



## About This Method



This document helps you to monitor Feral Pigs by counting pig tracks. This method has been adapted from: [Monitoring Techniques for Vertebrate Pests: Feral Pigs, B. Mitchell & S. Balogh \(NSW Department of Primary Industries\)](#). You can find more information on the Monitoring Country website: [monitoringcountry.org.au](http://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 apps
- Laptop/computer with software for:
  - mapping
- GPS device (recommended)
- Reference documents or field guides: Feral Pig signs (tracks, scats) guide

### 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?



## ENVIRONMENTAL MONITORING METHOD:

# Feral Pig Track Count



### When?

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



### Who?



1 ranger/staff to plan and prepare



### Training and skills

Staff involved in planning are trained and competent in:

- Mapping software (like QGIS or Google Earth) and/or [monitoring point generator](#)
- Navigation systems (like Avenza app or GPS device)
- Data collection systems (like Fulcrum app or paper datasheets)
- Identifying Feral Pigs from tracks and scats



### 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 survey for Feral Pig tracks
  - Try to do the monitoring at the same time each year for sites that you have monitored before
  - Plan the surveys to avoid weather conditions that are not good for monitoring, e.g. heavy rain and strong winds



## ENVIRONMENTAL MONITORING METHOD:

# Feral Pig Track Count



2. Gather Feral Pig [records in your area](#) and identify where potential Feral Pig habitat is
  - Such as from Traditional Owners, Atlas of Living Australia (ALA) or government databases.
3. Use the [monitoring point generator](#) or mapping software to select your sites
  - Feral Pigs are usually found near a waterbody (wetland, creek line, dam)
  - Make sure the site(s) you choose cover an area large enough to match the home range of Feral Pigs (up to 9 km<sup>2</sup>)
  - Choose which tracks or roads you will set up tracking stations
    - Try to choose tracks or roads that aren't used much by other people
  - Place at least 26 tracking station sites 1 km apart along tracks or roads
  - Decide on the route to and order you will visit the tracking stations. You will travel this same route and order of sites each day that you survey.
  - If you are monitoring to see the effect of feral pig management, do the monitoring in the same area you are managing. You can also choose a control site (an area without management) for comparison.
4. Give each site and all tracking stations a unique name, and export and save the location data in your data management system
  - e.g. one site is a dam, the other is a creek, so site + station – DAM\_01-DAM\_26, CREEK\_01-CREEK\_26
  - If you expect to have multiple dams or creeks (or other sites) over time, ensure you give each site a unique name, like DAM01\_01-26, DAM02\_01-26 etc
5. Prepare maps of sites and load sites onto navigation devices
6. Plan how you will record information on Country (electronic data forms or paper datasheets)
7. Plan your [data management system](#) (how you will store Feral Pig tracking data)
8.  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.
  - See [buying guide\(s\)](#) for advice [on which [units] may be suitable to buy].
9. Charge electronic devices (tablets/phones, power banks, GPS) and batteries
10. Print out and laminate guides for identifying Feral Pig signs (dung, tracks and other signs)

## Feral Pig Track Counts

Get Ready

On Country

In Office

Gear List

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National Environmental Science Program

We acknowledge Aboriginal and Torres Strait Islanders as the Traditional Owners and Custodians of Country and recognise their continuing connection to and stewardship of land, water, and sea. We honour their culture, customs, and community. We pay our respects to their Ancestors, Elders, and future leaders.



## ENVIRONMENTAL MONITORING METHOD:

# Feral Pig Track Count

### 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 Feral Pigs (scats, tracks, and other signs)
  - 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 (like tablets/phones and GPS)
  - b. How to use data collections apps and record data
  - c. How to identify Feral Pig signs and their habitat

**Next Section – Part 2: Out on Country**

## ENVIRONMENTAL MONITORING METHOD:

# Feral Pig Track Count



## 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: Feral Pig signs guide
- Vehicle with ability to transport sand (ute or trailer)
- Sand – from local area
  - Ensure you follow local biosecurity and permit requirements
- Rake, broom, or drag
- Shovel
- Ruler

### KEEP IN MIND



#### When?

You will need to set up the track station and then monitor it for at least the next three mornings. Check track stations as soon as possible after sunrise. Check the weather conditions are good for monitoring (avoid heavy rain and strong winds).



#### Where

Always monitor the same sites in the same order every visit by following the same route.



#### Who?



2 rangers per team



#### Training and skills

Make sure everyone knows the plan.

Field staff are trained and competent in:

- Navigation systems (like Avenza app or GPS device)
- Data collection systems (like Fulcrum app or paper datasheets)
- Identifying Feral Pig signs



## ENVIRONMENTAL MONITORING METHOD:

# Feral Pig Track Count

## ACTIONS

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

### ✓ Set up track stations

1. Drive to each track station location in the order you decided during the planning stage
2. Check that the location is suitable and move the station if needed
  - Record the coordinates of the new track station location if it is moved
3. Spread out sand across the road so that the sand pad covers the road from one side to the other, is 1 m wide, and 1-3 cm deep



Diagram of track station setup on a road.

4. Smooth the sand by raking or sweeping
5. Record **track station set up data**
6. Don't drive over the track station when leaving the site
  - If you have to drive over the track station, smooth the sand after you have driven over it

### ✓ Check track stations

1. The morning after setting up, check the track stations as soon as possible after sunrise
2. Drive to the track stations in the order you decided during the planning stage
  - Do not drive over the track stations until you have finished the track count

## ENVIRONMENTAL MONITORING METHOD:

# Feral Pig Track Count



3. At each track station, count all sets of feral pig tracks, and tracks of other species
  - A 'set' of tracks is the entire line or pathway of tracks created by an animal
  - It is usually easy to tell how many sets of tracks there are unless there were lots of animals in the sand plot
  - Sometimes it helps to tell sets apart by drawing lines on either side of the tracks with a stick to give it a boundary, then repeat for all other tracks
  - If you are unsure about track identification, take a photo of the track with a ruler next to it for scale to identify when you are back at the office.
4. Determine the track visibility value:
  - Take 10 steps across the track station
  - At each step, score your footprint on a visibility scale of 0-3, where:
    - 0 = can't see any footprint
    - 1 = can barely see footprint
    - 2 = can see complete outline of footprint but can't see some of the detail of the sole
    - 3 = can see complete outline of the footprint and all details of the sole
  - Add up the score for all 10 steps (it should add to a total score between 0-30)
  - Using the total score, give each track a visibility rating, where:
    - 0-5 = poor
    - 6-15 = fair
    - 15-25 = good
    - 26-30 = excellent
5. Record **track count data**
6. Smooth the sand by raking or sweeping
7. Don't drive over the track station when leaving the site
  - If you have to drive over the track station, smooth the sand after you have driven over it
8. Repeat the track station check for at least 2 more mornings in a row

## Feral Pig Track Counts

Get Ready

On Country

In Office

Gear List

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# Feral Pig Track Count



## RECORD DATA



Data to record when setting up track stations

What to record	Required?	Notes
<i>Information to record about each track station</i>		
Project name	Yes	Make it clear which project this data belongs to and its purpose
Date of set up	Yes	Record the date the site was set up
Personnel	Yes	Record the name of the people who set up the track station - this is helpful if any questions come up about the data
Site name/number	Yes	This is the name of the site which contains your track stations
Track station name/number		This is the name of the track station that you set up
Location coordinates	Yes	Record an accurate location (using a handheld GPS if possible) (latitude and longitude or eastings and northings)
Habitat description	Yes	Describe the vegetation type and landscape features at the track station (e.g. open Eucalypt woodland, grassy understorey next to seasonal creek)
Presence or absence of Feral Pig dung, tracks or other signs	Yes	Record whether Feral Pig signs were found in the track station during set up
Photo of track station	Optional	Take a photo of the track station and surrounding vegetation, 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.



**ENVIRONMENTAL MONITORING METHOD:**

**Feral Pig Track Count**



**Data to record when counting Feral Pig track**

What to record	Required?	Notes
<i>Information to record about each plot searched</i>		
Project name	Yes	Make it clear which project this data belongs to and its purpose
Date of track count	Yes	Record the date the track station was searched
Personnel	Yes	Record the name of the people who did the track counts - this is helpful if any questions come up about the data
Site name/number	Yes	This is the name of the site which contains your track stations
Track station name/number		This is the name of the track station that you searched
Presence/absence of Feral Pig tracks	Yes	Record whether there were Feral Pig tracks found in the plot
Count of Feral Pig tracks	Yes	Record how many Feral Pig track sets were counted inside the track station
Track visibility value	Yes	Give each track station a rating, where total score: <ul style="list-style-type: none"> <li>• 0-5 = poor</li> <li>• 6-15 = fair</li> <li>• 16-25 = good</li> <li>• 26-30 = excellent</li> </ul>
Photo of habitat	Optional	Take a photo of the track station and surrounding vegetation, 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.

**Next section – Part 3: Back in the Office**



## 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
- Laptop or computer with software for:
  - Spreadsheets
  - Mapping

### 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?



1 person to manage the data



#### Training and skills

Staff managing data are trained and competent in:

- Mapping software (like QGIS or Google Earth)
- Spreadsheet software (like Microsoft Excel)
- Data collection systems (like Fulcrum app or paper datasheets)
- Data management systems (like databases, cloud storage and 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 and site condition), anything that went wrong or didn't work and things that worked well.
2. Upload the **track station setup and track count data** to your data management system
  - Recommended: get someone else to proof the data to check for mistakes



## ENVIRONMENTAL MONITORING METHOD:

# Feral Pig Track Count



3. Upload any photos or videos taken during the survey to your data management system
  - Review any photos of tracks that still need to be identified
4. Import the data into a spreadsheet and calculate
  - Number of station nights = number of track stations set up multiplied by the number of mornings you checked them (AKA survey effort)
  - Number of operable station nights = number of station nights minus the number of station checks with a track visibility value rating of "poor"
  - Number of stations with Feral Pig tracks = add up the number of track stations that had Feral Pig tracks present each day
  - Catling Index Value = divide the number of stations with Feral Pig track by the number of operable station nights, and then multiply by 100
    - This number is a way to measure and compare Feral Pig activity levels

*Example of calculations using data from "Big Wetland" site in July 2023*

Number type	Calculation	Value
a. Number of station nights	150 track stations x 5 mornings	= <b>750</b> station nights
b. Number of operable station nights	750 station nights - 22 station checks with poor visibility	= <b>728</b> operable station nights
c. Number of station checks with Feral Pig tracks	Add up the stations during the monitoring that had Feral Pig tracks present for each day	= <b>523</b> station checks with Feral Pig tracks
d. Catling Index Value	$(523 \div 750) \times 100$	= <b>71.84</b> Catling Index Value

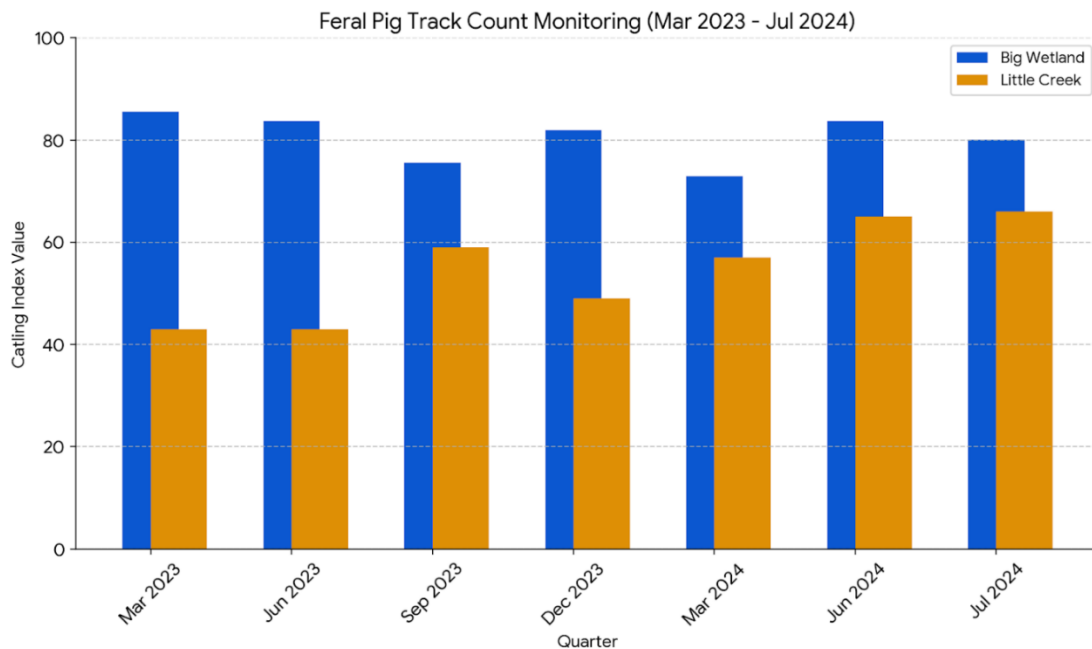
*Example of the data collected over two seasons at a site called "Big Wetland". We can see that the Catling Index Value has decreased in February 2024, which suggests that there was less pig activity at this site.*

Date	Site Name	No. track stations	No. mornings	No. station nights	No. stations poor visibility	No. operable station nights	No. stations Feral Pig tracks	Carling Index Value
July 2023	Big Wetland	150	5	<b>750</b>	22	<b>728</b>	523	<b>71.84</b>
February 2024	Big Wetland	150	5	<b>750</b>	6	<b>744</b>	160	<b>21.51</b>

## ENVIRONMENTAL MONITORING METHOD: Feral Pig Track Count



5. Create a simple graph of each site's Catling index value for each survey



6. Use the mapping software to create a map of
  - All survey sites
  - All sites where Feral Pigs were detected
  - Maps highlighting any differences in where Feral Pigs are being detected over time
7. Discuss with the ranger team or community the results of the monitoring, any reasons for the increase or decrease in pig track counts, and if there have been any changes to previous years.
  - Consider whether trends might be related to your management (like Feral Pig culling or fencing) 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**



# Feral Pig Track Count



## 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
Tablets/phones: <ul style="list-style-type: none"> <li>Ability to take photos</li> <li>Apps for data collection (like Fulcrum) and navigation (like Avenza)</li> </ul>	✓	✓	✓	✓
Laptop or computer with software for: <ul style="list-style-type: none"> <li>Mapping (like QGIS or Google Earth)</li> <li>Spreadsheets (like Microsoft Excel)</li> </ul>	✓	✓		✓
GPS device & spare batteries	<b>Recommended</b>	✓	✓	
Power bank	<b>Recommended</b>		✓	
Reference documents and/or field guides: <ul style="list-style-type: none"> <li>Feral Pig signs guide</li> </ul>	✓		✓	
Vehicle with ability to transport sand (e.g. ute, trailer)	<b>For site set up only</b>		✓	
Sand From local area	<b>For site set up only</b>		✓	
Shovel	<b>For site set up only</b>		✓	
Rake, boom or drag	✓		✓	
Feral Pig signs reference documents and/or field guides	✓	✓	✓	
Ruler	✓		✓	
Data management system (like databases, cloud storage and external hard drives)	✓			✓