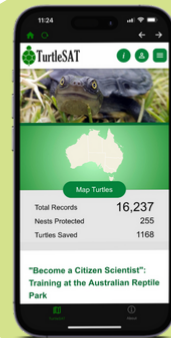




1 MILLION TURTLES

Land/Natural Resource Management Guide

Tips and ideas for conserving
freshwater turtles in your
locality.



2023-24



Photo credit: Dr Donald McKnight

AUSTRALIAN MUSEUM
**EUREKA
PRIZES**
2023 WINNER





PHOTO CREDIT: CHRIS VAN WYK

Globally, turtles are some of the most threatened species on earth, and many Australian native freshwater turtle species are in decline. This is concerning not only from the perspective of losing more native species to extinction, but also because turtles play a key role in maintaining water quality.

If your local jurisdiction includes the oversight of waterbodies such as lakes, creeks, dams, wetlands, reservoirs, or disposal ponds – it is highly likely that native freshwater turtle populations are residing in your area.

This document provides an overview of the different actions and steps you and your land/natural resource management agency can take to help our freshwater turtles. We would love for you to join the 1 Million Turtles program on our mission to conserve our Australian freshwater turtles.

WELCOME



Photo Credit: Dr Donald McKnight

OVERVIEW

The following sections each cover different categories of actions that you could take to help save our turtles. Many of the actions are highly suitable for embedding community and citizen scientist involvement to promote collaborative conservation initiatives - this includes feral species management such as foxes and pigs. We hope that you will find this guide useful and share it with others that may benefit from it too.

01

Critical Role of Freshwater Turtles

Learn more about the ecological role of freshwater turtles and why they are important to our natural environment - **Page 1**

02

Install Turtle Signage & Create Basking Sites and Islands

Learn more about the benefits of installing turtle signage, and how creating basking sites and turtle islands can value add to the signs and turtles - **Pages 2 - 4**

03

Monitoring Foxes and Pigs

Learn more about how you can leverage the different tools and approaches developed by 1 Million Turtles to optimise fox and pig management - **Page 4 - 5**

04

Removing Fish Hooks, and Other Ways to Help Turtles

Learn more about how to tackle fish hooks in turtles and discover other ways to help turtles - **Pages 6 - 7**

05

Activities to Engage Your Community, Important Environmental Days

Learn how you can engage with your community by involving in them in three different 1 Million Turtles activities plus a list of important environmental days - **Pages 8 - 13**

06

Turtle Nesting Periods by State, Team Contact List, Land Manager's Page

Learn the key nesting times for turtles in your region, list of 1MT team member contacts, links to further useful information and more - **Pages 14 - 16**

The Critical Role of Freshwater Turtles

It's particularly important to consider native freshwater turtle populations when managing the areas they live in, especially if needing to dry these spaces e.g. drying a lake for maintenance or wetland management.

Drying of waterbodies is often a cue for turtles to leave to find other suitable habitat.



Photo Credit: Dr Donald McKnight

Turtle injured by motor vehicle

While moving to another wet habitat they are vulnerable to predators and being hit by cars, particularly in urban areas.



Before

After

Photo Credit: Dr Claudia Santori

Turtles eat dead, rotting carcasses from the water reducing the risk of algal blooms. This helps to improve water quality, so preserving healthy populations of freshwater turtle populations in your locality is in everybody's interest. See image above - before/after result from an experiment by Dr Claudia Santori that investigated the amount of carrion (dead European Carp) freshwater turtles eat and their impacts on water quality.



Install Turtle Signage

There are several types of signage that can be installed to raise awareness about freshwater turtles and help minimise any negative consequences for them, e.g. roadkill.

SINGLE TURTLE SIGNAGE

A single information signage provides a quick overview about freshwater turtles and how someone can make their sighting count by recording it in TurtleSAT. This one page A3 signage can be printed as a corflute or metal signage and placed at strategic spots at a local water body. Ideally, these spots have known turtle populations.

Freshwater Turtles in [insert location]

Turtles You May See

 <p>Eastern Long-necked Turtle <i>Chelonia longicollis</i> Size: 20cm Found: eastern Australia Unique features: A long neck and releases pungent smell when threatened.</p>	 <p>Murray Short-necked Turtle <i>Emydura macquarii</i> Size: 30cm Found: Murray-Darling</p>	 <p>Belahard Slider <i>Trachemys scripta elegans</i> Size: 20cm Found: in Australia due to released pets Unique feature: Distinct red or orange marking behind eye.</p>
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More About Turtles

 <p>Basking Turtles need external sources to remain warm and can often be seen basking on rocks and logs during warmer months.</p>	 <p>Nesting Female turtles emerge from the water during the nesting season and walk for some distance to find a spot. Once found, they will use their back legs to dig a hole.</p>	 <p>Dug Up Turtle Nests You may come across a dug up hole on the ground with egg shells around it. A fox (or other local species) may have dug up the turtle's nest and consumed the eggs.</p>
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Seen a turtle or spotted a dug up nest? Make an impact by reporting it to TurtleSAT



Types of sightings you can report to TurtleSAT

- Turtles basking on logs or rocks
- Red-Sliders
- Turtles found dead, e.g. along roads
- Turtles found crossing or walking along roads
- Dug up turtle nests
- Turtles nesting or intact turtle nest



Scan to learn more about the 1 Million Turtles Program



Scan to learn more or download TurtleSAT

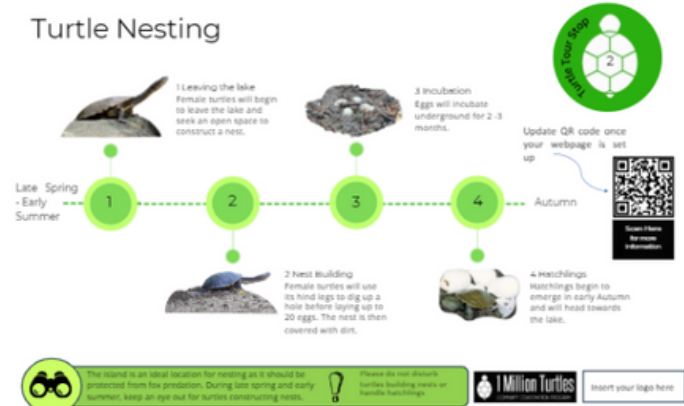
Insert your logo 

MULTIPLE TURTLE TOUR SIGNAGE

If you have a lake, river or other water bodies with public access, your agency could consider setting up a turtle tour. The turtle tour, depending on available budget and size of the water body, could consist of between 3 to 5 or 6 signs. Each will provide a variety of information about turtles and 'Call to Actions'. For example, this turtle tour signage advises visitors and local residents of what to

do if they see a turtle (basking or injured). These signs are great for encouraging people to become a citizen scientist to help monitor turtle numbers and threats. We have turtle tour signage templates that can be tailored for individual areas and needs.

Turtle Nesting



1 Leaving the lake
Female turtles will begin to leave the lake and seek an open space to construct a nest.

2 Nest building
Female turtles will use its hind legs to dig up a hole before laying up to 20 eggs. The nest is then covered with dirt.

3 Incubation
Eggs will incubate underground for 2-3 months.

4 Hatchlings
Hatchlings begin to emerge in early Autumn and will head towards the lake.

Update QR code once your webpage is set up

Scan Here to learn more

1 Million Turtles Insert your logo here

The nest is an ideal location for nesting as it should be protected from the predation. During late spring and early summer, keep an eye out for turtles constructing nests. Please do not disturb turtles building nests or burrows/hatchlings.

TURTLE CROSSING SIGNAGE

You could also work with your the local Council to install roadside signs warning drivers on nearby roads to watch for turtles crossing and possibly extended signage advising drivers of what to do if they see a turtle trying to cross a road, or if they see an injured turtle.

We have ready-to-go signage templates (single or multiple) that can be easily modified to suit your needs. Contact us at 1millionturtles@1millionturtles.com to discuss how we can assist you.



PHOTO CREDIT: SASIMOTO (ISTOCK)



Create Basking Sites

One effective method for actively engaging communities in conservation is the establishment of basking sites for turtles. There are two options for agencies considering this option, namely constructing floating basking platforms (which are cost-effective and engaging, visit 1MillionTurtles.com for details), and placing logs strategically positioned around water bodies like lakes, rivers, or ponds in your locality.

These sites not only provide resting spots for turtles but also offer ideal locations for informative signs, boosting community awareness about local ecosystems. Creating basking sites is a tangible step toward involving communities in preserving their natural environment.



If you are keen to create basking sites at your local area, contact us at 1millionturtles@1millionturtles.com to discuss.



Create Turtle Islands

The 1 Million Turtles program team can work with you to design and install artificial islands in water bodies (e.g. lake). The islands provide a turtle nesting habitat that is more isolated from predators like foxes.

The turtle islands provide habitat for freshwater turtles and other wildlife such as birds.

PHOTO CREDIT: BLUE MOUNTAINS GAZETTE



If you are keen to create a turtle island at your local area, contact us at 1millionturtles@1millionturtles.com to discuss.

Monitoring Foxes and Pigs

The program has developed a number of science based approaches and free online tools that can help enhance feral species management and facilitate long-term standardised monitoring of feral species such as foxes and pigs.

National Nest Predation Survey, Turtle Nest Predictor Tool, TurtleSAT

Nest predation rates on turtle nests are very high in many parts of Australia. Introduced foxes are known to be the major contributor of this negative impact on turtles. Feral species such as pigs also impact turtles through degradation of soil around riverbanks and areas near water bodies that could be suitable nesting spots.



To conduct the [National Nest Predation Survey](#), you will identify a suitable site that facilitates the set up of a 20m by 20m plot. You can use the [Turtle Nest Predictor tool](#) to help you identify suitable sites. To start, you will enter your address or the location of an area of interest. The nest predictor tool will then display a map showing all the known or likely nesting hotspots. These nesting areas are colour-coded in red and filters can be applied to the map. These hotspots are identified using AI powered by data from TurtleSAT and ideal vegetation characteristics.

In the survey plot, you will randomly dig 10 artificial turtle nests, bury two chicken eggs in each, and leave them untouched for three weeks. You can also set up a wildlife camera to monitor the site over the three weeks. When you return, you may see that the artificial nests have been dug up. You can then view the wildlife camera to investigate the type and number of species that have visited the plot (see images below) and identify which species have dug up the nests for the chicken eggs. The data from this survey will be entered into [TurtleSAT](#), which your agency will have access to.

How does this help with feral species management?

The standardised design of the nest predation survey can be easily replicated at different locations and at different times of the year (except in November during peak turtle nesting). You can carry out this survey before and after you engage in fox management initiatives to evaluate the effectiveness of the different actions implemented (e.g. fox baiting).

As foxes are known to dig up turtle nests for eggs, the nesting hotspots identified by the Turtle Nest Predictor Tool is a great way to quickly identify areas that are most likely to attract foxes and target management efforts there.





Removing Fish Hooks from Turtles

What do you do if you find a turtle with a fish hook stuck in it? In localities where recreational fishing is common, it is likely that someone may encounter this scenario. The following section gives an overview of some actions that you could promote to recreational fishers in your local area.

Hook in mouth - If the hook is stuck in the mouth of the turtle, and a person is able to easily remove the hook, they should do so and immediately release the turtle.

Hook swallowed - If the hook cannot be removed easily or has been swallowed by the turtle, then you should cut the fishing line leaving 20-30cm extending from the mouth. Then proceed to take the turtle to a vet for the hook to be removed. In these cases, it is likely that the turtle needs to be anaesthetised to have the hook removed. If the vet is unsure on what to do - they will normally contact a zoo or a vet specialising in wildlife health.

There are no good or bad fishing hooks. People used to think that the older types of hooks would just rust away inside the turtle, hence could be left in. However, there have been some incidences of pretty horrific injuries in turtles by leaving such hooks in place. The stainless steel hooks last forever. So it is recommended that all hooks are removed from turtles.

This section was contributed by Dr Shane Simpson (Director), the Unusual Pet Vets - Peninsula, Victoria,



Photo Credit: [The Daily Telegraph](#), 'Turtle Hooked and Helped by WIRES', published 8 Feb 2018.



Other Ways You Can Help Turtles



Include information about freshwater turtles on your agency's web page and/or links to the 1 Million Turtles Program and TurtleSAT websites.



Protect known turtle nesting areas from damage and fox predation. Check out [1millionturtles.com/nest-protection](https://www.1millionturtles.com/nest-protection) for more information on nest protection. Larger areas may also be able to be fenced.



Share and encourage your staff to learn about the importance of logging all sightings of turtles and turtle nests (e.g. damaged nests that have been dug out) in your area through [TurtleSAT](https://www.1millionturtles.com/turtlesat) to assist local and national turtle conservation efforts.



Photo Credit: Dr Donald McKnight

Prior to any drying of a waterbody conduct turtle trapping and relocation to a suitable location (and their return afterwards if habitat will still be suitable) with support from local experts and wildlife carers.



Photo Credit: Overlooked Nature Blog

Install drift fencing that can direct turtles away from roads and/or toward other nearby water bodies.

Engage with the local community and/or local wildlife groups for assistance in watching for turtles on the move and reporting their sightings to TurtleSAT.



Photo credit: Jiri Lochman

On-Ground Actions to Get Your Community Involved

01

Investigate Feral Species Impact with the Nest Predation Survey

If your agency is involved in feral species management, the National Nest Predation Survey, with its standardised design, could help enhance these efforts. Introduced foxes (and pigs) are the major predators of turtle eggs. Landholders and other community members can also easily participate (with land access permissions).

All data from this survey is entered into TurtleSAT which instantaneously develops a national interactive 'hotspot' map to determine region specific estimates of predation rates and density of feral species.

02

Protect Turtle Nests

If you have known turtle nesting activity in your locality along with feral species presence, the nest protection activity is a great way to engage the local community to participate in conserving freshwater turtles.

By protecting turtle nests, your community and agency can help to manage the impact foxes and pigs have on turtles.



03

Ground Truth the Nest Predictor tool

This user-friendly online tool, called 'Turtle Nest Predictor Tool' assists anyone to locate turtles in their local area. This tool uses advanced mapping techniques and data from TurtleSAT to predict potential nesting sites for turtles around water bodies across Australia.

Your agency and community can help to increase the accuracy and utility of this online tool by encouraging your local residents to visit various identified potential turtle nesting hotspots in the area and record habitat attributes and/or signs of turtle nesting in TurtleSAT.



Photo Credit: Dr Donald McKnight

Turtle Month Call-to-Actions

November each year marks ‘Turtle Month’. During or leading up to this month, you may wish to engage your local community in one or more call-to-actions listed below.

30 days Turtle Count in November

If you have areas with known turtle populations in your local area, the nesting season provides a great opportunity to encourage your local community to go out and look for freshwater turtles. They can record all their sightings in TurtleSAT. To do this, they will need to:

- Download the app and register for a TurtleSAT account.
- Visit local water bodies to look for freshwater turtles. They may be floating just beneath the water surface, crossing roads, or basking on logs or rocks.
- Record all sightings to TurtleSAT.



Protect Turtle Nests

Another great activity for Turtle Month is to organise interested local community members into groups to go out and look for active nesting turtles and protect their nests from feral predators. After rainfall is a great time to do this. Visit our [nest protection page](#) for more information. All participants engaging in nest protection must complete the online training and obtain a 100% proficiency in a short quiz or work under close supervision of trained staff. To do this, they will need to:

- Complete nest protection training ([via our 1MT website](#)).
- Individually or in a group (with your agency’s help or supervision) go looking for nesting turtles.
- Once the female adult turtle has left the nest, use the necessary equipment to protect turtle nests.
- Record all nest protection data to TurtleSAT.





Photo Credit: Dr Donald McKnight



Organise a Turtle Art Day

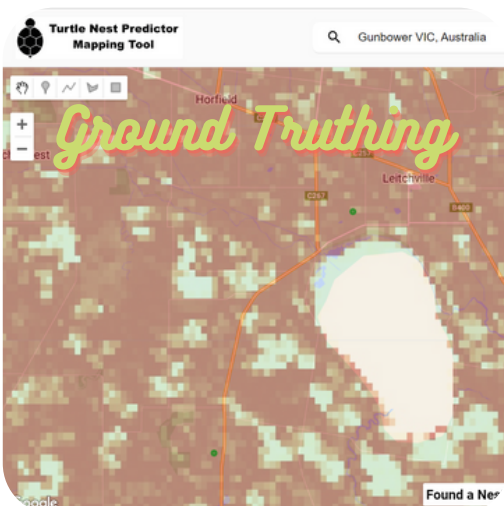
You could organise a stall or simply set up a table at the local park or near a playground to encourage kids and their parents to create turtle art. You could use rocks and acrylic paint, markers and paper, or chalk on ground. To do this, you will need to:

- Get all the necessary art materials.
- Organise a turtle art event.
- Even consider running a competition to select a few winning entries and award them prizes.
- This event could be repeated every year.
- Spread the turtle conservation message.

Ground Truth the Nest Predictor Tool

This is another great activity to get people outdoors and contributing to turtle conservation. It can be done at any time of the year (best times are spring/summer and after significant rain events). The Turtle Nest Predictor Tool helps people locate potential and existing hotspots of turtle nesting. It uses data from TurtleSAT, vegetation characteristics and AI to map these areas. To further enhance its accuracy, we need people to go out and verify habitat characteristics and any signs of nests at these hotspots. To do this, you will need to:

- Download and register for a TurtleSAT account.
- Use the online [Turtle Nest Predictor tool](#) to identify a location (or locations) that they would like to visit and ground truth.
- Take photos and submit observations to TurtleSAT.





Important Environmental Days

Many of these days are celebrated locally and across the globe. These important environmental days are great for organising activities and events that promote conservation awareness about freshwater turtles, their habitat and other wildlife too.



**WORLD
WETLANDS
DAY**
2 FEB

Celebrating the importance of wetlands.

WORLD WETLANDS DAY - FEB

On **2 February** every year, the world celebrates World Wetlands Day to raise public awareness of the importance of wetlands for humanity and the planet.

This is a great time to organise the following turtle events:

(1) Run a family fun day featuring talks about the importance of wetlands and how they support wildlife such as freshwater turtles - include a booth to engage children and their parents to create fun turtle art.

(2) Organise opportunities for your community to set up and carry out a National Nest Predation Survey near wetlands. Schools can get involved too.

(3) Organise a tour around your local wetlands to highlight their role and all the wildlife they support. You can take this opportunity to talk about TurtleSAT and how people can become citizen scientists by reporting sightings of freshwater turtles.

WORLD TURTLE DAY - MAY

On **23 May** every year, we celebrate 'World Turtle Day' to raise public awareness of the importance of turtles and tortoises globally and celebrate our love for them.

This is a great time to organise the following turtle events:

(1) Run a family fun day featuring expert talks about the importance of turtles and how they play a role in maintaining good water quality - include a booth or space to engage children and their parents to create fun turtle art.

(2) Organise opportunities to set up and carry out a National Nest Predation Survey on this day. This is a great way to engage the community in collective actions and learn more about the impacts of feral species on freshwater turtle populations.

(3) Organise a tour around your local wetlands, lake or river to highlight the role of water bodies and freshwater turtles. You may take this opportunity to talk about TurtleSAT.



Photo Credit: Dr Donald McKnight

**WORLD
TURTLE
DAY**
23 MAY

Celebrating our love for turtles and tortoises, and their importance to our world.



WORLD RIVERS DAY

4TH SUN OF SEP

Celebrating the world's rivers and their vital value to wildlife and us.

WORLD RIVERS DAY - SEP

Rivers provide vital habitat to our freshwater turtles and in turn, the turtles help maintain the water quality by feeding on carrion such as dead carps.

This is a great time to organise the following turtle events:

(1) Run a family fun day by your local river featuring talks about the importance of rivers and how they play a role in providing habitat for freshwater

turtles and many other wildlife. Include a booth or space to engage children and their parents to create fun turtle art. They could sit by the river and have fun creating turtle art.

(2) Organise a wildlife tour around your local river to visually highlight their values and how they support freshwater turtles. You may take this opportunity to talk about TurtleSAT and how people can report sightings of freshwater turtles found basking near riverbanks.

(3) If you have known turtle nesting spots near your river, this may be a great opportunity to carry out nest protection training just in time for the peak nesting season (See page 13 for more information on nesting timeframes).



Photo Credit: Dr Donald McKnight

NATIONAL THREATENED SPECIES DAY

7 SEP

Commemorating all the Australian native animal and plant species that are facing extinction.

NATIONAL THREATENED SPECIES DAY - SEP

On 7 Sep of each year, National Threatened Species Day commemorates all the Australian native animal and plant species that are facing extinction.

This is a great time to organise the following turtle events:

(1) Run a family fun day featuring talks about the different threatened freshwater turtle species. It could focus on a species specific to your local area. This event could highlight all threatened species in your local area.

(2) Include a booth to engage children and their parents to create art of threatened species. A national threatened species bake off is often run in the lead up to this day. A local competition could be encouraged where local residents could bake a threatened species of their choice and submit their photos to win a prize pack.

(3) If you have known turtle nesting spots near your river, this may be a great opportunity to carry out nest protection training with your community just in time for the peak nesting season (See page 13 for more information on nesting timeframes).



TURTLE MONTH - NOVEMBER

In November each year, we celebrate Turtle Month. This is a great time to focus on our local freshwater turtles and promote awareness about their uniqueness and all the wonderful things they contribute to our Australian rivers and other water bodies.

We have included a list of different ‘Call-to-Actions’ on pages 7 to 9 that you could do during turtle month.



Photo Credit: Dr Donald McKnight

TURTLE MONTH
ALL NOV

Celebrating our turtles and taking a moment to commemorate everything they give to our natural world.

Keen to have 1 Million Turtles at your events?

Reach out to the 1 Million Turtles team at 1millionturtles@1millionturtles.com today. We can give turtle talks and/or set up an interactive booth at events. **Subject to team availability and travel costs plus including a speaker fee may be requested.**





Turtle Nesting by States

Below we have provided approximate nesting periods for different turtles species in each state. Please note that this may vary due to changing weather patterns and climate change.



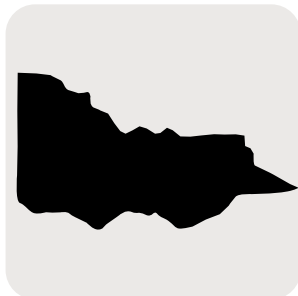
NSW (AND ACT)

- Turtle nesting starts around mid-October, with peak nesting during November and up until Christmas
- Or after any significant rain event



SA

- Short-necked turtle - starts +/- a week from 10 November, or as early as late October
- Long-necked turtle - November and December. Hatchlings can emerge in autumn, and sometimes in spring
- Broad-shelled turtle - highly variable, approximately between March to May
- Or after any significant rain event



VIC, NSW Riverina

- Last week in October up to mid-December
- Broad-shelled turtle - highly variable, approximately between March to May
- Or after any significant rain event



QLD

- Mary River turtle - October to December
- White-throated Snapping turtle - May to July
- Broad-shelled turtles - April/May
- Short-necked turtles - October to January
- Long-necked turtles - September to December
- Saw-shelled turtles - September to March
- Or after any significant rain event



WA

- Southwestern Snake-necked turtles - around September, peaks in October and tapers off in November, but can continue through to January (in Perth)
- Western Swamp turtle - between November to December
- Or after any significant rain event



Photo Credit: Dr Donald McKnight

Have a question? Contact our Team

For questions or one-on-one support from a team member, please email 1millionturtles@1millionturtles.com, and include 'Need 1 on 1 support' in the subject heading. In your email, kindly provide some information on the type of assistance you require, your current location and contact details. A local contact from our program team will be in touch with you.



Australian Capital Territory, New South Wales

Associate Professor Deb Bower - Armidale (left)

Associate Professor Ricky Spencer (right)



South Australia

Professor Mike Thompson (left)

Dr Sylvia Clarke (right)



Victoria, NSW Riverina

Associate Professor James Van Dyke (Van)



Queensland

Marilyn Connell (left)

Associate Professor Deb Bower (right)



Western Australia

Dr Anthony Santoro (left)

Atlanta Veld (right)



Visit our Council & Land Managers Page

We also have a Council and Land Manager’s page on our 1 Million Turtles website. This webpage contains much of the information provided here and more, including free resources for your download, and will be kept updated.

On the ‘[Other Ways](#)’ to get involved page, you will find posters to promote engagement, National Nest Predation Survey guides, and turtle tour signage templates.



LAND/NATURAL RESOURCE MANAGEMENT AGENCIES AND LOCAL COUNCILS

Opportunities are available for Land/Natural Resource Management Agencies or Local Councils involved in fox management to work with the 1 Million Turtles program to achieve positive outcomes for our environment and wildlife.

Read on to learn more about these opportunities.

FOX MANAGEMENT: WAYS WE CAN WORK TOGETHER

For Land/Natural Resource Management Agencies, Local Council

This page is tailored for agencies actively engaged in fox management aligned with wildlife conservation initiatives. Here, we outline the potential of using the various tools and approaches designed by the 1 Million Turtles program to further strengthen and evaluate fox management interventions and enhance freshwater turtle conservation efforts across Australia.

Scroll down to learn more or email us at 1millionturtles@1millionturtles.com to request for a chat with our team.

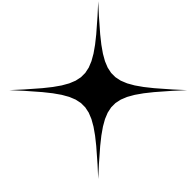


For Land/Natural Resource Management Agencies, Local Council

CONNECTING WITH COMMUNITIES AND SCHOOLS

On this page, you will discover different ways to engage and connect with your communities and schools with turtle conservation by working with 1 Million Turtles. Keen to take the first steps, reach out for a chat by clicking the button below.

Scan QR code to view the Local Council and Land Managers Page



THANK YOU!

This guide was developed by the
1 Million Turtles Community
Conservation Program



1millionturtles@1millionturtles.com

www.1millionturtles.com



Photo Credit: Dr Donald McKnight