when disturbed.

Carpenter bee

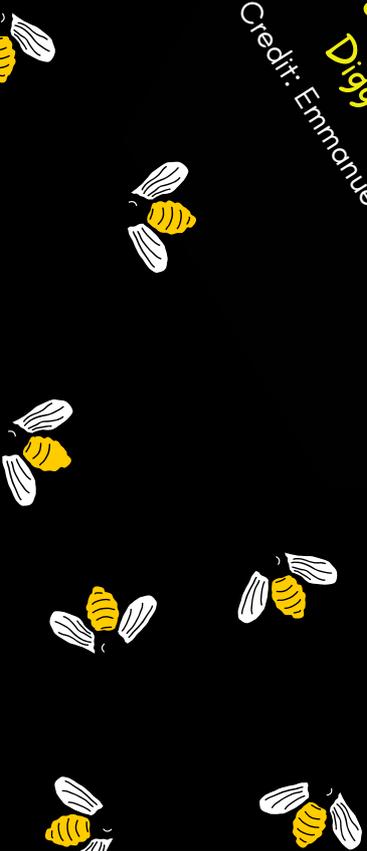
Credit: Tan Chuan Kai



Koroton Blue-banded  
Digger Bee  
Credit: Emmanuel Goh

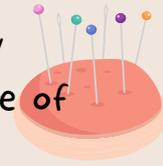


Striped Pearly Banded  
Bee  
Credit: Steven Cheong



# STINGLESS BEES

I'm extremely small, the size of a pinhead!



Credit: New Straits Times

## SOCIALITY

Stingless bees live in large colonies.

## HIVE CONSTRUCTION

They do not construct hives. They make nests within crevices in trees and rocky walls, or in manmade structures (e.g., lamp post).

DO  
WE  
STING?

We do not have stings, and cannot hurt people!

## WHAT SHOULD I DO IF THERE IS A BEEHIVE IN MY HOUSE OR ON MY PROPERTY?

Do not disturb the beehive. However, if the beehive is situated at a place where it brings inconvenience to you, you can engage local humane bee relocation service providers such as [Nutrifest](#), [Pollen Nation](#) or [Bee Amazed Garden](#). If the nest is within a park managed by NParks, call the 24-hour NParks Animal Response Centre at 1800-476-1600.



Credit: Daniel Neo



White-cheeked  
carpenter bee

Credit: Matthew Lim

## WHY ARE THERE BEES SWARMING AROUND MY HOUSE?

The bees are seeking out a new location to build their hive.<sup>123</sup> In most situations, you do not have to do anything but patiently wait for them to leave. The bees will usually leave after a while. If you are unsure, you can engage the local humane bee relocation service providers above for advice.

## WHAT SHOULD I DO IF I AM SWARMED BY BEES?

Bees do not seek to approach humans, and will only react in defense if their hive is disturbed. If you somehow find yourself in a situation where bees are swarming around/towards you, cover your head and eyes as much as possible since these areas are vulnerable. Run as far away from the beehive as possible to disorient the bees and try to head indoors or hide inside a vehicle, keeping all doors and windows shut. Even though it might be hard not to swat on impulse, resist the urge to do this as swatting (a swift movement) is perceived by bees as a threat and they will be all the more likely to try to defend their hive.



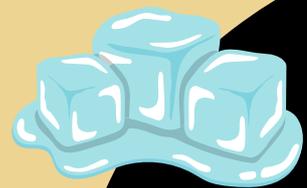
Credit: Annie Chew





## WHAT SHOULD I DO IF I GET STUNG BY A BEE?

When a bee stings you, it will leave its stinger in your wound. Carefully remove the stinger using the edge of a card, do not pull it with your fingers as you may accidentally release more venom into skin and worsen infection. Seek medical attention as necessary. Be aware of allergic reactions (e.g., rashes, swelling) and apply an ice pack to the wound.



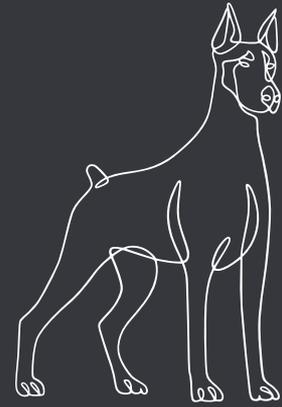
Did you know that all bees have 5 eyes? If you have the chance to observe them, you might be able to see all of their eyes!<sup>124</sup>  
[Click](#) to read more about how bees see colour.



# ANIMALS

in our

# COMMUNITY



This section will cover animals who are in our community, mainly abandoned pets who have bred and become feral.





# TNRM PROGRAMME



TNRM is an effective and humane way to manage community populations of dogs and cats.<sup>127</sup> Since neutered animals cannot reproduce, this reduces the stray population.



After neutering, dogs and cats who are deemed suitable for rehoming will be rehomed. However, not all stray dogs and stray cats are suitable to become companion animals due to various factors. Stray dogs and cats condition themselves to be wary of humans, so not all of them may accept living in a household with people. Some may have had past bad experiences on the streets or been victims of abuse.

## TRAP NEUTER RELEASE MANAGE



Hence, those who are not able to be rehomed will be released at suitable locations, where they will be happier on their own, to live out their lives naturally. They will continue to occupy these spaces, preventing new dogs and cats from coming over to populate the area.

# WHAT SHOULD I DO IF I SEE A STRAY DOG?

# DOGS



Credit: Tan Seng Kwang

If the dog appears sick/injured, call SPCA at 6287 5355 for advice.

Observe:<sup>128</sup>

- Do they have a collar? If they do, it is likely that they are a lost pet. Call AVS or SPCA and they will help to scan the microchip and return the dog to the owner.
- If the dog is a street dog, is calm, in their own territory and not in close proximity with people, leave the dog alone. There is no reason to disturb and provoke them just because they are in the area.

Remain calm.  
Do not stare at the dog.  
Keep a distance.  
Walk away slowly.

保持冷静。  
请勿盯住狗只并保持距离，  
然后慢慢走开。



## IS IT LEGAL OR ILLEGAL TO FEED STRAY DOGS?

Credit: Sing Jia;  
Source: The Smart Local Malaysia

Stray feeding is allowed in all areas except in Nature Reserves, Nature Parks and Public Parks.<sup>129</sup>

In the areas stated above, permission must be obtained. However, please throw away any uneaten food after feeding, to prevent scavenging by other animals and soiling the environment. Only by practicing responsible stray feeding can we create a safer environment for our street dogs, wildlife and people. Click for [AVS' Feeding Stray Dogs Responsibly Handbook](#).

# CATS



Credit: Wenyang Hong



## Did you know?

If a cat's ear has been tipped, it indicates that they have been neutered.

## WHAT SHOULD I DO IF I SEE A STRAY CAT IN MY NEIGHBOURHOOD?

If the cat is a community cat, leave them be. There are usually networks of community feeders in Singapore who take care of and feed these cats. Remember that some cats are feral, and not all community strays may accept human companionship. If you suspect that the cat is a lost pet cat, you can check online social media forums, and report to AVS or SPCA. If the cat is healthy, leave them be. There is no need to call a shelter unless the cat appears sick/injured and requires medical attention.

# WHAT SHOULD I DO IF I FIND KITTENS?

130

1

## Scan the area thoroughly for the mother cat.

Very young kittens need to nurse on their mother's milk, which contains essential nutrients, to survive. By separating kittens from their mother, the kittens may not survive under human care. Furthermore, by touching kittens, you will leave your scent on their bodies. When the mother cat returns, she may feel threatened about your presence and abandon their litter.

2

## Mother cats may leave their kittens for up to 3 hours to look for food.

That may explain their absence when you are in the area. It is best to walk away and return hours later to check if the kittens have been reunited with their mother, or are truly orphans.

3

## If the kittens have been abandoned, please contact a cat rescue organisation for help.

You may contact the Cat Welfare Society or SPCA for advice.

# IS IT LEGAL OR ILLEGAL TO FEED STRAY CATS?



*Feeding stray cats is not illegal in Singapore.<sup>131</sup>*

*However, littering is a punishable offence.*

Credit: Cepheus Chan;  
Source: Coconuts Singapore

Please remember to clean up any leftover food after the cat is done eating, or within 2 hours, to prevent attracting insects and rodents. Do not feed cats in common corridors or areas with high human traffic. Always put a piece of paper/bowl under the food, and not feed directly on the ground as this is unsanitary for both the cats and the surroundings.<sup>132, 133</sup>

Moreover, leftover food may lead to residents complaining to the authorities about the cats, leading to their removal. Leftover food may also attract other animals such as rodents, pigeons, mynas and cockroaches. If you see someone being irresponsible by not cleaning up, do try to educate them about their actions and the potential consequences.

# WHAT SHOULD I DO TO PREVENT COMMUNITY CATS FROM ENTERING MY HOUSE?

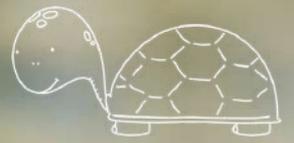


You may consider installing mesh on your door and windows. You can find more information on cat-proofing services by visiting [thecatpeople](http://thecatpeople). Alternatively, you may scatter lemon or orange peels outside your door to deter cats. Some cats strongly dislike the smell of citrus fruits, and will stay away from your property.<sup>134</sup>



Credit: CWS Facebook Page  
Source: Coconuts Singapore

# RED-EARED SLIDERS



Red-eared sliders (RES), native to North America,<sup>135</sup> are allowed to be brought in/kept as pets in Singapore,<sup>135</sup> and can legally be sold in pet shops and aquariums in Singapore.<sup>136</sup> If you wish to bring RES into Singapore as pets, you will first need a letter of authorisation from NParks.

## ARE WE EASY PETS TO KEEP?

Doing research on the RES and ensuring that you know enough about them to take care of them is a very important step prior to deciding on keeping a RES. For various reasons, ACRES does not encourage the purchase of RES. Even if you adopt a RES, please ensure that you are able to care for him/her. This is to prevent your RES from dying due to improper care, or you eventually releasing them into water bodies which is not only an offence in Singapore, but also harms other native species of turtles.

# ASPECTS OF THE RES THAT YOU SHOULD BE AWARE OF:



## 1 SIZE/ LIFESPAN

- Adult males can be 15 to 25cm long and adult females can be even larger -- 20 to 30cm long<sup>137</sup>
- Opportunistic feeders: growth rates can accelerate when overfed<sup>138</sup>
- Can live up to 20-30 years or more

## 2 DIET

- Feed juvenile as much as he/she will eat in 15 minutes, daily. Adult RES, on the other hand, can be fed once every 2-3 days.
- Diet should consist of a mixture of foods as they are omnivores:



Pellets  
(staple but should not make up the bulk of their diet)



Prey items  
(earthworms, crickets, silkworms, shrimp and mealworms)



Leafy greens  
(bok choy, collard greens, mustard greens and kale)



Aquatic plants  
(water lettuce, water hyacinth, duckweed and azolla)

## 3 UV HOUSING

RES are semi-aquatic animals and they spend a substantial amount of time basking too. Thus, they need both water to swim and dry platforms to bask. It is recommended to provide them natural sunlight, or UV light from a full spectrum reptile UVA/UVB light if access to sunlight is limited.<sup>139</sup>

Credit: CWS Facebook Page  
Source: Coconuts Singapore

# CAN I RELEASE MY RES INTO THE WILD?

*Releasing RES or any other pets is not only illegal, but also causes harm to the released animal and Singapore's wildlife.*

Under Singapore's Animals and Birds Act, it is the duty of pet owners to not abandon the animal, or cause or permit the animal to be abandoned, whether permanently or temporarily, without any reasonable cause. A fine not exceeding \$10,000 or imprisonment for a term not exceeding 12 months or both will be imposed for the first offence. For a second or subsequent offence, a fine not exceeding \$20,000 or imprisonment for a term not exceeding 2 years or both will be imposed.<sup>140</sup>

If you are no longer able to keep your pet RES, you can put him/her up for adoption at the [SG Terrapins Adoption](#) Facebook group or rehome him/her by asking around.

RES may not survive in the wild because they were previously domesticated pets, hence they have never learnt to hunt or forage for food. As RES are frequently released in large numbers, mass die-offs of released RES have occurred in Singapore.<sup>141</sup> Released RES may also spread diseases to our native turtles. RES are known to compete better for food than Singapore's native turtle species (Malayan box turtles), thereby potentially threatening the existence of our native turtles as RES may outcompete them.<sup>142</sup> Releasing them could also result in an untimely death in the event where they become victims of road accidents or other animal attacks.<sup>143</sup>



# PET BIRDS

## WHAT HAPPENS IF MY EXOTIC PET BIRD FLEW AWAY AND WAS UNINTENTIONALLY RELEASED INTO THE WILD?

Many exotic pet birds do not survive in the wild as it is an unfamiliar environment. They may be preyed upon by other animals, or die from starvation, dehydration and stress.

If they do survive, non-native species can and have bred to form feral populations. Eventually, if the species becomes invasive, negative impacts may be caused to the ecosystem and/or the community.

Population management measures may be taken on non-native birds, which include culling. One example of a species that has met this fate is the Javan myna.

Please contact NParks Animal Management Centre at 1800 476 1600 as they may have picked up your missing bird. Also share details of your bird on the Lost and Found Birds Singapore Facebook Page.

## WHAT TO DO IF I FIND A PET BIRD?

*Here are some tips on how you can try to reunite the lost bird with their owner. Remember to always keep their tag number (if applicable) discreet. It is up to the potential owner to inform you of the number as verification.*

You can post the details on the following FB pages to track/find their owner:

- [Lost and Found Birds SG](#)
- [ParrotAlert SG](#)
- [Parrot SOS \(Lost and Found\) Singapore](#)

**IMPORTANT**

Do not pass the bird to anyone who claims to be able to take care of the animal. If you are unable to take care of the bird while trying to locate the owner, and need someone to pick up the bird from you, do contact 24-hour NParks Animal Response Centre at 1800-476-1600.

## CONSIDERATIONS WHEN BUYING A PET BIRD

ACRES conducted an undercover investigative survey from October 2020 to February 2021 into the conditions of shops in Singapore displaying and selling birds. The investigation findings revealed concerning breaches directly related to the welfare of the birds. The underlying cause of these is the unclear definitions for overcrowding and space requirements that these diverse species of birds need. Click to read [the full report](#).

ACRES encourages adopting companion animals rather than buying them, in order to avoid contributing to the demand for pet animals which feeds such welfare issues above. Due to limited space in Singapore, ACRES does not support buying and keeping of birds in cages.

## FURTHER READING AND DIGITAL RESOURCES

ACRES Coexistence Webpage:  
<https://bit.ly/acrescoexistence>

Our Wild Neighbours (OWN) Website:  
<https://www.ourwildneighbours.sg/>

ACRES coexistence videos - [YouTube playlist](#)

Volume TWO of this handbook will have specific guidelines & resources for various stakeholders towards coexistence.

Expected release in Dec 2023.

Contact

[wildlifemanagement@acres.org.sg](mailto:wildlifemanagement@acres.org.sg)  
for feedback/info.

Credit: Sabrina Jabbar

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Credit: Matthew Lim





Credit: Tan Yong Lin

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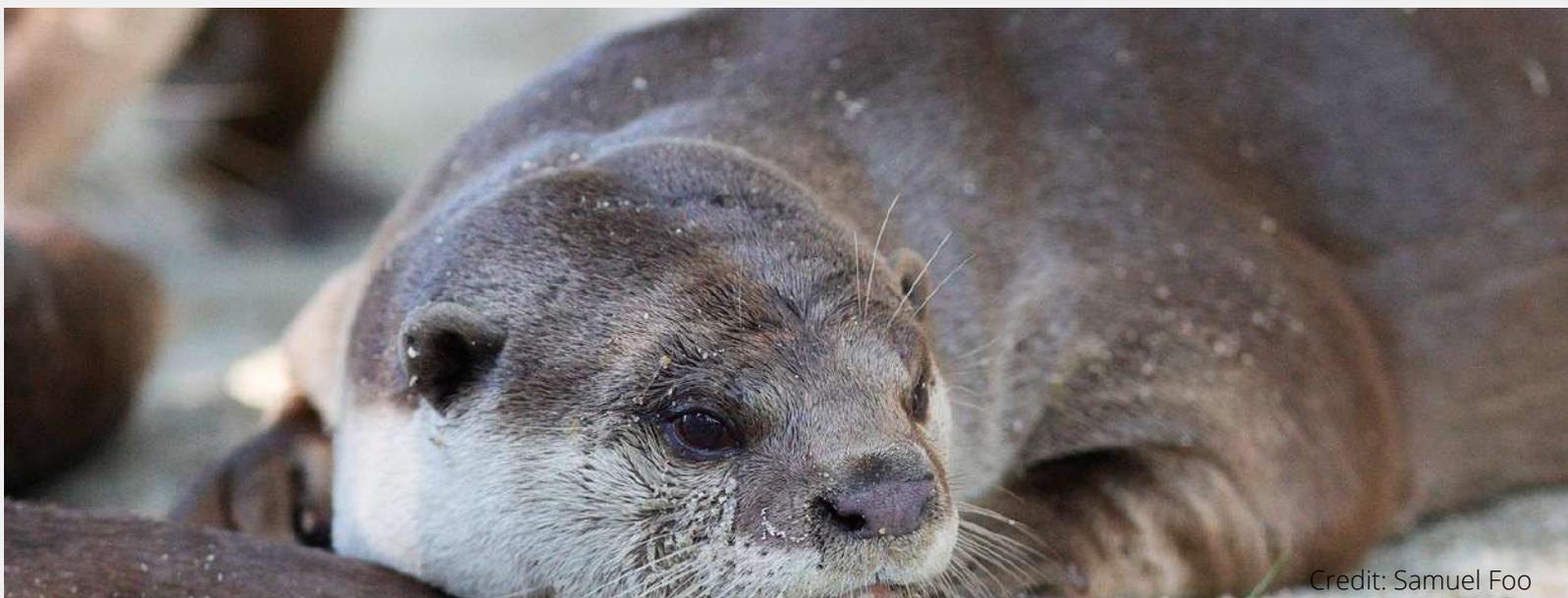
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END



Volume TWO of this handbook will have specific guidelines & resources for various stakeholders towards coexistence.

Expected release in Dec 2023.

Contact

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## A FINAL WORD...

### HEAR FROM OUR PARTNERS AND FRIENDS!

#### COEXISTENCE IS...



Hi, I am Xu Weiting. I am an instructor with the Department of Biological Sciences, NUS, teaching biodiversity and ecology modules. Besides teaching, I researched the biology of common palm civets in Singapore, with a particular interest in human-wildlife interactions. In my spare time, I also enjoy volunteering with NUS Toddecats to share with others about the lovely biodiversity and natural places we have in Singapore so that more people will appreciate them.

#### NUS Civet Research Team



Coexistence means accepting and living alongside our wildlife neighbours. To be a step closer to achieving human-wildlife coexistence, we sometimes need to be open-minded enough to learn from others about the wildlife around us and perhaps even be willing to make changes in our behaviour so that it is a win-win for both people and the animals.

- Xu Weiting

## COEXISTENCE IS...



**Hi, I'm Chiew Guat, a teacher by training who was with the Outward Bound School (OBS) as a Master Training Consultant for the past five and half years. Someone with a soft spot for animals especially those with fur/feathers with 2 or more legs and a tail.**

**Coexistence is** respecting the living space of all living things, lock stock and barrel, not one over the other - their calls, their movement, their poop...of course within accepted boundaries. Most of us would remember OBS camping in Coney Island Park way back in 2018 but most wouldn't know that we had done our due diligence in our preparation for a positive camping experience. We had recognised that the long-tailed macaques and wild boars were on the island first and by camping there, we were encroaching into their territory. To navigate better human-wildlife interaction, we engaged ACRES for assistance. ACRES' staff gave educational talks on coexisting with wildlife with each group that camped there and shared the importance of "leaving no trace" after meals. We were aware that wildlife is drawn to the remnants of food left behind after meals and we made sure to leave the campsite in its natural state if not better after each camp. The use of vinegar as a natural repellent worked well after we had flushed the cooking sites thoroughly. Coexisting with wildlife is also "treading lightly" in the wilderness so that wildlife is not "inconvenienced" by our presence - respecting each other's space, understanding their natural behaviours and taking appropriate steps to mitigate challenges. I am proud to share that we had a positive camping experience at Coney Island Park in 2018 because we strongly believe in coexisting with wildlife.

- **Chiew Guat**



**Sabrina: "With years of experience in primate research in the wild, I lead the Monkey guards programme under the Jane Goodall Institute Singapore."**



**Co-existence** is striking that unique balance between the community and wildlife. I mentioned the word 'unique' because each location has its own different story and the strategies used to foster co-existence are tailored to help people and wildlife live together. The end goal is not to force everyone to love wildlife but rather to acknowledge the presence of wildlife and equip them with the right skills so that they are empowered and confident to take the right steps when sharing the same space with wildlife. It is also about nature groups and agencies coming together to mitigate difficult situations and arrive at sustainable action(s). To me that is co-existence in a progressive approach.

- Sabrina

## COEXISTENCE IS...

**Hello! I am Karina and I started Project Co.Hab (@projectco.hab) to promote coexistence in Singapore!**

We occupied the island's greenery with our concrete buildings to build our homes at the expense of our wildlife losing their habitats. Not everyone loves animals, and that's okay. The least we can do is to treat these living creatures with respect, pick up some wildlife etiquette to live harmoniously alongside each other.





Thank You



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The numerous members of the public who enthusiastically responded to our call for photos. The beautiful photos that you see in the pages of this book are the collective work of our nature and wildlife community - let us keep up the good work for our wildlife neighbours!