Australian Government
Clean Energy Regulator

Nature Repair Market – reference ecosystems for the replanting method

Purpose

This document provides guidance on identifying and assigning reference ecosystems for the Nature Repair (Replanting Native Forest and Woodland Ecosystems) Methodology Determination 2025 (the method). This guidance should be used alongside section 46 of the method.

The following parts of the method relate to the assigned reference ecosystems:

- establishing permanent sampling plots
- stratifying activity areas and sub-areas
- determining benchmark values (which inform target and threshold values)
- environmental plantings.

Summary

The method requires you to use a reference ecosystem as a model for restoration. Section 46 of the method relates to assigning, identifying and describing reference ecosystems for a replanting project. The reference ecosystem(s) for a replanting project must be assigned by a suitably qualified person.

The selection of a particular reference ecosystem must be justified in the site assessment report. The justification should be based on the Prescribed Vegetation Classification System (PVCS), appropriate field survey information and other supporting evidence. A description of the assigned reference ecosystem must be provided in your project plan.

Definitions of key terms used in this guidance are included in Table 3.

Identifying and assigning reference ecosystems

You must identify and assign a native vegetation type as the reference ecosystem for each proposed activity area and any sub-areas. To do this, you must use the PVCS to conduct virtual and field-based assessments to determine whether mapped native vegetation types are accurate to the project area and suitable for use as reference ecosystems.

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Prescribed Vegetation Classification System (PVCS)

The PVCS consists of:

- the prescribed vegetation map on PLANR[1]
- raster datasets and the PVCS spreadsheet which can be accessed on the Department of Climate Change, Energy, the Environment and Water website[2].

Guidance on using PLANR[3] can also be found on the department's website.

The method provides 3 steps to assign a reference ecosystem:

1. **Based on the native vegetation types shown by the prescribed vegetation map in PLANR.**

   Where the prescribed vegetation map is accurate, a reference ecosystem can be assigned based on native vegetation types mapped in the prescribed vegetation map.

2. **Based on the eligible native vegetation types most likely to be present on the land prior to clearing or pre-1750 (whichever is later).**

   Where the prescribed vegetation map is not accurate, the PVCS spreadsheet must be used to determine the eligible native vegetation types that were historic ecosystems for the area and consider whether they are suitable to be used as the reference ecosystem.

3. **Based on an alternative eligible native vegetation type if revegetation towards the pre-clearing (or pre-1750) reference ecosystem is not likely to be feasible.**

   Where revegetation towards the historic ecosystem is unlikely to be feasible, an alternative native vegetation type can be assigned using the PVCS spreadsheet.

[1] https://planr.gov.au/
[2] https://fed.dcceew.gov.au/maps/erin::prescribed-vegetation-classification-system/about
[3] https://www.dcceew.gov.au/environment/environmental-markets/nature-repair-market/publication/planr-guidance-quick-reference-guide

Eligible native vegetation types

For step 2, the eligible native vegetation types are those which occur or previously occurred within the relevant eligible region (see schedule 1 of the method) or an adjacent IBRA subregion.

For step 3, the eligible native vegetation types are those which:

- occur or previously occurred within the relevant eligible region (see schedule 1 of the method) or an adjacent IBRA subregion
- are suited to the biophysical characteristics of the land and the type of ecosystem it is currently likely to support
- are from the same major vegetation group (MVG) as the native vegetation type that was most likely to be present on the land prior to it being cleared or pre-1750.

If biophysical characteristics of the land have changed to an extent where an eligible native vegetation type (as defined above) cannot be revegetated, the land must be excluded from the proposed activity area.

Using the Prescribed Vegetation Classification System

You must use the PVCS in the process of identifying and assigning the reference ecosystem.

Before going into the field, upload your project area in PLANR to view the prescribed vegetation map. This will show pre-1750 MVGs that are mapped for the area. This MVG mapping may be used to inform the initial stratification of the proposed activity areas.

Where state vegetation mapping data is available, you can use PLANR to show native vegetation types that apply to an activity area e.g. Plant Community Types. The native vegetation types for activity areas can be viewed when calculating the biodiversity benefit scores for each activity area in PLANR. References to the prescribed vegetation map in the method are intended to include both the MVG and native vegetation type mapping.

Alternatively, you can use the raster datasets available on the department's website with GIS software to view the prescribed vegetation map.

No mapping data available

Where vegetation mapping data is not available for an area, the PVCS spreadsheet and other relevant sources should be used to identify candidate native vegetation types that could be assigned as the reference ecosystem. The PVCS spreadsheet can be used to filter for candidate native vegetation types by relevant IBRA subregions and MVGs.

Virtual assessment

Virtual assessment must consider the PVCS as well as any other available resources on historic ecosystems for the activity area. Evidence of historic ecosystems for the activity area could include aerial photography, historic surveys and plans, other old maps and early site descriptions (where they exist) from suitable sources.

The suitability of candidate vegetation types (whether identified from the prescribed vegetation map or the PVCS spreadsheet) should be assessed through this virtual review, together with a field-based assessment of the site's biophysical attributes.

Field-based assessment

Field-based assessment must ground-truth whether the mapped vegetation types are likely to be the accurate. The suitability of candidate reference ecosystems should also be assessed with regard to the biophysical characteristics of the site and the type of ecosystem the activity area is likely to support.

The reference ecosystem assigned for a particular activity area or sub-area should be the native vegetation type that was most likely to be present on the land prior to clearing (or pre-1750). If the historic native vegetation type is no longer suited to the site because of irreversible environmental changes, there is flexibility to use an alternative native vegetation type as the reference ecosystem. Where appropriate, an alternative reference ecosystem may also be used based on the consideration of likely climate impacts.

Size requirements

The following requirements ensure activity areas do not contain varied reference ecosystems which are too small to provide meaningful ecological benefit if replanted. When assigning reference ecosystems, you must use:

- a maximum scale of 3 hectares
- a minimum width of 50 metres for linear features.

Stratification requirements

When stratifying your project into activity areas, each activity area must have the following:

- reference ecosystems that belong to the same MVG
- the same starting ecosystem condition state
- the same restoration target level.

If a proposed activity area has been assigned reference ecosystems (native vegetation types) from more than one MVG, the proposed stratification will have to be adjusted. You may need to designate the area with the different MVG as a different activity area or exclude it.

Where an activity area has the same MVG but has been assigned multiple reference ecosystems, the activity area must be divided into sub-areas so that each sub-area is assigned a single reference ecosystem.

Native vegetation types

The assigned reference ecosystem is the native vegetation type that is determined suitable from following the process in section 46 of the method. Table 1 gives examples of native vegetation types for each state and territory.

Table 1: State and territory native vegetation types

State/territory	Native vegetation type
NSW	Plant Community Type
Australian Capital Territory	Plant Community Type
Queensland	Regional Ecosystems
South Australia	Vegetation Associations & Alliances
Victoria	Ecological Vegetation Class
Tasmania	Vegetation Community
Western Australia	Vegetation Association

Describing the reference ecosystem

Each reference ecosystem must be described with reference to the applicable IUCN Global Ecosystem Typology (at the functional group level) and the National Vegetation Information System (NVIS) at level 5 and 6. The descriptions enable national and global comparison of reference ecosystem types. Table 2 provides an example description of a reference ecosystem which meets the method requirements.

Where data is not available at NVIS level 5 and 6, you may write a description based on other available vegetation type data to reflect the NVIS information hierarchy as follows:

- Level 5 – Dominant growth form, height, cover and species (3 species) for the 3 traditional strata (i.e. upper, mid and ground)
- Level 6 – Dominant growth form, height, cover and species (5 species) for all layers/substrata.

Where data is unavailable, you may leave out the NVIS level 5 and 6 descriptions. If data becomes available later, you can update your project plan to add the NVIS level 5 and 6 descriptions.

NVIS data[4] can be found on the department's website.

[4] https://www.dcceew.gov.au/environment/environment-information-australia/national-vegetation-information-system

Table 2: Example description of a reference ecosystem.

Required information	Example
Name of reference ecosystem	EVC 61 - Northern Inland Slopes Bioregion
IUCN functional group level	T2.6 - Temperate pyric sclerophyll forests and woodlands
NVIS level 5 and 6 descriptions	Level 5: U+ ^Eucalyptus sideroxylon s.s.,Eucalyptus macrorhyncha,Eucalyptus polyanthemos\^tree\7\c;M ^Grevillea alpina,Cassinia arcuata,Daviesia leptophylla\^shrub,vine\4\i;G ^Hibbertia obtusifolia,Goodenia hederacea,Drosera peltata subsp. auriculata\^shrub,tussock grass,rush\2\c Level 6: U1+ ^Eucalyptus sideroxylon s.s.,Eucalyptus macrorhyncha,Eucalyptus polyanthemos,Eucalyptus microcarpa\^tree\7\c;U2 Acacia pycnantha\tree\6\r;M1 ^Grevillea alpina,Cassinia arcuata,Daviesia leptophylla,Hardenbergia violacea\^shrub,vine\4\i;M2 Hibbertia riparia,Dillwynia sericea\heath shrub\3\i;G1 ^Hibbertia obtusifolia,Goodenia hederacea,Drosera peltata subsp. auriculata,Poa sieberiana,Dianella revoluta s.l.\^shrub,tussock grass,rush,forb,heath shrub\2\c;G2 Gonocarpus tetragynus,Lomandra filiformis,Acrotriche serrulata,Hydrocotyle laxiflora\rush,forb,heath shrub\1\i

Information to be provided to us

You must provide information related to the reference ecosystem for each activity area and any sub-areas in your application to register a project. Information needs to be provided in the project plan and site assessment report. This includes:

- a description of the reference ecosystems for each activity area
- the process used to assign the reference ecosystem
- any data obtained and relied upon in identifying and assigning reference ecosystems.

You must include details of the process used to assign your reference ecosystem and demonstrate how you have complied with relevant sections in s46 of the method. Data obtained and relied upon should include any mapping of vegetation types used, relevant field survey information and any other evidence/data used.

The description of reference ecosystems in the project plan must include the name of the reference ecosystem (native vegetation type) and be informed by the IUCN Global Ecosystem Typology and NVIS level 5 and 6 (where data is available).

Data submitted to us must be consistent with the Nature Repair Market Data Submission Guidelines[5]. Geospatial data must be consistent with the Nature Repair Market mapping guidelines[6].

Table 3: Key terms from the replanting method

Term	Definition
IBRA subregion	***IBRA subregion*** means a subregion defined by the Interim Biogeographic Regionalisation for Australia (IBRA) landscape classification framework version 7.0, as in effect at the relevant time (whether it is also an eligible region listed in Schedule 1).
Reference ecosystem	In relation to an activity area or sub-area, means an ecosystem that will serve as the model or benchmark for restoration, against which to compare the ecosystem condition of the activity area or sub-area.
Suitably qualified person	Suitably qualified person, for a replanting project, means a person who: (a) has an appropriate qualification in ecology or botany, or in another subject relevant to the replanting project; and (b) has at least 3 years post-qualification experience working as an ecologist or botanist, or in another profession relevant to the replanting project; and (c) has worked as an ecologist or botanist, or in another profession relevant to the replanting project, within the previous 3 years.
Prescribed Vegetation Classification System (PVCS)	Prescribed Vegetation Classification System means the database of that name published by the Department on the Department's website, as it exists from time to time.
Prescribed vegetation map	Prescribed vegetation map means a spatial data product that forms part of the Prescribed Vegetation Classification System.
PLANR	PLANR means the Department's Platform for Land and Nature Repair database available at planr.gov.au, as it exists from time to time.

[5] https://www.dcceew.gov.au/environment/environmental-markets/nature-repair-market/publication/nature-repair-market-data-submission-guidelines
[6] https://www.dcceew.gov.au/environment/environmental-markets/nature-repair-market/publication/nature-repair-market-mapping-guidelines

Legislative references

Table 4: relevant legislative references from the method

Nature Repair (Replanting Native Forest and Woodland Ecosystems) Methodology Determination 2025[7]	
S46(2)	The assignment of reference ecosystems must be undertaken at a maximum scale of 3 hectares, with a minimum width of 50 metres for linear features
S46(3)	The project proponent must set out the justification for making the selection, which must include any available evidence of historic ecosystems for the activity area
S46(4)	(4) The ecosystem must be identified and described consistently with: (a) the IUCN Global Ecosystem Typology, as it exists at the time the SSA is undertaken, at the functional group level; and (b) the National Vegetation Inventory System (NVIS), as it exists at the time the SSA is undertaken, at both the association level and sub-association level. Note 1: At time this instrument was made: (a) the IUCN Global Ecosystem Typology was available at https://global-ecosystems.org/; and (b) the NVIS was available on the department's website at https://www.dcceew.gov.au/environment/land/native-vegetation/national-vegetation-information-system. Note 2: The association level and sub-association level correspond to levels 5 and 6 of the NVIS respectively.
S46(5)-(9)	*Selection—prescribed vegetation map appears accurate* (5) The project proponent must access and examine the prescribed vegetation map for the activity area on PLANR. (6) If the activity area is shown by the prescribed vegetation map to have a single native vegetation type, that vegetation type must be assigned to the activity area. (7) If the activity area is shown by the prescribed vegetation map to have a mixture of 2 or more native vegetation types, the project proponent must divide the activity area into parts (the sub-areas of the activity area), based on the distribution of the vegetation types, so that: (a) each sub-area is assigned to a single native vegetation type; and (b) the native vegetation types assigned to the sub-areas are all in the same major vegetation group, according to the NVIS classification. Note: If a proposed activity area has native vegetation types from more than one major vegetation group, the proposed stratification will have to be adjusted.

[7] https://www.legislation.gov.au/F2025L00253

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	(8) The project proponent must, using: (a) a virtual assessment; and (b) a field survey (as part of the initial field survey); verify that the prescribed vegetation map is likely to be correct. (9) If the project proponent is satisfied that the prescribed vegetation map is accurate, the native vegetation types assigned under subsection 46(6) or (7) are the reference ecosystems for the activity area or sub-areas.
S46(10)-(13)	*Selection—prescribed vegetation map does not appear accurate* (10) If it appears that the prescribed vegetation map is likely not to be correct, the project proponent must use the Prescribed Vegetation Classification System to determine the eligible native vegetation type or types that were most likely to be present on the land prior to it being cleared or pre-1750 (whichever is later), having regard to the biophysical characteristics of the land and the type of ecosystem it is currently likely to support. (11) For subsection (10), a native vegetation type is eligible if it occurs, or previously occurred, within the relevant eligible region in which the land is located, or an adjacent IBRA subregion. (12) The project proponent must assign: (a) a single eligible native vegetation type to the activity area; or (b) 2 or more eligible native vegetation types to different parts of the activity area (the sub-areas of the activity area) in accordance with paragraphs (7)(a) and (b); (13) The native vegetation types so assigned are the reference ecosystems for the activity area or the sub-areas.
S46(14)-(16)	*Exception—changes since clearing too great* (14) If there is compelling evidence that the biophysical attributes of an activity area, of a part of a proposed activity area, have changed to such an extent that revegetation towards the pre-clearing (or pre 1750) reference ecosystem is not likely to be feasible, the project proponent may designate an alternative eligible native vegetation type as the reference ecosystem for the activity area, or for the part of the activity area (a sub-area of the activity area). (15) For subsection (14), a native vegetation type is eligible if it occurs, or previously occurred, within the relevant eligible region in which the land is located, or an adjacent IBRA subregion; and (a) is suited to the biophysical attributes of the land and the type of ecosystem it is currently likely to support; and (b) is from the same major vegetation group as the native vegetation type that was most likely to be present on the land prior to it being cleared or pre-1750.

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	(16) If changes to the biophysical attributes of land mean it is not likely to be possible to revegetate that land towards a native vegetation type that satisfies subsection (15), the land must not be included in a proposed activity area.
S22(8)	The whole of an undivided activity area must have the same reference ecosystem.
S22(9)	The whole of each sub-area of a divided activity area must have the same reference ecosystem, and all the sub-areas must have reference ecosystems from the same major vegetation group
S35(1)(m)	The site assessment report must include the following information and any relevant supporting evidence: (m) the reference ecosystem identified for each activity area or sub-area, including: (i) details of the process undertaken to identify the applicable reference ecosystem for each activity area or sub-area; and (ii) the data obtained from this process and relied upon to identify the applicable reference ecosystem for each activity area or sub-area.
S37(a)	The project plan must include the following information for each activity area: (a) a description of its reference ecosystem or ecosystems