Citizen Science Project Plan

CITIZEN SCIENCE

mallee catchment management authority

Citation

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Disclaimer

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Acknowledgement of Country

Mallee Catchment Management Authority acknowledges and respects Traditional Owners, Aboriginal communities and organisations. We recognise the diversity of their cultures and the deep connections they have with Victoria's lands and waters.

We value partnerships with them for the health of people and country.

The Mallee CMA Board, management and staff pay their respects to Elders past, present and emerging and recognise the primacy of Traditional Owners' obligations, rights and responsibilities to use and care for their traditional lands and waters.

Summary

The Mallee is a beautiful place, filled with hundreds of wetlands that provide habitat for many water-dependent species. Mallee Catchment Management Authority (Mallee CMA) is the peak body for delivering natural resource programs in the Mallee. This includes caring for the many wetlands found along the Murray River from Vinifera to the South Australian border.

Monitoring our wetland species and waterway health helps us understand what is happening in the environment. Observing and logging species such as waterbirds, frogs, waterbugs and turtles gives us a better idea of how healthy our habitat is and how well our ecosystem is functioning.

For Mallee CMA, citizen scientists play an important role in monitoring and reporting on waterway health, providing invaluable data to improve the way we manage our land and waterways.

Citizen science projects can be led by anyone, whether they're a research scientist or just someone who loves nature. You don't need any scientific training to participate, as projects are designed to accommodate people with a range of abilities, skills and interests.

Thanks to modern technology, it's easier than ever to record, submit and verify your observations using apps and mobile devices.

So, join other citizen scientists and get out into nature to learn more about the wonderful world of wetlands and the creatures that call them home! You'll get to experience the wonder of the Mallee region while contributing to local, state and national scientific knowledge.

In this plan, you will learn how to monitor the following:

- bats
- frogs
- waterbugs
- turtles
- echidnas
- birds
- water quality.

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1 About this plan

This plan tells you how to become a citizen scientist in the wetlands of the Mallee region. It covers citizen science programs that monitor waterbirds, bats, frogs, waterbugs, turtles, echidnas and water quality.

Citizen science is fantastic for the environment and fun for the community. It gets you outdoors and into nature, discovering and exploring while also contributing to our understanding of our amazing wetland spaces.

1.1 What is citizen science?

Citizen scientists collect and sometimes analyse scientific data in relation to the natural world, usually in collaboration with scientists and field experts. Citizen scientists work with scientists or the scientific framework to achieve scientific goals.

The Australian Citizen Science Association defines citizen science as involving 'public participation and collaboration in scientific research with the aim to increase scientific knowledge'.[1]

1.2 Aims

Here at Mallee Catchment Management Authority (Mallee CMA), citizen science programs provide valuable data and insights that we can use in our natural resource management policies and our environmental watering plans.

Through citizen science, we aim to:

- provide opportunities for our community to participate in a meaningful way into waterway restoration
- collect data to help natural resource managers and researchers maintain and improve the condition of our waterways
- improve the health of our waterways to support ecosystem function and improve habitat for native wildlife and vegetation.

[1] ACSA (Australian Citizen Science Association), *About us*, citizenscience.org.au, accessed 3 June 2023.

2 Why do we need citizen scientists?

Scientific research can be challenging, especially when it comes to collecting large amounts of data. Citizen scientists help fill this gap. They can help cover larger geographic areas more consistently over a longer period, collecting a wealth of information that would otherwise be hard to gather.

This data can be used for a range of activities, including informing scientists, project managers and communities. Citizen science benefits the scientific community, participants and the wider community.

Citizen scientists get to learn new skills and collaborate with a range of groups including scientists, government agencies, not-for-profit organisations and community groups. Meanwhile, scientists and organisations like Mallee CMA gain access to valuable data, skills, knowledge and advice that may not otherwise have been available. This can be used to improve policies, projects and reports.

Citizen science empowers the community to have input and effect change to their social, behavioural and natural environments by capturing information that may not be readily sourced through other means.

With the emergence of apps and digital communication technology, sharing citizen science data, knowledge and resources has never been easier. Data can be collected and verified quickly and can be used locally, regionally and even nationally!

2.1 Why get involved?

By joining forces, we can increase awareness of wetland species and the importance of protecting wetland ecosystems. Some of the benefits of becoming a citizen scientist are:

- getting outdoors and spending time in nature discovering and exploring our waterways
- learning about floodplain ecosystems and the animals that live there
- figuring out if the waterways you care about are healthy
- contributing to datasets that help us improve the condition of our rivers and wetlands.

Citizen science data helps us understand the ecological response of wetlands to environmental water. It shows how environmental flows help create the right habitat for a range of native birds and animals, some of which are listed under state and national legislation.

3 Bats

The Mallee CMA region is home to 14 different species of microbat – small nocturnal mammals typically around 7 cm in length. These tiny creatures are dependent on healthy wetlands for their survival. They need healthy trees for roosting and healthy wetland ecosystems to provide insects, which is their only food source.

We have limited data on the different microbat species living in Mallee wetlands. Citizen scientists can help increase awareness of this animal and the importance of protecting wetland ecosystems.

3.1 Bat monitoring equipment

An anabat is a non-invasive electronic detector that records the ultrasonic echolocation calls of bats. These devices add significantly to the variety of species detected at a site and do not need to be monitored constantly.

Studies are ideally conducted between October and March when bats are active. Bats hibernate during the cooler months and are less likely to be detected during this time.

The equipment is installed near a wetland with the attached microphone recording the echolocation sounds emitted by the microbats. The anabat is programmed to only record at night, when microbats are active, and to only record within the audio frequency of the echolocation. The recordings are stored on an SD card, which is sent for analysis to determine the species recorded.

Bat monitoring equipment can be borrowed from Mallee CMA. Refer to the Volunteer Equipment Loan Agreement and Schedule Form for more information (available online or in the appendix) or contact our Community Engagement Officer at citizenscience@malleecma.com.au.

4 Frogs

Frogs play a crucial role in maintaining healthy wetland ecosystems. Tadpoles keep waterways clean by feeding on algae and acting as water filters, while adult frogs eat large quantities of insects and provide a food source for fish, snakes, birds and other predators. Frog population numbers, diversity and breeding activities are all good indicators of wetland health.

You can contribute to preserving these important creatures by tracking frogs using the FrogID app. Your data will be used to measure our success against the frog habitat protection objectives in our environmental watering plans for Kings Billabong, Cowanna Billabong and other wetland sites.

4.1 How to use the FrogID app

The FrogID app logs diversity, distribution and breeding habits of Australian frogs in a nationwide database by logging frog calls. It connects volunteers with nature while raising awareness of frog and biodiversity conservation.

Get started in four easy steps

Step 1: Download app

Download the Frog ID app on iOS or Android, create an account and start recording frogs. Remember to join our team – Mallee CMA Frogs – so we can track your frog calls and include this valuable data in our planning documents.

Step 2: Explore habitat

Get out into the field to discover different frogs and their diverse habitats. Remember to wash your shoes between sites and be careful where you tread.

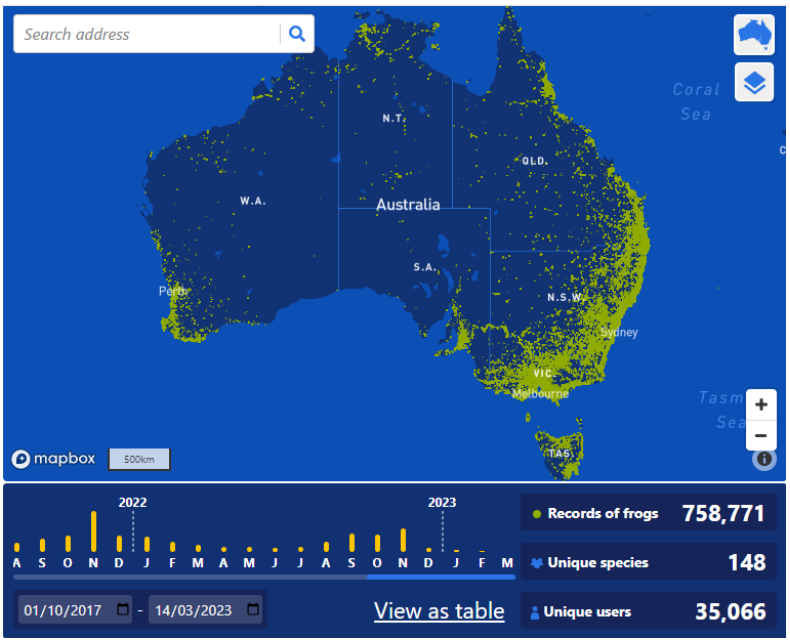
Step 3: Record and submit

Record the frog calls you hear in the field with the FrogID app and submit them to Australia's first national frog count.

Step 4: Get your results

Check back later to find your frog calls identified by the Australian Museum and Audio DNA experts.

You can explore frog call submissions across Australia on the live FrogID map:



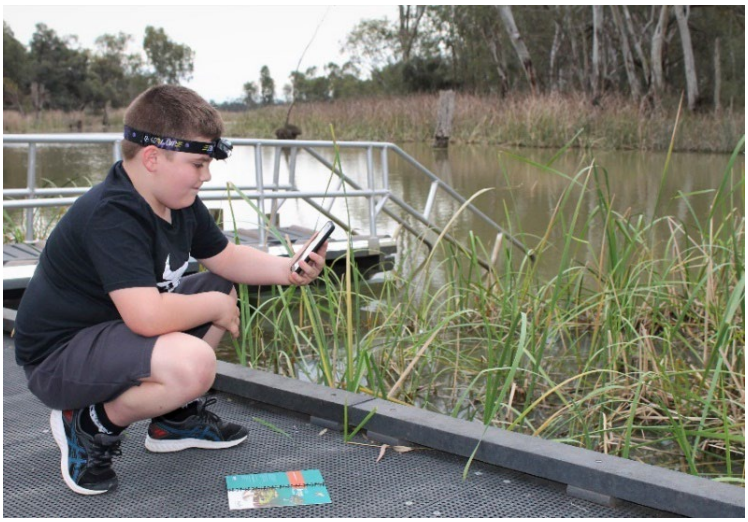
4.2 How to find frogs

Frogs are most active during breeding season in spring. You will hear their calls at local wetlands and around water holes.

You can get a headlamp and Frog Field Guide from Mallee CMA by completing the Volunteer Equipment Loan Agreement and Schedule Form online or in the appendix.

4.2.1 Safe frogging guide

- Be careful where you tread and do not touch frogs.
- Clean and disinfect your footwear between frog habitats so as not to spread frog germs.



5 Waterbugs

Aquatic macroinvertebrates, or waterbugs, are small creatures that live in freshwater for all, or part of, their lifecycle. Waterbugs play an important role in wetland ecosystems by providing a vital source of food for many native animals, including fish, frogs, turtles, waterbirds and microbats. Waterbugs are also important decomposers, helping to break down plants and ensuring that essential nutrients move through the ecosystem.

Waterbugs are good indicators of water quality and pollution. By monitoring waterbugs, we can gauge the health of our waterways and make informed decisions about policies and environmental watering plans.

You can contribute to protecting and preserving waterbugs by identifying and uploading waterbug data to the National Waterbug Blitz using the Waterbug app.

5.1 How to use the Waterbug app

Get started in four easy steps:

Step 1: Download app

Download the Waterbug app on iOS or Android and create an account.

Step 2: Get your kit

Mallee CMA can loan you a Waterbug Monitoring Pack with:

- a sampling net
- Waterbug ID book
- smart device tripod for taking photos
- picking tray
- ice cube trays
- plastic spoons
- magnifying glass.

You will need to provide:

- gumboots
- a bucket
- smart device with the Waterbug app.

To get your pack, complete the Volunteer Equipment Loan Agreement and Schedule Form online or in the appendix.

Step 3: Do your waterbug survey

Collecting waterbugs is as easy as gathering a water sample in your bucket and net, pouring some of your sample into the picking tray, scooping waterbugs out with a plastic spoon and placing individual waterbugs into the ice cube tray slots. Once you have the waterbugs sorted it is time to identify! See Section 5.2 for full instructions.

Step 4: Record and submit

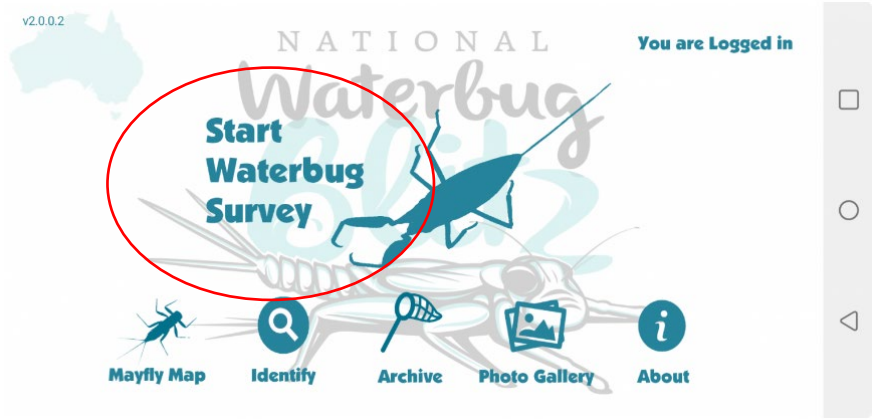
Tap 'start waterbug survey' and follow the steps in the app. Submit when finished! Your results will be sent to a scientist to validate the identification.

Instructions on how to use the app, 'how to' videos and additional resources are available on the National Waterbug Blitz website at www.waterbugblitz.org.au.

5.2 How to do a waterbug survey

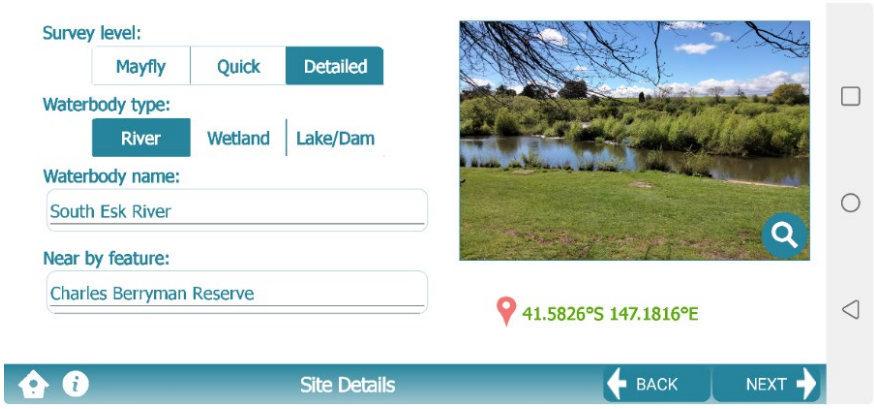
5.2.1 Get started

Open the app and select 'Start Waterbug Survey'.



5.2.2 Choose your survey type and enter site details

On the next screen, you'll be asked what level of survey you want to do, the name and type of waterbody you are surveying and to list any nearby features. You can also upload a photo of the wetland.



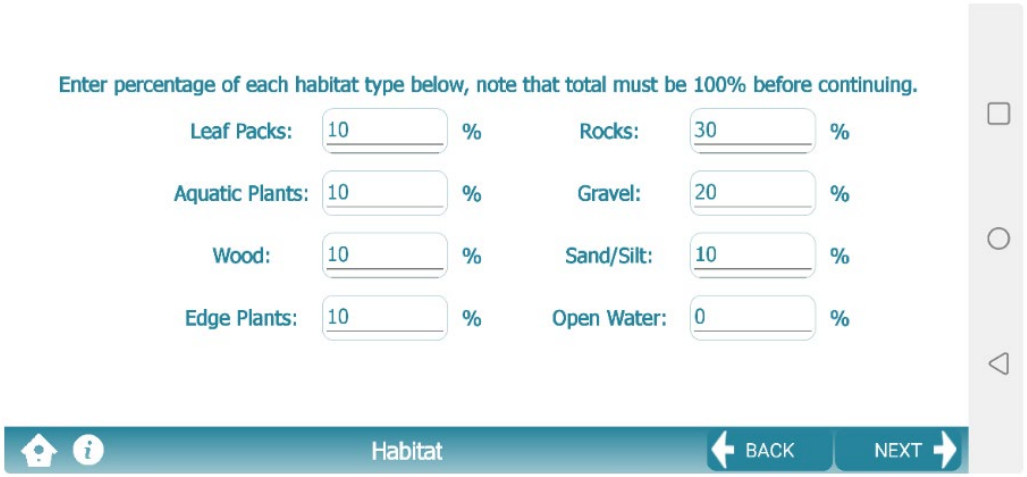
The app has three surveys levels – Mayfly Muster, quick and detailed. The table below explains the difference between them:

Blitz	Difficulty	What does it involve?	Time
Mayfly Muster	EASY	Have a quick look under rocks and on wood in the waterway...can you see any mayflies?	About 20 minutes
River Detectives	QUICK	Identify the obvious waterbugs such as dragonflies and water striders and use these to assess your site.	About 1–2 hours

Blitz	Difficulty	What does it involve?	Time
		This level is for kids and for some groups who identify to Order level only.	
Agreed Level Taxonomy (ALT) Survey	DETAILED	Complete a full assessment of your site identifying as many animals as you can with a magnifying glass, using the ALT method.	A few hours or make a day of it!

5.2.3 List the habitats you got your sample from

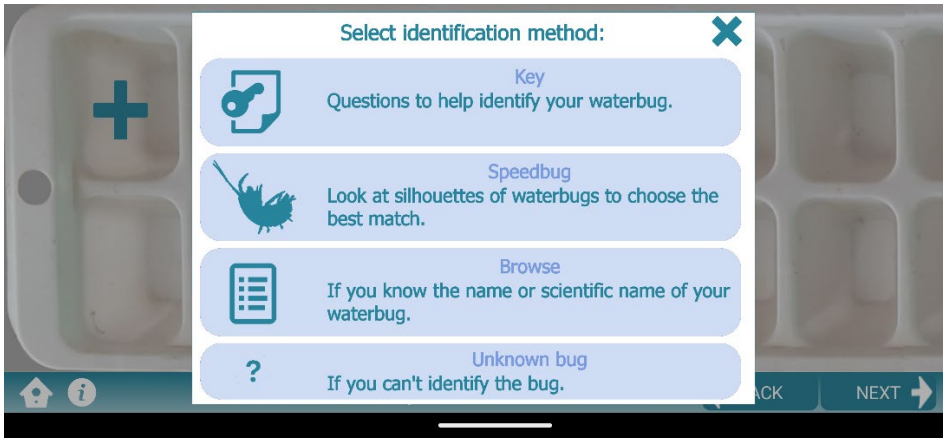
Next, you will describe the wetland habitat by entering percentages of each habitat type. Not every box needs a value, but the percentage needs to add up to 100%.



5.2.4 Pick your waterbugs and fill your tray

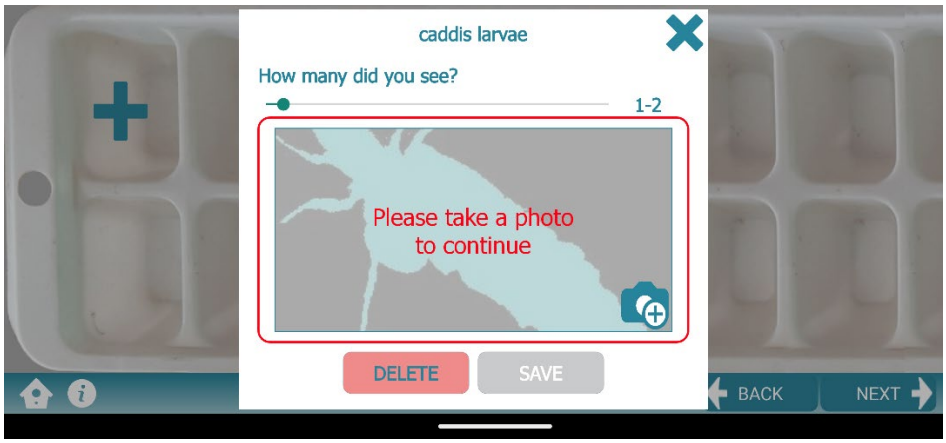
Now add the waterbugs to your tray!

Press the cross that corresponds to the square in your tray and select your identification method.

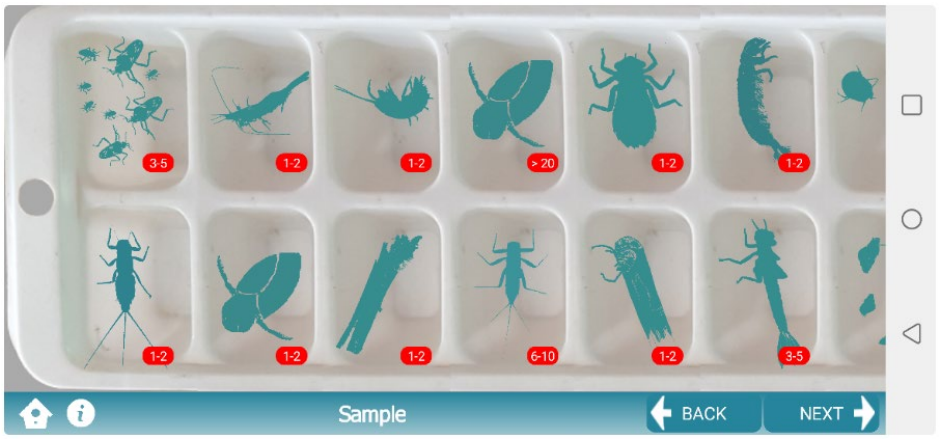


You can use a key or silhouettes to identify your bug. Or if you already know what it is, you can browse the list of bugs. Section 5.3 lists the most common waterbugs in the Mallee.

When you've found the right bug, the app will ask you to take a photo and list how many you saw.

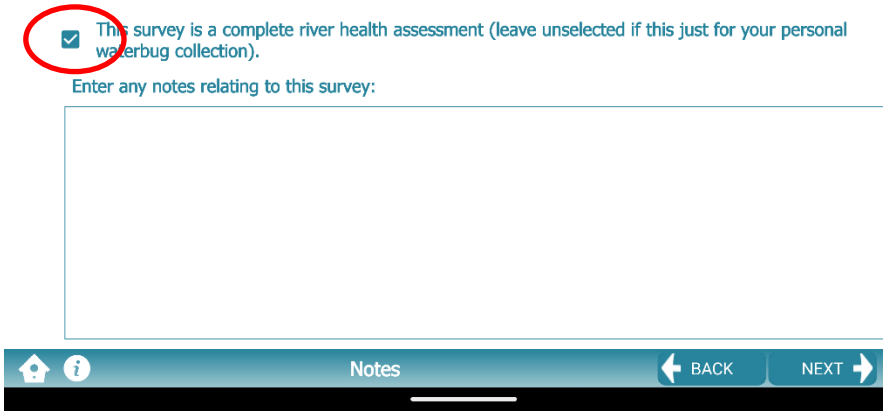


When you've finished your tray will look something like this:

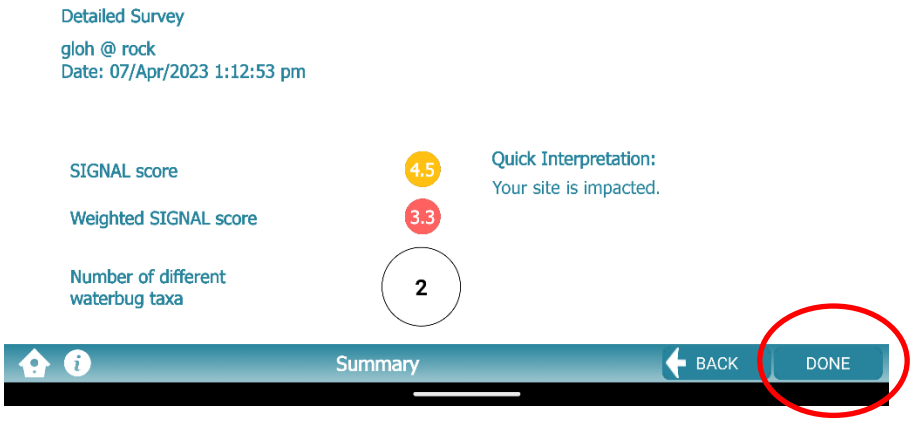


5.2.5 Submit your survey

Tick the box to certify that your survey is a complete river health assessment. You can also add notes if needed.



Remember to press ‘Done’ to submit your survey!



5.3 Know your Mallee waterbugs

Common waterbugs you may find are:

- striped boatman
- damselfly nymph
- slender backswimmer
- blood worm
- roundworms
- caddisfly larvae
- mosquito larvae
- watermite
- gastropods (snails)
- dragonfly nymph
- mayfly nymph
- glass shrimp (freshwater shrimp)
- freshwater yabbie.

6 Turtles

Freshwater turtles are a crucial part of our waterway ecosystems and help maintain a healthy aquatic environment by eating large amounts of algae and water plants, as well as scavenging on dead fish. This provides a healthy environment for other animals, birds and plants that rely on the river.

In the Mallee, we have three species of freshwater turtle: the Broad-shelled Turtle, the Eastern Long-necked Turtle and the Murray River Turtle. The Broad-shelled and Murray River Turtles are listed as Endangered and Critically Endangered in Victoria due to a range of threats, including river regulation and nest predation.

Nest predation is a major issue, affecting over 90% of turtle nests, with foxes and feral pigs being the main culprits. This has resulted in a low survival rate for hatchlings, which means few turtles survive to adulthood. With a lifespan of over 50 years, an ageing turtle population with no recruitment could lead to local turtle extinctions in future decades.

By monitoring turtle nesting and protecting nests from predators, citizen scientists play a vital role in providing valuable data to protect these precious species.

6.1 How to use the TurtleSat app

The TurtleSat app makes it easy to monitor turtles and their nests.

Step 1: Login to the app

Download the app from the Apple store or Google Play and login using this username and password:

Username: MalleeTurtle

Password: #MalleeTurtle

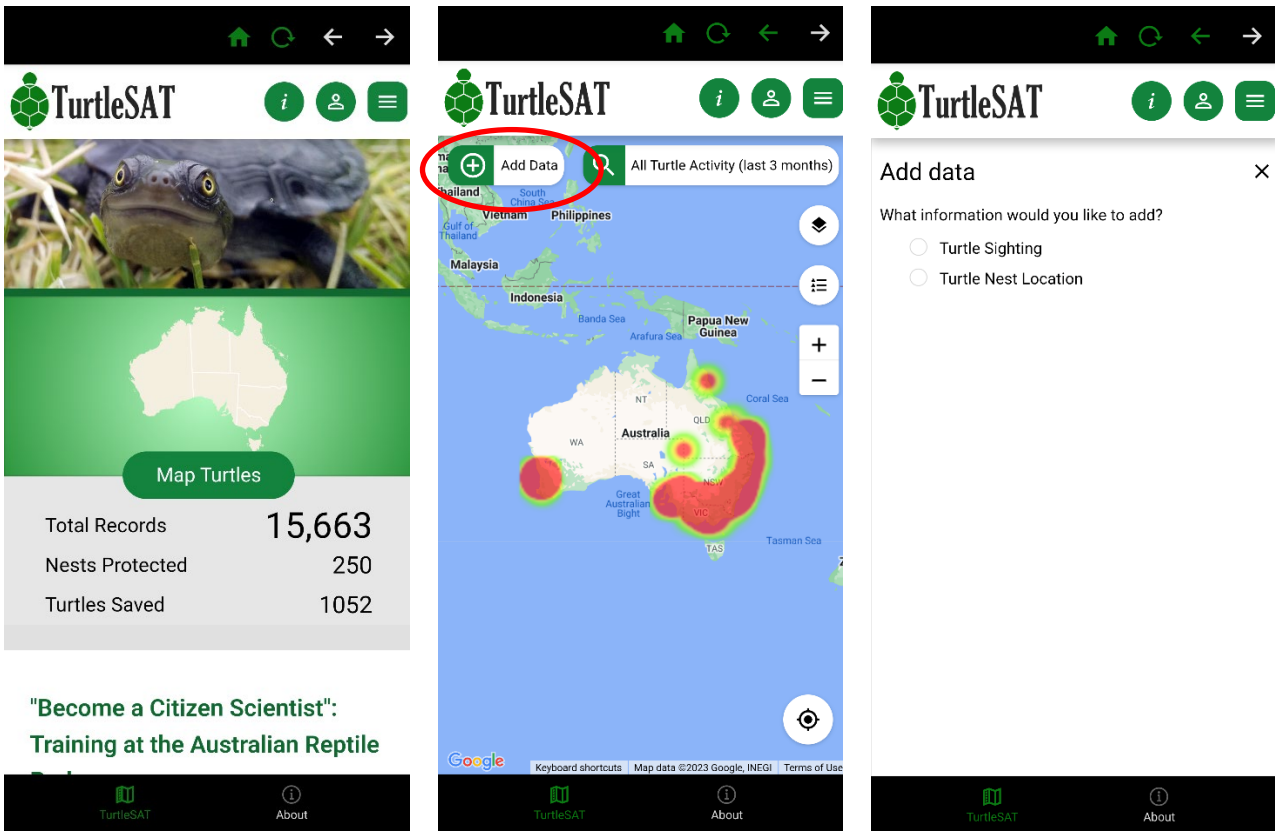
Please note that the password is case sensitive.

Step 2: Map your observations

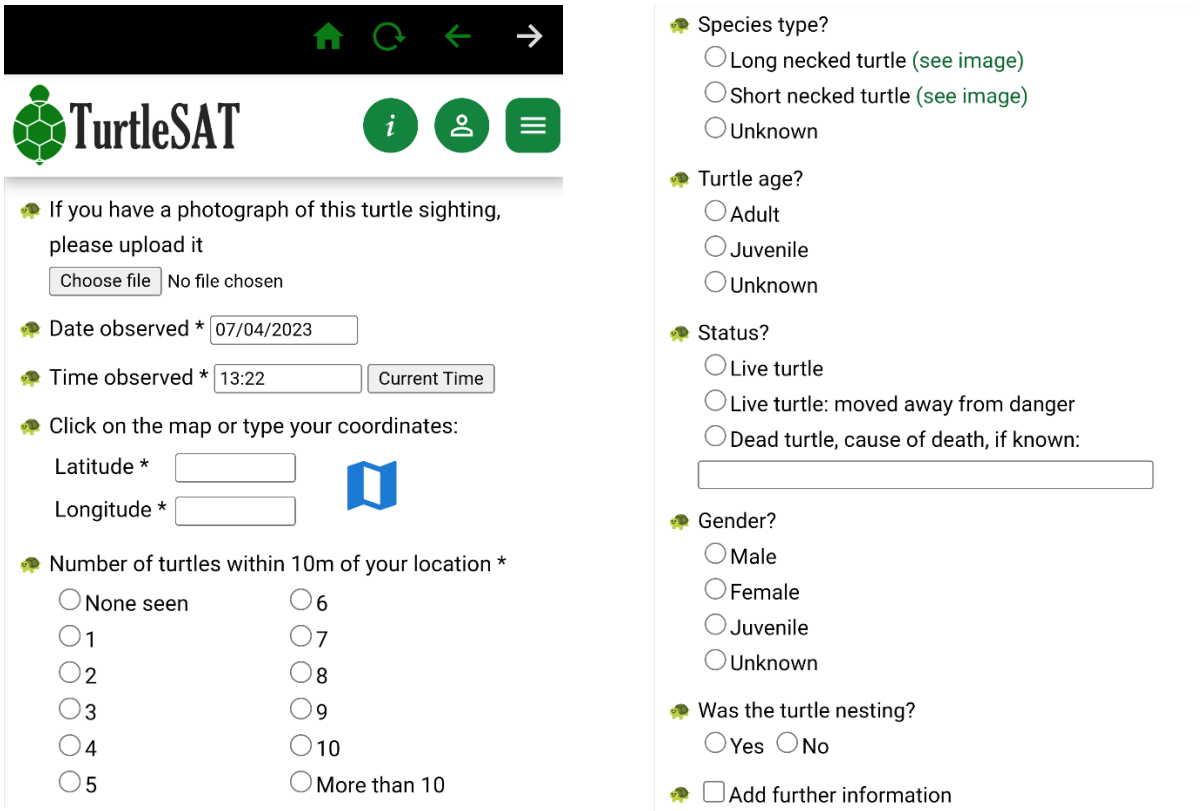
Record wherever you see freshwater turtles, their nests or evidence of predation on turtles by pests like introduced foxes using the instructions below.

6.1.1 How to record turtle sightings

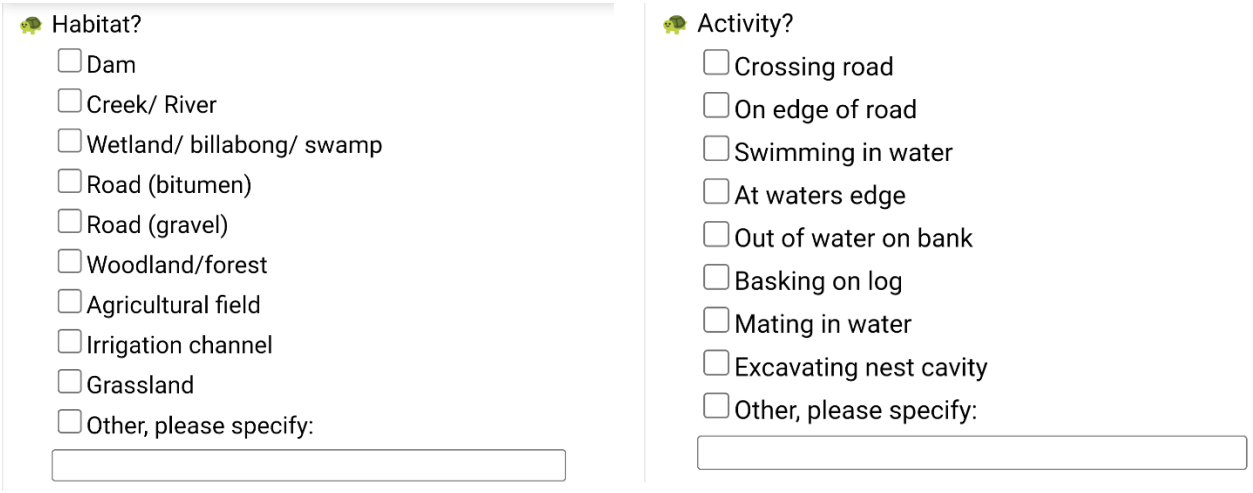
Click on ‘Map turtles’ to get started. On the next screen, select ‘Add Data’ in the top left-hand corner. Then choose between ‘Turtle Sighting’ and ‘Turtle Nest Location’.



Add the date, time, location and upload a photo if you have one. Then add the type and number of turtles seen with other details if known.



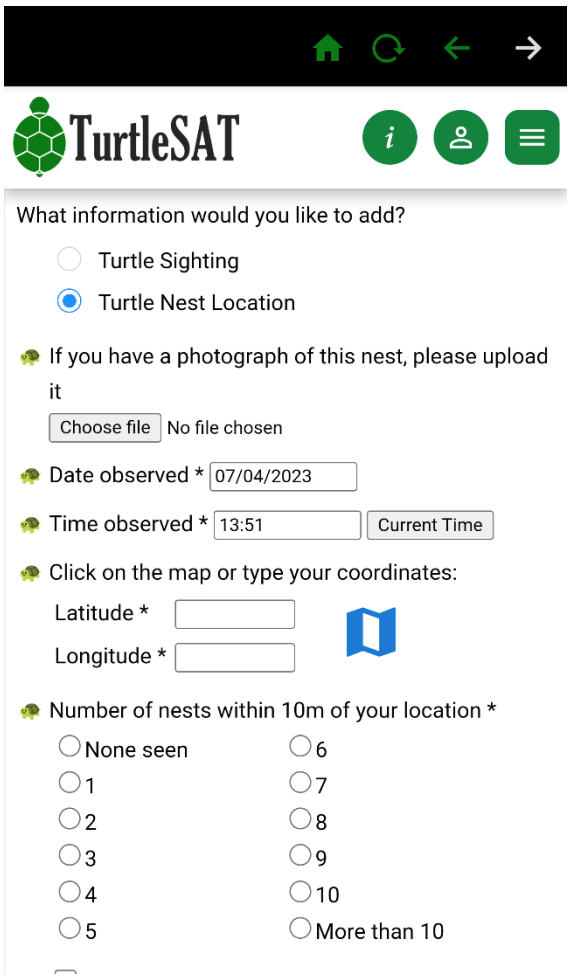
Click on ‘Add further information’ to provide as much habitat and activity information as you can:



Click submit to record your data.

6.1.2 How to record a turtle nest location

Add the date, time, location and upload a photo if you have one. Then add the number of nests within 10 metres of your location.



Select ‘Add further information’ to add more detail about the habitat such as soil type, vegetation cover and ground habitat. Then submit your record.

- [x] Add further information

Soil type at nest?
- ( ) Sandy
- ( ) Brown clay
- ( ) Red clay
- ( ) Brown soil
- ( ) Unknown
- ( ) Other, please specify:

Slope of soil at nest?
- ( ) Flat
- ( ) Medium
- ( ) Steep

Ground habitat?
- ( ) Open
- ( ) Grassy
- ( ) Shrubs
- ( ) Other, please specify:

Over-storey vegetation cover?
- ( ) No tree cover/open
- ( ) Some tree cover
- ( ) Lots of tree cover
- ( ) Other, please specify:

Distance travelled (m):

Direction you travelled from (N,S,E,W):

Possible abandoned nest?
- ( ) Yes
- ( ) No

Notes (250 character limit)

Email address *

- [ ] Continue adding records

Submit Cancel

6.2 Know your Mallee turtles

Broad-shelled Turtle

The Broad-shelled Turtle is the largest of the three turtle species and the least common species in the Murray River. It boasts the longest neck of any turtle in the world! The carapace (upper hard shell) can be up to 48 cm in length.

Juveniles and adults hide in the mud of river channels or in dense submerged or floating vegetation, where it preys on passing fish, yabbies, other aquatic animals and insects. Females lay between 9 to 17 hard-shelled eggs between mid-March and mid-May. Hatchlings can take up to 325 days to emerge from their eggs.

Eastern Long-necked Turtle

The carapace of the Long-neck Turtle is up to 25 cm in length and is distinguishable by the black seams of the belly plates. This turtle is better suited to billabongs than the river, where invertebrates are easier to catch as it creeps slowly along the bottom and near shallow edges.

The female usually nests on a rainy or overcast day in spring or summer, laying 8 to 24 hard-shelled eggs. After 105 to 150 days, the hatchlings emerge and head towards the water once it gets dark.

Murray River Turtle

Commonly called the Short-necked Turtle, the under-surface is bone coloured or very pale yellow. Juveniles and adults can often be found basking on logs or weedy banks. They eat crustaceans, fish, tadpoles and aquatic vegetation.

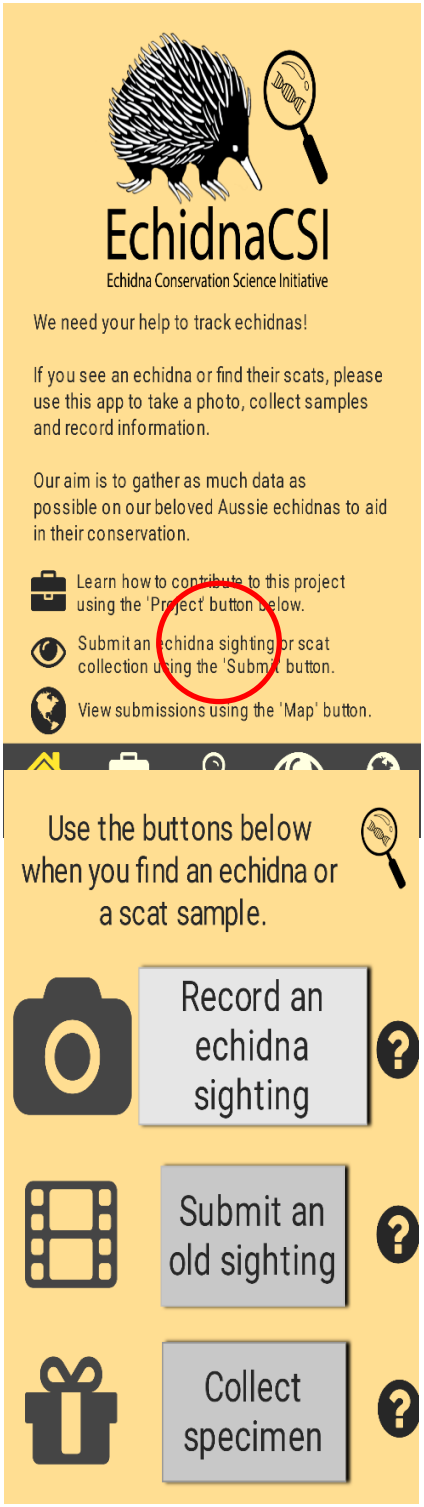
Females nest from late October to late December after rain, laying from 13 to 25 eggs per clutch and up to three clutches during a breeding season. Eggs take from 66 to 85 days to hatch, usually in the first half of February.

7 Echidnas

The echidna is usually found in open heathland, forests, woodlands, scrublands and grasslands, among vegetation or in hollow logs. In poor weather, they will often shelter under bushes or burrow into the soil.

The Short-Beaked Echidna can be found throughout Victoria, but we have limited data on where they are, what they are doing and if they are healthy. You can contribute to echidna conservation by logging echidna sightings using the EchidnaCSI app.

As well as monitoring echidnas, we can monitor their poo, known as a 'scat'. Researchers can learn a lot about echidnas by analysing the molecules in their scats. They can extract DNA and hormones to tell us about the echidna, and whether it's healthy, stressed or reproductively active. It helps us learn more about wild echidnas without having to track or capture them.



7.1 How to use Echidna CSI

EchidnaCSI is an Australia-wide initiative that is helping to conserve our wild echidnas. Download the EchidnaCSI app on iOS and Android.

You can submit sightings directly on the app and collect echidna droppings to send to EchidnaCSI.

Open the app, go to the 'submit' page and select 'Record an Echidna Sighting'.

On the next screen, you can choose to record an echidna sighting, submit an old sighting or collect a scat specimen.

7.1.1 How to record an echidna sighting

- Your camera will pop up so you can take a photo. Once you have taken a photo select 'Use Photo'. The photo will be sent to researchers with a GPS location.
- A new page will open with questions about the echidna, for example, if it was alive or dead, walking or digging, a juvenile or adult, and a section for you to add any interesting comments.
- Submit your recording.

7.1.2 How to collect a scat specimen

- Your camera will pop up so you can take a photo of the scat first. This photo is needed to get a GPS location to match the sample.
- A new page will appear asking you to get an envelope or bag and to write the date, time and your name on it. This is to identify which submission it belongs to once it's received.
- The next page will instruct you to place the scat in the envelope/bag, trying not to touch it. You will then get information on how to send your collection.

- If you are unable to submit the echidna scat through the EchidnaCSI app, you can download a paper submission form to send with your scat or use the form in the appendix.

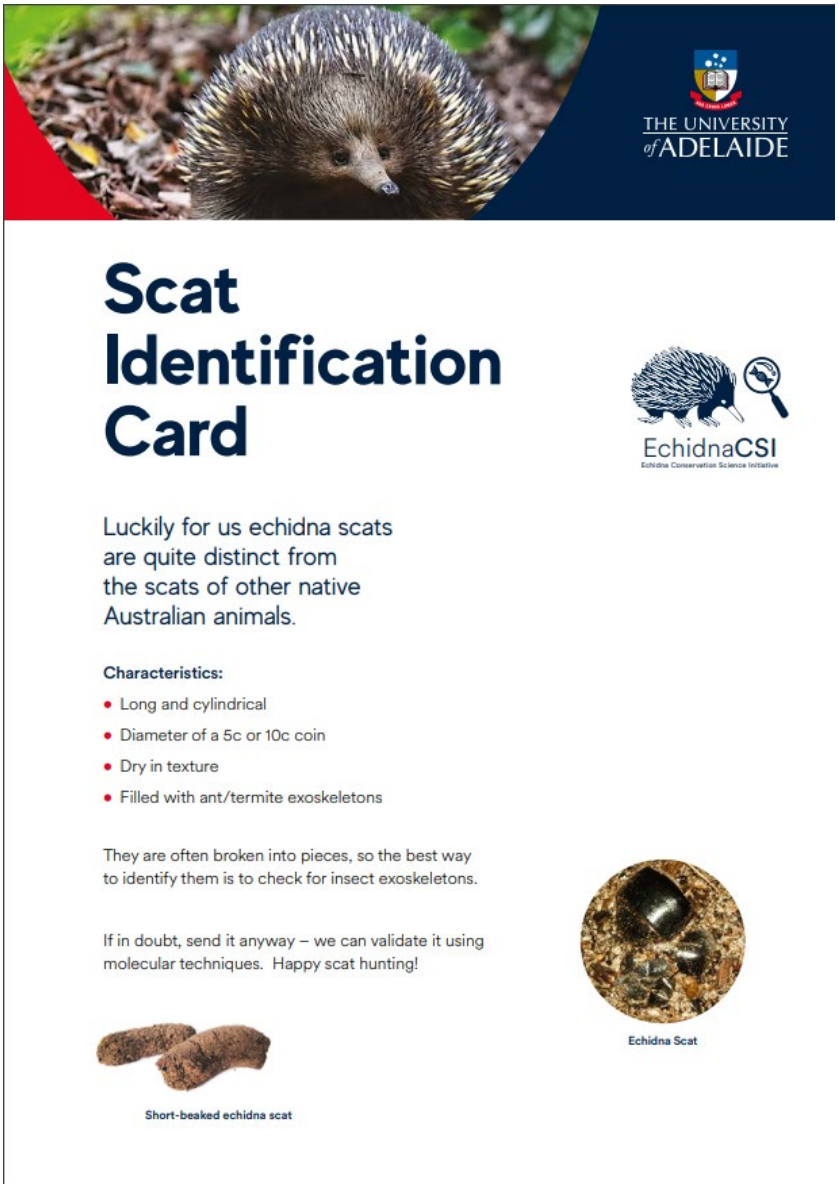
7.2 How to recognise a scat

Echidna scats are quite distinguishable. Their long and thick shape, as well as their dry texture, make them unique from the small, pellet-like scats of other animals.

You should also be able to spot lots of ants in echidna scats as this is what they eat. If in doubt, send it anyway – researchers can validate it using molecular techniques.

Use the scat identification card guide on the right or download it for on-the-go use.

Source: The University of Adelaide



8 Birds

Monitoring birds helps us understand what is happening in the environment. Birds are a good indicator of environmental health as they live in a variety of habitats and are sensitive to pollution and changes in water quality. They are generally easy to see and observe, mostly during the day and we already know a fair amount about most bird species.

We have many wetlands in the Mallee where you can observe an abundance of bird species including waterbirds, migratory shorebirds and terrestrial species. These wetlands serve as important stopover sites for migratory birds travelling from as far as Japan, China, Korea and Siberia.

Waterbirds are specially adapted to the fluctuating conditions of Mallee wetlands, which can change from wet to dry. The abundance, diversity and breeding activities of waterbirds are key indicators of wetland health. However, monitoring waterbirds can be challenging, especially in remote areas. It can also be hard to record the variation in bird populations as water levels change in the wetland.

That's where citizen scientists come in! If you live near a wetland, you can help monitor it regularly to record the diversity and abundance of waterbird species using the Birdata app. This data helps us understand how wetlands are responding to environmental water and whether they are providing the necessary feeding and roosting habitats for waterbirds.

8.1 How to use the Birdata app

Birdlife Australia or Birdata is an Australian web portal and free app where citizen scientists can record the species and location of the birds they see. The data is used to improve conservation efforts.

It's a good idea to familiarise yourself with the app before doing a bird survey out in the field. Practice logging in and shuffling between the screens to view the information needed when recording a survey.

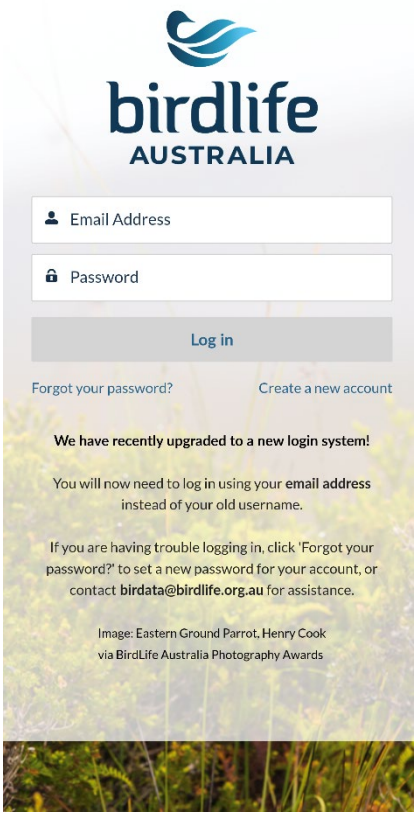
Step 1: Login to the app

Download the app from the Apple store or Google Play and login using this username and password:

Username: Citizenscience@malleecma.com.au

Password: Malleefowl#3500

Please note that the password is case sensitive.

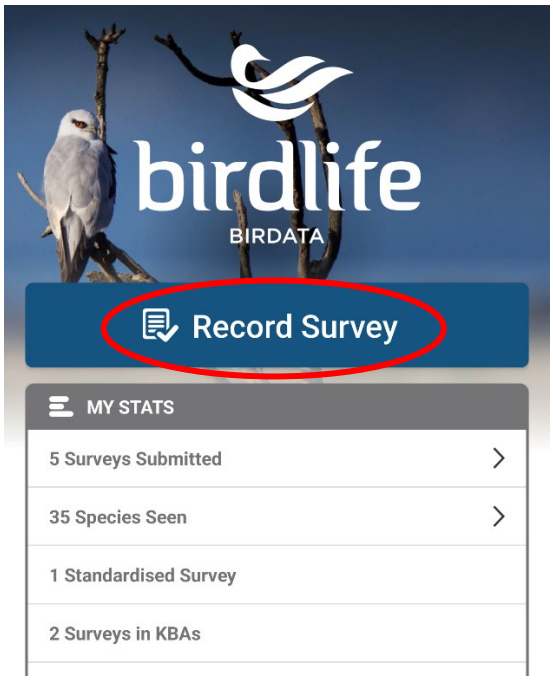


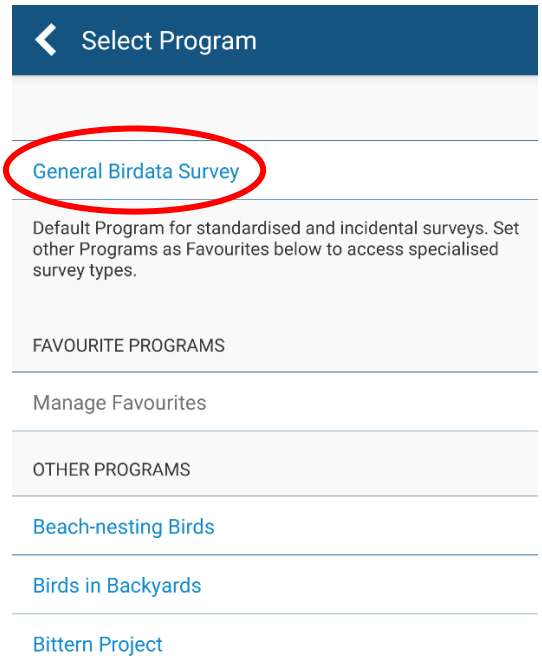
Step 2: Record survey

Press the record survey button.

Step 3: Select program

Select ‘General Birdata Survey’.





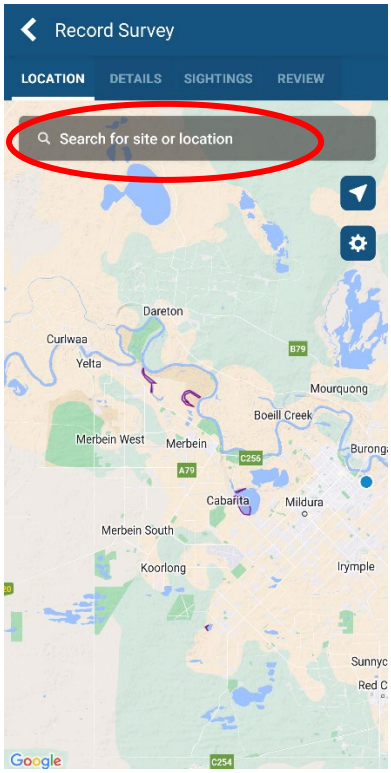
Step 4: Record survey location

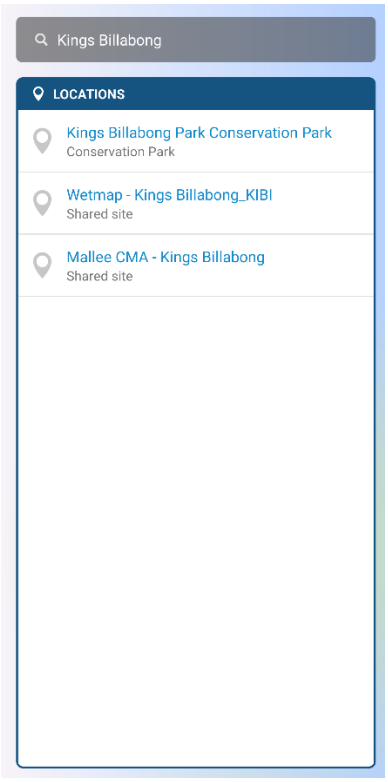
You can search for your location using the search bar or the map. If using the search bar, you can search by specific wetlands or localities.

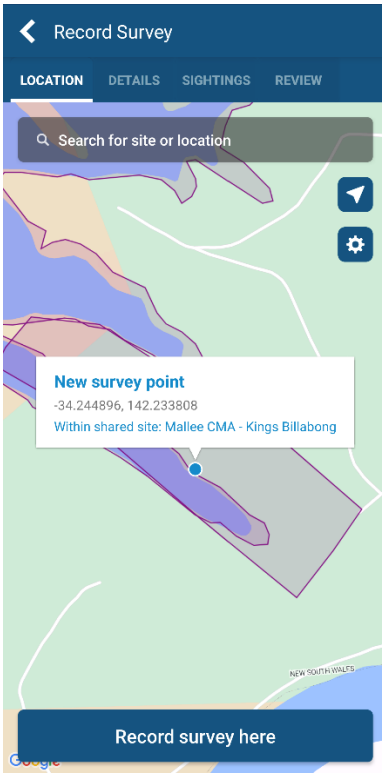
If you have allowed the app to use your location, you can find your location using the arrow icon on the right below the search bar.

Once you have found your location, tap and hold the screen to choose your exact location and create a new survey point.

Once your location is set, press ‘Record survey here’.





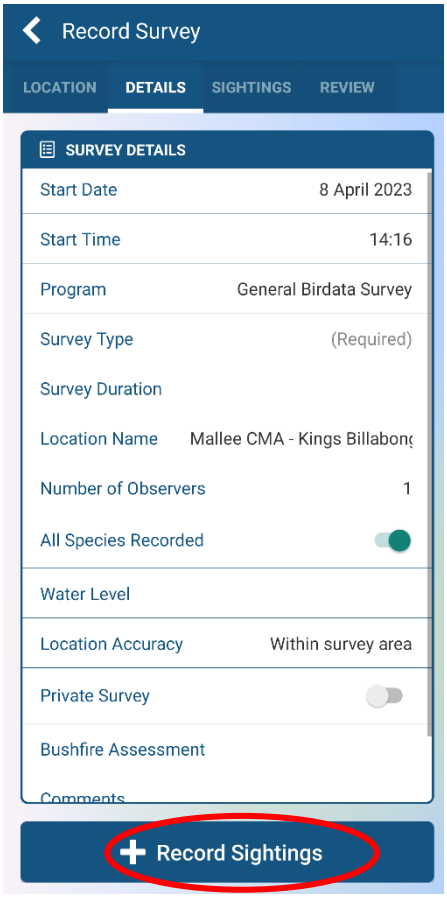


Step 5: Record survey details

The date, start time, location and program (General Birdata Survey) will automatically populate. You will need to add details such as survey type, survey duration (how long you are going to be surveying for) and number of observers.

Slide the button across to green for all species recorded and then choose the water level that most accurately reflects the amount in the wetland being surveyed. You can also add comments if you want to.

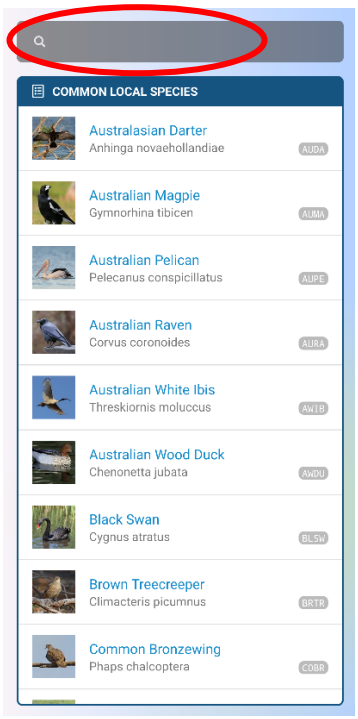
Then click on ‘Record Sightings’.

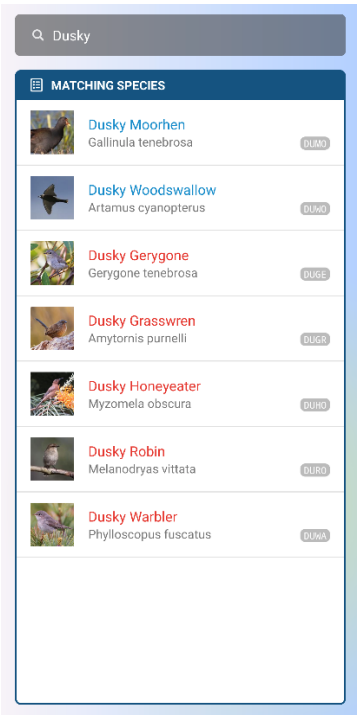


Step 6: Record sightings

You can record sighted birds in two ways. When you click on the grey search bar, you can either search by name or choose from the list of common local species below the search bar.

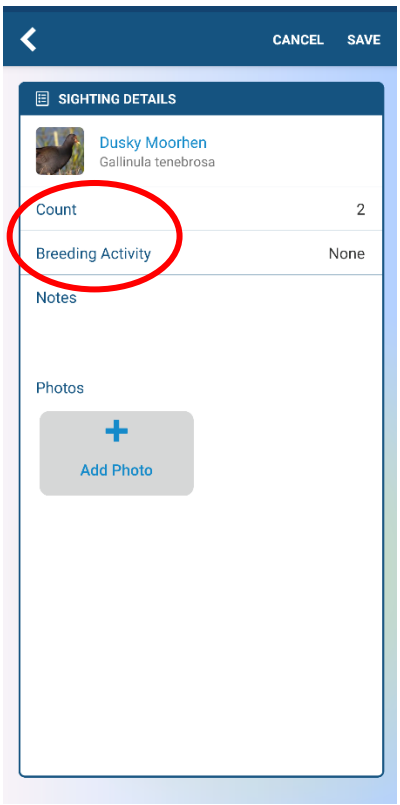
Birds are listed in alphabetical order and have photos to help you identify them. Birds listed in red are not usually found in your location.

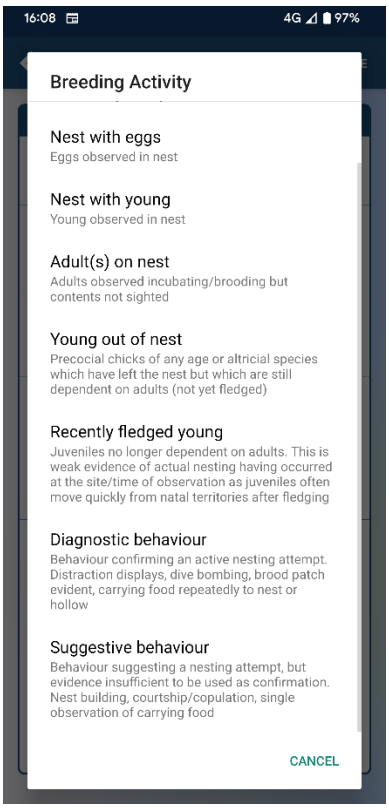


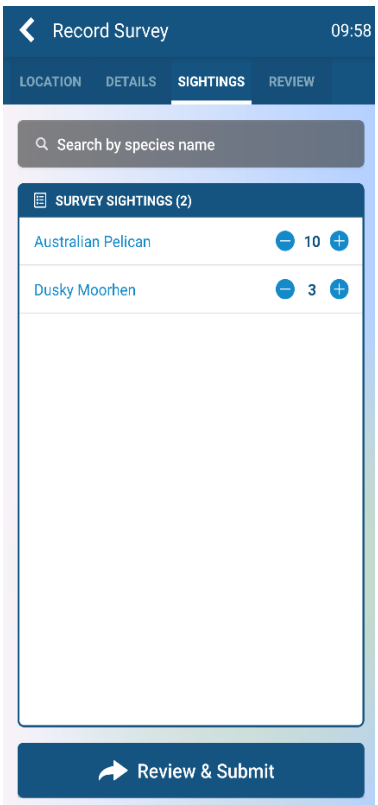


On the next screen, you'll be asked to enter the 'Count', which is the number of a bird species identified. The next step is to record any breeding activity that you observe. Select the one that most accurately describes what you have seen.

You can add notes about your bird sighting and upload a photo to support your identification. Once you have filled in all the information, click 'Save' on the top right of the screen. Repeat the process for every new species you find during your monitoring.







Step 7: Review and confirm

Once you have completed your survey, click on ‘Review and Submit’. This will provide a snapshot of the survey details and the species that you have observed. If you need to change any information, use the top menu bar to swap between the fields you have filled.

Once you are happy with your bird survey, click ‘Submit Survey’.

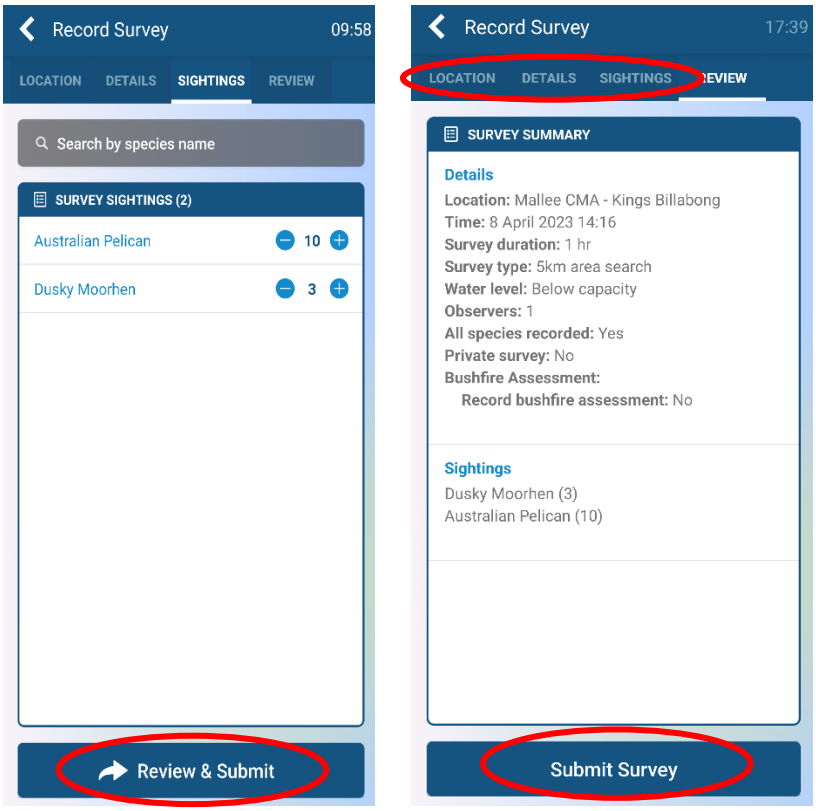


Photo credit: Hawkeye Photography – Yellow Spoonbill

8.2 Bird monitoring tips

Practice and persistence are the key to perfecting the art of bird identification. Here is a summary of the basics of bird watching and what you will need to take into the field to do safe and consistent bird surveys.

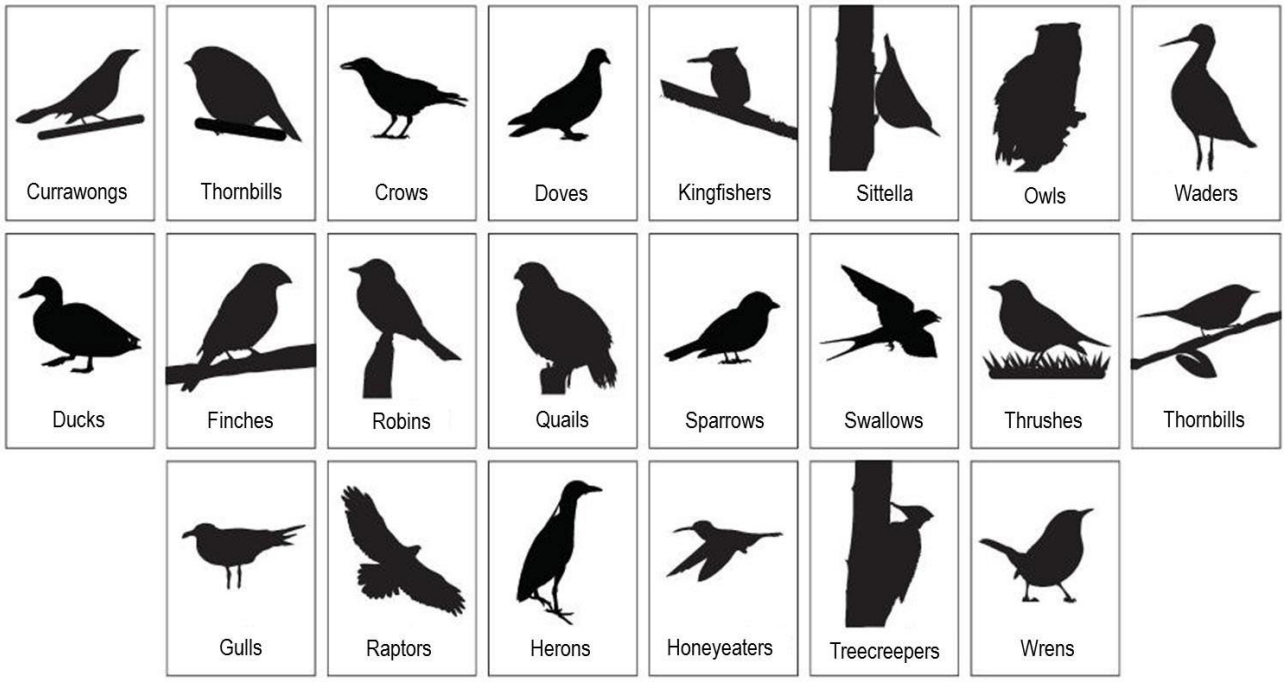
You may need additional resources to help you. Luckily, many books, publications and online resources highlight the joys of bird watching and explain how to capture bird data.

For a detailed introduction to different bird families, we recommend The Field Guide to the Birds of Australia written by Graham Pizzey and Frank Knight (HarperCollins Australia, 2012).

8.2.1 Australian bird classification

According to Pizzey and Knight, Australian birds fall into 20 orders, 85 families and some 793 species.

A bird's shape, specifically the shape of its head, wings or tail, gives clues to its identity. Size can help identify the family group of bird but can be difficult to confirm in the field. The diagram below shows the silhouette of some of the more common bird families likely to be encountered in the Mallee catchment area.



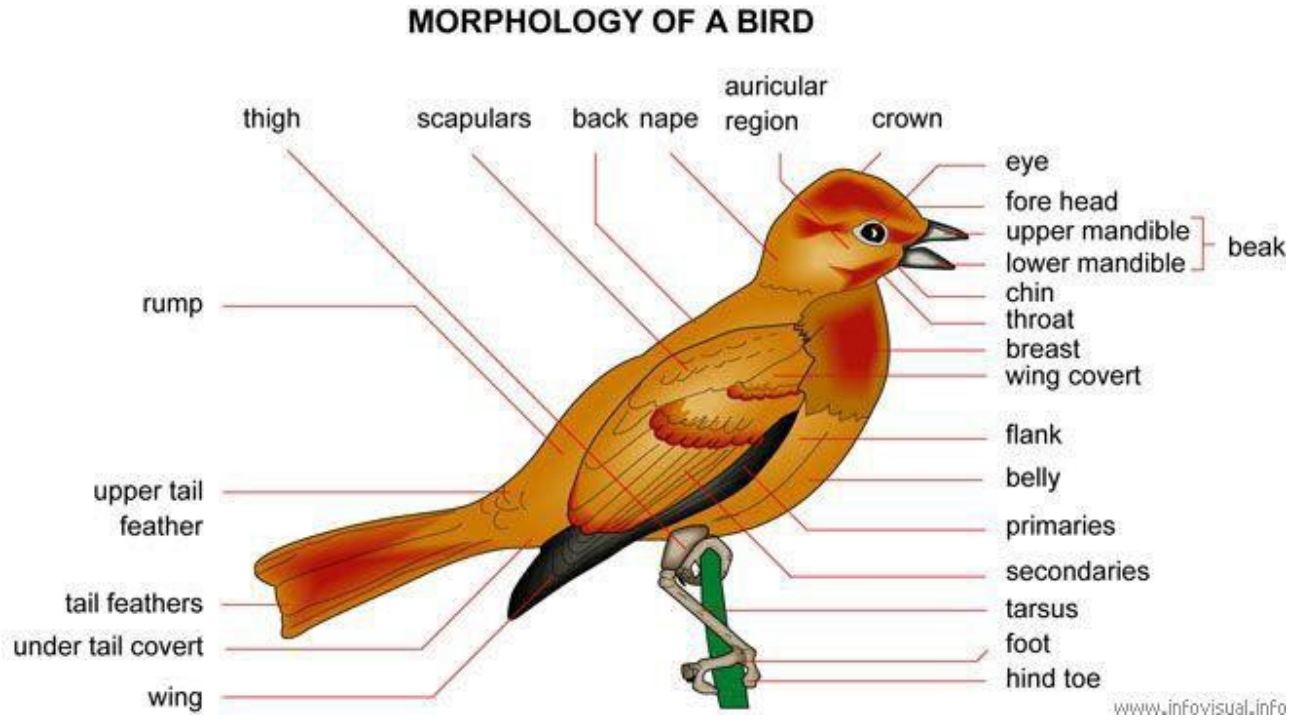
Source: Adapted from the Cornell Lab of Ornithology at www.birds.cornell.edu.

8.2.2 Field markings and colours

Field marks are the physical attributes of a bird that are generally visible during normal activities. A birds' markings and colours help distinguish one species from another. For example, a birds' plumage can indicate the sex, age and breeding status, in addition to providing a safety mechanism to avoid mid-flight collisions for fast flying flocks of some species of birds.

Fortunately, Pizzey and Knight tell us that few birds share the exact same markings. Subtle differences in field marks will allow you to differentiate between bird species. As you become more practiced at bird watching, you'll find it easier to pick up on these differences in the field.

The diagram below shows a bird's morphology – it's body parts and plumage structure.



Source: https://infovisual.info/biology-animal/bird (last accessed 14 March 2023)

8.2.3 Bird habitats and behaviours

Bird habits and behaviours are another tool to identify birds, such as observing where and how a bird interacts with its surrounds. Some characteristics that can help include whether the bird is nocturnal or diurnal (awake during the day), how the bird flies or walks and where the bird is located. Observing where and how a bird interacts with its surrounds is a valuable identification tool as some species are only found in very specific habitats.

8.2.4 Bird calls and songs

Birds can be extremely shy, cryptic animals. In many instances, you may need to identify the bird from its call or song rather than through visual identification. Ornithologists recognise two categories of bird vocalisation – calls and songs.

In general, calls are brief sounds with only one or two notes while songs are usually a rhythmic series of notes expressed in a recognisable pattern. Many digital smart device bird apps have digital recordings of bird songs and calls as an additional identification tool.

8.2.5 Bird watching techniques

Bird watching is generally more successful when birds are most active, usually early morning (between sunrise and mid-morning) and late afternoon (before sunset). Birds tend to be inactive during the heat of the day or when conditions are windy.

When bird watching, take your time and move through the landscape quietly and slowly, avoiding sudden movements and noise which may disturb the birds. Talk in a normal voice without shouting. Try not to whisper as this may disturb or alarm birds.

Bird watching in wetland areas

When searching for birds around wetlands, listen for calls then look for movement and plumage within the wetland vegetation. The best places to scan include:

- vegetation around the lake margins, nearest edges and far banks of the wetland
- open water areas
- canopies and tops of trees for roosting and nesting waterbirds.

Bird watching in forested and woodland areas

When searching for birds in denser vegetated areas, listen for calls then look for movement and plumage within the foliage. Scan the ground and all levels of vegetation for bird activity. Remember to check:

- the ground
- understorey shrub layer
- trunks of trees and lower branches
- tree canopy
- open areas where birds can be seen flying, particularly raptors, swallows or swifts.

8.2.6 Field equipment

You can contact Mallee CMA for a Bird Monitoring Pack to help you identify birds and be safe when doing so. Complete the Volunteer Equipment Loan Agreement and Schedule Form online or in the appendix.

The kit contains:

- waterbird field guide
- hardcopy field guide recording sheet (if recording manually)
- backpack with:
    - first-aid kit*
    - binoculars*
    - ankle gaiters*
    - hi-vis safety vest
    - hat
    - sunscreen
    - bug net over hat
    - water bottle.

*To be returned at end of use.

Wear loose, comfortable, SunSmart clothing (clothing that minimises sun exposure) when bird watching. Avoid bright colours or clothing that rustles.

9 Water quality

Water quality monitoring provides important information on the health of our waterways and contributes essential data to Mallee CMA's program development and environmental assessments.

Monitoring water quality helps meet objectives such as:

- measuring the quality of ambient freshwater
- characterising the biodata in the waterway
- assessing biological productivity
- identifying trends in the condition of the waterway
- assessing the effectiveness of watering strategies
- investigating why water may not meet water quality objectives.

A monitoring process allows citizen scientists to collect accurate and precise data, report the data in an informative way and use time and resources efficiently.

9.1 Common parameters

The parameters that affect the quality of water in the environment include physical properties such as temperature and turbidity and chemical characteristics such as pH and dissolved oxygen (DO).

Monitoring these parameters helps us predict natural processes in the environment. We can also assess the impact of human actions on the ecosystem, which helps with evaluating restoration programs.

9.1.1 Temperature

Water temperature is a physical property expressing how hot or cold water is. It's an important parameter to measure because it influences other parameters. It can alter the physical and chemical properties of water and affects aquatic organisms.

Temperature regulates the maximum DO concentration of the water, dictates the types of aquatic life and influences the rate of chemical and biological reactions.

9.1.2 pH units

Like temperature, pH is a determined value based on a defined scale from 0 to 14. It is not measured by a physical parameter but by assigning a value. The lower the number, the more acidic; the higher the number, the more basic (alkaline) it is. A pH of 7 is considered neutral.

pH is important to the aquatic organisms living in a waterway. If the water is too acidic or alkaline, the organisms may die.

9.1.3 Dissolved oxygen

DO is the level of free, non-compound oxygen present in water. It is important because of its influence on the organisms living in the water. DO is necessary for aquatic species such as fish, invertebrates, bacteria and plants to live as these organisms use oxygen to breathe. Bacteria and fungi use DO to decompose organic matter which is important for nutrient recycling.

9.1.4 Electrical conductivity

Electrical conductivity (EC) is a measure of the water's capability to pass electrical flow. It is directly related to the concentration of ions in the water. Ions conduct electricity due to their positive and negative charges; more ions in water equal higher conductivity of water. Fewer ions equal less conductive water.

Salinity is a strong contributor to conductivity as iconic particles are formed as salts dissolve. Higher salinity and conductivity levels lead to lower DO levels. This can have a negative effect on aquatic species – most can only tolerate a specific salinity range.

9.1.5 Total dissolved solids

Total dissolved solids (TDS) are the amount of organic and inorganic materials dissolved in a volume of water such as metals, minerals, salts and ions. These materials can be natural (water flowing underground absorbs minerals from rock) or artificial (such as pesticide and herbicide run-off).

Excessive TDS can produce toxic effects on fish and fish eggs. Levels are important for other aquatic life as the density of TDS determines the flow of water in and out of an organism's cells. If TDS levels are too high or too low, it may limit the growth of aquatic organisms and may lead to death.

9.1.6 Turbidity

Turbidity is a visible property of water and is caused by particles and coloured material in the water. Both plant and aquatic species growth depend on turbidity levels.

Materials in the water can be natural such as clay, silt, sand, algae and rainfall run-off or artificial such as run-off from mining and stormwater, or agricultural activities. High turbidity levels can indicate sediments, organic matter and pollutants in the water, affecting water clarity, clogging filters and reducing food supply for aquatic life through lack of sunlight.

9.2 WaterWatch Portal

Mallee CMA is a member of the Victorian WaterWatch group. We log and report water quality monitoring results on the WaterWatch Portal.

If you want to monitor water quality, you can get your own WaterWatch profile and access the portal by contacting Mallee CMA's Community Engagement Officer at citizenscience@malleecma.com.au.

9.3 Water quality equipment

Mallee CMA can loan you a water monitoring device with instructions to measure the parameters listed above.

To borrow a Multiparameter Waterproof Meter, complete the Volunteer Equipment Loan Agreement and Schedule Form online or in the appendix.

10 Occupational health and safety

We want our citizen science volunteers to be as safe as possible when collecting data. This means eliminating or minimising the risks associated with undertaking citizen science activities.

Workers, including volunteers, have duties under the *Work Health and Safety Act 2011*. These duties are based on what a reasonable person would do, covering those behaviours and actions expected from a committed volunteer.

As a volunteer, you will:

- take reasonable care for your own health and safety and manage health and safety risks associated with the activities you do
- take reasonable care to ensure you don't affect the health and safety of other people such as other volunteers and the public
- comply, so far as you are reasonably able, with any reasonable instruction given to you by the Mallee CMA
- cooperate with any reasonable policy or procedure that the Mallee CMA might provide.

We will fulfil our responsibility to our volunteers by providing:

- information on health and safety procedures
- training and accreditation as needed
- necessary Personal Protective Equipment (so far as is reasonably practicable)
- all equipment and associated calibration/maintenance materials
- confidentiality and information privacy
- avenues for conflict management/grievances
- access to Mallee CMA policies and procedures relevant to volunteer activities.

Being committed to a high standard of health and safety practices means ensuring everyone is involved in safety planning and decisions. Volunteers have valuable knowledge and experience and can contribute to managing health and safety. We encourage volunteers to raise any health and safety concerns or suggested improvements via citizenscience@malleecma.com.au.

Volunteers must comply with the Mallee CMA Child Safe and Wellbeing Code of Conduct. When children and young people are involved in citizen science activities, volunteers must hold a current Working with Children Check. To find out more, contact our Community Engagement Officer at citizenscience@malleecma.com.au.

10.1 Policies and procedures

The table below lists the policies and procedures relevant to volunteers. All policies and procedures can be found on our website at www.malleecma.com.au/citizen-science.

Policies and procedure type	Name
Policies	Occupational Health, Safety and Welfare Policy Risk Management Policy Code of Conduct Appropriate Workplace Behaviour Policy Field Work Policy Equal Opportunity Policy Grievance Process Policy Conflict of Interest Policy – Employees Privacy and Data Protection Policy Alcohol and Drugs Policy ICT Acceptable Usage Policy/Procedure Child Safe and Wellbeing Code of Conduct
Procedures	Safety Management of Volunteers Procedure Grievance and Dispute Resolution Procedure
Guidance notes	Role Statement for Managers Responsible for Volunteers Role Statement for Volunteer Coordinators Roles Statement for Volunteers
Forms	Volunteer Registration Form Volunteer Safety Briefing Checklist Project Checklist for Volunteer Activities Job Safety Plan for Volunteer Activities
Manuals	MCMA Volunteer Induction Manual

11 Appendix

11.1 Volunteer equipment loan agreement and schedule

Complete the Volunteer Equipment Loan Agreement and Schedule Form below or on our website and return to Mallee CMA.

How to submit your form

By email

Email your form to citizenscience@malleecma.com.au

By post

Post your form to PO Box 5017, Mildura Victoria 3502.

In person

Drop your form into the Mallee CMA office at 308–390 Koorlong Ave, Irymple Victoria 3498.

VOLUNTEER EQUIPMENT LOAN AGREEMENT AND SCHEDULE FORM

Document Reference No: FORM 031-402

Participant details

Participant Name		Phone	
Organisation (if applicable)	Name: Role:	Email	
Date allocated		Date to be returned	

Equipment details

Asset No / Pack No	**Equipment**	**No of Items / Packs**	**Condition** (new, used, working)	**Value $**
	Citizen Science Project Plan			
	Bird Monitoring Pack Returnable to Mallee CMA at end of use: • First aid kit • Binoculars • Ankle gaiters Consumables: • Hi Vis Safety vest • Hat • Sunscreen • Bug net over hat • Water bottle • Bird Field Guide			
	Waterbug Monitoring Pack Returnable to Mallee CMA at end of use: • Sampling net • Waterbug ID book • Smart device tripod • Picking tray • Ice cube trays • Magnifying glass Consumables:			

	• Plastic spoons • ALT key guide			
	Frog Monitoring • Headlamp • Frog Field Guide			
E00729	Echo Meter Touch 2 Pro – Android (Organisations Only)			
E00731	Echo Meter Touch 2 Pro – Android (Organisations Only)			
E00732	Echo Meter Touch 2 Pro – Android (Organisations Only)			
E00726	Echo Meter Touch 2 Pro – iOS (Organisations Only)			
E00727	Echo Meter Touch 2 Pro – iOS (Organisations Only)			
E00728	Echo Meter Touch 2 Pro – iOS (Organisations Only)			
	Anabat			
	Turtle Monitoring • Identification guide			
	Water Monitoring Equipment • Hanna hand-held Phosphate Checker • HI98194 Multiparameter Waterproof Meter • Sample Bottle and pole			

Participant declaration

I acknowledge that:

I accept responsibility for myself/authorised representative in respect to the resources provided to me as listed above. I acknowledge in the event of loss of any equipment, reimbursement will be made to Mallee Catchment Management Authority for the replacement cost of the item.

The equipment I have received is in working order and will be returned in the same condition on completion of the schedule as nominated in the Agreement For Use of Equipment.

Signature

Date / /

Agreement For Use of Equipment

This Agreement is made on the …….…. Day of ……..…… 20…...

Between: Mallee Catchment Management Authority

of 308 – 390 Koorlong Avenue

Irymple Victoria 3498

("owner")

And:

---

of

("participant")

Recitals:

R1. The owner is the proprietor of the equipment listed in the schedule to this Agreement ("schedule").
R2. The participant will use the equipment specified in the schedule from the owner upon the terms and conditions in this Agreement.

Operative Part:

1. Use of equipment

The use of the equipment will commence from the commencement date specified in the schedule and continue for the term specified in the schedule.

The participant is entitled to use the equipment for the agreed period and for any agreed extension of the period.

The participant agrees to return the goods identified to the address of the owner on or before the end of the use period as outlined in the schedule.

2. Payment for rental

2.1 The hirer agrees to pay the owner the hire fee specified in the schedule for the equipment for the hire period, which includes any applicable GST, if a hire charge is applicable.

2.2 The hire fee must be paid to the owner prior to or on the commencement date of the hire period.

3 Use, operation and maintenance

3.1 The participant agrees that using the supplied equipment to conduct citizen science activities carries with it dangers and risks of injury and the participant agrees to accept all dangers and risks.

3.2 The participant agrees to undertake all means necessary to eliminate or minimise the risks associated with undertaking citizen science activities.

3.3 The participant agrees to operate, maintain and store the equipment strictly in accordance with any instruction provided by the owner, with due care and diligence, only for its intended use.

3.4 The participant agrees to comply with all occupational health and safety laws relating to the use of the equipment and related operations.

3.5 The participant shall ensure the equipment is returned to the owner clean of soil or any other foreign matter and shall be thoroughly cleaned. Any written material to be returned will be in condition suitable for use by another participant. In the event that these requirements are not complied with the participant shall pay the owner the reasonable costs of compliance with these requirements.

4. Participant's warranties

4.1. The participant warrants that:

4.1.1. the equipment will be used in accordance with the conditions outlined in the schedule;

4.1.2. the particulars in the schedule are correct in every respect and are not misleading in any way including, without limitation, by omission;

4.1.3. the participant holds a valid Working with Childrens Check

4.1.4. the equipment will not be used for any illegal purpose;

4.1.5. the participant will not, without prior written consent of the owner, modify, or permit any modification of, the equipment in any way; and

4.1.6. the participant agrees that the equipment complies with its description, is in merchantable condition and is fit for the purpose of conducting citizen science activities.

5. Indemnity

5.1. To the full extent permitted by law the participant releases, discharges and indemnifies the owner from all claims and demands on the owner arising out of or consequent on the use or misuse of the equipment during the use period.

6. Loss, damage or breakdown of plant and equipment

6.1. The participant will be responsible for any loss or damage to the equipment irrespective of how the loss or damage occurred (fair wear and tear excepted) during the use period.

6.2. If there is a breakdown or failure of the equipment then the participant shall return the equipment to the owner.

7. Insurance

7.1. The owner will maintain current insurance policies in respect of the equipment to its full insurable value.

8. Liability

8.1. The participant will assume all risks and liabilities for and in respect of the equipment and for all injuries to or deaths of persons and any damage to property howsoever arising from the hirer's possession, use, maintenance, repair or storage of the equipment.

9. Disclaimer

9.1. To the extent permitted by law the owner disclaims all liability for and does not give any warranties to the participant as to the condition of the equipment.

10. Title to goods

10.1. The participant acknowledges that the owner retains title to the equipment and that the participant has rights to use the equipment as a mere bailee only. The participant does not have any right to pledge the owner's credit in connection with the goods and agrees not to do so.

10.2. The participant agrees not to agree, offer or purport to sell, assign, sub-let, lend, pledge, mortgage let or hire or otherwise part with or attempt top part with personal possession or otherwise not to deal with the equipment and not to conceal or alter the goods or make any addition or alteration to, or repair of, the equipment.

11. Repossession

11.1. The owner may retake possession of the equipment if the participant breaches any provision of this agreement, notwithstanding anything else herein contained.

12. Completion of the hire period

12.1. The use period is completed when the equipment has been returned to the owner:

12.1.1. in the same condition as when it was provided; and

12.1.2. on or by the date and time outlined in the schedule.

13. Non-merger

13.1. The covenants, agreements and obligations contained in this agreement will not merge or terminate upon the termination of this agreement and to the extent that they have not been fulfilled or satisfied or are continuing obligations they will remain in force and effect.

14. Severance

14.1. If any provision of this agreement is wholly or partly invalid, unenforceable, illegal, void or voidable, this agreement must be construed as if that provision or part of a provision had been severed from this Agreement and the parties remain bound by all of the provisions and part provisions remaining after severance.

15. Governing law

15.1. This Agreement is governed by the laws of Victoria. Each party submits to the non-exclusive jurisdiction of the courts exercising jurisdiction there in connection with matters concerning this Agreement.

16. Interpretation

16.1. In this Agreement, unless the context otherwise requires:

16.1.1. A reference to the singular includes the plural and vice versa;

16.1.2. A reference to any party to this Agreement includes the party's executors, administrators, successors or permitted assigns, and where applicable, its servants and agents;

16.1.3. A reference to an individual shall include corporations and vice versa; and

16.1.4. If a word or expression is defined, its other grammatical forms have a corresponding meaning.

16.2. In this Agreement, headings are for convenience only and do not affect interpretation.

1. Executed as an Agreement

For and on behalf of Mallee Catchment Management Authority ("the owner").

Authorised Person: ---------- ----------

Signature: ---------- Date: ----------

Participant: ---------- ----------

Signature: ---------- Date: ----------

Schedule

1. **Equipment:** As per attached Responsibility for Equipment form

2. **Replacement fee (if any):** ……

3. **Use period:**From …… to ……

Conditions of use specific to the equipment:

……

……

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File Action: To saved on project file

11.2 Echidna Scat Collection form

Echidna Scat Collection

EchidnaCSI
Echidna Conservation Science Initiative

Complete and submit this form for each echidna scat that you send in

Date: _____

Name: _____

Contact email: _____

Phone number: _____

Please mail scat to the following address

EchidnaCSI
Room 2.14
Molecular Life Science Building
University of Adelaide
Adelaide, SA 5005

Enquiries:
echidnacsi@adelaide.edu.au

1. **Take a photo of the scat where you find it without touching it.**

   Yes, I took a photo

   No, I didn't take a photo

2. **Write date, time, GPS location and your name on a ziplock bag and also record time and location below.**

   GPS location: _____ S _____ E

   Time: _____ AM PM

3. **Collect scat without touching it using the bag or a leaf/stick. This is to avoid human DNA or skin bacteria contamination.**

   Yes, I collected scat

   No, I didn't collect scat

4. **Any other comments e.g. anything you saw of interest?**

_____
_____
_____
_____
_____

THE UNIVERSITY of ADELAIDE

CRICOS 00123M

mallee
catchment management authority

Cnr Koorlong Ave & Eleventh St, Irymple
03 5001 8600 | reception@malleecma.com.au
www.malleecma.com.au