ENVIRONMENTAL MONITORING METHOD:

2 Ha Plot: Tracks, Scats, Diggings, and Signs Survey

About This Method

This document helps you to monitor animals by identifying their tracks, scats, diggings, and other signs. This method has been adapted from: Track-based survey design and data collection, Arid Zone Monitoring Project. You can find more information on the Monitoring Country website: monitoringcountry.org.au or scan the QR code.

This method has three parts: **1. Get Ready**, **2. Out on Country** and **3. Back in the Office.** Each part can be undertaken separately but you must complete all three parts to finish the method. At the end of the document, you will find guidance for all the gear you need - **Gather Your Gear – Complete List**.

We recommend you read the whole document before you start.

Part 1: Get Ready

GATHER YOUR GEAR

Equipment required for this part:

- ☐ Tablets/phones with:
  - ability to take photos
  - data collection and navigation systems
- ☐ Laptop or computer with software for:
  - mapping
- ☐ GPS device (recommended)
- ☐ Reference documents or field guides: animal signs guide to print and laminate

KEEP IN MIND

Why?

Make sure there is a clear monitoring question and that the method you have selected will answer the monitoring question.

If this is the first time you are monitoring, you will need to design the survey: what are you monitoring, where will you survey, and when and how often you will survey?

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When?

Prepare well before heading out on Country so that you have time to gather gear or train staff, if needed.

Who?

At least one ranger/staff to plan and prepare.

Training and skills

Staff involved in planning are trained and competent in:

- ☐ Mapping software (like QGIS, Google Earth) and/or monitoring point generator
- ☐ Navigation systems (like Avenza, GPS)
- ☐ Data collection systems (like Fulcrum, datasheets)

Check permissions

Consult with Traditional Owners, landholders and relevant government agencies and authorities, to determine appropriate access and approvals for environmental monitoring:

1. Where you can go – consult with the owners/managers of the land.
2. What you can do – check if you need scientific licences or ethics permits
3. What or who can you take photos of
4. What can be done with data and photos – who owns them, where will they be stored and how will data be interpreted and communicated.

ACTIONS

Make a plan and prepare

If you have done this monitoring before, it is best to do the surveys at the same time and same sites so that you can compare the data to previous surveys and see if there have been changes.

1. Plan which dates you will conduct the surveys:
   - Which species are you monitoring, and when are they active?
   - When did you last do they survey (month or season)? If repeating the survey, try to do the survey in the same months or seasons each time
   - If you can't survey each year, you should survey at least 2 times every 5 years

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2. Gather species of interest records in your area and identify where potential species of interest habitat is.
    - Such as from Traditional Custodians, Atlas of Living Australia (ALA) or government databases.
3. Use the monitoring point generator or GIS mapping software to select your sites
    - You will need 40-80 sites for a typical property or Indigenous Protected Area (that are usually between 100,000 hectares to 400,000 hectares)
    - Choose sites in sandy country where tracks and signs are easy to see
    - Try to keep sites more than 4-5 kilometres apart from each other
4. Create a rectangular 2-hectare (200 metre x 100 metre) plot for each of your sites.
5. Give each plot a unique name, and export and save the location data in your data management system
6. Prepare maps of sites and load sites onto navigation devices
7. Plan how you will record information on Country (electronic or paper data forms)
8. Plan your data management system - how you will store plot data
9. Check **GATHER YOUR GEAR** lists for **Get Ready, Out on Country** and **Back in the Office** (complete list on last page) and get any equipment you don't have.
10. Charge electronic devices (tablets/phones, power banks, GPS) and batteries

Train

1. Check the **Training and skills** requirements for **Get Ready, Out on Country** and **Back in the Office** steps and arrange any training or expertise that you need.
2. Run everyone involved in the survey through the plan.
    - Be clear on how many people will be involved, what everyone will be doing, and what they will need to do the survey.
3. Prepare guides for identifying animal signs (tracks, scats, diggings) for species of interest
    - ID books or apps can be used instead, but a short guide that is specific to your area/species makes it quicker and easier to check when out on Country.
    - Guides can be loaded onto tablets/phones or printed and laminated.
4. Run a training session for all rangers involved in the survey to learn or refresh:
    a. How to use the devices (tablets/phones, GPS)
    b. How to use data collections apps and record data
    c. How to identify species of interest

Next Section – Part 2: Out on Country

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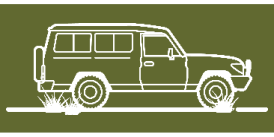
Part 2: Out on Country



GATHER YOUR GEAR

One set of this equipment for each team:

- ☐ Tablets/phones
- ☐ Power bank (optional)
- ☐ GPS device and spare batteries (recommended)
- ☐ Reference documents or field guides: animal signs (tracks, scats, diggings)
- ☐ Hammer, mallet, or picket driver
- ☐ Rulers (to show scale in photos)

One set of this equipment for each site:

- ☐ 4 star pickets

KEEP IN MIND

When?

Do the survey when it is going to be sunny, and avoid when it is windy or if it has rained in the last few days.

Check the plots in the early morning when tracks are easier to see because the sun is slanted.

Who?

At least two people

At least one person should know how to correctly identify and age signs.

Training and skills

Make sure everyone knows the plan.

Field staff are trained and competent in:

- ☐ Navigation systems (like Avenza, GPS)
- ☐ Data collection systems (like Fulcrum, paper datasheets)
- ☐ Identifying animal signs, including age of the signs

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2 Ha Plot: Tracks, Scats, Diggings, and Signs Survey

ACTIONS

Check that your electronic devices (tablets/phones, power banks, GPS, batteries) are charged before you head out.

Set up the 2 ha plot

If you are at a new site:

1. Use the navigation device (like GPS) to find the corners of the 2 ha plot.
2. Mark out the plot by hammering in star pickets at each corner.
   - Each plot is a rectangular shape, 200 metres long and 100 metres wide
3. If you moved the plot, record new coordinates on your navigation device

Survey the 2 ha plot

4. Walk through the site slowly, zig zagging up one side and back down the other, searching for tracks, scats, diggings and other signs of animals.
   - Spend enough time to search the plot thoroughly but try to keep your search effort similar at other plots.
   - If there are more signs of animals, it may take more time to search.
   - Avoid stepping on signs that haven't been recorded yet.
5. Record all signs of each species, including tracks, scats, diggings, burrows, other signs, sightings.
   - Only record animals you are certain of. If you are not sure, then leave it out of the data or take a photo (with a ruler for scale) to see if it can be identified later
6. Record **plot and signs data**

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RECORD DATA

Data to record when surveying each plot

What to record	Required?	Notes
Information to record about each plot		
Project name	Yes	Make it clear which project this data belongs to and its purpose
Date	Yes	Record the date the plot was surveyed
Personnel	Yes	Record the name of the people who surveyed the plot- this is helpful if any questions come up about the data
Site name/number	Yes	Record the name/number of the plot that was surveyed
Location coordinates of site corner	Yes	Record an accurate location (using a handheld GPS if possible) (latitude and longitude or eastings and northings)
Habitat description and/or photo	Optional	Describe or take a photo of the habitat type and landscape features at the site
Vegetation description	Optional	Record the most common plant species, and other useful notes about the vegetation (like age/size of plant)
Fire age	Optional	Record the fire history of the site.
Signs of disturbance	Optional	Types and causes of disturbance you can see at the site
Photo of site	Optional	Take a photo of the site and make note of which camera/tablet/phone it was taken on, and the filename of the photo (usually end in .JPG)
Stories and notes	Optional	Record information or stories from Elders, and anything else worth noting about the area or animals.
Video	Optional	Record videos of information or stories from Elders, and rangers performing or describing the work they are doing.
Information to record about each animal sign		
Species	Yes	What species left the sign
Sign type	Yes	Record what sort of sign it is, like track, scat, digging, burrow, sighting etc.
Number of signs	Yes	How many of each type of sign was seen
Freshness of signs	Yes	How fresh is each type of sign, like fresh (1-2 days), old (3 days to 1 week) or very old (more than 1 week)
Photo of signs	Optional	Take a photo of the signs, with a ruler in the field of view to show scale, and make note of which camera/tablet/phone it was taken on, and the filename of the photo (usually end in .JPG)

Next section – Part 3: Back in the Office

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Part 3: Back in the Office

GATHER YOUR GEAR

Equipment required for this part:

- ☐ Tablets/phones (or paper datasheets) that you used to record data
- ☐ Data management system (like databases, cloud storage, external hard drives)
- ☐ Laptop or computer with software for:
  - Spreadsheets (like Microsoft Excel)
  - Mapping (like QGIS, Google Earth)

KEEP IN MIND

When?

Always try to complete this work as soon as you can after returning from your time on Country so that what you did and what you saw is fresh in your memory.

Who?

At least one person to manage the data

Training and skills

Staff managing data are trained and competent in:

- ☐ Mapping software (like QGIS, Google Earth)
- ☐ Spreadsheet software (like Microsoft Excel)
- ☐ Data collection systems (like Fulcrum, datasheets)
- ☐ Data management systems (like databases, cloud storage, external hard drives)

ACTIONS

Data entry, analysis and reporting

1. Record a summary of what you did and why, any observations (like weather conditions, fire history, site condition), anything that went wrong or didn't work and things that worked well.
2. Upload the **plot and signs data** to your data management system.
   - Recommended: get someone else to proof the data to check for mistakes.

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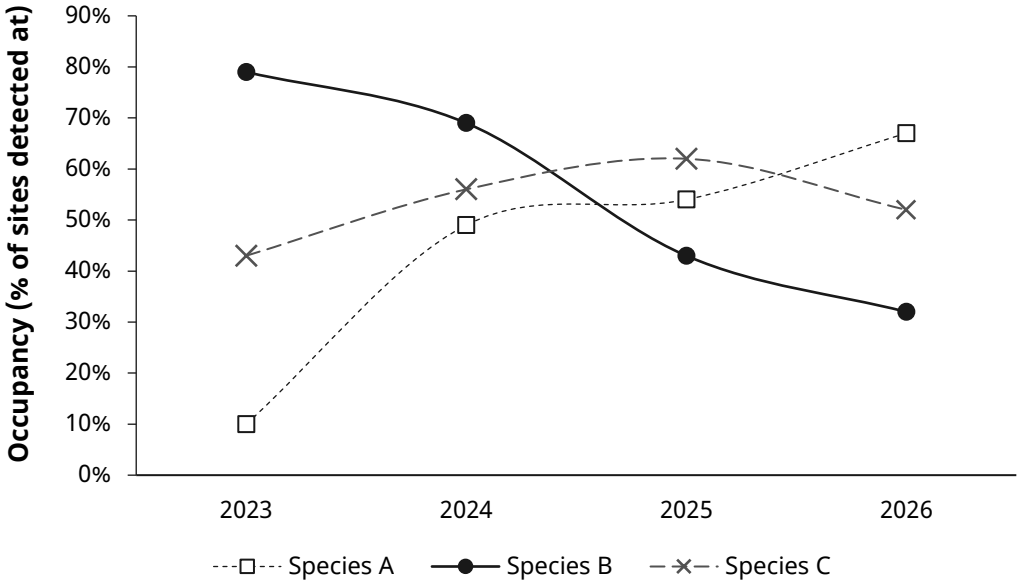
3. Upload any photos or videos taken during the survey to your data management system.
4. Import the data into a spreadsheet, and calculate:
    a. How many species, and which species, were found at each plot
    b. How many times each species was detected across all plots
5. Create a simple graph of
    a. species occupancy over time – the proportion of all sites that any given species was detected at (number of sites detected divided by total number of sites)



Example line graph of occupancy trends over time for three different species.

6. In GIS mapping software, create a map of where species of interest were detected
7. Discuss with the ranger team or community the results of the monitoring, any reasons for the presence or absence of species, and if there have been any changes to previous years.
    - Consider whether trends might be related to your management of Country and to check how well management is working, or if you need to make adjustments.
8. Share the data according to any data sharing or funding agreements you have made

Next section – Full Equipment List

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Gather Your Gear – Complete List

The complete **GATHER YOUR GEAR** list for **Get Ready**, **Out on Country** and **Back in the Office**.

Gear List	Required?	Get Ready	On Country	In Office
Electronic device(s): • Charged • Ability to take photos • App for data collection (like Fulcrum) • App for navigation (like Avenza) •	✓	✓	✓	✓
Power bank • Charged	**Recommended**		✓	
Laptop or computer with software for: • Mapping (like QGIS, ArcGIS, Google Earth) • Spreadsheets (like Microsoft Excel)	✓	✓	✓	✓
GPS (like Garmin handheld device) & spare batteries	**Recommended**	✓	✓	
Animal signs reference documents and/or field guides	✓	✓	✓	
Star pickets • 4 for each plot	✓		✓	
Hammer, mallet or picket driver	✓		✓	
Rulers	✓		✓	
Data management system (like cloud storage)	✓			✓

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Document version: CM-JH-JH-090326