NSW Biodiversity Conservation Trust

Check in with nature, check out the data

Land Libraries | Survey Guide

NSW
GOVERNMENT

Acknowledgement of Country

The NSW Biodiversity Conservation Trust acknowledges the Traditional Custodians of NSW and recognises their ongoing connection to land, waters, biodiversity, and culture.

Aboriginal cultural values are connected to Country and are found in waterways, mountains, wetlands, floodplains, hills, sandhills, rock outcrops and within the biodiversity of these geological features.

These cultural values are often present on privately-owned land and are associated with ongoing cultural practices and learning.

We pay our respects to Elders past, present, and future and commit to genuinely collaborate and partner with Aboriginal people in private land conservation.

bct.nsw.gov.au

Contents

Key dates

Land Library workshop   DD / MM / YY

Song Meter start date   DD / MM / YY

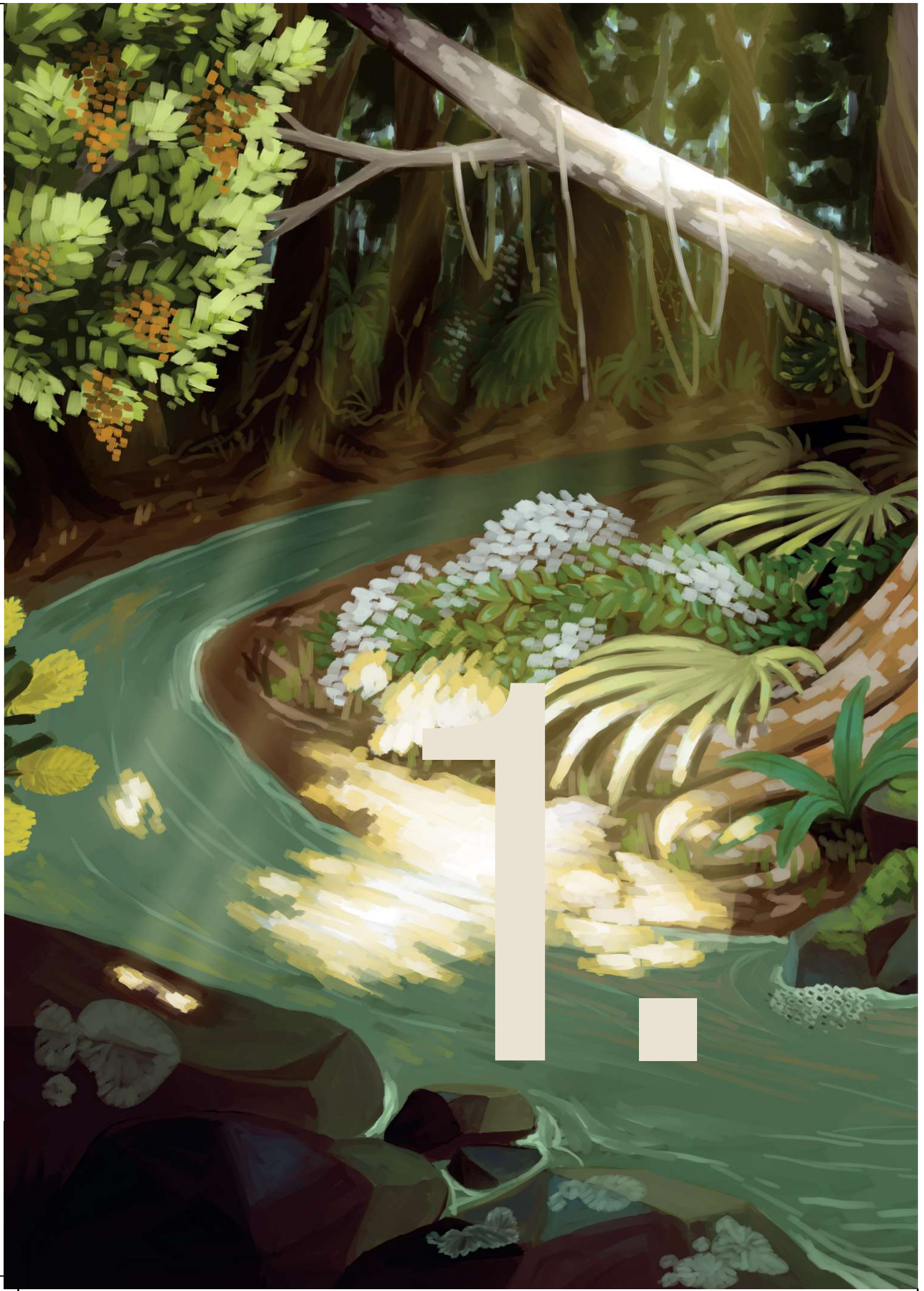**Song Meter end date**   DD / MM / YY

Gear return workshop   DD / MM / YY

Library Exchange   DD / MM / YY

✉ **info@bct.nsw.gov.au**

📞 **1300 992 688**
    bct.nsw.gov.au/resources

1.

Build your Land Library

Congratulations on becoming a NSW Biodiversity Conservation Trust Land Librarian and committing to collecting valuable biodiversity data within your conservation agreement area using methods outlined in this guidebook.

The information you collect will help you better understand the species you have on your land and contribute to a broader understanding of biodiversity across NSW.

Species you find with loaned survey equipment will be recorded in the NatureMapr Hub.

The online NatureMapr Hub will become your go-to resource to share, verify and build your Land Library.

There, you'll find videos and tutorials to complement the details in this guidebook.

NSW Biodiversity Conservation Trust ecologists and staff will be supporting you to build your Land Libraries collection.

In this guidebook you will find helpful notes on what you learn through workshops, as well as tips and tricks to make the most of the biodiversity data you collect.

By participating in Land Libraries, you will receive a kit of equipment. You will be trained to use the equipment and loaned it for three months to use on your conservation agreement area.

This list will help you keep your kit together and can be checked when returning it.

- [ ] 2 x Reconyx white flash remote cameras
- [ ] Song Meter Mini Bat 2
- [ ] 32 NiMH Fujitsu rechargable batteries
- [ ] Enecharger 12-cell smart battery charger
- [ ] 3 x 64GB SD cards
- [ ] USB card reader
- [ ] 2 x bait tubes/lures
- [ ] 2 x brackets
- [ ] 4 x screws
- [ ] 4 x tent pegs
- [ ] 3 x straps

What is NatureMapr?

NatureMapr is an online citizen science website and app that allows you to collect, manage and analyse information about biodiversity on your land.

The NatureMapr website is the main platform where all citizen scientists, including Land Librarians, can contribute data.

As a NSW Biodiversity Conservation Trust Land Librarian, you have exclusive access to the 'Land Libraries Hub'.

Once logged on, you can access the Hub through your user profile, or directly at the NatureMapr Land Libraries Hub page.

You can also find the login button at the top right of the NatureMapr homepage, next to the search bar.

After logging in, click the 'person' icon in the top right corner (see the navigation bar example, below). Here you will find a link to the NSW Biodiversity Conservation Trust Land Libraries Hub.

The NatureMapr website is where you can access your hub, view the data you have collected, upload historical records, or submit new sightings.

- naturemapr.org
- naturemapr.org/locationhubs/land-libraries

The NatureMapr app is designed specifically for collecting biodiversity data. Download the app from Google Play or App Store.

Google Play

App Store

Our mission is to empower anybody to report plant or animal information anywhere in Australia and ensure the information gets to the people that need to know about it.

Aaron Clausen, NatureMapr founder

The Land Libraries NatureMapr Hub

The Land Libraries Hub has been created by NatureMapr for the NSW Biodiversity Conservation Trust's Land Libraries program.

You can access the Hub from your computer, or via your mobile phone.

It is your one-stop shop for viewing your species records;

accessing how-to guides and videos; chatting with NatureMapr experts; and, talking to fellow Land Librarians.

Access and use the NatureMapr Hub

How-to guides

Find step-by-step instructions on how to use equipment such as remote cameras, Song Meters, and how to use NatureMapr.

Add a sighting

You can use this feature to upload media, like photos from a digital camera or audio from a recording device.

Dashboard

Check visual statistics, such as lists, graphs, and charts that summarise the species you have found on your property.

Sightings

Find all the records, or sightings, you have contributed through the Land Libraries project.

Featured sightings

View featured, and the latest, sightings from across the Land Libraries project. Featured sightings include rare or threatened species or those found in unusual areas.
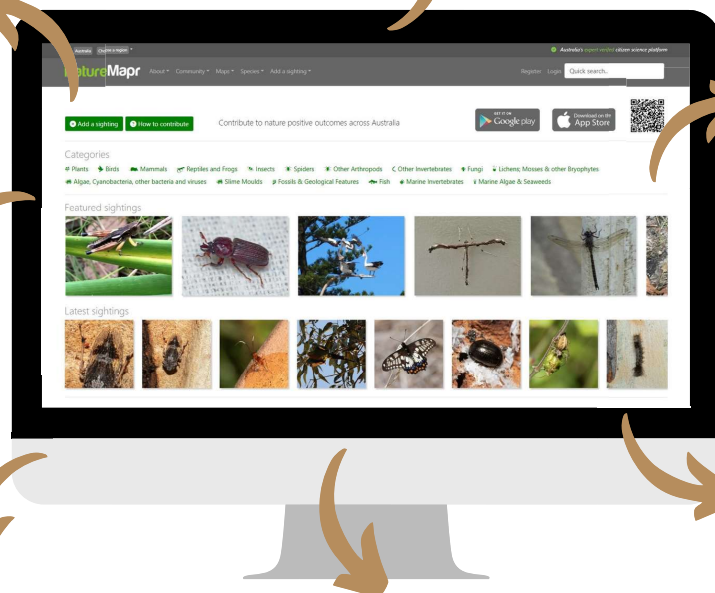
Announcements

Stay up to date with important news and updates from the NSW Biodiversity Conservation Trust.

Discussion

Ask a question about a sighting or discuss something with fellow Land Librarians.

How to use the NatureMapr data collector app

The NatureMapr data collector app is your primary tool for collecting and submitting biodiversity data on your smart phone. You can record images or audio of species sightings, which will then be verified by NatureMapr experts. These sightings are added to your species list and contribute to your Land Library.

Record

This is the main tab where you can take photos or record audio of species. Follow the prompts and provide as much detail as possible to assist experts with the verification. Using GPS, the app will automatically record the location. Your GPS permissions need to be set to 'on' for this app.
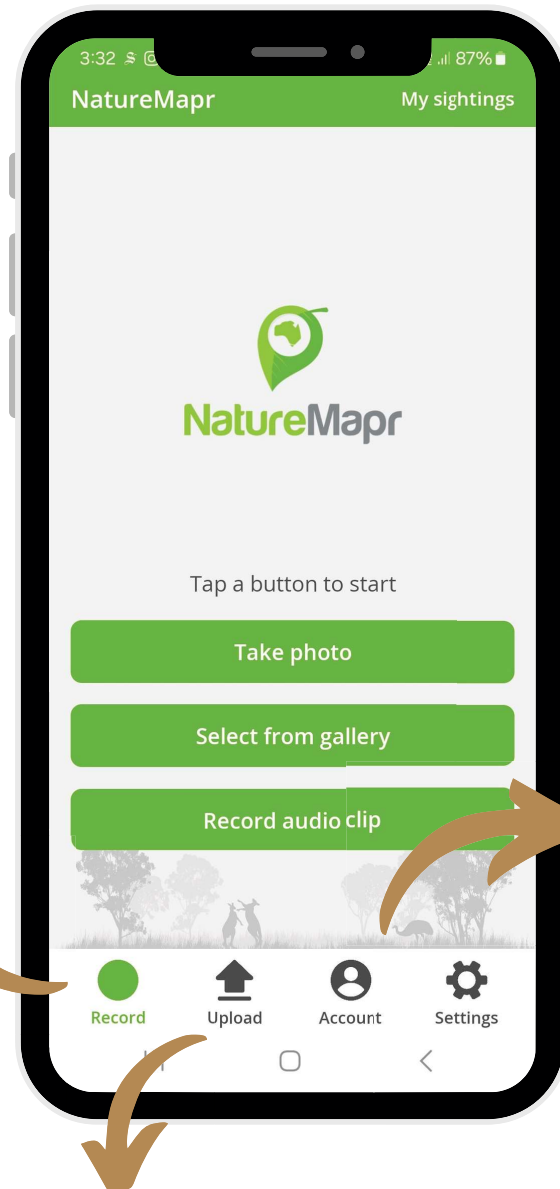
Your account

Make sure you are logged into your account before uploading sightings. Use the email and password linked to your Land Libraries Hub.

Upload

Use this button to upload your sightings. If you are in an area with no mobile coverage, you can still record sightings, but you'll need to wait until you're in coverage, or have access to Wi-Fi to upload them.

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Your notes

Survey secrets

Capturing and submitting images for species identification

Using smart phone or mobile device cameras

Modern smart phones have impressive cameras capable of capturing sufficient detail for NatureMapr experts to identify species. For many common species, phone images may be enough for accurate identification.

Using DSLR cameras for challenging species

Some species, like insects, birds and reptiles, are more difficult to identify and may require high-quality images. A DSLR camera with a zoom lens is ideal for capturing detailed shots. You can submit DSLR images through the NatureMapr website.

Get in close

Many phones now have 'macro' camera settings for capturing the small details useful in identifying species. There are also 'clip on' lenses available if you want to go that extra length to focus on the smaller things in life.

The benefits of wildlife photography

Wildlife photography encourages you to spend time outdoors and enjoy the benefits, such as reduced stress, and an enhanced mood. Enjoy a moment in nature while expanding your Land Library.

Safety reminder

Always be aware of your surroundings. Wild animals can be unpredictable, so avoid putting yourself or them in harm's way.

Maximise your data collection

Build your catalogue

Most species (e.g. plants, fungi and invertebrates), will not be identified by remote cameras or Song Meters. Using the app or website is essential for collecting valuable sightings of these species and expanding our understanding of their distribution.

Nature's symphony

Frog and bird species can often be identified by their calls. You can record audio clips using your phone through the NatureMapr app or FrogID. Ensure the recording has minimal background noise and provide as much information as possible for accurate identification.

Flora in focus

When photographing plants, focus on key features to aid in accurate identification:

Credit: Joel Stibbard

Form

Capture the overall shape of the plant (tree, shrub, grass). Take multiple photos from different angles to capture a clear view of the specimen

Flowers

Focus on colour, shape, size, petal count, and reproductive structures. For slender subjects, place your hand behind the plant to help the camera focus.

Leaves

Photograph the leaf shape, size, arrangement, and any unique features like serrated margins or hairs.

Fruit and seeds

Photograph the type of fruit and the seeds' shape and texture.

Stems and bark

Capture the texture of the stem and any bark features

2.

Song Meter set-up guide

The Song Meter Mini Bat 2 is a device that can capture the calls of microbats, birds and other wildlife in the landscape. We call this recording bio-acoustic surveying.

Once recorded, we work with a team of specialists to analyse these recordings and identify the species present on your property.

This guide will show you how to set up and use the Song Meter Mini Bat 2.

Prepare the equipment

Download the app
Search 'Song Meter Configurator app' from the Apple App Store or Google Play Store on your mobile device.

Google Play

App Store

Enable Permissions
For Apple devices:
- Go to Settings.
- Go to Song Meter Configurator.
- Enable Bluetooth and Location permissions.

For Android phones:
- Go to Settings.
- Go to Apps.
- Go to Song Meter Configurator.
- Go to Permissions.
- Allow Bluetooth and Location.

Insert the batteries
Install eight charged batteries in the Song Meter. For best results, charge the batteries overnight.

Ready the gear
Ensure the strap is attached to the top of the device. It's a great idea to bring some fluoro tape or similar to 'flag' the location once its installed.

App connection
Test that the Song Meter connects with your device before heading into the field.

Make sure the app has permission to access Bluetooth and location services on your phone. Use the steps provided on Page 10 to connect to the device through the Configurator app

Tutorial help

The app offers in-app tutorials. A Land Libraries Song Meter tutorial video is also on the How-To page of the Land Libraries Hub, online at NatureMapr.

What will be heard?

Despite its name, the Songmeter Mini Bat 2 used for Land Libraries can record both acoustic and ultrasonic sounds.

Acoustic recordings

This captures sounds that humans can hear, such as the calls of animals that fall within the audible range. For example, koalas produce deep bellows that are within the human hearing range.

Your Song Meter is pre-programmed to use this method to detect acoustic species during the survey period

To ensure you capture activity during peak times, like dawn and dusk, the device is set to automatically turn on two hours before sunset, record all night and turn off two hours after sunrise.

Ultrasonic recordings

This captures sounds too high-pitched for humans to hear.

To capture sounds from species with these audio frequencies, the device will switch to ultrasonic recording through the recording period and will automatically turn on at sunset, and off at sunrise.

Site selection

Consider the landscape

Sound travels differently depending on the environment. When selecting your site, think about how sound may move through the landscape and how that will affect your recordings.

Target species

Make sure the habitat is appropriate for your target species. Look for things like:
- Flyways along tracks suitable for Microbats
- Large hollows that may have gliders and owls
- Feed trees for Koalas and gliders

Background noise

Choose to place your device away from noisy areas like busy roads or highways. Low-frequency traffic noise can drown out animal calls.

Ensure no branches or foliage block the microphone's path to sounds.

Optimal height

The Song Meter Mini Bat 2 has a strong recording range, so it will need to be placed about two metres (shoulder or head height) off the ground and be securely strapped to a tree. Remember to mark the location, or photograph it in situ to find it again.

Sound check

If you can hear the sound, it's most likely the acoustic microphone will pick up the sound you're hearing.

Install the device in the field

1. **Attach the Song Meter**
Strap the Song Meter to your chosen tree at a height roughly 2 metres above ground, ensuring the batteries and SD card are inserted before installation.

2. **Turn on the Song Meter**
Open the device and switch the Song Meter on.

3. **Open the Configurator app**
Launch the Song Meter Configurator app on your phone and navigate to the **Recorders** page.

This is the microphone (🎤) icon at the bottom left and is the first page that appears.

4. **Pair the Song Meter**
If the device is on, you should see it listed under **Recorders** with a name like *LLS* or *BCTLLS* followed by a number. If it is not appearing, see the 'app connection' section on Page 9.

On the Song Meter, locate the **Pair** button near the power switch. Hold it down until the Bluetooth light flashes green.

Back in the app, tap the **Pair** button that appears. When pairing is successful, the text should turn green.

5. **Update date and time**
The app will prompt you to update the date and time based on the Song Meter's location.

Click **Yes** when prompted to ensure correct time settings.

Note this is very important to ensure the device has the correct sunset and sunrise schedule.

6. **Check status**
Once updated, tap the **Status** button in the app to verify the device is set correctly. It should show the current time and recording start date.

7. **Unpair**
On your phone, the 'PAIR' icon should now change to 'UNPAIR.' Tap this. Keep the device switched on and close it up.

8. **Close the Song Meter**
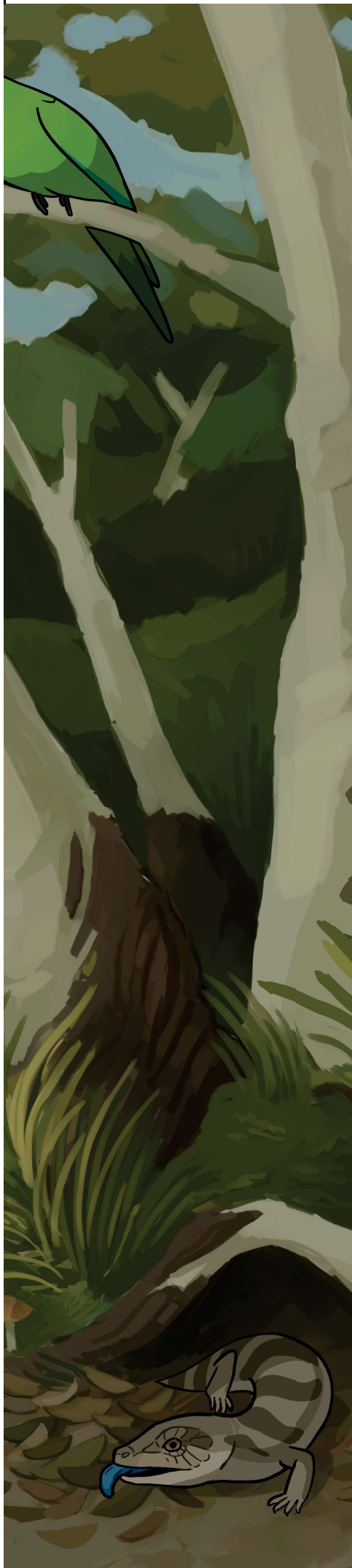Ensure the rubber seal is properly in place when closing the device to keep it secure.

9. **Relocating the Song Meter**
If you move the Song Meter, you'll need to repeat the pairing process so that the device is updated with the new location.

3.
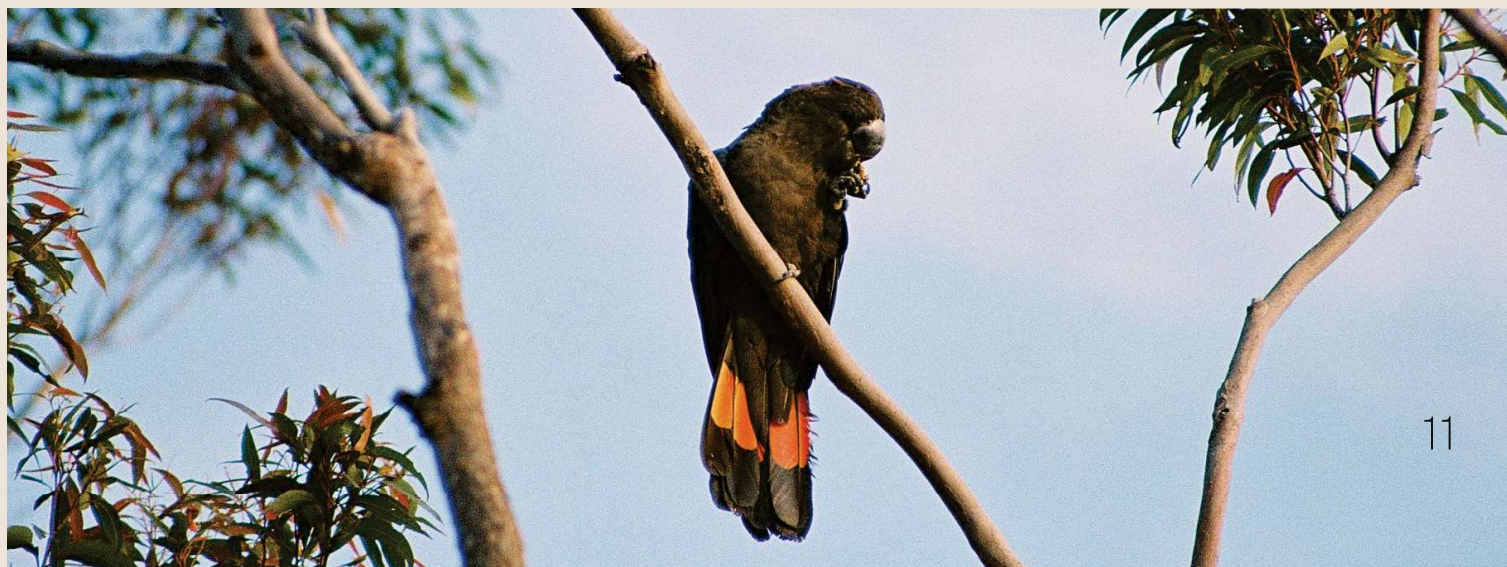
Remote camera set-up guide

Remote cameras use motion sensors to detect wildlife and capture images.

When movement is detected from the sensor, a white flash illuminates the scene, ensuring clear shots even at night.

These cameras help monitor animal activity, identify species, and gain insights into local wildlife.

This guide will show you how to set up and use the remote cameras.

Prepare the equipment

Batteries and SD card

Make sure the batteries are fully charged and the SD card is empty.

Install both into the camera. Both should last for about three months, but it's a good idea to check and recharge batteries periodically.

Practice makes perfect

Before setting up the camera in your conservation agreement area, set up the camera in your backyard and follow the steps on Page 14. Let the camera take some motion triggered photos and use the provided SD Card reader to check your set-up.

Check to see if your photos are in focus and framed well. Continue practicing to get better focusing and framing your target area

Lure them in

Many animals are attracted to a simple bait of honey, oats and peanut butter rolled into a ball. Some species like the quoll are attracted to meat baits like cans of tuna. For an arboreal set-up, honey is your friend. Smear it all over the trunk where the lure is placed for better results.

Ready the gear

Ensure the provided strap is attached to the back of the device.

If using a lure, ensure you have the bait, bait holder and attachments (bracket and screws for tree attachment, or tent pegs in the ground).

It's a great idea to bring some fluro tape or similar to 'flag' the location once its installed.

Tutorial help

A Land Libraries Remote Camera tutorial video is also on the How-To page of the Land Libraries Hub, online at NatureMapr.

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What will be captured?

Remote cameras can capture a whole range of animals from mammals, birds, reptiles and even the neighbours dog!

White! Flash! Camera!

The provided cameras use a white flash to show colour on images taken at night. This is great for identifying between similar species.

As the flash only travels so far (3-5m) it's important to adjust the camera angle to face the lure or focal point within that range. You can use plastic wedges, rocks, or sticks to help position it correctly.

Areas of activity

Check for signs of animal activity and target them with your camera setup.

- A camera at a 45 degree angle across animal trails or fallen trees can snap a passing critter.

- Targeting the trunk of a flowering tree, or one bleeding sap or with lots of scratches or hollows could coax a curious glider or koala into frame.

- A quiet spot on the water's edge can capture those coming in for a drink.

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Site selection

Choose a location

Look for a level spot to position the camera. You may want to mark the camera's location with fluoro tape, or record it via GPS or a photo.

Clear vegetation

Trim any vegetation that could obstruct the camera's view, or the lure. This will avoid empty images and make it easier to identify animals. Remember to check growth around the camera over time.

Clear access

Do not pile trimmed vegetation near the camera. This can block animals from reaching the lure.

Put cameras together

Placing cameras in a 'cluster' (<400m apart) will better survey the area you are targeting

Move regularly

If you can, we recommend shifting the cameras to new habitats every few weeks to capture a variety of species.

Target structures

Positioning the camera at structures like log and rock piles can increase detection of various species, especially smaller critters that are taking refuge.

Set up your camera

Think about what species you are targeting. Do they live in trees (arboreal) or are they ground-dwelling (terrestrial)? The section below offers guidance for each set-up.

1. Attach the camera

Once the batteries and SD card are installed, secure the camera to a tree with a trunk diameter of at least 20cm using the provided strap. Avoid dead trees, as they may not be stable. If no suitable tree is available, you can use a metal star picket or stake.

2. Position the camera

Try to face the camera south (south-east to south-west) to avoid glare from the sun.

3. Install the lure

For ground animals: Use the lure tubes to hold the bait and secure them with pegs or screw them into a tree or log.

For arboreal animals: Mount the lure on trees with a diameter larger than 100cm. Lures are not essential, but they do increase the likelihood of capturing images.

4. Align and angle the camera

Although the provided white flash cameras are great for identifying between similar species, they have limitations. The white flash will struggle to illuminate animals more

than 3m away from the camera. Try to avoid this by adjusting the camera angle to face the lure or focal point. You can use plastic wedges, rocks, or sticks to help position it correctly. Also remember you can use the provided string to help align the cameras or you can check any test images with the provided SD card reader.

5. Switch on the camera

Open the camera case, switch the camera on, and press the (>) button twice to find the "WALKTEST" mode. Press OK and close the camera case.

6. Test the orientation

Walk in front of the camera where you expect animals to pass. If the red "WALKTEST" light blinks, it has detected motion.

After two minutes of no motion, the camera will automatically arm itself. The red light will flash for 10 seconds and then stop when the camera is ready to start recording.

Note: the blinking light may be hard to see in bright sunlight.

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Camera configuration

Small to medium terrestrial animals

Species examples: Small animals include antechinus, bush rats, skinks and small birds. Medium-sized animals include bandicoots, possums, crows, owls and potoroos.
Lure suggestion: Oats, peanut butter, and honey; or tuna for meat eaters.
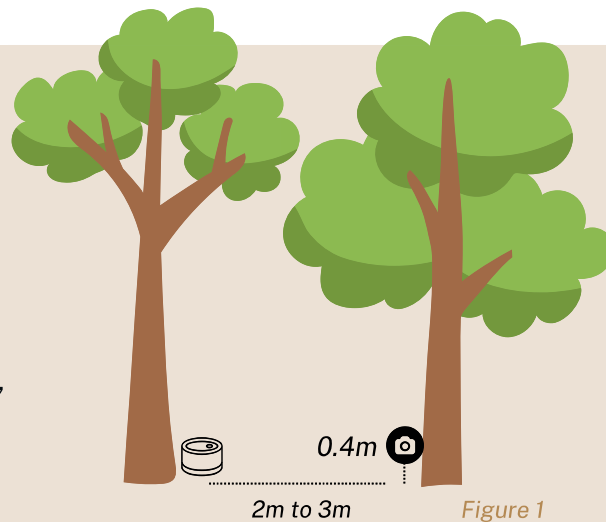**Camera height:** 0.4m (Figure 1)
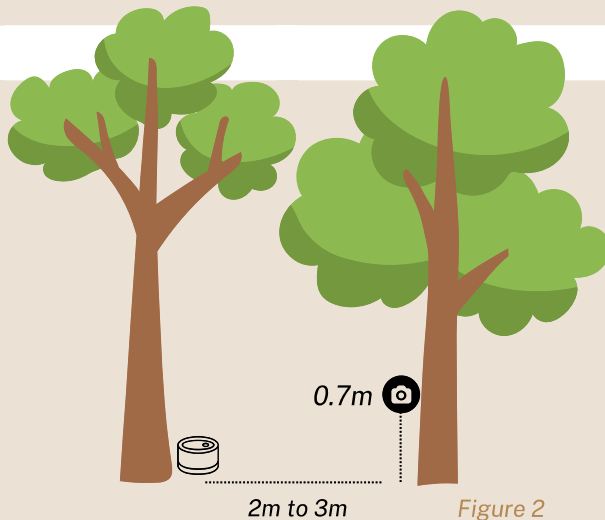**Camera to lure:** 2 to 3m away.

0.4m

2m to 3m   *Figure 1*

Medium to large terrestrial animals

Species examples: wombats, kangaroos, wallabies, dingos, quolls.
Lure: Oats, peanut butter, and honey; or tuna for meat eaters.
Camera height: 0.7m (Figure 2)
Camera to lure: 2 to 3m away.

0.7m

2m to 3m   *Figure 2*

Arboreal animals

Species examples: Small mammals include feathertail glider, eastern pygmy possum. Medium-sized mammals include koalas, possums and gliders.
Lure: Oats, peanut butter, and honey, or maple syrup as an additional attractant.
Camera height: 2m (FIgure 3)
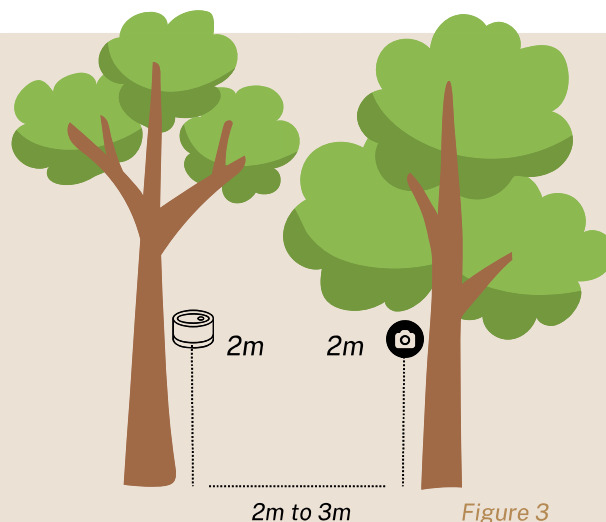**Camera to lure:** 2 to 3m away.

2m   2m

2m to 3m   *Figure 3*

Perfect your camera set-up

Now that you understand how to prepare your camera, select the ideal monitoring site and configure your camera, here's a few more ideas to try for a perfect capture.

Wary predators

Predators can be wary of cameras. Consider partially burying the lure to bring them into frame.

Sweet tooths

For arboreal critters, honey is your friend. Smear it all over the trunk where the lure is placed for better results.
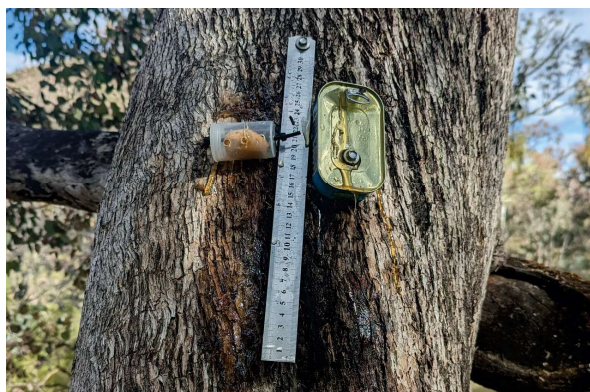
Size matters in identification

Attaching rulers or other items that help get an idea of scale can be really helpful in identifying what species has been captured.

Innovate with what you have

Instead of the provided bait tube you can use a tea strainer to hold the bait.

How to capture small species

Shift focus

An external lens helps magnify your camera's lens to record and identify smaller animals. A simple but effective method uses the lens from a pair of reading glasses. Simply use BluTack to attach the lens over the top of the camera's lens.

The distance to the lure will depend on the magnification of the reading lens you choose. The following is a general guide to work out the distance to lures:

> **1x magnification = 70-90cm**
> **1.5x magnification = 30-50cm.**

Trial the new focal length in your back yard before setting it in the bush.

Get their good side

For small animals, like rodents and marsupials, placing the lure on a post can give you a better view of the animal's body and tail as they climb to reach the lure.

Dare to be different

Consider using different configurations when placing cameras in a cluster. For example, try one arboreal and one terrestrial set-up placed less than 400m apart.

Battery care instructions

Your Land Libraries kit includes 32 high-quality rechargeable NiMH batteries and a 12-bank battery charger. Here's how to ensure optimal battery performance and longevity.

Charging the batteries

Initial charging
Before using the batteries in your equipment, they will need to be fully charged. The estimated charge time for the provided batteries is about five hours.

Correct polarity
When installing batteries into the charger or equipment, ensure the correct polarity (+ and -) is followed, as indicated inside the battery compartments.

Charger features
The charger has an LCD screen that displays the charging status of each battery. It also offers both charging and discharging options to help maintain battery health.

CHG — Charging

DISCHG — Discharging

Fully charged

(Flashing)
Charging in progress

Battery installation and removal

Red Ribbon reminder
The Song Meter Mini Bat 2 features a red ribbon next to the battery compartment to help with battery removal. Be sure to place the ribbon underneath the batteries during installation for easy removal later.

Tip: It's best to install the batteries starting from the outer edge and working inward.

Post field use
After removing the devices from the field, please remove the batteries and store them separately in a plastic zip-lock bag in the Land Libraries Kit. Leaving batteries in the devices for extended periods may cause damage.

General battery tips

Check battery levels
Periodically check the remaining charge in your devices to ensure they do not run out of power while in the field.

Low battery warning
If the batteries are low, remove them and recharge them at home if possible. Missing one day of data collection will not cause any significant issues.

Avoid mixing brands
Always use the same brand and type of rechargeable batteries. Mixing different brands or types can lead to operational problems and reduce battery life.

Your notes

Your notes