

# NATIONAL NEST PREDATION SURVEY

## DIGITAL TRAINING GUIDE

This information resource has  
been developed by the  
1 Million Turtles Program Team

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Photo Credit: Ricky Spencer

# Introduction to NNPS



**The National Nest Predation Survey (NNPS) unites land owners, the general public, community groups and management agencies throughout the country. The NNPS is a part of the 1 Million Turtles Community Conservation Program. By participating in the NNPS, you will be monitoring the impacts of predation on turtle nests in your area and be part of a powerful citizen science network providing data to improve conservation actions for our unique wildlife.**

Nest predation rates on turtle nests are very high in many parts of the country. Introduced foxes are the major predator. By conducting the National Nest Predation Survey throughout Australia we will develop a national interactive 'hotspot' map to determine region specific estimates of predation rates.

## **What can I do?**

You will be trained as a Citizen Scientist to conduct the survey in your region. The survey will see you creating artificial nests by placing chicken eggs underground at an appropriate site and monitoring their fate.

Citizen Scientists throughout the country are doing the same thing, creating a network of geo-specific data.

## **Where can I do the survey?**

The NNPS must be done on private land or under the guidance or approval from local land management agencies (e.g., Local Council). Ideally the survey is done near a wetland (eg river, creek, lagoon, pond), but it can be done anywhere if you have enough space.

What would be considered as 'enough space'? A standard backyard is not enough space. You would need to have access to "acreage". However, please alert your local council or Local Land Services and alert them to this Citizen Science initiative and they may coordinate it in your suburban park or local creek.

## **When can I do the survey?**

The survey can be done throughout the year, however please avoid carrying out this survey during peak turtle nesting activity is occurring (November- Turtle Month). Your data will be reported through the TurtleSAT app. It will be visualised almost instantaneously through a "hotspot" map.

## **Why do I need to train?**

To become a scientist, you need to train. Similarly, to become a Citizen Scientist, you must do some training to understand how to implement the survey protocols correctly and in an ethically responsible way, while minimising any potential risk of injury or damage to you and any species.

***Please note: you will find various links to documents, videos, download button and websites throughout this information guide. To open, place mouse cursor over the link, right-hand click your mouse and select 'Open in new tab'.***



# THE THREE 'R' PRINCIPLE

## Animal Welfare

THE AUSTRALIAN CODE FOR THE CARE AND USE OF ANIMALS FOR SCIENTIFIC PURPOSES PROMOTES THE ETHICAL, HUMANE AND RESPONSIBLE USE OF ANIMALS FOR SCIENTIFIC PURPOSES. YOUR TRAINING WILL INCLUDE BASIC INFORMATION ABOUT THE CODE AND HOW IT IS BEING APPLIED TO THIS SURVEY.

**1 Million Turtles.com**  
Community Conservation Program

### THE THREE 'R' PRINCIPLE

**REPLACE** We have replaced live turtle eggs with unfertilised chicken eggs.

**REDUCTION** While many plots will be setup throughout Australia, we will limit the number of plots in a particular area. E.g., 1 person -> 1 plot

**REFINEMENT** We have refined this survey since 2014, besides improving methodologies, we have seen no sign of negative welfare impacts at any stage of this survey. You will be part of this refinement process.

Keen to learn more about the AUSTRALIAN CODE FOR THE CARE AND USE OF ANIMALS FOR SCIENTIFIC PURPOSES? [Click here](#)

### STEP 1:

To continue, please watch the 1st video by clicking on the link below.  
[Watch Video](#) (length of video: 4:03)

### STEP 2:

Watch the 2nd video - ['How to conduct the survey'](#) (length of video: 9:42)



## EQUIPMENT LIST

You may already have one or more equipment from the list below. If this is the case, we highly encourage you to use what you have available and only purchase what is missing. To progress, create a kit with the following:

### For your personal safety

- Gloves (e.g., disposable gloves)
- Alcohol wipes
- 1 × First aid kit

### To set up the survey site

- 2 x Carton of dozen eggs (it can be any brand)
- 1 × 15 cm Hand auger (if you have one) or a hand trowel
- 1 X 30 metre Tape (or you may also use shorter tape measures if available)
- 10 × Steel flags (it could be any bright colours for easy identification when taking photos upon completion of the site set-up)(1#)
- 3 x Wooden stakes (or 4 if you are not setting up a wildlife camera)(2#)
- Your phone or a camera to take photos of your site (before removing the steel flags)
- 1 X Garbage bag (to carry back any rubbish)

### If you are setting up a wildlife camera (optional)

- 1 × Star post plus cap
- 1 × Star dropper or Star picket
- 1 × Hammer or Mallet
- 2 × Cable ties (to secure the camera to the star dropper or picket)
- 1 × Wildlife camera trap (aka remote sensor camera or motion sensor camera)
- Alcohol wipes (to wipe down the camera after set-up)

Don't worry if you don't have a camera, it won't stop you taking part in the National Nest Predation Survey. However, if you are keen to use a wildlife camera – we have put together a list of economical camera purchase options. [Please refer to the guide for more information.](#)

The screenshot shows a document header with the 1 Million Turtles logo. The title is "Nest Predation Experiment: Remote Sensor Cameras". Below the title, it states: "This document provides several cost-effective purchase options if you wish to install a remote sensor camera to monitor your nests. This way, you will be able to capture images or videos of the animals visiting and digging up the nests." A note follows: "Please note that it is not a mandatory requirement of your participation in the nest predation experiment." There are two small images: one of a turtle and one of a camera trap. At the bottom, it says "Have questions? Contact us at: w: <https://1millionturtles.com> (via the contact form) e: [1millionturtles@1millionturtles.com](mailto:1millionturtles@1millionturtles.com)". The footer features the 1 Million Turtles logo and the text "1 Million Turtles COMMUNITY CONSERVATION PROGRAM".

### IMPORTANT

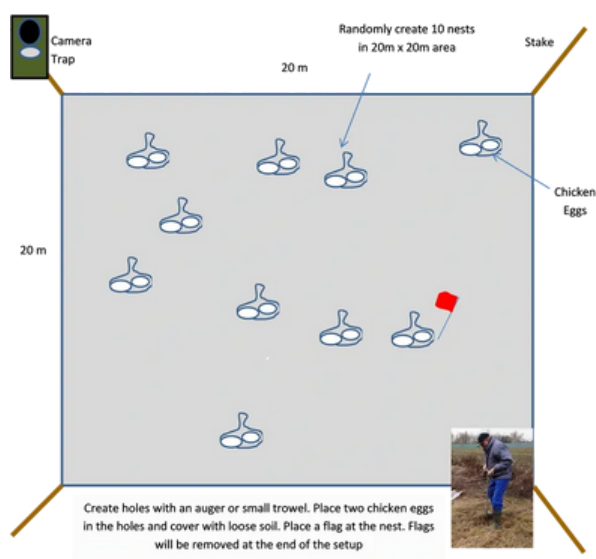
If you do not have a wildlife camera, you can take a photo (e.g., using your phone camera) of the diggings and any animal tracks around it. Email the photos to [1millionturtles@1millionturtles.com](mailto:1millionturtles@1millionturtles.com) with your full name and location. This will help our team to assess what might have dug up the artificial nests.

Disclaimer: The program (including team members, stakeholders and other partners or associated agencies) do not receive any monetary or product compensation for promoting these cameras. The program is not liable for any defects or issues that may arise from this purchase.





## SET-UP THE SURVEY SITE



The diagram above provides you with an overview of how to set up the survey on site. The small double white circles that you find in the grey box represent the chicken eggs and the holes in the ground.

The survey plot measures 20m by 20m (square). You can use the measure tape to get the correct measurements. At each point of the square, place the star post plus caps (or wooden stakes) as one marker at one point and the 3 wooden stakes with one each at the other points. If possible, use a marker pen or paint to number each wooden stakes.

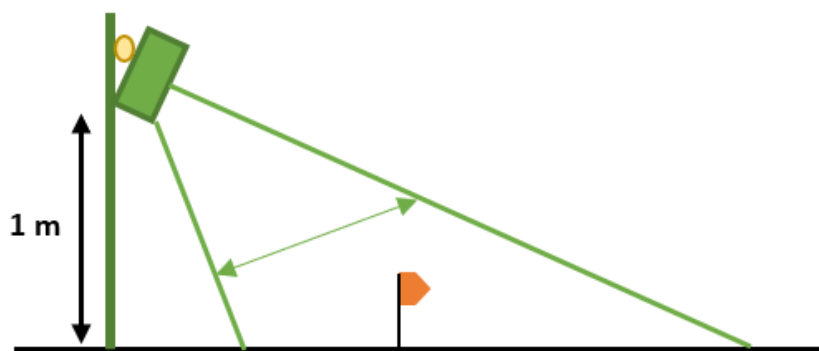
You can use an auger or a trowel to create 10 holes. As you can see, the holes are created randomly and are not spaced systematically. In each hole, bury two chicken eggs. **Please ensure that you are wearing gloves at all times while undertaking these tasks.** This ensures that you don't leave your scent trail on the eggs. After placing the eggs into each hole, cover them with the loose soil and place one orange flag at each hole. Once all the holes have been filled, first take as many photos as possible from each point where you have placed the star post and the wooden stakes. These photos will help you remember the location of the holes. Once this is done, remove all the orange flags. You may leave the star posts or wooden stakes intact.

If you plan to set up a remote sensor camera, you can use the star post. You can use the cable ties to secure the camera to the post. Please ensure it is switched on before you leave the site. Come back and check in three weeks.

For detailed information, please [watch the video](#) or refer to pages



## SET UP THE WILDLIFE CAMERA (OPTIONAL)



- You may use a star picket or dropper (if available) or any existing sturdy structures such as a fence post, or tree trunk. If you are strapping the camera to a tree, please check that your camera strap is large enough to go around the trunk.
- Generally, it is not recommended to mount your camera on trees that are thin as this may cause your camera to sway during windy conditions causing the camera to trigger falsely.
- If your camera doesn't come with a mounting strap, you may also use a cable tie to mount the camera.
- Another important consideration is minimising the effect of grass waving in the wind. If possible, please try and set up your cameras in areas with short grass.
- Mount the camera facing in the southerly (e.g., southeast or southwest) direction to avoid strong sun glare or cause the camera to trigger falsely.
- Tilt the camera slightly so that it faces downwards. This ensures that the camera sensor's detection zone or field of view (FOV) width is maximised when it hits the ground. This helps to detect the movement of any wildlife on the ground that are visiting the nests. Please note that the FOV may vary between camera models.
- It is likely that some of the nests may be outside of the camera's FOV. This is ok, as long as one or more nests are within the FOV.
- You may opt to set up your camera once the survey site has been selected and do the necessary test to ensure your camera is working well. Once you finish testing the camera, you may switch it off.
- Once the nests set-up is complete (and all the flags are removed), switch the camera on before leaving the survey site and leave it switch on for the duration of the survey (i.e., 3 weeks). Please wipe down the camera's exterior before leaving the site (using the alcohol wipes). This ensures that you minimise any scent trails from the handling of the camera.
- Please note that wildlife cameras are also known as remote sensor cameras, motion sensor cameras, camera traps or trail cameras.

Let's Keep Going...

# SITE SELECTION AND RISK ASSESSMENT



**Risk Assessment**

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**The survey is to be conducted on private land. Land management agencies may conduct the National Nest Predation Survey on public land, however the lead manager must complete the on-line training, along with all volunteers.**

An [example risk assessment has been provided here](#). Please go through it with your team and update it for your local conditions. Although foxes are considered pests, intervention by people should NOT be undertaken. All participants should upload a completed copy as part of their registration at the end of the training module.

**Information for Management Agencies:** Management agencies can take part in the survey on land that they manage by having all participants completing this training module. A signed letter of approval allowing the survey to be conducted at the site indicating the locations (GPS coordinates) must also be uploaded. All volunteers must demonstrate that they have completed this training module before commencing the survey. Volunteers/participants that you engage with may also be subject to your additional risk assessments/training approval processes.

NOTE: Approval will not be granted if the survey plot is located in a known nesting area and planned during the peak nesting period.

Next Step

# SELECT A SITE



**Freshwater turtles are present in most wetlands throughout mainland Australia. Ideally, the NNPS is done near a wetland (e.g., river, creek, lagoon, pond), but it can be done anywhere if you have enough space. You must conduct the survey on private land or in conjunction with local management agencies.**

It is best to conduct your nest predation survey within 100m from shore. Turtles come out of the water and generally nest in habitats that are open and away from trees. Some species, like Eastern Long-Neck turtles, may walk long distances but most turtles nest relatively close to shore.

Turtles dig a hole that is up to 30cm deep and will deposit 10-30 small eggs per nest. We will use 2 larger chicken eggs in our artificial nests. Turtle eggs will incubate underground for 2-3 months for most species, but some like the Broad-Shelled Turtle, have eggs that remain underground for up to 12 months before hatching. The NNPS can take place at any time of year, except during Turtle Month (November), to make sure we avoid encountering and disturbing turtles actively nesting.

We also do not recommend setting up the survey on land with cattle present as they destroy the set up. Sheep don't appear to do as much damage.

**One site is sufficient for this survey.**

You can often find dug up nests and eggs shells on the ground while walking around your site. Don't forget to record those dug up nests into [TurtleSAT.org.au](http://TurtleSAT.org.au). Sites close to these nesting grounds make ideal areas to conduct your survey.





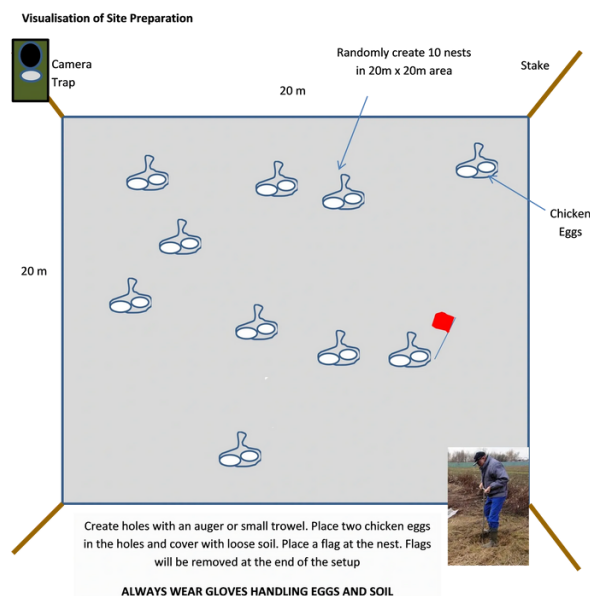
Ready to take the next step?

# SET UP YOUR 20M X 20M SURVEY PLOT



It is best to have at least 2 people setting up a site. Measure out a 20m x 20m square plot using the tape measures in your kit (or you can step this out if you don't have a measure) and at each of the four corners hammer in a small wooden stake or star post. If possible, use a marker pen or paint to number each corner wooden stakes.

Place your wildlife camera (if you are using one) on one corner star picket facing southerly towards the middle of your plot securing it with cable ties. Remember to switch on the camera before leaving your site. We recommend to set the camera to capture three still shots with a 1-minute delay. Record the GPS the location of your site. Please use decimal degrees (e.g., -34.04214, 151.05211).





Almost there...

# CREATING NESTS



Ensure you are wearing gloves at this point.



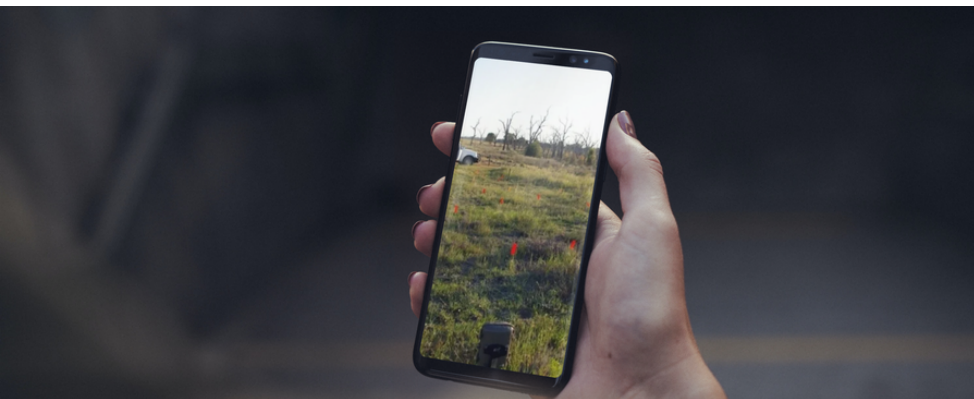
You can use an auger or a trowel to create 10 holes. The holes are created randomly and are not spaced evenly. We recommend using an auger to create a round nest. If you don't have an auger, trowels (e.g., garden trowels) can also be used. However, if possible, please don't use a shovel as the hole may end up being too large.

Dig the hole approximately 10-15cm wide and 15-20cm deep. In each hole, bury two chicken eggs. Please ensure that you are wearing gloves at all times while undertaking these tasks. This ensures that you don't leave your scent trail on the eggs. After placing the eggs into each hole, cover them with the loose soil so that it is flush with the ground and place one brightly coloured flag (or other visible marker) at each hole.



All set up? Great.

# LEAVING THE SITE



Before you leave, go to each corner of the site and take a photo. Take as many photos as needed from each corner point while the coloured flags or visible markers are still in place. Please ensure that the photo captures sufficient details of the surrounding (e.g., clear visibility of the coloured flags and the corner stakes such as the wooden stakes) to help you identify and locate the nests when you return.



What's next?

# RETURNING TO COLLECT DATA



**While natural turtle nests are underground for 2-12 months, most predation occurs within the first few weeks of nesting. We recommend returning to your sites in 3 weeks to collect data.**

This requires two people. The first person will stand at each wooden stake with the relevant photo and guide the 2nd person to each nest location. If the nest has been dug up, egg shells and a hole will be present and easy to find. If it has not been dug up, it may require some time and effort to find. Once you have located all 10 nests, record how many nests have been dug up. Remove or destroy any remaining eggs within intact nests. Once you are done, collect your wooden stakes (or star posts) and wildlife camera, and don't forget to write down how many nests have been destroyed by foxes.

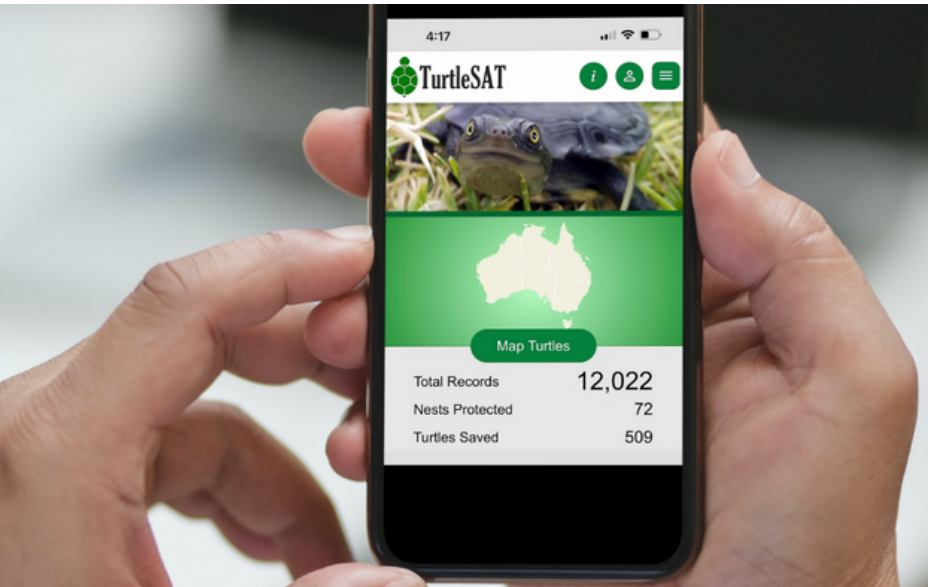
If you have used a wildlife camera, you need to look through all the images captured on the SD card. Please record the number of days that a fox was observed (not the number of fox images). For example, if a fox was captured 6 times in one night, it still gets recorded as a "1". Similarly, if a fox is observed once over a 24h period it also gets a "1". If no fox was observed over a 24h period, then it is given a "0". Tally the number of "1s" recorded and that will be recorded into the online survey. You will also need to record the number of nights that the camera was out there.

**IMP:** If you do not have a wildlife camera, you can take a photo (e.g., using your phone camera) of the diggings and any animal tracks around it. Email the photos to [1millionturtles@1millionturtles.com](mailto:1millionturtles@1millionturtles.com) with your full name and location. This will help our team to assess the damage to the artificial nests.



More about data

# ENTERING YOUR DATA



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**Before you commence the data submission process, please go through the list below for a quick data check.**

#### DATA CHECK

- Number of nests destroyed
- Number of nights that the camera was deployed (if you used a camera)
- Number of day/nights that at least one fox was observed on camera
- Date when you started and ended the survey
- Location (your GPS coordinates) or you can tap on the site location on the TurtleSAT map.

**Now that you have all the data, please enter into TurtleSAT mobile app or via the [TurtleSAT.org.au](https://www.turtlesat.org.au) website.**

Did you know that you can access TurtleSAT using your FeralScan ID?

We will regularly keep you updated via 1MillionTurtles.com and will be creating a National Nest Predation Survey real-time map within TurtleSAT in due course. We will regularly keep you updated via 1MillionTurtles.com and will be creating a National Nest Predation Survey real-time map within TurtleSAT in due course. Please click the download now button below to get a copy of the scientific article - How Much Long-Term Data Are Required to Effectively Manage A Wide-Spread Freshwater Turtle?. This paper is about turtle nest predation and why long-term data like this is are very important for managing turtles. We highly encourage you to have a read.





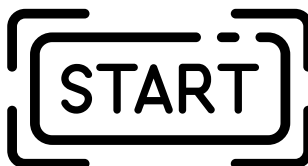
# READY TO DO THE QUIZ?

We hope you found the information and videos useful. If you are ready, you can now commence to take the quiz. This quiz is based on the information provided in this document (or available via our website) and is required as a part of the Animal Care and Ethics Permit (#A1469).

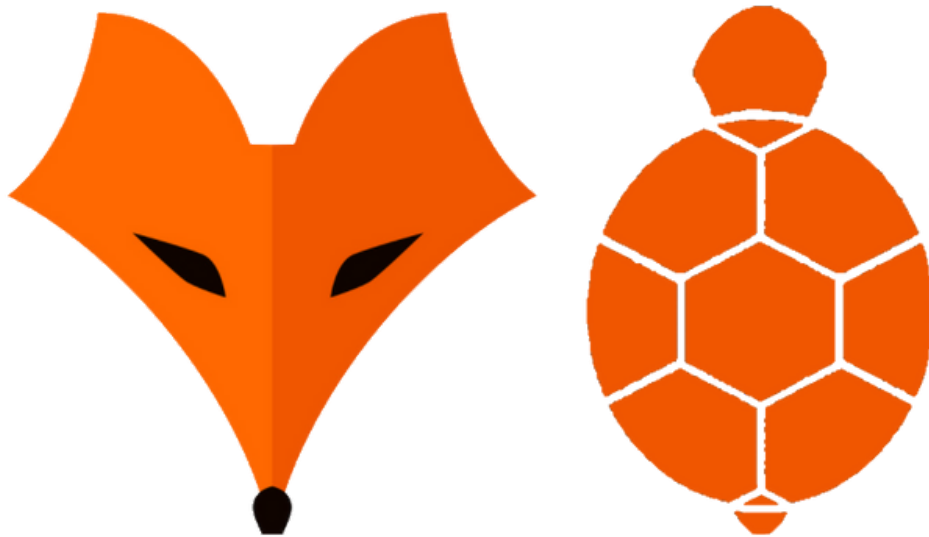
You can retake the quiz as many times until you get all questions correct. A digital certificate will be emailed to you upon successful completion.

We have also developed a checklist to help you through the NNPS process. You can download a copy from [here](#).

To commence the quiz, click on **START** below.







## National Nest Predation Survey

THANK YOU FOR BEING A PART OF OUR NATIONAL NEST  
PREDATION SURVEY!

WE REALLY APPRECIATE YOU.

FOR ANY QUESTIONS OR ASSISTANCE, PLEASE CONTACT  
THE 1 MILLION TURTLES PROGRAM TEAM AT:  
[1MILLIONTURTLES@1MILLIONTURTLES.COM](mailto:1MILLIONTURTLES@1MILLIONTURTLES.COM)