Reviewing area clearing threshold results from the BMAT tool

Guidance for proponents and local government

**Department of Climate Change,
Energy, the Environment and Water**

NSW GOVERNMENT

Acknowledgement of Country

Department of Climate Change, Energy, the Environment and Water acknowledges the Traditional Custodians of the lands where we work and live.

We pay our respects to Elders past, present and emerging.

This resource may contain images or names of deceased persons in photographs or historical content.

Cover photo: Golden hour near Barrington Tops, NSW. Victoria Lees/DCCEEW

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ISBN 978-1-923200-34-0
EHG 2024/0132 May 2024

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1. Purpose

This guidance is for proponents and decision-makers seeking to review the native vegetation area clearing calculations generated by the Biodiversity Values Map and Threshold tool (BMAT tool). It describes standards for developing a property-scale native vegetation extent (NVE) map and calculation of proposed native vegetation clearing. A review may be either:

- requested by the consent authority to further investigate the estimate provided in the BMAT tool report
- prepared by the proponent as an alternative to the BMAT tool and provide evidence with a development application.

2. The Biodiversity Values Map and Threshold tool

The Biodiversity Conservation Regulation 2017 sets out entry requirements for the Biodiversity Offsets Scheme (the scheme). This includes either:

- proposed native vegetation clearing that exceeds an area threshold
- proposed clearing of land within an area mapped on the Biodiversity Values Map.

The BMAT tool is a web-based decision-support tool. It generates an evaluation report that will indicate whether the proposal is likely to impact on land within the Biodiversity Values Map or exceed a native vegetation clearing area threshold.

The BMAT tool uses the Native Vegetation Area Clearing Estimate (NVACE) data layer, which is not a regulatory map (unlike the Biodiversity Values Map). The NVACE is built using a combination of existing vegetation extent layers, land-use classification and recent clearing and disturbance information. For more information, see the *NSW Native vegetation area clearing estimate mapping method* and the *Biodiversity Values Map and Threshold Tool user guide: a step-by-step guide to using the Biodiversity Values Map and Threshold Tool* (see Section 4 'Additional guidance and resources').

A review of the outputs from the BMAT tool may be required when:

- the proponent or consent authority disputes the area clearing calculations in the BMAT tool evaluation report
- the proposed area of native vegetation clearing calculated by the BMAT tool is close to the area clearing threshold
- the BMAT tool reports 'unknown' for the area clearing threshold.

When a review is proposed, engage early with the consent authority to confirm what information will be required to submit with the development application to avoid delays in the development approval process.

It is the role of the consent authority to decide if the area of proposed native vegetation clearing exceeds the area clearing threshold.

2.1 What is included as native vegetation clearing?

Clearing of native vegetation for the purposes of development is defined in section 60C of the *Local Land Services Act 2013* and includes:

a. cutting down, felling, uprooting, thinning or otherwise removing native vegetation
b. killing, destroying, poisoning, ringbarking or burning native vegetation.

Native vegetation occurring on the native vegetation regulatory map (NVR map) category 1-exempt land is not included in the area clearing threshold calculations. For more information on the NVR map categories and the scheme, please see the *Determining native vegetation land categorisation for application in the Biodiversity Offsets Scheme* guidance document (Section 4 'Additional guidance and resources').

Native vegetation is defined in section 60B of Local Land Services Act as any of the following types of plants that are native to New South Wales:

a. trees (including any sapling or shrub or any scrub)
b. understorey plants
c. groundcover (being any type of herbaceous vegetation)
d. plants occurring in a wetland.

A plant is native to New South Wales if it was established in the state before European settlement and is listed on the official database maintained by the Royal Botanic Gardens and Domain Trust and published on their website.

The definition of native vegetation extends to any plant situated on land that is shown on the NVR map as 'category 2-vulnerable regulated land' regardless of whether it is living, dead or dying, or is an exotic species. These category 2-vulnerable regulated land areas must be included in the area clearing calculation.

Native vegetation also exists as grassland, herb-land and low shrublands that do not have trees or large shrubs, and freshwater wetlands. It does not include marine vegetation (i.e. mangroves, seagrasses or any other species of plant that at any time in its life cycle must inhabit water other than fresh water), this is regulated under the *Fisheries Management Act 1994*.

3. How to review the area clearing calculations from the BMAT tool

A review involves preparing an alternative property-scale map and NVE calculations with an evidenced-based justification to demonstrate to the consent authority that the area clearing threshold has not been exceeded.

Best practice for review of BMAT tool reports

- The method to assess and calculate NVE must have a high level of accuracy, be repeatable and sufficiently documented with an evidenced-based justification.
- All vegetation within the proposed development/clearing footprint is considered native unless it can be demonstrated to be non-native.
- Partially exotic vegetation occurring in a mosaic with native vegetation is considered native vegetation for the purpose of calculating NVE.
- Exotic groundcover with an overstorey of native vegetation is considered native vegetation for the purpose of calculating NVE.
- The area clearing threshold applies to native groundcover or partially native groundcover that is not already underneath other native vegetation such as shrubs or trees.
- Calculations may be adjusted to account for partially exotic areas in groundcover within heavily disturbed ecosystems with no native overstorey (i.e. derived plant communities) in line with this guide.
- Trees from adjacent properties with canopies that overhang the development/ clearing footprint are not included in calculations for NVE, unless the canopy will be removed.
- Data used (e.g. photos and aerial images) should include the date of collection.

Figure 1 shows the process flow to review results of the area clearing threshold calculation. Detailed guidance is provided in section 3.1.

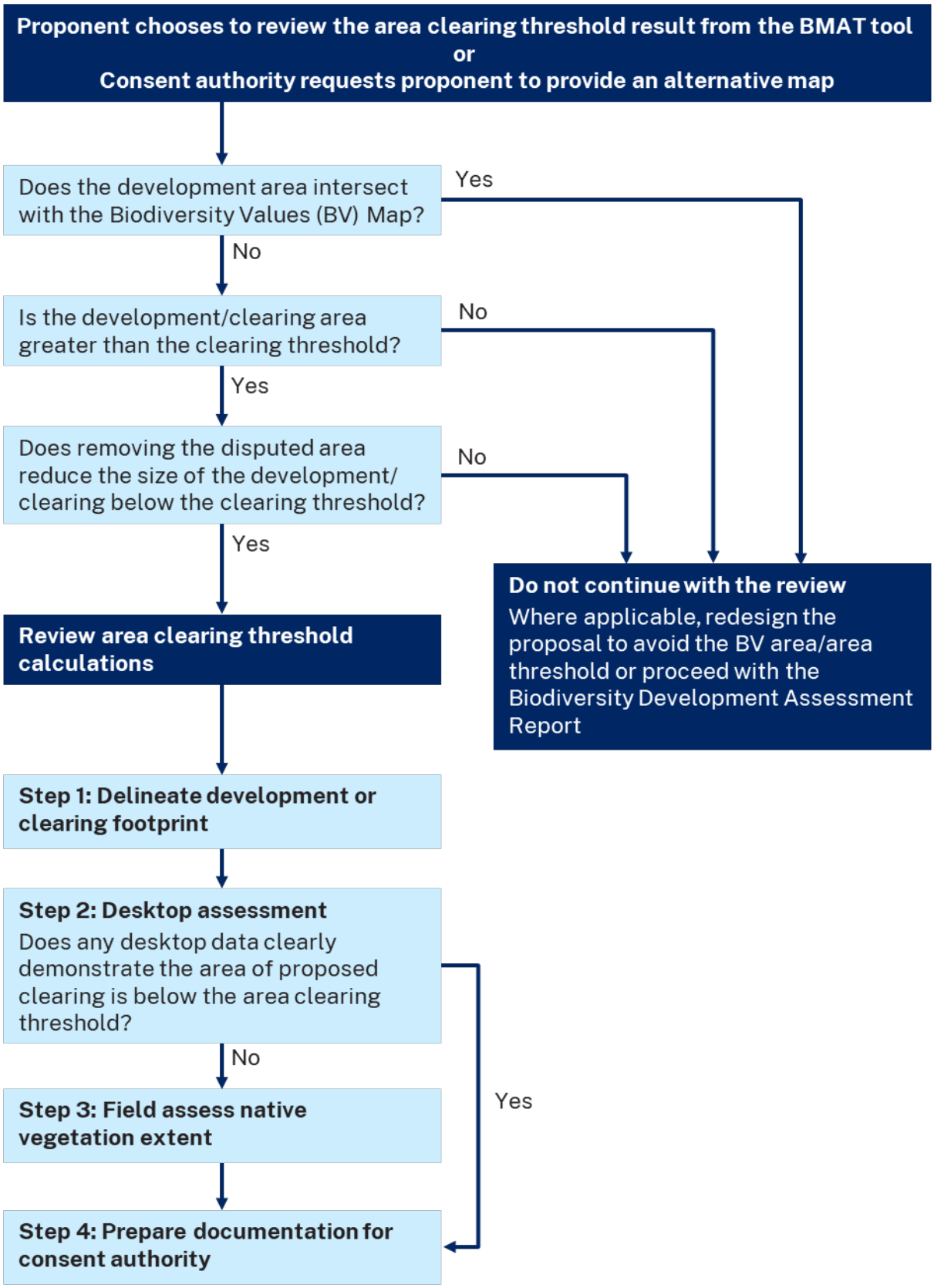

Figure 1 **Process to review area clearing threshold results of the BMAT tool**

3.1 Review method

Step 1 – Delineate development or clearing footprint

Identify the boundaries of the development or clearing footprint on a map. In some cases, a screenshot/export from the BMAT tool may be a suitable map. Alternatively, use a map of aerial images and include the date of capture.

What is included in a development or clearing footprint?

Include all buildings and ancillary uses such as asset protection zones (APZ), tree protection zones (TPZ), landscaping, fence lines, driveways, services (refer to civil works plans) and any temporary works or facilities required during construction or operation.

For proposed subdivision developments under Part 4 of the *Environmental Planning and Assessment Act 1979*, include the total area of native vegetation clearing that, in the opinion of the consent authority, is required or likely to be required for future land use (such as housing development); for example, areas of future vegetation degradation or clearing resulting from operational use.

Step 2 – Desktop assessment

Review the best available native vegetation mapping and aerial imagery for the clearing footprint (see Section 4). Only the disputed area needs to be assessed.

Use the imagery or best available vegetation mapping to demonstrate that the NVE proposed to be cleared is less than the area calculated by the BMAT tool. For more information on government data services and aerial imagery see sections 4.2 and 4.3 in this guidance. Use the data to generate a map, supported by site photos and their locations, and submit to the consent authority. If the consent authority is satisfied that the evidence provided clearly demonstrates that the area clearing threshold has not been exceeded, no further calculations are required.

Where the evidence fails to clearly demonstrate that the area clearing threshold has not been exceeded, further field assessment is required. **Go to Step 3**.

Step 3 – Field assess native vegetation extent

Conduct an on-site assessment of vegetation species and groundcover to evaluate the presence and extent of native vegetation.

Evidence from field survey results must be prepared by a person with sufficient skills in native vegetation identification, field survey and spatial mapping, but the person does not need to be accredited in the use of the Biodiversity Assessment Method (BAM).

Map the following (where relevant):

- the area(s) of the NVACE map that are in dispute

- any area mapped as category 2-vulnerable regulated land – these areas are considered 100% native vegetation for the purpose of the scheme threshold and are included in NVE calculations
- areas of groundcover with a mix of native and exotic species in a derived (disturbed) plant community (see Appendix A for a recommended assessment method)
- areas that are 100% exotic, such as primary production crops or orchards – these areas are excluded from calculations of NVE
- areas that meet the definition of a threatened ecological community, including bare areas, rock or litter – these areas are included in calculations of NVE.

Calculations of NVE should include temporal variations in certain vegetation communities; for example, during drought some native vegetation communities can have rocky ground and open patches, such as soaks, saltpans or bare areas.

If the alternative calculation of NVE demonstrates that the area clearing threshold is exceeded, investigations can be concluded.

If the assessment demonstrates that the area clearing threshold has not been exceeded, **go to Step 4**.

Ruleset for adjusting native vegetation extent for partially exotic groundcover

An adjustment to NVE may be appropriate in partially exotic groundcover of heavily disturbed ecosystems with no native overstorey (i.e. derived ecosystems).

Adjustments to NVE do not apply to vegetation that is a threatened ecological community. For example, partially exotic groundcover that is part of a derived or highly disturbed plant community that meets the description in the final determination for a threatened ecological community, must be included as native vegetation.

All calculations apply 'as viewed from above', and where non-native vegetation occurs above native vegetation, treat as native vegetation.

To adjust NVE calculations for partially exotic groundcover in highly disturbed/ derived plant communities, apply the following ruleset:

- if there is >75% native groundcover – this is adjusted to 100% native
- if there is 15–75% native groundcover – the calculation of NVE is adjusted by multiplying the proportion (%) of native groundcover by the total area to be cleared
- if there is <15% native groundcover – the area is assessed as non-native vegetation and is not included in NVE.

The ruleset has been developed based on an analysis of thresholds for offset generation and is designed to avoid BAM assessments in degraded areas that fail to generate an offset obligation.

The proportion of exotic to native vegetation cover should be assessed using a robust and repeatable method (see Appendix A). The approach used and subsequent adjustment must be documented in the supporting information submitted with a development application.

Step 4 – Documentation

A report submitted to the consent authority should document the methods and results of the alternative NVE calculations for the review area in a short, clear and concise format.

The aim of the report is to assist the consent authority with decision-making. Check that the report includes:

- the original BMAT tool evaluation report
- the alternative property-scale NVE map for the development/clearing footprint showing all of the areas identified in Step 3 (see example below)
- the alternative total area calculations for NVE proposed to be cleared
- methods used to assess and calculate NVE
- images and photos labelled with location, orientation and date
- field survey results, including, where relevant, results of the assessment of groundcover, including scanned field datasheets and any spatial data generated during the assessment
- evidenced-based justification for adopting any alternative methods or variations to assessment.

3.2 Example map

Figure 2 shows the area that exceeds the area clearing threshold as identified by the BMAT tool report.

The example map displays the following features:

- lot boundary and size
- size and location of development footprint
- size and location of areas mapped on the NVACE layer (i.e. NVE)
- size and location of the disputed area under review
- location of the photo points / field surveys.

The disputed area is highlighted in a hatched pattern. The photo points are clearly marked and are within the disputed area. The area calculations are shown within the image indicating the size of the total development footprint, lot size, the area mapped as native vegetation by the BMAT tool (i.e. NVACE) and the area being disputed. In this instance the area being reviewed is 0.14 ha. If the consent authority accepts evidence that the disputed area is not native vegetation, this reduces the area of native vegetation being impacted and puts it below the area clearing threshold.

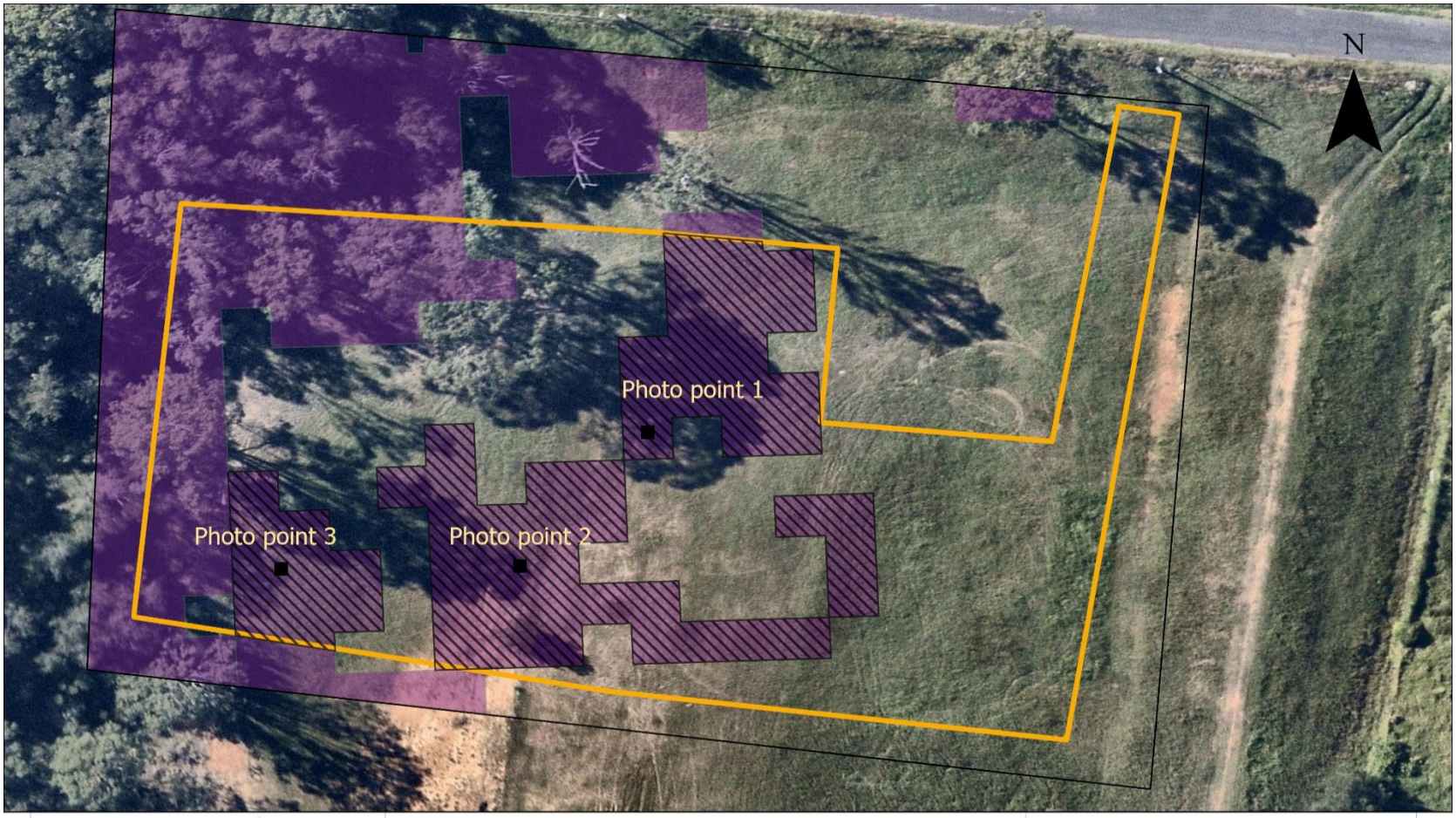

Figure 2 **Example of a property-scale native vegetation extent map**

4. Additional guidance and resources

A range of mapping products are available to assist proponents and consent authorities with the review and refinement of property-scale NVE maps.

4.1 Guidance documents

- NSW native vegetation area clearing estimate method (DPE 2023)
- Biodiversity Values Map and Threshold Tool user guide: a step-by-step guide to using the Biodiversity Values Map and Threshold Tool (DPE 2022)
- Determining native vegetation land categorisation for application in the Biodiversity Offsets Scheme (DPE 2022)

4.2 Government web services

4.2.1 Sharing and Enabling Environmental Data (SEED)

The SEED data portal is the NSW Government's central resource for Sharing and Enabling Environmental Data.

The SEED map, a tool found on the SEED webpage, can also be used to perform basic GIS operations such as drawing polygons and calculating areas.

To search for available map data, go to SEED The Central Resource for Sharing and Enabling Environmental Data in NSW and use the search function to select the relevant local government area for your area, and available file formats if relevant. To filter specifically for vegetation type maps, use 'VIS' or 'SVTM' in the search bar or filter relevant tags (e.g. vegetation, TEC, Coastal wetlands). Some useful layers in SEED are:

- NSW State Vegetation Type Map (DPE 2022)
- Biodiversity Values Map (DPE 2018 v14.4).

4.2.2 ePlanning Spatial Viewer

The NSW Planning Portal is an initiative of the NSW Government and has been designed to provide public access to a range of planning services and information, including documents or other information in the NSW planning database established under the Environmental Planning and Assessment Act.

4.2.3 SIX Maps (Spatial Information Exchange)

SIX Maps (Spatial Information Exchange) is the entry point to view Spatial Services' interactive images and mapping of New South Wales, incorporating a range of spatial and property data.

4.3 Aerial imagery

Aerial images are an essential part of the review process. The NSW Government web services listed above all have aerial images as basemaps for their spatial services. The following sources contain some aerial photo repositories for New South Wales:

- **Google Earth** – a unique geo-mapping and tagging program that uses composite imagery to form a comprehensive, interactive map of the Earth
- **Esri World imagery** – the base map provided in the Esri GIS systems such as ArcMap and ArcGIS pro
- **Nearmap Limited** – an Australian aerial imagery technology and location data company that provides frequently updated, high-resolution aerial imagery around major population centres, covering 88% of Australia's population
- **MetroMap by Aerometrex** – an aerial imagery data-providing service, offering high-quality and accurate imagery to a subscriber base. The geospatial data can be used for varied applications across a diverse range of industries.

Appendix A: Method for calculating native vegetation extent in partially exotic grassland areas for disturbed plant community types

Groundcover species

Native groundcover is any native herbaceous vegetation below 1 m in height when mature (excluding seasonal taller flowering stems on plants like grasses). This includes all such species native to New South Wales (i.e. not confined to species indigenous to the area).

Quadrat field assessment method

Use the quadrat field assessment method to determine the proportion of native and exotic species in the overall groundcover.

Persons undertaking the field assessment are responsible for ensuring the accuracy of their assessment. Where possible, the assessment of groundcover should be made during the time of year and under seasonal conditions when the extent of native groundcover on the subject land is likely to be at its maximum, to achieve a quality assessment.

This method, based on Local Land Services' Assessing native groundcover [PDF 1.8MB], uses a square frame (quadrat) of 100 × 100 cm.

A quadrat is easily assembled using 4 thin pieces of PVC pipe cut to equal lengths and joined with tight-fitting elbow joints.

Step-by-step method

1. Prepare a field sheet like the example shown in Figure 3, on which to record your observations.
2. Select a representative sample patch (or patches) in the assessment area.
3. For each representative patch, place the quadrat randomly 10 times.
4. For each of the 10 quadrat placements estimate:
   a. Column A – percentage of groundcover (native and non-native plants)
   b. Column B – percentage of groundcover in the quadrat that is native.

   Note: Non-vegetative elements that are typical of the native ecosystem, such as sticks and leaf litter, should be included as native groundcover.
5. For each sample patch and for each column, add squares Q1 to Q10 and divide these totals by 10 to calculate:

a. average percentage of **overall** groundcover (native and non-native) across the sample patch (Column A)
b. average percentage of **native** groundcover across the sample patch (Column B).

6. Average results for the whole site in Column A and B to calculate:
   a. total average of **overall** groundcover for the site (native and non-native)
   b. total average of **native** groundcover for the site.

Table 1 Example of a quadrat method field assessment

Quadrat method field sheet												
Date of Assessment:							Assessor:					
	Cover type											
	Column A % Overall groundcover						Column B % Native groundcover					
Patch 1	Q1	Q2	Q3	Q4	Q5	Total	Q1	Q2	Q3	Q4	Q5	Total
	Q6	Q7	Q8	Q9	Q10	Average	Q6	Q7	Q8	Q9	Q10	Average
Patch 2	Q1	Q2	Q3	Q4	Q5	Total	Q1	Q2	Q3	Q4	Q5	Total
	Q6	Q7	Q8	Q9	Q10	Average	Q6	Q7	Q8	Q9	Q10	Average
Patch 3	Q1	Q2	Q3	Q4	Q5	Total	Q1	Q2	Q3	Q4	Q5	Total
	Q6	Q7	Q8	Q9	Q10	Average	Q6	Q7	Q8	Q9	Q10	Average
Patch 4	Q1	Q2	Q3	Q4	Q5	Total	Q1	Q2	Q3	Q4	Q5	Total
	Q6	Q7	Q8	Q9	Q10	Average	Q6	Q7	Q8	Q9	Q10	Average
Patch 5	Q1	Q2	Q3	Q4	Q5	Total	Q1	Q2	Q3	Q4	Q5	Total
	Q6	Q7	Q8	Q9	Q10	Average	Q6	Q7	Q8	Q9	Q10	Average
	Average across site						Average across site					

7. Where necessary, adjust the calculation for overall groundcover:
   a. where there is <100% **overall** groundcover (from Step 6a), use the proportion of non-groundcover to reduce the total average of **overall** groundcover
   b. adjust the calculation of NVE (from Step 6b) using the ruleset described in this guidance (section 3.2 – Step 3).

Example

A 1 ha (10,000 m^2) assessment area is measured as having 80% overall groundcover (native and non-native, Step 6a). The assessment area is therefore reduced by 20% to be 0.8 ha (8,000 m^2) in accordance with Step 7a:

- 1 ha × 80% = 0.8 ha (8,000 m^2); or 1 ha – 20% = 0.8 ha (8,000 m^2).

The proportion of native groundcover is measured at 45%. Using the ruleset, multiply the proportion of native groundcover (45%) by the total overall groundcover area proposed to be cleared (0.8 ha) in accordance with step 7b:

- 0.8 ha × 45% = 0.36 ha (3,600 m^2).

In this example, the adjusted calculation of NVE reduced the area of NVE in the groundcover from 1 ha to 0.36 ha.