



Ecological Field Monitoring Protocols Manual

Using the Ecological Monitoring System Australia

Plot Selection and Layout Module – PLOT SELECTION PROTOCOL PROCEDURE ONLY



Citation

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Version

Readers are advised that all modules of the Ecological Field Monitoring Protocols Manual regularly undergo revision. Readers should check the website emsa.tern.org.au/documents to ensure they are viewing the current version.

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Acknowledgements and contributors

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Key components of this module were developed, written, and field tested by the TERN Ecosystem Surveillance team based at The University of Adelaide. Additional to the authors, the following team members made contributions to the project: Ellen Kilpatrick, Kate Matthews, Rhys Morgan, David Peacock, and Carly Steen. Technical components, including the development of the accompanying app, were developed by the team led by Andrew Tokmakoff, including Luke Derby, Matthew Barty, Jin Zhou, Ho Hai Huy Vo, Walid Al Naim, Muhammad Khan, and Michael Doroch. Aspects of the protocols that have been built on by this project are the result of the extensive and ongoing body of work conducted by the TERN Ecosystem Surveillance team, as part of TERN's field-based ecosystem monitoring program. A full list of team members who have contributed is available on the TERN eSupport Services [website](#).

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Main front cover photograph: Bogong High Plains, Victoria.

Version control

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The version history of this module is identified below. The version history of the Ecological Field Monitoring Protocols Manual, the methods and data implications, both historical, current and future interpretations of data, are available from the TERN website. Enquiries should be directed to tern@adelaide.edu.au.

Version	Date	Version update overview
1	20 November 2025	First published version

1 Plot selection protocol

1.1 Desktop component

1.1.1 Pre-requisites

Pre-requisites for completing this protocol:

- None.

1.1.2 Time requirements

Project area stratification and proposed plot selection time estimates will vary depending on the complexity of the project area and the availability of spatial layers and other relevant information. As a general guide:

- Allow up to 2 hours.

1.1.3 Personnel requirements

Number of personnel and skills:

- One person is required when selecting plot locations during the desktop stratification stage. The person needs to be familiar with and experienced in using GIS software. The person may require assistance from personnel that are familiar with the project area/region and experienced in establishing plots in the field.

1.1.4 Equipment

- Computer with GIS mapping software.
- Geographical tools (satellite imagery and GIS layers), biological, historical, logistical, and political data.

1.1.5 Instructions and procedures

1. Review available satellite imagery, vegetation mapping and other GIS layers (e.g. soil, landform, watercourses, land-use) to stratify the project area into sampling units and identify prospective plot locations that capture the variation present across the project area. Table 2 provides an overview of the different information that can be considered and reviewed during the desktop assessment and stratification phase. Details about where to obtain spatial and other environmental information for each state and territory is provided in Appendix 1.

Table 1. Desktop assessment decision making framework.

Scientific and Environmental Information	<ul style="list-style-type: none"> ▪ IBRA bioregions, subregions and environmental associations ▪ Climate ▪ Land systems and units ▪ Vegetation cover and type ▪ Soils and geology ▪ Hydrology ▪ Reserves and protected areas ▪ Ecological communities ▪ Flora and fauna records ▪ Previous survey data for the region, including biological surveys, TERN AusPlots and research data. ▪ Discussions with landholders/managers
Historical Information	<ul style="list-style-type: none"> ▪ Location and compatibility of any existing monitoring sites ▪ Land use and management history ▪ Fire history

Logistical Considerations	<ul style="list-style-type: none"> ▪ Ease of access to suitable sites ▪ Vehicle access ▪ Traversability ▪ Financial limitations ▪ Development or intervention footprint
Political or Legislative Considerations	<ul style="list-style-type: none"> ▪ State priorities ▪ NRM region priorities ▪ Site ownership and tenure ▪ Listed communities & species

2. The stratification process often requires a number of steps to divide the project area into sampling units that are environmentally similar (i.e. areas of the same vegetation type, same land use) and then filtering within these sampling units to identify or control for other aspects such as slope and aspect, distance to watercourses, vegetation condition, threatened or target species records and accessibility (i.e. distance from tracks or roads, terrain; Figure 2 and Figure 3).

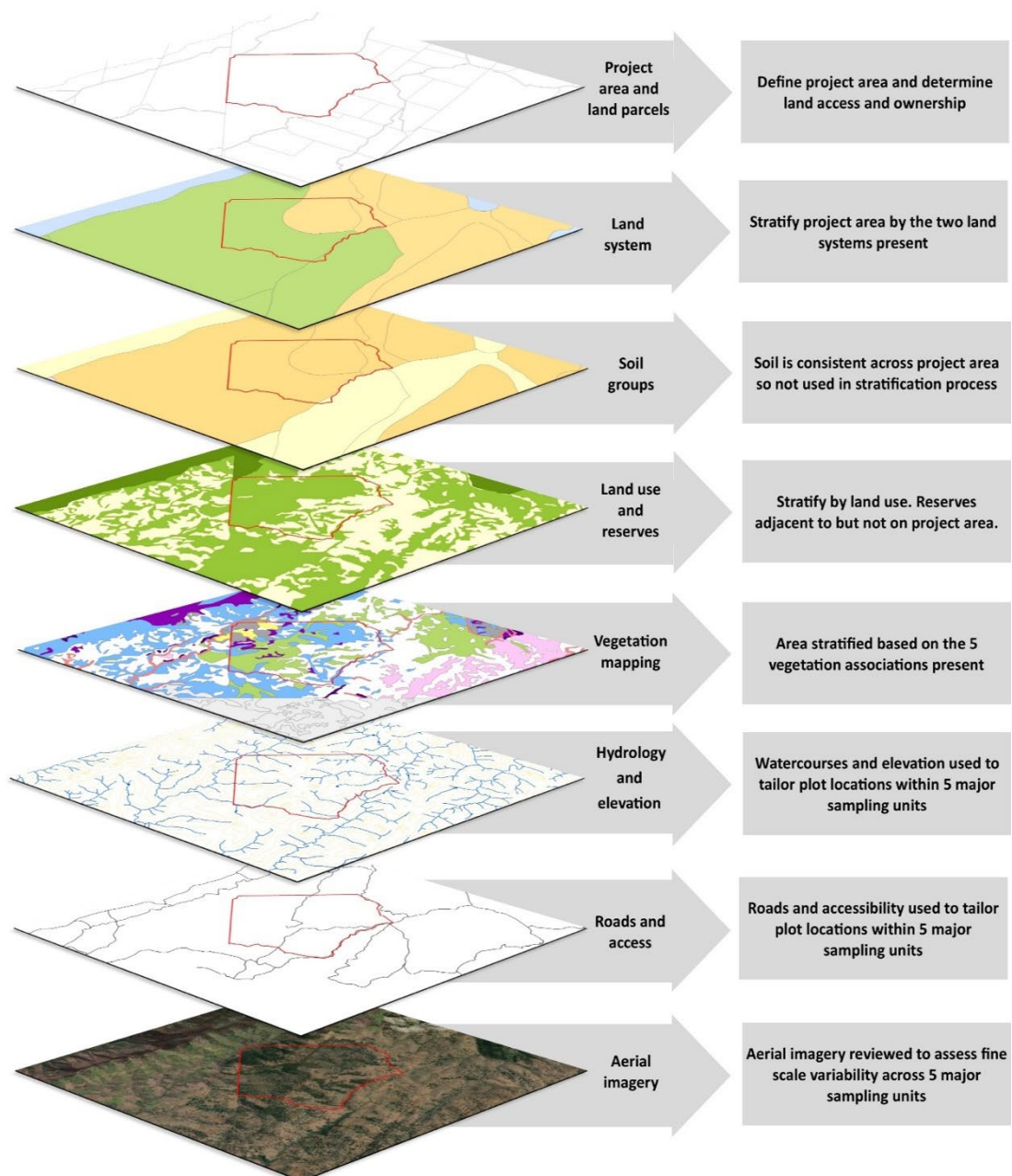


Figure 1. Example desktop stratification and preliminary plot selection process

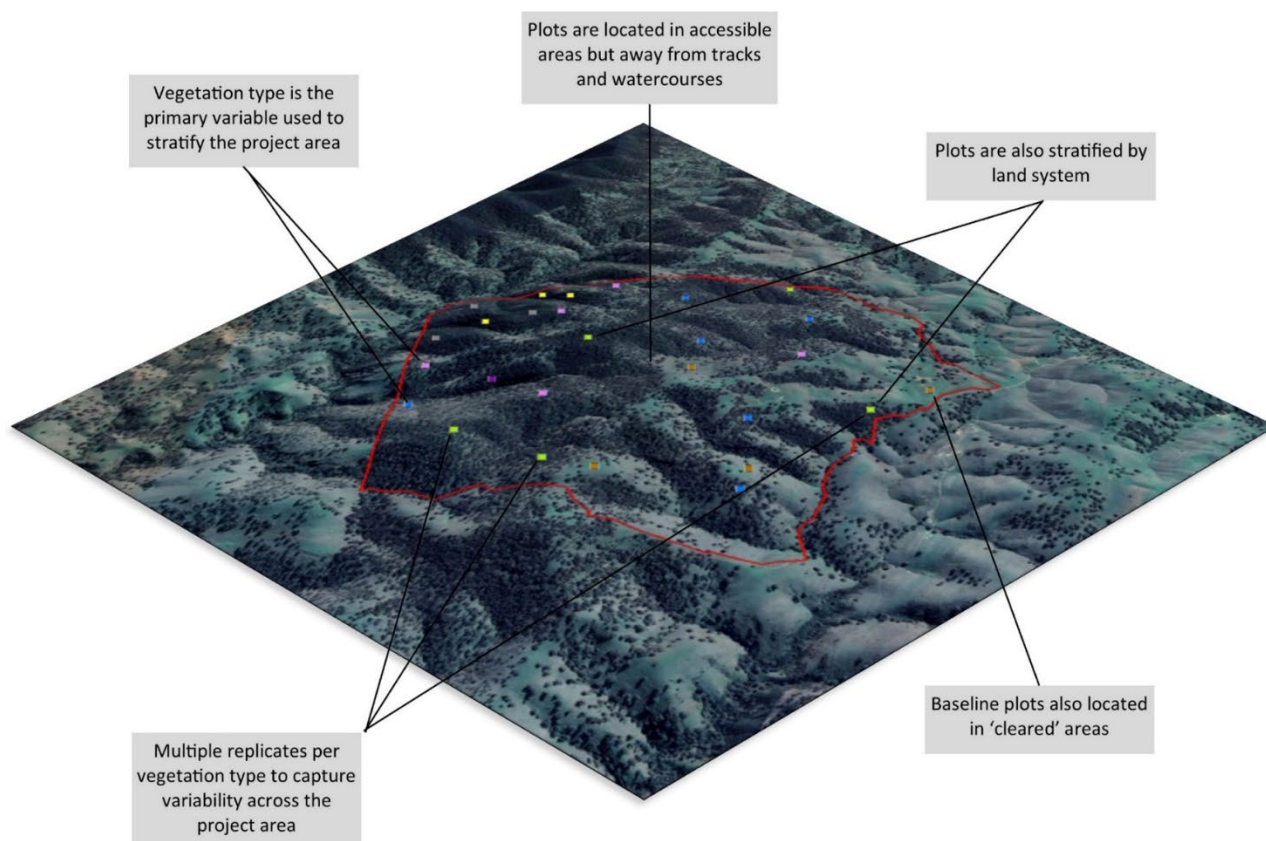


Figure 2. Example of preliminary plot selection

3. Once the available datasets have been reviewed, record the locations of the proposed plots in the Monitor app. The number of plots needs to be tailored to the size and complexity of each sampling unit or vegetation association. Use a database to keep track of different layers or information sources that were used to determine potential plot locations.
4. Open the Plot Selection and Layout Module in Monitor webapp on your computer and select the Plot selection protocol.
5. Pre-select all relevant *projects for plot selection*. This step is required to allow plots to be associated with multiple projects over time if necessary and populates the *current project for plot* drop-down list (see step 8), in which the specific plot being established is assigned to one or more of the projects.
6. Launch the mapping interface and add vertices to delineate the *project area* for the selected project(s) if not already defined. Ensure this area encompasses all of the proposed plot locations.
7. Register the new plot by entering the *state*, *program* and *bioregion* and providing four *unique digits*. This will enable the Monitor app to automatically generate a *plot name*.
8. Record the *current project for plot* from the drop-down list (i.e. assign the specific plot being established to the current project).
9. Launch the mapping interface to record the *recommended location* of the core monitoring plot. Consider if the location is suitable to position a fauna plot adjacent to the core monitoring plot. Even if not doing fauna monitoring during the current survey or project, permitting a paired fauna plot in the future is recommended. The actual location of the plot may differ from the recommended location recorded. The suitability of the recommended location is assessed on ground in the Plot Layout and visit protocol outlined below. Adjustments to the plot location are made in that step.
10. Record the *recommended location point* from the drop-down list, relevant to the position of the proposed core monitoring plot (NE, NW, SE, SW, Centre).

11. Record any information about the plot and why the location was selected in the *comments*. For example, details about the treatment and replicate number, the landform, vegetation and land surface, the proposed location of the paired fauna plot, site access, any potential constraints or issues that may limit on-ground plot selection and layout. This information will assist when selecting final plot locations in the field.
12. Save the plot.
13. Add additional plots as required, repeating steps 7–12 for each plot. Define more proposed plots than will ultimately be surveyed in case locations are deemed unsuitable upon a site visit, or if weather, terrain or other factors constrain accessibility and suitability in the field. Depending on the nature of the study, plan for control and impact plots and a suitable number of replicates in each sampling unit, where required.
14. Complete the Plot selection protocol once all proposed plots have been saved.
15. Check the summary of the data and mark it ready for submission to return to the module selection screen.
16. Sync the queued collection. The plots will now be available to select in the create new section when undertaking the Plot layout and visit protocol in the app in the field.

1.1.6 Additional guidelines

- Review any state or territory guidelines to ensure that the survey is compliant or aligns with any legislation or recommendations relevant for the area. These guidelines can also indicate other useful sources of information or databases that can be reviewed.
- It can be most effective to use spatial data as a series of filters to first identify areas of interest, starting with broad layers such as climate or bioregion and then focus in using finer-scale detailed layers such as vegetation or soil type. Soil and vegetation data can then be further refined using other information such as slope, watercourses, fire history or tracks to pinpoint proposed plot locations within these larger areas of interest.
- The review of available satellite imagery should not be restricted to only spatial layers and should include any other available historical, scientific and environmental information (Table 2).

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