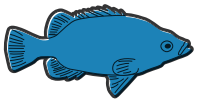
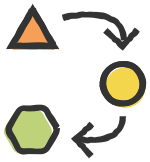
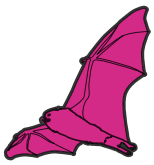
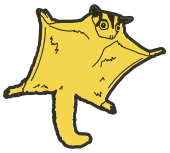
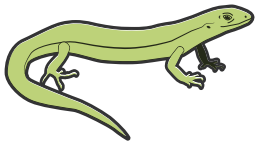





EMBRACE THE WILD


Jane Goodall's roots&shoots




Acknowledgment of Country

We at the Jane Goodall Institute Australia acknowledge the Traditional Custodians of the lands where we work and live, and pay respects to Elders past and present. We celebrate the diversity of First Nations peoples and their enduring cultures, connections and custodianship of the lands, waters and wildlife of Australia.

Aboriginal and Torres Strait Islander Australia is a collection of many different Nations and language groups with their own beliefs, customs and cultures. Australia's First Nations peoples have territory or Country that they belong to, rather than the Country belonging to them. They have actively managed Australian landscapes by employing cultural burning and land management techniques to sustainably use natural resources - by moving with the seasons, adapting to what is locally available and giving the Country time to recover.

Australian First Nations culture centres around looking after Country, and that if we look after the land, the land will look after us. Some Aboriginal and Torres Strait Islander community members hold a wealth of ecological knowledge that can be applied to contemporary land management and conservation challenges today.

While working through the Embrace the Wild resource, we encourage you to engage with your local First Nations community by contacting local Land Councils, Aboriginal and Torres Strait Islander bodies or speaking with local Elders and community members. This is the best way to learn about Aboriginal and Torres Strait Islander conservation practices and the importance of the environment. You may also like to learn and use the indigenous names for plants and animals in your local area.

Megalong Valley NSW
Hamish Weir

Thanks to the Embrace the Wild Team

The Jane Goodall Institute Australia would like to thank the amazing creators of Embrace the Wild, who were inspired to develop this program as a tool to help young people everywhere to make a difference in their communities. The creators came together from every corner of the globe, and are Jessica Pinder (Australia), Emily Major (Canada), Tessina Strelow (Germany) Andrea Stiglingh (Australia), Georgia Law (United Kingdom) and Gwanwoo Jin (South Korea).

We also acknowledge our incredible support crew of editors and writers from the Jane Goodall Institute of Australia, who further shaped the Embrace the Wild program for an Australian context. They are - Benjamin Howes, Alexandra Lay, Abbie Mitchell, James Forbes and Gemma Freeman.
A huge thank you to Anders Alexander for designing this beautiful book.

Jane Goodall Institute Australia is enormously proud to be partnering with these organisations to deliver Embrace the Wild – Australian Edition.

PARADICE
INVESTMENT MANAGEMENT

The Royal
BOTANIC GARDEN
Sydney

NSW GOVERNMENT | TAFE NSW

TARONGA
CONSERVATION SOCIETY AUSTRALIA

UNE PARKINSON
FOUNDATION

From left to right: initial Embrace the Wild creators Dominik Hrťo Hrtánek (JGI Slovakia), Tessina Strelow (JGI Germany), Georgia Law (JGI UK), Emily Major (JGI New Zealand), Jessica Pinder (JGI Australia), and Gwanwoo Kim (JGI South Korea)

Foreword

For me, Embrace the Wild began with a promise I made way back in December 2015 at the age of 21. At the time I was freezing my pants off in the Victorian Alpine Country, unprepared for a height-of-summer snowfall which had caught us completely off guard. Having taken some time off work to help out with a field survey of native marsupials, I was spending a week setting up Elliot and Camera traps to monitor the tiny co-inhabitants of a popular ski resort, who were mostly of the broad-toothed rat and swamp antechinus variety.

But one icy night on this trip I had a magic experience - standing alone under moonlit snowgums, cradling a small canvas pouch against my chest for warmth. Inside was a critically endangered Leadbeater's possum, one of fewer than 1000 individuals thought to be living in the wild. Happening upon this creature, with it's tiny striped face, soft fur and beady eyes, was a rare and sobering discovery, and one I couldn't quite believe.

Re-releasing this little possum back into its wild home was an experience that struck me with profound clarity and purpose. It was the first time in my life that I was personally confronted by very real consequences of climate change and extinction, and it awoke a deep sense of interconnection and responsibility within me.

In those moments I made a promise to myself that I would do everything in my power to prevent the extinction of the Leadbeater's possum and other threatened species in Australia, and I have been working to bring other young people along this journey with me ever since.

So with this in mind I thank you for having the courage and caring to Embrace the Wild in your own life. Whether you do just one project, take the time to notice and nurture the wild lives' around you, or perhaps even devote your own life to conserving people and planet, we can all make room to care for other living things. Together we are shaping a brighter future, one that celebrates the interconnectedness of people and the natural world, and the glorious technicolour of life in all of its diverse forms.

Jessica Pinder (co-creator of Embrace the Wild)

An encounter with a Leadbeater's possum sparked a promise by Jess Pinder to take responsibility for nature
D Harley

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Background

The Jane Goodall Institute

The Jane Goodall Institute is a global community conservation organisation that creates sustainable solutions to support all life on Earth.

Dr Jane Goodall, world renowned primatologist, humanitarian, conservationist, and United Nations Messenger of Peace, founded the Jane Goodall Institute (JGI) in 1977. The Institute now has offices worldwide representing over 50 countries, which are united by a mission to support wildlife research, education and conservation for animals, people, and our shared environment. We provide education programs for community and schools, promote leadership opportunities, and support fundraising and conservation efforts.

We invite you to join us as a member of our flagship program, Roots & Shoots, designed to unite and empower young people to make a difference – learn more in 'Join Roots & Shoots'.

Embrace the Wild

Embrace the Wild is a global community conservation program of the Jane Goodall Institute, that seeks to restore habitats and community connection to the natural world.

Our mission is to help living things flourish, especially in environments that have been heavily shaped by humans. By taking achievable, meaningful actions at home or in our local communities, collectively we can all make a big difference.

Embrace the Wild will inspire connectedness to the natural world and actions that will help to save it. This book will guide you through five stages on your journey, as you Embrace the Wild within and around you.

Why is Nature Important?

Ecosystem Services

Nature is about more than the trees and animals around you. It is an incredibly intricate and complex system of relationships between different species interacting with other living and non-living things (such as rocks and water) to not only enable their own life, but consequently, add to the tapestry of processes that the Earth, and therefore people, need to exist. We call these ecosystem services. These range from services such as climate control and disease regulation, to providing food, oxygen, fresh water, medicines, and nutrient recycling, as well as cultural services including spiritual and recreational opportunities.

Humans are reliant on these free services provided by nature; however, we often overlook what nature needs in order to provide them – such as specific nesting habitat for native bees so that they can provide pollination services.

Your reason for Embracing the Wild may be simply to encourage beautiful butterflies into your garden, or to grow a few veggies for dinner. But as individuals promoting nature, cliqued as it might sound, we really are making the world a better place. This book is packed with projects and the steps to take that will help you do just that.

But to kick off, we will dive into some of the core ecosystem services that are specifically promoted by our Embrace the Wild projects so you can be aware of how your actions really are helping the planet at large.

Nature provides life for all
Abbie Mitchell

Teddy bear bees are fabulous buzz pollinators

Ausnative

Pollination

Pollination is the fertilisation of a plant via pollen transfer from the male part of the plant to the female part of the plant – on either the same plant (self-pollination) or between flowers on different plants of the same species (cross-pollination).

Pollination is vital for plants to create seeds. Given that plants provide oxygen, food, animal habitats, medicinal sources, timber, fibres, climate control (such as shade or winter sun), wind breaks, erosion control, water recycling, ground nutrients, carbon sequestration, and beauty – humans could not exist without them!

For some plants, pollination can occur by wind or water. However almost 90% of flowering plants need an animal pollinator. The introduced European honeybee may be the most well-known, but there are many other insects that pollinate flowers: butterflies, flies, moths, wasps, beetles, ants, and over 2000 native Australian bee species. Other animals also provide pollination services, including lizards, flying foxes, birds, rodents, gliders, and possums.

There are many ways that you can support these pollinating animals in your own neighbourhood - in particular, by providing habitat. This means a constant seasonal food source from the pollen and nectar in flowers, and perhaps also the host plant for caterpillars (butterfly larvae) or nesting or sheltering site for bees or gliders for example.

Projects that benefit pollinators range from the obvious such as a Bee Hotel to providing a Nest Box for a sugar glider!

Look for this symbol beside projects that promote pollination

Seed Dispersal

Animals that eat fruits (such as bower birds and flying foxes), or seeds (such as finches and ants) provide a vital service in distributing the seeds of the parent plant to new ground. As humans continually fragment habitats with our housing or farms for instance, we rely more and more on animals to travel between areas of habitat to allow plants to reproduce. Some species such as flying foxes can travel huge distances transferring pollen and seeds across greater areas than other animals could cover.

The spectacled flying fox is a keystone pollination and seed dispersal species

Matt Wright

But many people do not like flying foxes and attempt to deter them in their area. However, by coexisting with these species we are also helping ourselves. Therefore, sometimes projects for species such as flying foxes may be as much about educating the community to embrace a species as it is in providing habitat.

Look for this symbol beside projects that promote seed dispersal

Food Production

Plants provide essential food that support us, and entire ecosystems. Many different parts of plants are edible, including roots, seed, leaves, fruits, sap, nectar, and pollen – and the resulting foods such as honey.

A veggie patch or fruit trees will not only provide you with fresh seasonal produce but can also support wildlife. Check out our project guides on Vegetable Gardens, Regrowing Vegetable Scraps and Companion Planting, to find out how you can grow vegetables, attract pollinators, and sustain insectivores such as microbats, who will naturally control pests (including aphids or mosquitoes) without using chemicals.

Lilly pilly's provide nectar and fruit for many species

Resa Infinite from Pixabay

Local native plants can add a lot of value to your area too and are often the first choice for native animals. You might even find there are edible varieties of native plants that are resistant to pests and require minimal watering. Ask your local Council or community nursery for advice.

Look for this symbol for projects that promote food for humans and animals

Species such as the long-nosed bandicoot are ecosystem engineers – helping to turn over nutrients in the soil

Danielle Shaw from Pixabay

Nutrient Recycling

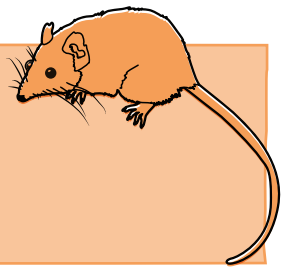
Many species provide nutrient recycling services by recycling carbon, oxygen and nitrogen from dead or decomposing plant and waste matter (faeces and dead animals) as they break it down and turn it through the soil. This recycling of nutrients supports the growth of many plants, so is vital in supporting our environment and food systems.

Bandicoots, brush turkeys and lyre birds can leave obvious traces in the garden as they scratch about, aerating the soil and moving leaf litter around. However, much nutrient recycling is carried out by invertebrates – most notably the earthworm, but also by millipedes and native cockroaches for instance. We have several great projects to promote nutrient recycling that will help to create healthy, nutrient-rich soil.

Look for this symbol for projects that promote nutrient recycling

ECOTIP: KNOW THE NATIVES

Some native animals such as antechinus and native rodents are often mistaken for introduced species and are killed, when in fact they can be great for controlling them!



Spiders such as the St Andrew's Cross are fantastic for insect control and also provide a food source for other animals

Louise Robinson-Lay

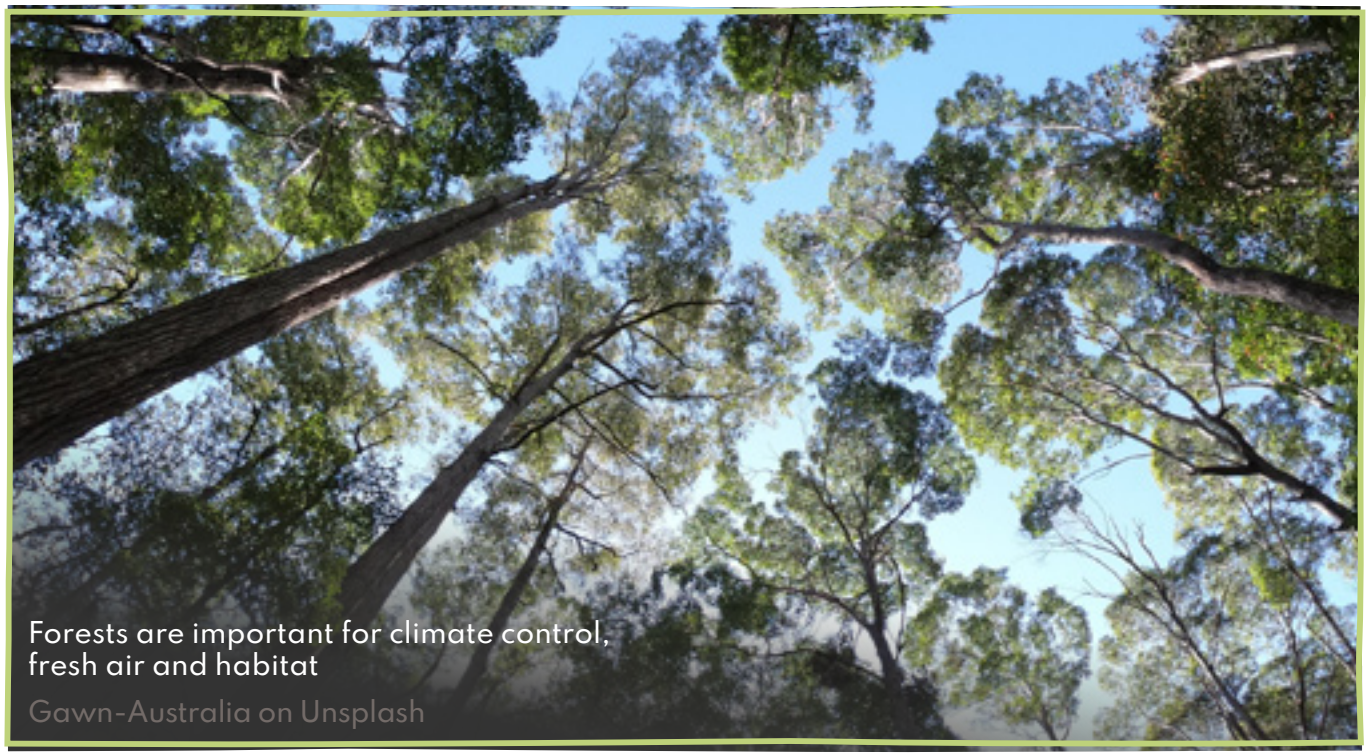
Pest Control

In our efforts to be comfortable, hygienic or maximise agricultural produce, humans have developed toxic chemicals that not only kill target pests but also directly kill other animals. Products such as weed killers can also kill beneficial insects such as caterpillars (and consequently butterflies). Many plants contain systemic chemicals that infuse the pollen and nectar that end up poisoning pollinators, and that we also ingest in the fruits and vegetables produced. We are killing spiders that control mozzies, and other insects that sustain birds, reptiles, frogs, and mammals. Some chemicals are causing secondary poisoning to animals such as blue tongues who eat snails poisoned by snail bait, and we kill owls that have predated rats targeted by rodent bait. The irony is that in killing these 'pests' we are also reducing the effectiveness of nature to sustain us.

Embrace the Wild has many projects that can assist to control pests in your area without chemicals. In other words, by encouraging animals that prey on other animals we can reduce pests that bother us. Praying mantises, lacewings, robber flies, dragon flies, microbats, lizards and loads of birds control mosquitos, ants, cockroaches, flies, and caterpillars, just to name a few. We also need to consider if a little nibble here and there is really such a big price to pay for organic fruit and veggies when the munching caterpillar becomes the pollinating butterfly.

We offer a few projects to encourage animal pest predators, and also some projects to reduce pests – such as companion planting and natural pest controls. Lastly, if you do decide to use chemical controls – make sure you read the packet very carefully as you are likely to be killing way more than the product suggests.

Look for this symbol for projects that promote natural pest controls



Forests are important for climate control, fresh air and habitat

Gawn-Australia on Unsplash

Regulating Systems

This is a big one, but without getting too detailed just think about what one large tree provides. Through photosynthesis it provides oxygen for us, improving the air quality in our dense urban areas. It promotes water recycling via the process of transpiration and evaporation, whereby water drawn from the soil is cycled back into the atmosphere to gather into clouds and fall back as rain – removing any impurities in the process such as pollution in the water taken in by its roots.

It absorbs carbon dioxide from the atmosphere and stores carbon in its wood. The canopy provides shade, and protection from heavy rain giving smaller plants a chance to establish. The roots hold the soil together to stop erosion or the wash of sediment sliding down a hill into a creek for example, and collectively trees provide a filtration system promoting cleaner water along waterways. The leaves and branches fall to the ground to become nutrients to sustain further growth in the web of life around it too.

Trees also provide food, medicines, fibres, building materials and multiple animal habitats within their bark, roots, timber, on branches, in tree hollows, and even within the leaves, flowers and fruits themselves.

Trees and other plants reduce the local temperature through both the shade provided, and the water recycling (evapotranspiration), and planting more of them is vital in our efforts to reduce global warming. Lastly, trees are incredibly beautiful, sculptural, diverse, and interesting!

Look for this symbol for projects that promote trees and plants

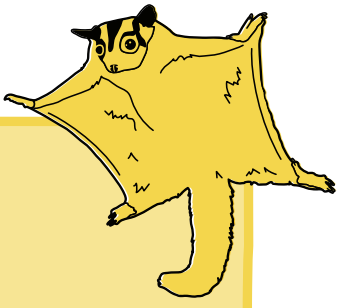
Be inspired, be humbled, be in nature!

Puyalroyo

Human Health and Wellbeing

All of the ecosystem services provided by nature benefit human health and wellbeing both directly and indirectly. Many are important for sustaining us with healthy food, oxygen, and nutrients, but we also benefit from being out in nature. There are known links between our access to green spaces and nature and our mental wellbeing. It is so important that people can see and interact with natural areas in their own neighbourhoods and to literally take the time to smell the flowers and touch the earth.

Look for this symbol for projects that promote human health and wellbeing



ECOTIP: PROVIDE CONNECTIVITY

Many Aussie marsupials are arboreal and need the connectivity of tree branches, rooftops, fence railings and even wires, to move safely above the ground. If forced to the ground they are in danger of car strike and predators.

Help connect the dots!

Clean water is vital for a healthy environment
Kikki Starr

Waterways and Environments

Freshwater habitats provide important fresh water for both humans and animals. Water is important for our survival and the freshwater systems near our homes help to provide clean drinking water for ourselves and wildlife. If we support the diverse species that live in the water, then they provide a natural filtering system and can help to increase the biodiversity in our local rivers and ponds too!

A lot of our freshwater systems can collect rubbish and pollution from human activities, so a simple River or Beach Clean Up can be really beneficial to all of the animals that live there – as well as ourselves. Other species also need access to fresh, clean water, so providing these in your garden such as Watering Stations, Bird Baths and ponds can help animals stay hydrated and provide habitat, even if there is not a natural water source nearby.

Look for this symbol for projects that promote freshwater habitats

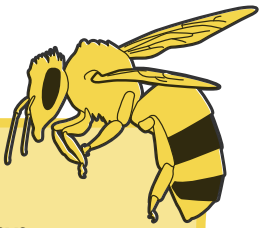
Biodiverse ecosystems function more efficiently. The yellow-tufted honeyeater is a great pollinator

Alex Lay

Biodiversity

Increasing the biodiversity in an ecosystem helps it to maintain important ecosystem services. As we have seen, different animals have niche roles such as decomposers and pollinators. But the relationships individual species have with their own species and other species, including competition for space or food, seasonal cycles and the complex food chains that exist, means that the more and varied habitats we can provide, the greater opportunity there is for different animals to coexist in an area, making it a more interesting and productive environment!

Look for this symbol for projects that promote freshwater habitats.



ECOTIP: BIODIVERSE GARDENING

Attract wildlife with a native garden that offers seeds, pollen and nectar, invertebrates and fruits, places to rest, nest and hide, different microhabitats, nesting materials, water, and connectivity!

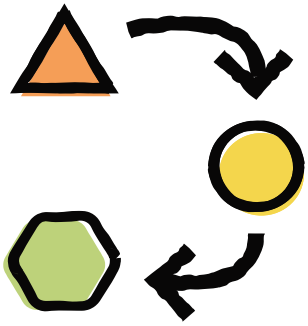
How to Embrace the Wild

Embrace the Wild is a global program however this edition has been tailor made for our Australian environment. This program is designed in stages that will walk you through how to identify local habitat and community needs and select a project to improve your neighbourhood. The projects range from dead-easy to requiring a bit of skill or a skilled helper; for areas with limited space, to those with abundant room; and even projects to get you out to make a difference in the wider world. Each project provides a link to plans and instructions that outline the very best practise, authority, and science-backed reason for the approach. Check out our website for more detailed instructions to support each project.

At the end of this book, you will find a bunch more helpful links to follow up projects with research, species identifications and monitoring tools. We offer some tips to educators and some cool case studies to inspire you too. So, get ready to Embrace the Wild and make nature a feature in your life!

INVESTIGATE

Explore and understand the ecosystem around you

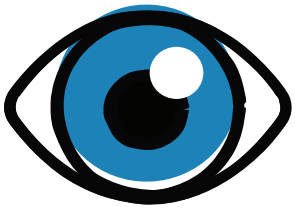


PLAN

Identify an opportunity to make a difference

TAKE ACTION

Build, grow and create a new habitat!



MONITOR

Observe and measure the impact of your project

CELEBRATE

Reflect, share, and celebrate the difference you have made

Action 1: INVESTIGATE

Habitats

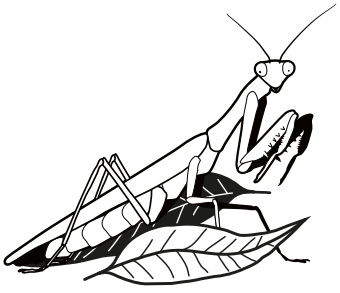
Habitats are the natural environment that provide the requirements for a living thing to feed, shelter and reproduce. Habitats differ enormously depending on the geographic location, and can be broadly identified as being a woodland, rainforest, wetland, heathland, alpine area, grassland, or desert for example, but essentially, all of these are made up of many smaller microhabitats, that offer very slight variation in conditions particularly temperature, light, or air.

The underside of a mossy log, a fallen leaf or a slippery rock in a stream are microhabitats. Thinking at this scale, you can easily imagine the tremendous variety of habitats and microhabitats that exist in the landscape all around you.

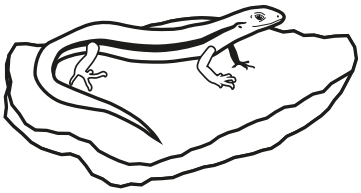
Generally speaking, the more microhabitats that are available, the greater diversity of life an environment can support! Complex ecosystems such as a tropical rainforest which foster many microhabitats, allow for a larger diversity of living things to coexist in harmony. This is because different species of plant, animal and fungi often find 'niches' in microhabitats and develop complex food chains, and specialised adaptations, which allow them to thrive.

Importantly though, you need to understand the habitat around you to support it. Habitat Mapping is a great method to investigate and assess your local environment and consider what you can do to improve it.

Some examples of microhabitats include:



Praying mantises are carefully camouflaged to hide among foliage and surprise their prey



Small skinks may bask on a warm rock with nooks to escape predators

Leaf litter creates many small microhabitats for insects and larvae to forage and grow

Gliders shelter in tree hollows that provide thermal protection from heat and cold

Animal Clues

The tracks and traces that an animal leaves behind can help you to find out what kinds of wildlife live in your area.

Footprints

Animal tracks are best spotted in bare earth including on riverbanks, dry creek beds and dirt paths. In your own backyard, you could try creating a footprint trap by placing a tray of sand or raking an area of smooth dirt where animals may be active. Checking the trap after a few days, may reveal footprints that you can use to identify the visitor.

Keep in mind that identifying animals using their prints or tracks can be tricky. It is rare that you will find a perfect track. More often you will find partial prints that will look different depending on whether they are in wet mud, sand, snow, or hard dirt.

Clockwise from here: Magpie prints, spotted-tail quoll prints, swamp wallaby prints, lace monitor prints

Abbie Mitchell

Blueberry ash berries

This scat contains berries eaten from beneath a nearby tree

Abbie Mitchell

Scats and Droppings

Scat is a word commonly used to describe any kind of dung, dropping or poo from an animal. Some animals use their scats to mark their territories, in which case you may find them displayed on rocks or logs. You will also find scats in areas where animals spend a lot of time, such as near nests or burrows and along creek banks.

Scats can tell us much about the animal that made them, such as the species or size of the animal. For example, birds and reptiles only have the one opening for waste (cloaca) so their urea and faeces are expelled together. Their scats often have a clear white and brown component, or liquid surrounding it. We can also tell what foods make up an animal's diet, and the freshness of the scat gives a hint about how recently the animal visited the area. While you may need an identification key to find out the species, it is usually easy to tell whether the animal was a carnivore, herbivore, omnivore, or insectivore:

Carnivores

As carnivores predominantly eat meat, their scats may have a strong smell. You may see traces of animal remains, including bones, feathers, or hair. In general, these scats are likely to be cylindrical and pointed.

Herbivores

Herbivorous animals eat plant materials, so their scats tend to be produced in larger quantities and have a greenish colour to them. Using a stick, break apart the scat to get a better clue. Herbivore scats are more fibrous, and you may be able to see partially digested leaves, grass, seeds, or berries.

Omnivores

Omnivorous animals eat a combination of both plant and animal material, so their scats will contain a combination of plant fibres and animal parts, including eggshells and bones.

Insectivores

Because insects are the primary source of an insectivore's diet, their scats contain shiny remains of insect bodies and wings. In general, insectivore scats can be more easily broken than other scats and may also contain large amounts of soil or wood fibres.

Homes and Habitats

Just like humans, animals need safe, warm, and dry places to sleep. Some animals live in permanent homes throughout the whole year, while other animals have numerous shelters which they travel between.

While some homes are built by the animals that use them, many rely on natural structures such as tree hollows or caves or have adapted to use human-made shelters to survive.

In some cases, it is obvious what kind of animal is using a particular shelter. For example bird nests are easy to identify - but most of the time you will have to use your animal detective skills to determine the occupant.

Keep an eye out for feathers, fur, skin, scats, tracks, and leftover food items that will help you understand whether a shelter might be occupied by a bird, reptile, insect, or mammal.

- Burrows can be home to many kinds of mammals and sometimes even birds such as pardalotes and reptiles such as dragons.
- Caves and rock fissures are great shelters for many species of microbat.
- Shrubs and grass tussocks are used as nest sites or rest sites for animals such as frogs and lizards.
- Hollow logs may hide insects, small reptiles, mammals, and frogs.
- Tree hollows are an important shelter for birds, mammals, reptiles, and frogs.
- Buildings can also be occupied by animals.
- Some social wasps, ants, and bees build mounds or hives to home their colony.
- Holes and scratches in the dirt are good indicators of mammals such as bandicoots that have been looking for fungi, plant roots, larvae, or insects.
- Runways are paths that animals such as bush rats and wallabies create through regular travel in an area.

Tree hollows are vital places of refuge and nesting for over 300 species including the Galah

Nina Matthews

Sounds

Animals can be masters of disguise, so it is far more likely that you will hear an animal than see it! Many species can be identified by their unique sounds or calls. These noises help animals communicate with one another.

While some people are skilled at identifying animals by their calls or sounds in situ, an alternative is to record a call on a phone for identification later. Many online resources and phone apps are available that can help you identify species based on your recordings – see helpful links for details.

Some animal calls to listen out for:

- Many birds call to locate or warn others, or sing to attract a mate.
- Microbats (not to be confused with flying foxes) make chirps that help them find their prey by echolocation. The sounds are so high pitched that only a few species can be heard by humans!
- Male frogs croak to attract females and defend their territory from other males.
- Some insects make noisy calls by rubbing their body parts together (called stridulation) or drumming on thin membranes called tymbals.
- Many mammals have a distinct call such as possums that growl, the yip-yip call of a sugar glider or the alarmed squeak of a bandicoot.

Animals can also make a unique sound as they move about:

- Lizards make a scurrying sound as they scramble through leaves.
- Wallabies and kangaroos move with a thump-thump sound.
- Kookaburras often tap their food on tree branches.
- Some birds have a distinct flight sound such as the flittering of the spinebill or the whistling sound of a wonga pigeon.
- Flying insects sound different if you listen carefully - such as the low buzz of a teddy bear bee or the sporadic bzzzzz of a blue-banded bee compared to the drone of a fly.
- Listen out for the plop of an animal such as a water dragon dropping into water to hide.

An eastern water dragon may swim away to avoid an encounter

D Gordon E Robertson

Yellow-tailed black-cockatoos leave a messy pile where they have been eating banksia seeds

Abbie Mitchell

Brushtail possums often scratch trees as they move about

Abbie Mitchell

Other Traces

Animals often leave behind clues where they have been feeding. Chewed leaves, partially eaten fruits, and the remains of prey animals are classic examples. Field guides and online resources can provide traces to look out for. Remember that animals tend to hide from humans so look under shrubs, beneath trees and behind buildings for clues.

- Tree-dwelling (arboreal) animals like possums and some goannas leave scratches as they climb trees.
- A chewed branch or tree base might suggest exotic animals such as deer or goats are present.
- Trees oozing sap or displaying cuts may indicate a glider has been feeding.
- Chewed leaves are often a sign of insect or mammal activity including leaf cutter bees, possums, or koalas.
- Birds such as cockatoos and mammals such as fruit bats often leave behind partially eaten fruits and seeds.
- Carnivores will occasionally leave behind remnants of their prey including broken eggshells, feathers, and bones.
- Owls create pellets – the regurgitated remains of their prey - which feature feathers, fur, and bones.
- Scraped leaves and twigs may indicate an echidna, bush turkey or lyre bird has been foraging.
- Poke holes in the dirt can show where a bird such as a magpie has been hunting for ground-dwelling invertebrates.
- Flattened grass may show where an animal such as a kangaroo has taken a nap.

Nesting materials in a tree hollow

Abbie Mitchell

Poke holes made by bandicoots

Abbie Mitchell

Activity 1: Habitat Mapping

Time: 2+ hours

Materials: Map of your focus area, and coloured pencils / markers in a variety of colours

Maps are a great way to identify habitat in your local area. In this activity, you will learn how to use a map to record local habitat and determine what you can do to help improve it. Note the examples of Animal Clues in the previous section and have a look through Activity 2: Wildlife Detective before you head out so you can keep your eye out for these things as you survey your area.

Getting Started

Start this activity by downloading a map or drawing one of your project area and surroundings. Your map should show your focus area such as your backyard and local houses or perhaps your school or university area.

We recommend that you start with a simple black and white line map, rather than a coloured satellite image.

While a satellite view will help identify different environments, a simple map (right) is easier to use for colour coding

Colour Coding

Now that you have your map, it is time to start identifying the main features described below. To make it easy to compare, we are going to use key colours to differentiate where these occur on the map.

Human Structures

Urban environments are filled with human structures like transport routes, energy infrastructure, and buildings. Some such as roads and fences can prevent animals from moving across the landscape or increase their risk of injury as they do. Other structures can limit habitat available to wildlife and make it difficult to find food or shelter.

By identifying built features, we can consider their impact on plant communities and native wildlife. This activity provides insights into actions we can take to improve safety, habitat, and connectivity for the local wildlife.

A wide road can cut habitat into smaller fragments making it dangerous for animals to move safely

Colour human structures on your map in dark grey

Water Resources

Water is essential for all life, so locating freshwater can provide clues about the route an animal may travel to access it. This includes creeks, rivers and ponds, as well as swimming pools, bird baths, dams or sprinkler systems.

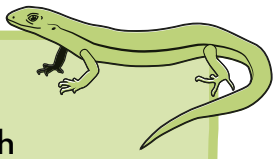
Colour water resources on your map in light blue

Plant Communities

Plants are the foundations for healthy habitats that humans and wildlife depend upon. They provide all the essential resources that we need to survive, including food, shelter, and the oxygen we breathe.

To map plant communities in your area, go outdoors and record what you see. You may wish to take a camera with you, to help identify any plants that you would like to learn more about later. Lots of online resources are available to help you identify plants, some of which are detailed on our website.

Of course all plants provide important ecosystem services, but for this exercise we are going to focus on five key plant types which represent different habitat opportunities for animals.



ECOTIP: BARE EARTH FOR BIODIVERSITY

Leave some bare earth as nest sites for ground dwelling creatures such as native bees, beetles, grasshoppers, spiders, cicadas and skinks, and be careful not to disturb nest areas.

Trees

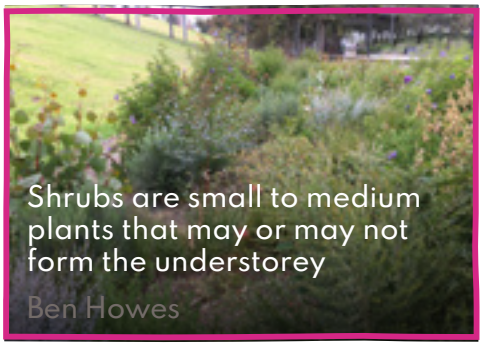
Trees are large woody plants with a tall main trunk. Trees help wildlife by providing habitat and food, which may include edible leaves, flowers, fruits, and seeds, as well as a canopy that shelters from the weather. Many older trees have hollows that are used by possums, gliders, microbats and birds for nesting, resting, or hiding.

Trees for habitat and soul!
Jose Pedro Ortiz

Use a light green colour to indicate trees and forested areas

Shrubs and Bushes

Shrubs or bushes are smaller woody plants with multiple stems. Shrubs provide a great hiding place from predators, and opportunities for nest building. Shrubs often produce flowers and fruits to attract birds, mammals, and insects, many of which are important pollinators and seed dispersers.



Shrubs are small to medium plants that may or may not form the understorey
Ben Howes

Use brown to indicate shrubs. If they are found in the understorey of forests, add brown dots on top of your light green colouring

Vines

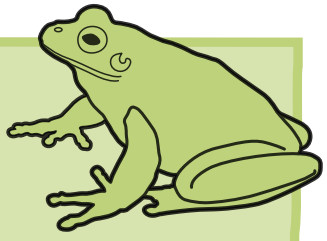
Vines are climbing plants that attach to all kinds of structures such as fences, buildings, and trees. Many vines provide abundant food resources and habitat for wildlife, and some have symbiotic relationships with pollinators like butterflies (especially their caterpillars), meaning that both species depend on one another for their survival.

Vines like hardenbergia can have beautiful flowers for pollinators or offer refuge for birds
Dereel

Use purple to indicate vines. If vines are found in the understorey of trees, add purple dots on top of your light green colouring

ECOTIP: KEEP IT WILD

The clearing of plants for farming or fire control is removing the homes of many species. Make sure there are some pockets of vegetation that animals can move between.



Grasses, Sedges and Reeds

Grasses, sedges and reeds are simple plants that have a narrow blade and slender leaves. Grasses are important because they establish quickly and can create large amounts of flowers and seeds - these are a valuable food source for many wildlife including pollinators. Reeds (round stems) and sedges (edged stems) are a very important component in wetland ecosystems.

Native grasses offer seeds for wildlife

MrsKirk72

Use orange to colour in grasses, sedges and reeds

Aquatic Plants

Aquatic plants are adapted to living either submerged in water or on the water's surface. They provide important cover for fish, provide oxygen, and act as a food source for wildlife. You can tell aquatic plants apart from algae by their stems, leaves or flowers.

Aquatic plants provide food and shelter for aquatic wildlife

Daniel Burkett

Use dark blue to mark aquatic plants

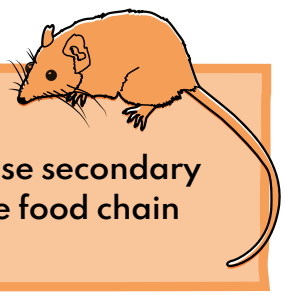
Monocultures

Monocultures are areas dominated by one species of plant. Cities and towns are highly modified from the natural environment, where areas can be dominated by plants that are not native or naturally found. Examples of this include lawns, such as in parks or ovals, as well as thickets of weedy grasses, shrubs or vines, that may have grown along roads or riversides.

A monoculture is an area that is dominated by a single species – including lawns

Lynn Greyling

Use yellow to mark out any lawns or areas where a single plant species has taken over. It may be possible to identify this from a satellite image, but if you can it's best to check in person!

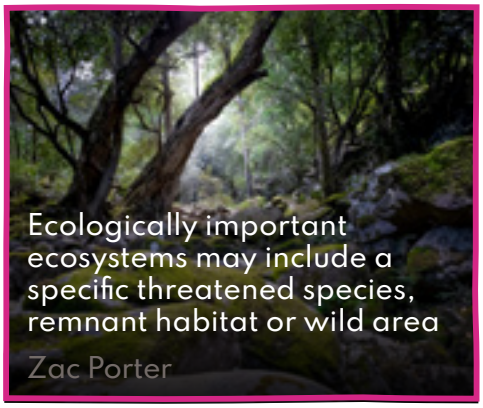


ECOTIP: AVOID CHEMICALS AND BAITS

Chemicals and baits used to control pests such as slugs or rats can cause secondary poisoning to other animals when they eat poisoned prey. Consider the food chain and opt for a natural solution.

Ecologically Important Ecosystems

Science tells us that some ecosystems are especially biodiverse, meaning that they support a greater range of different species. Some may be obvious and could include wetlands, mangroves, rainforests, intertidal zones, or other protected habitats such as national parks. Others may be less well known, and you may wish to do some research to find out whether there are any threatened or important ecosystems near you by asking your local Council, National Parks authority or community groups for example.



Ecologically important ecosystems may include a specific threatened species, remnant habitat or wild area

Zac Porter

Use pink to colour in ecologically important ecosystems

Other Notable Features

Your search may reveal other features in your area that could either positively or negatively impact wildlife. For example, you might spot an enormous old tree that features tree hollows or a cave that may home roosting bats or note a landfill or quarry area that could be causing harm.

Use red to mark out any other notable features

Tree hollows are prized habitat and definitely a notable feature

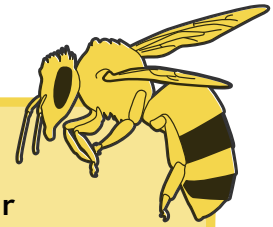
Abbie Mitchell

Interpreting your Map

Congratulations on your completed map! Your map is now a valuable decision tool to help you choose where you can make an impact! While at first it may appear to be a random assortment of colours and shapes, you can now tell what environments dominate. Ask yourself some of these questions:

- What is the main colour I see? What might this mean for wildlife?
- What habitat colours are missing or are underrepresented?
- Where are the multi-coloured areas? There is likely to be a lot of high-value habitats here!
- How well connected are the colourful areas? Can wildlife move safely from one to another?
- Where are the dark grey and yellow areas, where human structures and monocultures are likely to restrict wildlife movement?

Your map will help you answer these and other questions in Action 2: Plan Your Mission.



ECOTIP: MORE FLOWERS PLEASE!

Bees need a constant supply of flowers to provide their food. The closer food is to their nest site, the less time they need to spend travelling and the more time they can spend nesting - meaning more bees!

Activity 2: Wildlife Detective

Time: 2+ hours

Materials: Your Habitat Map (or copy of it), notebook and phone / camera

Animals live all around us, even in the biggest cities though we do not always see them, especially if they are rare, shy, nocturnal, or well-camouflaged. As we have just discussed, animals leave many clues.

This activity is about finding and recording any traces, tracks and scats for animals that live in your area. You may want to investigate your area several times and at different times of day, in varying weather and seasons. Birds are most active at sunrise, and most Australian mammals are nocturnal. Some animals are only around in certain seasons, such as those that migrate and insects that have an annual lifecycle. Additionally, most animals avoid really hot, cold or wet weather, so it is a good idea to note the conditions and time of year in your survey and repeat it a few times. There are more tips and methods included in Activity 4 and 5 that you might like to consider at this point too.

By being quiet and moving slowly you are more likely to notice clues of animal activity

Pat Whelen

Preparing for your Expedition

For the activity, we recommend bringing the following items:

- A friend, parent, or guardian.
- A notepad and clipboard to record your observations.
- Your Habitat Map (or copy of it) from Activity 1.
- A digital camera or mobile phone to photograph animal clues or habitat.
- A pair of binoculars (if you have them) to help you see animals at a distance.
- A magnifying glass (if you have one) to see tracks and traces up close.
- A spotlight or torch if you are heading out at night.
- Good walking shoes.
- A water bottle, sun hat, sunscreen, and snacks!
- Insect repellent.
- Weather dependent: a raincoat and/ or waterproof walking shoes!
- A field guide – which may be a published guidebook, app (see Helpful Links) or research you have collected about your local wildlife.

Embarking on your Expedition

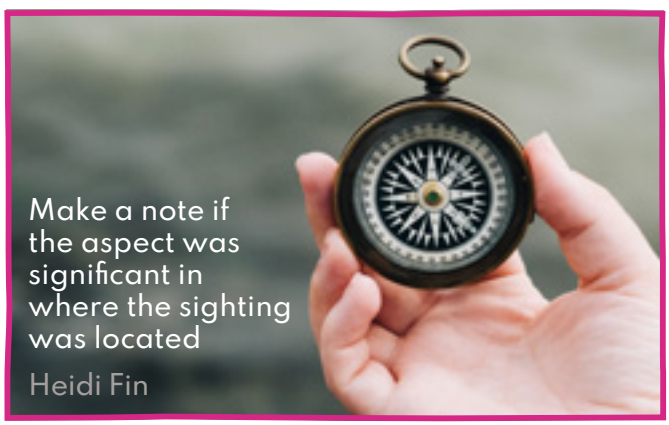
Walk around your local area slowly and quietly – if you are too fast and noisy you may miss clues or scare animals off! Pay attention to places you think animals may like to hide, especially in or under hedges and trees, dark spaces or near water and food resources. Look up, down and under – think like an animal, as you look for them, and their clues!

Recording your Success

Take a photo or do a sketch of your clue or record any sounds so you can identify it later. When you do see a clue or wild animal, taking note of key details can really help with identification. The tips below will help make this easier.

- **Identification:** If you see any animals, note the size, shape, colour, behaviour, and any markings or features (such as stripes or tail length) which may help you identify it later. You may even grab a reference and use it as a comparison for size (such as noting the bird you saw is twice as big as a reference leaf) then measure it later.
- **Location:** Mark the location where the clue (or animal) was seen. Include as much information as you can, such as the kind of habitat, and whether it is natural or made by humans, and why an animal may be using it (a food or nest site). Also note how old the clue is (such as a dry scat compared to a fresh one).
- **Distribution:** Most field guides and the Atlas of Living Australia (see Helpful Links) offer a distribution map which can assist in determining which species may live in your area. This is especially helpful when determining between similar species.
- **Behaviour:** Write some notes about what the animal is doing to try and understand its behaviour. For example, do you think it might be searching for food (what type?), resting (where?) or moving between habitats (which ones?). Consider the clues when using the field guide – for example it may mention that an animal takes flight in a certain way if startled, which matches your observation.
- **Context:** Record whether the animal is alone or in a group. If there are many animals, how many are there, and are they all the same species? What time of year is it? What are the conditions like including the temperature, wind, rain, or other factors such as smoke haze? Note the date, season, and time of day.

Check out Action 4: Monitoring Your Project to find out more about how to turn your notes and observations into data that can be used for citizen science!



Make a note if the aspect was significant in where the sighting was located

Heidi Fin

Note any animal behaviour such as these two male grey kangaroos sparing for dominance

Arun Clarke

Action 2: PLAN

Using your new knowledge of the plants and animals in your neighbourhood, it's now time to design a simple project that will make a big difference!

Before selecting an Embrace the Wild project, you must understand any gaps between what an animal needs to survive, and what the local area is actually providing. By systematically focusing on what essential habitat exists, what is missing, and what could be improved, you will be able to select a project that addresses that need aiming to assist your local animals and community.

Take some time to consider the questions in this short quiz. It will help you to look at your neighbourhood from a completely different perspective! - that of the animals that live in it. It may even help to 'think like an animal' (and even a few different species).

Activity 3: Project Planning Quiz

Instructions

Use your Habitat Map (Activity 1) and Wildlife Detective findings (Activity 2) to answer the quiz questions. On the scale below, select the number between 0 and 5 that best represents your project area. Each question will provide important insight in its own right to guide focus areas, but you could also add all the scores together to get an indication about the habitat quality of the entire area – summarised at the end of the quiz.

1 **How urbanised is the landscape around your project area?**

Does urban infrastructure such as buildings, concrete, roads and lawns feature heavily in the landscape? What proportion is represented by greenspace (such as parks), or other natural features such as trees, gardens, grasslands, and water?

You can refer to a satellite image via Google Maps (and compare green areas to grey areas) or your Habitat Map (remembering you coloured grey for urban areas and yellow for monocultures such as lawns), to rate the proportion of urban and natural spaces.

Completely urban **1 2 3 4 5** **As green as can be**

If you have a low score, it sounds like you could do with more greenspace! Check out our projects on Vegetable Gardens, Regrowing Veggies, Pollinator Gardens, Caterpillar Nurseries, and Shrub Shelters.

2 Connectivity

How connected is your project area to natural habitats?

Nature reserves and forest patches provide food and shelter for animals that may live near humans. Some creatures like birds, flying insects, bats and other mammals may travel to and from urban spaces frequently.

Looking at your Habitat Map and surroundings, are there any high-value habitats or large forest patches nearby for animals to use? How connected are these patches to your project area? Is there a park, habitat corridor or conservation area nearby? Is it close enough for an animal to travel safely by foot, or is the connectivity only really suitable for animals that can fly over urban spaces such as roads? This will determine the types of animals that can travel, or that are able to travel, to your area – for example many native bee species only have a short flight range.

No close natural habitat **1 2 3 4 5** **Great natural habitat**

To improve connectivity, check out our habitat creation projects like Pollinator Gardens, Shrub Shelters, Frog and Turtle Ponds. You may want to encourage your neighbours too, and together build toward creating a wildlife corridor.

Connecting branches provide an elevated runway for possums and gliders
Abbie Mitchell

3 Water

Is there a water source nearby?

Animals and plants need a reliable source of fresh water year-round to survive. This can come from a variety of sources including rainwater, ponds, wetlands, creeks, rivers, and lakes.

Does your project area have a steady supply of fresh water that a variety of animals (such as insects, birds, and reptiles) can access?

No water **1 2 3 4 5** **Close constant supply of fresh water**

If you scored low on water resources, consider projects including Frog and Turtle Ponds, Watering Stations, Bird Baths and Wetland and Freshwater Conservation!

4 Microhabitats

How many different sorts of microhabitats are there?

Microhabitats are small-scale habitats, like the underside of a log or a rock in a stream. Microhabitats can also be provided by specific sorts of plants such as trees, shrubs, herbs, and grasses.

Think back to when you explored your project area and its surroundings. How would you rate the site for microhabitats? Does it provide variation for different kinds of animals to live?

No microhabitats **1 2 3 4 5** **Many microhabitats**

For projects that score low on microhabitats, check out our instructions for Minibeast Hotels, Bee hotels, Frog Habitats, Frog and Turtle Ponds, Shrub Shelters, Nest Boxes, Lizard Lounges, and Leave your Leaves.

Rotting logs can provide a cool moist environment for invertebrates

Devon Mackay from Unsplash

5 Plant Diversity

What is the plant community like?

A plant community is made up of all the different types of plants that are found in one place or habitat. Healthy plant communities usually have a layered structure, starting with ground covering plants like grasses and herbs. The mid-story is filled with shrubs and tree saplings of varying heights. Finally, established tall trees make up the canopy or roof of the patch. Mixed among the different layers are climbing plants like vines, which can also provide important food resources.

Thinking about your project area, how diverse and layered is the plant community?

Poor plant community **1 2 3 4 5** **Excellent plant community**

If your project area scored below 2, or to improve it further, check out our projects on Shrub Shelters, Caterpillar Nurseries, and Pollinator Gardens!

6 Flowers

Is there a selection of seasonal flowers available all the time ?

The pollen and nectar within most flowers provides an important food source for many animals including fruit bats, birds, possums, and insects. In turn, these animals provide a vital role as pollinators in transferring pollen between flowers, and many also later transfer the seeds produced (as a result of pollination) to a new place to germinate. These animals also attract other animals that prey on them. Having plants that flower across different seasons can provide a constant supply of food, supporting large wildlife populations in your project area.

No flowers 1 2 3 4 5 Constant supply of flowers

If your project area scored below 2 for the availability of seasonal flowers, or to give the area a boost, check out our projects on Shrub Shelters, Vegetable Gardens, Caterpillar Nurseries, Regrowing Veggies and Pollinator Gardens!

7 Animal Diversity

How diverse is the wildlife that lives in your project area?

Biodiversity is the variety of living things that live in a landscape. When many different plants and animals are present, it is a sign that nature is doing well, and the environment is providing the animals that live there with the requirements they need to thrive.

This section will evaluate how well your project area is supporting the wildlife in your area.

During your Wildlife Detective expedition (Activity 2), how many different kinds of native animals did you record? For this part of the quiz we have separated the species by class (sub questions marked 7a-e). You can also count the traces of different animal species you observed such as nests, burrows, tracks, calls and scats, if you have a reasonable idea of the type of species that made it.

The numbers below (0-5) do not represent the exact number of species you recorded – but rather provide a scale for the diversity. You will need to consider if the number of species you saw seems low or high (as a proportion of what may occur in the greater area); however also consider that there are likely many more bird species than mammal species for example. For example, if you only saw 10 bird species that may be low bird diversity (and you might rate it as 1 or 2), whereas if you saw 10 mammal species that may be good mammal diversity (and you might score that 4). So that you have a basis for comparison visit the Atlas of Living Australia for a list of the species that have been recorded within 1km radius of your project site – details in Helpful Links. You could even check them off as you see them and work out the percentage observed compared to those existing – which would really inform your quiz answer!

7a Birds

No birds **1 2 3 4 5** A huge diversity of birds

If you have a low score for birds, or would like to attract more birds, check out our projects on Shrub Shelters, Leave your Leaves, Bird Baths, Nest boxes, Caterpillar Nurseries, Friendly Fences and Shorebirds!

7b Mammals

No mammals **1 2 3 4 5** A huge diversity of mammals

If you have a low score for mammals, or would like to attract more, check out our projects on Nest Boxes, Friendly Fences, Pollinator Gardens and Shrub Shelters!

7c Reptiles

No reptiles **1 2 3 4 5** A huge diversity of reptiles

If you have a low score for reptiles, or would like to increase their numbers, check out our projects on Lizard Lounges, Frog and Turtle Ponds, Friendly Fences and Frog Hotels!

7d Insects

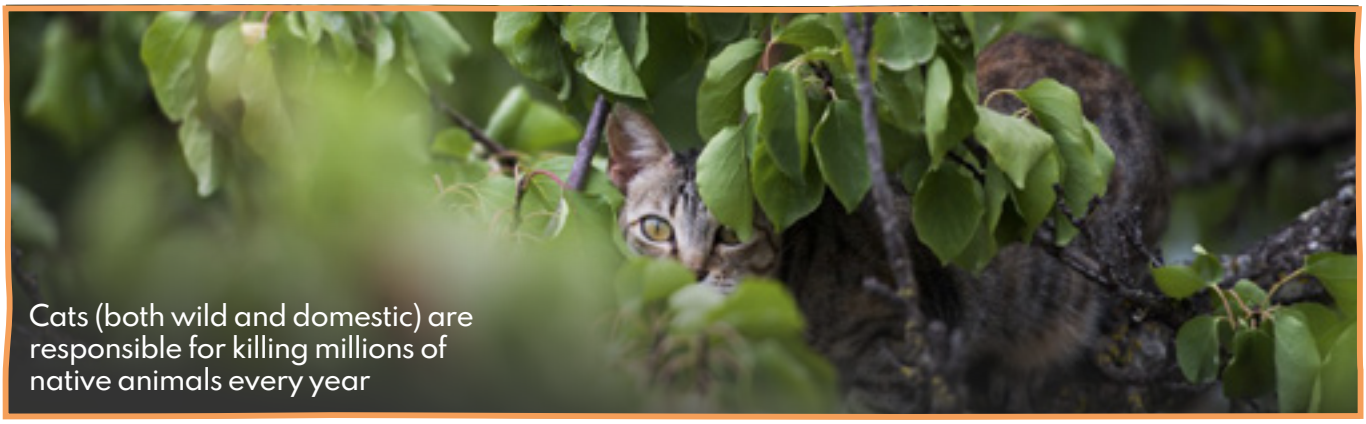
No insects **1 2 3 4 5** A huge diversity of insects

If you have a low score for insects, or would like to attract more, check out our projects on Minibeast Hotels, Bee hotels, Watering Stations, Leave your Leaves, Pollinator Gardens, Free Range Wormeries, Caterpillar Nurseries and Companion Planting!

7e Amphibians and other aquatic animals

No amphibians **1 2 3 4 5** A huge diversity of amphibians

A poor score for this category can be helped by the following projects: Frog and Turtle Ponds, Frog Hotels, River and Beach Clean Ups, and Wetlands and Freshwater Conservation.



Cats (both wild and domestic) are responsible for killing millions of native animals every year

8 Invasive Species

Are native or introduced species dominant?

Introduced species are plants and animals that do not naturally occur in an area and may have been intentionally or accidentally introduced by humans, or by animals dispersing seeds for example. Native species occur naturally in an environment.

Introduced species **1 2 3 4 5** **Mostly native species**

If there is a high proportion of introduced animals in your area, you can help native wildlife by providing specific shelter and food sources. Check out the following projects: Shrub Shelters, Pollinator Gardens and Caterpillar Nurseries.

9 Community Benefits

How does your project benefit your community?

An important part of Embrace the Wild is taking care of all living things around us, and of course this includes our local community! One of the best ways that Embrace the Wild can help your community is through food production, or natural 'pest' control, which provides great health and economic benefits. Involving people in your projects can also increase their time in nature, which is hugely beneficial for human health and wellbeing.

No benefit to community **1 2 3 4 5** **Great community benefits**

Embrace the Wild projects can help people as much as animals. To include your friends and local community take a look at projects including Vegetable Gardens, Composting, Regrowing Vegetable Scraps, Pollinator Gardens, River and Beach Clean Ups, Free Range Wormeries and Companion Planting.

10 Climate Benefits

How many mature trees are in your area?

Climate Change or global warming, along with species loss is the biggest environmental challenge facing the planet today. Where we can, one thing we can do to address this is to plant and retain more large and leafy mature trees that provide a bunch of important services to reduce the impacts of a warming world (see Regulating Systems on page 9). Rate the presence of mature trees in your area.

Note – if you live in a naturally sparse arid area such as a desert region for example this action may not be applicable to your local environment.

No mature trees **1 2 3 4 5** **Many mature trees**

If you scored poorly on this question or wish to increase the mature trees around your area, consider grabbing some friends to do the Rehabilitation and Regeneration project – or simply plant a tree or two at your place!

Interpreting the Results

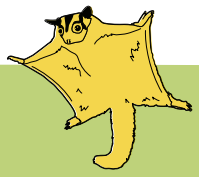
Total Score

Add the scores you received for each of the questions 1-10 to give you an overall score out of 50. Remember that the score for question 7 was the average score when the 5 wildlife groups were added together (and divided by 5). The results will help you identify the sorts of projects that can assist your local area.

Score 0-20: Your area is obviously lacking in habitat! It might be wise to start with projects that can attract insects (and eventually their predators) such as a pollinator garden and build towards adding other elements like a bee hotel and lizard lounge as it becomes more established.

Score 25-35: This is a pretty average score but there is definitely room for improvement. Review the questions and focus on where your weakest areas are to select projects that will provide a better environment for the animals and people around you.

Score 40-50: Wow! This is a great score! But of course, more habitat is always better than less. Apart from improving you focus area with some microhabitat projects such as a frog hotel for instance, you might like to work with your neighbours to improve connectivity across the broader landscape or use your skills to communicate the importance of habitat and ecosystem services - check out our Design and Communication challenges or perhaps create a biodiversity mural!



Action 3: TAKE ACTION

Build, grow and create a new habitat!

Activity 4: Choose a Project

The most important step in Embrace the Wild is choosing to take action for animals, people and our shared environment. Using your new knowledge about what may be lacking in your project area, it is now time to select some projects!

There are a number of considerations which might impact what project you choose, for example what target species you are aiming to help, size of your project area, the time you require to construct and maintain the project, your level of skill, and the cost of materials.

To help you navigate these factors, we've developed a handy chart that sorts Embrace the Wild projects by target species, skillset, assembly ease and resource requirements.

Embrace the Wild starts with your decision to make a difference

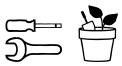
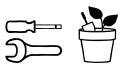
Abbie Mitchell

Project Chart

Benefit Key: Biodiversity, Food, Health and Wellbeing, Nutrient Recycling, Pest Control, Pollination, Regulating Systems, Seed Dispersal, Waterways

Skill Key: Construction, Design, Gardening, Planting, Rubbish Collecting, Weeding

Project	Description	Species	Difficulty	Time	Skills	Benefit	Resources
Nest Boxes	Install nest boxes to provide habitat and boost the population of native hollow-dwellers	Birds, possums, gliders, reptiles, microbats, and frogs	Difficult	2+ hrs			High
Ringtail Possum Drey	Create a nest habitat for ringtail possums	Mostly Eastern and Western ringtail possums	Moderate	2+ hrs			Moderate
Pollinator Gardens	Plant a garden to bring life to your backyard and attract an array of insects and other pollinators	Pollinating species including bees and other insects, birds, bats, possums, gliders	Moderate	2+ hrs			Moderate
Shrub Shelters for Little Animals	Plant shrubs to create habitat and provide food to little animals in your local area	Small birds and mammals	Moderate	3+ hrs			Moderate
Seeds Please	Provide seed-bearing plants for animals to feed on	Parrots, cockatoos and finches	Easy	2+ hrs			Moderate
Invertebrate Homes	Build a shelter for a specific type of invertebrate species	Bees, minibeasts and other invertebrates	Moderate	<2 hrs			Moderate
Leaves Your Leaves	Leave or collect your fallen leaves to provide habitat, food and nutrient rich soil	Small animals including insects and earthworms	Easy	15 mins			Low
Lizard Lounges	Build lizards the perfect habitat with a basking area and safe shelter	Lizards and skinks	Easy	<1 hour			Low
Bird Baths	Give birds a place to drink and bathe in your garden by creating a bird bath	Birds	Easy	30 mins			Moderate

Project	Description	Species	Difficulty	Time	Skills	Benefit	Resources
Nesting Materials	Build a nesting materials dispenser for birds to take materials such as sticks, leaves etc. to use in their nests	Birds	Moderate	30 mins			Moderate
Watering Stations	Provide a watering station so a wide range of animals can have a drink	Thirsty animals and insects	Easy	30 mins			Moderate
Caterpillar Nursery	Using a range of different plants, create a garden that caterpillars can use at each stage of their life-cycle	Caterpillars, butterflies and moths	Easy	1+ hrs			Low
Frog Hotels	Make your local frogs the perfect hangout to provide shelter and water by building one of the frog hotel options	Frogs	Moderate	1+ hrs			Moderate
Frog and Turtle Ponds	Dig, decorate and fill a pond in your area for frogs and turtles to use	Frogs and turtles	Moderate-Difficult	4+ hrs			High
Friendly Fences	Build, adapt or remove fencing to make it safe and friendly for wildlife to travel through, under or over	Birds, mammals, reptiles and amphibians	Easy- Difficult	2+ hrs			HIgh
Wormeries	Build a worm farm that can be used to reduce household waste and turn it into natural fertiliser for your garden	Earthworms	Moderate	1 hour			Moderate
Composting	Reduce your carbon footprint by transforming food scraps that would normally go into landfill into rich healthy soils for your garden	Vegetables and fruit	Moderate	<1 hour			Moderate
Regrowing Veggies	Regrow vegetables from scraps like the base or stem while you enjoy the rest of it in your dinner	Vegetables and fruit	Easy	Unlimited			Low
Vegetable Garden	Grow your own fruits and vegetables in your backyard or in a community garden, eat them and share with friends	Vegetables and fruit	Easy	2+ hrs			Low

Project	Description	Species	Difficulty	Time	Skills	Benefit	Resources
Companion Planting	By planting specific plants side by side you can improve your harvest and ditch the pesticides	Vegetables and fruit, insects	Easy	1+ hrs			Low
River and Beach Clean Ups	Head out to the nearest beach or river or a local nature reserve and spend some time with friends and family collecting rubbish	All animals and plants that rely on the waterway/ecosystem	Easy	1+ hrs			Low
Shorebird Awareness	Raise awareness about shorebirds in your local community or start some weeding to improve their habitat	Shorebirds	Easy-moderate	Unlimited			Low
Wetland and Freshwater Ecosystem	Make some simple changes at home like changing cleaning products to reduce chemicals, reuse items rather than throwing them out, or join a local volunteering group to help look after our freshwater ecosystems	Birds, fish, turtles and frogs	Easy-moderate	Unlimited			Low
Rewilding	Allow parts of your garden or nature strip to grown wild with native plant species, remove unwanted weeds and watch the area become a natural wild habitat	Whole ecosystem	Easy-Moderate	Unlimited			Low-Moderate
Biodiversity Mural	Use your creativity to design and paint a mural celebrating biodiversity and raise awareness in your local community	Whole ecosystem and community	Moderate	Unlimited			Moderate
Guided Nature Walk	Design a walking route with your own map and signs in the local area to show your community how to respectfully explore the environment	Whole ecosystem and community	Moderate	Unlimited			Moderate
Design Challenge	Use your own innovative idea or build on one of the suggested ideas to show us your creativity!	Whole ecosystem and community	Easy-Difficult	Unlimited			Low-HIgh

Project: Nest Boxes

2+ hrs

Anytime

Difficult

Skills

Benefit

Over 340 different Australian animal species need a tree hollow to nest, rest or hide in. These include species of birds, possums, gliders, reptiles, microbats, and frogs. In many parts of the world, woodpeckers excavate tree hollows that other animals later use as is, or in some cases expand to accommodate themselves. However, in Australia, we do not have woodpeckers and consequently tree hollows can take over 100 years to develop, assisted by fungi, termites, borers and sometimes even fire to hollow out their wood. They can appear in the trunk or branches of live or dead trees.

Tree hollows are used differently by the variety of animals that need them. Some, such as gliders and possums need a hollow daily to shelter in – perhaps supersizing during breeding time. Others only need a hollow when they are nesting – which mostly applies to birds particularly owls and parrots. The last group requires a hollow opportunistically – in other words they may use a tree hollow, but a cave, burrow or hollow log might do just as well -such as for a carpet python while it is digesting a meal. Hollow-using species often need multiple hollows as they move about following seasonal food or to avoid predators for example.

There is competition for hollows and to reduce this, and also to minimise predators, animals will select a hollow with an entrance that is about the same size as their own body, while the interior itself may be more spacious depending on their needs – particularly how many individuals they will be sharing with – for example a microbat colony. This means that different hollow dimensions and characteristics appeal more to particular species.

The Australian owlet-nightjar naturally rests in a tree hollow but will also use a nest box

Kazredracer

Andrea Stiglingh

Why Help?

Due to the pressures of urbanisation and land clearing, natural hollows have declined, threatening the survival of many species. While a nest box is always the second choice to a natural hollow, and the best option is protecting old growth trees, creating artificial nest hollows or nest boxes can help the survival of native species in altered landscapes. Literally reducing the competition for this important resource can mean life or death for an animal.

Installing nest boxes can boost the population of native hollow-dwellers, who play a vital role in forest health by controlling plant parasites, pollinating flowers, and dispersing seeds!

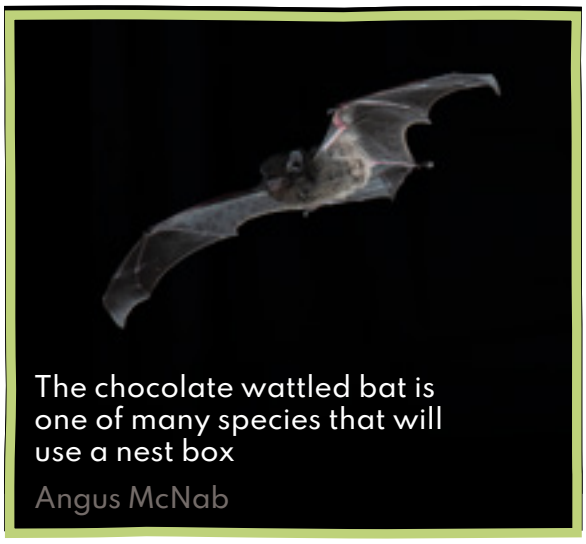
Step 1: Choose an Animal to Help

Start by doing some research on local wildlife, including lesser-known species that might be struggling to survive. See the Helpful Links for tips on researching your local animals – but the Atlas of Australia is a great starting point by offering a list of species recorded in your immediate area! Once you have worked out the species you would like to assist, you then need to make sure that the box you make (or buy) is targeted for that animal.

As a general rule, the entrance hole should be just big enough to fit your target animal, to minimise the risk of unwanted visitors. Keep in mind that wildlife may regularly change their hollows to avoid parasites or predators, and follow seasonal food, so it is perfect if you can provide several nest boxes for a single individual to choose from – which may not be practical within a small area obviously! It sounds like a lot of work, but the results will be worthwhile. Here is a quick breakdown of some of the species you may wish to target:

Microbats

Firstly, let's just clarify that there are two very different sorts of bat – fruit bats (flying foxes) and microbats (tiny insectivorous bats that navigate by echolocation). This project is for microbats that, depending on the species, roost in a cave, tree hollows or even beneath peeling bark. However of the seventy or so species of Australian microbat, more than half will use a nest box (bat box).



The chocolate wattled bat is one of many species that will use a nest box

Angus McNab

This is in part because microbats are losing their natural homes due to intensive agriculture, forestry, and urban expansion – including loss of tree hollows and light pollution.

But as microbats play an important role as predators and provide natural pest control by hunting a variety of bugs, including mosquitoes and moths, keeping them close with a nest box is a great idea!

Birds

Most hollow using birds, apart from the Australian owlet nightjar, use a tree hollow only when they are breeding - so your box will need to be installed ready for the parents to scope out ahead of this. Cockatoos, owls, different parrots, some finches, woodswallows, kookaburras and other kingfishers, select species of duck, and many other bird types need a hollow. Birds also help with insect and rodent controls, seed, and pollen dispersal, and add to the joy of life so choose a bird or two to support with a bird box!

Kookaburras need a hollow with an entrance of 10-15cm

Alex Lay

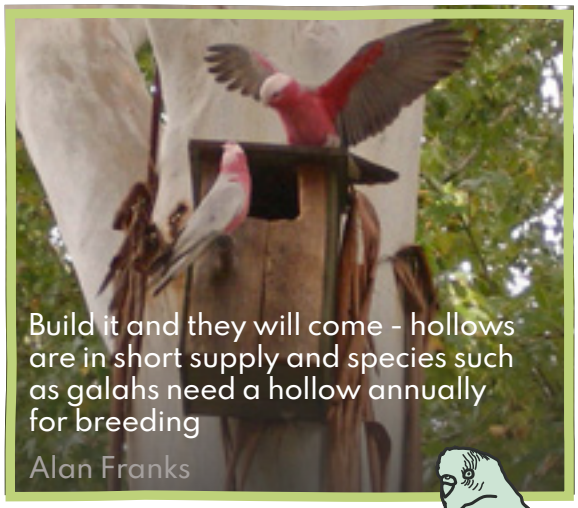
Gliders, Possums and other Mammals

Gliders and possums need a tree hollow almost all the time. Some possums such as the Eastern ringtail possum create dreys – either inside an existing hollow or they create a self-contained drey. See Project: Ringtail Possum Drey on how you can create one for this species. But for the other species the dimensions are quite different – from providing for the matchbox-sized feathertail glider, to the weighty brushtail possum – work out what lives near you and make them the perfect home!

For instructions to make your hotel, or suggested suppliers to buy one, see Helpful Links,

Gliders such as the yellow-bellied glider need multiple hollows across their territory

Matt Wright



Build it and they will come - hollows are in short supply and species such as galahs need a hollow annually for breeding

Alan Franks

ECOTIP: NATURAL PEST CONTROLS

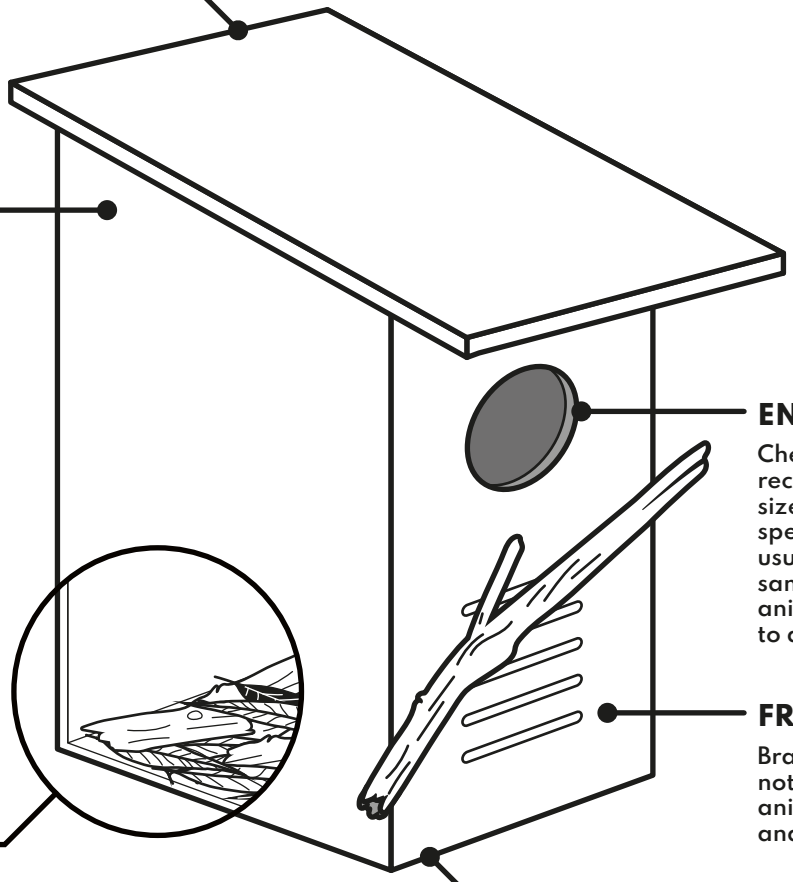
Many chemicals used for controlling pests, diseases and weeds can poison other animals. Limit chemical use and encourage natural pest controllers such as lizards and birds to your garden instead!

Step 2: Select your Materials

Whether you're building your own nest box or purchasing one ready-made, it's important to select natural materials. Durable hardwood, at least 1.5cm thick is a good option, providing thermal insulation against hot or cold temperatures inside. You can also get creative and use a rescued hollow – perhaps from a felled or trimmed tree - but do not take one from the wild as this may already be someone's home!

If you're making your own nest box, you will need the appropriate tools (including a saw, wood glue, nails, hammer, hinges, and safety equipment) and nest box instructions for your target species (see Helpful Links).

Before installing your nest box, it's important to check the following:



ROOF

An angled, hinged roof allows for rain run off and easy access

CONSTRUCTION

Use untreated or recycled timber. Thick timber provides better thermal insulation

ENTRY

Check the recommended entry size for your target species which is usually about the same size as the animal you aim to attract

FRONT

Branch and/or sawn notches to help animals climb in and out of the box

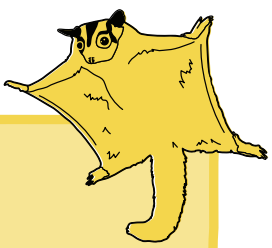
NESTING

Many animals will furnish a box with nesting material themselves.

Check Handy Hints for a link to advice about the best practice for your target species

DRAINAGE HOLES

Drill in a few drainage holes for liquids



ECOTIP: PROTECT TREE HOLLOWS

Tree hollows can take hundreds of years to form and are needed by over 300 Aussie species. Clearing of old growth trees for agriculture, urbanisation and firewood, as well as large wildfires destroying habitat, has increased competition for this vital requirement. Love your hollows!

Step 3: Select a Location

Choosing where to install a nest box can be a tricky business. Though places may look similar, at a microclimate level, the temperature, sunlight, humidity, and wind exposure can be very different. Below is a checklist to help you find the best location ideal for your animal – this will also depend on its behaviour and how it moves about.

- Choose a stand of tall trees that are a good distance away from human disturbances such as busy roads and bright streetlights.
- If necessary, seek permission from your local council or property owner to install the boxes.
- Avoid installing your nest boxes on elevated ground or the exposed edge of a bushy patch, as these are more prone to wind and rain.
- Install the box at least 3 - 5m above the ground - check the requirements of your target animal.
- If possible, install the box near food sources, (or plant more!) for example a flowering tree may provide nectar for gliders, and also attract insects for insectivores to feast on.
- Install the box on the side of the tree that it is facing toward the morning sun – avoiding hot afternoon sun.
- For arboreal animals (such as possums and gliders) make sure the site has above ground connectivity so that they can use the interconnecting tree branches to move around and avoid coming to the ground.
- For flying animals (such as birds and microbats) make sure there is a flight path where they can spread their wings right to the door.
- For microbats make sure they have a space beneath the box to fall from before they take flight.
- Most animals prefer stable homes that don't sway wildly with the wind! For this reason, it is best to secure your nest box to a tree trunk.
- Place the box where other animals particularly predators including cats and dogs cannot reach it.

Squirrel gliders will line a nest box with leaves themselves

Alan Franks

Step 4: Install your Nest Box

Use a secured extension ladder to access the installation site. It is best to drill the box directly into the tree using two coach screws or bolts that are at least 6cm long. Use spacers over the screws (between the box and the tree) to prevent rotting, and to allow the tree to grow and shed its bark. Do not provide nesting materials in the box itself unless it is suggested for a specific species - the animals will furnish the box themselves, but you could provide some nesting materials nearby – See Project: Nesting Materials.

Step 5: Watch, Wait and Monitor!

Avoid using food to attract birds to your project area, as this can cause health issues including malnutrition and disease. Instead, consider other Embrace the Wild projects, such as Shrub Shelters, Pollinator Gardens and Bird Baths to welcome guests.

Keep an eye out for visitors seeking refuge from winter cold or scouting breeding sites over spring.

Check your nest box occasionally by lifting the lid and making sure it is watertight and secure. Observe the box for activity - which may require a night-time spotlighting survey to reveal the occupant, though scats or scratches could also provide a clue. Just at dusk is when you are likely to see guests such as possums and microbats emerging too. Be wary of unwanted occupants such as European honeybees and Indian myna birds.

Detailed instructions are included in Action 4: Monitoring Your Project, which will help you monitor changes in biodiversity from your nest box that will be worth celebrating!

A naked tree frog shares a nest box with pale headed rosella chicks

Alan Franks

A colony of eastern long eared bats using a nest box

Alan Franks

Project: Ringtail Possum Drey

2+ hrs | Anytime | Moderate

Skills | Benefit

A number of ringtail possum species, including the Eastern and Western ringtail possum, create a drey (nest) that is either wedged directly in a tree fork or created within a tree hollow. The drey is about the size of a large watermelon and cylindrical in shape with an opening or two. It looks a bit like a weird bird's nest often made of bark or leaves.

Why Help?

Though ringtail possums can make their own nest, they are also competing with other animals for a hollow if they prefer it (which in cooler climate they may), and as we discussed in the previous project, hollows are becoming a scarce commodity – especially in urban areas where the ringtail possum is quite capable of living. Ringtail possums mostly eat gum leaves but also flowers and fruits, so not only are they pollinators but they also assist to prune plants.

The Eastern ringtail possum builds a drey within thick bushes or hidden in a tree hollow

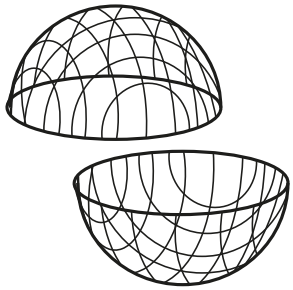
David Laurie – Focus on Fauna Project

Step 1: Check for Ringtails in your Area

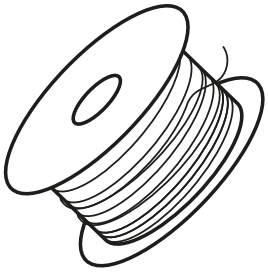
You may have observed ringtail possums in your area or been told that they are present. Otherwise, ask around or check with the Atlas of Living Australia to check they occur in or near to your focus area.

Step 2: Select your Materials and Get Busy

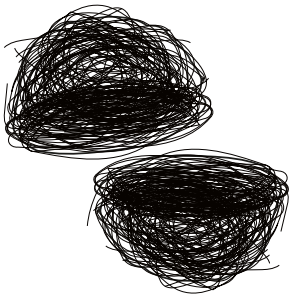
For this project you will need:



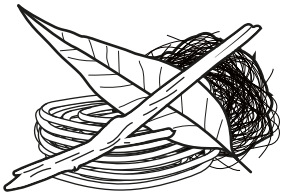
TWO HANGING BASKET FRAMES



SOME MALLEABLE WIRE



TWO COCONUT FIBRE BASKET LINERS



EXTRA COCONUT FIBRE OR NESTING MATERIAL

Instructions for how to build your drey are on our website.

Step 3: Choose a Location

Ringtails are arboreal and rarely come to the ground so the drey needs to be placed securely in a tree that is interconnecting with other trees and beyond. They will use rooftops or timber fences to move about too. If there is a short space between trees of a metre or two you could connect them by placing a sturdy stick or piece of timber wedged in the branches of the two trees. A tall plant offering bushy shelter from predators is perfect.

Ringtails mostly eat eucalyptus and other native leaves, as well as fruits and flowers, and some exotic species. Select a site that has these food options close by.

Step 4: Install your Drey

The drey needs to be secured to the tree – ideally in the branches rather than to the main trunk. Make sure it is safe from predators, especially domestic cats. Though this is made from a hanging basket the idea is not to hang the drey – ringtails do not like to swing about! Place it where it gets early morning rather than afternoon sun at least 3 metres above the ground.

Step 5: Watch, Wait and Monitor!

Keep an eye out for occupants – perhaps best observed in the early evening using a torch. However, be mindful that bright torchlight can harm the eyes of nocturnal animals so do not shine it directly at them and consider securing some red cellophane to the torch to ease the intensity of the light.

Do not be tempted to feed the ringtail however you can grow some of its preferred foods to keep it happy!

Build a drey for a local ringtail (right) which mimics one they build themselves (above)
Abbie Mitchell

Project: Pollinator Gardens

2+ hrs Anytime Moderate

Skills Benefit

Almost all flowering plants on the planet need help from pollinating animals to reproduce! Creating a pollinator garden is a wonderful way to learn about insects, pollination and changing seasons. Gardens bring colour and life into any area, from school and community grounds to nature strips and private yards. Most importantly, they will attract a variety of pollinating species including bees, birds, wasps, butterflies, bats, moths, flies, possums, gliders, and other insects.

Why Help?

Many pollinator populations are rapidly declining due to loss of feeding and nesting habitats and misuse of pesticides. These animals play a critical role in ecosystems and help us to produce over a third of the world's food supply!

Step 1: Read and Research

Some pollinators are specialised to specific plants and will only show up at your garden if you have something to offer them!

It is very important to start by doing some research on the types of pollinators that live around you, and how to grow the native flowers they rely on. However as a general guide:

- Provide a year-round selection of different flowers.
- Provide flowering plants featuring different shapes, colours and heights.
- A great tip is to source locally occurring native plants from your community nursery – the natural food for the local animals.
- Don't forget that flowering plants include mighty trees, such as eucalyptus, and if you have space your pollinator garden can be quite a substantial and layered ecosystem.
- Some plants are treated with systemic chemicals – designed to stop pests – but this also impacts other animals as they feed on the plant and become poisoned themselves. This is because the chemical becomes infused in every part of the plant, including the leaves, pollen, nectar and even the seeds - repeating the cycle. Buy organically grown plants or those not treated with systemic chemicals.
- Also add some host plants for caterpillars – future pollinators!

Hover flies are great pollinators
T Taylor

Step 2: Location, Location, Location

Wildflowers and pollinating plants thrive best if they are protected from wind. If the area you have can be windy, make use of existing barriers like a wall, hedge or fence that can help stop gusts of wind from blowing away your pollinators or the pollen! It is also important to ensure you select an area that receives sunlight.

Pollinator gardens can be a mix of natives, exotics, veggies and herbs offering seasonal flowers for pollinators

Ben Howes

Step 3: Prepare the Soil

If you are sowing or planting directly into the soil, prepare your soil with a rake or hand fork to break up any clumps and remove any debris, like rocks or roots. Don't prepare the ground using chemicals (such as weed killers) – these also kill the ground dwelling larvae of important pollinators such as native bees!

This is also a great time to add compost (see Project: Composting) to enrich the soil – but be aware that some native plants prefer specific soil types. Finish this step by watering well to moisten the top 10cm of soil.

Butterflies such as the imperial hairstreak not only need flowers, but host plants for their young

David Cook

Step 4: Planting

Follow the guidelines below to plant your chosen species.

Seeds: As a rule of thumb, you can plant seeds at a depth equal to 3x their width. Some seeds may prefer to be sown on the soil surface, but they should be lightly pressed in to prevent blowing away.

Seedlings: Make a hole big enough to fit the seedlings. Place them in the soil a little below the soil level, then press down the earth around the seedling. Remember to leave room between your seedlings to give them space to thrive and spread across your garden!

Sunflowers can add a fun element to your pollinator garden

Ben Howes

Water your seeds or plants as soon as they are in the ground, allowing the moisture to soak in. Continue watering daily for about 1 - 2 weeks. This will help them get established. From this point, you may reduce watering to around twice a week, depending on your climate.

Step 5: Looking after your Garden

Never use chemicals in your pollinator garden, as this is harmful to all insects including our target pollinating species. You will need to water and take care of your plants, especially during periods of very hot weather and little rain. Over time, you will observe an increase in the number of insects and other pollinators that come to visit. You may wish to record this activity. See Action 4: Monitoring Your Project, you can become a citizen scientist and measure these changes!

Hungry for more? Add on a complimentary Embrace the Wild project like a Bee Hotel, Caterpillar Nursery, Insect Hotel, Watering Station, or our Leave your Leaves project.

Jewel beetles may be regular visitors to your pollinator garden

Jean and Fred

Project: Shrub Shelters for Little Animals

3 hrs+ | Anytime | Moderate

Skills | Benefit

Transforming your project area into a haven for small birds and other animals will greatly benefit local biodiversity. There is no better way to provide wildlife with essential shelter and food than by planting some locally native shrubs and grasses! Native plants are easily grown, are climate tolerant and provide the perfect habitat for local species. By adding a diversity of native plants to your project area, you can help to reconnect habitat, and provide food and shelter to the wildlife around you.

Why Help?

Small birds and mammals provide excellent natural 'pest' control by eating many kinds of insects and their larvae. They are also important seed dispersers and pollinators!

Step 1: Choose a Location

Shrub shelters can be planted in many locations, including small areas like courtyard gardens or nature strips (verges). They can be planted along a building or fence line, in the corner of a yard or as a circle in an open area. You could also plant beneath existing trees and create a more layered structure for lots of animal species.

Hint: measure out the area before you head to the nursery, as this will help to determine how many plants you need!

Spiky plants are fantastic to protect small animals from predators

Peter Soltys

Little birds such as Eastern spinebills need shrub shelters to hide from predators and forage for food

Louise Docker

Step 2: Selecting Native Plants

Your local nursery or community nursery will have great insights about the best species of native plants to grow in your area. Try and choose a variety of shrubs that flower at different times of the year (to provide a consistent food source) and grow to different heights. Shrubs about 1 - 2m high are ideal for small birds to build their nests in. Also select a variety of dense or spiky shrubs, herbs, and grasses, as these will provide important ground cover and protection from predators.

Step 3: Creating Habitat for Little Animals

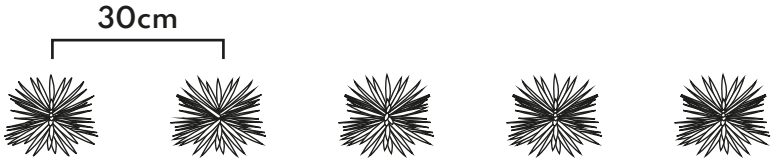
It is important to plant your shrub shelter in layers. This helps to provide a variety of different environments, and helps to deter predators. Work your way outwards with the tallest plants (Later 1) in the centre.

LAYER 1

Large shrubs provide dense cover for small birds to nest in, protecting them from predators.

LAYER 2

Prickly and spiky plants will deter any unwanted guests!



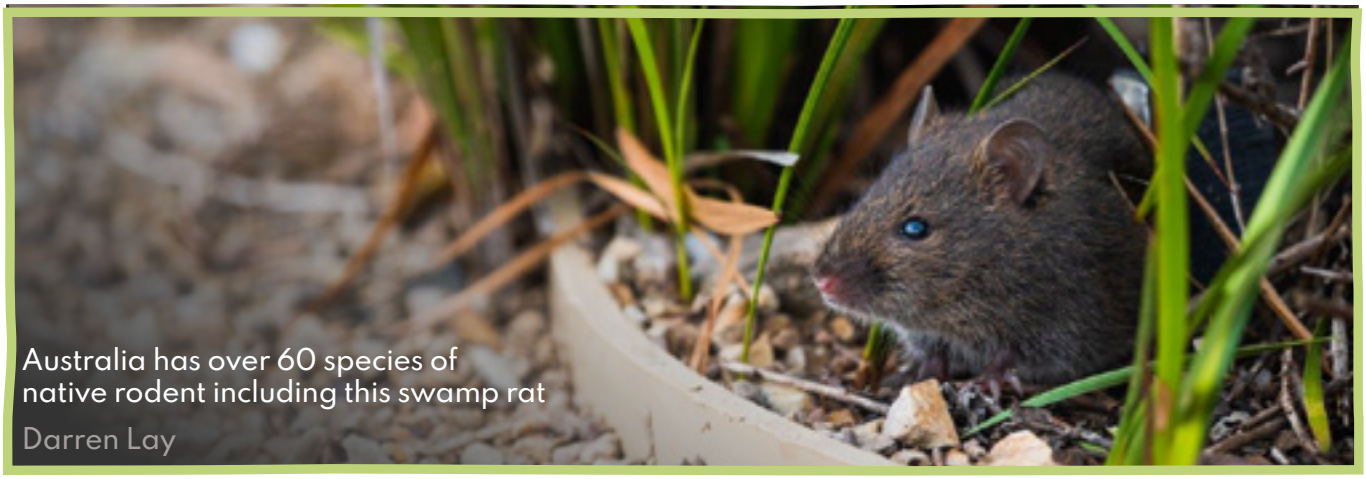
LAYER 3

Smaller shrubs, herbs and small flowering plants will provide tasty treats for inhabitants.

LAYER 4

Finally, a mixture of native grasses are an extra food source.

Water your plants as soon as they are in the ground, allowing the moisture to soak in. Keep watering every morning for about 1 - 2 weeks. This will help them get established in their new home. From this point, you can reduce watering to around twice a week, depending on your climate.



Australia has over 60 species of native rodent including this swamp rat

Darren Lay

Make sure you have plenty of nesting material nearby – you can add to it via the Nesting Materials Project, or you may also want to add a bird bath, and depending on where you live, this habitat may be attractive to small mammals such as pygmy possums, bandicoots, and antechinus. A Lizard Lounge would work on the ground here too!

Step 4: Monitor and Share your Success

Keep a patient eye on your shrub shelter to see what kinds of animals come to visit. You could even survey the animals you see every month, using instructions from Action 4: Monitoring your Project! We are sure that you will see some increase in biodiversity and that is worth celebrating!

Antechinus are not rodents but a tiny marsupial that feeds on invertebrates and smaller animals

Patrick Kavenagh

ECOTIP: CONTROL PETS

Cats and dogs may attack or play with animals but even a small scratch can become infected and kill wildlife. Pop a bell on your cat and keep pets inside at night.

Project: Seeds Please

2 hrs+ | Anytime | Easy

Skills | Benefit

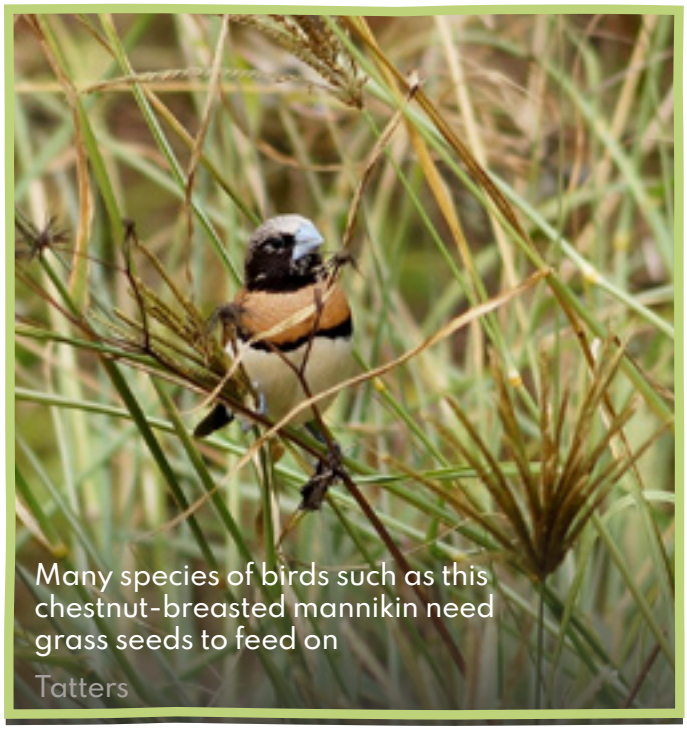
Australia is a land of birds. Many of these, particularly parrots and finches, require a year-round supply of seeds to sustain them. Smaller birds often forage on grass seeds but larger cockatoos for example use their secateur-like beak to crack open tough seed pods. With such a specific diet, many bird species are in decline because the plants that provide these seeds have been cleared by humans for reasons including agriculture, urban infrastructure, fire mitigation and even for aesthetic reasons – many people consider these plants as too spikey or messy for their garden.

Why Help?

Seed eating animals provide an important role in seed dispersal. Apart from spreading ready to grow seeds via a nutrient-filled power-pack (their faeces!), parrots, especially cockatoos, can access seeds that other animals just can't crack open. By providing specific seed-bearing trees for cockatoos and seeding grasses such as wallaby or tussock grassess for smaller native birds and animals, you can assist these important native plants to establish their numbers, and also feed the granivores (seed eaters) that need them.

Step 1: Do Some Research

Jump on the Atlas of Living Australia website (see Helpful Links) and investigate the bird species that have been recorded nearby. For this project, you can look a bit more broadly than just in your immediate area as many birds will fly to access seasonal foods. Look particularly for cockatoos and other parrots and investigate their diet via the species profiles provided. Of special mention is the Glossy Black Cockatoo which primarily eats the seeds of casuarina and allocasuarina trees. Once you have researched your target seed-eating birds you can contact your local community nursery or council for advice on the best plants to provide for them.



Many species of birds such as this chestnut-breasted mannikin need grass seeds to feed on

Tatters

Step 2: Choose a Location and Get Planting

There is a big difference in the space you will need depending on if you are providing for little birds or cockatoos. For small birds see tips in Project: Shrub Shelters.

For cockatoos, the seed-bearing plants they prefer can get quite big and ideally you could provide a grove of them (planting a pollinator or shrub garden underneath!).

Obviously, you may need to remove lawn, weeds or infrastructure to allow for your plants. Then follow the instructions for the specific plants you have sourced including for soil and light conditions, and spacing allowance. You may wish to put plant protectors around them to help them establish.

The black cockatoo is extremely fussy and only eats seeds from casuarina and allocasuarina species

Ausnative

Step 3: Maintain your Garden and your Patience!

Water your plants and weed the area regularly. Seed-bearing trees and shrubs may not produce seeds suitable for cockatoos for many years. This is a long-term commitment! In the short term, you could be an advocate for cockatoos and assist your local community to understand and protect important food sources.

Seeds come in all shapes and sizes and are preferred by different species

Ben Howes

Spiky plants such as hakea are not often favoured by gardeners but are a favourite food source for black cockatoos

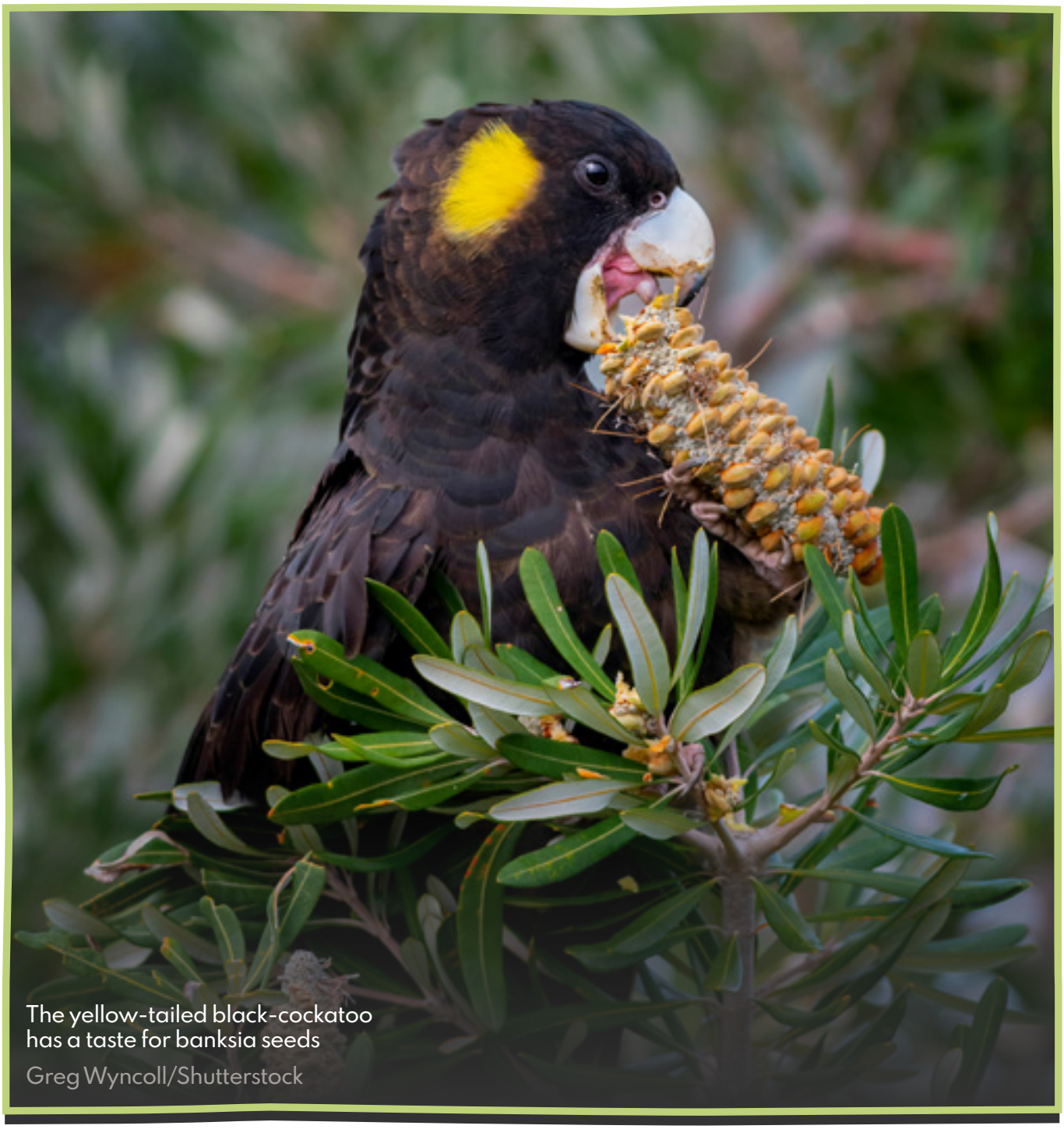
Yarra Ranges Gardens for Wildlife

Step 4: Monitor

Check out our tips for monitoring your site later in this book. In particular, photo-point monitoring will provide a good method to track plant growth – which can be reassuring when it is such a slow process until the wildlife can reap food rewards.

But of course in the meantime your grove is providing many benefits for the environment and local wildlife, including shelter and in stabilising the soil, and it would be hugely rewarding to monitor the succession of animal species that your grove attracts as it matures.

Add More: See our projects for Shrub Shelters, Pollinator Gardens, Nest Boxes and Lizard Lounges. A grove of trees is the perfect habitat for lots of species – build it and they will come.



The yellow-tailed black-cockatoo has a taste for banksia seeds

Greg Wyncoll/Shutterstock

Project: Invertebrate Homes

30 mins - 2 hrs

Bee hotels: Early spring (southern Australia), anytime (northern Australia);
Other hotels: Anytime

Skills

Benefit

Moderate

There are literally thousands of invertebrate species in Australia. Some may use a hotel in which to make a nest, such as some species of native bee. Others such as native cockroaches and millipedes need a place to shelter and/or have their young. But the accommodation is very specific to different invertebrates – and we say invertebrate here because we are talking about more than just insects! So create invert homes for different creatures and get set to become the real estate tycoon of the mini beasts!

Bee Hotels

Unlike social honey bees and stingless bees that live as a colony in a hive, most of the 2000 species of native Australian bees are solitary and nest in tunnels – either in the soil or in dead wood, such as within the pithy stem of plants or disused borer holes.

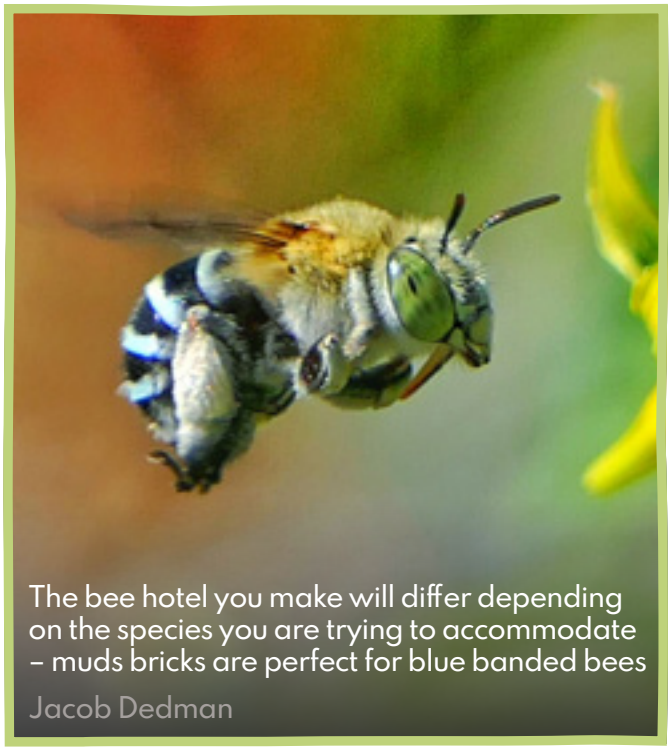
Sadly, many of our native bee species are facing threats from chemicals, diseases, warming climates and loss of important habitat and food sources.

Why Help?

Native bees play an essential role as pollinators of crops and wildflowers. Without them, we risk losing a substantial proportion of the world's flora and a third of our agricultural industry!

Step 1: Design your Bee Hotel

There are different kinds of bee hotels designed to attract specific species. We recommend using whatever recycled materials you have available. Detailed instructions for all of these projects can be found on our website.



The bee hotel you make will differ depending on the species you are trying to accommodate – muds bricks are perfect for blue banded bees

Jacob Dedman

Bee Hotels – You can recycle mugs, wooden boxes or build a house from recycled wood. You'll also need dried hollow stems - such as bamboo, curly bark, tree fern stems or reeds, offering a range of cavity entrances between 2-10 mm wide and a length of at least 12 cm long. Tightly pack the contents with the entrance facing out. This hotel is suitable for leafcutter bees, resin bees and masked bees.

Bee Rounds – You can use tree stumps, logs and untreated timber offcuts to create bee rounds - accommodation drilled into timber offcuts. Drill a range of deep holes, 2-10mm wide into the wood. Move the drill back and forth until the walls are smooth and sand down any wood fibres at the entrance. Make sure the holes are horizontal as vertical entrances may fill with rainwater. You can also add small timber rounds to the bee hotel above or have it as a stand-alone design. This is suitable for the bee species above.

A fire-tailed resin bee makes a nest in a bee round

Abbie Mitchell

Bee hotels should have a range of cavities between 2-9mm

Abbie Mitchell

Mud Bricks – Builders clay (or tennis court loam) can be mixed to a firm consistency (that forms a ball) and packed into a cavity such as a besser block, recycled length of PVC pipe, terracotta pot or even some large pieces of bamboo. The mud should occupy a cavity of about 6cm wide by about 15cm long. Poke a couple of pilot holes (about a pencil width) into the mix to guide the bees, then leave to dry. Mud bricks are particularly appealing to blue banded bees found throughout most of Australia. You could make a bunch to attract blue banded bees to your veggie garden too. These bees are buzz pollinators and better than honey bees for pollinating tomatoes, capsicums, eggplants and chillies.

Blue Banded bees nest in earth

Abbie Mitchell

Bee Bundles – Bundle 15cm lengths of dried pithy stems such as from roses or lantana, some bamboo pieces, and curled lengths of bark, with string or wire and secure them beneath a branch in your garden. Reed bees will create their own cavity within the soft centre of pithy stems.

Dead Wood – Carpenter bees are Australia's largest bee and excavate their own nest in soft dead wood such as banksia or within grass tree spears so leave these in place for the carpenter bees to nest in.

Stingless Beehive – These cute little bees are fantastic pollinators and fascinating to watch. Stingless bees occur in New South Wales, Queensland, Northern Territory and Western Australia. However tempting as it may be, simply building a hive rarely works to attract them so you will need to be gifted or purchase your first hive, but from there you will be able to split it periodically to create two – and so on!

Check the Atlas of Living Australia to see that they naturally occur in your area before you purchase one as they will not survive if the climate is not suitable.

Several species of bee nest in dead wood or borer holes

Ausnative

Step 2: Choosing a Safe Location

Select a spot that gets early morning sun and shade in the afternoon. Nest sites need to be within close distance to food (constant seasonal flowers which can include natural areas, a garden or vegetable patch) and water. Make sure chemical use is limited – many chemicals designed for pest species also kill bees. Take a look at our Watering Station and Pollinator Garden projects for other tips to improve your project area for bees.

The masked bee will use a bee hotel
Steve Kerr

Step 3: Installing your Bee Hotel

Even though 70% of Australian wild bees build tunnels at ground level, it is best to raise your hotel between knee and eye level to minimise other insects invading their home. If you want to protect your hotel from rain, add a roof with recycled wood, metal or plastic or give the outside (not the nesting materials) a coat of eco-friendly weather-proof paint. Remember though that this is habitat and while it is designed to attract bees, other animals may use it too. We have seen little lizards, spiders, ants, mole crickets, solitary mud wasps (not aggressive) and grasshoppers living in them!

Important Note: Apart from stingless bees, most other female native bees can sting. However they are not aggressive as they are not working to defend a colony as honey bees are. So as long as you do not touch them, they are very unlikely to sting you.

Top Tip: Make several smaller bee hotels rather than one large one then dot them about giving bees the option of locations and reducing the chance of a pest or disease from dominating.

Step 4: Monitor your Project

Once your new home is installed, watch from a safe distance for your guests to arrive! In southern locations, many species are dormant during the cooler months, and it may take a few seasons for your guests to find it, but once they do the bees tend to return to the place of their birth to secure their own nest. The closure will remain sealed until the young emerge – which can be up to a year later if it is created at the end of a southern season. The bees create a little closure when they have completed the nest. See our website for details.

You will need to replace the used bamboo once they have emerged as they will not reuse the same piece. It is great to take note of the species that use it and take some photos if you can!

Minibeast Hotels

Many species of invertebrates and small animals can live in handmade hotels that mimic the natural world. Providing a place for creatures to stay will not only benefit the ecosystem around you but can encourage other species such as frogs and little skinks to visit! This type of hotel is essentially a whole range of different microhabitats thrown together.

Why Help?

Invertebrates do an excellent job of recycling dead organic materials into valuable nutrients. Having a diversity of insects and other invertebrates in your area can help to pollinate flowers and control the populations of pest species such as aphids and blow flies. This Minibeast Hotel provides a nesting, hiding and safe place to overwinter (hunker down) when it is cold.

Step 1: Choose a Good Location

Insect hotels can be installed anywhere, from an apartment balcony to a flat roof, a backyard garden to a schoolyard. Though some bugs prefer warm and sunny environments, many inverts like cool and damp conditions. A shaded area next to a hedge or under a tree is an excellent place to put your hotel.

Step 2: Create a Structure with Recycled and Natural Materials

Insects are not picky and will make a home in any place that can safely shelter them from the heat and cold. You can make your hotel small or create a high rise - get creative by layering old wooden pallets, bricks, corrugated and logs or timber planks on top of each other as tall as you would like your home to be. You'll need to place the heavier materials at the bottom and secure the materials so that they don't wobble. Alternatively, you can wedge your materials into an existing structure to make it more stable.

There are many species of native cockroach with are beneficial in the garden

Abbie Mitchell

Slators are help with decomposition to create healthy soils

Jean and Fred

Centipedes are very caring mothers and curl around their young to protect them

Natalie Tapson

Step 3: Fill in the Gaps with other Materials

There are no rules about how you fill the empty spaces in your hotel structure, but here are some ideas to help you attract different insects:

- Dead wood makes a great home for wood-boring beetles, centipedes, millipedes, bush cockroaches, slaters, and larvae. It also supports fungi which can help to break down and recycle the natural material.
- Hollow stems, canes and holes drilled into blocks of wood are all ideal spots for solitary bees to lay their eggs. In spring, these bees will help to pollinate flowers and encourage plants to produce vegetables and fruit. Because solitary bees like to stay warm, place these materials on the sunniest side of the minibeast hotel.
- Stone and tiles provide cool and moist conditions for frogs. These are best placed lower down, on the shadiest side of the minibeast hotel.
- Hay, straw, sticks, and dry leaves provide minibeasts with a place to burrow and hibernate, just like they would in leaf litter on a forest floor. Ladybirds may hibernate in these habitats over winter, and in spring, will help eat aphids in your garden.
- Rotting wood and bark is where beetles, centipedes, spiders, and woodlice love to be. These invertebrates are an important part of your garden ecosystem that can help break down dead woody plant material.
- Bare earth is the ideal home for many types of larvae including brown lacewings (antlions), beetles, wasps, and bees.
- All of these microhabitats are options for different sorts of small animals too – such as lizards, snakes and spiders. So be mindful not to put your hand in somewhere you cannot see.

Step 4: Monitor your Minibeast Home

Your Minibeast Hotel will have an assortment of creatures that use it seasonally across the year. Some you will rarely see unless you carefully pick up pieces and have a look, others you may see moving between the hotel and foraging spaces nearby. Sit quietly and observe any activity and even keep a list or some drawings of the visitors to learn more about later.

Your minibeast hotel should have dead wood and moist crevices that mimic rotting vegetation – perfect for bush cockroaches and slaters

Abbie Mitchell

Abbie Mitchell

Project: Leave your Leaves

15 mins | Anytime | Easy

Skills | Benefit

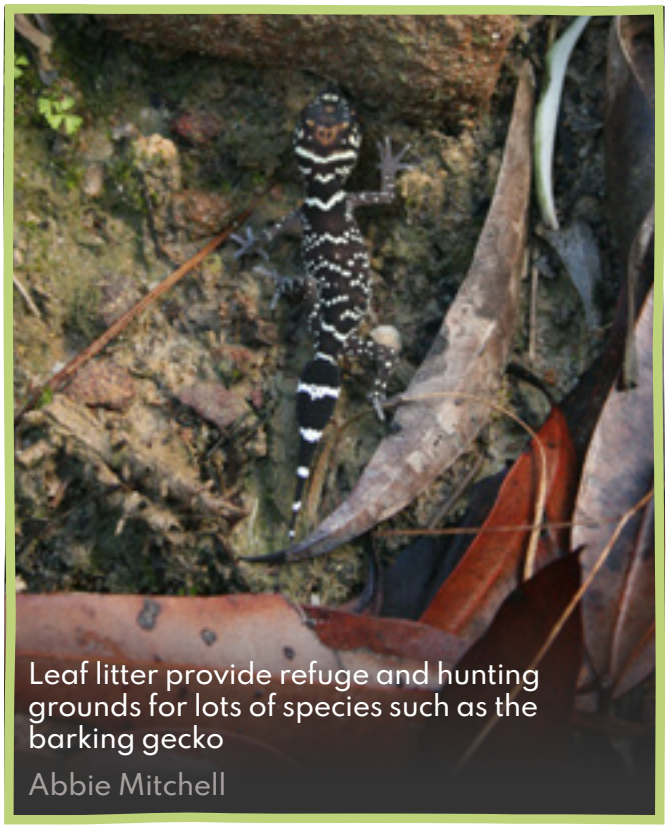
While we might think that leaf litter and fallen branches look messy, they actually create important microhabitats for small animals like insects and earthworms. Having insects in your garden helps to support a range of other wildlife in your neighbourhood, like birds, lizards, frogs, and small mammals. Decomposed leaves can also be used as a mulch or soil conditioner, helping you to create a thriving and productive vegetable patch.

Why Help?

Making the most of fallen leaves, sticks and bark can really help to improve biodiversity and soil quality in your project area.

Step 1: Leave your Leaves where they Fall

Removing the leaves, sticks and bark from gardens and parks is a common practice, but it doesn't have to be! Trust that nature knows best and leave your leaves where they fall. Not only will this save you time, but the leaves can now get to their important work in creating new habitats, enriching your soils, and bringing life such as invertebrates, little skinks and birds attracted to the feeding opportunity.



Leaf litter provide refuge and hunting grounds for lots of species such as the barking gecko

Abbie Mitchell

Leaving area untouched can nurture small delights such as flowering herbs

Abbie Mitchell

Step 2: Collect and Prepare your Leaves

Wet leaves can make concrete paths slippery, so it is best to keep these surfaces clear by raking them. We recommend gently sweeping these leaves into a large pile and either using these to layer through your compost, or for use as mulch around trees, veggie patches and garden beds.

Tips - Check to make sure your leaves are healthy looking and not affected by any plant parasites and diseases! Be wary of using leaves solely from trees like walnut, eucalyptus, and pines, as these can contain substances that inhibit the growth of other plants.

Step 3: Using Leaves as Mulch

Chop or shred your leaves into smaller pieces, using either a leaf shredder, lawn mower or your hands. This is important because smaller leaf pieces break down faster, releasing more nutrients including carbon, phosphorus, and nitrogen into your soil. Using whole leaves can prevent air and water from reaching your plants. An even layer of leaf litter will help your garden retain water and protect your plants from winter cold, or from dehydration on a hot summer's day. In Australia we do need to be mindful of the fire hazard imposed by leaving piled leaf litter on the ground but depending on where you live it can be done safely away from dwellings or other fuel. Your garden and the small critters that visit it will be much happier and healthier as a result!

Step 4: Monitor

You may notice different species of animals, insects, and birds are attracted to your leaf pile, so monitoring what you see can be an exciting activity. Perhaps you would like to keep a Wildlife Journal of the wildlife in your backyard or add to apps that record sightings – see Action 4 for details!

Leaf litter provides skinks a haven in which to feast and hide

Peter Soltys

Project: Lizard Lounges

<1 hour

Anytime, but warmer months are best

Skills

Benefit

Easy

Lizard lounges are an easy project that can quickly increase the habitat value of your backyard. Hiding places are especially important for lizards to survive temperature extremes as being ectothermic, their temperature is regulated by the environment. Over winter months, lizards may hibernate or torpor in sheltered areas, and in summer they may need to shelter from the scorching sun. Lizards need to sun themselves on rocky outcrops that are close to hiding places in case of unexpected predators. Using your creativity and recycled or natural materials, you can design a safe space that lizards and skinks will love to visit!

Why Help?

Lizards and skinks love eating bugs and slugs. Attracting them to your garden is a great natural way to control insects that munch on veggies and flowers in your garden and reduce the need for nasty insecticides.

Step 1: Find the Perfect Lounge Site

Lizards can be quite shy and are often attacked by dogs and cats. Look for a quiet, dry, safe sheltered area with lots of sunlight.

Step 2: Collect Supplies and Start Building

You can use large rocks, hollow logs, old PVC or terracotta pipes, large sticks, bits of bark, old garden pots, timber offcuts, metal pieces and some leaf litter and/or mulch to build your lounge. However, before you collect pieces to move to its new site, consider if it is someone's home already! Be aware that you are not allowed to remove these things from nature reserves by law.

First, spread the mulch, bark, or leaf litter in a thick layer for the lizards to burrow into. Then get to work creating a small tower of rocks, logs, PVC pipes and pots. Stack them loosely (but so the structure is stable) to create lots of little cracks and hide-aways that lizards can hide in. Ideally, these should vary in size from 5 - 19 mm to accommodate different types of lizards.

Lizards such as this Eastern water skink love to bask on a log

Kristian Bell

Step 3: Create a Basking Area

You can create a basking area by laying down flat rocks, bricks, and repurposed old roof tiles in an area of your lounge that gets full sun all day (or at least full sun in the morning). You could also add some rough rocks and logs for lizards to rub themselves against when it's time to shed their skin.

Your lizard lounge is mimicking the natural habitat of lizards with basking sites in close proximity to shelter from predators and cold

Abbie Mitchell

Step 4: Create some Shelter and Connectivity

Add some plants to your lounge to provide shelter and a year-round supply of food for the lizards. Densely planted tussock grasses and shrubs are best for creating thick cover from predators and for providing a shaded rest area during hot days. Try to provide a variety of plants that attract insects and supply flowers, seeds, and berries for the lizards. You can also add a shallow bowl of water near your lounge, with sticks placed strategically within it to help the lizards (and other small creatures) get to and from the water.

Also consider the connectivity to this area from other refuges (in other words how the plants and hiding spots connect together). If you can link it together, your lizard resident will be able to move about more safely. Check out our project on Friendly Fences too to consider how you could team up with your neighbours to give lizards such as blue-tongues a chance to move about their territory and disperse.

Step 5: Monitor

Patience is important for monitoring your lizard lounge; however, you may notice some exciting species of lizards coming to sun themselves! Detailed instructions are included in Action 4: Monitoring Your Project, which will help you monitor any other changes in biodiversity from your lizard lounge that will be really worth celebrating!

Important note: Insecticides, pesticides and snail baits can kill lizards through secondary poisoning. Minimising the use of these will help keep the lizards in your garden happy and healthy!

Your lizard lounge may appeal to a range of species including the eastern water dragon

Peter Soltys

Project: Bird Baths

30 mins

Anytime, especially summer

Skills

Benefit

Easy

Like humans, birds need clean and fresh water for drinking and bathing. Water is important to help keep birds cool in summer, and to shed loose feathers, dust and parasites. Installing a bird bath is a great way to attract a variety of interesting birds into your area.

Why Help?

Birds play an important role in dispersing seeds, pollinating flowers, and keeping insect populations under control. As a bonus, they eat lots of garden pests like snails and insect larvae!

Step 1: Choose a Good Location

Find a safe place where the birds will not be disturbed when using their bird bath. Raise your bath at least 1.5m off the ground to reduce the risk of predation, especially from cats, dogs, and foxes. This can be achieved by placing your bird bath on a pedestal or stump and ideally with plant cover close by.

The yellow-breasted robin is a seasonal visitor in some places

Alex Lay

Step 2: Selecting your Bird Bath

The best bird baths are similar to the shallow puddles and streams that birds naturally bathe in. You can purchase a shallow bath that is easy to clean, but you can also repurpose household items for a more affordable and eco-friendly option. An old frying pan, terracotta dish, baking tray or kitchen sink could do the trick!

Step 3: Add Some Structure

Good bird baths have a structure that birds can perch and hold onto, so that they can drink without getting wet, especially in colder seasons. You can add structure to your bird bath by placing some gravel or rocks at the bottom of your bath and arranging branches for birds to hold onto. It's important to place a step-rock near the edge so that any insects or small creatures that land in the water can crawl out.

Step 4: Fill and Maintain your Bird Bath

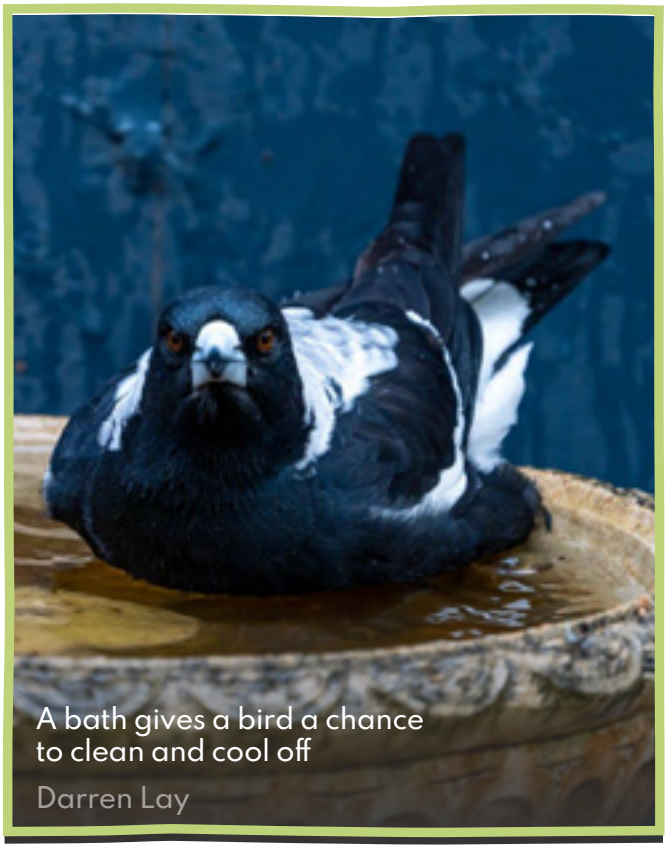
For birds to feel comfortable, your bath should be less than 10cm deep. Use fresh water to fill your bird bath and remember to refill and clean the bath regularly. Parasites and bacteria can spread quickly in still water if not cleaned properly and harm our bird friends.

Step 5: Monitor your Project

Keep an eye on the species of birds, or other insects or animals, you attract to your bird bath, as you may spot rare or endangered species. It may be a good idea to make a list of your visitors! Avoid feeding them and maintain a safe distance so as not to scare them. Other tips can be found in Action 4: Monitoring Your Project.

A bird bath will also be used by other creatures so make sure you add some stones to assist them to access it safely

Gordon Smith



A bath gives a bird a chance to clean and cool off

Darren Lay

Project: Nesting Materials

30 mins

End of winter – in preparation for nesting in spring

Skills

Benefit

Moderate

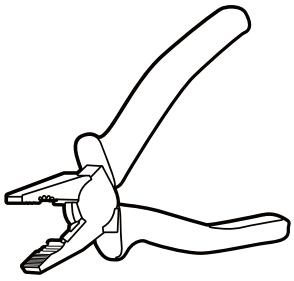
In many urban areas there is a shortage of nesting supplies for birds. This is because humans are neat freaks – raking up leaves and sticks, removing old spiders' webs and grass clippings, and putting animals' hair from fido or ourselves into the waste! Apart from leaving these things naturally we can also create a nesting dispenser with a whole bunch of materials for the birds to use. This reduces competition between birds including pinching materials from each other's nest!

Why Help?

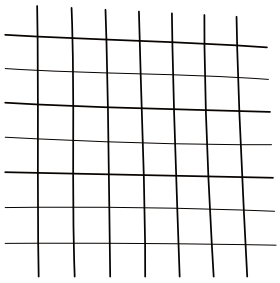
Birds are important for controlling pests, managing invertebrate numbers, dispersing seeds, and also providing pollination services. Apart from making sure the food they need is provided, they are more likely to stick around if it provides a safe breeding area with nesting materials and nest sites.

Step 1: Gather your Materials

You will need:

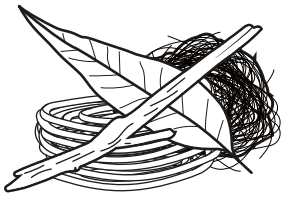


PLIERS



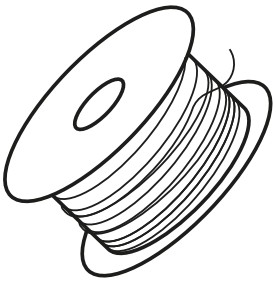
WIRE MESH

with wide spacing between the mesh (so birds can pull materials through easily)



NESTING MATERIALS

dry natural materials such as small sticks, stems, leaves, grass, old cobwebs, feathers, hair, bark, natural string, raffia, or coconut fibre.



SOME PLIABLE WIRE

TAKE ACTION

Step 2: Make a Nesting Materials Dispenser

Roll the mesh into a cone shape and secure it with wire. Make sure any sharp edges are tucked in. Now stuff the cylinder with all the different nesting materials. You may wish to tease some options out a little through the mesh so birds can see them more easily. Add some sticks – poke them right through the cone so that birds can perch on them as they select their nesting materials. Add a final piece of wire at the top of the cone to hang it from a tree.

Bend some wide gage wire into a cone shape
Abbie Mitchell

Step 3: Select a Location to Hang It

Choose a place where birds can explore the contents safely – perhaps hang it beneath a tree with canopy cover that they can easily retreat to, but also where it gets sunlight and air so as not to turn into a soggy mess. Ideally it will be somewhere that you can see from a distance so you can enjoy the show!

Stuff it full of a variety of natural materials, poke through some perches and hang it where the birds can access it

Step 4: Watch, Wait and Monitor!

Keep an eye on the nest materials and see who visits, and what they are taking. You may want to note the species of bird, date, and especially track where it is taking these materials to watch them build a nest and hopefully raise some chicks.

The eastern spinebill uses grass, leaves, spiders web and even hair to create their cosy nest

ECOTIP: PLANTS FOR YOUR PLACE

Select native plants that naturally occur in your area – they are adapted to the region and provide for the local animals. Ask your council or community nursery for tips.

Project: Watering Stations

30 mins

Anytime, especially summer

Skills

Benefit

Easy

All animals need water. Some such as koalas and possums get most of their water from the food they eat. Others such as insects, get it from dew as they forage. But when it is extremely hot, in drought times, or following serious habitat loss – or all three at once such as following a bush fire – it is vital that we provide watering stations that wild animals can access safely.

Why Help?

When animals are thirsty, they will move outside of their territory looking for water and put themselves at risk of car strike and predators. If you can provide water within their normal home range, or at various places that they can access they will be safer and well quenched!

Here are a few different options to provide water for wildlife depending on where you live – city or country - and the animal species and reason you need to provide water.

Water for Regular Backyard Visitors

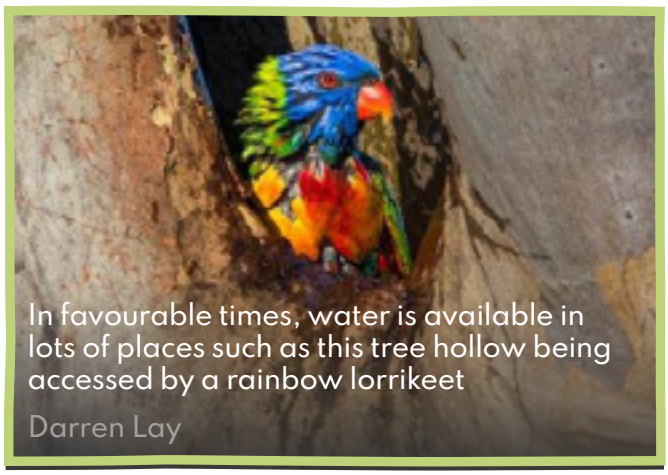
In urban or country backyards you may have regular visitors living in your area. Obviously, the bird bath project doubles as a watering station for birds and insects, but you can also provide a watering station for ground dwelling animals too.

Step 1: Creating your Station

Find a shallow container without holes that can contain water. Something like a flat bowl, a saucer, or something similar will do. Fill your watering station with 3 - 5cm of fresh water, preferably rainwater (but tap water is fine too).

Insects such as butterflies drink from tiny pools of water where they can safely perch

pxfuel.com



In favourable times, water is available in lots of places such as this tree hollow being accessed by a rainbow lorrikeet

Darren Lay

TAKE ACTION

Step 2: Add some Natural Structures

Since most insects such as bees and butterflies cannot swim, they will need something to sit on while also being able to reach the water. You can use small rocks, branches, or non-toxic materials to provide some structures to help insects and small vertebrates such as skinks reach the water without falling in. About 60-70% of the surface should be covered with landing areas. Imagine it like a miniature mountain range with water between the material.

Step 3: Find a Good Location

Place your watering station in a warm area where it is protected from wind. Ideally, choose somewhere with flowering plants nearby, or consider tying this project in with our Pollinator Gardens or Lizard Lounge example. Monitor the watering station regularly and check the water level is topped, particularly on hot days. Standing water that is not regularly changed may attract mosquitos and other insects to lay eggs on the surface.

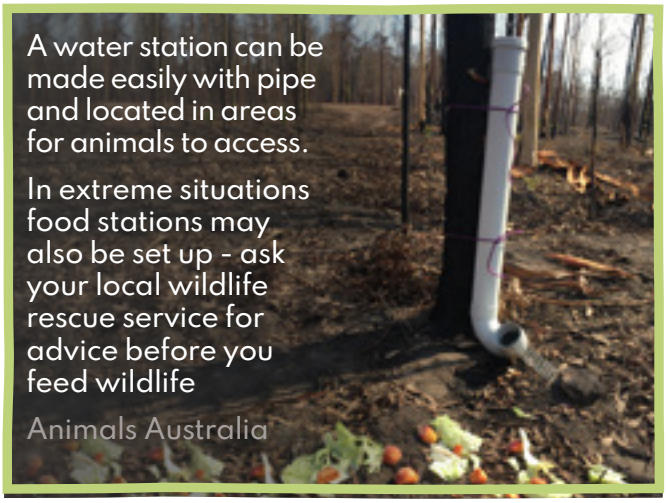
For ground dwelling animals such as blue tongue lizards place it near habitat such as grassy tussocks or low shrubs so that they can retreat if threatened.

Watering Stations for Stressed Animals

In extreme circumstances animals may be pushed out of their normal range in search of water. You can provide large tubs of water in various locations – such as in key spots in the bush or on the fringe of habitat. Make sure that you place a stick or similar to give an escape route for anything that may fall in.

Another option is to create these purpose-built watering stations that can be moved about as needed where the level is always topped up, and the station will need to be filled less often (depending on the situation). You will need to purchase or repurpose some PVC pipe, adhesive, and ties for this project.

Top Tip: If you have a swimming pool, stressed animals may be attracted when looking for a drink. Sadly, many animals and insects die as they fall in and cannot get out again. Make a secure ramp from the water to the edge where they can exit – this may be a thick rope, piece of timber or even a towel draped into the water.



A water station can be made easily with pipe and located in areas for animals to access.

In extreme situations food stations may also be set up - ask your local wildlife rescue service for advice before you feed wildlife

Animals Australia

Project: Caterpillar Nursery

1+ hr

Spring and Summer in cooler climates, or anytime in warmer areas.

Skills

Benefit

Easy

Creating a caterpillar garden is a great way to learn about the different life cycles of butterflies and moths. When hatched from eggs, caterpillars (larvae) need to find and eat a lot of plant material to store enough energy to pupate. This helps them to successfully metamorphose into moths and butterflies that have such an important role in pollination. Caterpillar gardens are the ideal way to help butterflies and moths in your project area!

Why Help?

While butterflies and moths will access a wide range of plants for nectar, often their caterpillars will only eat a very specific plant or two. Providing butterflies and moths with their preferred host plants on which to lay their eggs, and for their young to eat, will increase their numbers and enhance pollination!

Step 1: Find a Good Location

If you notice that caterpillars, butterflies, or moths, frequent areas around your garden, consider where you can safely place a caterpillar nursery. Like a pollinator garden, a caterpillar nursery provides food and habitat for caterpillars to thrive in.

Here's what to look for when choosing a site to attract and raise caterpillars:

- A spot with at least 6 hours of sun per day.
- Some protection from harsh winds that can put pupating caterpillars at risk.
- Good distance away from bird baths, to reduce predation.

The common crow butterfly feeds on nectar from many flowers

Graham Winterflood

The common crow caterpillar has specific host plants including the Port Jackson Fig

CC.20

Caterpillar of lesser wanderer

John Tann

The lesser wanderer is a common garden visitor

Jean and Fred

Step 2: Read and Research

Start by doing some research on the butterflies and moths that live in your area, and what host plants their caterpillars prefer – remembering that no host plant means no butterflies! There are over 22,000 moth and about 400 butterfly species in Australia, however we are very fortunate to have a fabulous resource for identifying them via the website listed in Helpful Links – which also includes host plants and regional species.

Step 3: Planting your Host Plants

First, it is important to check the conditions your selected plants prefer. While some herbs, shrubs and vines will thrive in full sunlight, many species prefer shaded areas or partial sunlight. Do your research and plant accordingly!

- **Flowers and Shrubs:** Use your finger to make hole big enough to fit the seedlings. Place them in the soil a little below the soil level and firm in well. Make sure you leave enough space and do not plant too close together.
- **Vines:** Select a position about 1m away from a tree or a supporting structure. Use a hand trowel or shovel to loosen up the soil, and perhaps add some compost or high-quality soil. Make a hole about twice the size of the root ball, and gently place the plant in the ground, being careful not to damage the root structure. Backfill the hole with high quality soil until the plant is secure - but do not press or firm the plant in as this will damage the root tips.
- **Grasses:** Native grasses are often planted from seed, by sowing evenly across a loose soil surface and sprinkling a light layer of soil over them. Water gently to avoid displacing your seeds!

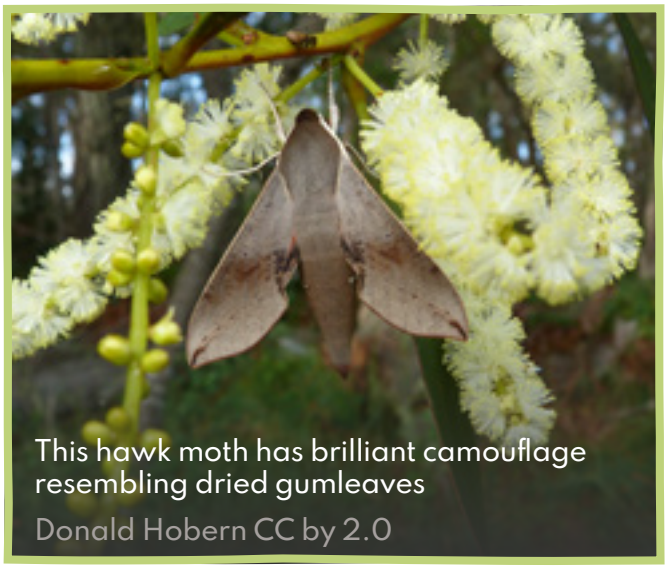
Visit your plants regularly to water and eliminate any weeds that may pop up. As vines grow, you may need to use a stake or other supporting structure to encourage them to climb in the right direction.

Step 4: Wait, Observe and Monitor!

As with any Embrace the Wild project, it is very important to be patient and wait for the host plants to establish and caterpillars to find your garden. There is no time frame for how quickly they may come, but you can pass the time by watching and monitoring what other species may live in and around your new garden that you have helped too! Detailed instructions are included in Action 4: Monitoring Your Project, which will help you monitor changes in biodiversity from your caterpillar nursery that will be really worth celebrating! In the meantime, why not try a complimentary Embrace the Wild project, like Pollinator Gardens, Watering Stations and Leave your Leaves!

There are numerous species of hawkmoth and the caterpillars often have eye spots

Jean and Fred



This hawk moth has brilliant camouflage resembling dried gumleaves

Donald Hobern CC by 2.0

ECOTIP: PLANT FOR LITTLE BIRDS

A dense shrub layer will provide little birds with shelter from predators and bigger, bossier territorial birds.

Project: Frog Hotels

1+ hr

Spring, Summer or Autumn

Skills

Benefit

Moderate

Many frog species are struggling to survive as we drain wetlands, swamps, and marshy areas to expand our cities and farmland. This is a problem for frogs because they are dependent on fresh, clean water for their survival. Frogs have permeable skin, meaning they can absorb any toxins in the water and become sick if the water is polluted. For this reason, seeing frogs in your neighbourhood is a great indicator that the ecosystem around you is doing well!

Male frogs croak loudly to attract a mate (females never call) and will sit within a hollow vessel to amplify their call – such as a frog apartment (see below). While tadpoles need a water source in which to develop, most adult frogs do not live in water – but in foliage, logs and hollows, soil or leaf litter, and even underground - often near to water so that they can breed.

Why Help?

Frogs eat many different kinds of insects and larvae (including mosquitos!), making them a natural insect control! Their tadpoles also eat algae, helping to keep waterways clean and clear.

Offer different sized pipes to accommodative different size frogs

Stephen Michael Barnett

Tree frogs use the pipes to not only hide but to amplify their calls

Ashleigh Miller

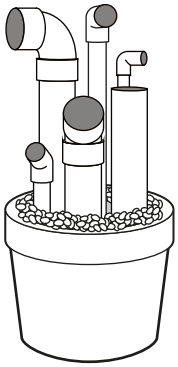
Step 1: Select a Location

Frogs like to get both (some) sunlight and shade throughout the day, so try and choose a site that receives both but is sheltered from full sun – which will dehydrate them. Create your habitat in an area that has some plant shelter nearby (or put some in!) and make a buffer zone around the project that does not get mowed. Long grass will protect your frogs from predators and provide them with a smorgasbord of insect visitors.

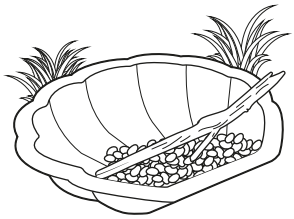
Step 2: Create your Habitat

The best frog habitats are made from recycled materials, and you can be as inventive as you like! You can make a frog habitat by repurposing an old bucket, flowerpot, waterproof container, or downpipes. We recommend the following projects:

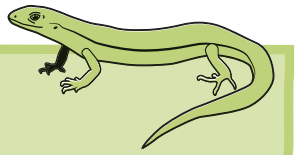
Flowerpot Caves: One of the easiest ways to create a frog habitat is to partially bury a terracotta flower pot on its side. This creates a small cave for frogs to climb under and shelter from predators. You can also stack broken pots together to create an artistic and spacious cave home!



Treefrog Apartments: There are over 200 frog species in Australia and many of them are tree frogs – that would love an apartment like this! Using an old container, bucket or pot and some PVC pipes or bamboo of varying lengths, you can make great hiding places for tree frogs to shelter. Half-fill your container with soil or pebbles and arrange 3 - 6 pipes of varying lengths and widths in your bucket. Firmly secure them with more soil or pebbles, leaving at least 2 cm of room between the soil and the rim of the container. Place the finished apartment in the garden nestled within some pot plants – making sure the site does not have direct sun. See our website for details.



Mini Frog Pond: Select a waterproof container such as plastic container, kiddie pool or sink and use a shovel to dig a hole of the same size and depth. Place your container in the ground and add a layer of gravel and rocks. It is important to arrange some stones or logs on the side of the container to create a slope for frogs and other animals to climb in and out. Arrange some plants around the side and you may also want to place an aquatic plant in as well – which can still be in its pots. Fill your mini pond with rainwater. Of course, this may take time for the frogs to find and in the meantime could attract mosquitos so you may need to flush this out regularly with rainwater to start, but soon the frogs should help control that! See our website for a simple example.



ECOTIP: GO SLOW

Species such as skinks can be slow movers, so may be run over when basking on a road or driveway, or killed by a mower as they hide in the grass. Keep an eye out!

Step 3: Add some Upgrades to make a 5-Star Hotel

You can decorate your hotel with pebbles, rocks and hardy plants like reeds and grasses – local natives will appeal to your local frogs. Frogs like to have many places to sit, and a water source to visit nearby – so consider teeming these projects for the ultimate habitat.

Step 4: Monitor and Wait for your Visitors

Do not try and stock your frog hotel yourself! Wild frogs will arrive eventually if they are present in your project area, so have patience. Just keep making sure that your water source is topped up regularly. Do not worry about cleaning out leaves and other organic matter that may fall in. It may not look pretty, but frogs love it! Continue on to Action 4: Monitoring Your Project for detailed instructions on how to monitor changes in biodiversity from your frog habitat that will certainly be worth celebrating!

Also see Important things to know under the Frog and Turtle Project.

Motor bike frog beside the frog pond
Clare Snow

A frog hotel made from reclaimed pvc pipe in different widths appeals to different frogs
Abbie Mitchell

Project: Frog and Turtle Ponds

4+ hrs (depending on size)

Spring and Summer

Skills

Benefit

Moderate/Difficult

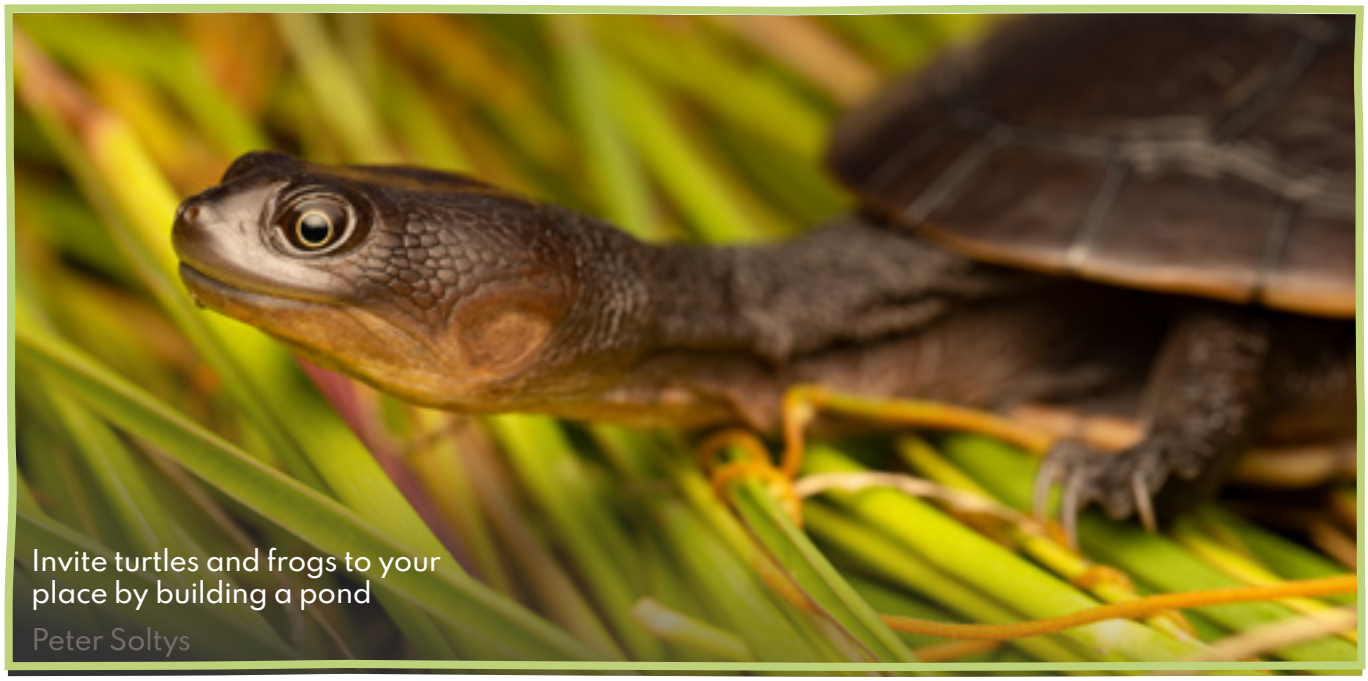
In many urban areas, frogs, and turtles struggle to survive as local wetlands, swamps and marshy areas are being drained as we expand our cities and farmland. This is a challenge because frogs and turtles play an important role in balancing the food chain in many ecosystems, as they eat both predators and prey. Turtles, frogs, and their eggs are also a valuable food source that many larger animals depend on for their survival. Without these animals to maintain the balance, ecosystems can become very vulnerable to collapse.

Why Help?

Tadpoles, frogs, and turtles keep water fresh by consuming algae, dead plants and animals that can foul the water. These aquatic inhabitants also eat many different kinds of insects and larvae (including mosquitos!), making them a great friend to have about.

Step 1: Choose your Location

Frogs and turtles need a network of healthy ponds to provide food and shelter. If you know frogs and turtles live in your area, or used to live there, you could think about creating a pond for them to visit. You want to choose a place that gets both sun and shade, because too much sun will cause algae to grow, and too much shade will mean these cold-blooded (called ectothermic) animals won't be able to stay warm.

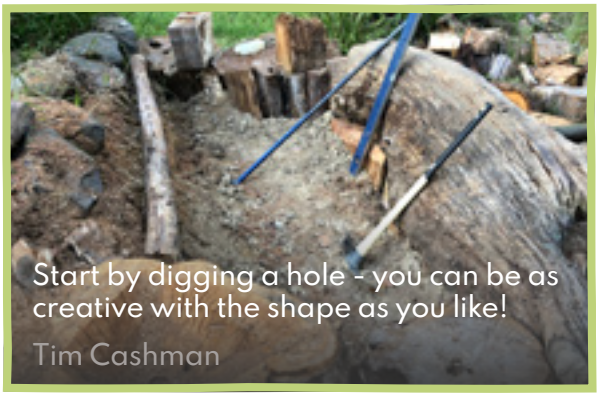


Invite turtles and frogs to your place by building a pond

Peter Soltys

Step 2: Digging your Pond

Safely use a shovel to dig a hole at least 1 x 1m in size and 60cm deep. (Note: be aware of any local council regulations about accessible water hazards). You'll need to make sure there are shallow sloping sides so that turtles and frogs can safely get in and out of the pool. Press the soil down with a tamper or other tool to flatten and compact the soil.



Start by digging a hole - you can be as creative with the shape as you like!

Tim Cashman

Step 3: Waterproof your Pond

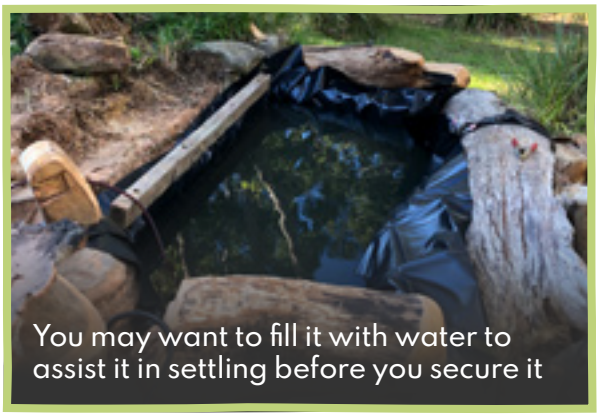
For this step, you'll need to source a waterproof pond liner that is big enough for your new pond. Reinforced polypropylene (RAPP) or poly-ethylene (RPE) plastic liners are best, and if possible, you can reuse an old liner or select a product made from recycled materials.

Check that there are no sharp rocks jutting out from your pond and lay the pond liner over the hole. Push the liner down so it fits in the shape of the pond and flatten it out to remove wrinkles and air pockets. You may also want to add some water at this point to help it settle before you secure it in step 4.

Line the pond with a pond liner

Step 4: Adding Rocks and Other Structures

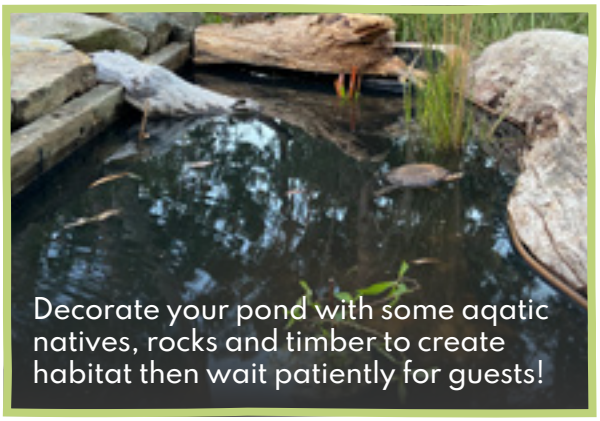
Place some heavy rocks around the edges of your liner to hold it in place. You will need to line your pond with an even layer of soil or gravel to help it retain water and protect the liner. You can also place some logs and large rocks in the middle of the pond to provide sunbathing for turtles.



You may want to fill it with water to assist it in settling before you secure it

Step 5: Decorate your Pond

Now that your pond is ready you can plant some native herbs and grasses around your pond. Ask your community nursery for advice. Your visitors will enjoy leafy plants that help them hide from predators and get shade from the sun. Scattering some old leaves and garden debris around your pond will attract different kinds of insects such a dragon flies and whirly beetles that will not only be a tasty treat for the ponds' residents but also help control pond health.



Decorate your pond with some aqatic natives, rocks and timber to create habitat then wait patiently for guests!

Step 6: Fill and Maintain your Pond

Your pond is finally ready to fill! Use fresh rain or tap water to fill the pool, leaving 8-10cm of space from the top. If your tap water is chlorinated it may kill tadpoles or insect larva, so let the water sit for a few days to let the chlorine evaporate. You'll need to top up the pond regularly but avoid keeping it too clean as frogs and turtles enjoy some of the algae that will grow. You could also consider a solar powered pump to circulate the water.

Step 7: Wait for your Visitors to Arrive and Monitor Success

If there are frogs or turtles that are living within 1 km of your pond, they will most likely come there on their own. Do not transport frogs or turtles from another location - just be patient and wait for them to arrive in their own time.

Important things to know:

- Frogs are very sensitive to chemicals and pollution. Treated water (such as tap water) should not be used for frogs. Use filtered water or collect rainwater. There are also a number of methods to remove the chemicals in treated tap water – do some research on your preferred method. Be aware that garden chemicals and fertilisers can wash into a pond and poison frogs also.
- Do not collect frogs, tadpoles, or frog spawn to add to your hotel or pond. Frogs will naturally find their way and the hotel may not be as desirable for the species that you collect.
- Do not handle frogs – any chemical residue on your hands such as hand lotion or soap can make them sick.
- Frogs are seriously impacted by a disease called Chytrid Fungus which does not harm humans but can be fatal to frogs. Do not transfer plants or frogs between water sites and if you are out enjoying frog habitat in nature be aware that you can accidently transport the disease on your shoes, clothes, or equipment – so decontaminate these between sites.
- Lastly, be aware that in some areas cane toads may be attracted to these sites too so you will need to dispatch of these humanely.

To learn more about frogs see our Helpful Links.

A bit of leaf litter in your pond provides extra habitat

Andrea Stiglingh

Dragonflies and other aquatic invertebrates will also love your pond

Peter Soltys

Project: Friendly Fences

2+ hours Anytime Varies

Skills Benefit

Transforming your fence line into a safe pathway for wildlife to pass through will encourage greater biodiversity. Fences are in all types of urban and rural landscapes and act as a barrier between properties for privacy, security, livestock and to safely keep pets. Simple changes like removing or adapting fences, can allow all kinds of birds, mammals, reptiles and amphibians to pass safely through our backyards, schoolyards and parks. Even something as simple as planting a diversity of native plants around a fence line can help to reconnect habitat, and provide food and shelter to the wildlife around you too.

Why Help?

Fences are a barrier to all kinds of wildlife moving through a landscape. They can trap wildlife in our yards and increase their risk of injury, whether from attacks by our pets or by entanglement in wires or other structures. Continuous fence lines can also funnel animals along roadways and train lines or stop animals moving around their territory safely. For example, a female blue tongue lizard has a territory the size of two urban backyards, and a male needs the equivalent of about seventeen. By working together with your neighbours and community you could really make a difference to reduce barriers and help animals such as these to move about.

For some animals, fences need to be lowered or adapted to enable animals to jump or climb along, and for others, a low gap will allow them to crawl or walk underneath safely. Animals can play an important role in your own backyard ecosystem by dispersing seeds, pollinating plants and controlling insect numbers.

Solid full length metal fences are a barrier for all animals unless they can fly

Daria Nipot/Shutterstock

Step 1: Location

If you have fences around your garden or local area, consider how to make your fence more wildlife friendly, and work with your neighbours to improve theirs too. Investigate what animals are out and about in your neighbourhood, and others that may be having trouble passing through. Here some monitoring and research would be beneficial to understand the behaviour and needs of your local animals, such as how they physically move and how the existing habitats link together – which will differ for example if they are a possum, or if they are a skink. Then consider how the fences would inhibit this movement or could even assist them with some modifications.

If the fence is not on your own property or it is shared with a neighbour, contact them to have a conversation about how you can make a fence more wildlife friendly, ask them if they would like to be involved and are happy for changes to be made.

Step 2: Design or Adapt for a Friendly Fence

There are a number of ways to make a fence line more friendly to our native wildlife.

Adapt an existing fully enclosed metal fence:

- Adding plants will reduce the reflective heat and light from a metal fence, improving the immediate climate and glare while also providing habitat for animals.
- Animals such as possums and koalas will run along a fence to move between trees, however a metal fence can be quite slippery! You could attach some timber pieces along the top of the fence to make it easy for animals to travel the length of it without coming to the ground.

While a timber fence is an easy climb for possums, consider providing holes at ground level for bandicoots and echidnas to pass though

Merrillie Redden

Timber capping on wire fences can assist koalas and possums to access different areas

Mornington Peninsula Koala Conservation

Providing some timber poles either side of a metal fence can help koalas and possums to move about

Mornington Peninsula Koala Conservation

- You could secure some timber or lattice pieces vertically to assist animals to get over the fence from ground height. Climbers and shrubs planted beside the fence can help with this too.

Adapt a fence that goes to the ground:

- Choose a location along the fence that already has some plants either side (or where you can add some later). Drill or cut some large holes in the base at different intervals along the fence and place a piece of terracotta or PVC pipe through it so that animals such as skinks can move either side of the fence. The pipe will provide shelter as they investigate for danger and stop jagged edges from hurting them.

- Remove some portions of the fence so that small animals such as bandicoots, echidnas or lizards can travel beneath it.

Creating a new fence?

There are a number of fence designs that are more fauna friendly than others.

Timber fences that have the vertical planks alternately placed on either side of the horizontal structure appear solid and provide a good barrier for pets while still providing access for animals.

Leaving space beneath any kind of fence will allow small animals to pass through.

Fencing mesh with a wide aperture (distance between the strands of wire) or spaced wire can allow small animals such as birds and lizards to pass through it and keep other animals such as dogs out (or in). You can then plant a garden either side of the fence and it will almost become invisible!

A fence can also be created just with plants to form a hedge. Many traditional hedges adopt non-flowering plants. While these provide some shelter, they do not provide food for pollinators – so planting native flowering plants that can be trimmed into a hedge shape can add privacy and benefits for wildlife.

Fence images left: Mornington Peninsula Koala Conservation


Add some holes to timber fences to allow animals to move between sides

freepix

TAKE ACTION

Step 3: Installing

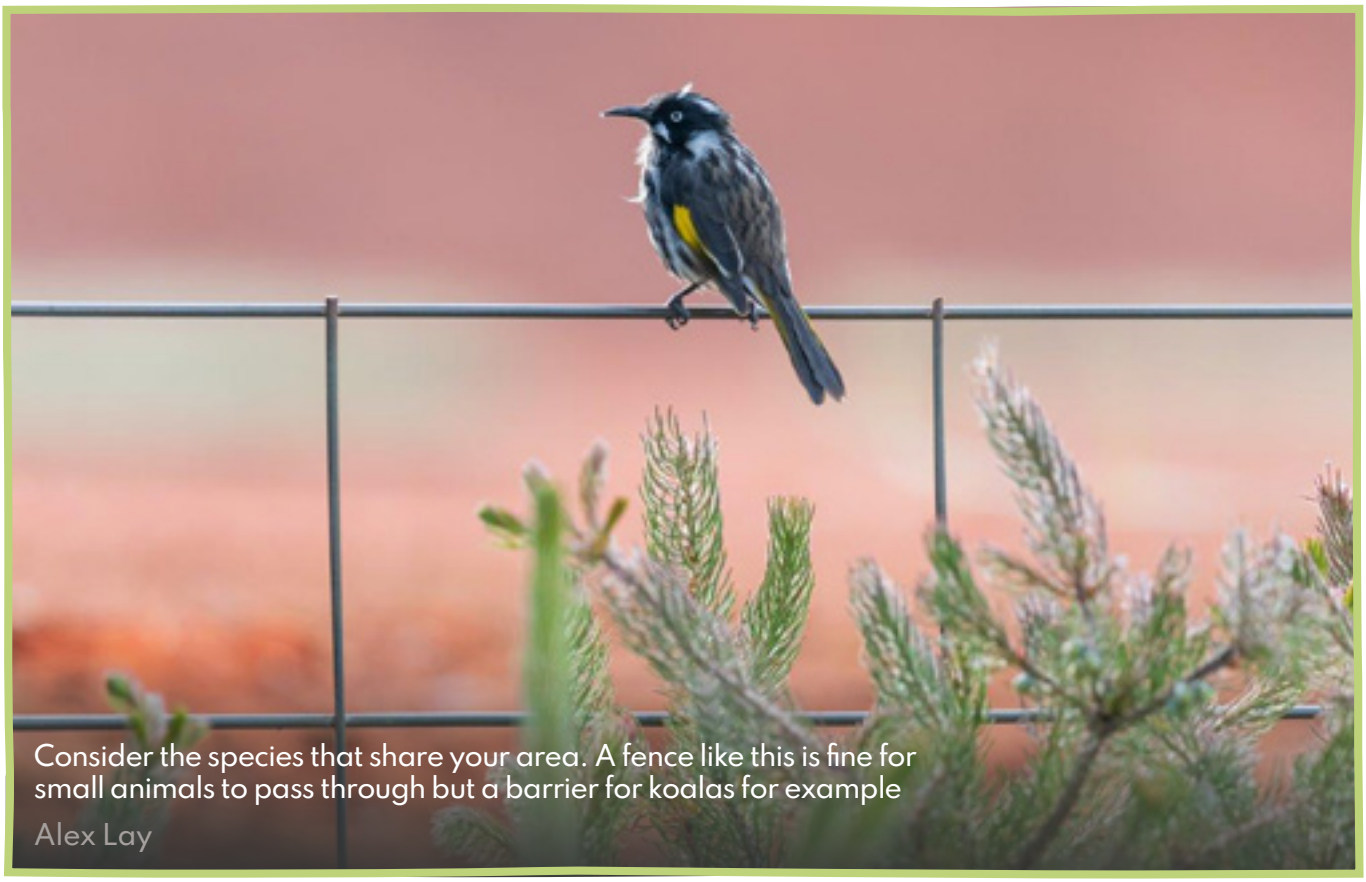
Once you've decided on what type of fence you want to create, collect your materials. These may include seeds and seedlings, timber such as fence palings and trellis for vegetation to climb up. If you're building your own fence or removing one, you will need the appropriate tools including a saw, wood glue, nails, hammer and safety equipment.

A raised fence for smaller animals should begin 30-50cm off the ground and may have gaps spaced at 30-50cm above this. It is best to keep fences under 1.2m in height and use vegetation above this level for privacy.

Step 4: Monitor

Monitor your friendly fence line to survey how many animals and which species are using the corridor to move through the area safely. You can survey your fence on a weekly or monthly basis to record your data. Take some photos and compare your results with what you saw at the beginning of your project. Look at Action 4: Monitoring your Project for more tips.

Pet Aware: Pet dogs and cats can kill and injure wildlife. If you have pets make sure they are kept in at night so as not to threaten nocturnal animals such as bandicoots or possums. Shelters such as stick piles and shrubbery will give small creatures such as lizards a retreat from pets. Make sure your cat has a bell on it which will warn birds and other animals of its approach, and limit their time outdoors or provide an adventurous outdoor cat run. Consider providing pet free areas by using our friendly fence ideas so that you can keep your pets away from wildlife entirely.



Consider the species that share your area. A fence like this is fine for small animals to pass through but a barrier for koalas for example

Alex Lay

Project: Wormeries

1 hour | Anytime | Moderate

Skills | Benefit

Did you know that there are over 8000 different species of earthworms living in the soils of every continent on our planet? Earthworms are incredible recyclers, eating wood debris and animal waste, microbes, and decayed plant materials. Building a worm farm can help you to reduce your household waste and carbon emissions, by avoiding sending food waste to landfill. As a thank you, worms produce a great natural fertilizer that will help your garden thrive. We have three ideas here to kick you off to suit any sized space.

Why Help?

Earthworms decompose plants, food scraps and other organic matter into rich healthy soils. Worms also create tiny underground passageways in our soils that help the circulation of water, air, and nutrients.

Free-range Wormeries

Step 1: Choosing a Location for your Wormery

Because food scraps and worm poop can be a bit smelly, it is important to select a well-ventilated area to place your wormery. Place it outdoors where it will be sheltered from direct sunlight, such as a shaded area of garden.

Step 2: Set up your Wormery

Here are three options for making a wormery – two free range designs, and a neat Worm Box optional extra.

To make a free-range wormery, you will need a large plastic pot or bucket.

- **Above ground:** Use a drill to create worm entry holes (about 2cm wide) on the bottom of a plastic pot or bucket. Press the container directly into the soil.
- **Underground:** Dig a hole that is as wide and as deep as your container. Using a drill, create worm entry holes (about 2cm wide) on the base and sides of your container. Place the container in the soil and backfill the hole so that the bucket is in contact with the soil on all sides.

To make a self-contained worm box see the optional extra at the end of this project.

Step 3: Inviting Worms

Place alternating layers of food scraps, leaf litter or shredded newspaper or straw into the tub. Lightly water the mixture and cover with either hessian cloth or a lid to prevent scavengers from visiting, and rainwater drowning your worms. If worms are naturally present in your garden, they will find their way into your worm farm and feast on the contents. Alternatively, you can stock your farm with a handful of worms and castings (worm poop) to give them a head start.

Invite earthworms by offering nutritious food scraps

Shanegenziuk CC by SA 3.0

Step 4: Feeding your Worms

Your worms need to be fed at least once a week. Fruit peels, vegetable scraps and other food waste like eggshells and coffee grounds provide the perfect meal. Ideally, the food should be at least 3 - 4 days old and broken down into smaller pieces for earthworms to digest them. Be mindful that worms have delicate taste buds and are not fond of large quantities of salty, spicy, or citrus foods like lemons, oranges, limes, and grapefruits.

Earth worms aerate the soil as they wriggle through it

Golf Bress/Shutterstock

Avoid putting meat scraps, dairy products, breads or fats and oils in your worm farm, as these can be very smelly and are not good for worms. Avoid turning over the soil too often, as this can be stressful for inhabitants. Check out Project: Composting for more ideas!

Worm Box

You can also make a self-contained wormery in a reused polystyrene box. This is perfect for a smaller space such as an apartment balcony. Gently poke a short piece of 2cm (or so) pipe through the one end of your box – as close to the bottom as possible. This is the drainage hole and the way to collect nutrient rich runoff.

Place about 5cm of gravel in the bottom and cover this with a piece of hessian or other fabric offcut. Now add some soil and some worms and their castings. You may have to go digging for these at a friend or neighbour's place. Next, place some straw on the top to keep them cool and water this to moisten it. Remember to pop a bucket under the flow pipe at the bottom first!

Finally place the lid on top – but poke a few air holes in it first. Your worm box will need to be kept in a cool dark place and watered regularly to avoid it drying out. Once your worm numbers build up you can start adding your kitchen scraps and enjoy the nutrient rich water it provides to boost your garden or pot plants.

Project: Composting

<1 hour | Anytime | Moderate

Skills | Benefit

Composting creates beautifully rich soil that will help both vegetable and flower gardens to thrive. Decomposition is usually a slow, natural process, however by putting our food and garden waste into a compost pile in a warm location where the heat can speed up the process. This activity also harnesses the work of tiny microorganisms that break down and transform organic waste into nutritious and moist soils for our plants.

Why Help?

Composting can reduce your carbon footprint by transforming food scraps that would normally go into landfill into rich healthy soils. The plants in your vegetable garden will thank you for the moist, nutrient-rich soil that will suppress diseases and unwanted pests!

Step 1: Gather your Materials

There are several options to get started. You could use a compost bin bought from a store, repurpose, or build your own wooden box, or simply create a loose compost pile. An enclosed container will be less likely to attract unwanted visitors looking for food scraps though! Whatever you use, it is important that your compost can breathe by having access to oxygen and some sun. To help speed up the composting process, having your compost in direct contact with the soil beneath can help bring nearby worms and other microorganisms to your pile!

Turn your food scraps into rich soil by composting

Daisy Daisy/Shutterstock

Step 2: Find a Sunny Area

Organic matter will decompose faster in a warm, sunny spot that has a bit of shade to prevent drying out. Because food scraps can be a bit smelly, find a well-ventilated or outdoors area.


Place your compost bin in a sunny spot to speed up the process

Jurate Buiviene/Shutterstock

Step 3: Feeding your Compost

For best results, aim to strike a 1:1 balance of nitrogen-rich (green) and carbon-rich (brown) material in your compost bin:

- Nitrogen can be provided by green material such as grass clippings, food waste, coffee grounds, manure or recently pulled weeds.
- Carbon materials come from brown material, such as woody stems, dry leaves, and cardboard. When adding wood, it is better to shred it beforehand so it will not take too long to decompose.

Your compost will create rich soil allowing your veggie garden to thrive

Fabrika Simf/Shutterstock

It's best to avoid the following:

- Meat, fish, egg or poultry scraps, dairy products as well as fats, grease or oils can create a very bad odour and attract pests.
- Coal or charcoal ash (contains substances which are harmful to plants).
- Diseased or insect-ridden plants (diseases or insects might spread).
- Pet waste (dog or cat faeces/litter as it can contain parasites or germs).

When adding to the pile, use a shovel or rake to turn over your heap thoroughly to help oxygen get all through the pile. A compacted and poorly aerated pile can cause the compost to rot, and it will quickly become very smelly. If you have stirred things in correctly, your compost should smell like forest soil!

Step 4: Maintaining and Monitoring your Compost

Composting is not particularly time consuming, however you should make sure it does not dry out or become too wet. Adding some water can help a dried-out pile, and absorbent materials will help soak up the extra moisture in an overly squelchy compost pile. Ideally you should aim for the texture of a wrung-out sponge, with a bit of moisture, but not too much! You may also notice interesting species of insects may visit your compost, so continue to the detailed instructions in Action 4: Monitoring Your Project, which will help you monitor changes in biodiversity from your compost that will be really worth celebrating!

Around 3 months after you build your pile, most of the materials should have decomposed a bit. You will notice after 6-12 months, your finished compost will be dark, crumbly, and ready for use! Use your compost to help with planting or sowing seeds in other Embrace the Wild projects like Vegetable Gardens, Companion Planting, Pollinator Gardens and Scrub Shelters!

Project: Regrowing Veggies

N/A

All year round!

Easy

Skills

Benefit

Embracing the Wild is not just about restoring animal habitats - it is also about learning where your food comes from! Believe it or not, we can do this by regrowing some of our vegetable scraps. The process of regrowing some vegetables can be as easy as putting the root end or top part of specific vegetables in a saucer with water and waiting for them to grow!

While many vegetables and fruits can be regrown from cuttings, some are easier to regrow than others. Here are some examples of easy vegetable scraps that can be regrown:

Celery

Cut around 2-4cm above the base of the celery and place the base in a saucer with water in an area that gets good sunlight. Remember to replace water regularly so that it doesn't foul. When the celery begins to sprout and form roots, transfer it to a pot with soil.

Celery

Lynn Maree Ross/ Shutterstock

Leek

Cut about 3cm above the base of the leek and place the base in a saucer with water in an area that gets good sunlight. Remember to replace water regularly so that it doesn't go slimy. When the leek begins to sprout a lot, transfer to a pot with soil and water every few days.

Leek

Alexanderstock23/Shutterstock

Garlic

You can either plant a whole clove of garlic upright in soil and water regularly or wait until garlic cloves begin to sprout themselves and place the sprouting clove in a shallow saucer with water until roots begin to grow, then transfer to soil when ready.

Shallots

Cut the plant about 2cm from the roots and place the base in a cup with 1cm of water. Remember to replace water regularly so that it doesn't foul. When the green onions begin to sprout upwards, transfer to a pot with soil and water every few days.

Garlic

Imagefingerprint/Shutterstock

Carrot Tops

Did you know that the leaves of a carrot are edible, and can be used to make pesto or eaten in a salad? To harvest carrot leaves, cut 3cm from the top of the carrot and place the carrot top in a 1 cm of water and leave in sunlight. Remember to replace water regularly so that it doesn't go slimy!


Carrot
Pete CC by 2.0

Leafy Greens

Such as cabbage, bok choy and lettuce

Cut 3 - 5cm from the base of a cabbage, bok choy or lettuce plant and sit in a half-filled cup of water. You'll need to replace the water regularly to prevent the water from fouling. Once the roots begin to form and leaves sprout upwards, transfer to a pot with soil in a semi-shaded spot and water every few days. Soon you'll have delicious healthy greens!


Lettuce
Mehriban A /Shutterstock

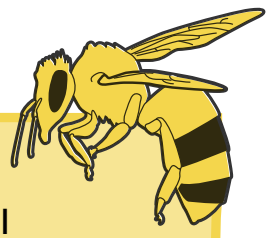
Herbs

Such as basil, mint, coriander, thyme, and rosemary

Place at least 2-3 inches of a herb's stem and leaf nodes (points in the stem where leaves grow from), upright in a cup of water on your kitchen windowsill. Remember to replace water regularly to prevent it from fouling. Once the roots begin to sprout to about 2 inches long, transfer the plant to a pot with soil

Tips and Tricks

- While it looks a little icky, slime is normal to develop on the base of some of the vegetables (such as celery or lettuce).
- Some scraps may not grow so do not be discouraged if it takes one or two tries to successfully regrow some food.
- The leftover scraps you do not use are great to use for composting or for use in your wormery!



ECOTIP: READ THE LABEL

Systemic chemicals impregnated into plants intended to kill pests also kill beneficial insects such as pollinators and those that prey on pest species. Humans are ingesting them too! Google neonicotinoids to learn more.

Project: Vegetable Garden

2+ hrs Anytime Easy

Skills Benefit

Have you ever eaten fruit and vegetables directly after you have picked them? Creating your own vegetable garden is a great way to reconnect with nature, learn something about plants, and also to eat the best food you can possibly get.

If you don't have access to your own garden, you can join a community garden in your area or plant vegetables on your balcony. For starters, we will provide you with basic information on how to start your own vegetable paradise.

Why Help?

Growing your own vegetables can make a huge difference to your carbon footprint and an even better one to biodiversity. Pollinators and soil microbes will love your new veggie patch as much as you do!

Step 1: Find a Sunny Sheltered Location

Vegetable gardens will be most successful in areas sheltered from strong winds that could dry the soil or damage plants. Try and choose a spot that gets at least 6 hours of sunlight over both summer and winter seasons (hint: making a sun map of your garden can help!). But don't be disheartened if you only have access to a shady space, as you can still plant herbs, salad greens and root vegetables such as potatoes and beetroots.

Step 2: Prepare the Soil

Whether you have marked out an area of lawn or have some pots on your balcony; you will first need to provide some healthy soil in which your plants can grow.

- **In Ground:** If you are working from scratch to make a garden, you will need to dig at least 30cm of soil and completely remove any rocks, clumps, or roots. If possible, mix through some compost or potting mix to improve the soil quality. This part is hard work initially, but it will be worth it in the end!
- **Planter or Pot:** To grow vegetables in a smaller area, you can fill a planter box or big deep pots with a mixture of your own compost or good quality garden soil.

Yum – salad in the making!
Markus Spiske

Step 3: Choose your Plants

When choosing vegetables for your garden, it is important to consider the different extremes of temperature, humidity, and rainfall in your project area. Though some plants will only grow in warm, moist tropical conditions, most garden vegetables grow well in areas that have distinct summer and winter seasons. Plants or seeds can usually be purchased at a hardware, nursery and some supermarkets.

You will have more success with your garden if you plant at the optimum time of year, which will differ between locations and for each type of vegetable.

Step 4: Planting

Once you decide which plants you would like to grow, you have two options. You could either buy pre-grown seedlings or sow seeds yourself. Starting from the seed is usually less expensive and can be enriching and educational to see the whole process from the beginning. Seedlings are often more costly but tend to be easier to grow.

- **Seeds:** As a rule of thumb, you can plant seeds at a depth equal to 3x their width. Be mindful that some seeds may prefer to be sown on the soil surface, but they should be lightly pressed in to prevent blowing away.
- **Seedlings:** Use your finger to make hole big enough to fit the seedlings. Place them in the soil a little below the soil level and firm in well. Make sure you leave enough space and do not plant too close together.

Water your seeds or plants as soon as they are in the ground, allowing the moisture to soak in. Keep watering in the morning every 1 - 2 days for about two weeks. This will help them get established in their new home. From this point, you may get away with watering them around twice a week, depending on the season and your climate – but the trick is to not let the soil dry out – which will happen quickly!

Step 5: Looking After your Plants

As your plants grow, your garden will not only provide you with fresh, delicious veggies, but it will also offer a habitat for pollinating insects and other wildlife that eat them. Your garden can become a great starting point for a thriving habitat, so consider expanding on more Embrace the Wild projects such as Composting, Free-Range Wormeries, Leave your Leaves, Companion Planting, Bird Baths, and Insect Hotels.

Your garden can contain a mix of vegetables and herbs that also provide habitat and food for little animals. Sharing is caring

Ben Howes

Nurture young plants in a homemade green house

Jess Pinder

Project: Companion Planting

~1 Hour | Varies | Easy

Skills | Benefit

When growing your own fruits and vegetables, you'll likely come up against pesky garden visitors like weeds, insects, slugs, or fungus at some point. But instead of reaching for toxic pesticides that will affect all biodiversity including beneficial pollinators and insect eating visitors, try mixing up your garden with decoy and companion species next to each other, that can support plant growth, provide protection from pests, attract beneficial insects, and even improve your soil quality!

Even though we have much of the same range of fruit and vegetables in Australia as the rest of the world, we do have different insects. Much literature that you may come across about companion planting will not necessarily work here. But we have done a bit of digging and here are the top tips for Australia.

Why Help?

Companion planting is a wonderful natural and eco-friendly solution to improving crop harvests, reducing harmful pesticide use, and encouraging symbiotic (beneficial for all) relationships between your plants!

Step 1: Plan your Garden

Here are some things to maximise the plant and animal relationships in your garden.

Mix Things Up

To make your plants less susceptible to pests, avoid planting only one kind of vegetable in a clump or row. Pests will easily detect their five-star menu and jump from one plant to the next. If you mix in other species, it will be harder for pests to spread.

A mix of veggies, herbs and flowers deter pests and attracts pollinators

Matchou/Shutterstock

Your veggie garden can be both attractive and productive

Joanna Tkaczuk/Shutterstock

To give you a few examples, here are some fruits and vegetables that are said to mix well together:

- **Beans with:** Broccoli, Carrots, Celery, Corn, Pumpkin, Potatoes, Squash, Strawberries
- **Broccoli with:** Beans, Beets, Celery, Cucumber, Peas, Potatoes, Sage
- **Cabbage with:** Beans, Cucumbers, Dill, Kale, Lettuce, Onions, Spinach, Thyme
- **Carrots with:** Onions, Peas, Radishes, Peppermint, Dill
- **Cucumbers with:** Beans, Broccoli, Corn, Cauliflower, Peas, Radishes, Sunflowers
- **Fennel with:** Cucumbers, Lettuce, Peas
- **Lettuce with:** Asparagus, Cabbage, Corn, Eggplant, Potatoes, Spinach, Strawberries
- **Onions with:** Beets, Broccoli, Carrots, Peppers, Spinach, Tomatoes
- **Peas:** Beans, Carrots, Corn, Cucumbers, Lettuce, Melons, Turnips, Parsnips
- **Peppers with:** Coriander, Onions, Spinach, Tomatoes, Basil
- **Potatoes:** Beans, Broccoli, Corn, Garlic, Kale, Lettuce, Peas, Radishes
- **Tomatoes:** Basil, Beans, Borage, Celery, Dill, Parsley, Peppers, Spinach, Thyme

Attract Beneficial Creatures

Beneficial invertebrates such as lacewings, lady beetles, wasps, mantises, and spiders will help you fight pests, while butterflies, hover flies and bees will pollinate your crops. Letting some of the herb's flower such as basil and mint will attract pollinators as will adding some flowering plants, even if they do not yield edible foods, to attract even more pollinators. These in turn will attract insectivorous creatures that will love the pests in your garden too! You could also consider having leafy vegetables such as spinach and lettuce, and herbs, in a separate area where birds can reach them. The birds will eat the pests but will not have access to fruits and other attractive vegetables.

Plant some Decoys

Plants such as marigolds, scented geranium, lavender, rosemary, and thyme are strong smelling and thought to be good in disguising the smells of plants that are more attractive to pests. You could have these surrounding your more susceptible plants.

Lacewing larve
HHelene/Shutterstock

Green lacewing larvae predate all sorts of garden pests
Jean and Fred

Like with Like

Plant combinations of plants that like the same soil type, light condition, and amount of water. This may help to reduce fungus on plants that are over watered next to thirsty plants.

Plants that Help Each Other

An example of this is old Native American technique called 'The Three Sisters'. These three stands for corn, beans and squash that together live in perfect symbiosis (they all help each other to grow). Beans need something to climb, and the high stable corn plants offer perfect conditions for that. The beans bring beneficial nitrogen into the soil that acts as a great fertiliser for the corn and squash. The squash on the other hand covers the ground and provides shade to cool the soil and reduce weed growth. Without one of the plants, all the plants will have a more difficult time to grow.

Another good combination to restore the nitrogen balance is by combining plants such as kale and lettuce (which absorb a lot of nitrogen from the soil) with broad beans and peas (that are nitrogen fixers), meaning they absorb nitrogen from the air and transfer it to the soil.

Get Real

Humans have become more and more obsessed with perfection. But nibbles, blemishes, spots and weird and wonky are part of an organic garden. Surely sacrificing a little bit of produce to the odd caterpillar is better than eating chemically treated food!

Other Tricks

There are a number of tricks that include barriers and deterrents for pests that you can use safely in your garden too. See our website for more information.

Step 2: Get Planting and Monitor Success

Check out our planting instructions in the Vegetable Garden project. A lot of gardening is about trial and error and learning from experience. Keep a note of what works, take photos and learn to identify the creatures in your garden that are both good and bad so you can provide for them or outsmart them respectively.

Organic vegetables may be weird and wonky but they are chemical free!

Johan Puisais/Pixabay

Project: River and Beach Clean Ups

1 hr (or more!) Anytime Easy

Skills Benefit

Of all the resources in the known universe, water is indispensable to life. Humans, plants and animals all rely on a source of clean and fresh water for drinking, food and even shelter. But sadly, wildlife is suffering from pollutants like toxic chemicals and plastic entering our waterways, which inevitably makes its way out to sea. Plastics greatly harm animals that ingest them, and research shows that microplastics (tiny broken-down plastics) are accumulating in animal tissues. Cleaning up our rivers and beaches is one easy contribution you can make to address this important problem.

Why Help?

The ocean is home to the greatest abundance of life on this planet and produces 70% of all the oxygen that we breathe. The animals that live there play an essential role in the trophic chain of all ecosystems and provide us with essential sources of food and income.

Step 1: Gather your Materials

All that you'll need for a clean-up is a pair of cotton work clothes, some containers, bags or sacks to gather the trash and some sturdy shoes (gumboots or waders are ideal). As a bonus, ask some friends and family members to join you!

Step 2: Choose a Good Location

A clean up can be conducted anywhere, like a school yard, hiking trail or park. However, as our oceans and waterways are most vulnerable to plastic pollution, it is best to start in these areas. Vulnerable ecosystems like wetlands and mangroves will be especially grateful for your help.

On its way to the sea – see some plastic pick it up

Abbie Mitchell

Cleaning up your favourite beach or creek makes it all the better for you to enjoy too

Jake Ingle

Step 3: Start your 60 minutes Clean Up (or Longer!)

When you've arrived at your location, put on your gloves, and collect any rubbish you see into your bag. You will find many items are recyclable so you can sort as you go by having different bags for each or creating a small pile to gather later. Be careful to pick up cigarette butts where you see them, as these contain chemicals that can leach chemicals into waterways.

Check for plastic bottles, lids, straws, and bags around rocks and grassy areas along the riverbank or shoreline. Be careful where you step and avoid wading too deep into water.

Hint: you can make the clean up more fun by listening to music, jogging between pickups and having a competition for who collects the most rubbish!

Step 4: Share your Success

Spend some time counting or weighing the rubbish you collected and give yourself a pat on the back for your efforts. Take a picture of all the rubbish you gathered to share your good deed with others. Your hard work might even inspire them!

Value add when you go to the beach by picking up some rubbish as well
Ella Cashman

Project: Shorebird Awareness

Varies | Anytime | Easy/Moderate

Skills | Benefit

Every year, millions of migratory shorebirds embark on epic journeys to fly between their breeding and overwintering grounds on different continents. Wetlands, mudflats, and intertidal coastlines are vital foraging habitats for these migratory shorebirds, (and resident shorebirds) seeking small prey animals like crabs, worms, insects and molluscs. Sadly, these habitats are rife with disturbances like plastic pollution, feral predators, urbanisation and general disturbance from recreation. For this reason, shorebird populations have suffered devastating collapse with average declines around 70% worldwide.

Why Help?

Shorebirds help to regulate and assist the functioning of intertidal mudflats and beaches through providing their droppings (guano) and food waste which fertilises coastal plants (especially on islands), and assist erosion and sediment control. The guano feeds phytoplankton, which at the bottom of the food chain inadvertently feed the entire ocean food web. Shorebirds also control different sorts of invertebrates.

Pied oyster catchers are distinct with their red beak and eye

Peter Shanks

Option 1: Raise Awareness

Shorebirds are easily disturbed by cars, construction, dogs and people. It is important that the public are aware of areas where shorebirds may be nesting as parent birds intermittently abandon their eggs leaving them exposed to weather and predators.

Installing a sign in these areas is a great way to help inform the public and discourage people from walking their dogs or driving their cars nearby. Using your artistic skills, a plaque and some paint, you can create a sign that informs and educates people about nesting shorebirds! To learn more about your local species – see our Helpful Links.

Option 2: Organise a Plastic Pick Up

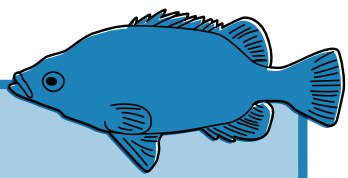
Following instructions from the River and Beach Clean Ups project, you can organise a Plastic Pick Up for a mudflat, beach or wetland where shorebirds frequent. Shorebirds are known to mistake plastic or disposable items for food and tragically feed them to their young. It is not uncommon for shorebirds to perish from ingestion of plastics and microplastics, or to suffer injury from cable ties, fishing wire and plastic rings. Just make sure you do this outside of breeding season.

Option 3: Remove Introduced Plants

Introduced plants can severely alter or damage roosting sites where shorebirds breed. Changed plant communities can limit the availability of food or leave shorebirds more exposed to predators. You can lend a hand by pulling out any exotic weeds that have invaded coastal shorelines, mangroves, or wetlands. Check out our project on Wetland and Freshwater Conservation for more info.

Everyone loves a clean beach!
Abbie Mitchell

Pied stilts feed in shallow water
Jacob Dedman



ECOTIP: LOOK AFTER WATERWAYS

Waterways can become polluted by runoff containing chemicals or blocked by sediment and invasive weeds that reduce suitable and safe habitat for animals. Pick up some plastic for the critters.

Project: Wetland and Freshwater Ecosystems

Depends | Anytime | Easy/Moderate

Skills | Benefit

Wetlands and freshwater habitats can be heavily affected by pollution, environmental degradation, and human interference, unfortunately preventing many vulnerable species from migrating, spawning, and living nearby. Some species of birds can travel huge distances around our planet, migrating from one continent to the other and supporting life on isolated islands. Helping the species that benefit from these wetland and freshwater habitats can be as simple as conducting a river clean up, volunteering for a local conservation authority or wetland association, or helping plant more native flora species in affected areas.

Why Help?

Wetlands are vital breeding sites that many kinds of birds, fish, turtles and frogs depend on to survive. They also improve water quality and prevent flooding by absorbing heavy rainfall and slowly releasing water into the surrounding environment!

Choosing a Project

There are many ways that you can help restore wetland habitats. Keep in mind that wetlands are generally situated on private land or areas that are governed by a local council, so it is important to seek permission before you do anything. Below are a few good options to consider!

Option 1: Volunteering

Many major wetland or freshwater habitats will already have established conservation groups that you can volunteer with. See our website for helpful links or ask your Local Council or National Parks and Wildlife Service if there are any Bushcare Groups or projects you can join. It can be a great way to make new friends with like-minded people and learn about your local fauna and flora including weed identification and survey techniques. To look for other volunteer opportunities see our website for links.

Volunteering on conservation projects can also be a lot of fun

Abbie Mitchell

Freshwater habitats include lakes, creeks, rivers and wetlands

Abbie Mitchell

Option 2: Home activities

Many of regular household behaviours can be detrimental to wildlife and contribute to wetland and freshwater degradation. By changing the habits below, we can greatly benefit our local biodiversity.

- **Break up with Herbicides and Insecticides**

  The chemicals you put on your lawn, especially in rainy and windy weather, can be washed into waterways and accumulate in wetland ecosystems. This is incredibly harmful to the plants and animals that live in these ecosystems, as well as to the larvae of ground dwelling species such as native bees.

- **Switch your Cleaning Products**

  Many chemical cleaning products such as detergents, shampoo and washing liquids, find their way into local waterways and pollute the water supply. To minimise the risk to freshwater ecosystems near you, switch your cleaning and personal hygiene products to natural or phosphate / chemical free alternatives. As a bonus, this is much healthier for your family members too!

- **Reduce and Reuse**

  Rather than relying on recycling, it's important to bring the emphasis back to reducing our plastic consumption at home. Easy switches include swapping plastic toothbrushes and dish brushes for bamboo ones and shampoo and conditioner bottles for solid bars.

  Always think about how you can recycle glass jars and plastic containers, which are great for storage of course, but you can also refill these at a zero-waste store with staple foods like flour, pasta and rice! All of our consumer choices impact the planet in some way beginning with sourcing of raw materials to the production and the disposal, so the less we consume, especially of single use items such as plastic straws, balloons and plastic bags it is always going to be better for the planet.

Assorted jars are a great way to store things and can look cool too

Bamboo toothbrushes are biodegradable

Project: Rewilding

<1 hour | Anytime | Easy/Moderate

Skills | Benefit

Even in small or urban areas we can Embrace the Wild. Consider planting the nature strip with local native plants or vegetables, or let patches of lawn get wild with native grasses and flowers. See our website for some great links.

The idea of weeds is somewhat confusing too. Obviously weeds that push out important habitat should not be encouraged but plants such as dandelions or clover that are often dotted through our backyard, school and park lawns provide food for lizards, birds and pollinators – which is definitely more beneficial than the area provided by a pristine lawn!

On a farm consider allowing patches of natural habitat to be included intermittently around crop or livestock areas, allowing wild animals to move more easily across the landscape. This will also give beneficial pollinators an area to forage and nest which in turn will help farm productivity. To give an idea – one of Australia's native bee species, *Homalictus*, has been shown to be a better pollinator than the honey bee. Where native vegetation and mixed crops exist side by side, it can only fly a maximum of 60 metres, so little pockets of habitat can make a big difference!

Remnant vegetation and rewildling areas provide habitat for many species such as blue tongue lizards

Jacob Dedman

Project: Biodiversity Mural

1 – several days

Anytime in good weather!

Skills

Benefit

Moderate

Embracing the Wild is not just about creating habitats, it's about ensuring people understand and care about the natural world around them. One big challenge can be finding a way to talk about conservation issues in a way that is positive, interesting, and fun! So why not let your art do the talking and create an Embrace the Wild biodiversity mural?!

Why Help?

Many people are unaware of the amazing local native animals and plants around them. Creating a mural to celebrate the diversity can really help raise awareness and get people caring.

Step 1: Location, Location, Location

The most important element of your biodiversity mural is maximising your visual impact – and that means finding a suitable wall, fence, or structure that has good exposure. Think about locations that have lots of people passing and note the size of the area and the ability for you to access the canvas safely (no ladder work please!).

Keep in mind that you can't just start painting directly on a structure – that's vandalism! For this project, it is essential to seek out permission from the property owner first, whether that be a government organisation, privately owned or your grandma's backyard fence!

The mural can be as whimsical or realistic as you like!

Jeremy McKnight

Step 2: Planning the Design

When planning your artwork, think about the subject and complexity. Beginner artists could consider choosing one or two plants or animals to feature, and some simple shapes or words to get their message across. Ambitious and experienced artists might challenge themselves with a mural featuring a diversity of local plants and wildlife. While this can be visually spectacular, more complexity requires more planning, resources and even helpers to assist.

There are lots of incredible biodiversity murals that can be researched online for inspiration – but remember that murals are protected by copyright and moral rights. For this reason, collect ideas, but keep your work original - and the best place to start is at the drawing board.

Develop a reference picture for your mural - a smaller scaled version of your design. This document can be photocopied and shared with other members of your team to use, or even projected onto the surface to trace the outline.

If you're not confident about painting directly onto a structure, an old bed sheet or large piece of cardboard may be the way to go!

Step 3: Preparing to Paint

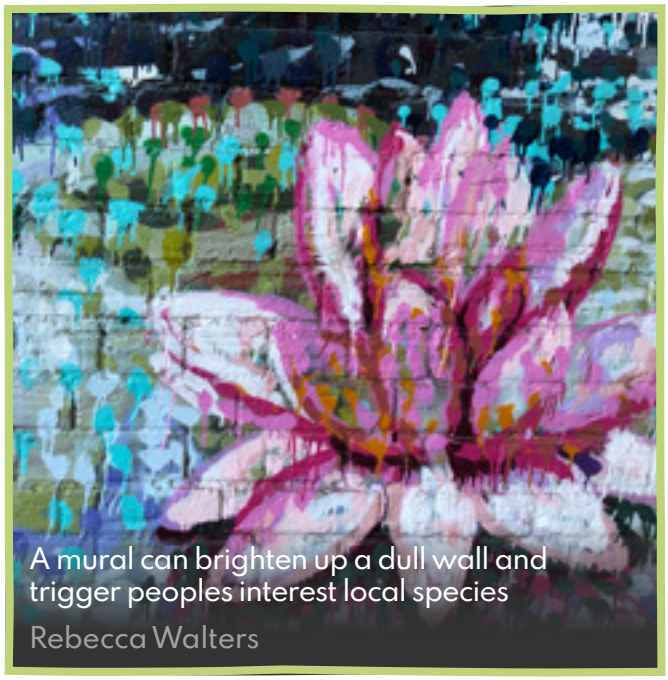
For this activity, you'll need paint, paint, and more paint! Plan your colour scheme and type of paint – water based mural paint will give good coverage, while thinner paints (such as household paint) may mean you need to do multiple coats to get rich colour. It's handy to have a few brushes of different sizes. A wider, angled brush will cover larger areas, while a skinnier brush can be used for finer details and lines.

Other essential items include a drop sheet, to avoid paint on the ground, rags to help with cleaning up mistakes, and containers to mix colours and clean brushes. It's advisable to wash dust and dirt from your painting surface with soapy water before you begin, and even do an undercoat of white or pale grey to help make your design pop.

Step 4: Have Fun!

It's time to put on some old clothes and head to your project site. If you can, it's fun to rope in some friends to help. If you're expecting to be outdoors for several hours be prepared with the essential items – hat, sunscreen, snacks, and bottled water.

Start by painting your background colour or pattern first – making sure to allow time for your paint to dry before adding new layers. You can lightly pencil in the details on top. A great mural takes time and patience – so don't rush the process! Before you know it, you'll have created something you can really be proud of!



A mural can brighten up a dull wall and trigger peoples interest local species

Rebecca Walters

Project: Guided Nature Walk

4+ hrs (depending on size)

Spring and Autumn

Skills

Benefit

Moderate

Spending time in nature is a really important way for children, youth, and young people to learn how to care for the environment. As Jane Goodall reflects: 'Only if we understand, can we care. Only if we care, we will help. Only if we help, we shall be saved.' It's the passion behind every stellar nature documentary! Not only is it a chance to connect with animals, people and our shared environment, it's also a great way to stay healthy. In this activity, you're going to create a guided nature walk; helping your community to explore and protect your local habitat.

Why Help?

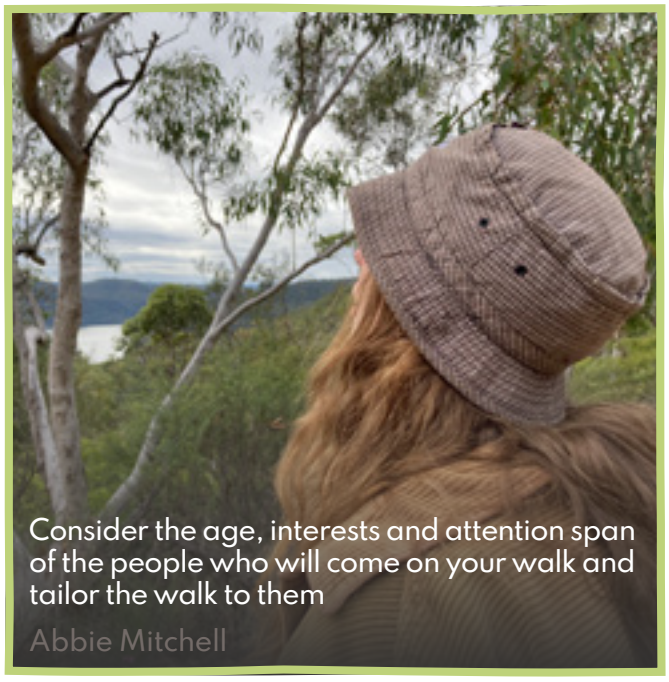
When people are more aware of the needs of their local wildlife, they are more likely to want to protect them. By supporting people to respectfully explore your local environment, you are actively increasing awareness of local wildlife and support for conservation. Guided nature walks also encourage people to take time to invest in health and wellbeing.

Step 1: Identify Different Habitats Along your Route

Take time to explore your school or community. Can you identify trees, old logs, grasses, rocks, and maybe piles of leaves? These are examples of habitats! To help record what you find, find a map of your local area. Create a symbol for each habitat type, (i.e. old log) and record their locations on your map within a defined area that's easy to access.

Step 2: Which Habitats Help our Friends?

Each animal and plant in your local area enjoys its own special habitat! Do some research to discover how local species would use these habitats and explain to people why these are important. See if you can find any specific signs that indicate animals are present - scats, tracks, scratches and nibbles - which will provide even greater interest to the walk.



Consider the age, interests and attention span of the people who will come on your walk and tailor the walk to them

Abbie Mitchell

Step 3: Creating Stops and Labels

It's time to create stops along your guided nature walk to help community members stop, listen, appreciate and reflect on the environment around them. Stops can be created at key habitat locations (i.e. a large tree) and feature a label with a description of wildlife in that location. Labels may be pegged to a tree branch, or a small wooden post at each stop. On each label, you might include drawings of wildlife (i.e. bird species that use the tree), and include a QR code to guide people towards helpful websites. You might seek permission from local First Nations groups to feature indigenous names for wildlife too.

Step 4: Design your Walking Route

After placing labels in key habitat areas in your local area, it's time to design the route! Circle the location of each habitat area and label on your map, drawing arrows between locations to show where your guided nature walk begins and ends. How can you create a route that cares for both visitors and the wildlife they are spotting? Ensure your track is safe, accessible and interesting, with diverse habitats.

Step 5: Invite your Community to Complete your Nature Walk

Congratulations on creating a guided nature walk! You might like to invite family, friends and your community to try it and offer feedback. Additionally, to help users stay healthy and reflect on the wildlife around them with all their senses, you might like to add 'exercise stations' at each stop, inspired by the local wildlife! If there's a tall tree, why not create a healthy challenge to do ten jumps up high? If there's a low rocky habitat, visitors can bend low, enjoying stretch routines. There are endless opportunities to increase engagement.

A walk in nature is great for your mental health and wellbeing

Sandro Antonietti

Project: Design Challenge

Varies | Anytime | Varies

Skills | Benefit

During the early stages of the Embrace the Wild program, you might have an original, ambitious or creative idea for an incredible project that could really make a difference in your community. This Design Challenge is all about supporting you to follow your ideas and to develop your very own project that will help animals, people and environment around you.

Perhaps you might like to develop a communications campaign to raise awareness about threatened species in your area or share some tips and tricks or how everyday people can help make a difference in conservation. The sky really is the limit for this project, but first, let's share some tips and tricks to get you started.

Step 1: Developing a Project

The best place to start is by thinking about your passions, your interests and the unique skill set that sets you apart from others. Perhaps you have a keen interest in art and creative projects and can use these skills to communicate important messages to your local community. You might even be a great (or aspiring!) public speaker, who wants to share some of your important learnings with your peers.

No matter the skill set you come to the challenge with, you're sure to have an important contribution to make to this topic. Identifying a project can be challenging though, so here are some ideas to inspire you.

Challenge 1: The Theatre Buff

For this project, you could organise a screening of a favourite documentary at your local school, library or cinema. We highly recommend 'Jane' or 'Jane Goodall: The Hope!'

Challenge 2: The Book Club

For those that prefer the written word over the cinematic experience – organising an environmental book club could be a great learning and community bonding experience.

Challenge 3: The Drama Queen

You could write a short screenplay, shoot a documentary, or even develop a monologue about Embrace the Wild. For an extra challenge – why not try communicating through music or interpretive dance?!

Be creative and have fun as you inspire others to Embrace the Wild

Luke Stambouliah

Challenge 4: The Weaving Enthusiast

Depending what species of plants are found in your bioregion, you could consider creating some household or creative items from plants. That's right – if you have materials like flax or wicker around, or even some sedges and grasses such as native lomandra, you can weave or sew items together, including baskets, rugs, furniture, ropes, or even wreaths for your front door.

Weaving with grass can be a nice way to enjoy nature

Luke Stambouliah

Challenge 5: Give a Speech

When you think about the most famous speeches of all time, who comes to mind? Greta Thunberg, Martin Luther King Jr, Barack Obama…or maybe even one of your family, friends or local community leaders. Chances are that they were talking about a topic really close to their heart, something that filled them with passion and excitement for the future. When you're thinking about your project, what aspect of conservation do you find most exciting? Start there! You might like to give a speech on something exciting like information on a unique species, advocate for a challenge like climate change, or maybe inform your audience about ways they can make a difference!

One of the most underrated parts of every great speech in history is the role the audience plays in responding to the vision. Researching your audience's interests, ages and values so you can target your message is one of the best ways to make an impact.

There are many excellent tips you can find for giving speeches. Here are just a few:

Tell a story: a story brings people together and let's them engage and make their own minds up! It's a great way to create empathy and make a message memorable!

Use personal experiences: You're always the expert when sharing about your life! Linking your speech to examples from your life is a great way to show integrity and vulnerability.

Use local and relevant examples: For example, when talking about climate change in a dry, desert region, you might focus on the impact of drought. Whereas if you're speaking in a very cold and icy location, you may focus on arctic environments etc.

Use questions to actively engage your audience: 'What would you do if you were in X situation? And why?'

Think about a mountain: When you climb a mountain, the key moments are the start, summit and end. Think about these three key moments in your speech - get people interested quickly with an engaging story, have a simple, clear message in the middle (i.e. the main point) and finish strongly, re-emphasising your main point. If you can get these three moments right, everything else tends to fall into place!

Finally, remember that it's **okay to be nervous** when giving a speech: adrenaline is actually a really important part of all great speeches! Remember that the most important part of your speech isn't necessarily you, but the idea you're sharing. Believe in yourself, your message and the idea you're wanting to share - you can guarantee all the Embrace The Wild community around the world share your passion and we're all cheering you on!

Challenge 6: The Fundraiser

For the avid bakers, raffle ticketers, and bucket rattlers – this project is for you! We have no doubt that there are organisations nearby (perhaps wildlife shelters) that need her help! Try baking earth-friendly treats and selling them to your family and friends or organising a walk-a -ton – perhaps you could raise some money to support your other Embrace the Wild projects!

Challenge 7: The Upcycling Aficionado

Upcycling is an activity which helps give old, worn items (like your grandad's mothballed sweater!) a new lease on life. What fresh start can you imagine for these old items – can antique teaspoons be refashioned into beautiful jewellery? Maybe that old dresser on the side of the road could do with a fresh coat of paint and some TLC? It's up to you!

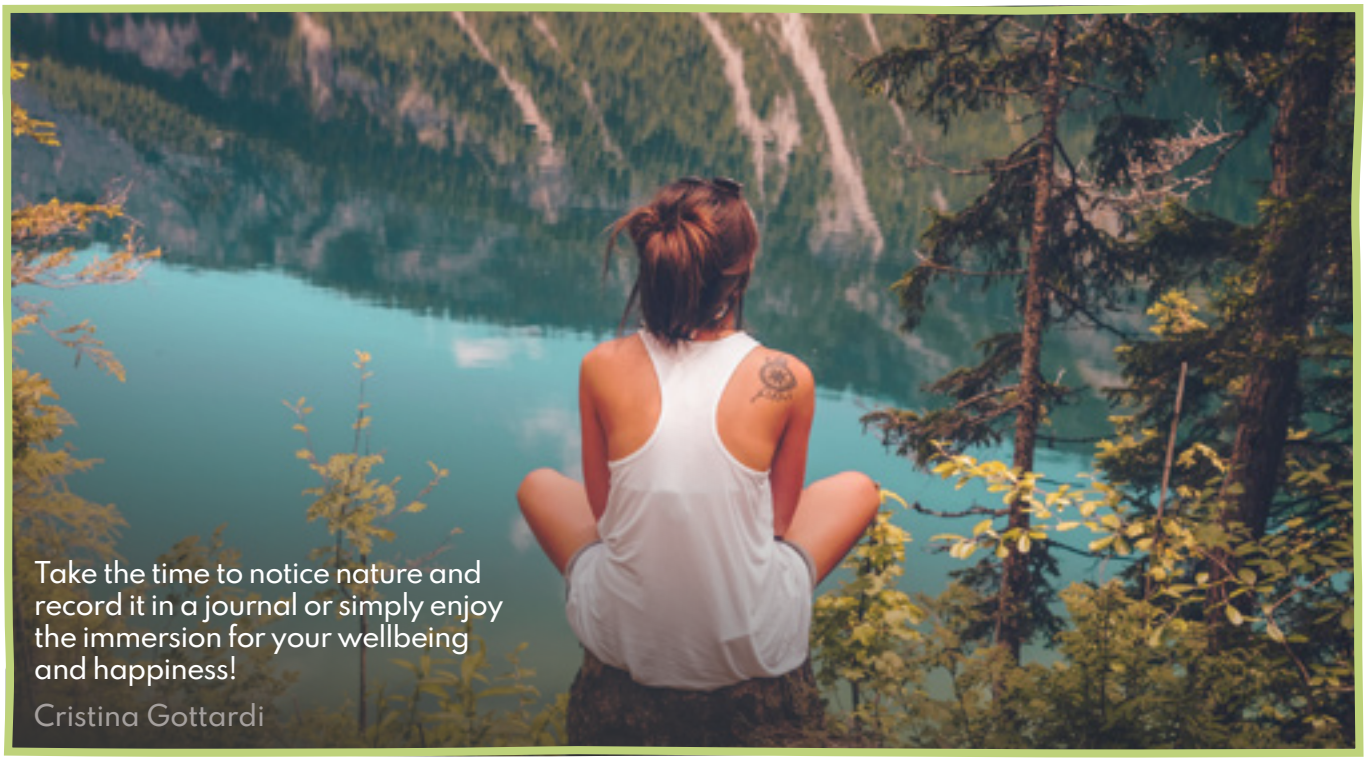
Challenge 8: The Nature Journal

This is part monitoring, part diarising, part observation and part creativity. Grab a blank book and get creative drawing and noting the species that you see around you. As time goes on, the seasonal patterns that you notice or the behaviour you observe can provide really valuable information about the biodiversity and changes in your area.

Challenge 9: The Animal Ambassador

Have you got a favourite local animal? Perhaps it is an individual that you see regularly in your garden or a species that is special in your area. You might even consider it as your spirit animal or just something that makes you react a certain way – smile, laugh or recoil!

You can also become an ambassador for that animal by learning all you can about it and nurturing the local environment to accommodate it – making sure its food and nesting requirements are plentiful or that existing local threats are addressed – for example by adding connectivity between your garden and the neighbours, campaigning for a wildlife crossing for it to cross a local road or raising awareness of pet control near to a particular habitat site. You can combine a number of Embrace the Wild projects to support your animal.



Take the time to notice nature and record it in a journal or simply enjoy the immersion for your wellbeing and happiness!

Cristina Gottardi

Step 2: Project Planning

A successful project needs a great plan for execution, so here are a few things to think about before you start taking action:

- How much lead time do you need to organise your project?
- Do you need to seek some assistance or guidance to help you run it?
- What physical materials do you need to create your project, and how can they be sourced sustainably?
- Who are you going to involve in your project, and how might you reach out to them? Perhaps a social media platform, a newsletter or local radio station could be the answer.
- Do you need to create anything else to support your project such as a flyer or event page?
- Where might your project take place, and why – and do you need permission to go ahead?

Step 3: Deliver and Enjoy

Once you've completed your project planning, it's time to kick things into gear. This means putting plans into action, which is arguably the most fun and rewarding part of any project. Don't forget to capture some photos and thoughts about the project while it's happening, and share these to inspire other members of the local community and fellow Embrace the Wilders around the world!

Getting involved in a project is a great way to make friends and connect with like-minded people

Inspire your friends to join you in your epic project

Cynthia Magna

Action 4: MONITOR

Observe and monitor the impacts of your project

Congratulations on finishing your Embrace the Wild project! Now it's time to find out how your project is benefitting the animals, plants and people in your community. In monitoring new habitats for example, noting changes such as the mix and diversity of animal and plant species present (species composition and richness) or the number of each counted (species abundance) will really help to assess the difference your project has made.

There are two main elements to monitoring the impacts of your project. The first is to continually observe changes – this is done through regular surveys (Activity 5: Regular Surveys below). Secondly you need to keep a record of these changes and observations so that you have something to compare against (Activity 6: Record Your Findings). Both of these activities go hand-in-hand, so it is wise to read through both first to consider the best survey and recording method for your site and to demonstrate your impact.

Activity 5: Regular Surveys

Wildlife surveys provide a snapshot of what an ecosystem looks like at a point in time. Running multiple surveys at different times of day, in different conditions, over different seasons, and years, allows for real comparisons. For example, some species may be migratory and only around at a certain time of year, or an animal such as a glider may be in torpor when it is cold, or very active when there is abundant food.

Having an idea of what you may possibly see and understanding its behaviour is helpful for knowing where and when to look for it. This information, gathered over time, will help determine the impact of your Embrace the Wild project.

Look closely - these photos feature the same site, but looking from ground level reveals the safe pathways for animals hidden in beneath the thick bracken

Abbie Mitchell

Choose a Survey Method

There are many techniques that can help identify what animals are present. The method you choose will depend on the size of your area, your available time, the number and ages of participants, and the type of animal you are aiming to survey. Observational, photo point monitoring and spotlighting surveys are easy to start with. To conduct a survey, take a field guide, camera and clipboard, and note any species that you see or hear - see Activity 2: Wildlife Detective for more tips. We have also created some templates to record your findings during your survey – see our website for details.

Before embarking on a wildlife survey, it is important to understand the health, safety, and ethical considerations of these activities. Evaluate how your activities might injure or harm people or wildlife. For example, when spotlighting, there is risk of trip hazards, so it may be good to access the area in daylight first to know what to expect and follow guidelines suggested below to reduce the impact to animals.

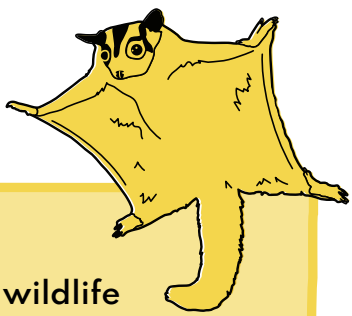
Your survey method will vary depending on what you are monitoring. For example, grey-headed flying foxes gather in a regular camp by day making it easier to monitor activity

Rene Riegal/Unsplash

Spotlighting is a fun way to discover nocturnal species such as the greater glider

Josh Bowell

MONITOR

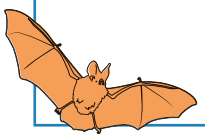


ECOTIP: WATCH OUT!

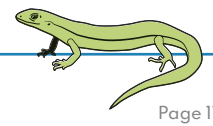
Many species are hit by a vehicle as they cross roads. Contact a wildlife rescue centre if you find an injured animal and check the pouch of any marsupials for young which may survive even if the mother does not.

Method	Description	Use	Considerations
Desktop study	You can learn a lot about the wildlife around you via the internet. By visiting trusted websites, you can quickly discover which species are locally common or rare.	The desktop research method can be used when on-the-ground surveys are impractical and to understand species behaviour, appearance, and distribution.	It is really important to get your information from reliable sources, such as government, museum or specialised websites – and cross referencing is a smart idea!
Observational survey	Observations, or species sightings, can be logged: a) By recording wildlife spotted from a single location (point) for a set period of time (e.g. 15 minutes). b) By recording wildlife spotted while walking along a straight line of set distance (transect).	The observational method is used to observe a range of species, such as birds. You may choose to record animal sightings, as well as signs of animal presence including feathers, scats, tracks and nests.	When choosing the transect method, it is important to be aware of trip hazards around you. It is helpful to bring an ID book/ app, stopwatch, camera and clipboard to record your notes.
Camera Traps	Motion triggered wildlife cameras are frequently used to capture images of a range of different animals. Camera traps are usually installed on trees or posts and can be placed near known food sources and nesting sites.	Camera traps are usually installed on trees or posts, and can survey a range of animals depending on their height and the bait used to entice an animal within range of the camera. They are particularly useful for nocturnal and secretive animals, and can be triggered any time of the day or night.	It's important to set up your camera trap where it won't be triggered by people walking past, and to move any vegetation which might set the camera off. Wildlife groups and councils can sometimes loan a camera trap, or you can hire or buy one.

Method	Description	Use	Considerations
Water Bug surveys	You can identify water bugs in water samples collected from streams or ponds. You can also look for invertebrates under rocks and wood (but replace these afterwards), and take note of any flying insects, like dragonflies, that you might see. around the area. Check our Helpful Links for an ID guide.	This method helps to identify the types of aquatic invertebrate species present indicating water quality, and the potential predators attracted for a meal.	It is important to be safe and waterwise when working near water. Have an adult assist you. Take a net, tray or bucket and a magnifying glass – or use a smartphone. Remember to take only pictures, and return all samples you have finished identifying to their original habitat afterwards. Be careful of cross-contamination between sites.
Bioacoustic Surveys	Bioacoustics refers to the sounds made by living organisms. Unique sounds can be used to identify specific species in an area – such as bats, birds and frogs. Many apps and online resources exist to identify calls you record - see our Helpful Links.	Bioacoustics are used to identify different species of mammals, birds, and frogs – especially when they may not be seen, or their call is beyond the range of human hearing.	Animal calls can be recorded on smartphones and identified using dedicated apps. There are also more sophisticated options available – such as recording the high-pitched calls of microbats and identifying individual species from their unique sound profile. These are specialised, but some clubs and citizen science projects may assist.



Method	Description	Use	Considerations
Spotlight surveys	Spotlighting is conducted at night by sweeping a torch across trees and the ground. It can be conducted in a single area, or by moving along a transect. The torch light will reflect the animals' eye-shine. Mammal eyes will often shine red, while spiders will shine green.	Spotlighting is used to locate nocturnal mammals, reptiles, birds, and invertebrates. Tip: You can also use a UV torch to see invertebrates such as scorpions that glow in the dark!	Be wary of trip hazards and possible habitats (such as hollows) – perhaps check out the location by daylight first. Do not shine bright light directly at an animal as it may damage their vision – direct it to one side and use a red filter on the torch for extended observation.
Minibeast survey	Try one of these methods: Tree shake – lay a white cloth or tray under a tree and shake the branch vigorously. This will dislodge creatures that you can capture in a clear container and inspect. Leaf litter search – scoop up leaf litter into a container and use a soft brush to investigate what invertebrates were captured. Use a stick to move leaves, sticks, rotting bark and logs to see what is beneath them.	Doing an invertebrate survey is a great way to assess what your site can provide for other animals. You can capture animals in a clear container or jar and use a magnifying glass to inspect them. Take a photo to record the find and identify it later. Make sure you release the invertebrate exactly where you found it.	Invertebrates can bite or sting. A few are venomous. Do not use your bare hands or have bare feet. Do not put your hands where you cannot see. Roll logs towards you – this allows anything underneath to escape away from you (an important point in snake country!). Be gentle with insects – use a soft brush to gently push them into a container.
Photo Point Monitoring	Take a photo from the exact same point at different times to compare the changes over time.	A picture tells a thousand words as they say – you can visually show the difference!	Take photos of the same location from a few different angles that way as it grows your view is still covered across the series of images.



Activity 6: Record your Findings

Step 1: Baseline Data

To identify any changes, we need something to compare these changes against, which is what we call baseline data. This is the information about what the area was like *before* or *immediately after* you started your project.

To create some baseline data we will need to collate information on:

- Species diversity, or how many different species are present.
- The abundance, or total number of each of those species.
- Habitat use, how animals are using different habitats.

A spotlighting survey may reveal nocturnal birds such as the Tawny frogmouth

Jacob Dedman

This data may already exist from Activity 2: Wildlife Detective or you can download one of the apps listed below, or use our data templates to assist (see our website).

Step 2: Organising your Data

Create an online database to ensure that you do not lose or misplace any data. You can make your own spreadsheet in Microsoft Excel or similar.

When saving your file, use labels and file names which are logical and specific, for example 'Wildlife_Survey' is a bit vague, while Autumn_Bird_Survey_2020 gives you a lot more information about what the dataset contains.

You may like to create different data tables for different animal types (like reptiles, mammals and birds), to keep similar observations together.

Echidnas may leave signs of foraging especially around termite nests or rotting logs

Jacob Dedman

Entering the data you collected from different surveys in the same spreadsheet allows you to make direct comparisons and ensure it is all in one place. Just make sure you don't misspell anything!

Step 3: Keep a Clear Record of all Metadata

Metadata is data about data and usually includes notes about the location that data was collected, the date and time of day it occurred, and other conditions such as the weather, human activity, pollution levels, the survey method used, and the names of the persons who collected it.

Behaviour of species like the sugar glider is seasonal so recording this info will help make sense of your sightings

Jacob Dedman

Metadata is incredibly important as it provides context for others to interpret your dataset. This helps give us clues as to why surveys on different days could be different, for example because animals were sheltering over winter, or because there were lots of people around that were scaring the animals away. Metadata provides vital information to help explain patterns of animal movements and behaviours. You may choose to include the metadata within your main dataset or as a separate supporting document file.

Step 4: Contributing your Data

Your surveys provide really important information and can contribute to numerous citizen science programs. For example, any frog calls could be uploaded to the Frog ID app to assist with monitoring frogs around Australia, or your photos could be used in a similar way by being uploaded to Inaturalist or Questagame, to build a picture of species occurrence in an area. A great part of using these apps is that firstly, there is a community to assist in species identification (you don't have to know what an animal or plant is to upload or contribute) and secondly, once verified this record is added to the Atlas of Living Australia – the central hub for all species records.

Reporting sightings of species such as a powerful owl are vital contributions to conservation projects

Jacob Dedman

There are also opportunities to participate in organised surveys such as the Great Aussie Bird Count or Pollinator Week when you can focus on specific animal groups and be part of a national survey effort!

Step 5: Analysing your Data

Depending on what your interest and background is, analysing your data can be quite complex (for example to contribute to a university research project) or relatively simple.

Your data can tell you about the diversity of species that are present, as well as which species are dominating and what are missing (that you expected to find but didn't). For example, territorial birds such as magpies, butcher birds and noisy minors will chase many other bird species away – particularly little birds. Knowing this information could help you focus your efforts on creating more little bird habitat, and will provide a baseline to compare species diversity against in the future.

Over time your data may reveal new arrivals - such as insectivorous birds like the red capped robin being fed thanks to your 'Leaving your Leaves' or 'Minibeast Hotel' project

Jacob Dedman

Action 5: CELEBRATE

Reflect, share and celebrate the difference you have made

Completing an Embrace the Wild project is a huge achievement! Congratulations! In this final stage of the program, it is important to take some time to document your project and celebrate your impact with others. By doing so, you will build your communication skills and maybe even inspire someone to Embrace the Wild too.

The completion of your project is the perfect time to reflect on the difference that you have made to your local community and the plants, animals and people within it. One of the most valuable ways to do this is by spending time in your project area. Notice all of the transformations that have occurred, as even the tiniest of details may have a big impact on living things. Imagine that you are a small animal coming to visit, stopping to rest under a newly planted shrub, or for a drink at a watering station.

Ask yourself what you did well, or could improve and add, and how wildlife may benefit. Is your project now complete, or will you make some adjustments? What are your plans for ongoing monitoring?

As you've completed the Embrace the Wild journey, have you picked up skills or knowledge, or learnt innovative new ways to apply them? Which aspects of the project did you enjoy the most, and did you learn anything new about yourself along the way? Reflect on the biggest challenges you faced in making your project, and how you overcame them. Take time to be proud of your achievement.

Enjoy the moment of success!
Melissa Askew

Activity 7: Share your Success

There are many ways that you can celebrate the success of your project with others:

- Make a short video or take photos.
- Create a poster or artwork.
- Write an article or blog post.
- Take before and after photos.
- Share your citizen science data.
- Join our Embrace the Wild Community.

Become Part of the Embrace the Wild Community

Did you know that by completing an Embrace the Wild project, you are now part of a large global network of changemakers restoring habitats in their communities?

To capture your important contributions, the Jane Goodall Institute is compiling photos, recording data and mapping Embrace the Wild projects all around the world! We want to be able to share and celebrate the incredible impact that individuals like you are making to our planet. But we really need your help to do this!

You can register your project on our website and consider sharing your success with us and others via some of the suggestions below.

Finally make sure to invite your friends, neighbours, local schools and community groups to Embrace the Wild. Together we can make a world of difference!

A beach picnic is well deserved after a successful project
Kimson Doan

'The cumulative impact of many small decisions, choices and actions makes a big difference.'

– Dr Jane Goodall

Make a Video or Photo Essay

Research and Plan

Start off by researching how other people have captured their own DIY habitat projects, by searching for relevant hashtags like #insecthotel or #pollinatorgarden.

Think about which videos or images you like best and why? Is it because of the great music or audio? Are they funny, or use interesting effects? What about the descriptive text – are there call outs on the video, or text below for example? This initial research will help to give you an idea of what you would like to include in your own video.

You may even like to develop a storyboard of the different elements featured in your video, and the timeline for different shots. Here are some video ideas:

- Create a time-lapse video.
- Comparing before and after images.
- Talking to the camera about your experience.
- Step-by-step instructions.
- Facts about a particular species.
- Mini documentary about your project.

Planning your storyboard and script will help to determine what shots you will need. Some apps, including Instagram Reels and Tiktok, give you the option to film continuously (one single shot) or stitch together different shots.

If you're creating a time-lapse or step-by-step instructions, film your project progression every week or so and stitch it together to show the transition and impact of your project. Alternatively, you may just want to film yourself talking about the project and showing the final project from different angles, which can be equally as dynamic and engaging.

Shooting your Project

Before you start filming, you'll need to consider a few logistics:

- Audience – where are you planning to show this?
- What format does it need to be: Portrait for Instagram and Tiktok, or landscape for Facebook or YouTube, or sharing in a different way?
- Will you be filming yourself, or can a friend or family member help you film?
- Do you need a tripod or homemade stand?
- Should you film your clips on a camera app (to import later), or directly into Apps such as TikTok and Instagram Reel if this is your preferred platform?

Plan your shots to keep the film interesting
Aaron Burton on Snapstock

Consider how the time of day will change the lighting and mood of your message

There are loads of online guides for creating and sharing videos. Most computers and tablets come with editing software to create simple videos, or you can even use PowerPoint to create a short account of your project.

Tip: Don't forget to get permission from anybody that is included in your video to broadcast it on social media or at any other public event.

Social Media

Social media platforms such as Instagram, Facebook, Twitter and Tiktok are a great place to share your project with the world. Make sure you tag it with #Embracethewild so we can share your achievement too.

Rather than creating a once-off social media post, you may wish to regularly share updates with others by creating your own blog, Facebook page/group or Twitter account specifically for your Embrace the Wild project.

This can be especially impactful for large Embrace that Wild projects that involve many community members or a variety of different projects. For example, you might be restoring an unused section of your school with a vegetable and pollinator garden, worm farm, insect hotel and lizard lounge!

Creating a dedicated social media page allows you to post updates about new project additions and milestones. Sharing the joyful aspects of your habitat restoration project - for example when a new insect species visits your pollinator garden, or when a bird takes up residence in your nesting box - validates your joint efforts! Have a look at the tips for writing an engaging article below.

Choosing your Platform

To figure out if a blog, Facebook Page or Twitter account is the most effective communication tool for your project, you need to think about your audience. Is this a private group or a public platform? Be sure to adjust the privacy settings to make it searchable or private. If you are under 18, we suggest having a chat with your parent, guardian or teacher, to decide what is best for you and your project.

Choosing a platform
Mike Renpening from Pixabay

Write an Article

Research

Take a look at some of your favourite media articles and consider what you like about them. Be conscious of the style of writing and format for your target publication - be it a school or organisation newsletter, website, online blog or magazine.

Ask yourself:

- What about those articles first drew you in and kept you reading?
- Were there funny headings, or pictures that caught your attention?
- What was it about the writing style that appealed to you?
- Is the language complicated, descriptive, or emotive?
- Are the sentences short and sharp or long and detailed?
- Are there pictures and diagrams that helped explain things?
- Where is this intended to be published? – a community newsletter, blog or specialist magazine for example.

Reflecting on these questions can help identify ways to make your own writing interesting and engaging for a specific audience.

Planning

Think about your main message or story before you start writing and commence with a brainstorm of what you could include in your article. Remember: who, what, when, where, why, and how!

Pick out the most important bits to produce a condensed bullet point list. Place them in order to provide a natural flow and create an outline for each point.

Take a quiet moment to plan the purpose, tone and delivery of your article

Katie Mourn on Unspash

Writing

What is the purpose of the article? How old is your target audience? Will they understand the type of language you are using, or are you including lots of technical or scientific terms?

When you are writing it is important that you put yourself in the readers' shoes.

Writing a feel-good engaging account of your experience is very different from writing an information report or scientific piece.

While a general article may be to inspire others or tell a story, the purpose of a scientific report is that it provides a detailed account of the intention, process and result of your project which means, theoretically, that anyone can repeat the process under the same circumstances - it can be replicated.

If you are producing a scientific report, you may want to follow the standard scientific report structure: 1 – Abstract (report summary); 2 – Introduction (aim); 3 - Materials and methods (exactly what you did); 4 – Results (exactly what occurred); and 5 – Discussion (How you interpret the results or what you could have done differently, and any further work you may consider in the future and why). However, you don't necessarily have to write your article in this order.

Many people find it easier to start with the methods section, describing what they did and why, what materials were used and how you monitored the success of your project. Others may prefer to start with the introduction or result sections.

Do some research to find other scientific reports that cover the same topic. This will provide a good reference to support your project or show how it differs from other projects. Make sure you include references within the article so that others can follow up.

While you may not be in a position to have a scientific report published in a journal you can definitely use it as a basis for future work, to share with others, and also to keep a very concise record of the technical elements of the project.

Don't forget to highlight key outcomes and findings from your project – this is the most important part!

Writing in a natural setting can be inspiring

Aman Upadhyay

Case Studies

Bringing Back the Butterflies

At Mark Oliphant College in South Australia, over 120 educators, families and community members have Embraced the Wild by attracting native butterflies back to their school.

Under the guidance of local Aboriginal elders of the Kaurna Nation, students and teachers began this project by learning together about native butterflies and their needs. This helped them to design a garden that would not only attract local butterfly species, but also provide food for their caterpillars.

The butterfly garden was hugely successful in bringing the community together and sharing knowledge about local native species. Importantly, the garden continues to benefit both butterflies and the community, by providing a beautiful new space for families to enjoy.

'Our children live in a highly urbanised community, and through this connection to the natural world we aim to spark a love of the natural environment and promote a stronger sense of wellbeing in children.'

– Linda Rich, Mark Oliphant Head Teacher

A chequered swallowtail is a species of butterfly the school aimed to attract by planting for the adults and the caterpillars

William Warby

Adding Diversity to an Existing Garden

In Western Australia, Kalamunda Public School took on four Embrace the Wild projects to make their vegetable garden more attractive to frogs and insects! First, they constructed a frog pond and planted a variety of local native plants to provide a refuge for the frogs. They also provided flowering plants to attract pollinators including butterflies, moths and native bees. As a bonus, they added a bee hotel.

Restoring Bush by Creating Understorey Habitats

In South Australia, Bellevue Heights Primary School has a wonderful leadership program which focuses on sustainability, student well-being and intercultural awareness. Under the guidance of their teacher Margot Bradley, Year 7 students have helped to restore a 600 m2 patch of local Greybox Grassy woodland. This habitat is listed as an 'endangered ecological community' under Australian federal law.

During working bees, student 'Park Rangers' helped to remove introduced weeds growing in the understorey, and to plant and mulch native shrubs in their place. With help from the community and the guidance of the Friends of Shepherd's Hill Recreation Park, students have contributed to restoring about a third of the understorey habitat! This has created a new wildlife corridor, helping a range of animals move between two wildlife refuges in the outer suburbs of Adelaide.

The school's aim in future is to use the park as an outdoor teaching space for biology classes. They hope to create a quiet space for students to reflect, and even plan to install a pond for native frogs sometime soon.

Understory habitats hold many hidden gems such as this amazing spider that mimics bird poo

Jean and Fred

Helpful Links

Embrace the Wild: rootsandshoots.org.au/embracethewild

Check our website for resources to support your projects.

Atlas of Living Australia (ALA): ala.org.au

This is a brilliant tool to help you discover the animal and plant species that occur within your immediate area. To use it, after opening the home page, select 'Community and Schools', and then 'Explore Your Area. Here you can enter an address or postcode which will then highlight records from your area. Some cool features to note:

- You can change the radius of the search between 1km-10km. This is useful to see what has been recorded in your immediate area and what exists just beyond it that you may be able to encourage with improved habitat connectivity.
- You can select to search by group (for example mammals in your search) and also by clicking on the species name you can isolate the records for that species and learn more about it via the linked species profiles.

Questagame Phone App: questagame.com

Questagame can assist you in plant, fungi and animal identification. This app feels like a game, and rewards users for their sightings and field notes. The rarer the find, the more points you get!

You can sign-up as an individual member of the public, contribute as a team member or make an account for your classroom at school. The more sightings you record, the more valuable data you contribute to citizen scientist projects!

iNaturalist: inaturalist.org

Suitable for adults and older children, the iNaturalist app helps you to identify both plants and animals. iNaturalist automatically shares the data you collect with scientific repositories, helping scientists make use of your valuable citizen science data.

Frog ID: frogid.net.au

By making recordings of frog calls this app will help you identify species while also adding to a citizen science project mapping frog species Australia wide.

eBird Australia: ebird.org/australia/home

eBird Australia is an app connecting the biggest global network of birdwatchers. You can use this app to track your sightings anywhere in the world, online or offline.

Flora and Fauna Identification

PlantNet Plant Identifier: identify.plantnet.org

PlantNet allows you to identify plants by photographing them with your smartphone. At present, the app can identify over 20,000 species around the world. PlantNet also maps your observations, helping scientists to understand where plants are located in the world.

Water bug ID

A beginners guide to waterbug identification – Melbourne water (pdf)

Water bug ID charts and posters

Great posters to use in the field – NSW waterwatch

Minibeast ID

A quick reference guide to the main invertebrate groups (pdf)

Spider ID: arachne.org.au

The most fantastic spider reference in the country

Spidentify: identify-spiders.com

An app to assist with spider identification in the field

Spider web ID

Identify the type of spider via its web structure (pdf)

Butterfly and moth ID

An incredible encyclopedia of the butterflies and moths of Australia including their larvae, host plants and eggs

Bat ID

Ausbat – Australiasian bat society: ausbats.org.au

Sydney bats: sydneybats.org.au

PlantNET NSW flora online: plantnet.rbgsyd.nsw.gov.au

Reptile ID: arod.com.au

The Australian reptile online database

Mammal ID: australian.museum/learn/animals/mammals

82 fact sheets about Australian mammals from the Australian museum

Australian native bees: aussiebee.com.au

A brilliant guide about Australian native bees

Project Assistance

See our website for step by step instructions for select projects. We will be adding to this regularly. Other instructions can be found via the links below.

Project: Pollinator Gardens and Caterpillar Nursery

Learn more about what to plant in your Pollinator Garden by downloading this great (free) ebook: Bee Friendly by Mark Leech - agrifutures.com.au

Also refer to the butterfly and moth encyclopedia links above to select specific plants for locally occurring butterflies and moths

Project: Nest boxes

Here are some links to our preferred designs:

Build your own wildlife nest box: A guide for Western Sydney, by Peter Ridgeway (this is suitable for other areas too of course!) – tinyurl.com/Wildlifenestbox

Australasian Bat society: tinyurl/microbathouse

Birds in Backyards: birdsinbackyards.net/nest-box-plans

You can also purchase a nest box or kit:

Hollow Log Homes: hollowloghomes.com.au

Nest Boxes Australia nestingboxes.com.au

Project: Shrub Shelters for Little Animals

Check out this lovely poster to inspire your little bird haven "Planting a small bird habitat haven" from The Habitat Network: habitatnetwork.org

An example of plants you could use:

Greening Australia: greeningaustralia.org.au › publications

Birds in Backyards: birdsinbackyards.net/Choosing-Native-Plants

Project: Watering Stations

Here is a great instructional video for creating a watering station for wild animals:

How to build a wildlife water station: youtube.com/watch?v=vdC6zCXGQPY

Educators Notes

The Embrace the Wild program has been designed according to principles of Project Based Learning, to encourage active exploration of real-world challenges and problems.

Our guidebook is structured as a simplified framework of the six stages of solution frequency:

Define: The 'Define 'phase engages students with a challenge, problem, question and task. This helps students to make connections between what they already know and opportunities for learning.

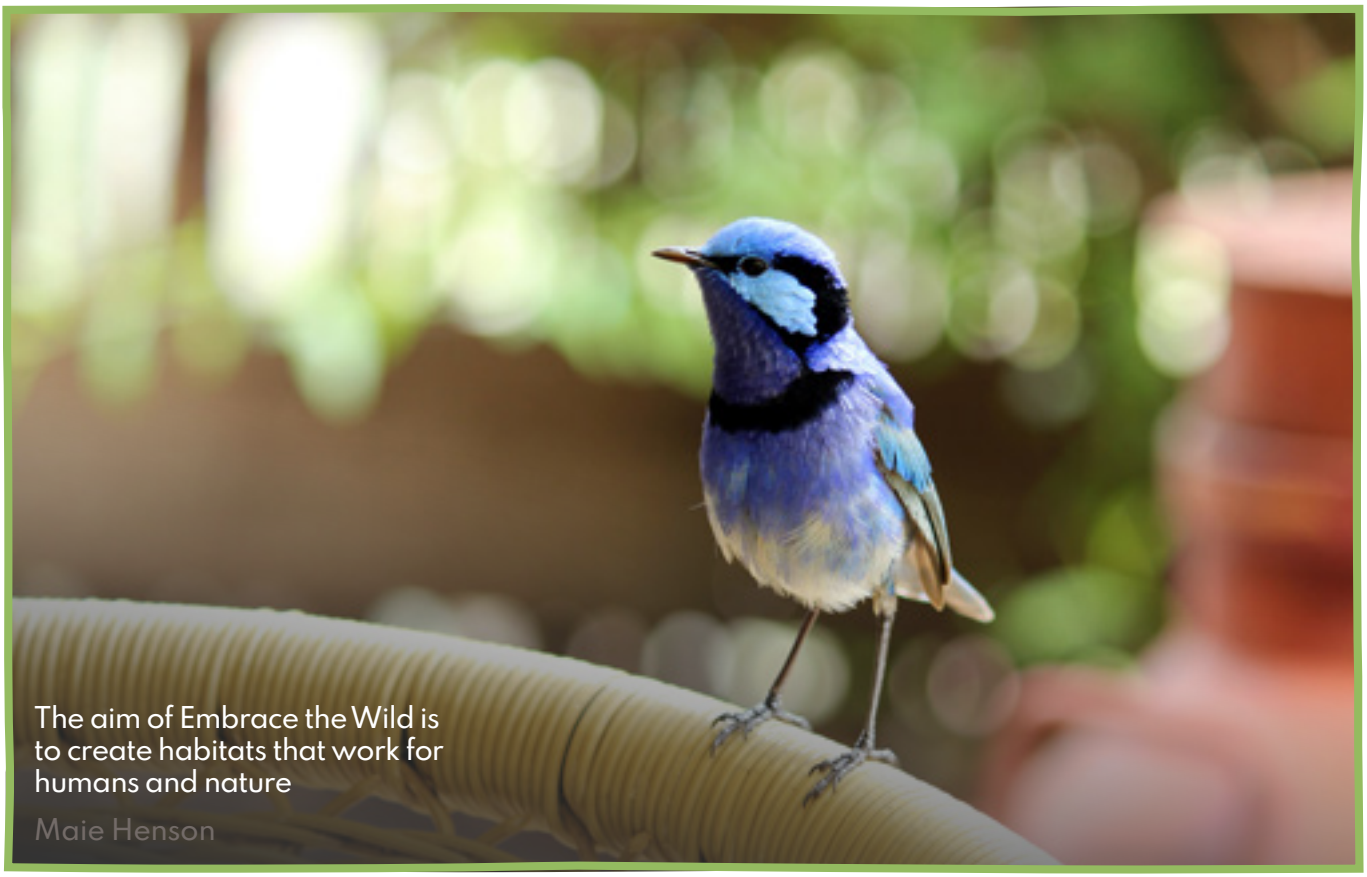
Discover: This stage identifies activities for students to explore, research and investigate their problem.

Dream: The dream phase enables students to imagine and develop possible solutions and explanations for the problem they are trying to solve, creating a higher order thinking experience.

Design: This phase offers opportunities for students to apply what they have learnt, developing a deeper understanding of the problem.

Deliver: In this stage, the project comes to life, delivering real-world outcomes for the student's chosen passion.

Debrief: Debriefing provides an opportunity for students to review, reflect and celebrate their own learning and new skills.



The aim of Embrace the Wild is to create habitats that work for humans and nature

Maie Henson

Join Roots & Shoots

Roots & Shoots began in Tanzania in 1991 when a group of twelve students approached Jane Goodall for advice on how they might take action on the environmental problems they were observing in their neighbourhood. From these humble beginnings Roots & Shoots has grown into a global movement, inspiring young people of all ages – from kindergarten to university – to find collaborative solutions to the problems they are facing.

By joining Roots & Shoots, you become part of a global community of like-minded changemakers who are committed to creating a better world for animals, people and the environment. People just like you are providing solutions to issues they care about in their very own communities all around the world. With thousands of Roots & Shoots groups worldwide, together we are making a world of difference! It is free to join, and you will receive the support of a Roots & Shoots local coordinator to mentor your projects and contributions. Learn more at www.rootsandshoots.org.au

'Roots creep underground everywhere and make a firm foundation. Shoots seem very weak but to reach the light they can break open brick walls.

Hundreds and thousands of Roots & Shoots, hundreds and thousands of young people around the world can break through these walls.'

– Dr Jane Goodall

Wild Careers

Conservation, horticulture and environmental roles will become increasingly important in our future and vary widely. There are many different avenues to train for a wild career, including formal learning at TAFE or university, as well as on-the-job learning such as volunteering and work experience.

Volunteering is a fantastic way to get involved. Whether you want to gain experience to become more employable or just to give the field a try, volunteering and internships can give you valuable learning and experiences that help you map your future. At Roots & Shoots we have a number of ways to get involved, so please visit our website to learn more.

If you are interested in working with animals, people and the environment, sharing your values with others and making positive changes, then a wild career may be for you. In this field you can learn discipline and specific skills, also known as technical skills, many of which you have started to use in your own Embrace the Wild projects. These can include skills such as animal handling or horticultural abilities as well as more complex technical skills such as the use of a specific software or devices used in conservation. These technical skills can be learnt in training at TAFE or University as well as on the job. No matter what field you work in and what job you have, there are valuable skills that are transferable across all industries. These include things like time management and communication skills.

Below are just a few examples of the sort of wild careers you may consider:

- **Ecological consultancy** - Get outdoors conducting flora and fauna surveys and provide advice on environmental impacts.
- **Environmental policy** - Work in federal, state and local government to develop policies and programs that protect and restore our natural assets.
- **Hands on (get your hands dirty)** - Park ranger, conservation field officer, botanist, fisheries or wildlife officer.
- Make an impact as a **project, advocacy or research officer** with a not-for-profit organisation like the Jane Goodall Institute, Trust for Nature or The Nature Conservancy!
- Use your **photography or filmmaking skills** to change people's hearts and minds – Think National Geographic and David Attenborough.
- **Wildlife vet or zoologist** - Maintain captive wildlife and support breeding programs at organisations like Taronga Zoo, or provide medical care to injured and sick wildlife.
- **Horticulture** - Use your love of plants and help grow native flora for use in vital habitat restoration projects.
- **Technologist** - Research technician using specialist equipment like drones, tracking devices or remote sensing technologies.
- Use your **people skills** to support conservation efforts through fundraising and promotion roles.
- **Science communication** - Share your scientific knowledge with the general public through articles, blog posts, social media and talk radio.
- **Environmental education or teaching** - Inspire young people to care about their local environment.
- **Journalism and environmental law** - Investigate the wildlife trade and other environmental protection issues.
- **Mapping** - Specialise in Geographic Mapping Systems to map species ranges or represent field work.
- **Analyst** - Crunch numbers and patterns to demonstrate what environmental studies are revealing.
- **Research** - Work for a university or research organisation and study a species or landscape or environmental issue in detail.

and many more...

Meet the Team

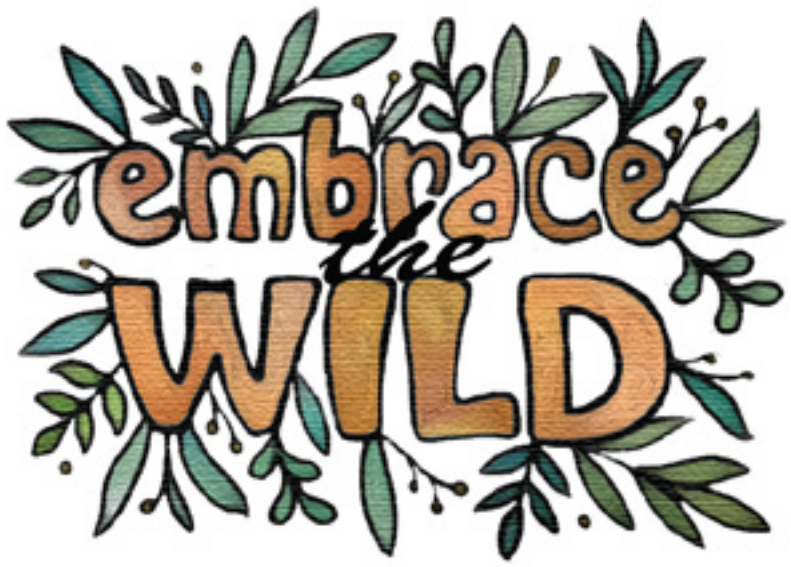
In July 2019, 26 passionate young changemakers from countries all around the world gathered at Windsor Castle in London for Jane Goodall's Global Leadership Gathering. At this event, young leaders aimed to tackle some of the world's greatest environmental and social challenges, like habitat loss, climate change and plastic pollution.

Under the helpful guidance of Dr. Jane Goodall herself, an idea for the Embrace the Wild program was developed and a seed of change planted. A team of five changemakers envisaged Embrace the Wild as a solution to help everyday people restore habitats and their connections in their community and with the natural world. The project even caught the attention of Harry Duke of Sussex (to watch the video see Helpful Links), who was thrilled by the idea of a program that embraced diversity in nature and emphasised harmony and interconnectedness.

After returning from Windsor, our Australian youth delegate, Jessica Pinder worked tirelessly with her international peers, Tessina Strelow, Emily Major, Andrea Stiglingh, Georgia Law and Gwanwoo Jin to develop a framework for a global Embrace the Wild program. Together the team created a step-by-step guidebook, filled with fun projects and outdoors learning opportunities, that would educate and inspire others to make a difference in their communities.

When finally Jessica pitched the draft program to The Jane Goodall Institute Australia in 2020, it was met with an enthusiastic response from the team. From here the project evolved with input from the whole Jane Goodall Institute Australia family (particularly James Forbes, Ben Howes, Gemma Freeman, Alexandra Lay and Abbie Mitchell), and our delivery partners The Royal Botanic Garden Sydney, TAFE NSW and Taronga Zoo.

The Jane Goodall Institute Australia would like to offer a special thank you to the Une Parkinson Foundation and Paradice Foundation for their generous support for this project and the important work that Roots & Shoots do to engage Aussie youth in environmental projects.



Jess Pinder designed the original logo that formed the pitch for JGIA to Embrace the Wild and develop this resource

Jessica Pinder


Jess Pinder

Jessica is an Australian conservation scientist who is passionate about empowering the next generation to become leaders of change. Through her work in environmental education, conservation psychology research and government policies, Jessica has contributed to many social and environmental challenges including the renewable energy transition, koala conservation, habitat restoration, freshwater ecosystem science and First Nations justice.

Andrea Stiglingh


Andrea Stiglingh

Andrea has a great love for the natural world and a keen interest in Australian fauna, which has sparked her active involvement in conservation research, habitat restoration works and native animal care. Andrea is a PhD candidate in soil science and the Roots & Shoots State Coordinator for South Australia.

Tessina Strelow


Tessina Strelow

Tessina Strelow has been a member of Roots & Shoots since 2012, and a co-opted board member of JGI Germany since 2020. Her first project supported "Gardens of Hope" for the Pine Ridge reservation, and she now has taken this inspiration to promote tree-planting and addressing plastic pollution. Tessina's passion is producing video content to inspire people to connect with nature as well as to support different projects. She loves gardening, watching animals, talking to plants and is also a wild herb enthusiast.Emily is a Canadian PhD candidate working to apply principles from compassionate conservation and positive empathy to improve mainstream conservation education messaging in Aotearoa New Zealand. Passionate about fusing academic forms of advocacy with grassroots activism, Emily works with Roots & Shoots at the Jane Goodall Institute of New Zealand.

Gwanwoo Jin (진관우)

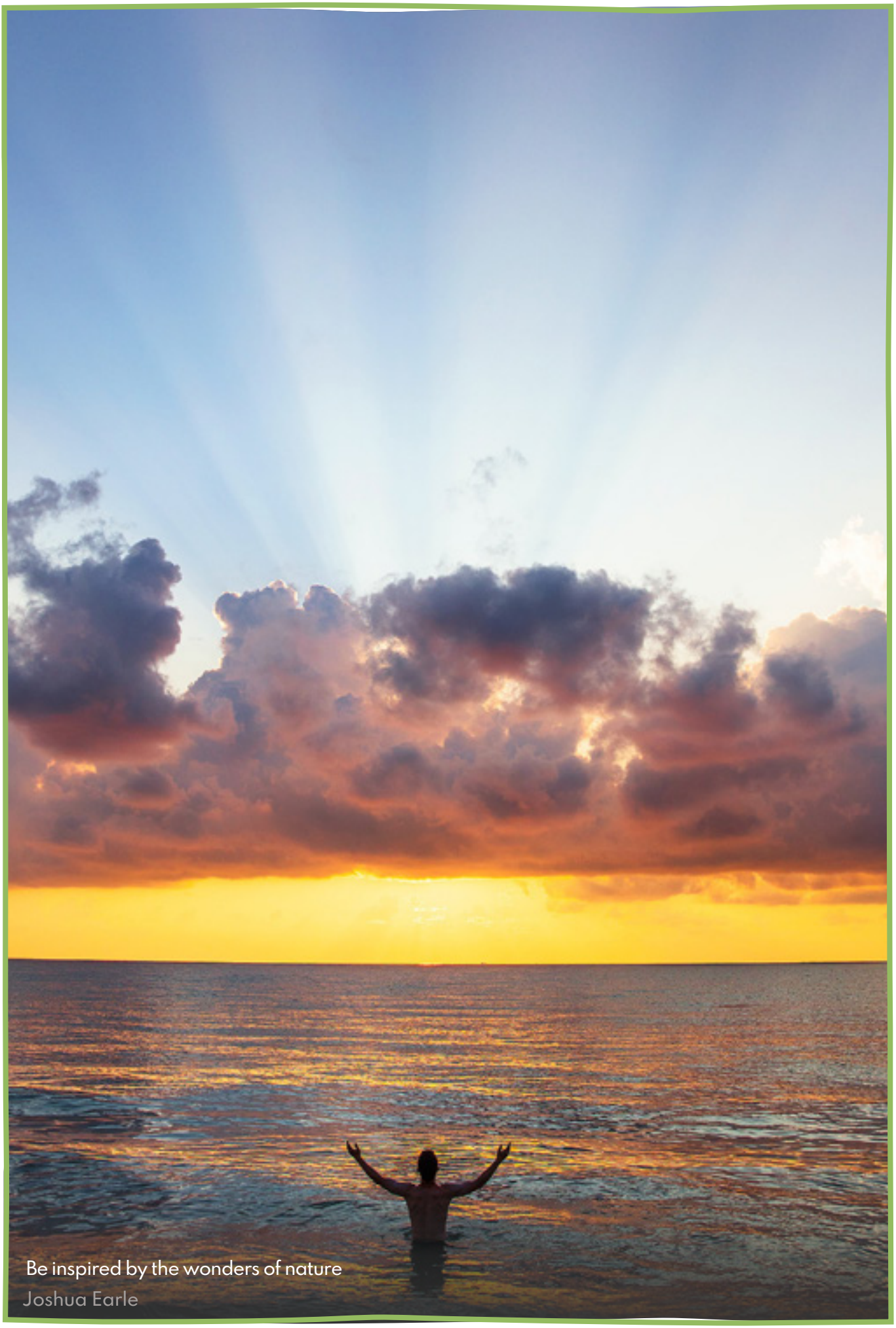
Gwanwoo is a Roots & Shoots representative of JGI South Korea. He is currently majoring in Biology and Environmental Science at Dongguk University, where he founded the club The Raonase in 2018. The Raonase educates teenagers about the environment and ecology, while encouraging them to take action to preserve endangered species. Gwanwoo hopes more people can work together to preserve global biodiversity and make their personal lifestyles more eco-friendly.


Gwanwoo Jin

Emily Major

Emily is a Canadian academic activist who loves all things furry, scaly, feathered, and slimy, and advocates through her work that all animals receive compassion, no matter their species. Currently a PhD candidate in Human-Animal Studies, Emily also volunteers for Roots & Shoots with the Jane Goodall Institute of New Zealand.


Emily Major



Be inspired by the wonders of nature

Joshua Earle