



# HOW TO CREATE HABITAT IN URBAN AREAS FOR ACT'S NATIVE ANIMALS



# Table of Contents

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|           |   |
|-----------|---|
| <b>01</b> | Acknowledgements  |
| <b>02</b> | How to use this guide   |
| <b>03</b> | Top tips for creating habitat                                 |
| <b>04</b> | How to get involved   |
| <b>05</b> | Grassland Reptiles  |
| <b>06</b> | Grassland Reptiles cont...                                    |
| <b>07</b> | Grassland Reptiles Plant Species Guide                        |
| <b>08</b> | Native Bees   |
| <b>09</b> | Native Bees cont...   |
| <b>10</b> | Native Bees Plant Species Guide                               |
| <b>11</b> | Small & medium Terrestrial Mammals and Marsupials             |
| <b>12</b> | Small & Medium Terrestrial Mammals and Marsupials cont...     |
| <b>13</b> | Small & Medium Terrestrial Mammals and Marsupials Plant Guide |
| <b>14</b> | Small Woodland Birds  |
| <b>15</b> | Small Woodland Birds cont...                                  |
| <b>16</b> | Small Woodland Birds Plant Species Guide                      |
| <b>17</b> | Riparian (semi-aquatic) species                               |
| <b>18</b> | Riparian (semi-aquatic) species cont...                       |
| <b>19</b> | Riparian (semi-aquatic) species Plant Guide                   |
| <b>20</b> | Frogs   |
| <b>21</b> | Frogs cont...   |
| <b>22</b> | Frogs Plant Species Guide                                     |
| <b>23</b> | Small Fish  |
| <b>24</b> | Small Fish Plant Species Guide                                |
| <b>25</b> | References  |

# Acknowledgements

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Thank you everyone for your time, talents and knowledge.

# How to use this guide

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This booklet is created to give practical advice on how to create and care for habitat within our urban environment. Urbanisation and urban expansion have vast impacts on biodiversity, both immediate and continuing. Living in the highly modified environment of the Bush Capital means we have an ongoing impact on the native plants and animals who live along side us. Community can help mitigate this by understanding habitat essentials for species and creating, protecting and expanding areas of habitat to allow native species to live in and move through. In turn this can improve our mental wellbeing by helping Canberrans connect to the natural values of our city. It is important to remember that no species exists as a singular unit but relies on a healthy ecological community to thrive. This booklet is a guide for Canberrans to improve habitat for specific species and consequently, for the entire ecosystem.

Canberra's network of urban nature reserves, gardens and urban greenspaces, provide vital areas of habitat for biodiversity conservation, as well as a connection with nature and the Ngunawal culture, which has been part of this land for many thousands of years.

As our city grows, the combined influences of habitat loss, fragmentation and climate change pose a serious threat to native plant and animal conservation, Ngunawal cultural practices and the wellbeing of our community. To ensure Canberra's nature, people and culture can flourish, our urban landscapes need to host biodiverse and resilient green spaces.

Connecting Nature, Connecting People is an ACT Government initiative designed to address these complex issues. Through a series of projects Connecting Nature, Connecting People will enhance the movement of species through the broader landscape (known as 'ecological connectivity'), enrich and build the resilience of urban biodiversity and enhance our community's connection to the natural world.

This booklet describes seven specific species groups that are present in the urban footprint of the ACT. These groups have been chosen as habitat improvement for these species will also benefit a broader group of species who share their habitat. These species groups are grassland reptiles, native bees, small terrestrial marsupials and mammals, small woodland birds, riparian species (semi-aquatic species), frogs and small fish. It does not include other pollinator species (such as butterflies, beetles and ants), large marsupials (such as wallabies or wombats), medium to large birds (such as kookaburras or eagles), arboreal mammals (such as bats), or large native fish (such as Murray cod).

For each taxa this booklet describes ideal habitat and provides a guide caring for and improving habitat for these species including recommended planting lists.

# Top tips for creating habitat

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- Preserving existing habitat is important. Work with existing vegetation, revegetate around and protect remnant trees, grasslands and waterways
- The larger the size of the area you can restore, the better. The number of species increases with size of the site. Remember small areas of habitat, are also important as corridors, for movement through the landscape, so never underestimate the impact of small sites for species
- Create layers of vegetation and encourage complexity and variety. Keep open areas with grasses and forbs for reptiles, and areas with tall trees, low shrubs and groundcover for small-medium mammals and small woodland birds
- Leave branches and leaf litter where they fall. Large woody debris (greater than 10cm wide and 1m long) is critical for habitat health, encouraging invertebrate life, and providing shelter and nesting materials for a large variety of species
- Plant locally native plants
- Allow native grasses to grow tall. Native tussock grasses, such as Kangaroo Grass and Poas form natural tussocks that create shelter, food and nesting materials for a large variety of species (reptiles, birds, small mammals)
- Plan for the long-term outcomes in plantings. For example, let fast growing local wattles dominate the site (providing a secure nesting space for small birds) while the slower eucalypts develop. These eucalypts will later dominate the site when the wattles start to senesce (mature and die)
- Care for waterways, keep water free from pollution and plant riparian vegetation

# How to get involved

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Wherever you live in the Australian Capital Territory, there are opportunities and ways to become involved in supporting species conservation, habitat restoration and landscape connectivity. Below is a list of organisations that support volunteers in the community to undertake environmental restoration and citizen science. Find a group near you to get involved with conservation efforts in the ACT.

## **ACT Peak Body for Landcare**

Landcare ACT - [www.landcareact.org.au](http://www.landcareact.org.au)

## **Catchment Groups**

Ginninderra Catchment Group - [www.ginninderralandcare.org.au](http://www.ginninderralandcare.org.au)

Molonglo Conservation Group - [www.molonglo.org.au](http://www.molonglo.org.au)

Southern ACT Catchment Group - [www.sactcg.org.au](http://www.sactcg.org.au)

## **Citizen Science and Habitat Protection**

Canberra Nature Map - [www.canberra.naturemapr.org](http://www.canberra.naturemapr.org)

Frogwatch - [www.ginninderralandcare.org.au/frogwatch](http://www.ginninderralandcare.org.au/frogwatch)

Waterwatch - [www.act.waterwatch.org.au](http://www.act.waterwatch.org.au)

ACT for bees and other pollinators - [www.actforbees.org](http://www.actforbees.org)

Canberra Ornithologists Group - <https://canberrabirds.org.au>

Friends of Grasslands - [www.fog.org.au](http://www.fog.org.au)

ACT Parks and Conservation Service - [www.parks.act.gov.au/get-involved/parkcare-volunteering](http://www.parks.act.gov.au/get-involved/parkcare-volunteering)

ACT Urban Parks and Places - [www.cityservices.act.gov.au/public-land/maintenance/volunteering](http://www.cityservices.act.gov.au/public-land/maintenance/volunteering)

# Grassland Reptiles

## Species in the ACT:

Grassland reptiles are reptiles that depend on open areas of grassland throughout their life cycle, such as Eastern blue tongue lizard, Eastern brown snake, Canberra grassland earless dragon, Pink-tailed worm-lizard, Striped legless lizard, Three-toed skink, Delicate skink, Common garden skink, Dwarf skink, Boulenger's skink. There are also a few species that can be found in both grasslands and woodlands, often occupying the edge habitat. These include the Olive legless lizard, Shingleback, Cunningham's skink, Jacky dragon and Eastern bearded dragon. Red-belly black snakes, Tiger snakes and Eastern long-necked turtles may also be found in urban grasslands where water bodies are present or nearby.

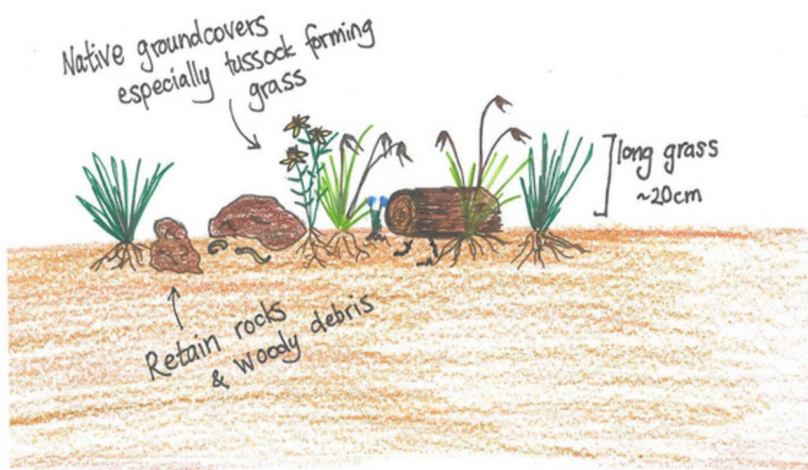
## Ideal Habitat:

Grasslands with less than 10% tree cover are ideal grassland reptile habitat.

As reptiles are primarily diurnal species they need protection from visual predators. Rocks, woody debris and dense native ground cover (especially tussock forming native grasses) provide this shelter. Keeping a complex ground layer with grasses of different heights is ideal. Retaining areas with grasses and ground cover high (10–20cm) is important, as well as areas with lower ground cover (as low as 5cm). Native reptiles will use ground cover for shelter and others, such as the Canberra Grassland Earless Dragons, are sit and wait predators who climb up tussocks and pounce on their prey.

Keeping a healthy ecosystem is necessary for interdependent relationships between species. Many reptile species not only eat invertebrates but also rely on burrows created by other species. For example, the Canberra Grassland Earless Dragon can be found sheltering in burrows created by invertebrates, such as wolf spiders while Pink-Tailed Worm-lizards live in ant nests.

Keep exposed rocks in the landscape as reptiles rely on external heat sources to maintain their body temperature. Rocks provide areas for reptiles to sun themselves and warm their bodies. These rocky areas are also home to ants and other insects that are important food for many reptiles.



# Grassland Reptiles



Eastern Brown Snake  
Credit: Nathanael C

## Threats:

Loss of grassland habitat is a major threat to these reptiles. Native grasslands and open woodland once covered the majority of the urban areas in Canberra. These have now been turned into farmland and housing. Caring for and conserving existing grasslands is an important action to protect grassland reptiles.

Predators such as cats, dogs, foxes and predatory birds will all hunt small reptiles. Providing lots of shelter such as rocks or large woody debris are necessary for reptiles to shelter from these predators.

Barriers to reptiles include large, paved areas (such as roads) as reptiles are unlikely to cross paved areas >5m wide or climb barriers higher than 20cm. Reptiles have a low ability to move outside ideal habitat (<10m dispersal range). As such, keeping reptile friendly habitat well connected is important. The exception to this are Eastern brown snakes who are able to travel further into new habitat.



Eastern Blue-tongue, Credit: Zohara Lucas

## Did you know...

Grasslands are of significant ecological importance, providing habitat for specific reptiles, invertebrates, and plants that are grassland specialists.

Keeping a gap of 5cm between the base of your fence and the ground can allow for reptiles to move between gardens, using urban backyards as a corridor.

Some areas of native grasslands in the ACT are classified as Natural Temperate Grasslands (an endangered ecological community). Natural Temperate Grasslands have a high number of native grasses, particularly Kangaroo Grass, Poa grasses and native forbs (small flowering plants) such as daisies and peas. Monash Grasslands, Budjan Galindji (Franklin Grasslands), Mulanggari Grasslands Nature Reserve and Lawson Grasslands are examples of a Natural Temperate Grassland communities in the ACT.

## Get Involved:



Friends of Grasslands care for, restore and educate people about the diversity and importance of native grasslands in south eastern Australia

<https://www.fog.org.au>

Contact your local Landcare groups on the Landcare ACT website to find groups that care for habitat in and around Canberra.

<https://www.landcareact.org.au/members>





# Grassland Reptiles

## Species to plant for grassland reptile habitat

| Plant type | Species                    | Common name                        | Notes  |
|------------|----------------------------|------------------------------------|--|
| Grass      | <i>Poa labillardieri</i>   | River tussock                      | Excellent habitat and structural plant. Grows naturally along river banks. Forms a dense tussock.                                  |
| Grass      | <i>Poa siberiana</i>       | Snow grass                         | Excellent habitat and structural plant. Grows in upland areas. Forms a dense tussock up to 60cm high.                              |
| Grass      | <i>Themeda Triandra</i>    | Kangaroo grass                     | Excellent habitat and structural plant. Grows in range of soils, sand to clay. Main growth in summer.                              |
| Grass      | <i>Bothrichloa macra</i>   | Redleg grass                       | Hardy species of our region. Mostly summer growing and establishes readily.  |
| Forb       | <i>Lomandra longifolia</i> | Spiny-headed matt rush             | Provides good structure and habitat. Establishes well and able to grow in boggy or clay soils.                                     |
| Forb       | <i>Lomandra multiflora</i> | Multi-flowered matt rush           | Good structural plant. Forms small tussock up to 40cm tall.  |
| Forb       | <i>Goodenia sp.</i>        | Hop goodenia                       | Low growing, with yellow flowers. Provides food for skinks and attracts insect pollinators (a food source).                        |
| Forb       | <i>Wahlenbergia sp.</i>    | Native bluebells                   | Blue flowers provide food for skinks and attracts pollinators (a food source). Easy to establish, tolerate a wide variety of soils |
| Forb       | <i>Vittadinia sp.</i>      | New Holland daisies, Fuzzweeds     | Low growing ground cover with purple flowers. Provide food for skinks and attracts pollinators (a food source).                    |
| Forb       | <i>Chrysocephalum sp.</i>  | Common everlasting, Yellow buttons | Low growing and long-lasting yellow flowers. Provide food for skinks and attracts pollinators (a food source).                     |



# Native Bees

## Species in the ACT:

There are approximately 150 species of native bees that occur within the ACT including Blue banded bees, Neon, Chequered and Domino cuckoo bees, Reed bees, Carpenter bees, Leafcutter bees, Resin bees, Wasp mimic bees and Masked bees as well as many other bees that do not have common names



Halictid bee  
Credit: Joe Johnstone



Blue banded bee  
Credit: John Bundock



Wasp mimic bee  
Credit: Joe Johnstone

## Ideal Habitat:

The ideal habitat for native bees is a moderately open area with trees, mid-storey shrubs and ground covers, with variable distances between plants (some close and bunched together, others with open space between them). Planting flowering plants in clumps of up to 1m across makes it easier for pollinators to find. Native bees only have foraging ranges of between 50–500m, so keeping flowering plants close together reduces the energy needed to forage and accessibility of plants.

Plant variety! Plants that flower in different seasons, grow at different heights and have different flower colours will provide for the specific needs of different species. Planting native plants is best. While native bees are adaptable and can access pollen from both native and introduced flowers, some species of native bees prefer native flowering species, while others are less fussy.

When temperatures are higher than 36 degrees celsius, all native bees need shady areas to rest and access to water. For example, a pond with semi submerged rocks provide a ramp for bees to access water.

Leave areas of undisturbed ground with long grass, dead wood and large trees with hollows for nesting sites.



# Native Bees



Halictid bee  
Credit: Joe Johnstone

## Threats:

Habitat loss and fragmentation is a threat to native bees. As dispersal distance depends on the size of the bee, small native bees can probably fly no more than 50m, while other larger bees can fly 500m. Native bees are unlikely to fly over large open areas such as water or pavement. Roads with vehicles also present a danger to low flying species. Creating accessible habitat for native bees is important, especially in urban areas where we can use our gardens as refuges where there are bee friendly plants.

Pesticides and herbicides are a threat to all pollinators. Pesticide chemicals kill bees while herbicide chemicals penetrate the plant tissue and the pollen and nectar. Avoid the use of pesticides and herbicides.

## Did you know...

Native bees are important for pollinating native plants, wasps, ants, flies, butterflies, moths and beetles are also important insect pollinators.

Female leaf cutter bees cut sections of leaf with their mandibles and use these to line the brood nests where their young will grow.

All of the native bees in the ACT are solitary and do not live in hives like honey bees. Most native bees make small nests in the ground, while some make nests in cavities in trees or hollow stems. Eggs are laid on top of a globule of pollen and honey for the larvae to feed on once hatched from the egg.

## Get Involved:



ACT for Bees and other Pollinators: organisation dedicated to raising awareness of the importance of bees and other pollinators for the health of the environment and food security.

<https://www.actforbees.org>

Contact your local Landcare groups on the Landcare ACT website to find groups that care for habitat in and around Canberra.

<https://www.landcareact.org.au/members>



# Native Bees

## Species to plant for native bee habitat

| Plant type | Species   | Common name                        | Notes  |
|------------|---|------------------------------------|--|
| Forb       | <i>Xerochrysum viscosum</i>   | Sticky everlasting daisy           | Hardy perennial forb. Yellow flowers in spring-summer.   |
| Forb       | <i>Chrysocephalum spp.</i>  | Common everlasting, Yellow buttons | Grows well in sunny open positions. Ground cover with small yellow flowers spring-summer.  |
| Forb       | <i>Dianella spp.</i>  | Native flax                        | Excellent habitat and structural plant. Forms a dense tussock. Purple flowers in spring – summer.  |
| Forb       | <i>Lomandra multifolia</i>  | Multi-flowered matt rush           | Good structural plant. Food for larval skipper butterflies.  |
| Low shrub  | <i>Hardenbergia violaceae</i>                                       | Purple coral pea                   | Can spread to 1m in diameter. Prefers sheltered location. Purple flowers in spring.  |
| Shrub      | <i>Bursaria spinosa</i>   | Sweet Bursaria                     | Excellent food source for pollinators, small white fragrant flowers in spring & summer.  |
| Shrub      | <i>Cassinia longifolia</i>  | Cauliflower bush                   | Pioneer species with a long flowering season of white flowers in summer  |
| Shrub      | <i>Hakea spp.</i>   | Hakeas                             | Flowers in winter and spring. High amount of nectar.   |
| Shrub      | <i>Grevillea spp. (including local native Wee Jasper Grevillea)</i> | Grevillea iaspicula                | Flower during winter with a high amount of nectar.   |
| Shrub      | <i>Leptospermum spp.</i>  | Tea tree                           | High in nectar and pollen. White flowers in spring and summer  |
| Tree/Shrub | <i>Acacia spp</i>   | Wattles                            | High in pollen. Flower mostly in spring  |
| Tree       | <i>Eucalyptus polyanthemos</i><br><i>Eucalyptus viminalis</i>       | Red box<br>Manna gum               | Flowers provide nectar and pollen. Trees provide habitat. Resin is used by stingless and resin bees for building nests and sealing nest holes. |



# Native Small Terrestrial Marsupials and Mammals

## Species in the ACT:

Terrestrial marsupials and mammals with a weight range between 35g – 5 kg. The most commonly seen of these species is the Short beaked echidna, however the Common dunnart, Yellow-footed antechinus and Agile antechinus have been detected in remnant forests adjacent to urban ACT. (However the Bush rat, Eastern chestnut mouse, Southern brown bandicoot, Long-nosed bandicoot, New Holland mouse, Eastern bettong and Brush tailed phascogale once occurred through the ACT and may now be locally extinct within the urban footprint of the ACT).

## Ideal Habitat:

The ideal habitat for small-medium marsupials and mammals is woodland native vegetation with large amounts of woody debris, protected from predators. Native low growing shrubs and trees are essential key elements for suitable habitat. These species are very mobile within ideal habitat, but highly unlikely to move out from the safety and shelter provided within this habitat.

Maintaining healthy woodlands is critical for these species. The density of the vegetation should be shrubs spaced no more than 5m apart, and trees spaced no more than 10m apart.

These species are usually found in woodlands, open heathland and forests, among vegetation or in hollow logs. In poor weather, they will often shelter under bushes or burrow into the soil. They will search for and eat many invertebrates, ranging large distances within the habitat.

Leaf litter and large woody debris (fallen branches at least 10 cm wide and 1 meter long) provide both shelter and a food source, as they attract invertebrates.



Short-beaked echidna, Credit: Anke-Maria Hoefler



Long-nosed bandicoot, Credit: Joe Johnstone



# Native Small Terrestrial Marsupials and Mammals

## Threats:

Small-medium native mammals and marsupials are highly vulnerable to habitat loss from urban expansion, predation, and decreased habitat complexity resulting from changed fire regimes.

Habitat loss, fragmentation and the spread of urban areas, are major threats to small-medium mammals and marsupials. They are vulnerable to predation and have a high rate of mortality on roads, as well as a low ability to move outside their ideal habitat (<100m dispersal range).

Cats and foxes are their main predators in the urban landscape. As such, shelter such as grass tussocks, low shrubs or large woody debris are vital for these mammals to survive.

These species need protection from urban development and its impact on their habitat. It is critically important to maintain and protect healthy existing habitat to maintain these species in Canberra.

## Did you know...

Short-beaked Echidnas are monotremes (egg laying mammals) and lay one egg that incubates inside the mothers pouch, the young is blind and hairless and suckles for 2-3 months. Once it develops spines the mother removes it from the pouch and builds a burrow for it to remain safe. It continues to suckle for another 6 months until it eventually leaves home.

To survive extremes in weather small mammals and marsupials will burrow into the soil, hide under vegetation or shelter in hollow logs, rock crevices and in burrows created by wombats or rabbits.

The holes made in the soil by these animals searching for food are important for both water infiltration and as places for seeds to collect in and be protected as they germinate and grow into seedlings. For this reason, we refer to this group as 'ecosystem engineers'.

Antechinus and Dunnart species are nocturnal and can eat their body weight in invertebrates in a single night. Antechinus are largely arboreal, while dunnarts remain close to the ground.

Surveys in the ACT in the 1970's found Agile Antechinus, Yellow-footed Antechinus and Common Dunnarts on Black Mountain and Ainslie-Majura woodland. Further surveys found none of these species. Predator free sanctuaries such as Mulligans Flat have successfully introduced and maintained small terrestrial mammal and marsupial populations, including Spotted-tailed quolls, Common Dunnarts, Agile antechinus, Yellow-footed antechinus, Eastern bettong, New Holland mouse and Short-beaked echidna, with beneficial effects on the flora of the area.

## Get Involved:

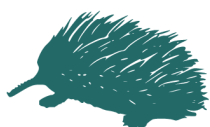


Mulligans Flat is a predator-proof sanctuary in North Canberra managed for conservation and actively researching restoration ecology.

<https://www.mulligansflat.org.au>

Contact your local Landcare groups on the Landcare ACT website to find groups that care for habitat in and around Canberra.

<https://www.landcareact.org.au/members>



# Native Small Terrestrial Marsupials and Mammals

## Species to plant for terrestrial mammal/marsupial habitat

| Plant type | Species   | Common name  | Notes  |
|------------|---|--|--|
| Grass      | <i>Poa labillardieri</i>  | River tussock  | Excellent habitat and structural plant. Forms a dense tussock.   |
| Grass      | <i>Poa sieberiana</i>   | Snow grass   | Excellent habitat and structural plant. Grows in upland areas. Forms a dense tussock up to 60cm high.                        |
| Grass      | <i>Themeda triandra</i>   | Kangaroo grass   | Excellent habitat and structural plant. Grows in range of soils, sand to clay. Main growth in summer.                        |
| Forb       | <i>Lomandra longifolia</i>  | Spiny-headed matt rush   | Provides good structure and habitat. Establishes well and able to grow in boggy or clay soils                                |
| Forb       | <i>Lomandra multifolia</i>  | Multi-flowered matt rush   | Good structural plant. Forms small tussock up to 40cm tall.  |
| Shrub      | <i>Bursaria spinosa</i>   | Sweet bursaria   | Excellent source of nectar and invertebrate pollinators, small white fragrant flowers produced spring & summer.              |
| Low shrub  | <i>Hardenbergia violaceae</i>   | Purple coral pea   | Flowers attract pollinators and plant provides shelter. Can spread to 1m in diameter. Prefers sheltered location.            |
| Low shrub  | <i>Acacia buxifolia</i><br><i>Acacia gunnii</i><br><i>Acacia paradoxa</i><br><i>Acacia rubida</i> | Low growing wattles Agunnii is spikey, providing shelter from predators. | Flowers in winter and spring. High amount of nectar. Low growing, providing shelter and food source.                         |
| Low shrub  | <i>Cassinia longifolia</i>  | Cauliflower bush   | Dense low growing shrub.<br>*Can become weedy, don't use in ecologically sensitive areas.                                    |
| Trees      | <i>Eucalyptus macrorhyncha</i><br><i>Eucalyptus rossii</i><br><i>Eucalyptus mannifera</i>         | Red stringybark<br>Scribbly gum<br>Brittle gum                           | These trees provide important shelter and habitat for small mammals and marsupials, especially antechinus who use the canopy |



# Small Woodland Birds

## Species in the ACT:

Small woodland bird species are birds that are <40g and live in an open woodland habitat. They include: the Brown headed honeyeater, Buff-rumped thornbill, Diamond firetail, Eastern yellow robin, Fuscous honeyeater, Grey fantail, Leaden flycatcher, Mistletoe bird, Painted button quail, Rufous whistler, Southern whiteface, Speckled warbler, Striated pardalote, Striated thornbill, Superb fairywren, Tree martin, Weebill, White browed scrubwren, White-throated gerygone, Yellow-rumped thornbill.



Eastern yellow robin



Juv. Eastern yellow robin



Superb fairy-wren



Superb fairy-wren,  
(non-breeding male)



Juv. Red-browed finch  
(Credits: Joe Johnstone)



Red-browed finch

## Ideal Habitat:

Small woodland birds need a diversity of upper, mid-storey and ground covers to flourish. This diversity provides access to nesting materials, nesting sites, food and protection from predators. Keep shrubs and trees planted relatively close together (with branches touching) and retain open areas with grasses and forbs for birds to forage in.

Different species of small woodland birds forage in different areas of the canopy. Retaining large trees and mistletoes will provide a healthy and complex upper storey. The mid storey should have plenty of access to native flowering shrubs, and shrubs with spikey leaves to provide excellent shelter from predators. A complex understory should be made up of tall grasses, native forbs (flowering ground covers), fallen branches, hollow logs and rocks provide shelter, nesting materials and food.

Small birds are capable of moving distances of 1 – 10km over unsuitable habitat, so are able to leave unsuitable habitat and populate suitable habitat when necessary. By creating appropriate woodland habitat for small bird species you may be rewarded with new arrivals!





# Small Woodland Birds

## Threats:

Habitat loss and the simplification of woodlands from activities such as, the removal of woody debris and the loss of a shrub layer is a major threat to small bird habitat. Small woodland birds need variety of structure within a site, dense vegetation for nesting and open areas for foraging.

Cats are a major threat to small woodland birds. This is especially relevant in urban areas where cats can easily access reserves.

Increased competition by territorially aggressive bird species such as Noisy miners, Indian mynas and Wattle birds affect small woodland bird populations.

## Did you know...

Keeping woody debris on the ground attracts and provides shelter for invertebrates, which are a food source for small birds.

Allowing native grasses to grow tall will provide lots of seed for small birds to eat, nesting material and good shelter from predators.

Grasses and large woody debris are important for ground nesting species like Speckled Warblers, who will make a nest in in the grass, lined with soft animal fur or feathers.



## Get Involved:



Canberra Ornithologists Group (COG) this group promote identification, education and preservation of native bird habitat.

<https://www.canberrabirds.org.au>

Contact your local Landcare groups on the Landcare ACT website to find groups that care for habitat in and around Canberra.

<https://www.landcareact.org.au/members>



# Small Woodland Birds

## Species to plant for woodland bird habitat

| Plant type | Species  | Common name  | Notes  |
|------------|--|--|--|
| Grass      | <i>Poa labillardieri</i>   | River tussock  | Excellent habitat and structural plant, grows naturally along river banks. Forms a dense tussock.  |
| Grass      | <i>Poa sieberiana</i>  | Snow grass   | Excellent habitat and structural plant. Grows in upland areas. Forms a dense tussock.  |
| Grass      | <i>Themeda triandra</i>  | Kangaroo grass   | Excellent habitat and structural plant. Grows in range of soils, sand to clay.   |
| Forb       | <i>Chrysocephalum sp.</i>  | Common everlasting,<br>Yellow buttons                          | Grows well in sunny open positions. Ground cover with small yellow flowers spring & summer.  |
| Forb       | <i>Dianella revoluta</i><br><i>Dianella tasmanica</i>  | Native flax lilly  | Excellent habitat and structural plant. Forms a dense tussock. Purple flowers in spring & summer.  |
| Low shrub  | <i>Hardenbergia violaceae</i>  | Purple coral pea, native violet                                | Can spread to 1m in diameter. Prefers sheltered location. Purple flowers in Spring. Insect attracting.   |
| Shrub      | <i>Hakea spp.</i>  | Hakeas   | Spiky leaves provide protection and nesting sites. Flowers are a good source of nectar.  |
| Shrub      | <i>Bursaria spinosa</i>  | Australian blackthorn  | Abundance of flowers and spikey branches provide excellent bird habitat  |
| Shrub      | <i>Leptospermum spp</i>  | Tea tree   | High in nectar and pollen, white flowers in summer.  |
| Tree/shrub | <i>Acacia spp.</i>   | Wattles  | High in pollen. Flower in spring. Attract a huge variety of insects. Provides seed as a food source and nesting sites.   |
| Trees      | <i>Eucalyptus mellidors</i><br><i>Eucalyptus cincerea</i><br><i>Eucalyptus macrorhyncha</i><br><i>Eucalyptus sideroxylon</i> | Yellow box<br>Argyle apple<br>Red stringy bark<br>Red ironbark | Locally adapted. Prolific flowers and fruits and insect habitat. Provides nesting and foraging sites. Note the importance of older Eucalypts in providing nesting hollows. |



# Riparian (semi-aquatic) species

## Species in the ACT:

Gippsland Water Dragon, Eastern Water Dragon, Rakali, Platypus, Red bellied Black Snake, Tiger Snake, Eastern Long neck turtle.

These are species that live by the water's edge and rely on the waterbody throughout their lifecycle.



Eastern Water-dragon, Credit: Joe Johnstone

## Ideal Habitat:

Species within the riparian zone require healthy waterways and ease of access between the waterbody and surrounding vegetation. Native trees, shrubs, long grass, large woody debris and rocks (as shelter and nesting sites) are essential parts of a healthy riparian ecosystem.

Healthy waterways require clean, slow flowing water, ideally in a chain of deep ponds (minimum of 2m deep) and emergent vegetation (i.e. reeds). A substrate with pebbles, organic material (such as logs), and leaves (rather than sand) provide habitat for invertebrates which are a key food source.

Healthy vegetation surrounding waterways is important as the roots hold the soil together, preventing erosion and run off. Moderately spaced trees, shrubs and long grasses (height of 25–50cm) provide habitat, shelter and breeding sites for riparian animals.

Riparian species are highly mobile and can move within suitable habitat up to 5km during foraging. During breeding season, Eastern long neck turtles can move between water bodies that are up to 3–5km apart and go through unsuitable habitat like farmland, even crossing roads to reach the next water body. Most dispersal occurs in spring (after winter dormancy) and summer, as animals are then active.

## Threats:

Habitat loss is the major threat to riparian species. The simplification of waterways (removal of vegetation and concreting natural drainage lines) has destroyed vast areas of riparian habitat.

Vehicles, fences and roads are barriers to movement through the landscape. Watch out during summer, especially when it rains as Eastern Long-necked Turtles will be moving, and possibly crossing roads.

Predation by dogs, foxes and cats is a threat for these species, especially during spring and summer when many of these animals disperse. As such, it is important to have areas for these animals to shelter from predators.



Rakali, Credit: Joe Johnstone



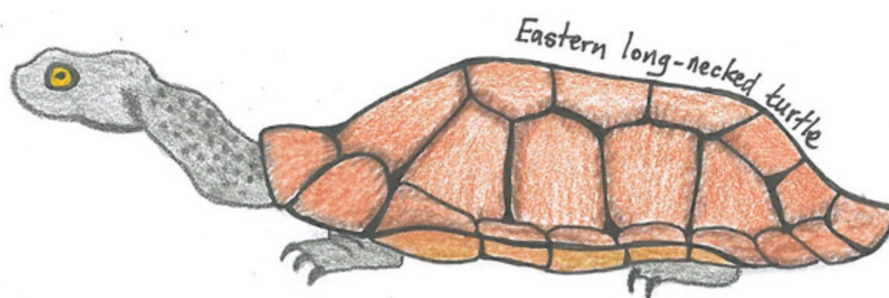
# Riparian (semi-aquatic) species

## Did you know...

Platypus live up to 24 years in the wild. During November – January platypus mothers nurse their young in nesting burrows hidden along the bank. Working on the habitat should be avoided in riparian areas in this time to not to disturb the nests.

Turtles will lay their eggs during Summer. Eggs are buried in bare ground and the mother turtles can walk up to 200m from the water to find a suitable site. Keeping areas of soft bare ground can help breeding turtles during this season.

Watch out during summer, especially when it rains as Eastern Long-necked Turtles will be moving, and possibly crossing roads.



## Get Involved:



Upper Murrumbidgee Waterwatch, run Platypus month in late winter (August) observing and monitoring platypus

<https://www.act.waterwatch.org.au/programs/platypus-month>

Contact your local Landcare groups on the Landcare ACT website to find groups that care for habitat in and around Canberra.

<https://www.landcareact.org.au/members>



# Riparian (semi-aquatic) species

## Species to plant for riparian habitat

|                           | Plant type  | Species  | Common name                  | Notes   |
|---------------------------|-------------|--|------------------------------|---|
| Plant in water            | Water plant | <i>Potamogeton ochreatus</i>                                 | Blunt pond weed              | Submerged annual that grows in water up to 5m deep.   |
|                           | Rush        | <i>Eleocharis acuta</i>                                      | Common spike rush            | Excellent habitat and structural plant. Perennial can grow with roots submerged in water or in damp soil.             |
| Plant on waters edge      | Rush        | <i>Juncus subsecundus</i>                                    | Finger rush                  | Perennial rush will grow to 90cm high.  |
|                           | Rush        | <i>Juncus usitatus</i>                                       | Common rush                  | Grows well in damp soils and shallow water. Excellent habitat plant and filters nutrients. Grows to 1m x 2m.          |
|                           | Sedge       | <i>Carex appressa</i>  | Tussock sedge, cutting grass | Grows well in sunny open positions. Excellent habitat plant. *Leaves have serrated edges and can cut skin.            |
| Plant in dryer upper-bank | Grass       | <i>Poa labillardieri</i>                                     | River tussock                | Excellent habitat and structural plant. Grows naturally along river banks.  |
|                           | Forb        | <i>Lomandra longifolia</i>                                   | Spiny-headed matt rush       | Provides good structure and habitat. Establishes well and able to grow in boggy or clay soils (as found on site).     |
|                           | Forb        | <i>Lomandra multifolia</i>                                   | Many-flowered matt rush      | Good structural plant. Food for larval skipper butterflies.   |
|                           | Shrub       | <i>Bursaria spinosa</i>                                      | Sweet bursaria               | Roots maintain soil structure, white flowers present spring-summer.   |
|                           | Shrub       | <i>Indigofera australis</i>                                  | Austral indigo               | Nitrogen fixing roots Spring flowering, with pink-purple flowers.   |
|                           | Tree        | <i>Casuarina cunninghamiana</i> subsp. <i>cunninghamiana</i> | River she oak                | Large tree growing up to 20 m. Roots stabilise soil and fallen branches provide shelter and breeding sites for frogs. |



# Frogs



Whistling Tree-frog



Perons Tree-frog  
(Credit: Joe Johnstone)

## Species in the ACT:

Native frogs and toadlets including Common eastern froglet, Eastern banjo frog, Plains froglet, Peron's tree frog, Sudell's frog, Smooth toadlet, Spotted marsh frog, Spotted burrowing frog, Striped marsh frog, Whistling tree frog.

The Green and golden bell frog and Broad palmed rocket frog, once occurred in urban areas of ACT, but are now locally extinct from the ACT, however measures are being made to reintroduce these species.

## Ideal Habitat:

Frogs spend the majority of the year in vegetation close to water, such as long grasses, reeds, trees, shrubs and under logs, frogs will travel into waterways to breed. Protecting frog habitat includes caring for surrounding vegetation as well as waterways. Long grasses (20 - 50cm), low growing shrubs, fallen wood and rocks provide excellent shelter for frogs while they are out of the water. Leave fallen branches where they fall.

Local frog species love standing waterbodies, such as ponds, dams and wetlands with shallow edges for ease of access. Water depth can be as shallow as 60 cm (puddles are used by some species). A substrate with pebbles (rather than sand), organic material such as logs and branches provide habitat for invertebrates, which are a key food source.

Native trees, shrubs, long grass, large woody debris and rocks are essential parts of a healthy ecosystem for frogs. These can be easily maintained by allowing a zone around waterways that is not mown.

## Threats:

Roads are a major barrier to frog movement and dispersal. Healthy ponds surrounded by roads can remain empty of frogs if there is no safe way to access the pond.

Cats are a threat to frogs, especially as most frogs will move during the night, when cats are actively hunting. Creating sites for frogs to shelter in is important for their survival, as well as keeping cats inside, at all times, but especially at night.

Chytrid fungus is a threat to frogs globally. By creating frog friendly habitat (water and surrounding vegetation) you can actively encourage populations to increase and help survival of these species.

Frog populations are also threatened by introduced small fish, such as Eastern gambusia (or Mosquito fish) who are territorially aggressive and eat frog eggs and small tadpoles.

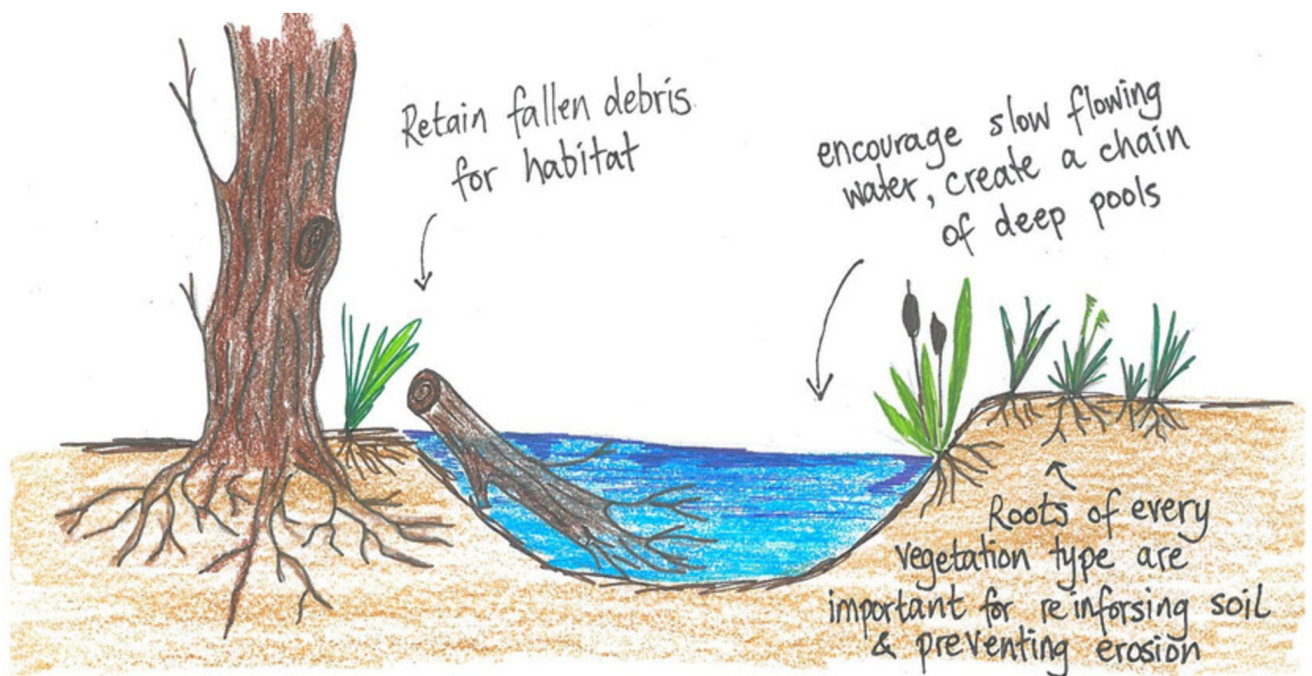


# Frogs

## Did you know...

Gaps under fences (especially Colorbond fencing) can allow frogs to pass through, creating a corridor for frogs between gardens.

Tadpoles eat algae and plants submerged in the water, while adult frogs are predatory feeding mostly on small insects.



## Get Involved:



Frog watch is a citizen science group monitoring frog populations through Canberra, volunteers receive training in identification of frog species.

[www.ginninderralandcare.org.au/frogwatch](http://www.ginninderralandcare.org.au/frogwatch)

Contact your local Landcare groups on the Landcare ACT website to find groups that care for habitat in and around Canberra.

<https://www.landcareact.org.au/members>



# Frogs

Large rocks and logs within and around the water body provide shelter and protection from predators. Keep waterways clean and healthy, remove rubbish.

## Species to plant for frog habitat

|                           | Plant type  | Species  | Common name                  | Notes  |
|---------------------------|-------------|--|------------------------------|--|
| Plant in water            | Water plant | <i>Potamogeton ochreatus</i>                                 | Blunt pond weed              | Submerged annual that grows in water up to 5m deep.  |
|                           | Rush        | <i>Eleocharis acuta</i>                                      | Common spike rush            | Excellent habitat and structural plant. Perennial that grows to 2m high and 50cm wide. Can grow with roots submerged in water or in damp soil. |
|                           | Sedge       | <i>Cyperus exalatus</i>                                      | Tall flat sedge              | Excellent habitat and structural plant. Grows as a tussock up to 1.5m high.  |
| Plant on waters edge      | Rush        | <i>Juncus subsecundus</i>                                    | Finger rush                  | Perennial rush. Will grow to 90cm high.  |
|                           | Rush        | <i>Juncus usitatus</i>                                       | Common rush                  | Grows well in damp soils and shallow water. Excellent habitat plant and filters nutrients. Grows to 1m x 2m.                                   |
|                           | Sedge       | <i>Carex appressa</i>  | Tussock sedge, cutting grass | Grows well in sunny open positions. Excellent habitat plant. *Leaves have serrated edges and can cut skin.                                     |
| Plant in dryer upper-bank | Grass       | <i>Poa labillardieri</i>                                     | River tussock                | Excellent habitat and structural plant. Grows naturally along river banks.   |
|                           | Forb        | <i>Lomandra longifolia</i>                                   | Spiny-headed matt rush       | Provides good structure and habitat. Establishes well and able to grow in boggy or clay soils.   |
|                           | Shrub       | <i>Indigofera australis</i>                                  | Austral indigo               | Nitrogen fixing roots Spring flowering, with pink-purple flowers.  |
|                           | Shrub       | <i>Bursaria spinosa</i>                                      | Sweet bursaria               | Roots maintain soil structure, sweet flowers attract pollinators (food source) in spring-summer.   |
|                           | Tree        | <i>Casuarina cunninghamiana</i> subsp. <i>cunninghamiana</i> | River she oak                | Large tree growing up to 20 m. Roots stabilise soil and fallen branches provide shelter and breeding sites for frogs.                          |





# Small Fish

## Species in the ACT:

Freshwater fish <10cm total length which are found in small stream environments, such as those created in urban waterways, Australian smelt, Mountain galaxias and Western carp gudgeon.

## Ideal Habitat:

The ideal habitats for small fish are clean permanent waterways, with a moderate amount of submerged and emergent vegetation and healthy riparian vegetation.

Healthy waterways require clean, slow flowing water (ideally with sections of still water) with emergent native vegetation (reeds). A substrate with pebbles and rocks (rather than sand) provide habitat for invertebrates (a food source for fish), and organic material such as large logs (snags) provide shelter and breeding sites.

Healthy vegetation surrounding waterways is important as the roots hold the soil together, preventing erosion and intact grassy areas filter run off improving water quality. Keeping water with different depths is important for fish species, as they need to move through for different aspects of their life cycle e.g. feed on invertebrates in the shallows, cool down on hot days in the deeper areas.

## Did you know...

The introduced Eastern gambusia is now the dominant small fish in urban small streams. However up to 20 years ago small native fish were living in urban streams in the ACT. There is a chance that, with habitat restoration and control of gambusia, native species can be reintroduced into urban streams.

Although they have been out competed from the small urban streams, small native fish such as Western carp gudgeon can still be found in urban lakes of the ACT.

## Threats:

Small fish have been decimated by urbanisation, habitat loss and predators. Small streams in urban ACT do not currently support small native fish populations. Habitat simplification in the form of concrete drains, which are so numerous in the ACT, do not support healthy fish habitat. The renaturalisation of concrete drains has occurred in some areas of the ACT, slowing water flow and creating areas with vegetation, which is necessary for healthy water ways.

A threat to small native fish is the introduced Eastern gambusia (or Mosquito fish), who are territorially aggressive and nip the fins of fish and eat fish eggs. Gambusia are fast breeders and tolerate a wide range of water quality.

Keeping water clean and healthy is critical for the health and survival of native fish.

## Get Involved:



Waterwatch is a citizen science program monitoring the health of waterways through the ACT, using macro invertebrate surveys and water quality testing. The Waterwatch program gathers important information which informs catchment management.

<https://www.act.waterwatch.org.au>

Contact your local Landcare and Catchment groups, links can be found on Landcare ACT website. These groups work to care for habitat in and around Canberra.

<https://www.landcareact.org.au/members>



# Small fish

## Species to plant for small fish habitat

|                           | Plant type  | Species  | Common name                  | Notes  |
|---------------------------|-------------|--|------------------------------|--|
| Plant in water            | Water plant | <i>Potamogeton ochreatus</i>                                 | Blunt pond weed              | Submerged annual that grows in water up to 5m deep.  |
|                           | Rush        | <i>Eleocharis acuta</i>                                      | Common spike rush            | Excellent habitat and structural plant. Perennial that grows to 2m high and 50cm wide. Can grow with roots submerged in water or in damp soil. |
| Plant on waters edge      | Rush        | <i>Juncus subsecundus</i>                                    | Finger rush                  | Perennial rush. Will grow to 90cm high.  |
|                           | Rush        | <i>Juncus usitatus</i>                                       | Common rush                  | Grows well in damp soils and shallow water. Excellent habitat plant and filters nutrients. Grows to 1m x 2m.                                   |
|                           | Sedge       | <i>Carex appressa</i>  | Tussock sedge, cutting grass | Grows well in sunny open positions. Excellent habitat plant. *Leaves have serrated edges and can cut skin.                                     |
| Plant in dryer upper-bank | Grass       | <i>Poa labillardieri</i>                                     | River tussock                | Excellent habitat and structural plant. Grows naturally along river banks.   |
|                           | Forb        | <i>Lomandra longifolia</i>                                   | Spiny-headed matt rush       | Provides good structure and habitat, Establishes well and able to grow in boggy or clay soils.   |
|                           | Forb        | <i>Lomandra multiflora</i>                                   | Multi-flowered matt rush     | Good structural plant, roots maintain soil.  |
|                           | Shrub       | <i>Bursaria spinosa</i>                                      | Sweet bursaria               | Roots maintain soil structure, sweet flowers present spring & summer. Insect attracting (food source)  |
|                           | Shrub       | <i>Indigofera australis</i>                                  | Austral indigo               | Nitrogen fixing roots Spring flowering, with pink-purple flowers.  |
|                           | Tree        | <i>Casuarina cunninghamiana</i> subsp. <i>cunninghamiana</i> | River she oak                | Large tree growing up to 20 m. Roots stabilise soil and fallen branches provide shelter and breeding sites for fish.                           |



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