

ENVIRONMENTAL MONITORING METHOD:

Photo Point Monitoring



About This Method



This document helps you to monitor changes in vegetation structure and health by taking photos over time. This method has been adapted from [Photopoint Monitoring: A Guide to Establishing Sites and Taking Consistent Photos, T. Storer et al., Department of Water and Environmental Regulation](#). 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/computer with software for:
 - mapping
- GPS device (recommended)
- DSLR camera (if using instead of phone/tablet)

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?

Photo Point Monitoring

Get Ready

On Country

In Office

Gear List

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National Environmental Science Program

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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 do the monitoring this year, and how often you will take repeat photos.
 - The aim of your monitoring can help you decide when and how often to take photos.
 - You will need to baseline photos at the start of the monitoring and then repeat photos at least after significant changes at the site and at the end of the monitoring
2. Use the [monitoring point generator](#) or GIS mapping software to select your sites

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- The aim of your monitoring can help you decide where and how many sites.
 - It's a good idea to pick areas that are easy to get to so that the monitoring can be done quickly.
 - Avoid putting sites on tracks, roads, cattle yards, bores and fences unless that is something that you want to monitor.
3. Give each site a unique name, and export and save the location data in your data management system
 4. Prepare maps of sites and load sites onto navigation devices
 5. Plan how you will record information on Country (electronic or paper data forms)
 6. Plan your [data management system](#) - how you will store images and data
 - A DSLR camera can be used to get high quality photos.
 - If you don't have a DSLR camera available, photos can be taken on a phone or tablet. If you use an electronic data collection app, you may be able to take the photos in the app, which will then link the photos automatically to the site data, but note that many tablets have poor image quality
 7. 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 cameras may be suitable to buy
 8. 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. 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 use DSLR camera (if using)

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:
 - Original site photos (printed and laminated or stored on device)
- Compass (or use the GPS or electronic device)
- Measuring tape
- DSLR camera (if using)
- Hammer, mallet or picket driver
- Spray paint (optional)
- Small whiteboard or piece of paper/card
- Whiteboard or permanent markers

One set of this equipment for each site:

- 1 long star picket
- 1 short star picket
- Weatherproof or aluminium tag and wire (recommended)

KEEP IN MIND



When?

It is best to take photos on a bright but cloudy day between 10 am and 4 pm when the sun is high in the sky so that there aren't too many shadows.



Where

Avoid trampling vegetation within the sites.



Who?



At least two people

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Get Ready

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The survey can be done with one person, but it's better to have someone else to help get the field of view correct.



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)
- Taking photos with DSLR cameras (if using)
- Using a compass (or digital equivalent)

ACTIONS



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



Set up photo point site

If you are at a new site:

1. Use the navigation device (GPS) to find where the site should be.
2. Check that it is a good place to take a photo and move to a nearby area if needed.
 - Does it have a good field of view of what you want to monitor?
 - Will plants grow in front of the star picket and obscure the view?
 - Can you easily get to the site without trampling the vegetation at the site?
 - Can the site be disturbed by people, or periodic flooding?
3. If you moved the site, record new coordinates on your navigation device.
4. Hammer in the Photopoint post where the photo is taken from (long star picket)
 - The top of star picket should be 1 to 1.5 metres above the ground.
5. Hammer in the sighter post that is captured in the photo (short picket) at desired distance
 - The distance between the spotter post and the Photopoint post depends on what you are trying to monitor
 - Shorter distances between 10 and 20 metres are good for monitoring a smaller areas like waterholes or specific structures (barriers, troughs)
 - Larger distances between 20 and 100 metres are good for monitoring large areas of revegetation, weed control, erosion, or habitat

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Resilient
Landscapes

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6. It is a good idea to spray paint the top of the sighter post a bright colour so that it can easily be found next time.
7. It is also a good idea to attach a weatherproof tag with wire to the Photopoint post and label it with the site name/number on it so that you can check you are at the correct site next time.

 8. Record **site set up data**

Take the photos

9. Take a photo of the site number (tag attached to the Photopoint post)
 - This can help keep track of what photos belong to what site.
 - It's a good idea to check that the star picket is still at the correct height.
10. Place the camera or device on top of the Photopoint post and:
 - Face toward the sighter post – centre the sighter post in the photo
 - Make sure the camera is fully zoomed out
 - Make sure you are taking a landscape photo – turn the phone or tablet onto their side
 - Make sure the sky only takes up a third of the image
11. If this is a repeat photo, check that the field of view matches the original photo. The second person can hold up the original photo next to the photographer so that the field of view can be lined up.
12. Take the photo
 - It can be good to take two photos in case one is blurry
 - Check photo quality before leaving
 - Check that the photo matches the previously taken photo/s
13. Repeat steps 9 to 11 but take photos facing east, then south, then west

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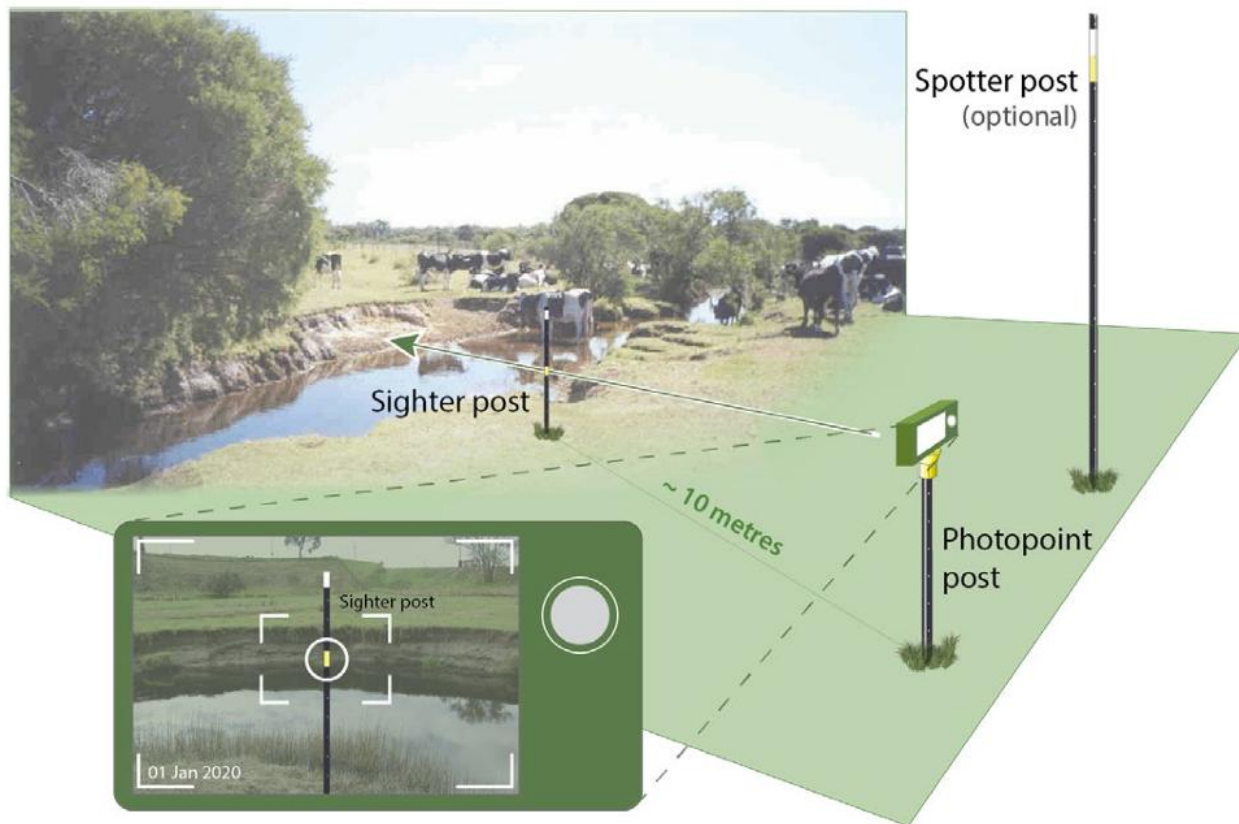


Figure 1. Example Photopoint diagram from Storer T, Beale N, Lynch R, O'Neill K, Marino G and Christie E (2021), Photopoint monitoring: A guide to establishing sites and taking consistent photos, River Science technical series, report no. 9, Healthy Rivers program, Department of Water and Environmental Regulation, Perth.

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ALWAYS TAKE THE PHOTOS IN THE RECORD DATA



Data to record when setting up sites

What to record	Required?	Notes
<i>Information to record about each site</i>		
Project name	Yes	Make it clear which project this data belongs to and its purpose
Date	Yes	Record the date the photo point site was setup
Personnel	Yes	Record the name of the people who set up the site - this is helpful if any questions come up about the data
Site name/number	Yes	Record the name/number of the site
Location coordinates	Yes	Record an accurate location (using a handheld GPS if possible) (latitude and longitude or eastings and northings)
Photopoint post height	Yes	Record the height of the top of the star picket. This is so that if something happens to the star picket, you can put another one in at the same height.
Distance to Sighter post	Yes	Record the distance between the Photopoint post and the Sighter post (in metres). This is so that if the Sighter picket becomes hidden over time (growing vegetation) or if it moves (accidental or intentional) a new one can be placed at the same location.
Angle to Sighter post	Yes	Record the angle from the Photopoint post to the Sighter post (in degrees). This is so that if the Sighter picket becomes hidden over time (growing vegetation) or if it moves (accidental or intentional) a new one can be placed at the same location.
Fire age	Optional	Record the fire history of the site.
Habitat description and/or photo	Optional	Describe or take a photo of the habitat type and landscape features at the site. This can provide some landscape context to the photo point monitoring. Make note of which camera/tablet/phone it was taken on, and the filename of the photo (usually end in .JPG)
Vegetation description	Optional	Record the most common plant species and their condition.
Signs of disturbance	Optional	Types and causes of disturbance you can see at the site
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.

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Data to record when taking photos

What to record	Required?	Notes
<i>Information to record each time a site has photos taken</i>		
Project name	Yes	Make it clear which project this data belongs to and its purpose
Date	Yes	Record the date the photos were taken
Personnel	Yes	Record the name of the people who took the photos - this is helpful if any questions come up about the data
Site name/number	Yes	Record the name/number of the site
Photos and photo direction	Yes	There should be at least 1 photo per site. Make note of which camera/tablet/phone they were taken on, and the filenames of each photo (usually end in .JPG)
Notes about site changes	Optional	Make note of any significant changes that have happened at the site, like fire, signs of disturbance, plant growth etc.
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 (like databases, cloud storage, external hard drives)
- Laptop or computer with software for:
 - Spreadsheets (like Microsoft Excel)
 - Mapping (like QGIS, Google Earth)
- SD cards with images from the DSLR camera (if used)

KEEP IN MIND



When?

Always try to complete this work as soon as you can after returning from your time on Country so that photos don't get lost or deleted.



Who?



At least one person to manage the photos and 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)

Photo Point Monitoring



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 **site set up and photo data** to your data management system.
 - Recommended: get someone else to proof the data to check for mistakes.
3. Upload any photos or videos taken during the survey to your data management system.
 - Be careful that you don't mix up photos that were taken from different directions and different sites.
 - A folder for each site and for each date is a good way to organise them.
 - Rename each photo file with the name/number of the site, order/direction of the photo, and the date.
4. Compare photos from each site to the photos taken previously, and note down if there have been changes:
 - Are there obvious differences in vegetation like after fire, drought, or flood?
 - Are there new, or more signs of, feral animals compared to previous photos?
 - Have management interventions had an effect on the vegetation like
 - i. Has weed control worked (less weeds, no weeds regrowing)
 - ii. Has live-stock exclusion (with fences) allowed plants to regrow?
 - iii. Is erosion getting better or worse after revegetation efforts?
 - iv. Has water flow changed over time (if vegetation has changed)
5. Import the data into a spreadsheet
6. In GIS mapping software, create a map of your photo point monitoring sites
7. Discuss with the ranger team or community the results of the monitoring, and if there have been any changes to previous years.
 - Consider whether trends might be related to your management (like feral animal control, fire management) 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



Gather Your Gear – Complete List



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

Gear List	Required?	Get Ready	On Country	In Office
Electronic device(s): <ul style="list-style-type: none"> Charged Ability to take photos App for data collection (like Fulcrum) App for navigation (like Avenza) 	✓	✓	✓	✓
Power bank <ul style="list-style-type: none"> Charged 	Recommended		✓	
Laptop or computer with software for: <ul style="list-style-type: none"> Mapping (like QGIS, ArcGIS, Google Earth) Spreadsheets (like Microsoft Excel) 	✓	✓		✓
GPS (like Garmin handheld device) & spare batteries	Recommended	✓	✓	
Original photos reference documents <ul style="list-style-type: none"> Printed and laminated or kept on electronic device 	✓		✓	
Star picket <ul style="list-style-type: none"> One per site 	Site set up only		✓	
Measuring tape	✓		✓	
Hammer, mallet or picket driver	✓		✓	
Spray paint	Optional		✓	
Weatherproof tag and wire <ul style="list-style-type: none"> One per site 	Recommended		✓	
Small whiteboard or piece of paper/card	Optional		✓	
Whiteboard or permanent markers	Optional		✓	
Compass <ul style="list-style-type: none"> Alternatively use the one of the GPS or electronic device 	Optional		✓	
DSLR camera <ul style="list-style-type: none"> Charged Blank SD card 	Optional		✓	✓
Data management system (like cloud storage)	✓			✓