New South Wales

# Biodiversity Assessment Method Order 2020

under the

## Biodiversity Conservation Act 2016

I, Matt Kean, the Minister for Energy and Environment, in pursuance of section 6.7 of the *Biodiversity Conservation Act 2016:*

(a) revoke the Biodiversity Assessment Method Order dated 24 August 2017 and published on the NSW legislation website, and

(b) replace it with the following order establishing the Biodiversity Assessment Method.

Dated this 14th day of October 2020.

**MATT KEAN**

**Minister for Energy and Environment**



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# Biodiversity Assessment Method Order 2020

## 1 Name of Order

This Order is the *Biodiversity Assessment Method Order 2020.*

## 2 Commencement

This Order commences on 22 October 2020.

**Note.** In accordance with section 6.7 of the Act, this Order will continue to have effect unless and until it is amended or replaced by the Minister administering the Act.

## 3 Adoption of the Scheme

This Order establishes the following *Biodiversity Assessment Method:*

DEPARTMENT OF PLANNING, INDUSTRY & ENVIRONMENT

# Biodiversity Assessment Method

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# Acronyms and abbreviations

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| BAM-C | Biodiversity Assessment Method Calculator |
| BAR | Biodiversity Assessment Report |
| BC Act | *Biodiversity Conservation Act 2016* (NSW) |
| BCAR | Biodiversity Certification Assessment Report |
| BC Regulation | Biodiversity Conservation Regulation 2017 (NSW) |
| BCT | Biodiversity Conservation Trust |
| BDAR | Biodiversity Development Assessment Report |
| BSSAR | Biodiversity Stewardship Site Assessment Report |
| BOS | Biodiversity Offsets Scheme |
| CEEC | Critically endangered ecological community |
| DBH | Diameter at breast height over bark |
| EPBC Act | *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth) |
| EP&A Act | *Environmental Planning and Assessment Act 1979* (NSW) |
| EEC | Endangered ecological community |
| HTW | High threat weed |
| IBRA | Interim Biogeographic Regionalisation for Australia |
| LLS Act | *Local Land Services Act 2013* (NSW) |
| NPW Act | *National Parks and Wildlife Act 1974* (NSW) |
| NSW | New South Wales |
| PCT | Plant community type |
| SAII | Serious and irreversible impact |
| TBDC | Threatened Biodiversity Data Collection |
| TEC | Threatened ecological community |
| Vegetation SEPP | *State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017* |
| VEC | Vulnerable ecological community |


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# 1 Overview of the Biodiversity Assessment Method

1. The NSW Biodiversity Assessment Method (BAM) is part of the Biodiversity Offsets Scheme (BOS). The BOS is a legislated framework that is required when addressing impacts on terrestrial biodiversity from development and clearing. It also ensures that land used to offset impacts is secured in the long term. The BAM provides a consistent method to assess impacts on biodiversity values from a proposed development (including major projects), activity, clearing or biodiversity certification as well as improvements in biodiversity values from management actions undertaken at a stewardship site. The survey and assessment effort required by the BAM is scaled according to the extent and risk of impacts on biodiversity from a proposal, the availability and quality of existing information (such as native vegetation maps), and the area of land being assessed.
2. The BAM outlines how to assess changes in native vegetation, threatened species and their habitats. Specifically, the BAM is used to:
    a. identify the biodiversity values on land proposed for:
        i. development that requires consent under Part 4 of the *Environmental Planning and Assessment Act 1979 (*EP&A Act*)*
        ii. an activity that requires approval under Part 5, Division 5.1 of the EP&A Act (where the proponent has opted-in to the BOS)
        iii. development that requires approval under Part 5, Division 5.2, of the EP&A Act
        iv. clearing that requires approval under Part 5A of the *Local Land Services Act 2013* (LLS Act); or a permit under the *State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017* (Vegetation SEPP)
        v. biodiversity certification and the biodiversity certification assessment area in the case of an application for biodiversity certification under the *Biodiversity Conservation Act 2016* (BC Act)
        vi. a biodiversity stewardship site in the case of an application for a biodiversity stewardship agreement under the BC Act
    b. determine the impacts of a proposal on terrestrial biodiversity values
    c. assess whether a proposal will have any additional (prescribed) biodiversity impacts
    d. demonstrate how to avoid, minimise and/or mitigate impacts on biodiversity values
    e. quantify and describe the biodiversity credits needed to offset the residual impacts of a proposal on biodiversity values
    f. quantify and describe the biodiversity credits that can be created at a biodiversity stewardship site from management actions at the site to improve biodiversity values.
3. Thus, the BAM provides the number and class of biodiversity credits that need to be offset to achieve ‘no net loss’ of biodiversity, but only after attempts to avoid, minimise and mitigate impacts have been considered and addressed.

## 1.1 Legislation and policies underpinning the Biodiversity Assessment Method

1. The overarching legislation for biodiversity conservation in New South Wales (NSW) is the BC Act and the *Biodiversity Conservation Regulation 2017* (BC Regulation).


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2. The BOS is established under Part 6 of the BC Act. The LLS Act, the Vegetation SEPP and the BC Regulation are also relevant to the BOS.
3. The Minister administering the BC Act enacts the BAM. The BAM is made by order of the Minister under Section 6.7 of the BC Act and published on the NSW legislation website.
4. The BAM is established for the purposes of assessing the impacts of a proposal on threatened species, ecological communities, and their habitats including native vegetation. The BAM is also used to assess additional (prescribed) biodiversity impacts. 'Native vegetation' has the same meaning as in Section 60B of the LLS Act.

## 1.2 Biodiversity credits and classes

1. The BAM uses biodiversity credits to measure:
   a. the residual impacts of a proposal on biodiversity values
   b. gains in biodiversity values at biodiversity stewardship sites.
2. There are two broad classes of credits: ecosystem credits and species credits. The BAM determines the credit class that is required or created for certain types of impact or gain.
3. Each ecosystem credit is assigned up to seven attributes that are used to distinguish the type of biodiversity values represented by the credit and to determine whether a credit within a class is 'like' another credit.
4. Each species credit is assigned four attributes.
5. Matching of attributes is used to apply the 'like-for-like' rules and variation rules as set out in the BC Regulation.

## 1.3 Accredited person (assessor)

1. Biodiversity Assessment Reports (BARs), which set out the outcomes of an assessment, must be prepared by a person accredited under Section 6.10 of the BC Act. An accredited person is referred to as an assessor.
2. Assessors use the BAM to determine the impact on biodiversity for proposed development, activity, clearing or biodiversity certification, and the estimated gain in biodiversity values at proposed stewardship sites.
3. Assessors must use the Biodiversity Assessment Method Calculator (BAM-C) for the purpose of carrying out an assessment using the BAM. The BAM-C is an online computer program that supports the application of the BAM. The BAM-C allows assessors to enter field data for a proposal and applies the equations outlined in the BAM to determine the number and class of biodiversity credits required or created.
4. The BAM-C prepares a biodiversity credit report, which assessors must include in a BAR that is prepared for the consideration of the decision-maker.

## 1.4 Data and information used in the Biodiversity Assessment Method

1. The BAM-C contains relevant biodiversity data and information from the published databases listed in Subsection 1.4.1(1.). Assessors should refer to the published databases for additional information regarding plant community types (PCTs), and profiles and records for threatened species and threatened ecological communities (TECs), (hereafter referred to as threatened entities), and their habitat.

### 1.4.1 Published databases

1. When preparing a BAR, the assessor must use the following databases published by the NSW Department of Planning, Industry and Environment (the Department):
   a. BioNet Vegetation Classification (formerly known as the NSW Vegetation Information System Classification Database)
   b. BioNet Threatened Biodiversity Data Collection (TBDC, formerly known as the Threatened Species Profile Database)
   c. BioNet Atlas (formerly known as the NSW Wildlife Atlas).
2. The assessor must also use information in the:
   a. Directory of Important Wetlands in Australia
   b. BioNet NSW (Mitchell) Landscapes – Version 3.1, and
   c. NSW Interim Biogeographic Regions of Australia (IBRA region and subregion) – Version 7.

### 1.4.2 More appropriate local data

1. In some instances, the assessor may use more appropriate local data, rather than the information and datasets specified in Subsection 1.4.1, to prepare a BAR. The assessor must give the decision-maker the reasons these data better reflect local environmental conditions. The assessor may use the more appropriate local data if the decision-maker agrees (in writing).
2. The assessor may use local data from relevant published sources or appropriate local reference sites to develop a benchmark for a PCT (see Appendix A) to amend the reference data in the BAM-C for a proposal.
3. The assessor may use benchmark data in the BioNet Vegetation Classification that reflect seasonal or climatic variation in the benchmark values for a PCT as more appropriate local data.
4. After the data are amended, the BAM may be used to reassess the proposal.
5. The assessor must **not** use more appropriate local data to change the:
   a. sensitivity to loss class for a TEC, a PCT, or a threatened species or a component of its habitat
   b. sensitivity to gain class for a TEC, a PCT, or a threatened species or a component of its habitat
   c. biodiversity risk weighting for a TEC, a PCT, or a threatened species or a component of its habitat.

### 1.4.3 Updates to the BAM-C and databases

1. The assessor must use the BAM-C (described in Section 1.3) to assess the biodiversity values of the proposed subject land.
2. The published databases (Subsection 1.4.1) that are used in the BAM and the BAM-C are updated periodically with new information. These updates may include newly listed threatened species, TECs and changes to the BioNet Vegetation Classification.
3. Changes to the databases may require the Secretary of the Department or anyone authorised by the Secretary to issue an updated version of the BAM-C. The Secretary will notify assessors when an updated version of the BAM-C is available.



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## 1.5 Biodiversity values not assessed under the Biodiversity Assessment Method

1. The BAM does not assess biodiversity values for:
   a. marine mammals
   b. wandering seabirds
   c. biodiversity that is endemic to Lord Howe Island
   d. native vegetation and loss of habitat on category 1-exempt land (within the meaning of Part 5A of the LLS Act), other than the additional biodiversity impacts under clause 6.1 of the BC Regulation (referred to as prescribed impacts in the BAM).
2. The BC Act or the EP&A Act may require a separate assessment of the biodiversity values listed above and the impacts of a proposal on those values.

## 1.6 Structure of the Biodiversity Assessment Method

1. The BAM has three stages, several appendices supporting the stages, and a glossary.
2. **Stage 1** establishes a consistent approach to assessing the biodiversity values of land. It applies to any of the following types of proposals:
   a. development that requires consent under Part 4 of the EP&A Act
   b. an activity that requires approval under Part 5, Division 5.1 of the EP&A Act (where the proponent has opted-in to the BOS)
   c. development that requires approval under Part 5, Division 5.2, of the EP&A Act
   d. clearing that requires approval under Part 5A of the LLS Act, or a permit under the Vegetation SEPP
   e. biodiversity certification, in the case of an application for biodiversity certification under the BC Act
   f. a biodiversity stewardship site, in the case of an application for a biodiversity stewardship agreement under the BC Act.
3. **Stage 2** outlines the guidance and requirements to apply the hierarchy of avoid, minimise and offset for assessing direct, indirect or prescribed impacts on biodiversity values arising from the proposed development, activity, clearing or biodiversity certification. Stage 2 also provides guidance on the use of mitigation measures where there is uncertainty on the timing or extent of impacts. Stage 2 does not apply to proposed biodiversity stewardship sites.
4. **Stage 3** outlines the management requirements at a proposed biodiversity stewardship site and the likely improvement in biodiversity values that is predicted to occur over time. The predicted gain from the management actions determines the number of biodiversity credits that can be created at the biodiversity stewardship site.


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# Stage 1: Biodiversity assessment

## 2 Introduction to Stage 1

1. Stage 1 of the BAM establishes a consistent approach to assessing the biodiversity values on the subject land as follows:
   a. a development site that requires consent under Part 4 of the EP&A Act or approval under Part 5, Division 5.2 of the EP&A Act
   b. the site of an activity that requires approval under Part 5, Division 5.1 of the EP&A Act (where the proponent has opted-in to the BOS)
   c. a clearing site that requires approval under Part 5A of the LLS Act, or a permit under the Vegetation SEPP
   d. the biodiversity certification assessment area in an application for biodiversity certification under the BC Act
   e. land proposed to be managed under a biodiversity stewardship agreement under the BC Act.
2. The BAR must provide an introduction that sets out a brief description of the proposal.
3. For proposals other than an application for a biodiversity stewardship agreement, the introduction to the BAR must:
   a. Clearly identify the boundary of the subject land that shows the operational footprint and the
   b. construction footprint for any additional clearing associated with temporary/ancillary construction facilities and infrastructure, and
   c. For development proposal, indicate the threshold that triggered the requirement for the proposal to be assessed under the BOS.

### 2.1 Assessment of biodiversity values

1. Each chapter in Stage 1 outlines how the assessor must assess biodiversity values on the subject land:
   a. Chapter 3 describes how to assess the landscape context.
   b. Chapter 4 describes how to assess native vegetation, TECs and vegetation integrity.
   c. Chapter 5 and Chapter 6 describe how to assess the habitat suitability for threatened species and TECs (threatened entities), on the subject land including the assessment of prescribed impacts.

### 2.2 Streamlined assessment modules

1. The BAM contains three streamlined assessment modules that are set out in Appendices B, C and D. The streamlined assessment modules include specific requirements to assess the impacts on biodiversity values for the purpose of preparing a Biodiversity Development Assessment Report (BDAR). These streamlined assessment modules may be used where the proposal impacts on:
   a. scattered trees (Appendix B)
   b. a small area (Appendix C)



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c. planted native vegetation, where the planted native vegetation was planted for purposes such as street trees and other roadside plantings, windbreaks, landscaping in parks and gardens, and revegetation for environmental rehabilitation (Appendix D).

2. Appendices B, C and D set out the circumstances where each of the streamlined assessment modules can be used to assess a proposal and the specific assessment requirements.

3. The streamlined assessment modules for scattered trees and planted native vegetation may be used in conjunction with the full BAM to assess particular parts of the subject land under a single BDAR.

# 3 Establishing the site context

1. This chapter sets out the requirement to assess landscape features and to establish the site context of the subject land in the surrounding landscape.
2. The assessor must identify a range of landscape features that may occur on the subject land or within the surrounding assessment area. These features may contain biodiversity values that are important for:
   a. establishing the context of the subject land in relation to the surrounding area
   b. identifying the likely habitat suitability on the subject land for threatened entities.
3. For proposals assessed using the streamlined assessment modules described in Section 2.2, the assessor must identify the Interim Biogeographic Regionalisation for Australia (IBRA) bioregion and the IBRA subregion, and any other landscape features relevant to the proposal.

## 3.1 Identify landscape features

### 3.1.1 Prepare a Site Map

1. The assessor must prepare a Site Map based on digital aerial photography (such as ADS40 imagery) or the best available imagery, showing (at a recommended scale of 1:1000 or finer):
   a. the boundary of the subject land
   b. the cadastre boundaries within the subject land
   c. landscape features identified in Subsection 3.1.3.

### 3.1.2 Prepare a Location Map

1. The assessor must prepare a Location Map based on digital aerial photography (such as ADS40 imagery) or the best available imagery, showing (at a recommended scale of 1:1000 or finer):
   a. the boundary of the subject land
   b. the assessment area, which includes the subject land and a 1500 m buffer surrounding the outside edge of the boundary of the subject land **or** 500 m along each side of the centre line of a linear-shaped proposal. The assessor must establish the assessment area using GIS software
   c. landscape features identified in Subsection 3.1.3
   d. additional relevant detail, such as local government area boundaries or other base data relevant at this scale.

### 3.1.3 Identify landscape features

1. All the following landscape features must be included on the Site and Location maps.

**IBRA bioregions and IBRA subregions**

2. The IBRA bioregion and IBRA subregion inform the identification of PCTs and benchmarks in Chapter 4, and habitat suitability for threatened species in Chapter 5. Note that for linear proposals that cross multiple IBRA subregions, the assessment of habitat suitability will be required in each IBRA subregion in accordance with Section 5.2.



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**Rivers, streams, estuaries and wetlands**

3. The assessor must map rivers, streams, estuaries, wetlands on, adjacent to, and downstream of, the subject land and within the assessment area.
4. The assessor must consider the impacts of all proposals (except biodiversity stewardship sites) on:
    a. **rivers, streams and estuaries** (classified by stream order and including riparian buffers; see Appendix E)
    b. **wetlands** including important wetlands (including riparian buffers; see Appendix E).

**Habitat connectivity**

5. For all proposals (except biodiversity stewardship sites), the assessor must identify **the connectivity of different areas of habitat** that may serve as movement corridors for threatened species across their range.
6. For development proposing the construction of wind turbines, the **flyways for migratory species** that pass over the subject land must be mapped and shown on the Location Map.

**Karst, caves, crevices, cliffs, rocks and other geological features of significance**

7. The assessor must identify and map areas containing karst, caves, crevices, cliffs, rocks or other geological features of significance.

**Areas of outstanding biodiversity value**

8. The assessor must identify and map any areas of outstanding biodiversity value that have been identified under the BC Act.
9. Areas of outstanding biodiversity value must be shown on the management plan required in Section 11.2 for a biodiversity stewardship site.

**NSW (Mitchell) landscape**

10. Identifying the NSW (Mitchell) landscape is required for assessing the site context of the subject land for all types of proposals, except for the following:
    a. assessment of scattered trees under the streamlined assessment module in Appendix B
    b. assessment of small areas under the streamlined assessment module in Appendix C
    c. threatened species habitat assessed under the streamlined assessment module for planted native vegetation in Appendix D (see D.2)

**Additional features**

11. Additional features that are required to be assessed according to any applicable Secretary's Environmental Assessment Requirements must be mapped.
12. For vegetation clearing proposals (that require approval under Part 5A of the LLS Act, or a permit under the Vegetation SEPP), the assessor must identify and show:
    a. all soil hazard features that occur on the subject land on the Site Map
    b. any other soil hazard features that occur within the assessment area on the Location Map.
13. The assessor must map and show all areas of native vegetation cover within the assessment area on the Location Map, including all areas of planted native vegetation identified in accordance with Appendix D.

## 3.2 Assess native vegetation cover

1. The assessor must assess native vegetation cover on the subject land in relation to native vegetation cover across a broader area. This feature is later used (in conjunction with patch size, Subsection 4.3.2) to assess habitat suitability for threatened species (see Section 5.2).
2. For all proposals, the assessor must identify the extent of woody and non-woody native vegetation cover within the assessment area (see Subsection 3.1.2).
3. The percentage of native vegetation cover in the assessment area is assigned to one of the following classes:
   a. 0–10%
   b. >10–30%
   c. >30–70%
   d. >70%.
4. For a proposal that only uses the streamlined assessment module for clearing scattered trees (Appendix B) or planted native vegetation (Appendix D), the assessor does not need to assess the percent of native vegetation cover.

# 4 Assessing native vegetation, threatened ecological communities and vegetation integrity

1. This chapter describes the requirements to assess native vegetation, identify PCTs and TECs and determine the vegetation integrity condition score.

## 4.1 Map native vegetation extent on the subject land

1. The native vegetation extent on the subject land includes all areas of native vegetation; this extends to native ground cover and tree canopy cover.
2. The assessor must map the extent of native vegetation cover on the subject land, using:
   a. digital aerial photography (such as ADS40 imagery) or the best available imagery of the subject land
   b. a capture scale consistent with the Site Map and the Location Map (recommended scale of 1:1000 or finer). Where the map scale exceeds 1:10,000, the Site Map should be split into separate maps that capture the entire area.
3. The assessor may undertake a field assessment on the subject land or use existing maps of native vegetation in the area, provided such maps identify vegetation as a recognised PCT, are based on field survey and are of an appropriate scale.

### 4.1.1 Changes to the mapped native vegetation extent

1. The assessor must identify differences between the actual native vegetation extent and that shown in the imagery. Any differences must be described in the BAR. The assessor can update the extent of native vegetation shown in the Site Map and confirm the changes following a field survey.

### 4.1.2 Areas that are not native vegetation

1. Any part of the subject land that does not contain native vegetation does not need to be assessed under this chapter, **unless** the land is:
   a. proposed for restoration as part of a biodiversity stewardship site (see Stage 3), or
   b. assessed as habitat for threatened species according to Chapter 5.
2. All parts of the subject land that do not contain native vegetation must be clearly shown on the Site Map. Justification as to why these areas do not support **any** native vegetation must be provided in the BAR.

## 4.2 Identify and map plant community types and ecological communities

1. The assessor must identify and map the distribution of PCTs, or the most likely PCTs, and all TECs on the subject land. The identification must be in accordance with the NSW PCT classification as described in the BioNet Vegetation Classification. The identification of TECs must be consistent with the Threatened Species Scientific Committee Final Determination for the TEC. Information that can support the identification of PCTs and TECs can be found on the:



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a. BioNet Vegetation Classification database, which describes how to identify PCTs and TECs as per the NSW PCT classification, and details each PCT and its geographic distribution
b. Threatened biodiversity profile search webpage, which describes TECs.

2. The assessor must identify the most likely PCTs where vegetation on the subject land, or on part of the subject land:
   a. is missing structural layers, or
   b. has no distinct linear boundary to determine differences between PCTs on the subject land, or
   c. includes planted native vegetation (unless it is planted native vegetation eligible to be assessed in accordance with Appendix D).
3. Assessors must not identify native vegetation as a derived PCT in the BioNet Vegetation Classification. Assessors must identify the original PCT from which the derived PCT has developed, e.g. for the derived PCT, shrubby mid-storey in an open woodland, the original PCT is open woodland.
4. The assessor should review any existing information on native vegetation that is relevant to the subject land and land within the 1500 m buffer area. This includes:
   a. survey data or individual species records that are held in the Flora Survey (BioNet), or
   b. existing maps of native vegetation in the area such as those held by the Department, or a local government authority, or
   c. information in ecological reports, soil surveys or previous native vegetation surveys that is relevant to the subject land.
5. The map of PCTs used in the BAR must delineate the distribution of the PCTs on the subject land based on the data collected in Section 4.1, Section 4.2 and Subsection 4.2.1.

### 4.2.1 Perform a plot-based vegetation survey

1. Using the information from Section 4.1, the assessor must perform a plot-based vegetation survey of the subject land to identify the most likely PCTs on the subject land (Box 1). The survey must be stratified and targeted to assess the expected environmental variation and address any areas with gaps in existing mapping and information.

**Box 1 Plot-based floristic vegetation survey**

The plot-based floristic vegetation survey is based on a 20 m × 20 m plot (or 400 $m^2$ equivalent for linear areas). The assessor must assess the plot for the information contained in Table 1 and record these data in the BAR.

**Requirements for species names**

2. The full species name (*Genus species*) must be recorded for all native and exotic species, unless insufficient diagnostic plant material is present. In this case, the genus name followed by a species number must be used.



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**PCT identification**

3. The PCT must be identified using the data collected in Section 4.1, Section 4.2 and Subsection 4.2.1.
4. The map of PCTs used in the BAR must delineate the distribution of the PCTs on the subject land based on the outcomes of the plot-based floristic vegetation survey.
5. The assessor must also record the estimated extent to which the PCT has been cleared, using data from the BioNet Vegetation Classification. This is automatically populated in the BAM-C.
6. Floristic vegetation survey plots may also be used to support the vegetation integrity plots (see Subsection 4.3.3). When they are also used for vegetation integrity, the assessor must assign each native plant species recorded in the plot to the growth form group identified for that species published on the BAM-C webpage.

**Table 1 Vegetation survey data collected on the subject land**

| Attribute | Survey requirement |
|---|---|
| Growth form | Growth form for each recorded native species |
| Species name | Scientific name of each native and exotic species |
| Cover | Estimate the foliage cover of each native and exotic species within the boundaries of the plot including all attached plant material, alive or dead, rooted in or overhanging the plot. Cover should be recorded:<br>• in decimals if less than 1% (e.g. 0.1, 0.2)<br>• in whole numbers up to 5% (e.g. 1, 2, 3)<br>• to the nearest 5% if >5% cover (e.g. 5, 10, 15, 20, 25). |
| Abundance rating | Count (when ≤10) or estimate (when >10) the number of individuals of each native and exotic species rooted within the plot. Record abundance as:<br>• counts of 1, 2, 3…<br>• estimates of 10, 20, 30…<br>• 100, 200, 300…<br>• 1000, 2000, 3000… |

### 4.2.2 Identify threatened ecological communities

1. The assessor must identify any TECs that are associated with a PCT, or the most likely PCTs.
2. The BioNet Vegetation Classification indicates where a PCT may be associated with a TEC. The assessor must also consider information in the determination made by the Threatened Species Scientific Committee to list the TEC, including the bioregions referenced in the determination. This information must be used in conjunction with a field assessment to determine the presence of a TEC on the subject land.
3. The assessor must map the distribution of all TECs on the subject land and show these on the Site Map.

### 4.2.3 Biodiversity Assessment Report requirements for identification of plant community types and ecological communities

1. For the purpose of Section 4.2, a BAR must include the following:
   a. the review of existing information on native vegetation relevant to the subject land, including references to previous vegetation maps
   b. the maps and associated documentation where these are used to determine the PCT, in place of field survey data collected in accordance with Section 4.1(3.) and Section 4.2(4.)
   c. a description of the systematic field-based floristic vegetation survey undertaken using accepted methods
   d. a description of how the systematic survey effort of the subject land has been carried out to sample across the expected environmental variation
   e. a description of how the survey effort was targeted to fill gaps in the existing mapping and site information.
2. The assessor must provide information in the BAR to support the methods used to identify the PCT, or the likely PCTs, on the subject land including:
   a. a quantitative analysis of existing and new survey data, and matching the outputs to PCTs in the Flora Survey module of the BioNet Vegetation Classification.
   b. any information sources set out in Section 4.2
   c. a map showing the distribution of the PCTs on the subject land.

## 4.3 Map vegetation zones and assess vegetation integrity (vegetation condition)

### 4.3.1 Map vegetation zones

1. The assessor must:
   a. use the PCT map from Section 4.2 to identify and map the area of each PCT into a vegetation zone on the subject land
   b. delineate areas of each PCT that are in different broad condition states into separate vegetation zones. Disturbance to growth form groups for tree, shrub and ground cover or extent of exotics (or combinations of these) can be used to identify areas of similar condition.
2. A vegetation zone may have discontinuous (fragmented) patches of vegetation (Subsection 4.3.2(1.)), provided the vegetation within the discontinuous areas are the same PCT and in a similar condition state.

### 4.3.2 Assess the patch size for a vegetation zone

1. A patch is an area of native vegetation that occurs on the subject land and includes native vegetation that has a gap of less than 100 m from the next area of native vegetation (or ≤ 30 m for non-woody ecosystems). A patch may extend onto adjoining land.
2. For each vegetation zone, the assessor must determine the patch size in hectares and assign it to one of the following classes:
   a. <5 ha
   b. 5–<25 ha
   c. 25–<100 ha
   d. ≥100 ha.

3. The patch size class is used to assess habitat suitability on the subject land for threatened species in Subsection 5.2.1.
4. The assessor may assign more than one patch size class to the vegetation zone if **both of the following apply**:
    a. a vegetation zone comprises two or more discontinuous areas of native vegetation, and
    b. the areas of discontinuous native vegetation have more than one patch size class.

### 4.3.3 Assess vegetation integrity (vegetation condition)

In this section, 'the map' means the map of vegetation zones on the subject land prepared under Subsection 4.3.1.

1. Vegetation integrity is a metric-based assessment used to measure the condition of native vegetation against a benchmark, based on survey data collected by the assessor.
2. The assessor must survey each vegetation zone identified on the map to obtain a quantitative measure of the **composition**, **structure** and **function** attributes listed in Table 2 for PCTs classified as any of the following vegetation formations:
    a. rainforests
    b. wet sclerophyll forests
    c. dry sclerophyll forests
    d. forested wetlands
    e. grassy woodlands
    f. semi-arid woodlands
    g. heathlands with trees: Wallum Sand Heaths (NSW031), Sydney Coastal Heaths (NSW032), Northern Montane Heaths (NSW033) and Sydney Montane Heaths (NSW034).
3. In addition to the attributes set out in Table 2, the assessor must also assess the presence of hollow bearing trees in each vegetation zone for PCTs classified in formations listed in Subsection 4.3.3(2.) above.
4. For PCTs classified under the following vegetation formations, the assessor must survey each vegetation zone identified on the map to obtain a quantitative measure of the **composition** and **structure** attributes and the functional attribute, high threat weed cover, listed in Table 2:
    a. freshwater wetlands
    b. saline wetlands
    c. grasslands
    d. alpine complex
    e. arid shrublands
    f. heathlands without trees: Southern Montane Heaths (NSW035), South Coast Heaths (NSW065) and Coastal Headland Heaths (NSW070).
5. The assessor must assess the composition, structure and relevant function attributes listed in Table 2 for each vegetation zone against the benchmark data for the relevant PCT. The assessor must use benchmark data:
    a. from the BioNet Vegetation Classification, or
    b. obtained from local reference sites as per Appendix A, or
    c. from relevant published sources, including the Department's website, as per Appendix A.

**Table 2 Growth form groups and condition attributes used to assess the composition, structure and function components of vegetation integrity**

| Condition attributes used assess composition | Condition attributes used assess structure | Attributes used to assess function |
|---|---|---|
| Tree richness | Tree cover | Number of large trees |
| Shrub richness | Shrub cover | Tree regeneration |
| Grass and grass-like richness | Grass and grass-like cover | Tree stem size classes |
| Forb richness | Forb cover | Total length of fallen logs |
| Fern richness | Fern cover | Litter cover |
| Other richness | Other cover | High threat weed cover |

### 4.3.4 Sample vegetation integrity survey plots

#### Required number of plots

1. Table 3 shows the minimum number of plots that must be sampled by the assessor for each vegetation zone. Relevant attributes from the plot-based floristic vegetation survey data from Subsection 4.2.1, which was established to identify a PCT, may be used to meet the minimum number of plots that must be sampled for a vegetation zone.
2. If the broad condition state of the vegetation varies across the zone, additional plots may be needed to ensure a representative sample is taken for the vegetation zone.

**Table 3 Minimum number of plots required per zone area**

| Vegetation zone area (ha) | Minimum number of plots |
|---|---|
| <2 | 1 plot |
| >2–5 | 2 plots |
| >5–20 | 3 plots |
| >20–50 | 4 plots |
| >50–100 | 5 plots |
| >100–250 | 6 plots |
| >250–1000 | 7 plots; more plots may be needed if the condition of the vegetation is variable across the zone |
| >1000 | 8 plots; more plots may be needed if the condition of the vegetation is variable across the zone |

#### Establish the vegetation integrity survey plots

3. Acceptable methods that can be used by an assessor to locate plots within vegetation zones to provide a representative assessment of vegetation integrity of the vegetation zone include:
   a. random location of waypoints and bearings, and establishing plots at all or some of these waypoints
   b. walking a random distance into the vegetation zone and establishing the plot on a random bearing
   c. locating plots to ensure they capture attributes relevant to that vegetation zone (e.g. see Subsection 4.3.4(5.)).

4. Plot boundaries should not be established within 50 m of ecotones, vehicle tracks and their edges, or other disturbed areas that are easily distinguishable from the broad condition state of the vegetation zone.
5. The assessor must ensure that all function attributes relevant to the PCT, including the presence of any hollow bearing trees, are captured within a minimum of one plot.
6. When combining discontinuous areas of vegetation into a single vegetation zone, the assessor must not establish the survey plots within a single area. Survey plots should sample across the separate areas.
7. The assessor must establish survey plots around a central 50 m midline as follows:
   a. one 400 $m^2$ plot (standard 20 m × 20 m), to assess all the composition and structure attributes set out in Table 2
   b. one 1000 $m^2$ (standard 20 m × 50 m) plot, to assess the function attributes (number of large trees, stem size classes, tree regeneration and length of logs)
   c. five 1 $m^2$ subplots, to assess average litter cover (and other optional ground cover components) for the plot.

**Assess the presence of hollow bearing trees**

8. The assessor must assess the vegetation zone for the presence of hollow bearing trees.
9. The presence of hollow bearing trees in a vegetation zone is used in the habitat suitability assessment for candidate threatened species in Chapter 5. In assessing the presence of hollow bearing trees within a vegetation zone, the assessor must consider identifying specific types of hollows (e.g. dimensions, height above ground).
10. The presence of hollow bearing trees is also used to identify the credit class for ecosystem credits in Chapter 10.
11. Where hollow bearing trees are present within a vegetation zone, the assessor must include a hollow bearing tree in at least one plot for that zone.
12. Hollow bearing trees include living and dead native species allocated to both the tree and shrub growth form groups. Hollow bearing trees that are rooted within the plot with hollows that are visible from the ground must be included.

**Assess composition**

13. The assessor must assess composition within the 400 $m^2$ plot.
14. To assess the composition, the assessor observes and records the number of native plant species (richness) within a plot for each growth form group shown in Table 2.
15. The assessor must assign a native plant species to a growth form group as defined in Appendix F. Allocation is based on the adult/mature growth form of the species. A list of native species by growth form is published on the BAM-C webpage.
16. The composition data to be recorded for each 400 $m^2$ condition plot are:
   a. full species name (*Genus species*) for the three dominant native species within each growth form group. Dominant native species are the native species that contribute most to the total cover of the growth form group
   b. genus name followed by species 1, species 2 and so on, or the full species name, where practicable, for all other species. 'Practicable' means that sufficient plant material is present to make a species-level identification, and the assessor has sufficient skills and knowledge to identify the species in the field
   c. whether each species is native, or high threat weed or non-high threat weed
   d. the growth form group to which each native species has been allocated.
17. The assessor must count the number of different native plant species recorded for each growth form group within each 400 $m^2$ condition plot.

### Assess vegetation structure

18. **Structure** is the assessment of the summed species foliage cover for each growth form group within the 400 $m^2$ survey plot boundary.

**Foliage cover** is the percentage of the plot covered by a vertical projection of all attached plant material, regardless of whether it appears alive or dead, of all individuals of a species. This includes leaves, stems, twigs, branchlets and branches, from forb, grass and grass-like species, and any canopy overhanging the plot, even if the stem is outside the plot.

19. The assessor must estimate the foliage cover for each native and exotic species present within the 400 $m^2$ plot. Foliage cover should be recorded:
    a. in decimals if less than 1% (e.g. 0.1, 0.2)
    b. in whole numbers up to 5% (e.g. 1, 2, 3)
    c. to the nearest 5% if >5% cover (e.g. 5, 10, 15).
20. The assessor must sum all the individual foliage cover estimates of all native plant species recorded within each growth form group in each 400 $m^2$ plot.
21. For a Biodiversity Stewardship Site Assessment Report (BSSAR), the assessor must estimate the foliage cover of each high threat weed species. Estimates of foliage cover for high threat weed species are required to assess the impact the presence of high threat weeds has on the future management of the vegetation (see Chapter 11 and Appendix G). This is not required for a BDAR or BCAR.

The following methods for recording foliage cover are not acceptable and will result in incorrect structure scores:

- Braun–Blanquet (or other) classes
- a transect point intercept method
- estimating projected foliage cover or canopy cover.

### Assess vegetation function

*Number of large trees, tree stem size classes and tree regeneration*

22. The assessor must determine the number of large trees, tree stem size classes and tree regeneration within the 1000 $m^2$ plot. Only native tree species are recorded for these attributes.
23. The tree stem size is measured at 1.3 m above ground height, referred to as 'diameter at breast height over bark' (DBH). Tree stem size classes include all species in the tree growth form group. DBH classes are (in centimetres):
    a. <5
    b. 5–9
    c. 10–19
    d. 20–29
    e. 30–49
    f. 50–79
    g. 80+.
24. Only living trees must be counted. For multi-stemmed trees, only the largest living stem is included in the count.

25. The **number of large trees** is a count of all living stems with a DBH equal to or greater than the large tree benchmark DBH for that PCT or vegetation class. For a multi-stemmed tree, at least one living stem must be equal to or greater than the large tree benchmark DBH.
26. The large tree benchmark sizes for a PCT or a vegetation class/IBRA are published in the BioNet Vegetation Classification database.
27. **Tree regeneration** is the presence of living trees from the tree growth form group with a maximum stem diameter of <5 cm regardless of height.
28. **Stem size classes** are the presence of living tree stems. Stem size classes identify the presence of living stems in each size class that is ≥5 cm DBH and less than the large tree benchmark size DBH for the PCT. The numbers of stem size classes for a PCT or a vegetation class/IBRA are published in the BioNet Vegetation Classification database.

*Fallen logs*

29. The assessor must record the length of fallen logs within the 1000 $m^2$ plot. The combined length of fallen logs from native and exotic species are recorded for this attribute.
30. The length of fallen logs is the total length in metres of all woody material greater than 10 cm in diameter that is dead and entirely or partly on the ground within the 1000 $m^2$ plot. If logs extend outside the plot, the assessor must record only the length of fallen logs within the plot.

*Litter cover*

31. Litter includes leaves, seeds, twigs, branchlets and branches (<10 cm in diameter). Litter from native and exotic species (combined) are recorded for this attribute. Litter cover is the average percentage ground cover of litter recorded from five 1 m × 1 m plots evenly located parallel to the central 50 m midline.
32. The assessor must include all plant material that is detached from a plant and forms part of the litter layer on the ground surface. Litter cover is the two-dimensional litter layer in contact with the ground surface, including litter under the canopies of erect plants. Plant material that is not detached should be assessed as growth form foliage cover, regardless of whether it appears alive or dead.

## 4.4 Determine the vegetation integrity score

1. The assessor must use the composition, structure and function scores from the plot survey data to determine the vegetation integrity score for a vegetation zone (see Appendix H and the BAM-C).
2. The assessor must use Equations 16–24 from Appendix H and the BAM-C to determine the current score.

# 5 Assessing the habitat suitability for threatened species

1. This chapter describes how to assess the habitat suitability for threatened species including survey requirements and identifying the biodiversity risk weighting for a species.
2. Information from the TBDC is used to identify threatened species that require assessment for a proposal and support the assessment of habitat suitability. Some of this information, including the suite of species that require assessment for a proposal is accessed through the BAM-C. Assessors should also review additional information about a threatened species in BioNet (e.g. the profile of a threatened species), the TBDC, or from published, peer-reviewed literature, to inform aspects of the habitat suitability assessment (e.g. as evidence of microhabitats depended on by a species).
3. The assessor may use more appropriate local data (as per Subsection 1.4.2), instead of data from the TBDC, if approved by the decision-maker (in writing) or as part of the approval of the proposal. The reasons that justify the use of more appropriate local data must be detailed in the BAR.

## 5.1 Ecosystem credit species, species credit species and dual credit species

### 5.1.1 Species that can be predicted by habitat surrogates (ecosystem credit species)

1. Ecosystem credit species are threatened species whose occurrence can generally be predicted by vegetation surrogates and/or landscape features, or that have a low probability of detection using targeted surveys. The TBDC identifies the threatened species assessed for ecosystem credits. A targeted survey is not required to identify or confirm the presence of ecosystem credit species.
2. The assessor must identify the species assessed for ecosystem credits in conjunction with:
   a. information about the site context of the subject land (Section 1)
   b. information about PCTs and vegetation integrity attributes (Chapter 4)
   c. data from the TBDC.
3. Based on this information, the threatened species that can be predicted by habitat surrogates and assessed as part of the ecosystem credits for a proposal are automatically populated in the BAM-C.
4. The condition of the threatened species' habitat assessed for ecosystem credits is measured using the vegetation integrity score for each vegetation zone (Appendix H).
5. Species that require ecosystem credits are assessed according to Section 5.2, Step 1 and Step 2 (Subsections 5.2.1 and 5.2.2).

### 5.1.2 Species that cannot be predicted by habitat surrogates (species credit species)

1. Species credit species are threatened species for which vegetation surrogates and/or landscape features cannot reliably predict the likelihood of their occurrence or components of their habitat. These species are identified in the TBDC. A targeted survey or an expert report is required to confirm the presence of these species on the subject land. Alternatively, for a development, activity, clearing or biodiversity certification proposal only, the proponent may elect to assume the species is present. (This option must not be applied to proposed biodiversity stewardship sites).



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2. The assessor must identify the species assessed for species credits in conjunction with:
   a. information about the site context of the subject land (Section 1)
   b. information about PCTs and attributes (Chapter 4)
   c. data from the TBDC.
3. Based on this information, the threatened species identified to be assessed for species credits for a proposal are automatically populated in the BAM-C. In the BAM-C, these species are referred to as candidate species.

### 5.1.3 Species assessed for ecosystem credits and species credits (dual credit species)

1. In some circumstances the TBDC may identify a threatened species that requires assessment for ecosystem credits and species credits (referred to as dual credit species). For dual credit species, part of the habitat is assessed as a species credit (e.g. breeding habitat or land mapped on an important habitat map for a species). The remaining habitat components for the species are assessed as an ecosystem credit (e.g. foraging habitat).
2. Dual credit species are generally:
   a. highly mobile species that rely on particular habitat components for breeding, such as maternity caves for bats, tree hollows for some large forest owls or cockatoos, or
   b. species for which particular areas in the landscape are important for their survival, such as selected beaches for migratory shorebirds.

## 5.2 Assess habitat suitability for threatened species (ecosystem credit species and species credit species)

1. The assessor must use Subsections 5.2.1–5.2.6 to identify the habitat suitability for threatened species on the subject land.

### 5.2.1 Step 1: Identify threatened species for assessment

1. Step 1 identifies the threatened species that are likely to occur on or use the subject land and thereby predicts the species that require assessment. This step uses information from the TBDC (which is automatically populated in the BAM-C) and information collected from assessing the subject land in Chapters 3 and 4. The assessor can manually apply any relevant geographic limitations, which are based on information from the BioNet Atlas, and accessed through the Department's Threatened biodiversity profile search webpage (see Subsection 5.2.1(2.b.) below).
2. The assessor must use the following criteria to identify those threatened species that have or may have, suitable habitat on the subject land:
   a. the distribution of the species includes the IBRA subregion within which the subject land is mostly located
   b. the subject land is within any geographic limitations of the species distribution within the IBRA subregion. If no geographic limitations are listed for the species, then this step is not applicable
   c. the species is associated with any of the PCTs occurring within the subject land
   d. the native vegetation cover within the assessment area (Section 3.2) is equal to, or greater than, the minimum class needed for the species (unless the proposal is, or is part of, a linear-shaped development proposal)



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e. the patch size (associated with the relevant vegetation zone) is equal to, or greater than, the minimum specified for that species (see Subsection 4.3.2)

f. the species is identified as being assessed for ecosystem credits or species credits in the TBDC.

3. Not all of the criteria in (2.a–2.f.) are relevant to every species. A criterion is considered to be not relevant if the species' profile in the TBDC does not contain information for that criterion. For example, native vegetation cover (criterion d) and patch size (criterion e) are generally not relevant criteria for the assessment of threatened flora species.

   Note: Geographic limitations are not reported in the TBDC and instead are located on the threatened biodiversity profile webpage. Many threatened species do not have information on geographical limitations.

4. A threatened species is identified as requiring assessment if all the criteria relevant for the species in (2.a–2.f.) are met. Species that meet all the relevant criteria are automatically populated in the BAM-C to be assessed either for ecosystem credits or species credits.
5. If any one of the criteria (2.a–2.f) relevant to the threatened species is not met, the subject land should be considered as unsuitable habitat for that species. No further assessment is required for that species.
6. If any past surveys of the subject land have recorded the presence of a threatened species or it has been incidentally observed on site, the species must be assessed in accordance with Steps 2–6 below (Subsections 5.2.2–5.2.6), regardless of whether the relevant criteria in (2.) have been met.
7. If a vegetation zone covers more than one IBRA subregion, the IBRA subregion in which most of the proposal occurs must be used. For linear-shaped proposals, the assessor must assess the habitat suitability for each IBRA subregion separately.

### 5.2.2 Step 2: Assess the habitat constraints and vagrant species on the subject land

1. Where a threatened species meets all relevant criteria in Subsection 5.2.1(2.) or (6.), the assessor may evaluate the habitat constraints required by that species on the subject land, to further refine the list of threatened species for assessment.

   Note that dual credit species may have different habitat constraints for each credit class (e.g. habitat constraints for breeding habitat which is a species credit component). The assessor must use the habitat constraints identified for individual threatened species in the TBDC (and automatically populated in the BAM-C). If the TBDC does not list habitat constraints for the species, then this step is **not** applicable.

2. The assessor may consider that a threatened species is unlikely to occur on the subject land or in a vegetation zone if:
   a. the assessor determines that none of the habitat constraints for the species are present in a vegetation zone. No further assessment is required for that species in that vegetation zone. The assessor must record their reasoning for this determination in the BAR, or
   b. the assessor determines that none of the habitat constraints for the species are present on the entire subject land. No further assessment is required for that species. The assessor must record their reasoning for this determination in the BAR, or
   c. the species is a vagrant in the IBRA subregion. No further assessment is required. The assessor must record their reasoning for this determination in the BAR.
3. If the assessor determines that one or more of the habitat constraints is present on the subject land or in a vegetation zone, they must assess that threatened species further.

4. All remaining threatened species identified for the proposal in the BAM-C as:
    a. **ecosystem credit species** are considered likely to have suitable habitat on the subject land and must be assessed for the impacts of the proposal in Stage 2 (unless it is a proposed biodiversity stewardship site), including measures taken to avoid, minimise and mitigate impacts. These species are referred to as 'predicted species' in the BAM-C and the assessor must calculate ecosystem credits to offset any residual impacts
    b. **species credit species** are likely to have suitable habitat on the subject land. They are referred to as 'candidate species credit species' in the BAM-C and require further assessment in accordance with Step 3 below (Subsection 5.2.3).

### 5.2.3 Step 3: Further assessment of candidate species credit species

1. Further assessment of candidate species credit species is optional for a proposed biodiversity stewardship site; however, to create species credits for a proposed biodiversity stewardship site, Steps 3–6 must be undertaken.
2. A candidate species credit species is considered unlikely to occur on the subject land (or specific vegetation zones) if one of the following applies:
    a. After carrying out a field assessment:
        i. the assessor determines that microhabitats required by a species are absent from the subject land (or specific vegetation zone). The assessor must include a description of the microhabitats assessed as being required by the species in the BAR. This must be based on **evidence** such as published literature, or
        ii. the assessor determines that the habitat constraints or microhabitats are degraded to the point that the species is unlikely to use the subject land (or specific vegetation zones).
    b. An expert report (prepared as per Box 3) states that the species is unlikely to be present on the subject land or specific vegetation zones.
3. A candidate species credit species that does not have suitable habitat as per (2.a.) or (2.b.) does not require further assessment.
4. The assessor must provide their reasons for determining a candidate species credit species is unlikely to have suitable habitat on the subject land (or specific vegetation zones) in the BAR.

### 5.2.4 Step 4: Determine the presence of a candidate species credit species

1. The assessor must determine whether each remaining candidate species credit species is present on the subject land (or specific vegetation zone).
2. To determine presence, the assessor must:
    a. assume the species is present. This is permitted for all proposals except a proposed biodiversity stewardship site (assessors cannot assume a species is present on a biodiversity stewardship site), or
    b. conduct a threatened species survey, as per Section 5.3, or
    c. obtain an expert report, as per Box 3, or
    d. for candidate species including dual credit species, where the TBDC indicates that an important habitat map identifies the species credit component, the assessor must confirm whether the subject land is within an area identified on the important habitat map.



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3. A species must be assessed further in accordance with Steps 5 and 6 below (Subsections 5.2.5 and 5.2.6) if:
   a. the survey, expert report or important habitat map confirms that the species is present or is likely to use suitable habitat on the subject land or specific vegetation zones, or
   b. the species is assumed to be present (except for a proposed biodiversity stewardship site).
4. No further assessment is required for a species if the survey or expert report confirms that it is not present, or is unlikely to be present, on the subject land. The expert report must be included in the BAR.

### 5.2.5 Step 5: Determine the area or count, and location of suitable habitat for a species credit species (a species polygon)

1. A species polygon must be prepared in accordance with Box 2 for each species credit species if:
   a. a survey, expert report or important habitat map confirms that the species is present or is likely to use suitable habitat on the subject land, or
   b. the species is assumed to be present (except for a proposed biodiversity stewardship site).
2. For fauna species, and flora species assessed by area (as per the TBDC), the species polygon is used to measure the area of suitable habitat on the subject land.
3. For flora species assessed by a count of individuals (as per the TBDC), the targeted survey or expert report is used to estimate the number of individuals and their location (or the location of a group of individuals) on the subject land. The species polygon must be established by adding a 30 m buffer around the individuals or groups of individuals on the subject land.
4. Where a species is assumed to be present on the subject land (except for a proposed biodiversity stewardship site), the assessor may use:
   a. an expert report (as per Box 3) to determine the location and area of the species polygon. The expert report must be used to identify the area of habitat for the species, or for species assessed by count, to identify the likely location and estimated number of individuals, or
   b. the area supporting the habitat constraints relevant to the species in the vegetation zone(s) (from Subsection 5.2.2, e.g. small rocky outcrops) as the species polygon for species assessed by area, or
   c. the entire vegetation zone(s) the species is predicted to occur within (based on Steps 1–4 in Subsections 5.2.1–5.2.4) as the species polygon for species assessed by area (when no habitat constraints were identified in Subsections 5.2.1 and 5.2.2).
5. The species polygon for a species identified in Subsection 5.2.4(2.d.), must include the entire area mapped on the important habitat map that occurs within the subject land.
6. The boundary of the species polygon must be finalised when the species survey or expert report is completed.
7. For proposed biodiversity stewardship sites, the species polygon may be extended to incorporate new areas where appropriate management actions are used to restore suitable habitat for the species.
8. The BAR must include a description of the species, any habitat constraints or microhabitats associated with the species on the subject land and information used to create the species polygon.

**Box 2 Requirements for the species polygon**

The species polygon must:

- use the unit of measurement identified for that species in the TBDC to show the locations of individual flora species (see Subsection 5.2.5(3.)), or the area of suitable fauna/flora species habitat
- contain the habitat constraints or other suitable microhabitats or features associated with that species, and any buffer area identified for species in the TBDC
- include additional areas where management actions are proposed to be used to restore or create new areas of suitable habitat for a threatened species at a biodiversity stewardship site
- take into consideration information within the TBDC for the species in regard to any requirements on the size or shape of the species polygon, including the buffer area around breeding habitat features such as nest trees or caves
- be established by adding a 30 m buffer around the individuals or groups of individuals for flora species assessed by count on the subject land
- include the entire area of the subject land that is identified by an important habitat map for a species
- use GPS to confirm the location of the species polygon on the best available ortho-rectified aerial image of the subject land.

### 5.2.6 Step 6: Determine the habitat condition within the species polygon for species assessed by area

1. The assessor must determine the habitat condition within the species polygon by using the vegetation integrity score for each vegetation zone that is wholly or partially within the species polygon.
2. Different areas of the species polygon may have different habitat conditions if the species polygon encompasses multiple vegetation zones.
3. Where the species polygon contains an area of land that is not part of a vegetation zone, the assessor must not use a vegetation integrity score to determine the habitat condition of this area. Such areas can include non-native vegetation, caves, rock outcrops, rock faces or bridges. These features are assessed in Chapter 6 as prescribed biodiversity impacts for development, activity, clearing or biodiversity certification proposals.

## 5.3 Threatened species survey requirements

1. The assessor must perform a targeted species survey for all candidate species credit species identified as likely to occur on the subject land (based on Steps 1–3 in Subsections 5.2.1–5.2.3) unless:
   a. an expert report has been obtained for the species, prepared in accordance with Box 3, or
   b. the species is assumed to be present. A species can be assumed present on land for all proposals except biodiversity stewardship sites
   c. an important habitat map has been prepared for the threatened species.

2. If undertaking a species survey the assessor must:
   a. only survey during the time specified for that species in the TBDC, unless there is clear justification to vary the timing and the reasoning is documented in the BAR
   b. comply with the Department's threatened species survey guides published by the Secretary of the Department or anyone authorised by the Secretary
   c. use best-practice methods that can be replicated for repeat surveys, if the Department has not published any relevant guides. The TBDC often provides information on appropriate survey methods and effort.
3. The BAR must describe the timing, methods and effort used for a species survey.

### Box 3 Using expert reports instead of a survey

An expert report can be used instead of a species survey for all proposals to determine whether a species is present or not present on the subject land. Where an assessor assumes the species is present (except for a proposed biodiversity stewardship site), an expert report may be used to determine the location and area of fauna/flora habitat for the species polygon, and the estimated number of individuals of the flora species.

An expert report can only be prepared by a person who, in the opinion of the Secretary of the Department or anyone authorised by the Secretary, has specialised knowledge, which may be based on training, study or experience, to provide an expert opinion regarding the threatened species to which the report relates.

The Secretary of the Department or anyone authorised by the Secretary may publish a list of experts. The published list is not intended to be comprehensive. There may be conditions and limits on the expert listing (e.g. restrictions to certain regions of NSW). The Secretary or anyone authorised by the Secretary may remove people from the list if, in their opinion, they no longer have the specialist knowledge or behave unprofessionally. Before removing people from the list, the expert will be notified and given adequate opportunity to respond.

A person not on the published list of experts may be contracted to prepare an expert report in accordance with this section. However, the proposed expert must be approved by the Secretary of the Department or anyone authorised by the Secretary, before any BAR is submitted that relies on the outcomes of the expert report.

**Experts' credentials**

To demonstrate expert status, applicants must prepare a submission for review by the Secretary of the Department or anyone authorised by the Secretary, that addresses all the following criteria:

a. the expert's academic qualifications such as relevant degrees, post graduate qualifications

b. their history of experience in the ecological research, habitat assessment and survey method, for the relevant species

c. a resumé detailing projects pertaining to the survey of the relevant species (including the locations and dates of the work), their employers' names and periods of employment (where relevant) over the previous 10 years

d. peer-reviewed publications on the species or other evidence that the person is a well-known authority on the species to which the survey relates. The assessor cannot act as a referee for the proposed expert for this purpose.

Continued…

**Box 3 continued**

**The expert report**

An expert report can only be used instead of survey for species credit species. An expert report may be used to support the estimation of the area of suitable habitat or number of individual flora where the species is assumed to be present on a development site or in the biodiversity certification assessment area.

The expert report must document the information that was considered, and/or rejected as unsuitable, to reach the determination made in the expert report. The BAR must include the expert report.

An expert report must set out whether:

a. the species is unlikely to be present on or use habitat on the subject land, in which case, no further assessment of the species is required, or

b. the species is likely to be present on or use habitat on the subject land.

If the species is likely to be present on or use the subject land, the expert report must:

a. identify the species or population

b. justify the use of an expert report

c. justify the likelihood of occurrence of the species or population and prepare a species polygon as per Subsection 5.2.5

d. estimate the area of habitat (if the species is assessed by area) or the maximum number of individuals (if the species is assessed by count of individuals) on the subject land. Evidence such as a population estimate from a reference site could be used to justify this estimation

e. include the information considered in making this determination

f. state the expert's credentials.

## 5.4 Identify the biodiversity risk weighting for the species (proposals for development, activity, clearing and biodiversity certification)

1. The biodiversity risk weighting for a species is used in Chapter 10 to determine the number of species credits and ecosystem credits required to offset the residual impacts of all proposals except biodiversity stewardship sites. The biodiversity risk weighting is based on combining the sensitivity to loss and the sensitivity to gain, using the criteria in Appendix I. The TBDC details the sensitivity to loss, sensitivity to gain and biodiversity risk weighting for **species credit species** and sensitivity to gain for **ecosystem credit species**.
2. The biodiversity risk weighting is used to:
   a. determine the number of ecosystem credits required for impacts on TEC, threatened species habitat and PCTs. Here, the biodiversity risk weighting is based on the ecosystem credit species with the highest sensitivity to gain score and the sensitivity to loss score according to the threat status of a TEC. If the native vegetation is not a TEC, the sensitivity to loss score is based on the estimated percent cleared value of a PCT (see Appendix I).
   b. determine the required number of species credits. Here, the biodiversity risk weighting is based on the sensitivity to loss and the sensitivity to gain score for that species (see Appendix I).

# 6 Identifying prescribed additional biodiversity impacts

1. Prescribed additional biodiversity impacts (prescribed impacts) must be assessed as part of the BOS, as per clause 6.1 of the BC Regulation. Such prescribed impacts (including direct and indirect impacts) are impacts:
   a. on the habitat of threatened entities including:
      i. karst, caves, crevices, cliffs, rocks and other geological features of significance, or
      ii. human-made structures, or
      iii. non-native vegetation
   b. on areas connecting threatened species habitat, such as movement corridors
   c. that affect water quality, water bodies and hydrological processes that sustain threatened entities (including from subsidence or upsidence from underground mining)
   d. on threatened and protected animals from turbine strikes from a wind farm
   e. on threatened species or fauna that are part of a TEC from vehicle strikes.

## 6.1.1 Karst, caves, crevices, cliffs, rocks and other geological features of significance

1. If karst, caves, crevices, cliffs, rocks or other geological features of significance are on the site, the assessor must:
   a. prepare a list of threatened entities that use or are likely to use these habitat features on the subject land and within the surrounding assessment area
   b. describe how these features provide habitat for, or are used by, each threatened entity (based on published literature and other reliable sources).
2. If relevant, these features must be identified on the Site Map and the Location Map prepared in Chapter 3.

## 6.1.2 Human-made structures and non-native vegetation

1. If human-made structures (e.g. bridges, culverts, abandoned buildings) and non-native vegetation (e.g. camphor laurel trees) provide habitat for threatened species, the assessor must:
   a. provide a description of the type of human-made structure or non-native vegetation habitat
   b. prepare a list of threatened species that use these features as habitat
   c. describe how each threatened species could, or does, use the human-made structure or non-native vegetation as habitat (based on published literature and other reliable sources).
2. If relevant, these features must be identified on the Site Map and the Location Map prepared in Chapter 3.

## 6.1.3 Habitat connectivity

1. The assessor must use the map of native vegetation cover to identify areas of habitat connectivity between the subject land and the assessment area.
2. Where corridors or other areas of connectivity link habitat for threatened entities, the assessor must:



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a. prepare a list of threatened entities that are likely to use or are a part of the connectivity or corridor
b. describe the importance of the connectivity to threatened entities, particularly for maintaining movement that is crucial to the species' life cycle (based on published literature and other reliable sources).

3. If relevant, these features must be identified on the Site Map and the Location Map prepared in Chapter 3.

### 6.1.4 Water bodies, water quality and hydrological processes

1. Where water bodies or any hydrological processes that sustain threatened entities occur on the subject land, the assessor must:
   a. prepare a list of threatened entities that may use or depend on water bodies or hydrological processes for all or part of their life cycle, or
   b. prepare a list of threatened entities that will be, or are likely to be impacted by changes to existing water bodies or hydrological processes or the construction of a new water body
   c. describe the habitat provided for each threatened entity by the water body or hydrological process, including consideration of water quality, volume, flow paths and seasonal patterns (based on published literature and other reliable sources).
2. If relevant, these features must be identified on the Site Map and the Location Map prepared in Chapter 3.

### 6.1.5 Wind farm developments

1. For a wind farm development, the assessor must identify a list of **protected animals** that may use the development site as a flyway or migration route, including:
   a. resident threatened aerial species
   b. resident raptor species
   c. nomadic and migratory species that are likely to fly over the proposed development site.
2. For the species identified above, the assessor must perform a targeted survey:
   a. using appropriate methods as per Section 5.3
   b. using methods that measure movement of a species (e.g. ultrasonic bat detectors on monitoring masts or other structures of suitable height)
   c. at times of the year appropriate for identifying the species
   d. as part of an ongoing monitoring program post development approval, and/or
   e. in accordance with any guide published by the Department for this purpose.
3. The technique, effort and timing of targeted surveys for each species must be documented and justified in the BAR.
4. Based on the outcomes of the targeted surveys, the assessor must:
   a. predict and map the habitual flight paths for nomadic and migratory species likely to fly over the proposed development site on the Site Map and Location Map
   b. map the likely habitat for resident threatened aerial and raptor species on the Site Map.

### 6.1.6 Vehicle strikes

1. Where the proposal may result in vehicle strike on threatened fauna, or animals that are part of a TEC, the assessor must:
   a. identify potential impact locations on the Site Map, and
   b. prepare a list of threatened fauna or animals that are part of a TEC at risk of vehicle strike.

# Stage 2: Impact assessment (biodiversity values and prescribed impacts)

## 7 Avoiding or minimising impacts on biodiversity values

1. Stage 2 provides guidance and outlines requirements to apply the hierarchy of avoid, minimise and offset for assessing direct, indirect or prescribed impacts on biodiversity values. Stage 2 also provides guidance on the use of mitigation measures where there is uncertainty on the timing or extent of impacts.
2. Stage 2 is used to assess the direct impacts of the proposal on the subject land and any indirect or prescribed impacts on threatened ecological communities, threatened species and their habitat.
3. Stage 2 is also used to determine the number and class of biodiversity credits that are required to offset the residual impacts on biodiversity values.
4. Stage 2 does not apply to proposed biodiversity stewardship sites or Biodiversity Stewardship Site Assessment Reports (BSSARs).
5. BDARs and BCARs document the combined outcomes of Stages 1 and 2. The BDAR or BCAR must contain the matters in Appendix K (or Appendix L for assessments that used a streamlined assessment module).

### 7.1 Avoid or minimise direct and indirect impacts when planning the proposal

1. This chapter outlines strategies and actions that may be taken to avoid or minimise impacts on biodiversity values during proposal planning.

#### 7.1.1 Locate the proposal to avoid or minimise direct and indirect impacts on native vegetation, threatened species, threatened ecological communities and their habitat

1. Knowledge of biodiversity values should inform decisions about the location of the proposal. The initial assessment of biodiversity values from Stage 1 may be used to inform the early planning of the route or location of a proposal.
2. Selecting a final proposal location may be an iterative process. Decisions may need to be revisited after all field surveys have been completed.
3. Impacts from clearing native vegetation and threatened species habitat can be avoided or minimised by locating the proposal in areas:
    a. lacking biodiversity values
    b. where the native vegetation or threatened species habitat is in the poorest condition (i.e. areas that have a low vegetation integrity score)
    c. that avoid habitat for species with a high biodiversity risk weighting or land mapped on the important habitat map, or native vegetation that is a TEC or a highly cleared PCT.
    d. outside of the buffer area around breeding habitat features such as nest trees or caves.

4. When selecting a proposal's location, all of the following should be analysed. Justification for the decisions in determining the final location must be based on consideration of:
    a. alternative modes or technologies that would avoid or minimise impacts on biodiversity values
    b. alternative routes that would avoid or minimise impacts on biodiversity values
    c. alternative locations that would avoid or minimise impacts on biodiversity values
    d. alternative sites within a property on which the proposal is located that would avoid or minimise impacts on biodiversity values.
5. The proposal may also list and map site constraints, such as:
    a. bushfire protection requirements, including clearing for asset protection zones
    b. flood planning levels
    c. servicing constraints.
6. In the BDAR or BCAR, the assessor must document and justify any actions taken to avoid or minimise impacts through careful location of the proposal.

### 7.1.2 Design the proposal to avoid or minimise direct and indirect impacts on native vegetation, threatened species, threatened ecological communities and their habitat

1. The BDAR or BCAR must document the reasonable measures taken by the proponent to avoid or minimise clearing of native vegetation and threatened species habitat during proposal design, including placement of temporary and permanent ancillary construction and maintenance facilities. The types of measures that can be used to demonstrate this include:
    a. reducing the proposal's clearing footprint by minimising the number and type of facilities
    b. locating ancillary facilities in areas that have no biodiversity values
    c. locating ancillary facilities in areas where the native vegetation or threatened species habitat is in the poorest condition (i.e. areas with the lowest vegetation integrity scores)
    d. locating ancillary facilities in areas that avoid habitat for species and vegetation that has a high threat status (e.g. an endangered ecological community (EEC) or critically endangered ecological community (CEEC) or is an entity at risk of a serious and irreversible impact (SAII)
    e. actions and activities that provide for rehabilitation, ecological restoration and/or ongoing maintenance of retained areas of native vegetation, threatened species, threatened ecological communities and their habitat on the subject land.
2. The BDAR or BCAR must document and justify efforts to avoid or minimise impacts through design.



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## 7.2 Avoid or minimise prescribed impacts when planning the proposal

1. The timing and extent of a prescribed impact on the habitat of threatened entities can be difficult to assess and adequately offset through the provision of biodiversity credits. Prescribed impacts may occur on habitat features that are not native vegetation, e.g. caves, rocky outcrops and flyways. Because these types of features cannot be readily replaced or offset, it is important that measures to avoid or minimise impacts are undertaken and are clearly documented in the BDAR or BCAR.

### 7.2.1 Locate the proposal to avoid or minimise prescribed biodiversity impacts

1. To avoid or minimise prescribed biodiversity impacts, the proponent must consider how to:
    a. locate surface works to avoid direct impacts on the habitat features identified in Chapter 6
    b. locate subsurface works, in both the horizontal and vertical planes, to avoid and minimise operations beneath the habitat features identified in Chapter 6. For example, locating longwall panels away from geological features of significance, groundwater-dependent plant communities and their supporting aquifers
    c. locate the proposal to avoid severing or interfering with corridors connecting different areas of habitat and migratory flight paths, to important habitat or local movement pathways
    d. optimise the proposal layout to minimise interactions with threatened entities; for example, design a wind farm that has:
        i. 100 m turbine-free buffers around features that attract and support aerial species, such as forest edges, riparian corridors, wetlands, ridgetops and gullies
        ii. turbine-free corridors in zones of regular movement for species of concern, to avoid a barrier effect
    e. locate the proposal to avoid impacts on water bodies or hydrological processes.
2. When locating a proposal, the following need to be analysed and justification should be provided for each alternative selected:
    a. alternative modes or technologies that would avoid or minimise prescribed impacts
    b. alternative routes that would avoid or minimise prescribed impacts
    c. alternative locations that would avoid or minimise prescribed impacts
    d. alternative sites within a property on which the proposal is located that would avoid or minimise prescribed impacts.
3. Justifications for a proposal's location should identify any other site constraints that the proponent has considered in determining the location and design of the proposal, such as:
    a. bushfire protection requirements, including clearing for asset protection zones
    b. flood planning levels
    c. servicing constraints.
4. The assessor must document and justify in the BDAR or BCAR all efforts to avoid, or the reasonable measures proposed to minimise, prescribed impacts when choosing the proposal's location.


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### 7.2.2 Design the proposal to avoid or minimise prescribed impacts

1. Design measures that can avoid or minimise prescribed impacts include:
   a. engineering solutions, such as proven techniques to:
      i. minimise fracturing of bedrock underlying features of geological significance, or groundwater-dependent communities and their supporting aquifers
      ii. restore connectivity and movement corridors
   b. design elements that minimise interactions with threatened entities, such as:
      i. designing turbines to dissuade perching and minimise the diameter of the rotor swept area
      ii. designing fencing to prevent animal entry to transport corridors
      iii. providing vegetated buffers rehabilitated with native species
   c. maintaining environmental processes that are critical to the formation and persistence of habitat features not associated with native vegetation
   d. maintaining hydrological processes that sustain threatened entities
   e. controlling the quality of water released from the site, to avoid or minimise downstream impacts on threatened entities.
2. The proposed measures must be evidence-based and directed towards the threatened entities identified in Chapter 6. The BDAR or BCAR must document the designs that are proposed to avoid or minimise prescribed impacts.



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# 8 Assessing the impacts of the proposal on biodiversity values

1. This chapter sets out requirements to assess the impacts of the proposal on biodiversity values including:
   a. direct and relevant indirect impacts on native vegetation, TECs, threatened species and their habitat
   b. prescribed impacts on TECs, threatened species and their habitat, and other protected entities in relation to wind farm developments.
2. It also provides guidance on management strategies that are aimed at mitigating prescribed impacts.

## 8.1 Assess direct impacts on native vegetation, threatened ecological communities, threatened species and their habitat

1. The assessor must determine the direct impacts on threatened entities and their habitat.
2. The BDAR or BCAR must include an assessment of the impacts of the proposal on threatened entities and their habitat, and describe the directs impacts of the proposal on native vegetation, TECs and threatened species habitat that were identified on the subject land in accordance with Chapters 4 and 5.
3. For any entity at risk of a serious and irreversible impact (SAII), the BDAR or BCAR must include the extra information set out in Section 9.1.
4. The assessor must determine the impacts of the proposal:
   a. using information collected in Stage 1
   b. based on the final boundary of the proposal, considering the measures taken to avoid or minimise impacts, as described in Chapter 7, and
   c. considering the spatial and temporal extent of the impact.

### 8.1.1 Calculate the change in the vegetation integrity score for direct impacts on native vegetation, threatened ecological communities, threatened species and their habitat

1. For each vegetation zone the assessor must estimate the future value of:
   a. each growth form group used to assess composition, and determine the composition condition score in Appendix H
   b. each growth form group used to assess structure, and determine the structure condition score in Appendix H
   c. each attribute used to assess function, and determine the function condition score in Appendix H.
2. The future value of the attributes may be amended to reflect the impacts from partially clearing a vegetation zone, including areas such as asset protection zones and easements. The assessor must map these areas of the vegetation zone as a separate management zone and refer to these areas in the BDAR or BCAR. The BDAR or BCAR must specify how the remaining attributes will be maintained. If it is likely they will continue to degrade, full loss should be assumed. The future value of an attribute must not be higher than the current observed value for that attribute.
3. The future value for each attribute must be 0 when a proposal will clear that attribute or all the vegetation in the development footprint, or equivalent area for other types of proposals on the subject land.


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4. Using the future value for each attribute, the assessor must use the BAM-C to apply Equations 16–22 and Equations 25–26 in Appendix H to determine the future vegetation integrity score for each vegetation zone and/or management zone.
5. The change (loss) in the vegetation integrity score is a measure of the direct impact on a TEC/PCT and threatened species habitat. It is the difference between the current vegetation integrity score determined before the development, activity, clearing or biodiversity certification takes place and the future vegetation integrity score determined after the assessor accounts for the impacts from the proposal. The assessor must use the BAM-C to apply Equation 27 in Appendix H to determine the change in vegetation integrity score for each vegetation zone.
6. For threatened species assessed by area, the assessor must use the change (loss) in the vegetation integrity score of each vegetation zone in the species polygon to measure the direct impact on the habitat condition for the species. The change in the vegetation integrity score across the area of habitat within a species polygon is used in Subsection 10.1.3 to determine the offset requirement for the species.
7. For threatened species assessed by count the assessor must measure the direct impact on individual flora (defined by the species polygon as per Subsection 5.2.5), using the number of individuals of the target species in the species polygon. The number of individuals directly impacted within a species polygon is used in Subsection 10.1.3 to determine the offset requirement for the species.

## 8.2 Assess indirect impacts on native vegetation, threatened ecological communities, threatened species and their habitat

1. The BDAR or BCAR must include an assessment of the indirect impacts of the proposal on native vegetation, threatened entities and their habitat, and describe:
   a. the nature, extent, frequency, duration and timing of indirect impacts of the proposal:
      i. during construction
      ii. during operation
      iii. arising from a change in land-use patterns
   b. the consequences of indirect impacts on biodiversity values
   c. any limitations to data, assumptions and predictions about impacts on biodiversity.
2. The assessor must describe and assess the indirect impacts of the proposal on TECs/PCTs and/or threatened species and their habitat, beyond the development footprint, including but not limited to:
   a. inadvertent impacts on adjacent habitat or vegetation
   b. reduced viability of adjacent habitat due to edge effects
   c. reduced viability of adjacent habitat due to noise, dust or light spill
   d. transport of weeds and pathogens from the site to adjacent vegetation
   e. increased risk of starvation or exposure, and loss of shade or shelter
   f. loss of breeding habitat
   g. trampling of threatened flora species
   h. inhibition of nitrogen fixation and increased soil salinity
   i. fertiliser drift
   j. rubbish dumping
   k. wood collection
   l. removal and disturbance of rocks, including bush rock


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m. increase in predators
n. increase in pest animal populations
o. changed fire regimes
p. disturbance to specialist breeding and foraging habitat (e.g. beach nesting for shorebirds).

3. The assessment of indirect impacts must:
   a. describe the nature, extent and duration of short-term and long-term impacts
   b. identify the native vegetation, threatened species, TECs and their habitats likely to be affected and the type of indirect impact that is likely to occur.

## 8.3 Assess prescribed biodiversity impacts

1. The assessor must assess the prescribed impacts that the proposal will, or is likely to have, on threatened entities and their habitat, taking into account:
   a. the TECs, threatened species and their habitat identified in Chapter 6
   b. ongoing or future impacts that the proposal will have on biodiversity values, considering the measures taken to avoid or minimise impacts, as described in Chapter 7
   c. the spatial and temporal extent of the impacts likely to result from changes in land use arising from the proposal, in accordance with Subsections 8.3.1–8.3.6.
2. The BDAR or BCAR must include an assessment of any prescribed impacts of the proposal on threatened entities and their habitat, and describe:
   a. the nature, extent, frequency, duration and timing of prescribed impacts that may occur:
      i. during construction
      ii. during operation
      iii. that are uncertain (predictions should be made)
   b. the consequences of prescribed impacts on biodiversity values
   c. any limitations to data, assumptions and predictions about impacts on biodiversity.

### 8.3.1 Karst, caves, crevices, cliffs, rocks and other geological features of significance

1. Assessment of the impacts of the proposal on threatened entities associated with karst, caves, crevices, cliffs, rocks and other geological features of significance must:
   a. predict the nature, extent and duration of short-term and long-term impacts
   b. predict the consequences of impacts on the threatened entities identified in Subsection 6.1.1
   c. justify predictions with appropriate modelling, relevant literature and other published sources (if available), or advice from experts.

### 8.3.2 Human-made structures or non-native vegetation

1. Assessment of the impacts of the proposal on the habitat of threatened entities associated with human-made structures or non-native vegetation must:
   a. describe the nature, extent and duration of short-term and long-term impacts
   b. predict the consequences of impacts on threatened entities identified in Subsection 6.1.2
   c. justify predictions of impacts with relevant literature and other published sources of information, or advice from experts.

### 8.3.3 Habitat connectivity

1. Assessment of the impacts of the proposal on connectivity of habitat of threatened entities must:
   a. describe the nature, extent and duration of short-term and long-term impacts
   b. predict the consequences of impacts for the persistence of the threatened entities identified in Subsection 6.1.3, taking into consideration mobility, abundance, range and other relevant life history factors
   c. justify predictions of impacts with relevant literature and other published sources of information.

### 8.3.4 Water bodies, water quality and hydrological processes

1. Assessment of the impacts of the proposal on water quality, water bodies and hydrological processes that sustain threatened entities must:
   a. describe the nature, extent and duration of short-term and long-term impacts
   b. predict the consequences to the threatened entities identified in Subsection 6.1.4
   c. where the proposed impact is in relation to longwall mining, calculate the maximum predicted offset liability as per the *Addendum to NSW Biodiversity Offsets Policy for Major Projects: upland swamps impacted by longwall mining subsidence*, using predictions of impacts on water-dependant plant communities and the threatened species they support
   d. justify predictions of impacts with appropriate modelling (if available), relevant literature and other published sources of information, or consultation with species experts.

### 8.3.5 Wind turbine strikes

1. Assessment of the impacts of wind turbine strikes on **protected** animals identified in Subsection 6.1.5 must:
   a. predict the:
      i. impact on species living in, or likely to fly over, the proposed development site, including bat or bird strike and barotrauma
      ii. rate and timing of impact per turbine per year for species likely to be affected
      iii. consequences of impacts for the persistence of populations
      iv. cumulative impacts of the proposed development alongside existing wind farms, on species mortality, movement patterns and use of adjacent habitat
      v. likelihood and nature of impacts on aerial species living in, or likely to fly over, the proposed development site, including barriers to migratory pathways, and breeding, feeding and resting resources
      vi. impact of avoidance behaviour for migratory species relative to migration distances, and the availability of suitable habitat for breeding, feeding and resting over the migration route
   b. justify predictions with reference to data, collision risk modelling (if available), relevant literature or other published sources including any publications by the Department
   c. map the disturbance zone around wind turbines, and the significant landscape and habitat features within that zone, for species likely to be affected, e.g. hollow bearing trees and important habitat for migratory species.



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### 8.3.6 Vehicle strikes

1. Assessment of the impacts of vehicle strikes on threatened fauna or fauna that are part of a TEC as identified in Subsection 6.1.6 must:
   a. predict the likelihood of vehicle strike to each relevant species, considering mobility, abundance, range and other relevant life cycle factors
   b. estimate vehicle strike rates with supporting data or literature, where available
   c. predict the consequences of the impacts for the persistence of the relevant species
   d. justify predictions of impacts with relevant literature and other published sources of information.

## 8.4 Mitigate and manage impacts on biodiversity values

1. The proponent must identify measures to mitigate and manage impacts. Guidelines for mitigating and managing impacts on biodiversity values are in Subsections 8.4.1 and 8.4.2.
2. The BDAR or BCAR must:
   a. document mitigation measures proposed to manage impacts, including techniques, timing, frequency and responsibility for implementing each measure
   b. identify any measures for which there is risk of failure
   c. evaluate the risk and consequence of any impacts likely to remain after mitigation measures are applied
   d. document any proposed adaptive management strategies, including:
      i. baseline data against which monitoring will occur
      ii. any seasonal changes to the resource that are relevant to the impacts being monitored
      iii. monitoring methods, including frequency, timing and reporting
      iv. trigger values for when adaptive management actions should be initiated
      v. adaptive management actions proposed to reduce or eliminate the impact, which may include actions to retire additional biodiversity credits
      vi. information that will be necessary to measure the impact over time
      vii. how the results of the adaptive management strategy will be applied to the ongoing management of the proposal to reduce the extent of indirect and/or prescribed impacts.

### 8.4.1 Mitigate impacts on native vegetation, threatened species, threatened ecological communities and their habitat

1. Removing vegetation and habitat features not associated with native vegetation from within the subject land is likely to result in resident fauna being displaced. Impacts related to such displacement occur in both the construction and operational phases, including when:
   a. hollow bearing trees and other habitat features are removed during construction
   b. construction causes injury or death
   c. an established home range is disrupted
   d. connectivity between suitable habitat for foraging and dispersal is disrupted.

2. Measures for mitigating impacts related to the displacement of resident fauna include:
   a. timing works to avoid critical life cycle events, such as breeding or nursing
   b. instigating clearing protocols, including pre-clearing surveys, daily surveys and staged clearing, and using a trained ecologist or licensed wildlife handler during clearing events
   c. relocating habitat features (e.g. fallen timber, hollow logs) from the development or clearing site or land to be biodiversity certified, to adjacent retained vegetation.
3. Measures for mitigating indirect impacts on native vegetation and habitat include, but are not limited to:
   a. adoption of clearing protocols that identify vegetation to be retained, prevent inadvertent damage and reduce soil disturbance; for example, a chainsaw is preferable to heavy machinery to remove native vegetation for partial clearing
   b. using noise barriers, or daily/seasonal timing of construction and operational activities to reduce impacts of noise
   c. using light shields, or daily/seasonal timing of construction and operational activities to reduce impacts of light spill
   d. using adaptive dust management and monitoring programs to control air quality
   e. scheduling the timing of construction activities to avoid impacts (e.g. timing the construction for when migratory species are not at the site, or when particular species known to, or likely to use the habitat on the site, are not breeding or nesting)
   f. erecting temporary fencing to protect significant environmental features, such as riparian zones
   g. using hygiene protocols to prevent the spread of weeds or pathogens between infected and uninfected areas
   h. training staff and conducting site briefings to communicate environmental features to be protected and measures to be implemented
   i. preparing a vegetation management plan to regulate activity in vegetation and habitats adjacent to residential developments. The plan may include controls on pet ownership, rubbish disposal, wood collection, fire management, and disturbance to nests and other niche habitats
   j. providing for the ecological restoration, rehabilitation and/or ongoing maintenance of retained native vegetation habitat on, or adjacent to, the development or clearing site or land to be biodiversity certified.
4. To determine whether it is reasonable to apply a particular measure, the proponent should consider:
   a. industry best practice and standards
   b. the proportion of the total cost of the proposal that is dedicated to biodiversity protection
   c. the risk that the measure could fail.
5. Measures that are proposed for mitigating impacts on native vegetation, threatened species, TECs and their habitat must be set out in the BDAR or BCAR.

### 8.4.2 Mitigate prescribed impacts

1. Measures that may be used to mitigate prescribed impacts include, but are not limited to:
   a. scheduling the timing of construction activities to avoid critical life cycle events (e.g. timing construction activities to avoid migratory species on site, or using the site)
   b. instigating clearing protocols, including pre-clearing surveys, daily surveys and staged clearing, and using a trained ecologist or licensed wildlife handler during clearing, construction and maintenance activities for human-made structures and non-native vegetation

c. retaining habitat features (e.g. fallen timber, hollow logs, rocks) within the subject land, or relocating them to adjacent retained remnant vegetation
d. installing artificial connectivity measures (e.g. glider poles, rope crossings, habitat bridges) to re-establish connections between habitat and favoured transport corridors
e. erecting temporary fencing to protect significant environmental features, such as karst, caves, rock outcrops and water bodies
f. replacing habitat provided by human-made structures and non-native vegetation with alternative habitat
g. using sediment barriers or sedimentation ponds to control the quality of water released from the site into the receiving environment
h. training staff and conducting site briefings to communicate environmental features to be protected and the measures implemented to protect them
i. ecological restoration, rehabilitation actions and/or maintenance of retained native vegetation on, or adjacent to, the subject land
j. development control measures that regulate the types of activities that can occur in native vegetation and habitat adjacent to residential development, including prohibiting the collection of bush rocks.

2. To determine whether it is reasonable to apply a specific measure, the proponent should consider:
   a. industry best practice and standards
   b. the proportion of the total cost of the proposal that is dedicated to biodiversity protection
   c. the risk that the measure could fail.

## 8.5 Adaptive management for uncertain biodiversity impacts

1. An adaptive management plan can be used to address impacts that are infrequent or difficult to measure. These include indirect or prescribed impacts, or other remaining biodiversity impacts.
2. The proponent must develop an adaptive management plan to address any remaining impacts where mitigation measures in Section 8.4 have not been proposed in the BDAR or BCAR.
3. Adaptive management plans can be predictive, based on existing literature and a best analysis of the potential biodiversity impacts, including the timing and extent of the impact.
4. An adaptive management plan must identify and describe:
   a. the threatened species and/or TECs likely to be impacted
   b. a monitoring program of sufficient scope and duration to provide data that can inform when direct and indirect impacts on biodiversity occur. For example, a monitoring program for a wind farm development would include survey of aerial and migratory species undertaken across multiple seasons prior to the planning and construction phase. The surveys are then repeated for the first two years of the operational phase and for another two years at the 10-year mark
   c. thresholds or triggers associated with the monitoring program that identify when a prescribed impact has occurred or is likely to occur. The adaptive management plan should include justification for which of these will trigger the implementation of adaptive management actions
   d. suite of potential adaptive management actions to be implemented during the construction or operational phases. The management actions can be targeted at minimising or mitigating the prescribed impact, or in response to meeting or exceeding a threshold or trigger.

5. An adaptive management plan should also consider, where appropriate:
   a. relevant literature to inform and guide adaptive management, and support predictions about short-term and long-term biodiversity impacts
   b. that the monitoring program and the implementation of management actions may extend into the construction and/or operational phase of the proposal
   c. the proposed measures to address the residual prescribed impacts on threatened species or TECs during the construction or operational phases. These measures address uncertain biodiversity impacts and may include the retirement of biodiversity credits to offset the impacts in accordance with Section 10.1
   d. any other conservation measures, including the retirement of biodiversity credits.
6. An adaptive management plan for impacts related to subsidence and upsidence resulting from underground mining should be in line with the *Addendum to NSW Biodiversity Offsets Policy for Major Projects: upland swamps impacted by longwall mining subsidence* and include:
   a. measures to secure biodiversity credits to fulfil the maximum predicted offset liability
   b. a strategy for monitoring changes to groundwater and secondary environmental consequences
   c. a strategy for delivering offsets that are commensurate with monitoring results
   d. any other measures proposed to mitigate potential impacts.
7. The BDAR or BCAR must outline the adaptive management strategy proposed for minimising uncertain impacts.

## 8.6 Use of biodiversity credits to mitigate or offset indirect or prescribed impacts

1. The retirement of biodiversity credits may be used with other conservation measures to mitigate prescribed impacts or the indirect impacts of a proposal on areas of native vegetation, TECs and/or threatened species, or their habitat adjacent to the subject land.
2. To consider the extent of indirect impacts adjacent to the subject land, the assessor may use the vegetation integrity data from vegetation zones within the subject land (Section 4.3). The assessor can then use the BAM-C to attribute a partial loss by reducing the current observed value of the attributes for the vegetation zone.
3. Where actions described in adaptive management plans for mitigating prescribed impacts are considered high risk, measures to secure offsets in the event of failure can be proposed in the BDAR or BCAR. These measures may include the retirement of credits and/or other conservation measures that benefit the threatened entity. The approach to calculating any proposed offsets must be documented in the BDAR or BCAR.
4. Where part or all of the indirect or prescribed impacts cannot be avoided, minimised or mitigated, the assessor can propose offsets or other measures that benefit threatened entities and their habitat. The approach to calculating any proposed offsets should be documented and justified.
5. The decision-maker may take these impacts (including offsets or other measures to address the impacts) into account when it determines the number of biodiversity credits required to be retired or other conservation measures required to be taken. The decision-maker can also require the retirement of additional biodiversity credits or alternative measures to address these impacts (see section 7.13(4) of the BC Act and clause 6.1(2)(b) of the BC Regulation).



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# 9 Thresholds for assessing and offsetting the impacts of development

1. In Stage 1, the site context, native vegetation, TECs and habitat suitability for threatened species were assessed. In Chapter 7 (Stage 2), avoidance and minimisation were demonstrated. These assessments inform the final footprint for the proposal.
2. This section sets out the impact thresholds the assessor must apply, including:
   a. impacts on biodiversity values at risk of a serious and irreversible impact
   b. impacts for which the assessor is required to determine an offset requirement
   c. impacts for which the assessor is not required to determine an offset requirement
   d. impacts that do not require further assessment by the assessor.

## 9.1 Assessment for serious and irreversible impacts on biodiversity values

1. The determination of a serious and irreversible impact on biodiversity values is to be made by the decision-maker in accordance with the principles set out in the BC Regulation.
2. To assist the decision-maker, the document Guidance to assist a decision-maker to determine a serious and irreversible impact includes criteria that enable the application of the four principles set out in clause 6.7 of the BC Regulation to identify the species, populations and ecological communities that are likely to be at risk of SAIIs.
3. The assessor must identify every threatened entity at risk of an SAII that would be impacted by the proposal.
4. The assessor may identify any other threatened entity impacted by the proposal that is likely to be at risk of an SAII, in accordance with the four principles in the BC Regulation.
5. A decision-maker may require an assessor to include an assessment of additional threatened entities that are at risk of an SAII other than those identified in the BAM-C as part of a proposal.
6. To assist the decision-maker to evaluate the extent and severity of the impact on an entity at risk of an SAII, the BDAR or BCAR must contain details of the assessment of SAIIs, in accordance with the criteria set out in Subsection 9.1.1 for impacts on each TEC and in Subsection 9.1.2 for each threatened species. All criteria must be addressed for each TEC or threatened species at risk of an SAII and likely to be impacted by the proposal.

### 9.1.1 Additional impact assessment provisions for threatened ecological communities at risk of an SAII

1. The assessor is required to provide further information in the BDAR or BCAR regarding the impacts on each TEC at risk of an SAII. This must include the action and measures taken to avoid the direct and indirect impact on the TEC at risk of an SAII. Where these have been addressed elsewhere the assessor can refer to the relevant sections of the BDAR and BCAR.
2. The assessor must consult the TBDC and/or other sources to report on the current status of the TEC including:
   a. evidence of reduction in geographic distribution (Principle 1, clause 6.7(2)(a) BC Regulation) as the current total geographic extent of the TEC in NSW AND the estimated reduction in geographic extent of the TEC since 1970 (not including impacts of the proposal)



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b. extent of reduction in ecological function for the TEC using evidence that describes the degree of environmental degradation or disruption to biotic processes (Principle 2, clause 6.7(2)(b) BC Regulation) indicated by:
   i. change in community structure
   ii. change in species composition
   iii. disruption of ecological processes
   iv. invasion and establishment of exotic species
   v. degradation of habitat, and
   vi. fragmentation of habitat

c. evidence of restricted geographic distribution (Principle 3, clause 6.7(2)(c) BC Regulation), based on the TEC's geographic range in NSW according to the:
   i. extent of occurrence
   ii. area of occupancy, and
   iii. number of threat-defined locations

d. evidence that the TEC is unlikely to respond to management (Principle 4, clause 6.7(2)(d) BC Regulation).

3. Where the TBDC indicates data is 'unknown' or 'data deficient' for a TEC for a criterion listed in Subsection 9.1.1(2.), the assessor must record this in the BDAR or BCAR.

4. In relation to the impacts from the proposal on the TEC at risk of an SAII, the assessor must include data and information on:

   a. the impact on the geographic extent of the TEC (Principles 1 and 3) by estimating the total area of the TEC to be impacted by the proposal:
      i. in hectares, and
      ii. as a percentage of the current geographic extent of the TEC in NSW.

      Data and information should include direct impacts (i.e. from clearing) and indirect impacts where partial loss of the TEC is likely as a result of the proposal. The assessor should consider for example, changes to fire regime (frequency, severity), hydrology, pollutants, species interactions (increased competition, changes to pollinators or dispersal), fragmentation, increased edge effects and disease, pathogens and parasites, which are likely to contribute to the loss of flora and/or fauna species characteristic of the TEC

   b. the extent that the proposed impacts are likely to contribute to further environmental degradation or the disruption of biotic processes (Principle 2) of the TEC by:
      i. estimating the size of any remaining, but now isolated, areas of the TEC; including areas of the TEC within 500 m of the development footprint or equivalent area for other types of proposals
      ii. describing the impacts on connectivity and fragmentation of the remaining areas of TEC measured by:
         - distance between isolated areas of the TEC, presented as the average distance if the remnant is retained AND the average distance if the remnant is removed as proposed, and
         - estimated maximum dispersal distance for native flora species characteristic of the TEC, and
         - other information relevant to describing the impact on connectivity and fragmentation, such as the area to perimeter ratio for remaining areas of the TEC as a result of the development
      iii. describing the condition of the TEC according to the vegetation integrity score for the relevant vegetation zone(s) (Section 4.3). The assessor must also

include the relevant composition, structure and function condition scores for each vegetation zone.

5. The assessor may also provide new information that demonstrates that the principle identifying that the TEC is at risk of an SAII is not accurate.

### 9.1.2 Additional impact assessment provisions for threatened species at risk of an SAII

1. The assessor is required to provide further information in the BDAR or BCAR for any species at risk of an SAII, including the action and measures taken to avoid the direct and indirect impact on the species at risk of an SAII. Where these have been addressed elsewhere the assessor can refer to the relevant sections of the BDAR or BCAR.
2. The assessor must consult the TBDC and/or other sources to report on the current population of the species including:
    a. evidence of rapid decline (Principle 1, clause 6.7(2)(a) BC Regulation) presented by an estimate of the:
        i. decline in population of the species in NSW in the past 10 years or three generations (whichever is longer), or
        ii. decline in population of the species in NSW in the past 10 years or three generations (whichever is longer) as indicated by: an index of abundance appropriate to the species; decline in geographic distribution and/or habitat quality; exploitation; effect of introduced species, hybridisation, pathogens, pollutants, competitors or parasites
    b. evidence of small population size (Principle 2, clause 6.7(2)(b) BC Regulation) presented by:
        i. an estimate of the species' current population size in NSW, and
        ii. an estimate of the decline in the species' population size in NSW in three years or one generation (whichever is longer), and
        iii. where such data is available, an estimate of the number of mature individuals in each subpopulation, or the percentage of mature individuals in each subpopulation, or whether the species is likely to undergo extreme fluctuations
    c. evidence of limited geographic range for the threatened species (Principle 3, clause 6.7(2)(c) BC Regulation) presented by:
        i. extent of occurrence
        ii. area of occupancy
        iii. number of threat-defined locations (geographically or ecologically distinct areas in which a single threatening event may rapidly affect all species occurrences), and
        iv. whether the species' population is likely to undergo extreme fluctuations
    d. evidence that the species is unlikely to respond to management (Principle 4, clause 6.7(2)(d) BC Regulation) because:
        i. known reproductive characteristics severely limit the ability to increase the existing population on, or occupy new habitat (e.g. species is clonal) on, a biodiversity stewardship site
        ii. the species is reliant on abiotic habitats which cannot be restored or replaced (e.g. karst systems) on a biodiversity stewardship site, or
        iii. life history traits and/or ecology is known but the ability to control key threatening processes at a biodiversity stewardship site is currently negligible (e.g. frogs severely impacted by chytrid fungus).



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3. Where the TBDC indicates data is ‘unknown’ or ‘data deficient’ for a species for a criterion listed in Subsection 9.1.2(2.), the assessor must record this in the BDAR or BCAR.
4. In relation to the impacts from the proposal on the species at risk of an SAII, the assessor must include data and information on:
    a. the impact on the species’ population (Principles 1 and 2) presented by:
        i. an estimate of the number of individuals (mature and immature) present in the subpopulation on the subject land (the site may intersect or encompass the subpopulation) and as a percentage of the total NSW population, and
        ii. an estimate of the number of individuals (mature and immature) to be impacted by the proposal and as a percentage of the total NSW population, or
        iii. if the species’ unit of measure is area, provide data on the number of individuals on the site, and the estimated number that will be impacted, along with the area of habitat to be impacted by the proposal
    b. impact on geographic range (Principles 1 and 3) presented by:
        i. the area of the species’ geographic range to be impacted by the proposal in hectares, and a percentage of the total AOO, or EOO within NSW
        ii. the impact on the subpopulation as either: all individuals will be impacted (subpopulation eliminated); OR impact will affect some individuals and habitat; OR impact will affect some habitat, but no individuals of the species will be directly impacted
        iii. to determine if the persisting subpopulation that is fragmented will remain viable, estimate (based on published and unpublished sources such as scientific publications, technical reports, databases or documented field observations) the habitat area required to support the remaining population, and habitat available within dispersal distance, and distance over which genetic exchange can occur (e.g. seed dispersal) and pollination distance for the species
        iv. to determine changes in threats affecting remaining subpopulations and habitat if the proposed impact proceeds, estimate changes in environmental factors including changes to fire regimes (frequency, severity); hydrology, pollutants; species interactions (increased competition and effects on pollinators or dispersal); fragmentation, increased edge effects, likelihood of disturbance; and disease, pathogens and parasites. Where these factors have been considered elsewhere in relation to the target species, the assessor may refer to the relevant sections of the BDAR or BCAR.
5. The assessor may also provide new information that can be used to demonstrate that the principle identifying the species as at risk of an SAII, is inaccurate.

## 9.2 Determine an offset requirement for impacts

### 9.2.1 Impacts on native vegetation and TECs (ecosystem credits)

1. The assessor must determine an offset for all impacts of proposals on PCTs that are associated with a vegetation zone that has a vegetation integrity score of:
    a. ≥15, where the PCT is representative of an EEC or a CEEC
    b. ≥17, where the PCT is associated with threatened species habitat (as represented by ecosystem credits) or represents a vulnerable ecological community
    c. ≥20, where the PCT does not represent a TEC and is not associated with threatened species habitat.

2. The method for determining offset requirements for impacts on native vegetation is described in Chapter 10.
3. An offset is not needed for impacts on native vegetation if the vegetation integrity score is below those listed in Subsection 9.2.1(1.); however, if the entity is at risk of an SAII the assessor will need to address the relevant criteria in Section 9.1 and include this in the BDAR or BCAR.

### 9.2.2 Impacts on threatened species and their habitat

1. The assessor must determine an offset for the impacts of proposals on the habitat of threatened species assessed for ecosystem credits and associated with a PCT in a vegetation zone with a vegetation integrity score of ≥17.
2. The assessor must determine an offset for the impacts of proposals on threatened species that require species credits, identified in accordance with Chapter 5.
3. The method for determining offset requirements for impacts on threatened species and threatened species habitat is described in Chapter 10.
4. An offset requirement can be proposed for a prescribed impact in accordance with Section 8.6.

## 9.3 Impacts that do not need further assessment

1. Areas within the subject land that do not contain native vegetation do not need to be assessed for ecosystem credits.
2. Areas of land that do not contain native vegetation must still be assessed for threatened species habitat in accordance with Chapter 5 and prescribed biodiversity impacts in accordance with Chapter 6.



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# 10 Applying the no net loss standard

1. The BAM identifies the circumstances in which offsetting the impacts of proposals on biodiversity will result in a no net loss outcome. This includes when improvements in the condition of native vegetation or threatened species habitat at a biodiversity stewardship site offset the impacts of development, activity, clearing or biodiversity certification on biodiversity values. Such improvements are based on management actions that are undertaken at a biodiversity stewardship site.
2. The baseline from which the no net loss standard applies accounts for the expected annual decline or loss in biodiversity values without management. Subsection 11.4.1 sets out the annual rate of decline that applies in the BAM. Improvement in the condition of native vegetation or threatened species habitat at a biodiversity stewardship site includes the 'gain' from the averted loss that would have occurred from the expected annual decline without undertaking the required management actions.
3. The BAM sets a standard that will result in no net loss of biodiversity values in NSW where:
    a. the impacts on biodiversity values from a development, activity, clearing or biodiversity certification proposal are avoided, minimised or mitigated through reasonable measures, as per Chapter 7, and
    b. all residual direct impacts on biodiversity values from clearing native vegetation and habitat loss are offset by:
        i. retiring the required number of biodiversity credits determined in Section 10.1, with a class of credit identified in Section 10.2 that meets the 'like-for-like' rules under clause 6.3 of the BC Regulation, or
        ii. in the case of a development, activity, clearing or biodiversity certification proposal, undertaking biodiversity conservation actions that qualify as biodiversity conservation measures under the offset rules and are listed in the ancillary rules, and the action benefits the entity that is impacted by the proposal.

## 10.1 Calculate the offset requirement for direct impacts

1. The assessor must determine the number and class of biodiversity credits required to offset the residual impacts of proposals that are not prescribed or indirect impacts. These are referred to as baseline credits.
2. The residual impact is the remaining impact after all reasonable measures are made to:
    a. avoid or minimise the impacts of the proposal, as per Chapter 7
    b. mitigate the impacts, as per Chapter 8.
3. The BAM does not provide an approach for determining the number and class of biodiversity credits required to offset any residual prescribed impacts. The assessor may propose the use of biodiversity credits as a mitigation measure to offset a prescribed impact. However, these biodiversity credits are additional to the baseline credits.
4. To determine the offset requirement for residual impacts of a proposal on a threatened species or TEC, the assessor must use the following information in the BAM-C that is sourced from the TBDC:
    a. sensitivity to loss value (threat status) for TECs, PCTs and threatened species
    b. sensitivity to gain value for threatened species
    c. biodiversity risk weighting for the species or the habitat component of the species that the proposal is impacting.
5. The ancillary rules list a specific suite of species for which biodiversity conservation actions are an option to meet an offset obligation instead of, or in combination with, the retirement of species credits for a threatened species.



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### 10.1.1 Ecosystem credits and species credits

1. Impacts of proposals (Section 9.2) on native vegetation, threatened species, TECs and their habitat are assigned as either ecosystem credits or species credits.
2. Ecosystem credits are used to offset the impacts on:
   a. TECs
   b. threatened species habitat for species that can be reliably predicted to occur on the subject land based on vegetation surrogates and the surrounding landscape (ecosystem credit species)
   c. other PCTs.
3. Species credits are used to offset the residual impacts on threatened species (individuals or area of habitat) that cannot be predicted to occur on the subject land based on vegetation surrogates and the surrounding landscape. Presence is determined by important habitat maps, survey, expert report or can be assumed (all proposals except for biodiversity stewardship sites).
4. The assessor must determine the number and class of biodiversity credits (ecosystem credits and species credits) required to offset the residual impacts.
5. The number of biodiversity credits is determined according to Subsection 10.1.2 for ecosystem credits and Subsection 10.1.3 for species credits.
6. Each ecosystem credit and species credit is assigned attributes as per Section 10.2 to identify a class of credits. A class of credits is formed where the biodiversity credits share the same attributes set out in Section 10.2.
7. A class of credits is used to determine when a particular credit within a class is 'like', or similar to, a credit in another class. This allows application of the 'like-for-like' offset rules and the 'offset variation' rules as per the BC Regulation.
8. The number and class of ecosystem credits and species credits that must be retired for the proposal is set out in the biodiversity credit report produced by the BAM-C. The biodiversity credit report must be included in the BDAR or BCAR as per the requirements in Appendix K or L (streamlined assessment modules). The biodiversity credit report that is included in a BDAR or BCAR submitted to a decision-maker must have a status of finalised.
9. The BAM will determine the number and class of biodiversity credits for a threatened entity that is at risk of an SAII as a result of the proposal. If a major project or a declared strategic biodiversity certification proposal is determined to have an SAII, the decision-maker may approve the proposal but impose additional offset requirements for these impacts.

### 10.1.2 Calculate the required number of ecosystem credits for the direct impact on vegetation that is a threatened ecological community, threatened species habitat or other plant community type

1. The direct impact of a proposal on vegetation that is a threatened ecological community, threatened species habitat or other plant community type must be measured using ecosystem credits for all impacts above the thresholds outlined in Subsection 9.2.1. This includes those that:
   a. the assessor has identified as a TEC under Chapter 5, or
   b. contain suitable habitat for a threatened species that is predicted to use the subject land, at Step 2 in Subsection 5.2.2, or
   c. contain any other PCT.



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2. The biodiversity risk weighting is based on:
   a. the sensitivity to loss class of the TEC, or
   b. if not a TEC, the sensitivity to loss class of the PCT, and
   c. the highest sensitivity to gain class of the predicted threatened species, which is derived from the suite of threatened species predicted to use the subject land as suitable habitat (Subsection 5.2.2).
3. The assessor must use Equation 1, within the BAM-C, to calculate the ecosystem credits.

**Equation 1 Determine the number of ecosystem credits required for the impact on vegetation that is a TEC, contains threatened species habitat, or is any other PCT**

$$\text{Ecosystem credits required for each vegetation zone} = \sum_{i=1}^{n} (\Delta\text{VI Loss} \times BRW\ x\ area)\ x\ 0.25$$

*where:*

*i = the i[th] vegetation zone on land directly impacted by the proposal*

*∆VI Loss = the change (loss) in the vegetation integrity score of a vegetation zone at the development site as determined by Equation 27*

*BRW = means the biodiversity risk weighting applied to the vegetation zone. The biodiversity risk weighting for a TEC or a PCT containing threatened species habitat is based on the sensitivity to loss class of the TEC/PCT and the highest sensitivity to gain class of the predicted threatened species. For a PCT or TEC not associated with threatened species habitat, the sensitivity to loss class for the PCT or TEC is used with the low sensitivity gain class*

*area = the area in hectares of the vegetation zone*

4. The assessor must record the required number of ecosystem credits for each TEC or PCT in the BDAR or BCAR.
5. If the total number of credits calculated for a vegetation zone is not a whole number, it should be rounded to the nearest whole number using conventional rounding rules. If the number being rounded is less than 1, the number of credits should be rounded to 1.

### 10.1.3 Calculate the required species credits for direct impacts on candidate species

1. The direct impact of the proposal on the candidate species and their habitat determined to be present must be measured using species credits.
2. For fauna and flora species assessed by area, the assessor must use Equation 2, within the BAM-C, to calculate the number of species credits, according to the area and condition of suitable habitat identified by the species polygon (Subsection 5.2.5).

**Equation 2 Determine the number of fauna species credits or flora species credits required for the impact of development, activity, clearing or biodiversity certification**

$$\text{Number of fauna or flora species credits required} = [\sum_{n=i}(HC_i\ x\ HL_i)]\ x\ BRW\ x\ 0.25$$

*where*:

*$HC_i$ = the condition of fauna or flora habitat within each vegetation zone (or portion thereof) which occurs within the i[th] species polygon*

*$HL_i$ = the area of habitat within each vegetation zone (or portion thereof) which occurs within the i[th] species polygon for the development site or biodiversity certification proposal, prepared in accordance with Box 2*

*$HC_i$ x $HL_i$ is summed for each vegetation zone (or portion thereof) which occurs within the i[th] species polygon*

*BRW = the biodiversity risk weighting for the species as set out in the TBDC*

3. For flora species assessed by a count of the number of individuals, the assessor must use Equation 3, within the BAM-C, to calculate the number of species credits, according to the number of individuals in the species polygon (Subsection 5.2.5).

**Equation 3 Determine the required number of flora species credits for the impact of development, activity, clearing or biodiversity certification**

$$Number\ of\ flora\ species\ credits\ required = HI \times BRW$$

*where:*

*HI = the number of individuals determined to be within the species polygon on the land directly impacted by the proposal, prepared in accordance with* Box 2

*BRW = the biodiversity risk weighting for the threatened species as set out in the TBDC*

4. If the required number of species credits calculated is not a whole number, it should be rounded to the nearest whole number using conventional rounding rules. If the number being rounded is less than 1, the number of credits should be rounded to 1.
5. The BDAR or BCAR must include the number of required species credits for each threatened species.
6. The assessor must use the BAM-C to produce a biodiversity credit report. This report sets out the number and class of species credits that measure the direct impact of the proposal on species credit species.

## 10.2 Identify the credit class for ecosystem credits and species credits

1. Biodiversity credits that share the same attributes form a **class of credits**.

### 10.2.1 Ecosystem credits

1. For ecosystem credits, the shared attributes are the:
   a. name of the PCT impacted by the proposal
   b. name of any TEC associated with the PCT identified in (a.)
   c. name of the offset trading group for the TEC, identified in Table 4, or then for the PCT, identified in Table 5 if not a TEC
   d. vegetation class of the PCT identified in (a.)
   e. vegetation formation of the PCT identified in (a.)
   f. presence or absence of hollow bearing trees
   g. IBRA subregion in which the proposal occurs.
2. The credit class within the ecosystem credit category is created for each PCT at the development or clearing site or land to be biodiversity certified. The same PCT may have different credit classes created for it if attributes (b.), (f.) or (g.) differ across the proposed site.
3. PCTs that are associated with the same TEC, as per attribute (b.), will need field verification at the biodiversity stewardship site, to confirm that the PCT is part of the TEC.
4. The credit class is included in the biodiversity credit report produced by the BAM-C. The biodiversity credit report sets out the number and class of ecosystem credits required to offset the impacts of the proposal as per Subsection 10.2.1, or of species credits as per Subsection 10.2.2.



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**Table 4 Offset trading groups for threatened ecological communities**

| Threat status | Offset trading group name for ecosystem credits |
|---|---|
| Critically endangered ecological community | Name of the critically endangered ecological community |
| Endangered ecological community | Name of the endangered ecological community |
| Vulnerable ecological community | Name of the vulnerable ecological community |

**Table 5 Offset trading groups for non-threatened plant community types**

| Threat status group | Offset trading group tiers for ecosystem credits |
|---|---|
| Very high threat status | Tier 1: PCTs in the same vegetation class with a percentage cleared value ≥90% (being the name of the vegetation class – percentage cleared value ≥90%) |
| High threat status | Tier 2: PCTs in the same vegetation class with a percent cleared value ≥70% and <90% (being the name of the vegetation class – percentage cleared value ≥70% and <90%) |
| Moderate threat status | Tier 3: PCTs in the same vegetation class with a percentage cleared value ≥50% and <70% (being the name of the vegetation class – percentage cleared value ≥50% and <70%) |
| Low threat status | Tier 4: PCTs in the same vegetation class with a percentage cleared value <50% (being the name of the vegetation class – percentage cleared value <50%) |

### 10.2.2 Species credits

1. For species credits, the shared attributes are:
   a. name of the threatened species impacted by the proposal
   b. the threat status of the threatened species
   c. the kingdom to which the threatened species belongs, and
   d. the IBRA subregion in which the proposal occurs.

## 10.3 Offset rules for biodiversity values

1. Clause 6.2 of the BC Regulation establishes the offset rules ('like-for-like' and variation offset rules). Ancillary rules are published in accordance with clause 6.5 of the BC Regulation so that assessors can interpret and apply the 'like-for-like' and variation offset rules, as required in clauses 6.3 and 6.4 respectively.
2. Variation offset rules must only be used if the proponent has taken reasonable steps to apply the like-for-like offset rules.

# Stage 3: Improving biodiversity values

## 11 Calculating gain in biodiversity values at a biodiversity stewardship site

1. The Biodiversity Stewardship Site Assessment Report (BSSAR) documents the improvement in biodiversity values on a biodiversity stewardship site as determined in Stage 3, combined with the outcomes of Stage 1. The BSSAR must include the requirements in Appendix M.

### 11.1 Assess gain in biodiversity values at the biodiversity stewardship site

1. The assessor must assess the gain in biodiversity values of the proposed biodiversity stewardship site by first assessing the:
   a. site context of the biodiversity stewardship site as per Chapter 3
   b. biodiversity values of native vegetation on the biodiversity stewardship site as per Chapter 4
   c. habitat suitability of the biodiversity stewardship site for threatened species as per Chapter 5.
2. The resulting information and data must be used to determine the class of biodiversity credits that can be created at the biodiversity stewardship site, in line with this chapter.
3. The assessor must determine the number of credits for each biodiversity credit class created at the biodiversity stewardship site according to the:
   a. averted loss of biodiversity values after completing the required management actions
   b. gain in biodiversity values after completing the required management actions
   c. additional gain in biodiversity values after completing active restoration management actions
   d. security benefit after entering into the biodiversity stewardship agreement.

### 11.2 Prepare a management plan for the biodiversity stewardship site

1. The assessor must prepare a 20-year management plan for the proposed biodiversity stewardship site, which must be prepared in the relevant template published by the Biodiversity Conservation Trust (BCT) and submitted with the BSSAR as part of the application for a biodiversity stewardship agreement for the site. The management plan must include:
   a. a Site Map of the biodiversity stewardship site
   b. a description and location of the required management actions and management activities that are to be undertaken on the biodiversity stewardship site
   c. the timing and duration of the required management actions and any active restoration management actions to be undertaken during the 20-year period
   d. the timing and duration of the management actions for the ongoing maintenance of the biodiversity stewardship site beyond the initial 20-year period from when the biodiversity stewardship agreement first commences


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e. performance measures for each of the required management actions and active restoration management actions in each management zone

f. a map of the management zones that shows the location of the required management actions and any active restoration management actions. Management zones usually replicate the area of a vegetation zone, a group of vegetation zones or a threatened species polygon. Management zones may also be formed as a subset of a vegetation zone to indicate where a different suite of management actions occurs compared to elsewhere in the vegetation zone

g. a vegetation map of the TECs and PCTs

h. a map of vegetation zones prepared as per Subsection 4.3.1

i. a map that shows the location of any threatened species polygons prepared as per Subsection 5.2.5.

2. The Site Map must show the boundary of the biodiversity stewardship agreement including the cadastre (e.g. Lot and DP details), any area of the biodiversity stewardship site that is subject to a legal obligation, such as a covenant, asset protection zone or easement on the land title, because some or all of the required management actions may not be able to be implemented in these areas.
3. For land that is subject to an existing legal obligation, the ability to create biodiversity credits may be reduced if:
   a. any of the required management actions cannot be implemented, or
   b. the legal impediment requires management activities that are not 'permissible' under the biodiversity stewardship agreement.
4. At the end of the 20-year management plan, the landowner may apply for a variation to the biodiversity stewardship agreement to replace the section of the management plan required for Section 11.2(1.d.) with a new 20-year management plan. The assessor must do this using Stage 1 and Stage 3 of the BAM.

## 11.3 Management actions that improve biodiversity values

In this section, 'management plan' means the management plan required under Section 11.2.

1. Biodiversity credits may only be created from the required management actions or active restoration management actions that are proposed to be carried out at a biodiversity stewardship site for 20 years as per Subsection 11.3.1.
2. In the BSSAR, the assessor must record the type and location of the required management actions and any active restoration management actions as per Section 11.2. Actions must be linked to a management zone.
3. The management plan must specify performance measures for each of the management activities to be carried out as part of all management actions.

### 11.3.1 Required management actions

1. Table 6 sets out the required management actions that can create biodiversity credits. All these management actions must be implemented on the biodiversity stewardship site to achieve the predicted gain in vegetation integrity (Equation 37). The gain in vegetation integrity is the difference between the future vegetation integrity score, with and without, management.
2. The assessor must determine the type of management activities undertaken at the biodiversity stewardship site for each management action.



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**Table 6 Required management actions for improving vegetation integrity and threatened species habitat at a biodiversity stewardship site**

| Management action | Activities that create ecosystem credits and species credits |
|---|---|
| Preparation of a management plan | Preparation of a management plan for the biodiversity stewardship agreement for the subject land |
| Fire management | Undertake ecological burning activities, as appropriate for the PCT or threatened species<br>Prevention of wildfire |
| Grazing management | Fencing to exclude stock<br>Strategic grazing of stock |
| Native vegetation management | Retain and manage regrowth<br>Prevent/restrict non-natural nutrient inputs<br>Threatened species habitat management activities related to native vegetation |
| Threatened species habitat management | Protection of breeding habitat features or sites<br>Undertake any other required management action identified in the *Saving our Species* database required for the management of that threatened species |
| Integrated pest animal control | Undertake feral pest management including control of foxes, cats, pigs, goats, avian pests, horses, deer and any other species as required |
| Integrated weed management and control of high threat weeds | Undertake weed management and activities to limit or reduce the spread of high threat weeds and other exotic vegetation<br>Fine-scale intensive removal non high threat weeds |
| Management of human disturbance | Exclude development and clearing activities except those listed as permissible in the biodiversity stewardship agreement<br>Identify sensitive locations and protect from disturbance<br>Undertake rubbish removal<br>Implement measures to restrict access to the subject land where necessary (vehicles, etc.) |
| Monitoring | Monitoring for evidence of disease<br>Monitoring to adequately assess outcomes against all performance measures. Measures should be described for monitoring outcomes in relation to threat control as well as biodiversity response<br>Establishment of permanent plots to provide a baseline for assessing and monitoring biodiversity outcomes<br>Establishment of 360° photo points<br>Monitoring of indicators to specifically assess change in threatened species abundance, occupancy or habitat<br>Review of the management plan and management activities<br>Monitoring must be designed and implemented in accordance with Biodiversity Conservation Trust guidance documents |

3. The assessor must ensure that the required management actions to create ecosystem credits are compatible with the required management actions to create species credits. The assessor must also ensure that required management actions to create species credits are compatible with the required management actions to create species credits for other species. Where the required management actions for a vegetation zone and a threatened species polygon are not compatible, the assessor must specify the primary conservation objective for that area of the biodiversity stewardship site in the BSSAR.

### 11.3.2 Active restoration management actions

1. In addition to required management actions, active restoration management actions may be used at a biodiversity stewardship site to create additional biodiversity credits for the subject land. Active restoration management actions include those set out in Table 7.
2. Active restoration management actions to create ecosystem credits may be proposed as part of the management plan to increase the gain in the vegetation integrity score for a vegetation zone or part of a vegetation zone.
3. The management plan must detail the active restoration management actions that are proposed. Active restoration management actions must be designed to achieve the outcomes specified in the management plan.
4. Using Equation 32, the assessor can determine a restoration target value that is greater than or equal to the default future value for:
   a. richness and cover of each growth form group
   b. length of logs
   c. litter cover
   d. number of stems.
5. The assessor should propose the future restoration target values that reflect the outcomes in biodiversity values that are sought at the biodiversity stewardship site. The future restoration target values are those expected after applying the active restoration management actions as set out in the management plan over a 20-year period, and any subsequent management periods.
6. The restoration risk weighting is then applied to the future restoration target value for each attribute in the BAM-C using Equation 35. This provides an estimate of the risk-adjusted gains that can be achieved for the attribute over the 20-year management period at a biodiversity stewardship site.
7. The final restoration risk weighting considers the level of high threat weed cover in the vegetation zone. If the 20-year management plan details the control of manageable high threat weeds, then these species are excluded from the level of high threat weed cover for determining the risk weighting in the vegetation zone.
8. The future vegetation integrity score is calculated from the risk-adjusted restoration gain using Equation 33 or Equation 34. Biodiversity credits are then created for the gain in vegetation integrity using Equation 37.
9. When the observed gains through active restoration management actions meet or exceed the 20-year risk-adjusted gain for an attribute, the vegetation integrity assessment may be reapplied at a vegetation zone as set out in Subsection 4.3.3 for the purpose of determining the current vegetation integrity score and the creation of biodiversity credits for the next 20-year management period.
10. Proposed restoration target values that are above the benchmark value for any attribute will not increase the maximum allowable gain for the attribute.

**Table 7 Active restoration management actions that may be undertaken to improve or manage native vegetation or threatened species habitat at a biodiversity stewardship site**

| Types of active restoration management actions | Types of management activities that may be undertaken as part of the active restoration management actions for ecosystem credits and species credits |
|---|---|
| Habitat enhancement | Inclusion of artificial nesting boxes or constructed hollows and the management plan specifies ongoing management, replacement and maintenance<br>Relocation of fallen logs onto the biodiversity stewardship site from appropriate sources<br>Relocation and securing of dead hollow bearing stag trees from appropriate sources |
| Native vegetation and habitat management and augmentation | Grazing management that promotes natural regeneration of species in the tree and shrub growth form group<br>Undertake targeted supplementary planting to:<br>• increase native plant richness and cover above the level determined for management gain<br>• restore the species composition of recognisable PCTs<br>• improve habitat suitability for specific threatened species<br>Restoration of PCTs through changed hydrological flows<br>Translocation of threatened flora species |
| Integrated weed management and control of high threat exotic vegetation | Removal of high threat exotic vegetation from the biodiversity stewardship site through appropriate methods (e.g. scalping) and replacement with native vegetation through natural regeneration and/or targeted supplementary planting<br>Repeated application of intensive fine scale actions that control and remove manageable high threat weeds and replacement with native vegetation through natural regeneration and/or targeted supplementary planting |
| Hydrology management | Create artificial frog ponds or wetlands<br>Manage drainage<br>Install sediment trap(s)<br>Manage woody debris to create habitat including snags<br>Undertake nutrient control to reduce or remove non-natural nutrients from the site |
| Monitoring | Assessment of outcomes against all performance measures related to the active restoration components such as:<br>• evidence of occupation of and condition of artificial hollows or relocated logs and stags<br>• persistence and abundance of species targeted by supplementary plantings or sowings<br>• improvement in vegetation integrity<br>• response of threatened species population or habitat quality/extent<br>Monitoring must be designed and implemented in accordance with Biodiversity Conservation Trust guidance documents |



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11. Active restoration management actions may be used to create species credits if:
    a. it is feasible to restore the habitat of the fauna species that is the target of the proposed active restoration activities, or
    b. the proposed active restoration activities are likely to result in the target flora species being present and self-sustaining on the stewardship site, and
    c. the proposed active restoration activities will be applied to the area or location of the threatened species habitat that the species polygon identifies, and
    d. the proposed restoration management activities and performance measures are set out in the management plan.
12. For flora species assessed as numbers of individuals, active restoration management actions can only be used to create credits if the BSSAR shows that the additional individual plants can be self-sustaining on the biodiversity stewardship site. The requirements for a BSSAR are in Box 4.

**Box 4 Biodiversity Stewardship Site Assessment Report requirements – Management actions**

The Biodiversity Stewardship Site Assessment Report (BSSAR) must provide evidence of the proponent's capability to implement the required management actions and any active restoration management actions set out in the management plan. The BSSAR must:

- set out the vegetation attributes and habitat that are subject to the required management actions and active restoration management actions
- identify any topographical, biophysical, financial, knowledge, resource, methodological or other constraints that are likely to affect reaching the management actions or restoration target values for each attribute or threatened species
- demonstrate how each constraint has been addressed in the management plan, including providing evidence of the proponent's capability to implement the action
- specify the duration and timing of all management actions to be undertaken within the initial 20-year period of the management plan and for ongoing maintenance of the biodiversity stewardship site beyond the initial 20-year period.

## 11.4 Calculate the change (gain) in vegetation integrity score at a biodiversity stewardship site

1. Using the information collected from the biodiversity stewardship site to determine the current vegetation integrity score, as per Subsection 4.3.3, the assessor must determine the future vegetation integrity score for two scenarios:
    a. the land **is not** managed under a biodiversity stewardship agreement
    b. the land **is** managed under a biodiversity stewardship agreement.
2. The difference between the vegetation integrity score with and without management is then used to determine the overall gain in the vegetation integrity score at the biodiversity stewardship site.

### 11.4.1 Estimate the decline in vegetation integrity attributes when the site is not managed under a biodiversity stewardship agreement (averted loss)

1. A continued decline in biodiversity values is assumed in the absence of a biodiversity stewardship agreement. This section estimates the future value of the vegetation integrity attributes under a continued decline scenario as if the subject land were not secured under a biodiversity stewardship agreement.
2. The assessor must estimate the decline in vegetation integrity at the biodiversity stewardship site by considering all of the following:
   a. annual rate of decline in condition of the vegetation integrity attributes
   b. mean of the observed values of these attributes, as per Subsection 4.3.3
   c. 20 years over which decline is estimated
   d. whether the proposed biodiversity stewardship site, or any part of it, is on land that has a high risk of decline in vegetation integrity as set out in 11.4.1(6.a–f).
3. The assessor must use this information to estimate the future condition score for these attributes and each of the growth form groups for each vegetation zone.
4. The annual rate of decline for the growth form groups used to assess structure, and some attributes used to assess composition and function, must be estimated using the estimated annual rate of decline set out in the Intrinsic rates of increase/Annual rate of decline tables published in the BAM-C. The assessor may vary the annual rate of decline for an attribute in circumstances defined in the Intrinsic rates of increase/Annual rate of decline table.
5. The assessor must use the current condition score for these attributes in Equation 29 or Equation 30.
6. Native vegetation that has a high risk of decline in vegetation integrity is on land that, at the time the application for a biodiversity stewardship agreement is made:
   a. is identified as category 1-exempt land on the native vegetation regulatory map published under Part 5A of the LLS Act (in the absence of the Native Vegetation Regulatory Maps the assessor will be required to identify lands as category 1-exempt land or category 2-regulated land by applying the definitions in the LLS Act, with support from Local Land Services), or
   b. is zoned for residential (including rural residential), business or industrial uses in a local environmental plan, or
   c. is zoned RU1 (primary production) or RU2 (rural landscape) or RU4 (primary production small lots), or
   d. is located in a NSW (Mitchell) landscape that is ≥30% cleared, or
   e. the proposed biodiversity stewardship site adjoins urban or industrial development (or future urban development) if the proposed biodiversity stewardship agreement is part of the biodiversity certification proposal, or
   f. the native vegetation is listed as an endangered or critically endangered community.
7. Native vegetation on all other land is considered to have a low risk of decline in the vegetation integrity score of the vegetation zone over 20 years.
8. For each vegetation zone, the assessor must use Equation 28 to determine the future condition of the attributes and growth form group without management.
9. Native vegetation on land that is part of a biodiversity stewardship agreement is considered to be under management. Therefore, the assessor must **not** apply this section of the BAM to an application for a variation to the agreement where the purpose of the variation is to create new or additional credits on land already covered by the agreement.



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### 11.4.2 Estimate the increase in vegetation integrity attributes when the site is managed under a biodiversity stewardship agreement

1. The assessor must estimate the future value of the attributes used to assess vegetation integrity at the biodiversity stewardship site. The assessor should consider the application of the required management actions, and any active restoration management actions proposed under a secured and funded biodiversity stewardship agreement.
2. The assessor must use the current condition score for these attributes in Equation 33 or Equation 34. The BAM-C will automatically populate the current condition scores for these attributes.
3. Appendix G has more information on the approach to determining the future value of the attributes used to assess composition, structure and function.

**Probability of reaching benchmark for composition, structure and function with management**

4. The estimated future values of the growth form groups used to assess composition and structure are based on the probability of reaching benchmark condition by performing the required management actions over 20 years. These values are calculated using a logistic probability function, as per Equation 31 in Appendix H.
5. The assessor must use the rate of increase of the growth form group for the vegetation formation of the PCT being assessed. The rate of increase for each growth form group and the function attribute is set out in the Intrinsic rates of increase/Annual rate of decline tables published in the BAM-C.
6. The rate of increase is modified as per Equation 8 and Equation 9 in Appendix G, which consider the effect of:
    a. current landscape vegetation cover
    b. high threat exotic vegetation cover
    c. site resilience (current vegetation integrity).

**Determine the future condition score for function attributes with required management actions**

7. Litter cover, stem diversity, length of logs and large trees are expected to increase over 20 years at the rate set out in the Intrinsic rates of increase tables published in the BAM-C.
8. The assessor must use Equation 28 and Equation 32 to determine the future value of:
    a. litter cover
    b. number of tree stem size classes
    c. number of large trees
    d. total length of fallen logs (this is only assessed if the biodiversity stewardship site has trees of >5 cm DBH).
9. Where regeneration is present on the biodiversity stewardship site at the start of the management period, the BAM assumes that the biodiversity stewardship site will continue to regenerate over the 20-year management period.
10. Appendix G details the probability of regeneration occurring at a biodiversity stewardship site that has no regeneration at the start of the management period. A biodiversity stewardship site is predicted to have no regeneration in 20 years if the subject land has no stems of >20 cm DBH at the start of the management period.



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11. The number of stem size classes expected to be present excludes tree regeneration (where the maximum stem diameter is <5 cm regardless of height) and the large tree class.

**Determine the future habitat condition score for threatened species**

12. For threatened species assessed by area, the assessor must determine the gain in the vegetation integrity score of each vegetation zone that is in the species polygon, considering the vegetation integrity score without management (Subsection 11.4.1) and with management (Subsection 11.4.2).
13. The assessor must not use a vegetation integrity score to determine the habitat condition for any area of the species polygon that is not part of a vegetation zone because it does not contain native vegetation. However, non-vegetation habitat features, or habitat components such as caves, rock faces or bridges that provide habitat for the target species must be included in the management plan.

## 11.5 Calculate the security benefit score at a biodiversity stewardship site

1. The assessor must use Table 8 to calculate a security benefit score for the area of each vegetation zone that:
   a. has a current vegetation integrity score of ≥60, and
   b. has a current high threat weed cover of ≤10%, and
   c. is not on Crown land, or land to which an existing conservation obligation applies (see Section 11.9).
2. The security benefit score for each vegetation zone will be automatically populated in the BAM-C.

**Table 8 Security benefit score**

| Current vegetation integrity score | Security benefit |
|---|---|
| ≥60 – <70 | 4% of current vegetation integrity score |
| ≥70 – <85 | 4.5% of current vegetation integrity score |
| ≥85 | 5% of current vegetation integrity score |

## 11.6 Calculate the number of ecosystem credits created at a biodiversity stewardship site

1. Ecosystem credits are created for the improvement in biodiversity values at a biodiversity stewardship site as a result of undertaking the management actions set out in Section 11.3.
2. The assessor must calculate the number of ecosystem credits created for each vegetation zone on the biodiversity stewardship site as per Equation 4. The number of credits must be rounded to the nearest whole number using conventional rounding rules. If the number being rounded is less than 1, the number of credits is rounded to 1.

**Equation 4 Calculate the number of ecosystem credits at a biodiversity stewardship site**

$$Number\ of\ ecosystem\ credits = (VI\ gain\ x\ area)\ x\ 0.25$$

*where:*

*Number of ecosystem credits = the number of ecosystem credits created for the vegetation zone or part of a vegetation zone under a different management regime*

*VI gain = the change (gain) in the vegetation integrity score of a vegetation zone at the biodiversity stewardship site from management and averted loss and security benefit if applicable*

*area = the area of the vegetation zone or part of a vegetation zone under a different management regime*

## 11.7 Calculate the number of species credits created at a biodiversity stewardship site

1. For flora species where the unit of measurement is area, the assessor must use Equation 5 to calculate the number of species credits created at the biodiversity stewardship site. The area taken from the species polygon, as prepared in Subsection 5.2.5, is used.
2. For fauna species, the assessor must use Equation 5 to calculate the number of species credits created at the biodiversity stewardship site. The area taken from the species polygon, as prepared in Subsection 5.2.5, is used.

**Equation 5 Determine the number of fauna or flora species credits created at the biodiversity stewardship site**

$$Number\ of\ species\ credits\ created\ for\ i^{th}\ fauna/flora\ species = Hg_i\ x\ Ha_i\ x\ 0.25$$

*where:*

*$Hg_i$ = the gain in condition of the $i^{th}$ fauna/flora species habitat for each vegetation zone in the species polygon, taken as the $\Delta$VI gain determined in Equation 4*

*Ha = the area of habitat determined using the area of each vegetation zone within the species polygon for the biodiversity stewardship site, prepared in accordance with Box 2*

*$HC_i$ x $HL_i$ is summed for each vegetation zone (or portion thereof) which occurs within the $i^{th}$ species polygon*

3. For flora species where the unit of measurement is the number of individuals, the assessor must use Equation 6 to calculate the number of species credits created at the biodiversity stewardship site.

**Equation 6 Determine the number of flora species credits created at the biodiversity stewardship site**

$$Number\ of\ species\ credits\ created\ for\ the\ i^{th}\ flora\ species = (I_i - (I_i\ x\ (1 - ir)^t)$$

*where:*

*$I_i$ = the number of individuals in the species polygon for the biodiversity stewardship site, prepared in accordance with Box 2*

*ir = the estimated intrinsic rate of increase for the $i^{th}$ species based on the rate of increase for structure for the growth form group to which the species belongs*

*t = management timeframe (20 years)*

4. The number of fauna or flora species credits must be rounded to the nearest whole number using conventional rounding rules. If the number being rounded is less than 1, the number of credits is rounded to 1.

## 11.8 Identify the credit class for biodiversity credits created at a biodiversity stewardship site

1. The attributes in Section 10.2 are used to identify the credit class for ecosystem credits for each PCT at a biodiversity stewardship site. The same PCT may have different credit classes created for it if attributes (1.b.), (1.f.) or (1.g.) differ across the biodiversity stewardship site as per Subsection 10.2.1(1.).
2. The credit class of a species credit created at a biodiversity stewardship site is the species that is being managed at the biodiversity stewardship site.
3. The credit class is included in the biodiversity credit report (biodiversity credits) produced by the BAM-C. The BAM-C sets out the number and class of ecosystem credits created at the biodiversity stewardship site as per Section 11.6, or of species credits as per Section 11.7.

## 11.9 Existing obligations and management actions

1. A management action can only create ecosystem and species credits if it is carried out on a biodiversity stewardship site in addition to any biodiversity conservation measure or action that is an existing conservation obligation (Box 5).
2. 'Existing conservation obligation' means any measure or action required to be carried out under:
    a. a restriction on use or public positive covenant under Part 4A of the *Crown Lands Act 1989* or Part 5, Division 5.10 of the *Crown Land Management Act 2016*
    b. a conservation agreement entered into under the *National Parks and Wildlife Act 1974* (NPW Act)
    c. a trust agreement entered into under the *Nature Conservation Trust Act 2001* (NCT Act)
    d. a conservation agreement under Part 5 of the *Biodiversity Conservation Act 2016* (BC Act)
    e. any agreement entered into with a public authority under which the owner of the land received, or is entitled to receive, funding for biodiversity conservation purposes
    f. in the case of publicly owned land, any legislative requirements to manage the land for biodiversity conservation purposes
    g. a biobanking agreement entered into under the *Threatened Species Conservation Act 1995*
    h. a biodiversity stewardship agreement entered into under Part 5 of the BC Act
    i. a legal obligation imposed by a statutory body or officer where that officer or body (or the Minister to whom the officer or body is responsible) has advised in writing that the legal obligation was imposed for biodiversity offset purposes
    j. a property vegetation plan (PVP) under the *Native Vegetation Act 2003* that is described as a Conservation PVP (and relates to land that is required to be conserved or in respect of which public funding was provided to improve biodiversity).

Note: Clause 5.1(c) of the BC Regulation prevents land to which any of these instruments apply from being designated as a biodiversity stewardship site, unless the instrument was not imposed for biodiversity offsetting purposes. If the instrument was not entered into for biodiversity offsetting purposes, a biodiversity stewardship agreement may be entered into, and this Section 11.9 will apply in relation to the management actions required under the agreement that are additional to those under the relevant instrument above.

**Box 5 Definitions relating to existing conservation obligations and management actions**

'Existing conservation obligation' does not include management actions that are undertaken voluntarily and are not secured by any legal obligation.

'Publicly owned land' means land owned by, or under the control of, the state, the Commonwealth or a public authority under a long-term lease, licence or other arrangement. It does not include land that is under a perpetual lease, or land that is being managed by a person or body (other than the state, the Commonwealth or a public authority).

3. Section 11.9(2.) does **not** apply to:
   a. a restriction on use or public positive covenant under Part 4A of the Crown Lands Act that is imposed in connection with an application to purchase land that a leaseholder made in respect of that land before 10 March 2009, or
   b. a conservation agreement entered into under the NPW Act as a result of a proposal that a landholder made to the Minister administering that Act before 10 March 2009, or
   c. a trust agreement entered into under the NCT Act as a result of a proposal that the landholder made to the Nature Conservation Trust before 10 March 2009.
4. This section applies to a variation of a biodiversity stewardship agreement or biobanking agreement, to create an additional class or number of credits on land that is part of the existing agreement, if the date the application for the variation is made is later than:
   a. 12 months after the date of the first management payment, or
   b. 36 months after the date when the agreement first took effect

   whichever of (a.) or (b.) occurs earlier.
5. Where a biodiversity stewardship site, or part of a biodiversity stewardship site is proposed on land to which an existing conservation obligation applies, the number of biodiversity credits calculated as per Sections 11.6 and 11.7 must be reduced in line with Steps 1–3 in Subsections 11.9.1–11.9.3.

### 11.9.1 Step 1: Calculate credits for the vegetation zone and/or species polygon

1. The assessor must calculate the number of ecosystem credits and species credits that are created for the vegetation zone, as per Equation 4 for ecosystem credits, and for the species polygon using Equation 5 or Equation 6 for species credits.

### 11.9.2 Step 2: Identify the management actions being undertaken for the existing conservation obligations

1. The assessor must identify the management actions referred to in Section 11.3 that are needed for the existing conservation obligation within the vegetation zone and/or species polygon.

### 11.9.3 Step 3: Determine the management action reduction percentage required for the existing conservation obligations

1. For publicly owned land, the number of credits as determined in Step 1 for the proposed stewardship agreement is reduced by the percentage shown in:
   a. Table 9 for the types of legislative requirement listed
   b. Table 10 for all other types of publicly owned land.

**Table 9 Percentage reduction for ecosystem credits and species credits for a biodiversity stewardship site on certain types of publicly owned land**

| Legislative requirement | Reduction where the existing conservation obligation is in-perpetuity |
|---|---|
| Land classed as 'community' land under the *Local Government Act 1993*, Chapter 6, Part 2, Division 1 | 20% |
| Land classed as 'operational' land under the Local Government Act, Chapter 6, Part 2, Division 1 after 25 August 2017 | 20% |
| Land that is reserved land under Part 5 of the Crown Lands Act or dedicated or reserved land under the Crown Lands Act | 20% |

2. For privately owned land, and land not covered by Table 9, the number of credits as determined in Subsection 11.9.1 for the proposed stewardship agreement is reduced as per the:
   a. management actions that the landholder is already obliged to perform under the existing obligation
   b. percentage reduction for each management action in Table 10.

**Table 10 Percentage reduction for ecosystem credits and species credits for a biodiversity stewardship site with existing conservation obligations**

| Required management action | Management activities subject to additionality | Reduction where the existing conservation obligation is in-perpetuity |
|---|---|---|
| Preparation of a management plan | Preparation of a management plan is a required element of the existing conservation obligation | 5% |
| Fire management | Periodical ecological burning has been or is to be carried out<br>Ecological burning is supported by funding | 10% |
| Grazing management | Strategic grazing of stock | 5% |
| Native vegetation and threatened species habitat management | Existing obligation specifies actions that restore or rehabilitate native vegetation | 10% |
| Pest animal control | Existing obligation specifies actions that control:<br>• feral and/or overabundant native herbivores<br>• vertebrate pests including foxes, cats and/or other miscellaneous species such as pigs, goats | 10% |
| Integrated weed control | Existing obligation specifies that broad-scale weed control or site-based weed control has been or is to be carried out<br>Weed control actions are supported by funding | 10% |
| Management of human disturbance | Existing obligation specifies actions that require:<br>• removal of existing and future rubbish<br>• measures that restrict access to the site including vehicles and trail bikes | 5% |
| Threatened species habitat management | Existing obligation specifies other management actions identified in the TBDC as being required to create biodiversity credits for that threatened species | 5–10% |
| Monitoring | Existing obligation specifies:<br>• monitoring of biodiversity outcomes against performance measures<br>• reporting of actions undertaken | 5% |

# 12 Addressing the biodiversity impacts of biodiversity certification applications

1. The Biodiversity Certification Assessment Report (BCAR) must be accompanied by a biodiversity certification strategy that outlines the conservation measures proposed to offset the impacts of the proposed certification. This includes:
   a. credits proposed to be purchased (or created) and retired
   b. financial contributions proposed to be made to the Biodiversity Conservation Fund
   c. reservation of land under the NPW Act (declared strategic biodiversity certifications only)
   d. adoption of development controls under the EP&A Act that conserve or enhance the natural environment (declared strategic biodiversity certifications only)
   e. special infrastructure contributions that conserve or enhance the natural environment (declared strategic biodiversity certifications only)
   f. any other measure determined to be an approved conservation measure by the Minister for Energy and Environment (declared strategic biodiversity certifications only).
2. The BCAR must document the credit value of conservation measures applied to land in respect of a strategic biodiversity certification application. This includes measures (1.c.) and (1.d.) above. The method for valuing land-based conservation measures outlined in Appendix J must be applied.
3. The biodiversity certification strategy must outline the plan for implementation of the proposed conservation measures. The strategy must include the requirements in Appendix J.



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# Appendix A: Guidelines for collecting benchmark data from local reference sites or published sources

## A.1 When may the use of local benchmark data be appropriate?

The use of local benchmark data is appropriate when the assessor considers that the local data better reflect the local conditions; however, the use of local benchmarks must be agreed to by the decision-maker as per Subsection 1.4.2 of the BAM.

Assessors should consider using benchmark data from local reference sites when:

- the benchmark confidence rating is low for an attribute, or suite of attributes, or
- local data better reflects the local environmental conditions (e.g. drought), or
- benchmarks at the class by IBRA level are evidently unsuitable for a particular PCT.

### Benchmark confidence ratings

BioNet Vegetation Classification includes confidence ratings for the average benchmark values of the different attributes used to assess vegetation integrity. These confidence ratings should be reviewed by assessors when carrying out an assessment using the BAM and before collecting local benchmark data.

Within BioNet Vegetation Classification:

- all composition attributes (*growth form richness*) are given HIGH confidence
- structure attributes (*growth form cover*) are given LOW or MODERATE confidence
- function attributes, *number of large trees*, *length of logs* and *cover of litter* are each given a five-class confidence rating from VERY LOW to VERY HIGH.

The confidence rating for each attribute can be used as a general guide for when a local benchmark may be most appropriate. Generally, the use of local benchmark data in a proposal:

- is appropriate where the confidence rating is very low or low
- may be appropriate where the confidence rating is moderate, or
- may not be appropriate where the confidence rating is high or very high unless local data better reflects the local environmental conditions (e.g. drought) or the class by IBRA benchmark values are demonstrably unsuitable for the PCT.

### When local data better reflect the local environmental conditions

When the assessor considers that the local data better reflect the local environmental conditions, the use of wet or dry benchmarks may be considered before collecting local benchmark data. BioNet Vegetation Classification may contain:

- dry benchmarks based on data that are in the 10$^{th}$ percentile of long-term rainfall records
- average benchmarks based on the median or 50$^{th}$ percentile, and
- wet benchmarks based on the >90$^{th}$ percentile of long-term rainfall records.

To determine the appropriate prior rainfall class, the assessor must compare the cumulative rainfall for the 12 months prior to the survey using data from the nearest Bureau of



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Meteorology weather station with the WET and DRY rainfall thresholds within BioNet (if available).

A full 12 months of data must be used to calculate cumulative rainfall. Once the appropriate rainfall class has been determined, the assessor should consider the wet or dry benchmarks for this class/IBRA and determine whether these benchmark data better reflect the local environmental conditions before collecting local data.

### When benchmarks at the vegetation class by IBRA level are evidently unsuitable for the PCT

Benchmarks have been created at the scale of vegetation class by IBRA region. Benchmarks at this scale may not accurately describe the best-on-offer conditions for some PCTs. Where the assessor is of the opinion that existing regional vegetation class benchmarks do not accurately describe the best-on-offer condition for a PCT they can provide evidence to support a case to use local benchmark data or data from published sources.

The decision-maker must approve the use of benchmark data from local reference sites or published sources, as per Subsection 1.4.2 of the BAM.

## A.2 How do you locate best-on-offer reference sites?

Local benchmark data must be derived from measurements taken from reference sites that are the same PCT as that being assessed on the subject land. Reference sites must satisfy the definition of best-on-offer for that PCT in the local landscape. That is, they must have high numbers of native plant species within growth form groups, high foliage cover of growth form groups, and high values of function attributes, relative to other sites within the same PCT. Often, but not always, these will be sites that show relatively little evidence of human modification or disturbance.

The following guidance on best-on-offer reference site establishment and data analysis is based on Eyre et al. (2017).

In addition to presenting high values for composition, structure and function attributes, as much as practicable, a best-on-offer reference site (plot survey) should:

- be homogenous with regard to PCT and condition state
- be on land where the history of past land use does not involve extensive chemical use, application of fertiliser or mechanical disturbance
- not currently have excessive dieback in the tree canopy as evident from aerial photography or from on-ground observation
- have minimal modification through past land-use activities such as timber harvesting, firewood collection, grazing, erosion, dieback, and/or exotic weed infestation
- have no evidence of a very recent major disturbance event such as fire, flood or mechanical clearing
- be located within a patch of remnant vegetation >2 ha
- have all reference plots located at least 20 m, and where possible 50 m from a roadside, track, or other disturbed area
- be located at least 1 km from artificial permanent water sources in the following bioregions: Simpson Strzelecki Dunefields (SSD), Channel Country (CHC), Broken Hill Complex (BHC), Mulga Lands (ML), Darling Riverine Plain (DRP), Cobar Peneplain (COP), Murray Darling Depression (MDD) and Riverina (RIV).

Public land that contain examples of PCTs that may satisfy the conditions for having the best-on-offer reference sites include:

- travelling stock routes and reserves
- national parks and nature reserves
- state forests (especially flora reserves)
- cemeteries
- roadsides
- commons.

## A.3 How many best-on-offer reference plots are required?

It is important to sample the range of natural variation inherent in vegetation condition attributes at best-on-offer reference sites within the geographic range of a PCT. To sample this variation, the assessor must collect data from a minimum of three best-on-offer reference plots. The reference plots must not be closer than 1 km to each other, including to the subject land to which the local benchmark will be applied.

## A.4 What data need to be collected?

In addition to the attribute data used in a BAM assessment, a plot-based floristic survey is to be used for all plots from which local benchmarks will be generated for composition and structure attributes (*growth form cover*) using the method set out in Table 1. Plots must be set up in accordance with Subsection 4.3.4.

To create local function benchmarks, data collection must use the methods set out in Section 4.2. In addition, the number of stems must be counted (≤10) or estimated (>10) within each stem size class.

Data for plot disturbance and physiography must also be collected.

## A.5 How do you derive local benchmarks from the data?

The benchmark is calculated as the median for each attribute from the range of plots. The median is a measure of central tendency and is the 50$^{th}$ percentile of the data collected from more than one plot for a particular attribute. It is the value for which 50% of the values fall below it and 50% fall above it. It is the middle value among ranked values. Unlike the arithmetic mean, it is unaffected by very large or very small values.

If there are data from an even number of plots the median is calculated as the arithmetic mean of the middle two values.

## A.6 Can benchmarks come from published sources?

A local benchmark for an attribute or a suite of attributes may also be obtained from information in published sources, assuming it meets the criteria to be a local benchmark, in accordance with this appendix.

# Appendix B: Streamlined assessment module – Scattered trees assessment

An assessment of the impact of clearing scattered trees can be made using this module where:

a. the impacts of clearing or development proposals are for vegetation that meets the definition of scattered trees (see Section B.1), and
b. the scattered tree is not a threatened species itself nor does it have any record of candidate species credit species (flora or fauna) incidentally using it (see Section B.2), and
c. the impact is unlikely to be serious or irreversible (see Section B.4).

Where only part of the subject land contains scattered trees, this module may be used to assess that part of a development or clearing proposal, and the standard BAM used to assess impacts on the remaining areas.

## B.1 Scattered trees

Scattered trees are defined as species listed in the tree growth form group that:

a. have a percent foliage cover that is less than 25% of the benchmark for tree cover for the most likely plant community type and are on category 2-regulated land and surrounded by category 1-exempt land on the Native Vegetation Regulatory Map under the LLS Act, or
b. have a DBH of greater than or equal to 5 cm and are located more than 50 m away from any living tree that is greater than or equal to 5 cm DBH, and the land between the scattered trees is comprised of vegetation that are all ground cover species on the widely cultivated native species list, or exotic species or human-made surfaces or bare ground, or
c. are three or fewer trees that have a DBH of greater than or equal to 5 cm and are within a distance of 50 m of each other, that in turn, are greater than 50 m away from the nearest living tree that is greater than or equal to 5 cm DBH, and the land between the scattered trees is comprised of vegetation that are all ground cover species on the widely cultivated native species list, or exotic species or human-made surfaces or bare ground.

The assessment of ground cover should be made during the time of year when the proportion of native ground cover on the subject land is likely to be at its maximum compared to that of exotic ground cover.

The scattered tree module cannot be applied on the category of sensitive regulated land or vulnerable land under the Native Vegetation Regulatory Map. Other restrictions on the application of the scattered trees assessment module are listed below in B.4.

In the absence of a published Native Vegetation Regulatory Map, the assessor will be required to identify lands as category 1 or category 2 by applying the definitions in the LLS Act, or advice from Local Land Services.

Any proposed clearing of native vegetation that does not meet the definition of scattered trees must be assessed in accordance with Chapter 4 of the BAM.



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## B.2 Map the scattered tree vegetation zone and determine the assessment class

The assessor must:

a. prepare a map that identifies the scattered trees proposed to be cleared
b. identify the genus and species of each tree
c. assign each tree or group of trees to be cleared into a class as per:
    i. Class 1: trees that are <20 cm DBH and without hollows
    ii. Class 2: trees that are ≥20 cm DBH and less than the large tree benchmark for the most likely plant community type or trees that are <20 cm DBH that contain at least one hollow
    iii. Class 3: trees that are greater than or equal to the large tree benchmark for the most likely plant community type
d. record any sightings (e.g. in hollows) or evidence (e.g. scats) of threatened species (flora or fauna) using the scattered trees.

If a scattered tree is identified as a threatened species under B.2(b.) or a candidate species credit species has been recorded using the scattered tree as habitat under B.2(d.) the assessor cannot apply the scattered tree module. The assessment of threatened species must be made in accordance with Chapter 5 of the BAM.

## B.3 When no further assessment is required

Scattered trees with negligible biodiversity value are those trees identified as class 1. No further assessment or offset is required for these trees.

## B.4 Assessment of entities at risk of a serious or irreversible impact

The assessor must identify all species at risk of an SAII that would be impacted on by the proposed clearing of the scattered trees.

The assessor must use the BAM-C scattered tree module to generate a list of candidate entities at risk of an SAII that are likely to use, or occur on the subject land, based on the IBRA subregion in which the development takes place, and whether any threatened species is likely to use a scattered tree for habitat (refer to the TBDC).

All SAII candidate species generated by the BAM-C must be assessed in accordance with Steps 3–5 in Section 5.2. Where a species is considered likely to occur on, or use the subject land, a targeted survey (or expert report) must be undertaken in accordance with Section 5.3. If a threatened species at risk of an SAII is recorded on the subject land, the assessor must not apply the scattered tree module. The assessment of threatened species must be undertaken in accordance with Chapter 5 of the BAM.

If no threatened species at risk of an SAII are present (nor are likely to be present) the scattered tree module can be applied.



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## B.5 Determine the offset requirements

The assessor must visually assess every class 2 and class 3 scattered tree in the field to determine whether it is a hollow bearing tree.

All hollow bearing trees identified by the assessor must be clearly identified on the map.

The assessor is required to determine an offset requirement for development that requires the clearing of scattered trees in class 2 and class 3 as per Equation 7.

**Equation 7 Calculate the number of ecosystem credits required for clearing scattered trees in class 2 and class 3**

$$Number\ of\ ecosytem\ credits\ required = \#PT\ x\ \#EC/Tree$$

*where:*

*number of ecosystem credits required = the number of ecosystem credits required to offset the clearing of the scattered trees*

*#PT = the number of scattered trees in class 2, or the number of scattered trees in class 3 counted by the assessor and identified on the map*

*#EC/Tree = the number of ecosystem credits required per tree based on the class of scattered tree and the extent of native vegetation remaining on the property according to Table 11*

**Table 11 Number of ecosystem credits required per scattered tree**

| Class of scattered tree being cleared | Number of credits required to offset clearing of a scattered tree | |
|---|---|---|
| | Scattered trees that contain hollows | Scattered trees that do not contain hollows |
| Class 1<br>(<20 cm DBH and contains no tree hollows) | N/A | 0 |
| Class 2<br>(<20 cm DBH and contain at least 1 hollow) | 0.75 | N/A |
| Class 2<br>(≥20 cm DBH and < large tree benchmark) | 0.75 | 0.5 |
| Class 3<br>(≥ large tree benchmark) | 1.0 | 0.75 |

## B.6 Credit profile

The credit profile must include the seven attributes identified in Subsection 10.2.1(1.).

The assessor must nominate up to three candidate PCTs for attribute (1.a.), being a PCT that includes the species of the scattered tree being cleared as one of its dominant tree species as per information in the BioNet Vegetation Classification.

Attributes (1.b.) – (1.e.) are determined as per the PCTs identified for attribute (1.a.).

Attribute (1.f.) is assigned as per whether hollows were recorded for any class 2 or class 3 scattered trees.

Attribute (1.g.) is assigned as per the IBRA subregion in which the clearing occurs or mostly occurs.

# Appendix C: Streamlined assessment module – Small area

This section sets out a streamlined assessment module for assessing:

- the biodiversity values of a small area development (Stage 1), including a proposed activity or clearing
- the impacts of the development on biodiversity
- an offset requirement for the impact.

The assessor can use the streamlined assessment module for small area development in the BAM-C.

The streamlined assessment module for small area developments must only be used according to the area clearing threshold shown in Table 12. Even though these are small areas of impact, the assessor must still apply the hierarchy of avoiding and minimising impacts on biodiversity before considering offsetting residual impacts.

The streamlined assessment module for small area developments may be used to assess the biodiversity values of land that is located within an area on the Biodiversity Values Map, except where the biodiversity value included on the Biodiversity Values Map is core koala habitat identified in a plan of management under the *State Environmental Planning Policy (Koala Habitat Protection) 2019.*

The small area assessment is applied in accordance with Table 13.

**Table 12 Area clearing limits for application of the small area development module**

| Minimum lot size associated with the property * | Maximum area clearing limit for application of the small area development module |
|---|---|
| Less than 1 ha | ≤1 ha |
| Less than 40 ha but not less than 1 ha | ≤2 ha |
| Less than 1000 ha but not less than 40 ha | ≤3 ha |
| 1000 ha or more | ≤5 ha |

*shown in the lot size maps made under the relevant local environmental plan (LEP), or actual lot size (where there is no minimum lot size provided for the relevant land under the LEP

**Table 13 Steps to assess small areas**

| BAM chapter | BAM Section | Streamlined assessment requirement |
|---|---|---|
| Chapter 3: Establishing the site context | 3.1 | Identify the IBRA subregion in which the development takes place. |
| | | Identify any relevant landscape features listed in Section 3.1. |
| | 1 and 4.3 | The assessor must assess the site context, in accordance with Section 3.2 and Subsection 4.3.2:<br>a. native vegetation cover<br>b. patch size. |



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| BAM chapter | BAM Section | Streamlined assessment requirement |
|---|---|---|
| Chapter 4: Assessing native vegetation, threatened ecological communities and vegetation integrity | 4.1 | Prepare a map of native vegetation for the subject land as per Section 4.1. |
| | 4.2 | Identify the dominant PCT on the subject land either by:<br>a. use of existing information, or<br>b. collection of plot-based survey data as required by Box 1 and choosing the PCT based on analysis of the plot data.<br>Identify if the PCT is associated with a threatened ecological community (TEC) as required by Subsection 4.2.2.<br>Where a TEC is identified on a site that is not associated with the dominant PCT, that TEC is required to be assessed and offset accordingly. In this situation more than one PCT may be selected for assessment. |
| | 4.3.3 | Assess the vegetation integrity of the PCT(s) on the subject land as individual vegetation zones either:<br>a. qualitatively by observing values for the condition attributes set out in Table 2 (justification must be included as to how these values were determined), or<br>b. quantitatively by collecting field data for the condition attributes at a plot in accordance with Subsection 4.3.4. |
| | 4.4 | Determine the vegetation integrity score in accordance with Section 4.4, using Equations 16–24 in Appendix H, by entering observed values or plot data into the small area module of the BAM-C. |
| Chapter 5: Assessing the habitat suitability for threatened species | 5.2 | Determine the suite of threatened species likely to occur on or use the development site according to Step 1 and Step 2 in Section 5.2.<br>This includes the predicted species assessed for ecosystem credits and the candidate species assessed for species credits.<br>All of the candidate species credit species identified for the proposal according to Step 1 and Step 2 that are at risk of an SAII must be further assessed in accordance with Steps 3–5 in Section 5.2.<br>Candidate species credit species that are not at risk of an SAII and are not incidentally recorded on the subject land do not require further assessment. |
| | 5.3 | Survey (or an expert report) of species credit species that are at risk of an SAII must be undertaken in accordance with Section 5.3. The assessor must prepare a species polygon for each candidate threatened species that is recorded on the subject land.<br>Where a threatened species is identified on the subject land that is not at risk of an SAII (i.e. incidentally observed during site visit) the species must be recorded, and the assessor must prepare a species polygon. |
| Chapter 7: Avoiding or minimising impacts on biodiversity values | 7.1 and 0 | Address how the proposal has been located to avoid and minimise any impact on native vegetation and threatened species habitat including locating and designing the proposal. Record any measures that are proposed to be taken to minimise direct and indirect impacts. |

| BAM chapter | BAM Section | Streamlined assessment requirement |
|---|---|---|
| Chapter 8: Assessing the impacts of the proposal on biodiversity values | 8.1 and 8.3 | Complete Subsection 8.1.1 to determine the impact of the development on vegetation integrity and threatened species habitat.<br>Assess all direct and indirect impacts on biodiversity values, including any prescribed impacts. |
| Chapter 9: Thresholds for assessing and offsetting the impacts of development | 9.1 | The assessor must address the impact assessment requirements set out in Subsection 9.1.1 for TECs and Subsection 9.1.2 for threatened species or populations that are at risk of an SAII for the proposed development. |
| Chapter 10: Applying the no net loss standard | 9 | Calculate the number of ecosystem credits required for impacts on biodiversity values according to Subsection 9. |
| | 10.1.3 (only required when Section 5.3 is completed) | Calculate the number of species credits required for impacts on biodiversity values according to Subsection 10.1.3. This includes any species credit species that has been incidentally observed on the subject land.<br>Note that the species credits for any species at risk of an SAII are calculated in the event that the decision-maker forms the opinion that the proposed impact is **unlikely** to be serious and irreversible and therefore can be offset. |
| | 10.2 | Identify the credit class for ecosystem credits and species credits according to Section 10.2 (this report can be generated from the BAM-C). |



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# Appendix D: Streamlined assessment module – Planted native vegetation

The decision-making key below provides a framework for the assessment of planted native vegetation using the BAM.

Where only part of the subject land contains planted native vegetation, this module may be used to assess that part of the development, activity, clearing or biodiversity certification proposal. The standard BAM is then used to assess the remaining areas.

## D.1 Decision-making key

1. **Does the planted native vegetation occur within an area that contains a mosaic of planted and remnant native vegetation and which can be reasonably assigned to a PCT known to occur in the same IBRA subregion as the proposal?**

   i. Yes .... The planted native vegetation must be allocated to the best-fit PCT and the BAM must be applied.

   ii. No..... Go to 2.

2. **Is the planted native vegetation:**

   a. **planted for the purpose of environmental rehabilitation or restoration under an existing conservation obligation listed in BAM Section 11.9(2.), and**

   b. **the primary objective was to replace or regenerate a plant community type or a threatened plant species population or its habitat?**

   i. Yes .... The planted native vegetation must be assessed in accordance with Chapters 4 and 5 of the BAM.

   ii. No..... Go to 3.

3. **Is the planted/translocated native vegetation individuals of a threatened species or other native species planted/translocated for the purpose of providing threatened species habitat under one of the following:**

   a. **a species recovery project**

   b. ***Saving our Species* project**

   c. **other types of government funded restoration project**

   d. **condition of consent for a development approval that required those species to be planted or translocated for the purpose of providing threatened species habitat**

   e. **legal obligation as part of a condition or ruling of court. This includes regulatory directed or ordered remedial plantings (e.g. Remediation Order for clearing without consent issued under the BC Act or the Native Vegetation Act)**

   f. **ecological rehabilitation to re-establish a PCT or TEC that was, or is carried out under a mine operations plan, or**

   g. **approved vegetation management plan (e.g. as required as part of a Controlled Activity Approval for works on waterfront land under the NSW *Water Management Act 2000*)?**

   i. Yes .... The planted native vegetation must be assessed in accordance with Chapters 4 and 5 of the BAM.

ii. No..... Go to 4.

4. **Was the planted native vegetation (including individuals of a threatened flora species) undertaken voluntarily for revegetation, environmental rehabilitation or restoration without a legal obligation to secure or provide for management of the native vegetation?**

   i. Yes..... Go to D.2 Assessment of planted native vegetation for threatened species habitat (the use of Chapters 4 and 5 of the BAM are not required to be applied).

   ii. No..... Go to 5.

5. **Is the native vegetation (including individuals of a threatened flora species) planted for functional, aesthetic, horticultural or plantation forestry purposes? This includes examples such as: windbreaks in agricultural landscapes, roadside plantings (including street trees, median strips, roadside batters), landscaping in parks, gardens and sport fields/complexes, macadamia plantations or teatree farms?**

   i. Yes.... Go to D.2 Assessment of planted native vegetation for threatened species habitat (the use of Chapters 4 and 5 of the BAM are not required to be applied).

   ii. No..... Go to 6.

6. **Is the planted native vegetation a species listed as a widely cultivated native species on a list approved by the Secretary of the Department (or an officer authorised by the Secretary)?**

   i. Yes.... Go to D.2 Assessment of planted native vegetation for threatened species habitat (the use of Chapters 4 and 5 of the BAM are not required to be applied).

   ii. No..... There may be other types of occurrences of planted native vegetation that do not easily fit into the decision-making key above. Assessors should contact the BAM Support mailbox at bam.support@environment.nsw.gov.au for further advice on using the BAM to assess other types of occurrences of planted native vegetation.

Evidence demonstrating the application of the decision-making key to the areas of planted native vegetation must be provided in the BDAR or BCAR.

## D.2 Assessment of planted native vegetation for threatened species habitat

The assessor must assess the suitability of the planted native vegetation for use by threatened species and record any incidental sightings or evidence (e.g. scats, stick nests) of threatened species credit species (flora and fauna) using, inhabiting or being part of the planted native vegetation.

If there is evidence that threatened species are using the planted native vegetation as habitat, the assessor must apply Section 8.4 of the BAM to mitigate and manage impacts on these species. Species credits are not required to offset the proposed impacts.

The steps taken to assess threatened species habitat and all reasonable measures proposed to be taken to mitigate or minimise impacts must be set out in the BDAR or BCAR.

There may be unforeseen types of planted native vegetation that do not easily fit into the decision-making key above. In those circumstances contact the BAM Support mailbox at bam.support@environment.nsw.gov.au for further advice.



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# Appendix E: Ordering of waterways and riparian buffer distances

The Strahler stream ordering system is a classification system that gives a waterway an order. The order is determined by the number of tributaries associated with the waterway (Strahler 1952).

Figure 1 illustrates the Strahler stream ordering process. Numbering begins at the top of a catchment, with headwater ('new') flow paths being assigned '1'.

Where two flow paths of order 1 join, the section downstream of the junction is referred to as a second-order stream. Where two second-order streams join, the waterway downstream of the junction is referred to as a third-order stream, and so on. Where a lower-order stream (e.g. first order) joins a higher-order stream (e.g. third order), the area downstream of the junction will retain the higher number (i.e. it will remain a third-order stream).

The stream ordering system is designed so that results are consistent between catchments, but also recognises regional differences.

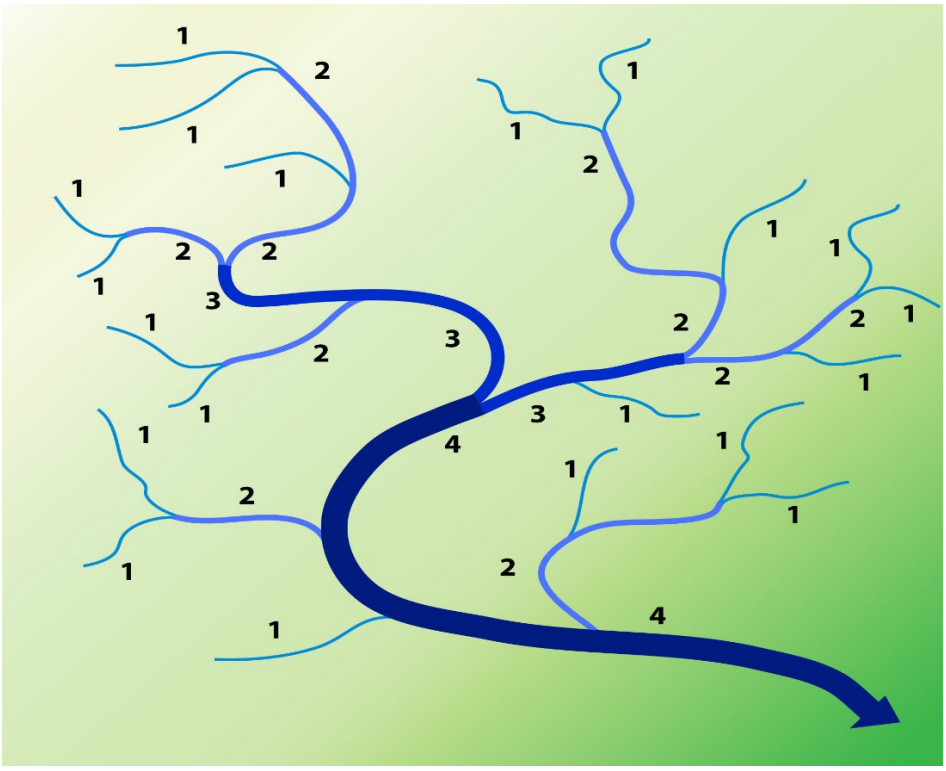


**Figure 1 Strahler stream ordering system**

If the top of the bank is defined, riparian buffer distances are measured on both sides of the stream. Otherwise, buffer distances are measured from the edge of the stream; they are only measured from the centre of the stream if the edge is not defined. If a stream has more than one bank on either side, the bank closest to the main channel is used, to protect vegetation on and within the stream banks.

Table 14 shows the riparian buffer distances for various types of water bodies. Riparian buffer distances do not include the width of the water body.



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**Table 14 Riparian buffer distances**

| Water body type | Riparian corridor width (each side of waterway) |
|---|---|
| Unmapped and 1st order streams | 10 |
| 2nd order stream | 20 |
| 3rd order stream | 30 |
| 4th and 5th order streams and above | 40 |
| 6th order stream and above | 50 |
| Wetland | 20 |
| Important wetland | 50 |
| Estuarine area | 50 |

# Appendix F: Growth form definitions

For the composition and structure components of the vegetation integrity assessment in Section 4.3, the assessor must assign all observed native plant species to a growth form group, as per the definitions in Table 15. Definitions have been modified from the NSW Native Vegetation Interim Type Standard (Sivertsen 2009) and the National Vegetation Information System V6 (Department of Environment and Heritage 2003).

The Department may provide a growth form group look-up table for assigning each plant species to a growth form group. If the assessor is unsure of the correct growth form group for a species, they should consult the growth form look-up table. The growth form assigned to each native plant species represents the most common growth form expressed by a species in its mature state across the extent of its geographic range.

**Table 15 Growth form groups and growth form definitions**

| BAM growth form group | Growth form code | Growth form category[a] | Growth form definition |
|---|---|---|---|
| Tree (TG) | t | Tree | Woody perennial plant usually with a distinct trunk. Usually more than 6 m tall when mature. |
| | m | Mallee tree | Primarily species of *Eucalyptus* with multiple stems arising from a lignotuber. Usually more than 6 m tall when mature. |
| Shrub (SG) | s | Shrub | Woody perennial plant, multi-stemmed at the base (or within 750 mm from ground level). Usually less than 6 m tall when mature. Not a mallee, heath or chenopod shrub. |
| | y | Mallee shrub | Primarily species of *Eucalyptus* with multiple stems arising from a lignotuber. Usually less than 6 m tall when mature. |
| | z | Heath shrub | Woody perennial shrub, commonly with ericoid leaves (nanophyll or smaller). Commonly occurs on nutrient-poor substrates. |
| | c | Chenopod shrub | Woody perennial shrub or sub-shrub from the family Chenopodiaceae (excludes forb-like chenopods). Single or multi-stemmed, may be semi-succulent, or leafless with fleshy, jointed stems (e.g. *Tecticornia* and *Sarcocornia*). |
| Grass & grass-like (GG) | g | Tussock grass | Any tussock or bunch grass that forms discrete but open tussocks usually with distinct individual shoots. Includes clumping species with deep subterranean rhizomes, e.g. *Imperata* and the reed *Phragmites*. |
| | h | Hummock grass | Coarse xeromorphic grass with a mound-like form often dead in the middle. Includes all members of *Triodia*. |
| | d | Other grass | Member of the family Poaceae that generally has a mat-forming habit (rhizomatous and/or stoloniferous, 'sod' grasses), rather than a distinctive tussock, reed or hummock habit. |
| | v | Sedge | Herbaceous, usually perennial erect plant generally with a tufted habit. Includes all members of the family Cyperaceae. |
| | r | Rush | Herbaceous, usually perennial erect plant that is neither a grass nor a sedge. Includes all members of the families Eriocaulaceae, Juncaceae, Lomandraceae, Restionaceae, Sparganiaceae and Typhaceae. |

| BAM growth form group | Growth form code | Growth form category[a] | Growth form definition |
|---|---|---|---|
| Forb (FG) | f | Forb | Herbaceous or slightly woody, annual, biennial or sometimes perennial plant.<br>Includes bulbous or tuberous herbs, ground orchids, lilies and irises from the families Amaryllidaceae, Anthericaceae, Araceae, Asphodelaceae, Blandfordiaceae, Commelinaceae, Hypoxidaceae, Iridaceae, terrestrial/geophytic Orchidaceae, Philydraceae and Phormiaceae.<br>Includes some aquatic or semi-aquatic species. Includes all members of the family Juncaginaceae, plus members of the genera *Lemna*, *Wolffia*, *Potamogeton* and *Vallisneria*.<br>Includes forb-like chenopod species (e.g. *Einadia* spp., some *Atriplex*, *Chenopodium*, *Dysphania* and *Maireana* species). |
| Fern (EG) | e | Fern and fern allies | Characterised by large and usually branched leaves (fronds), herbaceous; lithophytic or epiphytic; terrestrial to aquatic.<br>Includes all members of the families Adiantaceae, Aspleniaceae, Azollaceae, Davalliaceae, Grammitaceae, Marsileaceae, Psilotaceae, Pteridaceae, Polypodiaceae, Lycopodiaceae, Selaginellaceae and Isoetaceae.<br>Excludes tree ferns and all members of the families Cyatheaceae, Dicksoniaceae, Osmundaceae and Marattiaceae. |
| Other (OG) | q | Tree fern | Characterised by large and usually branched leaves (fronds), arborescent and terrestrial.<br>Includes all members of the families Cyatheaceae, Dicksoniaceae, Osmundaceae and Marattiaceae. |
| | p | Palm & palm-like | Palm and other arborescent monocotyledons. All members of the families Agavaceae, Arecaceae, Doryanthaceae or the genus *Cordyline.* |
| | a | Cycad & cycad-like | Palm-like plant, stemless to arborescent with fruit in cones. Includes all members of the family Zamiaceae and the genus *Pandanus*. |
| | l | Vine | Climbing, twining, winding, scrambling or sprawling plants. |
| | k | Epiphyte and lithophyte | Plant with roots attached to the aerial portions of other plants or rocks. Includes angiosperm epiphytes, mistletoes, parasites and some orchids. Includes all members of the families Loranthaceae and Viscaceae.<br>Excludes lithophytic or epiphytic ferns, which are included in the fern growth form category. |
| | x | Xanthorrhoea | Grass tree. All members of the genus *Xanthorrhoeaceae*. |

a Adapted from Walker & Hopkins (1990)

# Appendix G: Assessing the future value of attributes used to assess composition, structure and function at a biodiversity stewardship site

## G.1 Probability of reaching benchmark condition for composition and structure

The probability of reaching benchmark condition is estimated over the specified timeframe using Equation 31 (20 years) and used to derive a future value for each attribute. These probabilities depend on the:

- attribute
- vegetation formation
- landscape vegetation cover
- abundance of high threat exotic vegetation
- likely outcome from management actions (see below).

With the exception of regeneration, each structural and compositional attribute is assumed to have a rate of increase (*ir*) that is specific to the vegetation formation.

Differences in the *ir* will provide different probabilities of reaching benchmark condition within any given timeframe (Figure 2). For example, many structural attributes are assumed to have high initial rates of increase, whereas others, such as species richness, are likely to have very delayed and slow responses. The starting condition is also likely to influence the response. Sites in low condition are assumed to have delayed rates of increase, whereas those in moderate condition could improve relatively rapidly. Sites very near benchmark condition are also expected to improve more slowly. These patterns are approximated by a logistic probability function (Figure 2). Values of *ir* for each attribute are published in the BAM-C.

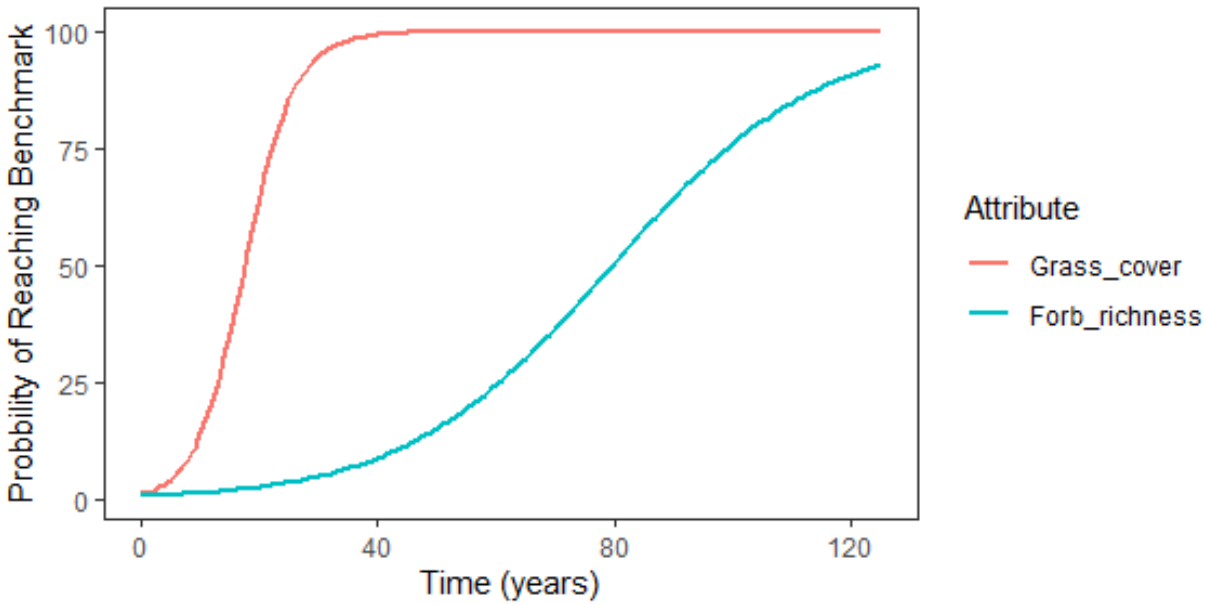


**Figure 2 Hypothetical curves illustrating how the probability of reaching benchmark condition might vary for different vegetation attributes**



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## G.2 Rate of increase for composition

The rate of gain for growth form groups used to assess composition attributes is calculated using Equation 8.

**Equation 8 Determine the intrinsic rate of increase for growth form groups used to assess composition**

$$r = (ir_i \; x \; PE \; x \; ER \; x \; PR)$$

*where:*

*$ir_i$ = estimated intrinsic rate of increase for the $i^{th}$ habitat attribute*

*PE = probability of new plant establishment as a function of landscape vegetation cover (see Equation 10)*

*ER = probability modifier based on the % cover of high threat exotic weeds estimated from Equation 11 below*

*PR = probability modifier based on the current vegetation integrity score for a vegetation zone from Equation 12 below*

## G.3 Rate of increase for structure

For biodiversity stewardship sites, Equation 9 is used to calculate the rate of gain for growth form groups used to assess structure.

**Equation 9 Determine the intrinsic rate of increase for growth form groups from active management**

$$r = (ir_i \; x \; PE \; x \; ER \; x \; PR)$$

*where:*

*$ir_i$ = estimated intrinsic rate of increase for the $i^{th}$ habitat attribute*

*PE = probability modifier based on landscape vegetation cover (see Equation 10)*

*ER = probability modifier based on the % cover of high threat exotic weeds estimated from Equation 11 below*

*PR = probability modifier based on site resilience from Equation 12 below*

## G.4 Assess the extant native vegetation cover and increase in species richness and plant cover

The BAM assesses the probability that a flora species can disperse into, and establish at, a biodiversity stewardship site, thus increasing the composition and cover of a growth form group. The model assumes that the likelihood that new plants will establish is based on a sigmoidal logistic curve with a threshold response at 40% vegetation cover, determined by Equation 10 (Figure 3).

Figure 3 shows the default relationship between *PE* and habitat cover (*v*), where $\beta = 3.2$ and $\varepsilon = 8$. Such a relationship assumes that the likelihood of plant establishment declines slowly, with increasing habitat loss until a threshold level of approximately 40%. At this point, the processes that lead to plant establishment are dramatically reduced.

The modifier is based on theoretical estimates of how vegetation cover in the surrounding landscape modifies average probabilities of plant migration. In theory, threshold behaviour should be expected.

**Equation 10 Assess the impact of native vegetation cover on the intrinsic rate of increase**

$$PE = \frac{1}{1 + e^{\beta - \frac{v}{\varepsilon}}}$$

*where:*

*PE = probability that new plants will disperse to and establish at the biodiversity stewardship site at the intrinsic rate of increase expected in a patch of native vegetation*

$\beta$ *= a constant to describe threshold behaviour in response to habitat loss*

*v = native vegetation cover in the landscape determined in Section 3.2*

$\varepsilon$ *= a constant that describes the slope or rate of decline probabilities of dispersal and establishment*

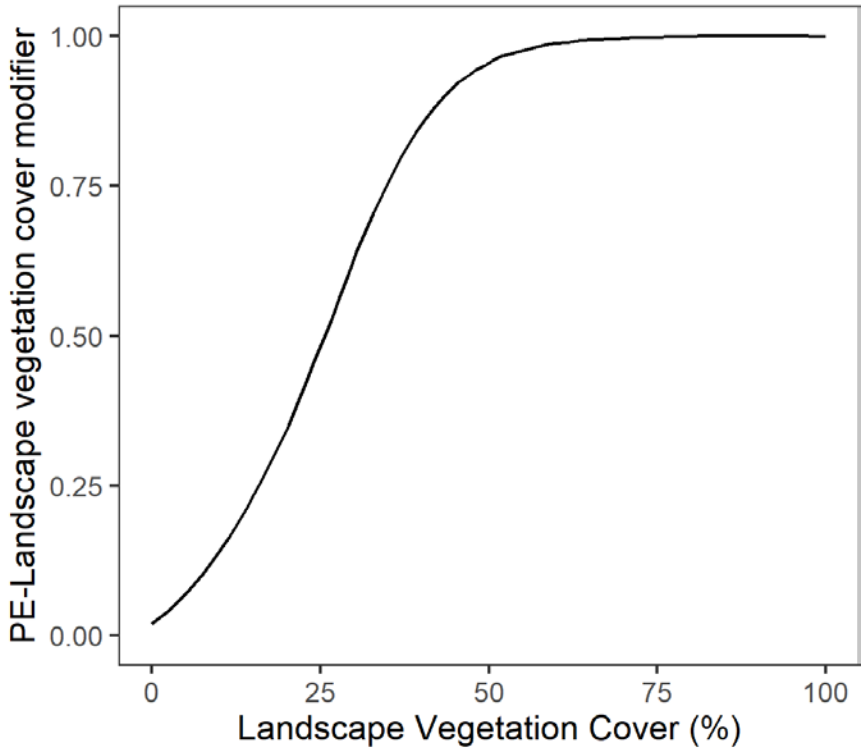


**Figure 3 Modifier for the intrinsic rate of increase in habitat attributes**

## G.5 Assess the impact of high threat exotic vegetation cover on the intrinsic rate of increase

Exotic plants, particularly high threat perennial species, can significantly reduce the ability to improve vegetation integrity and habitat suitability at a biodiversity stewardship site. The probability that most vegetation attributes will improve at the base intrinsic rate of increase is expected to decline as the cover of high threat exotic vegetation increases.

The probability that growth form groups and function attributes that occur in the ground layer will increase at the predicted intrinsic rate is expected to approach zero when high threat exotic vegetation cover dominates plant cover, and to approach 100% when high threat exotic vegetation is absent. Between these two values, the effect of high threat exotic vegetation cover on the intrinsic rate of increase is determined using a sigmoidal decay function, as per Equation 11. This means that the intrinsic rate of increase will slow as the percentage of high threat exotic vegetation cover increases (Figure 4).

**Equation 11 Determine the impact of high threat exotic vegetation cover on the intrinsic rate of increase**

$$ER = e^{((x/w)^{1.7} \times -ln\,2)}$$

*where:*

*ER = the effect of exotic vegetation on the intrinsic rate of increase ir*

*x = the average observed value for cover of high threat exotic vegetation in the vegetation zone at time = 0*

*w = a constant that varies according to the vegetation attribute (see Table 16)*

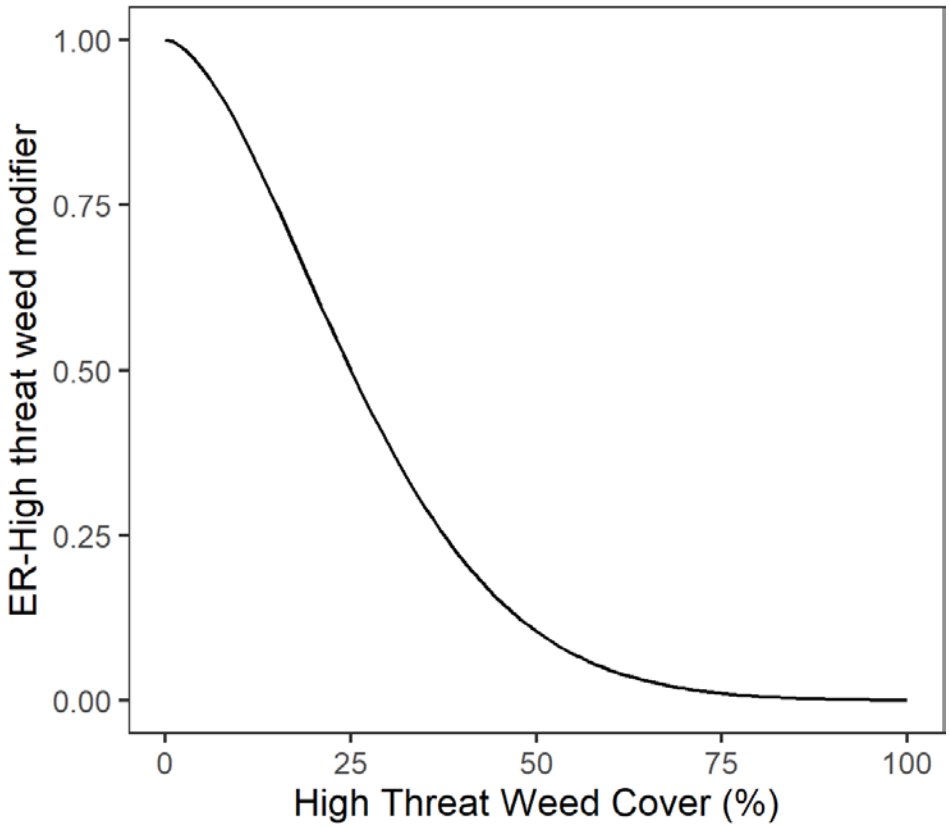


**Figure 4 Curve specified in Equation 11 to describe the effect of high threat exotic plants on rates of gain in habitat attributes**

**Table 16 Values for *w* (Equation 11) and *c* (Equation 12)**

| Attribute | W (constant) | C (constant) |
|---|---|---|
| **Structure** | | |
| Tree cover | n/a | 3.5 |
| Shrub cover | 25 | 3.5 |
| Grass & grass-like cover | 20 | 3.5 |
| Forb cover | 20 | 3.5 |
| Fern cover | 20 | 3.5 |
| Other cover | 20 | 3.5 |

| Attribute | W (constant) | C (constant) |
|---|---|---|
| **Richness** | | |
| Tree richness | 30 | 3.5 |
| Shrub richness | 25 | 4.0 |
| Grass & grass-like richness | 20 | 3.5 |
| Forb richness | 15 | 4.0 |
| Fern richness | 20 | 4.0 |
| Other richness | 20 | 4.0 |
| **Function** | | |
| Number of large trees | n/a | 3.5 |
| Litter cover | n/a | n/a |
| Length of logs | n/a | 3.5 |
| Regeneration | n/a | n/a |
| Stem size classes | n/a | 3.5 |

## G.6 Site resilience

Areas of vegetation with high integrity scores at the beginning of the management period are assumed to be more resilient and have greater likelihood of recovery. Therefore, key ecological processes are thought to be relatively intact and will favour recovery. Soil seed banks, soil nutrients, soil structure and soil microbial composition are assumed to be more intact. Processes such as pollination are also relatively intact.

Low-condition vegetation is expected to have modified pollinator fauna, soil seed banks, soil nutrient levels, soil microbial composition and soil structure. Here, recovery without active intervention (e.g. modification to soils and weed competition, seed and plant addition) is highly uncertain.

The probability of a biodiversity stewardship site recovering at the maximum rate is expected to be highest in areas with vegetation integrity scores >75, but declines quickly if scores are less than about 40–50 (see Equation 12).

**Equation 12 Probability of a biodiversity stewardship site recovering at the maximum rate**

$$PR = \frac{1}{1 + e^{c - \frac{VI}{10}}}$$

*where:*

*PR = probability of natural recovery from existing soil seed banks and locally dispersed seed based on the underlying site resilience*

*VI = total geometric mean vegetation integrity score at t=0*

*C = a constant that varies according to the vegetation attribute (see Table 16)*

Areas of vegetation with low vegetation integrity are more likely to be those with less resilience (e.g. higher soil nutrients, greater weed seed bank, lower diversity of soil mycorrhiza) and hence poorer establishment success. High threat exotic vegetation will also reduce the likelihood of success. The shape of this modifier is shown in Figure 5.

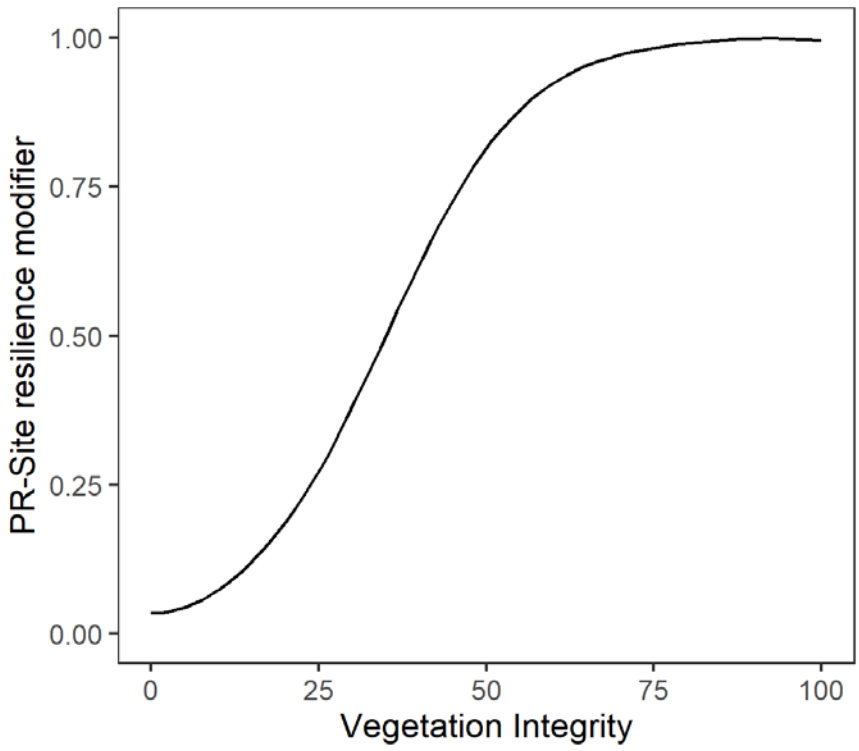


**Figure 5 Curve specified in Equation 12 to describe the effect of site resilience on rates of gain in habitat attributes**

# G.7 Functional attributes

## G.7.1 Number of large trees

A minor increase in the number of large trees is expected within the 20-year management timeframe. Where the required management actions are untaken, increases in the number of large trees are expected to follow Equation 31 and Equation 32. The rate of increase is calculated as *ir* x PR x PE.

## G.7.2 Litter cover

The gain in litter cover is estimated using *ir.* Rates of litter accumulation are not modified by high threat weed cover, site resilience or landscape native vegetation cover.

## G.7.3 Probability of tree regeneration

**Assumption:** If tree regeneration exists in a vegetation zone at the start of the management period, the BAM assumes that the biodiversity stewardship site will continue to support tree regeneration for the next 20 years.

The BAM also assumes that the probability of a successful tree regeneration event in any 5-year period is at its maximum (i.e. 25% of successive 5-year periods produce tree regeneration) if:

- the high threat exotic vegetation cover is <15%
- the vegetation integrity score is >50
- stem size classes >20 cm DBH are present.

The probability of tree regeneration is estimated to be a function of the:

- presence of stem size classes >20 cm DBH
- presence of exotic high threat weed cover
- current vegetation integrity score of the vegetation zone.

The actual probability of at least one successful tree regeneration event occurring over the 20-year management timeframe is estimated as the binomial probabilities of at least one in 16 years producing a germination event after subsequent seedlings survived for five years. (Individuals that germinate after 16 years cannot grow large enough to be included as successful tree regeneration.)

Under the BAM, a biodiversity stewardship site is predicted **to be likely to have tree regeneration** when:

- the probability of a successful tree regeneration event in 20 years is >0.9
- stems >20 cm DBH are present
- cover of high threat exotic vegetation is low.

When these conditions are met, the probability of a successful tree regeneration event during the 20-year management timeframe is >90%. Regeneration is most likely when high threat exotic vegetation is absent and the vegetation integrity score is >30 (see Figure 6).

The probability of tree regeneration **is low** when:

- stem size classes >20 cm DBH are absent or very low in abundance (<0.01), even in vegetation with high vegetation integrity and low abundance of high threat weeds
- the vegetation integrity score is <20 and high threat weed cover is >33%, even if seed-producing trees are present.

A biodiversity stewardship site is predicted to have **no tree regeneration** over 20 years when stems >20 cm DBH are absent.

The probability of successful tree regeneration when stems >20 cm DBH are present **decreases** as the cover of high threat exotic vegetation increases. Figure 6 shows cumulative likelihoods of a successful tree regeneration event over a 20-year management timeframe when seed-producing trees are present (A) and absent (B) in vegetation that has varying high threat weed cover and vegetation integrity scores.

Equation 13 is used to calculate the probability of tree regeneration.

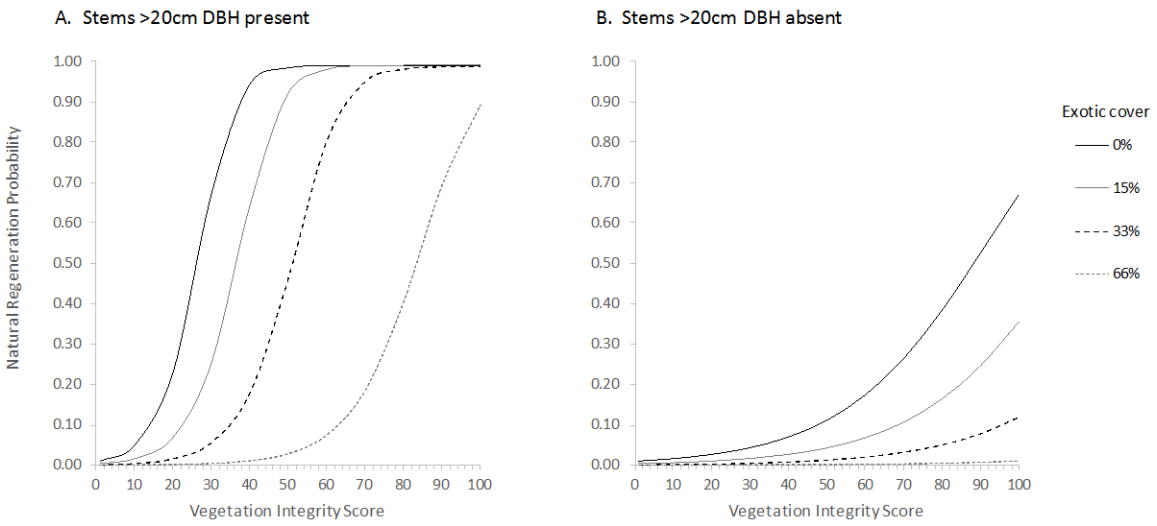


**Figure 6 Cumulative likelihood of a successful tree regeneration event, P(R), over a 20-year management timeframe**



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**Equation 13 Probability of tree regeneration occurring in a successive 5-year period at a biodiversity stewardship site**

$$S = \frac{0.25}{1 + e^{(6+6x-\frac{VI}{\alpha+6x})}}$$

*where:*

*S = probability of successful tree regeneration in a successive 5-year period*

*VI = total geometric mean vegetation integrity score at t=0*

*x = proportional cover of high threat exotic vegetation*

*$\alpha$ = constant that varies dependent on whether seed-producing trees are present ($\alpha$=6) or absent ($\alpha$=20)*

**Equation 14 Probability of tree regeneration occurring at a biodiversity stewardship site**

$$prR = 1 - (1 - S)^{16}$$

*where:*

*prR = the probability of at least one successful tree regeneration event in 20 years*

*S = the probability of a successful tree regeneration event in any successive 5-year period from Equation 13*

## G.7.4 Stem size classes

The stem size classes attribute is estimated from the number of stem size classes present, excluding those <5 cm DBH (tree regeneration) and the large tree class. Where the required management actions are undertaken, increases in the number of stem size classes are expected to follow Equation 31 and Equation 32. The rate of increase is calculated as *ir* x PR x PE.

## G.7.5 Length of logs

The rate of increase for length of logs is modified by multiplying *ir* x PR (resilience modifier).

## G.7.6 Effect of high threat exotic vegetation on active restoration management actions

The high threat weed (HTW) modifier is fixed at 1 for tree richness, tree cover and all functional attributes. In other words, HTW cover does not affect the risk weightings for these attributes. The HTW modifier is positively correlated with HTW cover for all other attributes, as per Equation 15. Manageable high threat weeds do not contribute to estimates of the HTW modifier if the 20-year management plan adequately details a strategy for their control.

**Equation 15 Determine the modifier for high threat exotic vegetation**

$$HTWm = e^{((x_1 - x_2)/60))^{2.5} \times -ln\,2)}$$

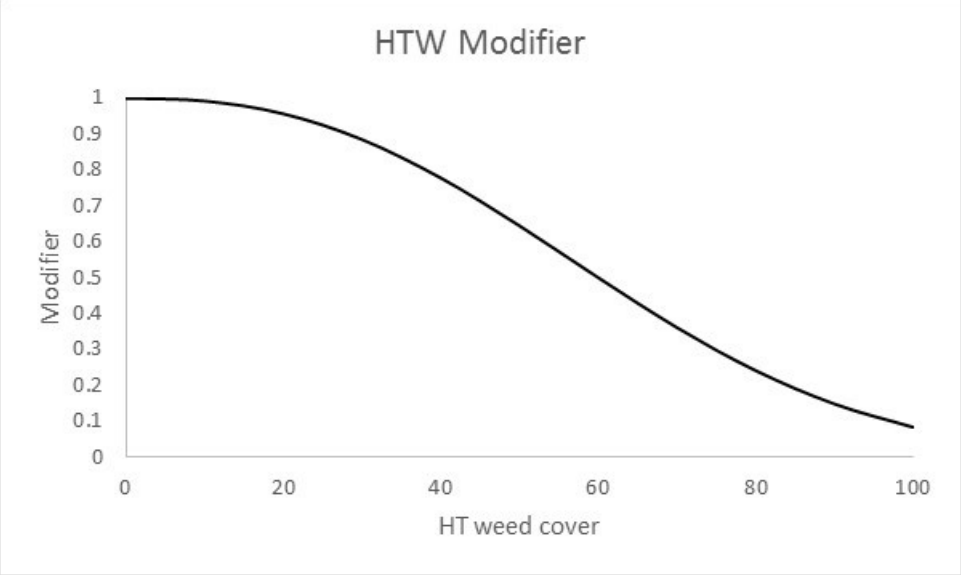
*where:*

*HTWm = the effect of exotic vegetation on the risk multiplier*

*$x_1$ = the average observed value for cover of high threat exotic vegetation in the vegetation zone at time = 0*

*$x_2$ = the average observed value for cover of manageable high threat exotic vegetation in the vegetation zone at time = 0*

Figure 7 shows the relationship between cover of high threat exotic vegetation, excluding manageable high threat weeds, and the modifier used to calculate the maximum allowable active restoration gains. It is used as part of Equation 35 to calculate the final risk weighting applied to the target attribute value from active restoration.




HTW = high threat weed

**Figure 7 Relationship between cover of high threat weed vegetation, excluding those that are manageable high threat weeds, and modifier used to calculate the maximum allowable active restoration gains**



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# Appendix H: Determining the vegetation integrity score

To determine the vegetation integrity score for a vegetation zone, the assessor must determine the composition score, structure score and function score using the plot and transect survey data collected for the vegetation zone.

## H.1 Determine the composition condition score

Each growth form group is initially scored out of 100 for composition condition. Average observed values for each growth form group are converted to continuous unweighted condition scores using Equation 16 (Weibull function; Figure 8).

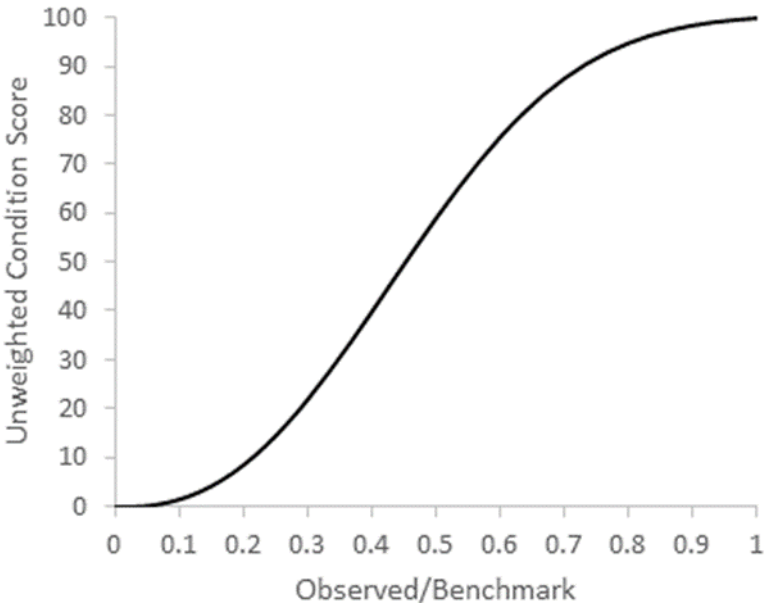


**Figure 8 Weibull distribution used for continuous unweighted scoring of composition condition for each growth form group**

Equation 16 is calculated for each growth form group shown in Table 2 based on the inputs:

- mean species richness of the growth form group recorded (observed) from all the plots in the vegetation zone, or
- mean species richness of the growth form group considering the impacts of development, clearing or biodiversity certification in the vegetation zone, or
- mean species richness of the growth form group from estimating the future value of vegetation integrity attributes without management in the vegetation zone, or
- mean species richness of the growth form group from estimating the future value of vegetation integrity attributes with management in the vegetation zone, and
- benchmark richness for that growth form group drawn from the BioNet Vegetation Classification.



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**Equation 16 Calculate unweighted condition score for each growth form group or relevant function attribute in a vegetation zone**

$$UCS_i = 100.68 \times (1 - e^{-5\left(\bar{x}_i / B_i\right)^{2.5}})$$

*where:*

*$UCS_i$ = unweighted condition score for the $i^{th}$ growth form group (composition) or function attribute in the vegetation zone*

*$\bar{x}_i$ = mean of species richness of the $i^{th}$ growth form group (composition) or function attribute among plots within the vegetation zone (observed or predicted future)*

*$B_i$ = benchmark value for the $i^{th}$ growth form group for composition or function attribute (from BioNet Vegetation Classification)*

The assessor must apply dynamic weights to unweighted composition condition scores for each growth form group based on the proportional contribution of each growth form group's benchmark richness to the benchmark total richness (sum of benchmark richness across all growth form groups); see Equation 17.

**Equation 17 Calculate dynamic weight for each composition growth form group**

$$w_i = B_i / \sum_{i=1}^{n} B_i$$

*where:*

*$w_i$ = dynamic weight for the $i^{th}$ growth form group*

*$B_i$ = benchmark cover value for the $i^{th}$ growth form group*

*n = number of growth form groups*

The composition condition score for the zone is calculated as the sum of the products of unweighted condition scores and their dynamic weights for each growth form group using Equation 18.

**Equation 18 Calculate composition condition score for the zone**

$$CCS = \sum_{i=1}^{n} UCS_i \times w_i$$

*where:*

*CCS = composition condition score for the zone*

*$UCS_i$ = unweighted composition condition score for the $i^{th}$ growth form group*

*$w_i$ = dynamic weight for the $i^{th}$ growth form group*

*n = number of growth form groups*

## H.2 Determine the structure condition score

Each growth form group is initially scored out of 100 for structure condition. The mean of all observed cover values for a growth form group within a vegetation zone is converted to a continuous unweighted condition score using Equation 19 (Weibull function; Figure 8). Where the mean of observed cover values for a growth form group within a vegetation zone is higher than the benchmark value, the mean value is assumed to be equal to the benchmark for that growth form group.



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Equation 19 is used to calculate the cover score of each structure growth form group shown in Table 2 based on the inputs:

- mean cover for the growth form group recorded (observed) from all plots/transects in the vegetation zone, or
- mean cover for the growth form group taking into account the impacts of development, clearing or biodiversity certification in the vegetation zone, or
- mean cover for the growth form group from estimating the future value of vegetation integrity attributes without management in the vegetation zone, or
- mean cover for the growth form group from estimating the future value of vegetation integrity attributes with management in the vegetation zone, and
- benchmark cover for the growth form group drawn from the benchmarks database.

**Equation 19 Calculate unweighted structure condition score for each growth form group in a vegetation zone**

$$USS_i = 100.68 \times (1 - e^{-5\left(\bar{x}i/B_i\right)^{2.5}})$$

*where:*

*$USS_i$ = unweighted structure score for the $i^{th}$ growth form group or function attribute in the vegetation zone*

*$\bar{X}_i$ = mean cover of the $i^{th}$ growth form group or function attribute among plots within the vegetation zone (observed or predicted future cover)*

*$B_i$ = benchmark value for the $i^{th}$ growth form group for structure or function attribute (from benchmarks database)*

Using Equation 20, the assessor must apply dynamic weights to unweighted structure scores for each growth form group, based on the proportional contribution of each growth form group's benchmark cover, to the total benchmark cover (sum of benchmark cover across all growth form groups).

**Equation 20 Calculate dynamic weight for each structure growth form group**

$$w_i = B_i / \sum_{i=1}^{n} B_i$$

*where:*

*$w_i$ = dynamic weight for the $i^{th}$ growth form group*

*$B_i$ = benchmark cover value for the $i^{th}$ growth form group*

*n = number of growth form groups*

Using Equation 21, the assessor can calculate the structure condition score for the zone as the sum of the products of unweighted condition scores and their dynamic weights for each growth form group.

**Equation 21 Calculate structure condition score for the zone**

$$SCS = \sum_{i=1}^{n} USS_i \times w_i$$

*where:*

*SCS = structure condition score for the zone*

*$USS_i$ = unweighted structure score for the $i^{th}$ growth form group*

*$w_i$ = dynamic weight for the $i^{th}$ growth form group*

*n = number of growth form groups*



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## H.3 Determine the function condition score

The assessor must determine a function condition score for PCTs classified under:

- vegetation formations that are rainforests, wet sclerophyll forests, dry sclerophyll forests, forested wetlands, grassy woodlands or semi-arid woodlands
- vegetation classes that are Wallum Sand Heaths, Sydney Coastal Heaths, Northern Montane Heaths or Sydney Montane Heaths.

The assessor does **not** determine a function condition score for PCTs classified under:

- vegetation formations that are freshwater wetlands, saline wetlands, grasslands, alpine complex or arid shrublands
- vegetation classes that are Southern Montane Heaths, South Coast Heaths or Coastal Headland Heaths.

Dynamic weights do not apply to function attributes. Static weights applied are in Table 17.

**Table 17 Static weights that apply to the scoring of function attributes**

| Attribute | Attribute weight |
|---|---|
| Number of large trees | 0.35 |
| Length of logs | 0.20 |
| Litter cover | 0.15 |
| Tree regeneration | 0.15 |
| Tree stem size classes | 0.15 |

**Number of large trees**. Equation 16 is used to determine the unweighted condition score for the average number of large trees observed among plots within a zone.

**Length of logs**. Equation 16 is used to determine the unweighted condition score for the average length of fallen logs observed among plots within a zone.

**Litter cover**. Equation 19 is used to determine the unweighted condition score for average litter cover observed among plots within a zone.

**Tree regeneration**. When counts at a plot are ≥1, the unweighted tree regeneration score for the plot is 100. When counts at a plot are zero, the unweighted tree regeneration score for the plot is zero. The average unweighted tree regeneration score for the zone is calculated as the sum of scores divided by the number of plots.

**Tree stem size classes** is based on the number of stem size classes present within the plot. The unweighted score for tree stem size classes is scored as per Table 18. The average unweighted tree stem size classes score for the zone is calculated as the sum of scores divided by the number of plots.

**Table 18 Tree stem size classes scores**

| Number of stem size classes present (not including large trees or regenerating trees) | Large tree benchmark size (≥80cm DBH) | Large tree benchmark size (≥50cm DBH) | Large tree benchmark size (≥30cm DBH) | Large tree benchmark size (≥20cm DBH) |
|---|---|---|---|---|
| None | 0 | 0 | 0 | 0 |
| One | 9 | 15 | 28 | 59 |
| Two | 40 | 59 | 85 | 100 |
| Three | 76 | 92 | 100 | n/a |
| Four | 95 | 100 | n/a | n/a |
| Five | 100 | n/a | n/a | n/a |

DBH = diameter at breast height over bark; n/a = not applicable

The function condition score for the zone is calculated as the sum of the products of unweighted condition scores and their static weights (Table 17) for each attribute, using Equation 22.

**Equation 22 Calculate function condition score for the zone**

$$FCS = \sum_{i=1}^{5} UFS_i \times w_i$$

*where:*

*FCS = function condition score for the zone*

*$UFS_i$ = unweighted function condition score for the $i^{th}$ attribute*

*$w_i$ = weight for the $i^{th}$ attribute*

### H.3.1 Vegetation integrity score

The assessor must determine a vegetation integrity score for each vegetation zone identified in Subsection 4.3.1.

The assessor must use Equation 23 to determine the vegetation integrity score for PCTs classified under:

- vegetation formations that are rainforests, wet sclerophyll forests, dry sclerophyll forests, forested wetlands, grassy woodlands or semi-arid woodlands
- vegetation classes that are Wallum Sand Heaths, Sydney Coastal Heaths, Northern Montane Heaths or Sydney Montane Heaths.

**Equation 23 Calculate current vegetation integrity score for treed systems**

$$VI = \sqrt[3]{CCS\ x\ SCS\ x\ FCS}$$

*where:*

*VI = current vegetation integrity score for the zone*

*CCS = composition condition score for the zone*

*SCS = structure condition score for the zone*

*FCS = function condition score for the zone*

The assessor must use Equation 24 to determine the vegetation integrity score for PCTs classified under:

- vegetation formations that are freshwater wetlands, saline wetlands, grasslands, alpine complex or arid shrublands
- vegetation classes that are Southern Montane Heaths, South Coast Heaths or Coastal Headland Heaths.

**Equation 24 Calculate vegetation integrity score for non-treed systems**

$$VI = \sqrt[2]{CCS\ x\ SCS}$$

*where:*

*VI = current vegetation integrity score for the zone*

*CCS = composition condition score for the zone*

*SCS = structure condition score for the zone*

## H.4 Determine the future vegetation integrity score accounting for the impacts of development, clearing or conferral of biodiversity certification

The assessor must determine the future vegetation integrity score for each vegetation zone identified in Subsection 4.3.1 by considering the:

- impacts of development, clearing or biodiversity certification on the growth form groups used to determine the composition and cover score
- attributes used to determine the function score.

The assessor must use Equation 25 to determine the future vegetation integrity score for a zone for PCTs classified under:

- vegetation formations that are rainforests, wet sclerophyll forests, dry sclerophyll forests, forested wetlands, grassy woodlands or semi-arid woodlands
- vegetation classes that are Wallum Sand Heaths, Sydney Coastal Heaths, Northern Montane Heaths or Sydney Montane Heaths.

**Equation 25 Calculate future vegetation integrity score for treed systems**

$$VID = \sqrt[3]{CS \; x \; SS \; x \; FS}$$

*where:*

*VID = future vegetation integrity score taking into account the impacts of development, clearing or conferral of biodiversity certification*

*CS = future composition condition score for the zone*

*SS = future structure condition score for the zone*

*FS = future function condition score for the zone*

The assessor must use Equation 26 to determine the future vegetation integrity score for a zone for PCTs classified under:

- vegetation formations that are freshwater wetlands, saline wetlands, grasslands, alpine complex or arid shrublands
- vegetation classes that are Southern Montane Heaths, South Coast Heaths or Coastal Headland Heaths.

**Equation 26 Calculate future vegetation integrity score for non-treed systems**

$$VID = \sqrt[2]{CS \; x \; SS}$$

*where:*

*VID = future vegetation integrity score taking into account the impacts of development, clearing or conferral of biodiversity certification*

*CS = future composition condition score for the zone*

*SS = future structure condition score for the zone*

## H.5 Calculate the change in vegetation integrity score for vegetation zones on the development site or land to be certified

The change (loss) in vegetation integrity is a measure of the direct impact on native vegetation and threatened species habitat. The assessor must calculate the change in the vegetation integrity score for the vegetation zone or management zone using Equation 27.

The change (loss) in vegetation integrity is the difference between the current vegetation integrity score determined before the development takes place and the future vegetation integrity score considering the impacts of development.

The assessor must measure the direct impact on:

- the area of suitable habitat defined by the species polygon as per Subsection 5.2.5, using Equation 27
- individual flora defined by the species polygon as per Subsection 5.2.5, using a count of the number of each flora species in the species polygon.

Note: The number of individual flora species directly cleared within a species polygon is used in Section 10.1 to determine the offset requirement.

**Equation 27 Calculate change in vegetation integrity score at the development site or land to be biodiversity certified**

$$\Delta VI\ \ Loss = VI - VID$$

*where:*

*$\Delta VI$ Loss = the change (loss) in the vegetation integrity score of a vegetation zone at the development site or land to be biodiversity certified*

*VI = the current vegetation integrity score, as determined in accordance with Section 4.4*

*VID = future vegetation integrity score taking into account the impacts of development, as determined in accordance with Subsection 8.1.1*

Note: The loss in vegetation integrity for a vegetation zone or a species polygon is used in Section 10.1 to determine the offset requirement.

## H.6 Estimate future value of vegetation integrity attributes without management

For each vegetation zone, the assessor must determine the future value of the attributes and growth form group without management, using Equation 28.

**Equation 28 Estimated future value of attributes without a biodiversity stewardship agreement**

$$FV_0 = V_i \times (1 - D_i)^t$$

*where:*

*$FV_0$ = future value of the attribute without a biodiversity stewardship agreement in a vegetation zone*

*$V_i$ = current observed mean of the $i^{th}$ attribute (at t=0) from plot data in the vegetation zone*

*$D_i$ = estimated annual probability of decline for the $i^{th}$ attribute according to the Intrinsic rates of increase/Annual rate of decline tables published in the BAM-C*

*t = management timeframe, which takes a value of 20 years*



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Once the assessor has determined the future value of the attribute without a biodiversity stewardship agreement, they can use the future value of the attribute to determine the:

- composition condition score without management
- structure condition score without management
- function condition score without management.

Future attribute values, without a biodiversity stewardship agreement, are converted to composition, structure and function condition scores using Equations 16–22.

The assessor must use Equation 29 to determine the future vegetation integrity score without management for PCTs classified under:

- vegetation formations that are rainforests, wet sclerophyll forests, dry sclerophyll forests, forested wetlands, grassy woodlands or semi-arid woodlands
- vegetation classes that are Wallum Sand Heaths, Sydney Coastal Heaths, Northern Montane Heaths or Sydney Montane Heaths.

**Equation 29 Calculate vegetation integrity score for treed systems without management**

$$VIal = \sqrt[3]{CCS\ x\ SCS\ x\ FCS}$$

*where:*

*VIal = the vegetation integrity score with averted loss taking into account the decline in vegetation integrity without management*

*CCS = composition condition score with averted loss for the zone taking into account the decline in composition without management*

*SCS = structure condition score with averted loss for the zone taking into account the decline in structure without management*

*FCS = function condition score with averted loss for the zone taking into account the decline in function without management*

The assessor must use Equation 30 to determine the vegetation integrity score for PCTs classified under:

- vegetation formations that are freshwater wetlands, saline wetlands, grasslands, alpine complex or arid shrublands
- vegetation classes that are Southern Montane Heaths, South Coast Heaths or Coastal Headland Heaths.

**Equation 30 Calculate vegetation integrity score for non-treed systems without management**

$$VIal = \sqrt[2]{CCS\ x\ SCS}$$

*where:*

*VIal = the vegetation integrity score with averted loss taking into account the decline in vegetation integrity without management*

*CCS = composition condition score with averted loss for the zone taking into account the decline in composition without management*

*SCS = structure condition score with averted loss for the zone taking into account the decline in structure without management*



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## H.7 Estimate the future condition score for composition, structure and function with required management actions

For each vegetation zone, the assessor must determine the future value of the attributes with management, using Equation 28 and Equation 32. If the current attribute value ($C_i$) is below benchmark ($K_i$), the predicted attribute value at a stewardship site ($FV_1$), when the required management actions are done over 20 years (t = 20), is estimated using Equation 32. If the current attribute value is greater than benchmark, the future value ($FV_1$) is assumed to be equal to $C_i$.

**Equation 31 Probability of an attribute reaching benchmark within a 20-year management timeframe**

$$P_i = \frac{\left(\frac{C_i}{K_i}\right) x\ e^{rt}}{1 + \left(\frac{C_i}{K_i}\right)\ x\ (e^{rt} - 1)}$$

*where:*

*$P_i$ = probability of specific attribute or growth form group reaching benchmark condition in the vegetation zone at the end of the management timeframe*

*$K_i$ = the benchmark value for the specific attribute or growth form group*

*$C_i$ = the current value of an attribute in a vegetation zone determined using Equation 16 for functional attributes, Equation 18 for composition attributes and Equation 21 for structure attributes at time = 0*

*r = intrinsic rate of increase for the attribute or growth form group*

*t = management timeframe (20 years)*

**Equation 32 Future value of attributes used to assess composition, structure and function with management**

$$FV_1 = P_i\ x\ K_i$$

*where:*

*$FV_1$ = the future value of the attribute at t=20 years*

*$P_i$ = the predicted probability of benchmark value at t=20 years*

*$K_i$ = the estimated benchmark value for the $i^{th}$ attribute*

Once the assessor has determined the future value of the attribute with management, the future value of the attribute is used to determine the:

- composition condition score with management
- structure condition score with management
- function condition score with management.

Future attribute values, with management (required and/or active restoration), are converted to composition, structure and function condition scores using Equations 16–22.

## H.8 Calculate the future vegetation integrity score at a biodiversity stewardship site with required management actions

**Treed systems:** The assessor must use Equation 33 to calculate the vegetation integrity score for a zone as the geometric mean of the composition, structure and function scores for PCTs in:

- grassy woodland
- wet sclerophyll forest
- dry sclerophyll forest
- semi-arid woodland
- rainforest formations.

**Non-treed systems:** The assessor must use Equation 34 to calculate the vegetation integrity score for a zone as the geometric mean of composition and structure scores for PCTs in:

- treeless heathlands
- shrublands
- grasslands
- wetlands formations.

**Equation 33 Calculate future vegetation integrity score for treed systems**

$$VIwm = \sqrt[3]{CCS\ x\ SCS\ x\ FCS}$$

**Equation 34 Calculate future vegetation integrity score for non-treed systems**

$$VIwm = \sqrt[2]{CCS\ x\ SCS}$$

*where:*

*VIwm = future vegetation integrity score taking into account the gain in vegetation integrity from required management or active restoration*

*CCS = composition condition score for the zone taking into account the gain in vegetation integrity from required and any active restoration management actions*

*SCS = structure condition score for the zone taking into account the gain from required and any active restoration management actions*

*FCS = function condition score for the zone taking into account the gain from required and any active restoration management actions*

## H.9 Calculate the future vegetation integrity score at a biodiversity stewardship site with active restoration management actions

Where active restoration management actions are done at a stewardship site, the assessor must calculate the maximum allowable gain for each condition attribute that is subject to active restoration management actions. The maximum allowable gain for each condition attribute is based on:



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- the difference, after 20 years, between the predicted attribute value determined for the required management actions and the target value for the attribute from undertaking the active restoration management actions
- application of the final restoration risk weighting, determined using Equation 35, to the target value to determine the maximum allowable gain for each condition attribute.

The maximum allowable gain for each condition attribute is then used in Equation 33 or Equation 34 to determine the future vegetation integrity score with active restoration.

**Equation 35 Calculate final restoration risk weighting *R***

$$R_i = (rw_i \times HTWm)$$

*where:*

*$R_i$ = final risk weighting for the $i^{th}$ habitat attribute*

*$rw_i$ = risk weighting of 0.3 for the $i^{th}$ habitat attribute*

*HTWm= effect of high threat weeds on the risk weighting determined using Equation 15*

The final risk weighting that is applied to the target attribute value from active restoration is calculated using Equation 35, which is based on the:

- initial restoration risk weighting of 0.3 for each target attribute
- high threat exotic vegetation modifier based on the cover of high threat exotic vegetation present at the stewardship site, as determined using Equation 15 and Figure 7.

**Equation 36 Calculate the difference between future value with management and proposed target with risk weighting**

$$RG = R_i \times (Tv - FV_1)$$

*where:*

*RG = restoration gain*

*Tv = proposed target active restoration value*

*$FV_1$ is the future attribute value with management*

## H.10 Calculate the gain in the vegetation integrity score for vegetation zones at a biodiversity stewardship site

The assessor must calculate the change in vegetation integrity score for the vegetation zone using Equation 37.

**Equation 37 Calculate change in vegetation integrity score at a biodiversity stewardship site**

$$VI\ gain = (VIwm - VIal) + Sb$$

*where:*

*VI gain = the change (gain) in the vegetation integrity score of a vegetation zone at the biodiversity stewardship site from management and averted loss*

*VIwm = the future vegetation integrity score taking into account the gain with required management actions and restoration management actions under a biodiversity stewardship agreement determined in accordance with Equation 33 or Equation 34*

*VIal = the future vegetation integrity score without a biodiversity stewardship agreement determined in accordance with Equation 29 or Equation 30*

*Sb = the security benefit that may apply in accordance with Section 11.5*



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# Appendix I: Biodiversity risk weighting

The BAM uses a biodiversity risk weighting to evaluate the ecological risks of threatened entities from the Biodiversity Offsets Scheme (BOS). The biodiversity risk weighting comprises two parts:

- sensitivity to loss considers the increased threat posed to an entity from offsetting the loss of habitat or population
- sensitivity to gain considers the ability of a species to respond to improvements in habitat condition at a biodiversity stewardship site.

The biodiversity risk weighting for determining the credit requirement for ecosystem credits is based on (see Table 19):

- the sensitivity to loss for the listed TEC identified on the subject land, or
- if the vegetation is not a TEC, the sensitivity to loss for the PCT identified on the subject land (i.e. threat status of the TEC takes precedence to determine the sensitivity to loss, regardless of the estimated percent cleared value for the PCT)
- the highest sensitivity to gain ranking for the ecosystem credit species associated with that TEC or PCT.

The BAM-C will apply the biodiversity risk weighting to each vegetation zone based on the survey data the assessor collected from the subject land in Stage 1 and the impact assessment outcomes determined by the assessor in Stage 2.

**Table 19 Application of the biodiversity risk weighting, ecosystem credits**

| **Sensitivity to loss**<br>**Ecological communities and PCTs** | **Sensitivity to gain**<br>**Ecosystem credit species (based on the species with the highest sensitivity impacted by the development, or biodiversity certification)** | | | |
|---|---|---|---|---|
| | **Very high (x 3)** | **High (x 2)** | **Medium (x 1.5)** | **Low (x 1)** |
| **CEEC or a PCT ≥90% cleared; very high sensitivity (x 3)** | 3 | 2.5 | 2.25 | 2.0 |
| **EEC or a PCT ≥70% – <90% cleared; high sensitivity (x 2)** | 2.5 | 2.0 | 1.75 | 1.5 |
| **VEC or a PCT ≥50% – <70% cleared; moderate sensitivity (x 1.5)** | 2.25 | 1.75 | 1.5 | 1.25 |
| **PCT <50% cleared; low sensitivity (x 1)** | 2.0 | 1.5 | 1.25 | 1 |

CEEC = critically endangered ecological community; EEC = endangered ecological community; PCT = plant community type; VEC = vulnerable ecological community

A PCT or TEC that does not provide habitat for threatened species assessed for ecosystem credits will have a low sensitivity to gain value (x 1) to determine the biodiversity risk weighting for the vegetation zone.



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The biodiversity risk weighting for determining the credit requirement for species credits is based on the sensitivity to loss and the sensitivity to gain for the species (see Table 20). The BAM-C applies the biodiversity risk weighting to the area of impact for the species-based site survey data the assessor collected in Stage 1 and the impact assessment outcomes the assessor determined in Stage 2.

**Table 20 Application of the biodiversity risk weighting, species credits**

| Sensitivity to loss | Sensitivity to gain | | | |
|---|---|---|---|---|
| | Very high | High | Moderate | Low |
| **Very high – critically endangered or very high sensitivity to loss** | 3 | 3 | 3 | 2 |
| **High – endangered or high sensitivity to loss** | 3 | 2 | 2 | 1.5 |
| **Moderate – vulnerable or moderate sensitivity to loss** | 3 | 2 | 1.5 | 1 |

The criteria used to determine the **sensitivity to loss class** for a threatened entity are in Table 21. The criteria used to determine the **sensitivity to gain class** for a threatened entity are in Table 22.

**Table 21 Sensitivity to loss class (threatened species, ecological communities and plant community types)**

| Sensitivity to loss class | Sensitivity to loss assessment criteria[a] |
|---|---|
| **Very high:** critically endangered or very high sensitivity to loss | Species that have a very high sensitivity to loss are:<br>a. listed under the BC Act as critically endangered, or<br>b. listed under the EPBC Act as critically endangered, or<br>c. species with a very highly restricted geographic distribution, or<br>d. species with a very small population size, or<br>e. species with a very high rate of decline |
| | Threatened ecological communities that have a very high sensitivity to loss are:<br>a. listed under the BC Act as critically endangered, or<br>b. ecological communities with a very highly restricted geographic distribution, or<br>c. ecological communities with a very small population, or<br>d. ecological communities with a very high rate of decline.<br>Plant community types that have a very high sensitivity to loss are those with a percent cleared value ≥90% |
| **High:** endangered or high sensitivity to loss | Species that have a high sensitivity to loss are:<br>a. listed under the BC Act as endangered, or<br>b. listed under the EPBC Act as endangered, or<br>c. species with a highly restricted geographic distribution, or<br>d. species with a small population, or<br>e. species with a high rate of decline |
| | Threatened ecological communities that have a high sensitivity to loss are:<br>a. listed under the BC Act as endangered, or<br>b. ecological communities with a highly restricted geographic distribution, or<br>c. ecological communities with a small population, or<br>d. ecological communities with a high rate of decline.<br>Plant community types that have a high sensitivity to loss are those with a percent cleared value ≥70% and <90% |
| **Moderate:** vulnerable or moderate sensitivity to loss | Species that have a moderate sensitivity to loss are:<br>a. listed under the BC Act as vulnerable, or<br>b. listed under the EPBC Act as vulnerable, or<br>c. species with a restricted geographic distribution, or<br>d. species with a moderately small population size, or<br>e. species with a moderate rate of decline |
| | Threatened ecological communities that have a moderate sensitivity to loss are:<br>a. listed under the BC Act as vulnerable, or<br>b. ecological communities with a restricted geographic distribution, or<br>c. ecological communities with a moderately small population size, or<br>d. ecological communities with a moderate rate of decline.<br>Plant community types that have a moderate sensitivity to loss are those with a percent cleared value ≥50% and <70% |
| **Low:** low sensitivity to loss | Plant community types that have a low sensitivity to loss are those with a percent cleared value less than 50% |

BC Act = *Biodiversity Conservation Act 2016* (NSW); EPBC Act = *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth)

a Detailed information on the criteria used to make these assessments are in the *Guidance to assist a decision-maker to determine a serious and irreversible impact*.

**Table 22 Sensitivity to gain class (threatened species)**

| Sensitivity to gain class | Sensitivity to gain assessment criteria |
|---|---|
| **Very high** | Flora and fauna species that have a very high sensitivity to gain are those:<br>a. for which effectiveness of management in controlling threats at a biodiversity stewardship site is not possible or threats are beyond control; the species' life history traits and/or ecology are known, but the ability to control key threats at the site scale is negligible, or<br>b. that are dependent on habitat attributes that do not respond to management (e.g. caves for roosting/breeding habitat), or<br>c. that are flora species with very restricted recruitment, being primarily sterile or clonal |
| **High:** the species is highly sensitive to gain | Flora and fauna species that have a high sensitivity to gain are those for which the effectiveness of management in controlling threats at a biodiversity stewardship site is limited, and/or their ecology or response to management is poorly known |
| | Fauna species that have a high sensitivity to gain are those:<br>a. that are dependent on habitat attributes (very slow-developing attributes)<br>b. whose ability to colonise improved habitat on a biodiversity stewardship site is limited (disperse <100 m, and/or have specific dispersal corridor or vector requirements)<br>c. whose fecundity in terms of average number of offspring is low (<1 per year)<br>d. whose fecundity in terms of age at which females first produce is low (>4 years) |
| | Flora species with a high sensitivity to gain are those whose:<br>a. recruitment strategy is to resprout and occasionally set seeds<br>b. recruitment in terms of age at first flowering is significant (>10 years)<br>c. recruitment in terms of seed production is significant (<100 viable seeds per mature adult)<br>d. ability to colonise improved habitat on a biodiversity stewardship site is limited (can only disperse near the adult plant)<br>e. ability to withstand temporarily poor environmental conditions is limited because of lifespan (<1 year)<br>f. ability to withstand temporarily poor environmental conditions is limited because of seed bank (transient canopy seed bank 0–2 years) |
| **Moderate:** the species has a moderate sensitivity to gain | Species that have a moderate sensitivity to gain are those for which the effectiveness of management in controlling threats at a biodiversity stewardship site is moderate |
| | Fauna species that have a moderate sensitivity to gain are those:<br>a. that are dependent on habitat attributes (slow-developing attributes)<br>b. whose ability to colonise improved habitat on a biodiversity stewardship site is moderate<br>c. whose fecundity in terms of average number of offspring is moderate (1–3 per year)<br>d. whose fecundity in terms of age at which females first produce is moderate (2–4 years)<br>e. that are a high-order predator |

| Sensitivity to gain class | Sensitivity to gain assessment criteria |
|---|---|
| **Moderate**, continued… | Flora species that have a moderate sensitivity to gain are those whose:<br>a. recruitment strategy is primarily to set seeds)<br>b. recruitment in terms of age at first flowering is moderate (5–10 years)<br>c. recruitment in terms of seed production is moderate (100s of viable seeds per mature adult)<br>d. ability to colonise improved habitat on a biodiversity stewardship site is moderate (disperse beyond the adult plant but within the population)<br>e. ability to withstand temporarily poor environmental conditions is moderate because of lifespan (1–5 years)<br>f. ability to withstand temporarily poor environmental conditions is moderate because of seed bank (transient soil seed bank 0–2 years) |
| **Low** | Species that have a low sensitivity to gain are those for which the effectiveness of management in controlling threats at a biodiversity stewardship site is good |
| | Fauna species that have a low sensitivity to gain are those:<br>a. that are not dependent on habitat attributes<br>b. whose ability to colonise improved habitat on a biodiversity stewardship site is good (disperse >10 km)<br>c. whose fecundity in terms of average number of offspring is high (>3 per year)<br>d. whose fecundity in terms of age at which females first produce is high (<2 years) |
| | Flora species that have a low sensitivity to gain are those whose:<br>a. recruitment strategies are to resprout and to set seeds<br>b. recruitment in terms of age at first flowering is few (<5 years)<br>c. recruitment in terms of seed production is few (1000s of viable seeds per mature adult)<br>d. ability to colonise improved habitat on a biodiversity stewardship site is good (outside the population)<br>e. ability to withstand temporarily poor environmental conditions is good because of lifespan (>5 years) |

# Appendix J: Valuing land-based conservation measures for strategic biodiversity certification

## J.1 Decision-making framework for strategic biodiversity certification

In addition to the retirement of biodiversity credits, the *Biodiversity Conservation Act 2016* (BC Act) enables an applicant of a strategic biodiversity certification to access additional approved conservation measures including:

- reservation of land under the *National Parks and Wildlife Act 1974* (NPW Act)
- adoption of development controls under the *Environmental Planning and Assessment Act 1979* (EP&A Act) that conserve or enhance the natural environment
- state infrastructure contributions under the EP&A Act (as per s7.24) that conserve or enhance the natural environment
- any other measure determined to be an approved conservation measure by the Minister for Energy and Environment.

Section 6.13(b) of the BC Act requires that the Biodiversity Certification Assessment Report (BCAR) specify the number and class of biodiversity credits to be retired to offset the impacts as determined in accordance with the Biodiversity Assessment Method (BAM).

Section 6.13(c) of the BC Act requires that the BCAR specify proposed conservation measures on or in respect of other land to offset impacts on biodiversity values and their value (in terms of biodiversity credits) determined in accordance with the BAM.

The offset obligation determined by the BAM must be set out in the BCAR. While the Minister for Energy and Environment must have regard to the BCAR, the Minister is not bound by the BCAR (section 8.7(2) of the BC Act) nor is the Minister bound by the offset rules (including variation rules) when conferring strategic biodiversity certification (clause 6.2(5)(b) of the BC Regulation).

## J.2 Land-based conservation measures

Conservation measures that can be applied to land (land-based conservation measures) for strategic biodiversity certification are:

- reservation of land under the NPW Act, and
- adoption of development controls under the EP&A Act that conserve or enhance the natural environment. This method only provides a value for these controls where they involve zoning land E2 Environmental Conservation.

The Minister may also determine that ‘any other conservation measure’ is an approved conservation measure. For the purposes of this appendix, actions taken to improve degraded native vegetation on public land are treated as a land-based conservation measure.

Land-based conservation measures apply to specific parcels of land and are proposed at the time a biodiversity certification application is made. Land-based conservation measures can be applied to land both within and outside of the biodiversity certification assessment area.

Land-based conservation measures must be valued in terms of biodiversity credits. The value of these measures can then be considered in the evaluation of whether the proposed conservation measures adequately address the likely impacts on biodiversity values of the biodiversity certification.



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To be considered suitable as a conservation measure, a proposed land-based conservation measure should satisfy the suitability criteria detailed in Section J.5.

The purpose of this appendix is to outline the process for identifying and valuing proposed 'land-based conservation measures'.

This appendix does not limit an applicant from proposing different conservation measures as 'other conservation measures' as per section 8.3(2)(b) of the BC Act. The value of such other conservation measures as an offset will be considered on a case-by-case basis.

Applicants also have the option of establishing a biodiversity stewardship agreement to generate credits that will be retired to offset the impacts of the biodiversity certification. Stages 1 and 3 of the BAM outline the process for establishing a biodiversity stewardship site to generate credits.

## J.3 Avoiding impacts in the biodiversity certification assessment area

The requirement to avoid and minimise impacts on biodiversity values in Chapter 7 of the BAM refines the area of land proposed for biodiversity certification within the biodiversity certification assessment area.

Avoided land is not automatically protected from future development by the biodiversity certification process. Avoided land will default to 'retained' land and will be subject to normal assessment and approval procedures under the EP&A Act.

Land-based conservation measures may be applied to avoided land, assuming suitability criteria are met. This will allow the biodiversity values of avoided lands to be recognised in the analysis of whether the proposed conservation measures adequately address the biodiversity impacts of the certification.

## J.4 Consultation and consent

### J.4.1 Consultation and consent for reservation of land under the *National Parks and Wildlife Act 1974*

Where the reservation of land under the NPW Act is proposed on land not owned by the applicant, it is expected the landowner will consent to be a party to the certification. All other parties with a registered interest in the property must also become parties to the certification. It is important to identify all of these parties early in the process of designing land-based conservation measures.

### J.4.2 Consultation and consent for adoption of development controls under the *Environmental Planning & Assessment Act 1979*

Since the adoption of development controls involves changes to land-use zones, consultation with affected landholders is strongly recommended. Adopting development controls as a conservation measure for the biodiversity certification is likely to mean that land uses become more restricted. If the environmental values of the land are such that they require protection, there may be opportunity for landowners to generate income from those values and offset loss of future development rights by entering into a biodiversity stewardship agreement. This highlights the importance of consulting with landholders early in the process of designing conservation measures.

Landholders and interest holders of land over which the adoption of development controls is proposed are not required to be a party to the certification.

Local government may be responsible for implementing development controls as part of a biodiversity certification proposal. Where this is the case and the applicant for the certification is not local government, the local government must be a party to the certification. Consultation with local government in designing development controls is essential.

### J.4.3 Consultation and consent for actions to improve degraded native vegetation on public land

In the case of actions to improve degraded native vegetation on public land, it is expected the landowner will consent to be a party to the certification. As actions are taken to improve degraded native vegetation, it is likely to mean that land uses become more restricted. Consultation with the landowner in the design of this conservation measure will be essential.

Local government may be responsible for implementing actions to improve degraded native vegetation as part of a biodiversity certification proposal. Where this is the case and the local government is neither the applicant for the certification nor the landowner, the local government must be a party to the certification. Consultation with local government in designing the required actions is essential.

## J.5 Suitability for land-based conservation measures

Land is considered eligible to be used for a land-based conservation measure if it is not already the subject of a legal offset obligation. A legal offset obligation could include a condition of consent or approval, a voluntary planning agreement or other formal offset arrangement designed to compensate for biodiversity impacts, including those referred to in clause 5.1 of the BC Regulation. An existing offset obligation could include an obligation imposed by an approval under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*.

A parcel of land with Environmental zoning is not considered a legal offset obligation only because of this zoning. If the parcel of land with Environmental zoning is the subject of an offset for a prior planning approval, a legal offset obligation may exist. Environmental zoning established as a conservation measure for a prior conferred biodiversity certification would be considered a legal offset obligation.

### J.5.1 Suitability for reservation of land under the National Parks and Wildlife Act

Reservation of land under Part 4 of the NPW Act must only be proposed as a conservation measure with the written consent of the relevant authorised National Parks and Wildlife Service (NPWS) Manager. NPWS will only accept land that it determines to be suitable for reservation. No commitment can be made to accept an offset that includes the reservation of land under the NPW Act without the written agreement of the Minister administering the NPW Act, or authorised delegate.

Additional requirements for reservation of land under the NPW Act to be used as a conservation measure must include:

a. a management plan outlining ongoing management actions, which must be negotiated with NPWS
b. provision of funds for ongoing management – these management funds would need to be negotiated with NPWS and secured under a biodiversity certification agreement
c. subdivision of land where the landholding is to be split between the developable area and an area to be reserved
d. a biodiversity certification agreement committing the landowner to the land transfer within a certain timeframe and describing future funding arrangements.

### J.5.2 Suitability for actions to improve degraded native vegetation on public land

To be considered as a conservation measure, land that is the subject of actions taken to improve degraded native vegetation must be protected from development and must be public land.

To be assigned a value under this method, actions to improve degraded native vegetation on public land that are proposed as conservation measures must be:

a. undertaken in a manner consistent with Table 6 and Table 7 and Subsections 11.3.1 and 3 of the BAM, and
b. on land classified, or to be dedicated, as community land (natural area) where the land is public land within the meaning of the *Local Government Act 1993*, and
c. secured by a biodiversity certification agreement that:
    i. outlines objectives, actions to improve degraded native vegetation, their timing, responsibilities and compliance monitoring processes
    ii. is signed by the applicant, the landowner and any other party with responsibilities for delivering the required actions
d. supported by sufficient funding to achieve objectives.

### J.5.3 Suitability for adoption of development controls under the Environmental Planning and Assessment Act

Development controls should only be considered when no alternative form of conservation measure is proposed for the land. Development controls will generate the lowest credit yield of the land-based conservation measures. Development control conservation measures are generally not considered suitable for land with limited biodiversity values.

Note: This does not prevent appropriate zoning from being applied to land that is the subject of an alternative conservation measure. In this scenario, credit yield will be determined using the weighting values of the alternative conservation measure.

When applying development controls as a conservation measure, existing approved or otherwise lawful uses should be considered for their compatibility with conservation. Split zones (i.e. different zones applied on one property to reflect different land uses) may be necessary to delineate between existing approved uses and areas subject to a conservation measure.

To be assigned a value under this method, development controls that are proposed as conservation measures must include:

a. new E2 Environmental Conservation zoned land that is rezoned as a direct result of the biodiversity certification application to protect existing biodiversity values, and
b. significant upgrades to existing environmental protection zoning and development controls in order to achieve improvement in existing biodiversity values to the satisfaction of the Minister, including all of the following:
    i. objectives consistent with environmental protection and permissible uses consistent with those objectives
    ii. a local provision that sets out the controls that will apply to protect native vegetation and any other habitat for native species on the land
    iii. minimum lot sizes and/or options for lot averaging and lot clustering that will apply to preserve the integrity of native vegetation and any other habitat for native species on the land.

New E2 Environmental Conservation zones must:

a. be in place at the time of the application for biodiversity certification, OR
b. be in a planning proposal that has been issued a Gateway determination including an anticipated date that the relevant planning authority will make the local plan, OR
c. be proposed by the Planning Agency Head or the Minister for Planning and Public Spaces AND nominate a timeframe for making the relevant instrument.

The management actions in Table 6 of the BAM can be used to guide the design of development controls that will improve biodiversity values.

## J.6 Calculating a credit score for land-based conservation measures

A credit score is an equivalent credit value for the proposed land-based conservation measure, expressed in terms of number and class of biodiversity credits. This calculation is required to satisfy section 6.13(c) of the BC Act.

The credit score will be employed in determining whether offsets adequately address biodiversity impacts. The credit score does not create actual biodiversity credits. Rather, the credits are provided to give those measures a value in offsetting impacts on biodiversity values on the proposed certified land. Biodiversity credits can only be created by following the assessment and application processes required to enter into a biodiversity stewardship agreement.

### J.6.1 Assessing biodiversity values

Stages 1 and 3 of the BAM must be applied to assess the biodiversity values of land-based conservation measures within the biodiversity certification assessment area

Stage 1 Section 4 of the BAM – *Assessing native vegetation, threatened ecological communities and vegetation integrity* and Section 5 – *Assessing the habitat suitability for threatened species* will have been applied across the biodiversity certification assessment area to identify land proposed for certification and land proposed to be avoided and retained. Assuming vegetation sampling has been representative across the biodiversity certification assessment area, additional plots in areas subsequently proposed for land-based conservation measures may not be required.

For land-based conservation measures proposed outside of the assessment area, vegetation integrity must be assessed (in accordance with Stages 1 and 3 of BAM).

Stage 3 of the BAM should be applied where the land-based conservation measure is intended to also offset the impacts of conferral on habitat suitability. Evaluating habitat suitability for species credit species will assist the applicant to demonstrate that the proposed offset adequately addresses the impacts of the strategic biodiversity certification.

### J.6.2 Weightings for different land-based conservation measures

It is assumed that land-based conservation measures result in a gain in the condition of vegetation, through protection from development or management actions or both. Different land-based conservation measures provide different levels of security and management of biodiversity values. The level of security and management is used to determine the weighting applied to a land-based conservation measure, relative to a biodiversity stewardship agreement.

Note: Applicants also have the option of establishing a biodiversity stewardship agreement to generate credits that will be retired to offset the impacts of the biodiversity certification.

Biodiversity credits will be determined as if preparing a biodiversity stewardship agreement application. In the case of development controls, the assessor will assume that management actions would be applied and gain would be achieved as if a biodiversity stewardship site were to be established. Weightings will then be applied to different types of land-based conservation measures as detailed below in Table 23.

**Table 23 Weightings for land-based conservation measures**

| Conservation measure | Value of biodiversity credits relative to a biodiversity stewardship agreement |
|---|---|
| Reservation of land under the *National Parks and Wildlife Act 1974* | 100% |
| Actions taken to improve degraded native vegetation on public land (in accordance with this appendix) | 25% |
| Adoption of development controls under the *Environmental Planning and Assessment Act 1979* (in accordance with this appendix) | 10% |

Note that these values are not additive. The highest weighting relevant to the proposed land-based conservation measure will apply.

The weighting is to be applied manually to the number of credits determined through the BAM-C.

## J.7 Documenting proposed conservation measures

### J.7.1 Biodiversity Certification Assessment Report

The credit score of land-based conservation measures calculated in accordance with this appendix must be reported in the BCAR. The BCAR will be appended to the biodiversity certification application form. The requirements for documenting proposed conservation measures in a BCAR are outlined in Appendix K.

The BCAR will include:

- identification of parcels subject to land-based conservation measures
- identification of land-based conservation proposed for each parcel
- supporting information to demonstrate suitability of land-based conservation measures
- credit score of land-based conservation measures, including scores produced via the BAM and weighting adjusted scores according to Table 23.

### J.7.2 Biodiversity certification strategy

The BCAR must be accompanied by a biodiversity certification strategy. The biodiversity certification strategy will be appended to the biodiversity certification application form. The requirements for a biodiversity certification strategy are outlined in Appendix K.

The biodiversity certification strategy will include:

- land proposed for biodiversity certification
- land proposed for biodiversity conservation
- proposed conservation measures, including:
    - credits proposed to be purchased (or created) and retired
    - financial contributions proposed to be made to the Biodiversity Conservation Fund



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  - reservation of land under the NPW Act (declared strategic biodiversity certifications only)
  - adoption of development controls under the EP&A Act that conserve or enhance the natural environment (declared strategic biodiversity certifications only)
  - special infrastructure contributions that conserve or enhance the natural environment (declared strategic biodiversity certifications only)
  - any other measure determined to be an approved conservation measure by the Minister for Energy and Environment (declared strategic biodiversity certifications only)
- legal mechanisms for securing delivery of proposed conservation measures
- parties to the biodiversity certification and responsibilities, noting where biodiversity certification agreements are proposed
- timing for delivery of conservation measures
- funding sources for delivery of conservation measures
- framework for monitoring, reporting or auditing implementation of conservation measures.

### J.7.3 Adequately addressing biodiversity impacts of the certification

The Minister, or delegate, will weigh the value of the proposed conservation measures in the evaluation of whether the measures adequately address the biodiversity impacts on biodiversity values of the proposed biodiversity certification. This could include:

- biodiversity credits proposed to be retired, from the market or from biodiversity stewardship sites established for the purposes of the biodiversity certification
- biodiversity credit retirement proposed to be met by payment into the Biodiversity Conservation Fund
- credit score of land-based conservation measures
- 'other' conservation measures not valued in credit terms.

Identification of developable land and conservation measures is likely to be an iterative process. The options available to improve the impact to the offset credit balance include:

- reduce the area proposed for biodiversity certification, to reduce the credit requirement
- apply land-based conservation measures that have a higher credit weighting
- complete Sections 5.2, 5.3 and 5.4 of the BAM to assess potential for species credits for land-based conservation measures
- increase the range of management actions to be applied to land-based conservation measures (e.g. include active restoration and/or secure land under a biodiversity stewardship agreement and retire the biodiversity credits generated), to increase the yield of credits and include these commitments in the biodiversity certification
- identify land for the application of conservation measures outside the biodiversity certification assessment area
- identify 'other' conservation measures (section 8.3 of the BC Act).


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# Appendix K: Requirements for a Biodiversity Development Assessment Report and a Biodiversity Certification Assessment Report

The BAM has three stages:

- Stage 1, biodiversity assessment
- Stage 2, impact assessment
- Stage 3, improving biodiversity values.

The Biodiversity Development Assessment Report (BDAR) and Biodiversity Certification Assessment Report (BCAR) document the first two of these stages and are submitted as part of an application or proposal for development, activity or clearing (BDAR) or biodiversity certification (BCAR). For a strategic biodiversity certification application, the BCAR must also document the credit value of conservation measures applied to land as outlined in Appendix J.

Checklists of the minimum information requirements for the BDAR or BCAR, depending on its specific purpose, are in Table 24 (Stage 1: Biodiversity assessment) and Table 25 (Stage 2: Impact assessment).

Stage 3 of the BAM is included in a Biodiversity Stewardship Site Assessment Report (BSSAR). See Appendix M, Table 29 and Table 30, for the BSSAR's requirements.

Checklists of the minimum information requirements for a BDAR for the streamlined assessment modules are in Appendix L. See Table 26 for an assessment of scattered trees, Table 27 for an assessment of a small area and Table 28 for an assessment of planted native vegetation.



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**Table 24 Minimum information requirements for the Biodiversity Development Assessment Report and the Biodiversity Certification Assessment Report – Stage 1: Biodiversity assessment**

| Report section | BAM ref. | Information | Maps & tables (in document) | Data (to be supplied) |
|---|---|---|---|---|
| Introduction | Chapters 2 and 3 | **INFORMATION**<br>Introduction to the biodiversity assessment including:<br>☐ brief description of the proposal<br>☐ identification of subject land[1] boundary, including:<br>☐ operational footprint (if BDAR)<br>☐ construction footprint indicating clearing associated with temporary/ancillary construction facilities and infrastructure (if BDAR)<br>☐ land proposed for biodiversity certification (if BCAR)<br>☐ general description of the subject land<br>☐ sources of information used in the assessment, including reports and spatial data | | |
| | | **MAPS and TABLES (in document)**<br>☐ Map of the subject land boundary showing the final proposal footprint, including the construction footprint for any clearing associated with temporary/ancillary construction facilities and infrastructure (if BDAR) | | |
| | | **DATA (to be supplied)** – N/A | | |
| Landscape context | Sections 3.1 and 3.2, Appendix E | **INFORMATION**<br>Identification of site context components and landscape features, including:<br>☐ general description of subject land topographic and hydrological setting, geology and soils<br>☐ percent native vegetation cover in the assessment area (as described in BAM Section 3.2)<br>☐ IBRA bioregions and subregions (as described in BAM Subsection 3.1.3(2.))<br>☐ rivers and streams classified according to stream order (as described in BAM Subsection 3.1.3(3.) and Appendix E)<br>☐ wetlands within, adjacent to and downstream of the site (as described in BAM Subsection 3.1.3(3.))<br>☐ connectivity of different areas of habitat (as described in BAM Subsection 3.1.3(5–6.))<br>☐ karst, caves, crevices, cliffs, rocks and other geological features of significance and for vegetation clearing proposals, soil hazard features (as described in BAM Subsections 3.1.3(7.) and 3.1.3(12.)<br>☐ areas of outstanding biodiversity value occurring on the subject land and assessment area (as described in BAM Subsection 3.1.3(8–9.))<br>☐ any additional landscape features identified in any SEARs for the proposal | | |

[1] As defined in the BAM.

| Report section | BAM ref. | Information | Maps & tables (in document) | Data (to be supplied) |
|---|---|---|---|---|
| | | ☐ NSW (Mitchell) landscape on which the subject land occurs | | |
| | | **MAPS and TABLES (in document)**<br>☐ Site Map<br>☐ Boundary of subject land<br>☐ Cadastre of subject land<br>☐ Landscape features identified in BAM Subsection 3.1.3<br>☐ Location Map<br>☐ Digital aerial photography at 1:1,000 scale or finer<br>☐ Boundary of subject land<br>☐ Assessment area, (i.e. the subject land and either 1500 m buffer area *or* 500 m buffer for linear development<br>☐ Landscape features identified in BAM Subsection 3.1.3<br>☐ Additional detail (e.g. local government area boundaries) relevant at this scale<br>Landscape features identified in BAM Subsection 3.1.3 and to be shown on the Site Map and/or Location map include:<br>☐ IBRA bioregions and subregions<br>☐ rivers, streams and estuaries<br>☐ wetlands and important wetlands<br>☐ connectivity of different areas of habitat<br>☐ karst, caves, crevices, cliffs, rocks and other geological features of significance and if required, soil hazard features<br>☐ areas of outstanding biodiversity value occurring on the subject land and assessment area<br>☐ any additional landscape features identified in any SEARs for the proposal<br>☐ NSW (Mitchell) landscape on which the subject land occurs | | |
| | | **DATA (to be supplied)**<br>☐ All report maps as separate jpeg files<br>Individual digital shape files of:<br>☐ subject land boundary<br>☐ assessment area (i.e. subject land and 1500 m buffer area) boundary<br>☐ cadastral boundary of subject land<br>☐ areas of native vegetation cover<br>☐ landscape features | | |

| Report section | BAM ref. | Information | Maps & tables (in document) | Data (to be supplied) |
|---|---|---|---|---|
| Native vegetation | Chapter 4, Appendix A and Appendix H | **INFORMATION**<br>☐ Identify native vegetation extent within the subject land, including cleared areas and evidence to support differences between mapped vegetation extent and aerial imagery (as described in BAM Section 4.1(1–3.) and Subsection 4.1.1)<br>☐ Provide justification for all parts of the subject land that do not contain native vegetation (as described in BAM Subsection 4.1.2)<br>☐ Review of existing information on native vegetation including references to previous vegetation maps of the subject land and assessment area (described in BAM Section 4.1(3.) and Subsection 4.1.1)<br>☐ Describe the systematic field-based floristic vegetation survey undertaken in accordance with BAM Section 4.2<br>☐ Where relevant, describe the use of more appropriate local data, provide reasons that support the use of more appropriate local data and include the written confirmation from the decision-maker that they support the use of more appropriate local data (as described in BAM Subsection 1.4.2 and Appendix A)<br>For each PCT within the subject land, describe:<br>☐ vegetation class<br>☐ extent (ha) within subject land<br>☐ evidence used to identify a PCT including any analyses undertaken, references/sources, existing vegetation maps (BAM Section 4.2(1–3.))<br>☐ plant species relied upon for identification of the PCT and relative abundance of each species<br>☐ if relevant, TEC status including evidence used to determine vegetation is the TEC (BAM Subsection 4.2.2(1–2.))<br>☐ estimate of percent cleared value of PCT (BAM Subsection 4.2.1(5.))<br>Describe the vegetation integrity assessment of the subject land, including:<br>☐ identification and mapping of vegetation zones (as described in BAM Subsection 4.3.1)<br>☐ assessment of patch size (as described in BAM Subsection 4.3.2)<br>☐ survey effort (i.e. number of vegetation integrity survey plots) as described in BAM Subsection 4.3.4(1–2.)<br>☐ use of relevant benchmark data from BioNet Vegetation Classification (as described in BAM Subsection 4.3.3(5.))<br>Where use of more appropriate local benchmark data is proposed (as described in BAM Subsection 1.4.2, BAM Subsection 4.3.3(5.) and BAM Appendix A):<br>☐ identify the PCT or vegetation class for which local benchmark data will be applied<br>☐ identify published sources of local benchmark data (if benchmarks obtained from published sources)<br>☐ describe methods of local benchmark data collection (if reference plots used to determine local benchmark data)<br>☐ provide justification for use of local data rather than BioNet Vegetation Classification benchmark values<br>☐ provide written confirmation from the decision-maker that they support the use of local benchmark data | | |

| Report section | BAM ref. | Information | Maps & tables (in document) | Data (to be supplied) |
|---|---|---|---|---|
| | | **MAPS and TABLES (in document)**<br>☐ Map of native vegetation extent within the subject land at scale not greater than 1:10,000 including identification of cleared areas (as described in BAM Section 4.1(1–3.)) and all parts of the subject land that do not contain native vegetation (BAM Subsection 4.1.2)<br>☐ Map of PCTs within the subject land (as described in BAM Section 4.2(1.))<br>☐ Map of vegetation zones within the subject land (as described in BAM Subsection 4.3.1)<br>☐ Map the location of floristic vegetation survey plots and vegetation integrity survey plots relative to PCTs boundaries<br>☐ Map of TEC distribution on the subject land and table of TEC listing, status and area (ha)<br>☐ Map of patch size locations for each native vegetation zone and table of patch size areas (as described in BAM Subsection 4.3.2)<br>Table of current vegetation integrity scores for each vegetation zone within the site and including:<br>☐ composition condition score<br>☐ structure condition score<br>☐ function condition score<br>☐ presence of hollow bearing trees | | |
| | | **DATA (to be supplied)**<br>☐ All report maps as separate jpeg files<br>☐ Plot field data (MS Excel format)<br>☐ Plot field data sheets<br>Digital shape files of:<br>☐ PCT boundaries within subject land<br>☐ TEC boundaries within subject land<br>☐ vegetation zone boundaries within subject land<br>☐ floristic vegetation survey and vegetation integrity plot locations | | |
| Threatened species | Chapter 5 | **INFORMATION**<br>Identify ecosystem credit species likely to occur on the subject land, including:<br>☐ list of ecosystem credit species derived from the BAM-C (as described in BAM Subsection 5.1.1 and Section 5.2(1.))<br>☐ justification and supporting evidence for exclusion of any ecosystem credit species based on geographic limitations, habitat constraints or vagrancy (as described in BAM Subsections 5.2.1 and 5.2.2)<br>☐ justification for addition of any ecosystem credit species to the list | | |

| Report section | BAM ref. | Information | Maps & tables (in document) | Data (to be supplied) |
|---|---|---|---|---|
| | | Identify species credit species likely to occur on the subject land, including:<br>☐ list of species credit species derived from the BAM-C (as described in BAM Subsection 5.1.1)<br>☐ justification and supporting evidence for exclusions based on geographic limitations, habitat constraints or vagrancy (as described in BAM Subsections 5.2.1 and 5.2.2)<br>☐ justification and supporting evidence for exclusions based on degraded habitat constraints and/or microhabitats on which the species depends (as described in BAM Subsection 5.2.2)<br>☐ justification for addition of any species credit species to the list<br>From the list of candidate species credit species, identify:<br>☐ species assumed present within the subject land (if relevant) (as described in BAM Subsection 5.2.4(2.a.))<br>☐ species present within the subject land on the basis of being identified on an important habitat map for a species (as described in BAM Subsection 5.2.4(2.d.))<br>☐ species for which targeted surveys are to be completed to determine species presence (Subsection 5.2.4(2.b.))<br>☐ species for which an expert report is to be used to determine species presence (Subsection 5.2.4(2.c.))<br>Present the outcomes of species credit species assessments from:<br>☐ threatened species survey (as described in BAM Section 5.2.4)<br>☐ expert reports (if relevant) including justification for presence of the species and information used to make this determination (as described in BAM Section 5.2.4 and 5.3, Box 3)<br>Where survey has been undertaken include detailed information on:<br>☐ survey method and effort, (as described in BAM Section 5.3)<br>☐ justification of survey method and effort (e.g. citation of peer-reviewed literature) if approach differs from the Department's taxa-specific survey guides or where no relevant guideline has been published<br>☐ timing of survey in relation to requirements in the TBDC or the Department's taxa-specific survey guides. Where survey was undertaken outside these guides include justification for the timing of surveys<br>☐ survey personnel and relevant experience<br>☐ describe any limitations to surveys and how these were addressed/overcome<br>Where an expert report has been used in place of survey (as described in BAM Section 5.3, Box 3), include:<br>☐ justification of the use of an expert report<br>☐ identify the expert, provide evidence of their expert credentials and Departmental approval of expert status<br>☐ all requirements of Box 3 have been addressed in the expert report | | |

| Report section | BAM ref. | Information | Maps & tables (in document) | Data (to be supplied) |
|---|---|---|---|---|
| | | Where use of local data is proposed (BAM Subsection 1.4.2):<br>☐ identify relevant species<br>☐ identify data to be amended<br>☐ identify source of information for local data, e.g. published literature, additional survey data, etc.<br>☐ justify use of local data in preference to VIS Classification or TBDC data<br>☐ provide written confirmation from the decision-maker that they support the use of local data<br>Species polygon completed for species credit species present within the subject land (assumed present or determined on the basis of survey, expert report or important habitat map) ensuring that:<br>☐ the unit of measure for each species is documented<br>for species assessed by area:<br>☐ the polygon includes the extent of suitable habitat for the target species within the subject land (as described in BAM Subsection 5.2.5)<br>☐ a description of, and evidence-based justification for, the habitat constraints, features or microhabitats used to map the species polygon including reference to information in the TBDC for that species and any buffers applied<br>for species assessed by counts of individuals:<br>☐ the number of individual plants present on the subject land (as described in BAM Subsection 5.2.5(3.))<br>☐ the method used to derive this number (i.e. threatened species survey or expert report) and evidence-based justification for the approach taken<br>☐ the polygon includes all individuals located on the subject land with a buffer of 30 m around the individuals or groups of individuals on the subject land<br>☐ Identify the biodiversity risk weighting for each species credit species identified as present within the subject land (as described in BAM Section 5.4) | | |
| | | **MAPS and TABLES (in document)**<br>☐ Table showing ecosystem credit species in accordance with BAM Section 5.1.1, and identifying:<br>☐ the ecosystem credit species removed from the list<br>☐ the sensitivity to gain class of each species<br>☐ Table detailing species credit species in accordance with BAM section 5.2 and identifying:<br>☐ the species credit species removed from the list of species because the species is considered vagrant, out of geographic range or the habitat or micro habitat features are not present<br>☐ the candidate species credit species not recorded on the subject land as determined by targeted survey, expert report or important habitat map | | |

| Report section | BAM ref. | Information | Maps & tables (in document) | Data (to be supplied) |
|---|---|---|---|---|
| | | ☐ Table detailing species credit species recorded or assumed as present within the subject land, habitat constraints or microhabitats associated with the species, counts of individuals (flora)/extent of suitable habitat (flora and fauna) (as described in BAM Subsection 5.2.6) and biodiversity risk weighting (BAM Section 5.4)<br>☐ Map indicating the GPS coordinates of all individuals of each species recorded within the subject land and the species polygon for each species (as described in BAM Subsection 5.2.5) | | |
| | | **DATA (to be supplied)**<br>☐ Digital shape files of suitable habitat identified for survey for each candidate species credit species<br>☐ Survey locations including GPS coordinates of any plots, transects, grids<br>☐ Digital shape files of each species polygon including GPS coordinates of located individuals<br>☐ Species polygon map in jpeg format<br>☐ Expert reports and any supporting data used to support conclusions of the expert report<br>☐ Field data sheets detailing survey information including prevailing conditions, date, time, equipment used, etc. | | |
| Prescribed impacts | Chapter 6 | **INFORMATION**<br>Identify potential prescribed biodiversity impacts on threatened entities, including:<br>☐ karst, caves, crevices, cliffs, rocks and other geological features of significance (as described in BAM Subsection 6.1.1)<br>☐ occurrences of human-made structures and non-native vegetation (as described in BAM Subsection 6.1.2)<br>☐ corridors or other areas of connectivity linking habitat for threatened entities (as described in BAM Subsection 6.1.3)<br>☐ water bodies or any hydrological processes that sustain threatened entities (as described in BAM Subsection 6.1.4)<br>☐ protected animals that may use the proposed wind farm development site as a flyway or migration route (as described in BAM Subsection 6.1.5)<br>☐ where the proposed development may result in vehicle strike on threatened fauna or on animals that are part of a threatened ecological community (as described in BAM Subsection 6.1.6)<br>☐ Identify a list of threatened entities that may be dependent upon or may use habitat features associated with any of the prescribed impacts<br>☐ Describe the importance of habitat features to the species including, where relevant, impacts on life-cycle or movement patterns (e.g. Subsection 6.1.3) | | |

| Report section | BAM ref. | Information | Maps & tables (in document) | Data (to be supplied) |
|---|---|---|---|---|
| | | Where the proposed development is for a wind farm:<br>☐ identify a candidate list of protected animals that may use the development site as a flyway or migration route, including: resident threatened aerial species, resident raptor species and nomadic and migratory species that are likely to fly over the proposal area (as described in BAM Subsection 6.1.5)<br>☐ provide details of targeted survey for candidate species of wind farm developments undertaken in accordance with BAM Subsection 6.1.5(2–3.)<br>☐ predict the habitual flight paths for nomadic and migratory species likely to fly over the subject land and map the likely habitat for resident threatened aerial and raptor species (BAM Subsection 6.1.5(4.)) | | |
| | | **MAPS and TABLES (in document)**<br>☐ Map showing location of any prescribed impact features (i.e. karst, caves, crevices, cliffs, rocks, human-made structures, etc.)<br>☐ Maps of habitual flight paths for nomadic and migratory species likely to fly over the site and maps of likely habitat for threatened aerial species resident on the site (for wind farm developments only) | | |
| | | **DATA (to be supplied)**<br>☐ Digital shape files of prescribed impact feature locations<br>☐ Prescribed impact features map in jpeg format | | |

**Table 25 Minimum information requirements for the BDAR or BCAR – Stage 2: Impact assessment (biodiversity values)**

| Report section | BAM ref. | Information | Maps & tables (in document) | Data (to be supplied) |
|---|---|---|---|---|
| Avoid and minimise impacts | Chapter 7 | **INFORMATION**<br>Demonstration of efforts to avoid and minimise impacts on biodiversity values (including prescribed impacts) associated with the proposal location in accordance with Chapter 7, including an analysis of alternative:<br>☐ modes or technologies that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed mode or technology<br>☐ routes that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed route<br>☐ alternative locations that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed location<br>☐ alternative sites within a property on which the proposal is located that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed site<br>☐ Describe efforts to avoid and minimise impacts (including prescribed impacts) to biodiversity values through proposal design (as described in BAM Sections 7.1 and 7.2)<br>☐ Identification of any other site constraints that the proponent has considered in determining the location and design of the proposal (as described in BAM Section 7.2.1(3.)) | | |
| | | | **MAPS and TABLES (in document)**<br>☐ Table of measures to be implemented to avoid and minimise the impacts of the proposal, including action, outcome, timing and responsibility<br>☐ Map of alternative footprints considered to avoid or minimise impacts on biodiversity values; and of the final proposal footprint, including construction and operation<br>☐ Maps demonstrating indirect impact zones where applicable | |
| | | | | **DATA (to be supplied)**<br>Digital shape files of:<br>☐ alternative and final proposal footprint<br>☐ direct and indirect impact zones<br>☐ Maps in jpeg format |

| Report section | BAM ref. | Information | Maps & tables (in document) | Data (to be supplied) |
|---|---|---|---|---|
| Assessment of Impacts | Chapter 8, Sections 8.1 and 8.2 | **INFORMATION**<br>☐ Determine the impacts on native vegetation and threatened species habitat, including a description of direct impacts of clearing of native vegetation, threatened ecological communities and threatened species habitat (as described in BAM Section 8.1)<br>Assessment of indirect impacts on vegetation and threatened species and their habitat including (as described in BAM Section 8.2):<br>☐ description of the nature, extent, frequency, duration and timing of indirect impacts of the proposal<br>☐ documenting the consequences to vegetation and threatened species and their habitat including evidence-based justifications<br>☐ reporting any limitations or assumptions, etc. made during the assessment<br>☐ identification of the threatened entities and their habitat likely to be affected<br>Assessment of prescribed biodiversity impacts (as described in BAM Section 8.3) including:<br>assessment of the nature, extent and duration of impacts on the habitat of threatened species or ecological communities associated with:<br>☐ karst, caves, crevices, cliffs, rocks and other features of geological significance<br>☐ human-made structures<br>☐ non-native vegetation<br>☐ connectivity of different areas of habitat of threatened species that facilitates the movement of those species across their range<br>☐ movement of threatened species that maintains their life cycle<br>☐ water quality, water bodies and hydrological processes that sustain threatened species and threatened ecological communities<br>☐ assessment of the impacts of wind turbine strikes on protected animals<br>☐ assessment of the impacts of vehicle strikes on threatened species of animals or on animals that are part of a TEC | | |
| | | **MAPS and TABLES (in document)**<br>☐ Table showing change in vegetation integrity score for each vegetation zone as a result of identified impacts | | |
| | | **DATA (to be supplied)** – N/A | | |

| Report section | BAM ref. | Information | Maps & tables (in document) | Data (to be supplied) |
|---|---|---|---|---|
| Mitigation and Management of Impacts | Chapter 8, Sections 8.4 and 8.5 | **INFORMATION**<br>Identification of measures to mitigate or manage impacts in accordance with the recommendations in BAM Sections 8.4 and 8.5 including:<br>☐ techniques, timing, frequency and responsibility<br>☐ identify measures for which there is risk of failure<br>☐ evaluate the risk and consequence of any residual impacts<br>☐ document any adaptive management strategy proposed<br>Identification of measures for mitigating impacts related to:<br>☐ displacement of resident fauna (as described in BAM Subsection 8.4.1(2.))<br>☐ indirect impacts on native vegetation and habitat (as described in BAM Subsection 8.4.1(3.))<br>☐ mitigating prescribed biodiversity impacts (as described in BAM Subsection 8.4.2)<br>☐ Details of the adaptive management strategy proposed to monitor and respond to impacts on biodiversity values that are uncertain (BAM Section 8.5) | | |
| | | | **MAPS and TABLES (in document)**<br>☐ Table of measures to be implemented to mitigate and manage impacts of the proposal, including action, outcome, timing and responsibility | |
| | | | | **DATA (to be supplied)** – N/A |
| Impact Summary | Chapter 9 | **INFORMATION**<br>Identification and assessment of impacts on TECs and threatened species that are at risk of a serious and irreversible impacts (SAII, in accordance with BAM Section 9.1) including:<br>☐ addressing all criteria in Subsection 9.1.1 for each TEC listed as at risk of an SAII present on the subject land<br>☐ addressing all criteria in Subsection 9.1.2 for each threatened species at risk of an SAII present on the subject land<br>☐ documenting assumptions made and/or limitations to information<br>☐ documenting all sources of data, information, references used or consulted<br>☐ clearly justifying why any criteria could not be addressed<br>☐ Identification of impacts requiring offset in accordance with BAM Section 9.2<br>☐ Identification of impacts not requiring offset in accordance with BAM Subsection 9.2.1(3.)<br>☐ Identification of areas not requiring assessment in accordance with BAM Section 9.3 | | |

| Report section | BAM ref. | Information | Maps & tables (in document) | Data (to be supplied) |
|---|---|---|---|---|
| | | **MAPS and TABLES (in document)**<br>☐ Map showing the extent of TECs at risk of an SAII within the subject land<br>☐ Map showing location of threatened species at risk of an SAII within the subject land<br>Map showing location of:<br>☐ impacts requiring offset<br>☐ impacts not requiring offset<br>☐ areas not requiring assessment | | |
| | | **DATA (to be supplied)**<br>Digital shape files of:<br>☐ extent of TECs at risk of an SAII within the subject land<br>☐ location of threatened species at risk of an SAII within the subject land<br>☐ boundary of impacts requiring offset<br>☐ boundary of impacts not requiring offset<br>☐ boundary of areas not requiring assessment<br>☐ Maps in jpeg format | | |
| Impact Summary | Chapter 10 | **INFORMATION**<br>Ecosystem credits and species credits that measure the impact of the development on biodiversity values, including:<br>☐ future vegetation integrity score for each vegetation zone within the subject land (Equation 25 and Equation 26 in BAM Appendix H)<br>☐ change in vegetation integrity score (BAM Subsection 8.1.1)<br>☐ number of required ecosystem credits for the direct impacts of the proposal on each vegetation zone within the subject land (BAM Subsection 9)<br>☐ number of required species credits for each candidate threatened species that is directly impacted on by the proposal (BAM Subsection 10.1.3) | | |
| | | **MAPS and TABLES (in document)**<br>☐ Table of PCTs requiring offset and the number of ecosystem credits required<br>☐ Table of threatened species requiring offset and the number of species credits required | | |
| | | **DATA (to be supplied)**<br>☐ Submitted proposal in the BAM Calculator | | |

| Report section | BAM ref. | Information | Maps & tables (in document) | Data (to be supplied) |
|---|---|---|---|---|
| Biodiversity credit report | Chapter 10 | **INFORMATION**<br>☐ Description of credit classes for ecosystem credits and species credits at the development or clearing site or land to be biodiversity certified (BAM Section 10.2) | | |
| | | **MAPS and TABLES (in document)**<br>☐ Table of credit class and matching credit profile | | |
| | | **DATA (to be supplied)**<br>☐ BAM credit report in pdf format | | |
| Biodiversity certification offsets and strategy (biodiversity certification only) | Chapter 12 and Appendix J | **INFORMATION**<br>Land-based conservation measures including (strategic biodiversity certification only):<br>☐ identification of parcels subject to land-based conservation measures<br>☐ identification of land-based conservation measures proposed for each parcel<br>☐ supporting information to demonstrate suitability of land-based conservation measures (Appendix J)<br>☐ credit score of land-based conservation measures (Appendix J)<br>Biodiversity certification strategy including:<br>☐ land proposed for biodiversity certification<br>☐ land proposed for biodiversity conservation<br>☐ proposed conservation measures<br>☐ legal mechanisms for securing delivery of proposed conservation measures<br>☐ parties to the biodiversity certification and responsibilities, noting where biodiversity certification agreements are proposed<br>☐ timing for delivery of conservation measures<br>☐ funding sources for delivery of conservation measures<br>☐ framework for monitoring, reporting or auditing implementation of conservation measures | | |
| | | **MAPS and TABLES (in document)**<br>☐ Maps of parcels of land proposed for land-based conservation measures<br>☐ Maps as per Appendix M as required in relation to any land-based conservation measures<br>☐ Tables as per Appendix M as required in relation to any land-based conservation measures<br>☐ Table of credit scores for land-based conservation measures, including scores produced by BAM and weighting adjusted scores as per Appendix J | | |
| | | **DATA (to be supplied)**<br>☐ Digital shape files of parcels of land proposed for land-based conservation measures<br>☐ Maps in jpeg format | | |



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# Appendix L: Requirements for a Biodiversity Development Assessment Report – Streamlined assessment modules

**Table 26 Minimum information requirements for a Biodiversity Development Assessment Report: Streamlined assessment module – Scattered trees assessment**

| Report section | BAM ref. | Information | Maps & tables (in document) | Data (to be supplied) |
|---|---|---|---|---|
| Introduction | Chapters 2 and 3 | **INFORMATION**<br>Introduction to the biodiversity assessment including:<br>☐ brief description of proposal<br>☐ identification of subject land[2] boundary, including:<br>☐ operational footprint<br>☐ construction footprint indicating clearing associated with temporary/ancillary construction facilities and infrastructure<br>☐ general description of the subject land<br>☐ sources of information used in the assessment, including reports and spatial data | | |
| | | **MAPS and TABLES (in document)**<br>☐ Map of the subject land boundary showing the final proposal footprint, including the construction footprint for any clearing associated with temporary/ancillary construction facilities and infrastructure (if BDAR) | | |
| | | **DATA (to be supplied)** – N/A | | |
| Landscape context | Sections 3.1 and 3.2, Appendix E | **INFORMATION**<br>Identification of site context components and landscape features at the proposed site, including:<br>☐ general description of subject land topographic and hydrological setting, geology and soils<br>☐ identification of assessment method applied<br>☐ IBRA bioregions and subregions (as described in BAM Subsection 3.1.3(2.)) | | |
| | | **MAPS and TABLES (in document)**<br>☐ Site Map<br>☐ Boundary of subject land | | |

[2] As defined in the BAM.

| Report section | BAM ref. | Information | Maps & tables (in document) | Data (to be supplied) |
|---|---|---|---|---|
| | | ☐ Cadastre of subject land<br>☐ Location Map<br>☐ Digital aerial photography at 1:1,000 scale or finer)<br>☐ Boundary of subject land<br>☐ IBRA bioregions and subregions | | |
| | | **DATA (to be supplied)**<br>☐ All report maps as separate jpeg files<br>Individual digital shape files of:<br>☐ subject land boundary<br>☐ cadastral boundary of subject land | | |
| Definition of scattered trees | Appendix B B.1 | **INFORMATION**<br>☐ Justification of how the trees proposed to be cleared or impacted meet the definition of scattered trees (BAM Appendix B, Section B.1 (a–c)):<br>a.<br>– have a percent foliage cover that is less than 25% of the benchmark for tree cover for the most likely plant community type, and<br>– are on Category 2 regulated land and surrounded by Category 1 exempt land on the Native Vegetation Regulatory Map under the LLS Act, or<br>b.<br>– have a DBH of greater than or equal to 5 cm and are located more than 50 m away from any living tree that is greater than or equal to 5 cm DBH, and are completely separated by<br>– 100% exotic vegetation, human-made surfaces or bare ground, or<br>c.<br>– are three or fewer trees that have a DBH of greater than or equal to 5 cm and are within a distance of 50 m of each other,<br>– that in turn, are greater than 50 m away from the nearest living tree that is greater than or equal to 5 cm DBH, and are completely separated by<br>– 100% exotic vegetation, human-made surfaces or bare ground.<br>☐ Description of the assessment of ground cover, demonstrating how the ground cover was assessed during the time of year when the proportion of native ground cover on the subject land is likely to be at its maximum compared to that of exotic ground cover? | | |
| | | **MAPS and TABLES (in document)**<br>☐ Map of scattered trees proposed to be cleared or impacted on the subject land including: | | |

| Report section | BAM ref. | Information | Maps & tables (in document) | Data (to be supplied) |
|---|---|---|---|---|
| | | ☐ showing areas of category 1 and 2 land on the Native Vegetation Regulatory Map<br>☐ distances between living trees<br>☐ living trees greater than 20 cm DBH<br>☐ area of native and non-native ground cover | | |
| | | **DATA (to be supplied)**<br>☐ All report maps as separate jpeg files<br>☐ Digital shape files for all maps and spatial data | | |
| Scattered tree class assessment | Appendix B B.2 and B.3 | **INFORMATION**<br>☐ Record the genus and species of each tree<br>☐ Record the class assigned in B.2(c.)<br>☐ Record of any sightings (e.g. in hollows) or evidence (e.g. scats) of threatened species (flora or fauna) using the scattered trees<br>Note: If a threatened species has been recorded using the scattered tree as habitat, this streamlined assessment module must not be applied to assess the threatened species. The assessment of threatened species must be undertaken in accordance with Chapter 5 of the BAM. | | |
| | | **MAPS and TABLES (in document)**<br>☐ Map of scattered trees proposed to be cleared or impacted on the subject land including:<br>☐ genus and species of each tree, and<br>☐ the class assigned in B.2(c.) | | |
| | | **DATA (to be supplied)**<br>☐ All report maps as separate jpeg files<br>☐ Digital shape files for all maps and spatial data | | |
| Assessment of entities at risk of an SAII | Appendix B B.4 (& BAM Section 9.1) | **INFORMATION**<br>☐ List of the candidate entities at risk of an SAII (BAM Section 9.1) generated by the BAM-C that are likely to use, or occur on the subject land, based on the IBRA subregion in which the proposal is located, and whether any threatened species are likely to use a scattered tree for habitat (refer to the TBDC). This information can be presented in the Maps and Tables below<br>☐ Description of the species, any habitat constraints or microhabitats associated with the species on the subject land in accordance with Steps 3 to 4 of BAM Section 5.2 including:<br>☐ justification for determining that a candidate species credit species at risk of an SAII is unlikely to have suitable habitat on the subject land (based on a field assessment of the subject land and published literature or an expert report prepared in accordance with Box 3 of the BAM) | | |

| Report section | BAM ref. | Information | Maps & tables (in document) | Data (to be supplied) |
|---|---|---|---|---|
| | | ☐ list of candidate species at risk of an SAII for which targeted surveys were undertaken to determine species presence/absence<br>☐ list of candidate species at risk of an SAII for which an expert report is used to determine species presence/absence<br>Describe targeted surveys undertaken to determine the presence/absence of each candidate species at risk of an SAII, including:<br>☐ details of targeted survey effort, timing and weather (as described in BAM Section 5.3(3.))<br>☐ justification of survey method (e.g. citation of peer-reviewed literature) if approach differs from the Department's threatened species survey guidelines or where no relevant guideline has been published<br>☐ survey personnel and relevant experience<br>Describe the use of expert reports where used in place of targeted survey (as described in BAM Section 5.3(1.) and Box 3), including:<br>☐ identify the expert and provide evidence of their expert credentials<br>☐ Determination of the presence/absence of remaining species at risk of an SAII (by conducting a threatened species survey, or an expert report). | | |
| | | **MAPS and TABLES (in document)**<br>☐ Table listing candidate entities at risk of an SAII (including associated habitat feature/component and sensitivity classes) that are likely to use, or occur on the subject land (using the BAM-C scattered tree module and TBDC)<br>☐ Table detailing the threatened species at risk of an SAII not recorded on the subject land via targeted survey or expert report (B.4 of Appendix B) | | |
| | | **DATA (to be supplied)**<br>☐ Expert reports and any supporting data used to support conclusions of the expert report | | |
| Prescribed impacts | Chapter 6 | **INFORMATION**<br>☐ Any prescribed impacts from the scattered tree proposal must be set out in the BDAR consistent with Appendix K | | |
| | | **MAPS AND TABLES (in document)**<br>☐ If relevant, maps showing location of any prescribed impact features (i.e. karst, caves, crevices, cliffs, rocks, human-made structures, etc.) | | |
| | | **DATA (to be supplied)**<br>☐ If relevant digital shape files of prescribed impact feature locations<br>☐ Prescribed impact features map in jpeg format | | |

| Report section | BAM ref. | Information | Maps & tables (in document) | Data (to be supplied) |
|---|---|---|---|---|
| Avoid and minimise impacts | Chapter 7 | **INFORMATION**<br>Demonstration of efforts to avoid and minimise impacts on biodiversity values (including prescribed impacts) associated with the proposed location in accordance with Chapter 7, including an analysis of alternative:<br>☐ modes or technologies that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed mode or technology<br>☐ routes that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed route<br>☐ alternative locations that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed location<br>☐ alternative sites within a property on which the proposal is located that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed site<br>☐ Describe efforts to avoid and minimise impacts (including prescribed impacts) to biodiversity values through proposal design (as described in BAM Subsection 7.2.2)<br>☐ Identification of any other site constraints that the proponent has considered in determining the location and design of the proposal (as described in BAM Subsection 7.2.1(3.)) | | |
| | | | **MAPS and TABLES (in document)**<br>☐ Table of measures to be implemented before, during and after construction to avoid and minimise the impacts of the proposal, including action, outcome, timing and responsibility<br>☐ Map of final proposal footprint, including construction and operation<br>☐ Maps demonstrating indirect impact zones where applicable | |
| | | | | **DATA (to be supplied)**<br>Digital shape files of:<br>☐ final proposal footprint<br>☐ direct and indirect impact zones<br>☐ Maps in jpeg format |

| Report section | BAM ref. | Information | Maps & tables (in document) | Data (to be supplied) |
|---|---|---|---|---|
| Assessment of Impacts | Chapter 8, Sections 8.1 and 8.2 | **INFORMATION**<br>Determine the impacts on native vegetation, including:<br>☐ description of direct impacts of clearing of scattered trees and threatened ecological communities (as described in BAM Section 8.1)<br>☐ description of the nature, extent, frequency, duration and timing of indirect impacts of the proposal (as described in BAM Subsection 8.2)<br>☐ Any prescribed impacts from the scattered tree proposal must be set out in the BDAR consistent with Appendix K | | |
| | | **MAPS and TABLES (in document)** – N/A | | |
| | | **DATA (to be supplied)** – N/A | | |
| Mitigation and Management of Impacts | Chapter 8, Sections 8.4 and 8.5 | **INFORMATION**<br>Identification of measures to mitigate or manage impacts in accordance with the recommendations in BAM Section 8.4 including (as described in BAM Subsection 8.4.1(2.)):<br>☐ techniques, timing, frequency and responsibility<br>☐ document any adaptive management strategy proposed<br>Identification of measures for mitigating impacts related to:<br>☐ indirect impacts on native vegetation and habitat (as described in BAM Subsection 8.4.1(3.))<br>☐ mitigating prescribed biodiversity impacts if relevant (as described in BAM Subsection 8.4.2)<br>☐ Details of the adaptive management strategy proposed to monitor and respond to impacts on biodiversity values that are uncertain (BAM Section 8.5) | | |
| | | **MAPS and TABLES (in document)**<br>☐ Table of measures to be implemented before, during and after construction to mitigate and manage impacts of the proposal, including action, outcome, timing and responsibility | | |
| | | **DATA (to be supplied)** – N/A | | |



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| Report section | BAM ref. | Information | Maps & tables (in document) | Data (to be supplied) |
|---|---|---|---|---|
| Offset requirements | Appendix B B.5 | **INFORMATION**<br>☐ Record of results of visual assessment (field based) of all class 2 and 3 scattered trees for hollows<br>☐ Record the number of ecosystem credits required for clearing all class 2 and 3 scattered trees | | |
| | | **MAPS and TABLES (in document)**<br>☐ Map of class 2 and 3 scattered trees that are hollow bearing<br>☐ Report produced by BAM-C (scattered tree module) determining an offset requirement for the proposal | | |
| | | **DATA (to be supplied)**<br>☐ Digital shape files for all maps and spatial data ☐ | | |
| Credit profile | Appendix B B.6 | **INFORMATION**<br>Credit profile for the proposed clearing of class 2 and 3 scattered trees including the 7 attributes identified in BAM Subsection 10.2.1 including:<br>☐ up to 3 candidate PCTs for attribute (a), being a PCT that includes the species of the scattered tree/s being cleared as one of its dominant tree species (refer to BioNet Vegetation Classification), and<br>☐ attributes (b) – (e) based on the PCTs identified for attribute (a), and<br>☐ attribute (f) based on whether hollows were recorded for any class 2 or 3 scattered trees, and<br>☐ attribute (g) based on the IBRA subregion in which the clearing occurs or mostly occurs<br>☐ Number of ecosystem credits that measure the impact of the development on biodiversity values<br>☐ Description of the credit classes for ecosystem credits at the development site (BAM Subsection 10.2.1) | | |
| | | **MAPS and TABLES (in document)** – N/A | | |
| | | **DATA (to be supplied)** – N/A | | |

**Table 27 Minimum information requirements for the Biodiversity Development Assessment Report: Streamlined assessment module – Small area**

| Report section | BAM ref. | Information | Maps & tables (in document) | Data (to be supplied) |
|---|---|---|---|---|
| Introduction | Chapters 2 and 3 | **INFORMATION**<br>Introduction to the biodiversity assessment including:<br>☐ brief description of proposed development<br>☐ identification of subject land[3] boundary, including:<br>☐ operational footprint<br>☐ construction footprint indicating clearing associated with temporary/ancillary construction facilities and infrastructure<br>☐ general description of the subject land<br>☐ Sources of information used in the assessment, including reports and spatial data<br>☐ Identification of assessment method applied (i.e. linear or site-based) | | |
| | | | **MAPS and TABLES (in document)**<br>☐ Map of the subject land boundary showing the final proposal footprint, including the construction footprint for any clearing associated with temporary/ancillary construction facilities and infrastructure (if BDAR) | |
| | | | | **DATA (to be supplied)** – N/A |
| Landscape | Sections 3.1 and 3.2, Appendix E | **INFORMATION**<br>Identification of site context components and landscape features at the proposed site, including:<br>☐ general description of subject land topographic and hydrological setting, geology and soils<br>☐ percent native vegetation cover in the assessment area (as described in BAM Subsection 3.2(4.)<br>☐ IBRA bioregions and subregions (as described in BAM Subsection 3.1.3(2.))<br>Other relevant landscape features which may include:<br>☐ rivers and streams classified according to stream order (as described in BAM Subsection 3.1.3(3–4.) and Appendix E)<br>☐ wetlands within, adjacent to and downstream of the site (as described in BAM Subsection 3.1.3(4.))<br>☐ connectivity of different areas of habitat (as described in BAM Subsection 3.1.3(5–6.))<br>☐ areas of geological significance and soil hazard features (as described in BAM Subsections 3.1.3(7.) and 3.1.3(10.) | | |

[3] As defined in the BAM.

| Report section | BAM ref. | Information | Maps & tables (in document) | Data (to be supplied) |
|---|---|---|---|---|
| | | ☐ areas of outstanding biodiversity value occurring on the subject land and assessment area (as described in BAM Subsection 3.1.3(8–9.)) | | |
| | | **MAPS and TABLES (in document)**<br>☐ Site Map<br>☐ boundary of subject land<br>☐ cadastre of subject land<br>☐ landscape features identified in BAM Subsection 3.1.3<br>☐ areas of outstanding biodiversity value within the subject land<br>☐ Location Map<br>☐ digital aerial photography at 1:1,000 scale or finer<br>☐ boundary of subject land<br>☐ 1500 m buffer area *or* 500 m buffer for linear development<br>☐ landscape features identified in BAM Subsection 3.1.3<br>☐ additional detail (e.g. local government area boundaries) relevant at this scale<br>☐ areas of outstanding biodiversity value within the assessment area<br>Landscape features identified in BAM Subsection 3.1.3 and to be shown on the Site Map and/or Location map include:<br>☐ IBRA bioregions and subregions<br>☐ rivers, streams and estuaries<br>☐ wetlands and important wetlands<br>☐ connectivity of different areas of habitat<br>☐ areas of geological significance and soil hazard features | | |
| | | **DATA (to be supplied)**<br>☐ All report maps as separate jpeg files<br>Individual digital shape files of:<br>☐ subject land boundary<br>☐ assessment area (i.e. buffer area) boundary<br>☐ cadastral boundary of subject land<br>☐ areas of native vegetation cover<br>☐ areas of habitat connectivity | | |

| Report section | BAM ref. | Information | Maps & tables (in document) | Data (to be supplied) |
|---|---|---|---|---|
| Native vegetation, TECs and vegetation integrity | Chapter 4 | **INFORMATION**<br>☐ Patch size (in accordance with BAM Subsection 4.3.2)<br>☐ Identification of the dominant PCT on the subject land and extent (ha) with justification of method used (existing information or plot-based survey data)<br>☐ Identification of any TEC associated with the PCT (BAM Subsection 4.2.2)<br>☐ Estimate of percent cleared value of dominant PCT (BAM Subsection 4.2.1(5.)<br>☐ Identification of any TEC on site that is not associated with the dominant PCT (Note: This TEC is required to be assessed and offset.)<br>☐ Equivalence with mapping units of previous vegetation maps reviewed as part of the assessment (i.e. equivalent mapping units)<br>☐ Vegetation integrity of the PCT(s) on the subject land as individual vegetation zones ☐<br>☐ Justification for how this was determined (i.e. qualitatively by observing values for the condition attributes set out in Table 2 of the BAM or quantitatively by collecting field data for the condition attributes at a plot in accordance with BAM Subsection 4.3.4)<br>☐ Use of relevant benchmark data from BioNet Vegetation Classification (as described in BAM Subsections 4.3.3(5.))<br>Where use of more appropriate local benchmark data is proposed (as described in BAM Subsection 1.4.2, BAM Subsection 4.3.3(5.) and BAM Appendix A):<br>☐ identify the PCT or vegetation class for which local benchmark data will be applied<br>☐ identify published sources of local benchmark data (if benchmarks obtained from published sources)<br>☐ describe methods of local benchmark data collection (if reference plots used to determine local benchmark data)<br>☐ provide justification for use of local data rather than BioNet Vegetation Classification benchmark values | | |
| | | **MAPS and TABLES (in document)**<br>☐ Map of native vegetation extent for the subject land (as described in BAM Section 3.1)<br>☐ Map of PCT/vegetation zones within the subject land (as described in BAM Section 4.2(1.)<br>☐ Map the location of floristic vegetation survey plots and vegetation integrity survey plots relative to PCT boundaries<br>☐ Map of TEC distribution on the subject land<br>☐ Patch size of native vegetation (as described in BAM Subsection 4.3.2)<br>Table of current vegetation integrity scores for vegetation zone within the site including:<br>☐ composition condition score<br>☐ structure condition score<br>☐ function condition score<br>☐ Report from BAM-C (Small area module) including vegetation integrity scores (BAM Section 4.4) | | |

| Report section | BAM ref. | Information | Maps & tables (in document) | Data (to be supplied) |
|---|---|---|---|---|
| | | **DATA (to be supplied)**<br>☐ All report maps as separate jpeg files<br>☐ Plot field data (MS Excel format)<br>☐ Digital shape files for all maps and spatial data<br>☐ Field data sheets (if relevant) for determining vegetation integrity (BAM Subsection 4.3.4) | | |
| Habitat suitability for threatened species | Chapter 5 and Section 9.1 | **INFORMATION**<br>☐ Describe the review of existing information and any field survey undertaken to assess habitat constraints and microhabitats for threatened species within the subject land<br>☐ Determination of the suite of threatened species likely to occur on or use the proposed site according to Steps 1 and 2 in BAM Section 5.2 including species to be assessed for ecosystem credits and the list of species to be assessed for species credits<br>☐ List of ecosystem credit species derived from the TBDC (as described in BAM Subsections 5.2.1 and 5.2.2) with justification for the exclusion of any ecosystem credit species based on habitat constraints (as described in BAM Subsection 5.2.2)<br>☐ Identification of candidate species credit species that are at risk of an SAII and therefore, must be further assessed (BAM Section 9.1)<br>Note: Candidate species credit species that are not at risk of an SAII and not incidentally recorded on the subject land do not require further assessment.<br>For candidate species credit species that are at risk of an SAII, a description of the species, any habitat constraints or microhabitats associated with the species on the subject land and information used to create the species polygon/s in accordance with Steps 3 to 5 of BAM Section 5.2 including:<br>☐ justification for determining that a candidate species credit species at risk of an SAII is unlikely to have suitable habitat on the subject land or specific vegetation zone (based on a field assessment of the subject land and published literature or an expert report prepared in accordance with Box 3 of the BAM)<br>☐ determination of the presence of remaining candidate species credit species at risk of an SAII (by assuming presence, conducting a threatened species survey or an expert report).<br>Note: If the subject land is mapped on an important habitat map for a species, or for a component of its habitat, the subject land is considered to have suitable habitat for the species to be present.<br>☐ species polygons identifying the location and area of suitable habitat for each candidate threatened species at risk of an SAII that is recorded on the subject land and is measured by area, OR<br>☐ species polygons identifying the area of suitable habitat and targeted surveys identifying the count and location of individuals on the subject land for each candidate threatened flora species at risk of an SAII that is recorded on the subject land and is measured by count<br>☐ species polygons for each threatened species identified on the subject land that is not at risk of an SAII (i.e. incidentally observed during site visit) | | |

| Report section | BAM ref. | Information | Maps & tables (in document) | Data (to be supplied) |
|---|---|---|---|---|
| | | ☐ Determination of habitat condition within species polygon/s for each threatened species (measured by area) at risk of an SAII or incidentally observed during the site visit (Step 6 of BAM Section 5.2)<br>☐ For flora species credit species at risk of an SAII or incidentally observed during site visit, provide a count, or an estimation, of the number of individual plants present on the subject land (as described in BAM Subsection 5.2.5(4.)) | | |
| | | **MAPS and TABLES (in document)**<br>☐ Table showing ecosystem credit species in accordance with BAM Subsection 5.1.1, and:<br>☐ identifying any ecosystem credit species removed from the list of species on the basis of further assessment in accordance with BAM Subsections 5.2.2 and 5.2.3<br>☐ identifying the sensitivity to gain class of each species (BAM Section 5.4)<br>☐ Table detailing species credit species within the subject land at risk of an SAII (BAM Section 9.1) or incidentally observed during the site visit including any associated habitat feature/components and its abundance (flora)/extent of habitat (flora and fauna) and biodiversity risk weighting (BAM Sections 5.2–5.4)<br>☐ Map of species credit species records within the subject land and species polygons for flora and fauna species at risk of an SAII or incidentally observed during the site visit (as described in BAM Subsection 5.2.5(1–7.)) | | |
| | | **DATA (to be supplied)**<br>☐ Digital shape files of species polygons<br>☐ Species polygon map in jpeg format<br>☐ Expert reports and any supporting data used to support conclusions of the expert report<br>☐ Field data sheets (if relevant) for threatened species surveys | | |
| Prescribed impacts | Chapter 6 | **INFORMATION**<br>☐ Any prescribed impacts from the small area proposal must be set out in the BDAR consistent with Appendix K | | |
| | | **MAPS AND TABLES (in document)**<br>☐ If relevant, maps showing location of any prescribed impact features (i.e. karst, caves, crevices, cliffs, rocks, human-made structures, etc.) | | |
| | | **DATA (to be supplied)**<br>☐ If relevant, digital shape files of prescribed impact feature locations<br>☐ Prescribed impact features map in jpeg format | | |

| Report section | BAM ref. | Information | Maps & tables (in document) | Data (to be supplied) |
|---|---|---|---|---|
| Avoid and minimise impacts | Chapter 7 | **INFORMATION**<br>Demonstration of efforts to avoid and minimise impacts on biodiversity values (including prescribed impacts) associated with the proposal location in accordance with Chapter 7, including an analysis of alternative:<br>☐ modes or technologies that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed mode or technology<br>☐ alternative locations that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed location<br>☐ alternative sites within a property on which the proposal is located that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed site<br>☐ Describe efforts to avoid and minimise impacts (including prescribed impacts) to biodiversity values through proposal design (as described in BAM Subsections 7.1.2 and 7.2.2<br>☐ Identification of any other site constraints that the proponent has considered in determining the location and design of the proposal (as described in BAM Subsection 7.2.1(3.) | | |
| | | | **MAPS and TABLES (in document)**<br>☐ Table of measures to be implemented before, during and after construction to avoid and minimise the impacts of the proposal, including action, outcome, timing and responsibility<br>☐ Map of final proposal footprint, including construction and operation<br>☐ Maps demonstrating indirect impact zones where applicable | |
| | | | | **DATA (to be supplied)**<br>Digital shape files of:<br>☐ final proposal footprint<br>☐ direct and indirect impact zones<br>☐ Maps in jpeg format |
| Assessment of Impacts | Chapter 8, Section 8.1 and 8.2 | **INFORMATION**<br>Determine the impacts on native vegetation and threatened species habitat, including:<br>☐ description of direct impacts of clearing of native vegetation, threatened ecological communities and threatened species habitat (as described in BAM Sections 8.1)<br>☐ description of the nature, extent, frequency, duration and timing of indirect impacts of the proposal (as described in BAM Subsection 8.2<br><br>☐ Any prescribed impacts from the small area proposal must be set out in the BDAR consistent with Appendix K | | |

| Report section | BAM ref. | Information | Maps & tables (in document) | Data (to be supplied) |
|---|---|---|---|---|
| | | **MAPS and TABLES (in document)**<br>☐ Table showing change in vegetation integrity score for each vegetation zone as a result of identified impacts | | |
| | | **DATA (to be supplied)** – N/A | | |
| Mitigation and Management of Impacts | Chapter 8, Section 8.4 and 8.5 | **INFORMATION**<br>Identification of measures to mitigate or manage impacts in accordance with the recommendations in BAM Subsections 8.4.1 and 8.4.2, including (as described in BAM Subsection 8.4.1(2.):<br>☐ techniques, timing, frequency and responsibility<br>☐ identify measures for which there is risk of failure<br>☐ evaluate the risk and consequence of any residual impacts<br>☐ document any adaptive management strategy proposed<br>Identification of measures for mitigating impacts related to:<br>☐ displacement of resident fauna (as described in BAM Subsection 8.4.1)<br>☐ indirect impacts on native vegetation and habitat (as described in BAM Subsection 8.4.1(3.))<br>☐ mitigating prescribed biodiversity impacts (as described in BAM Subsection 8.4.2)<br>☐ Details of the adaptive management strategy proposed to monitor and respond to impacts on biodiversity values that are uncertain (BAM Section 8.5) | | |
| | | **MAPS and TABLES (in document)**<br>☐ Table of measures to be implemented before, during and after construction to mitigate and manage impacts of the proposal, including action, outcome, timing and responsibility | | |
| | | **DATA (to be supplied)** – N/A | | |
| Thresholds for assessing and offsetting the impacts of the proposal | Chapter 9 | **INFORMATION**<br>☐ Information from the TBDC and/or other sources to report on the current status of threatened species, threatened populations at risk of an SAII and TEC/s for the proposal, and<br>☐ Report on impacts of the proposal on TEC/s in accordance with BAM Subsection 9.2.1<br>☐ Report on impacts of the proposal on threatened species and/or threatened populations at risk of an SAII in accordance with BAM Section 9.1<br>☐ Identification of impacts requiring offset in accordance with BAM Section 9.2<br>☐ Identification of impacts not requiring offset in accordance with BAM Subsection 9.2.1(3.)<br>☐ Identification of areas not requiring assessment in accordance with BAM Section 9.3 | | |

| Report section | BAM ref. | Information | Maps & tables (in document) | Data (to be supplied) |
|---|---|---|---|---|
| | | **MAPS and TABLES (in document)**<br>☐ Map showing the extent of TECs at risk of an SAII within the subject land<br>☐ Map showing the location of threatened species at risk of an SAII within the subject land<br>Map showing location of:<br>☐ impacts requiring offset<br>☐ impacts not requiring offset<br>☐ areas not requiring assessment | | |
| | | **DATA (to be supplied)**<br>Digital shape files of:<br>☐ extent of TECs at risk of an SAII within the subject land<br>☐ threatened species at risk of an SAII within the subject land<br>☐ boundary of impacts requiring offset<br>☐ boundary of impacts not requiring offset<br>☐ boundary of areas not requiring assessment<br>☐ Maps in jpeg format | | |
| Applying the no net loss standard | Chapter 10 | **INFORMATION**<br>☐ Description of the impact on PCTs/TECs<br>☐ Description of the impact on threatened species at risk of an SAII or incidentally observed via site visit<br>☐ Number of ecosystem credits required for impacts on biodiversity values according to BAM Subsection 9<br>☐ Number of species credits required for impacts on biodiversity values according to BAM Subsection 10.1.3, including any species credit species that has been incidentally observed on the subject land<br>Note: Species credits for any species at risk of an SAII are calculated in the event that the decision-maker forms the opinion that the proposed impact is unlikely to be serious and irreversible and therefore can be offset.<br>☐ Identification of credit class for ecosystem credits and species credits according to BAM Section 10.2 (this can be generated from BAM-C) | | |
| | | **MAPS and TABLES (in document)**<br>☐ Table showing biodiversity risk weightings<br>☐ Table of BC Act listing status for PCTs and threatened species requiring offset<br>☐ Table of PCTs requiring offset and number of ecosystem credits required (Subsection 10.2.1) | | |

| Report section | BAM ref. | Information | Maps & tables (in document) | Data (to be supplied) |
|---|---|---|---|---|
| | | ☐ Table of species at risk of an SAII or incidentally observed on site assessed for species credits and the number of credits required<br>☐ BAM-C credit report | | |
| | | **DATA (to be supplied)** – N/A | | |

**Table 28 Minimum information requirements for the Biodiversity Development Assessment Report: Streamlined assessment module – Planted native vegetation**

| Report section | BAM ref. | Information | Maps & tables (in document) | Data (to be supplied) |
|---|---|---|---|---|
| Introduction | Chapters 2 and 3 | **INFORMATION**<br>Introduction to the biodiversity assessment including:<br>☐ brief description of proposed development<br>☐ identification of subject land[4] boundary, including:<br>☐ operational footprint<br>☐ construction footprint indicating clearing associated with temporary/ancillary construction facilities and infrastructure<br>☐ general description of the subject land<br>☐ sources of information used in the assessment, including reports and spatial data | | |
| | | **MAPS and TABLES (in document)** – N/A | | |
| | | **DATA (to be supplied)** – N/A | | |
| Planted native vegetation | Appendix D, D.1 | **INFORMATION**<br>☐ Determination of which subsection of the decision-making key (D.1) applies to the native vegetation to be cleared or impacted by the proposal<br>☐ Justification and evidence for the above determination (e.g. photos, management plans/agreements, etc.) | | |
| | | **MAPS and TABLES (in document)**<br>☐ Map of the subject land boundary showing the final proposal footprint, including the construction footprint for any clearing associated with temporary/ancillary construction facilities and infrastructure (if BDAR) | | |
| | | **DATA (to be supplied)** – N/A | | |
| Landscape context | Sections 3.1 and 3.2, Appendix E | **INFORMATION**<br>Identification of site context components and landscape features at the proposed site, including:<br>☐ general description of subject land topographic and hydrological setting, geology and soils<br>☐ IBRA bioregions and subregions (as described in BAM Subsection 3.1.3(2.)) | | |

[4] As defined in the BAM.



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| Report section | BAM ref. | Information | Maps & tables (in document) | Data (to be supplied) |
|---|---|---|---|---|
| | | **MAPS AND TABLES (in document)**<br>☐ Site Map<br>☐ Boundary of subject land<br>☐ Cadastre of subject land<br>☐ Location Map<br>☐ Digital aerial photography at 1:1,000 scale or finer)<br>☐ Boundary of subject land | | |
| | | **DATA (to be supplied)**<br>☐ All report maps as separate jpeg files<br>Individual digital shape files of:<br>☐ subject land boundary<br>☐ assessment area (i.e. buffer area) boundary<br>☐ cadastral boundary of subject land | | |
| Native vegetation | Chapter 4, Appendix A and Appendix H | **INFORMATION**<br>Note: If D.1(2.i.) or D.1(3.i.) of the decision-making key in Appendix D apply, Chapter 4 is not required. If D.1(1.i.) or D.1(4.i.) apply, Chapter 4 is required – refer to the minimum information requirements for a BDAR or BCAR in Appendix K. | | |
| | | **MAPS and TABLES (in document)** – N/A | | |
| | | **DATA (to be supplied)** – N/A | | |
| Threatened species habitat (planted native vegetation) | Appendix D, D.2 (and Chapter 5 of the BAM) | **INFORMATION**<br>Note: If D.1(2.i.) or D.1(3.i.) of the decision-making key in Appendix D apply, Chapter 5 is not required and the assessment of planted native vegetation for threatened species habitat must be conducted in accordance with D.2. If D.1(1.i.) or D.1(4.i.) apply, Chapter 5 is required – refer to the minimum information requirements for a BDAR or BCAR in Appendix K.<br>☐ Describe the review of existing information and assessment of the suitability of the planted native vegetation for use by threatened species<br>☐ Record any incidental sightings or evidence (e.g. scats) of threatened species credit species (flora and fauna) found to be using, inhabiting or part of, the planted native vegetation | | |
| | | **MAPS and TABLES (in document)**<br>☐ Field data sheet including records of any incidental sightings or evidence of threatened species credit species as outlined above | | |

| Report section | BAM ref. | Information | Maps & tables (in document) | Data (to be supplied) |
|---|---|---|---|---|
| | | ☐ Table detailing the threatened species credit species found to be using, inhabiting or part of the planted native vegetation<br>☐ Map of threatened species credit species found to be using, inhabiting or part of the planted native vegetation | | |
| | | **DATA (to be supplied)** – N/A | | |
| Prescribed impacts | Chapter 6 | **INFORMATION**<br>☐ Any prescribed impacts from the planted native vegetation proposal must be set out in the BDAR consistent with Appendix K | | |
| | | **MAPS and TABLES (in document)**<br>☐ If relevant, map showing location of any prescribed impact features (i.e. karst, caves, crevices, cliffs, rocks, human-made structures, etc.) | | |
| | | **DATA (to be supplied)**<br>☐ Digital shape files of prescribed impact feature locations<br>☐ Prescribed impact features map in jpeg format | | |
| Avoid and minimise impacts | Chapter 7 | **INFORMATION**<br>☐ Demonstration of efforts to avoid and minimise impacts on biodiversity values (including prescribed impacts) associated with the proposal location in accordance with Chapter 7<br>☐ Describe efforts to avoid and minimise impacts (including prescribed impacts) to biodiversity values through proposal design (as described in BAM Subsection 7.2.2)<br>☐ Identification of any other site constraints that the proponent has considered in determining the location and design of the proposal (as described in BAM Subsection 7.2.1(3.)) | | |
| | | **MAPS and TABLES (in document)**<br>☐ Table of measures to be implemented before, during and after construction to avoid and minimise the impacts of the proposal, including action, outcome, timing and responsibility<br>☐ Map of final proposal footprint, including construction and operation<br>☐ Maps demonstrating indirect impact zones where applicable | | |
| | | **DATA (to be supplied)**<br>Digital shape files of:<br>☐ final proposal footprint<br>☐ direct and indirect impact zones<br>☐ Maps in jpeg format | | |

| Report section | BAM ref. | Information | Maps & tables (in document) | Data (to be supplied) |
|---|---|---|---|---|
| Assessment of Impacts | Chapter 8, Sections 8.1 and 8.2 | **INFORMATION**<br>Determine the impacts on threatened species habitat, including:<br>☐ description of impacts of clearing of threatened species habitat (as described in BAM Sections 8.1)<br>☐ description of the nature, extent, frequency, duration and timing of indirect impacts of the proposal (as described in BAM Section 8.2<br>☐ Any prescribed impacts from the planted native vegetation proposal must be set out in the BDAR consistent with Appendix K | | |
| | | **MAPS and TABLES (in document)** – N/A | | |
| | | **DATA (to be supplied)** – N/A | | |
| Mitigation and Management of Impacts | Chapter 8, Sections 8.4 and 8.5 | **INFORMATION**<br>Identification of measures to mitigate or manage impacts in accordance with the recommendations in BAM Section 8.4 including (as described in BAM Subsection 8.4.1(2.)):<br>☐ techniques, timing, frequency and responsibility<br>☐ identify measures for which there is risk of failure<br>☐ evaluate the risk and consequence of any residual impacts<br>☐ document any adaptive management strategy proposed<br>Identification of measures for mitigating impacts related to:<br>☐ displacement of resident fauna (as described in BAM Subsection 8.4.1(2.))<br>☐ indirect impacts on threatened species habitat (as described in BAM Subsection 8.4.1(3.)) | | |
| | | **MAPS and TABLES (in document)**<br>☐ Table of measures to be implemented before, during and after construction to mitigate and manage impacts of the proposal, including action, outcome, timing and responsibility | | |
| | | **DATA (to be supplied)** – N/A | | |
| Impact summary | Appendix D, D.2 | **INFORMATION**<br>Note: If D.1(2.i) or D.1(3.i.) of the decision-making key in Appendix D apply, Chapter 9 is not required and the assessment of planted native vegetation for threatened species must be conducted in accordance with D.2 of the BAM. If D.1(1.i.) applies, refer to the minimum information requirements for a Biodiversity Development Assessment Report in Appendix K. | | |
| | | **MAPS and TABLES (in document)** – N/A | | |

| Report section | BAM ref. | Information | Maps & tables (in document) | Data (to be supplied) |
|---|---|---|---|---|
| | | **DATA (to be supplied)**<br>☐ Maps in jpeg format | | |

# Appendix M: Requirements for a Biodiversity Stewardship Site Assessment Report

**Table 29 Minimum information requirements for the Biodiversity Stewardship Site Assessment Report (application for a biodiversity stewardship agreement), Stage 1: Biodiversity assessment**

| Report section | BAM ref. | Information | Maps & tables (in document) | Data (to be supplied) |
|---|---|---|---|---|
| Introduction | Chapters 2 and 3 | **INFORMATION**<br>Introduction to the biodiversity assessment including:<br>☐ brief description of proposed biodiversity stewardship site<br>☐ identification of subject land[5] footprint, including:<br>☐ location<br>☐ lot and DP numbers<br>☐ general description of the subject land<br>☐ sources of information used in the assessment, including reports and spatial data<br>☐ identification of assessment method applied (i.e. linear or site-based) | | |
| | | | **MAPS and TABLES (in document)**<br>☐ Map of the subject land boundary showing the final proposal BSA site | |
| | | | | **DATA (to be supplied)** – N/A |
| Landscape context | Sections 3.1 and 3.2, Appendix E | **INFORMATION**<br>Identification of site context components and landscape features at the biodiversity stewardship site, including:<br>☐ general description of subject land topographic and hydrological setting, geology and soils<br>☐ percent native vegetation cover in the assessment area (as described in BAM Section 3.2)<br>☐ IBRA bioregions and subregions (as described in BAM Subsection 3.1.3(2.))<br>☐ NSW (Mitchell) landscape features and area (ha) (as described in BAM Section 3(2.))<br>☐ rivers and streams classified according to stream order (as described in BAM Subsection 3.1.3(3.) and Appendix E)<br>☐ wetlands within, adjacent to and downstream of the site (as described in BAM Subsection 3.1.3(3.))<br>☐ connectivity of different areas of habitat (as described in BAM Subsection 3.1.3(5–6.))<br>☐ areas of geological significance and soil hazard features (as described in BAM Subsections 3.1.3(7.) and 3.1.3(10.) | | |

[5] As defined in the BAM.

| Report section | BAM ref. | Information | Maps & tables (in document) | Data (to be supplied) |
|---|---|---|---|---|
| | | ☐ areas of outstanding biodiversity value occurring on the subject land and assessment area (as described in BAM Subsection 3.1.3(8–9.)) | | |
| | | **MAPS and TABLES (in document)**<br>☐ Site Map<br>☐ Boundary of subject land<br>☐ Cadastre of subject land<br>☐ Landscape features identified in BAM Subsection 3.1.3<br>☐ Areas of outstanding biodiversity value within the subject land<br>☐ Location Map<br>☐ Digital aerial photography at 1:1,000 scale or finer<br>☐ Boundary of subject land<br>☐ 1500 m buffer area *or* 500 m buffer for linear site<br>☐ Landscape features identified in BAM Subsection 3.1.3<br>☐ Additional detail (e.g. local government area boundaries) relevant at this scale<br>☐ Areas of outstanding biodiversity value within the assessment area<br>Landscape features identified in BAM Subsection 3.1.3 and to be shown on the Site Map and/or Location map include:<br>☐ IBRA bioregions and subregions<br>☐ NSW (Mitchell) landscape regions<br>☐ rivers, streams and estuaries<br>☐ important and local wetlands<br>☐ connectivity of different areas of habitat<br>☐ areas of geological significance and soil hazard features<br>☐ any additional landscape features identified in any SEARs for the proposal | | |
| | | **DATA (to be supplied)**<br>☐ All report maps as separate jpeg files<br>Individual digital shape files of:<br>☐ subject land boundary<br>☐ assessment area (i.e. subject land and 1500 m buffer area) boundary<br>☐ cadastral boundary of subject land<br>☐ areas of native vegetation cover | | |

| Report section | BAM ref. | Information | Maps & tables (in document) | Data (to be supplied) |
|---|---|---|---|---|
| | | ☐ areas of habitat connectivity<br>☐ additional landscape features identified in any SEARs for the proposal | | |
| Native vegetation | Chapter 4, Appendix A and Appendix H | **INFORMATION**<br>☐ Identify native vegetation extent within the subject land, including cleared areas and evidence to support differences between mapped vegetation extent and aerial imagery (as described in BAM Section 4.1(1–3.) and Subsection 4.1.1)<br>☐ Review of existing information on native vegetation including references to previous vegetation maps of the subject land and assessment area (described in BAM Section 4.1(3.) and Subsection 4.1.1)<br>☐ Describe the systematic field-based floristic vegetation survey undertaken in accordance with BAM Section 3.2<br>☐ Describe the use of more appropriate local data and provide reasons that support the use of more appropriate local data (as described in BAM Subsection 1.4.2 and Appendix A)<br>For each PCT within the subject land, describe:<br>☐ vegetation class<br>☐ extent (ha) within subject land<br>☐ justification of evidence used to identify a PCT (BAM Section 4.2(1–3.))<br>☐ plant species relied upon for identification of the PCT and relative abundance of each species<br>☐ TEC status (BAM Subsection 4.2.2(1–2.))<br>☐ estimate of percent cleared value of PCT (BAM Subsection 4.2.1( 5.))<br>☐ equivalence with mapping units of previous vegetation maps reviewed as part of the assessment (i.e. equivalent mapping units)<br>Describe the vegetation integrity assessment of the subject land, including:<br>☐ identification and mapping of vegetation zones (as described in BAM Subsection 4.3.1)<br>☐ assessment of patch size (as described in BAM Subsection 4.3.2)<br>☐ survey effort (i.e. number of vegetation integrity survey plots) as described in BAM Subsection 4.3.4(1–2.)<br>☐ use of relevant benchmark data from BioNet Vegetation Classification (as described in BAM Subsection 4.3.3(5.))<br>☐ list of high threat weed species present on the land<br>Where use of more appropriate local benchmark data is proposed (as described in BAM Subsection 1.4.2, BAM Subsection 4.3.3(5.) and BAM Appendix A):<br>☐ identify the PCT or vegetation class for which local benchmark data will be applied<br>☐ identify published sources of local benchmark data (if benchmarks obtained from published sources)<br>☐ describe methods of local benchmark data collection (if reference plots used to determine local benchmark data)<br>☐ provide justification for use of local data rather than BioNet Vegetation Classification benchmark values | | |

| Report section | BAM ref. | Information | Maps & tables (in document) | Data (to be supplied) |
|---|---|---|---|---|
| | | **MAPS and TABLES (in document)**<br>☐ Map of native vegetation extent within the subject land at scale not greater than 1:10,000 (as described in BAM Section 4.1(1–3.))<br>☐ Map of PCTs within the subject land (as described in BAM Section 4.2(1.))<br>☐ Map of vegetation zones within the subject land (as described in BAM Subsection 4.3.1)<br>☐ Map the location of floristic vegetation survey plots and vegetation integrity survey plots relative to PCTs boundaries<br>☐ Map of TEC distribution on the subject land<br>☐ Patch size of native vegetation (as described in BAM Subsection 4.3.2)<br>Table of current vegetation integrity scores for each vegetation zone within the site and including:<br>☐ composition condition score<br>☐ structure condition score<br>☐ function condition score | | |
| | | **DATA (to be supplied)**<br>☐ All report maps as separate jpeg files<br>☐ Plot field data (MS Excel format)<br>☐ Plot field data sheets<br>Digital shape files of:<br>☐ PCT boundaries within subject land<br>☐ TEC boundaries within subject land<br>☐ vegetation zone boundaries within subject land<br>☐ floristic vegetation survey and vegetation integrity plot locations | | |

| | | |
|---|---|---|
| Threatened species<br>(optional for biodiversity stewardship agreements) | Chapter 5 | **INFORMATION**<br>☐ Describe the review of existing information and any field survey undertaken to assess habitat constraints and microhabitats for threatened species within the subject land.<br>Identify ecosystem credit species associated with PCTs on the subject land as outlined in BAM Subsection5.1.1, including:<br>☐ list of ecosystem credit species derived from the TBDC (as described in BAM Subsection 5.1.1 and Section 5.2(1.))<br>☐ justification for exclusions of any ecosystem credit species based on habitat constraints (as described in BAM Subsection 5.2.2)<br>Identify candidate species credit species on the subject land as outlined in BAM Subsections 5.2.1–5.2.6, including:<br>☐ list of species credit species derived from the TBDC (as described in BAM Subsection 5.1.2)<br>☐ justification for inclusions and exclusions based on habitat constraints (as described in BAM Subsection 5.2.2<br>☐ list of candidate species credit species with suitable habitat on the subject land (as described in BAM Subsection 5.2.3)<br>From the list of candidate species credit species, identify:<br>☐ species present within the subject land on the basis of being identified on an important habitat map for a species (as described in BAM Subsection 5.2.4(2.d.))<br>☐ species for which targeted surveys are to be completed to determine species presence (Subsection 5.2.4(2.b.))<br>☐ species for which an expert report is to be used to determine species presence (Subsection 5.2.4(2.c.))<br>Where use of local data is proposed (BAM Subsection 1.4.2):<br>☐ identify relevant species<br>☐ identify aspect of species data<br>☐ identify source of information for local data<br>☐ justify use of local data in preference to database values<br>Describe targeted surveys undertaken to determine the presence of each candidate species credit species, including:<br>☐ details of targeted survey effort, timing and weather (as described in BAM Section 5.3)<br>☐ justification of survey method (e.g. citation of peer-reviewed literature) if approach differs from the Department's threatened species survey guidelines or where no relevant guideline has been published<br>☐ survey personnel and relevant experience<br>Describe the use of expert reports where used in place of targeted survey (as described in BAM Section 5.3, Box 3), including:<br>☐ justification of the use of an expert report<br>☐ identify the expert and provide evidence of their expert credentials<br>Describe the presence of each candidate species credit species within the subject land based on:<br>☐ results of targeted threatened species survey (as described in BAM Section 5.3)<br>☐ results of any expert reports including justification for presence of the species assessed and information considered in making this assessment (as described in BAM Section 5.3, Box 3) |

| Report section | BAM ref. | Information | Maps & tables (in document) | Data (to be supplied) |
|---|---|---|---|---|
| | | For species credit species identified as present within the subject land (determined on basis of survey or expert report):<br>☐ determine the species polygons identifying the extent of habitat for the species credit species within the subject land (as described in BAM Subsection 5.2.5(1–5.))<br>☐ describe the habitat features and/or habitat constraints associated with each species credit species within the subject land (as described in BAM Subsection 5.2.5(6.))<br>☐ describe the habitat condition within each species polygon (as described in BAM Subsection 5.2.6)<br>☐ for flora species credit species, provide a count, or an estimation, of the number of individual plants present on the subject land (as described in BAM Subsection 5.2.5(3.)) | | |
| | | **MAPS and TABLES (in document)**<br>☐ Table showing ecosystem credit species in accordance with BAM Section 5.1.1, and:<br>☐ identifying any ecosystem credit species removed from the list of species on the basis of further assessment in accordance with BAM Subsections 5.2.2)<br>☐ identifying the sensitivity to gain class of each species<br>☐ Table detailing species credit species in accordance with BAM Subsections 5.2.1–5.2.2 and identifying:<br>☐ those species identified as candidate species credit species<br>☐ presence on site as determined by targeted survey expert report or important mapped area<br>☐ Table detailing species credit species recorded within the subject land, habitat feature/component associated with the species, its abundance (flora)/extent of habitat (flora and fauna) (as described in BAM Subsection 5.2.6)<br>☐ Map of species credit species records within the subject land and species polygons for flora and fauna species (as described in BAM Subsection 5.2.5(1–5.)) | | |
| | | **DATA (to be supplied)**<br>☐ Digital shape files of species polygons<br>☐ Species polygon map in jpeg format<br>☐ Expert reports and any supporting data used to support conclusions of the expert report | | |

**Table 30 Minimum information requirements for the Biodiversity Stewardship Site Assessment Report (application for a biodiversity stewardship agreement), Stage 3: Improving biodiversity values**

| Report section | BAM ref. | Information | Maps & tables (in document) | Data (to be supplied) |
|---|---|---|---|---|
| Improving biodiversity values | Chapter 11 | **INFORMATION**<br>Ecosystem credits and species credits created at a biodiversity stewardship site, including:<br>☐ description of the required management actions to improve biodiversity values (BAM Section 11.3)<br>☐ description of active restoration management actions to improve biodiversity values (BAM Section 11.3)<br>☐ description of active restoration management actions targeted at manageable high threat weeds<br>☐ number of ecosystem credits created for the improvement in biodiversity values for each vegetation zone at a biodiversity stewardship site (BAM Section 11.6)<br>☐ number of species credits created for each threatened species that occurs on the biodiversity stewardship site (BAM Section 11.7)<br>☐ full disclosure of existing management obligations and management actions and the credit adjustments relating to these (BAM Section 11.9) | | |
| | | **MAPS and TABLES (in document)**<br>☐ Table of vegetation zones detailing:<br>☐ future vegetation integrity score without management, including averted loss (BAM Subsection 11.4.1)<br>☐ future vegetation integrity score with required and active restoration management (in accordance with BAM Section 4.4, Equation 33 and Equation 34 in Appendix H)<br>☐ change in vegetation integrity score (BAM Section 11.4)<br>☐ gain in vegetation integrity score (Equation 37 in Appendix H)<br>☐ Table of required management actions, including:<br>☐ future value of vegetation integrity attributes with management (BAM Subsection 11.4.2)<br>☐ Table of active restoration management actions, including:<br>☐ future value of vegetation integrity attributes with management (BAM Subsection 11.4.2)<br>☐ Table of PCTs at the biodiversity stewardship site and the number of ecosystem credits created<br>☐ Table of threatened species at the biodiversity stewardship site and the number of species credits created<br>☐ Map of species polygon, identifying areas that will not generate credits and areas that will be restored to expand species habitat | |
| | | | | **DATA (to be supplied)**<br>☐ Submitted proposal in the BAM Calculator |
| Appendix | Chapter 11 | ☐ Credit reports for ecosystem and species credit species produced by the BAM Calculator<br>☐ Management plan for the biodiversity stewardship site (BAM Section 11.2) | | |



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# Glossary

References to databases in the BAM are references to databases as in force from time to time.

References to sections are to the BAM, unless otherwise indicated.

The following terms are defined for the purposes of the BAM.

**Accredited person:** has the same meaning as in the BC Act, referred to in the BAM as 'assessor', i.e. *in relation to the preparation of biodiversity assessment reports, means a person accredited under section 6.10* (of the BC Act) *to prepare those reports in accordance with the biodiversity assessment method.*

**Additional biodiversity impacts:** has the same meaning as in clause 6.1 of the BC Regulation; described as prescribed impacts in the BAM.

**Ancillary rules:** rules published by the Secretary of the Department or anyone authorised by the Secretary, under clause 6.5 of the BC Regulation for the purpose of the interpretation and application of the offset rules and variation rules.

**Annual probability of decline** in vegetation and habitat condition: an estimate of the average probability of decline of each attribute through clearing, stochastic factors or ongoing degrading actions (e.g. firewood removal, weed invasion, livestock grazing).

**Approved conservation measure:** measures specified as approved conservation measures in an order conferring biodiversity certification under Part 8 of the BC Act.

**Area of occupancy (AOO):** area of suitable habitat currently occupied by a taxon within its 'extent of occurrence'. This area is measured by species presence in 2 km x 2 km grids (e.g., AOO for species will be in multiples of 4 km2) or community presence in 10 km x 10 km grids (AOO for communities will be in multiples of 100 km2; grid squares with <1% occupied by the community are excluded). A taxon will generally not occur throughout the entire area of its extent of occurrence due to unsuitable or unoccupied habitats (IUCN 2001, 2012b). For migratory species, AOO is either the breeding area or the non-breeding (wintering) area, whichever is smaller.

**Assessment area:** includes the subject land and the area of land within the 1500 m buffer zone surrounding the subject land (or 500 m buffer zone for linear proposals) that is determined as per Subsection 3.1.2.

**Assessor:** has the same meaning as accredited person.

**Averted loss:** the gain in vegetation and habitat condition that arises from managing the proposed land as an offset compared with the probable future vegetation condition if the land were to be left unmanaged (see *Annual probability of decline*).

**Avoid:** measures taken by a proponent such as careful site selection, or actions taken through the design, planning, construction and operational phases of the development to completely prevent impacts on biodiversity values, or certain areas of biodiversity. Refer to the BAM for operational guidance.

**Biodiversity Assessment Report:** a biodiversity stewardship site assessment report, a biodiversity development assessment report or a biodiversity certification assessment report prepared by an accredited person.

**Benchmark data:** for a PCT, vegetation class or vegetation formation, benchmark data are contained in the BioNet Vegetation Classification. A local reference site may also be used to establish benchmark data for a PCT that may be used in a BAM assessment, as per Appendix A.

- Dry benchmarks are estimated for the 10$^{th}$ percentile of long-term rainfall records



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- Average benchmarks are estimated for the median or 50th percentile, and
- Wet benchmarks are estimated for the 90th percentile of long-term rainfall records.

**Benchmarks:** the quantitative measures that represent the 'best attainable' condition, which acknowledges that native vegetation within the contemporary landscape has been subject to both natural and human-induced disturbance. Benchmarks are defined for specified variables for each PCT. Vegetation with relatively little evidence of modification generally has minimal timber harvesting (few stumps, coppicing, cut logs), minimal firewood collection, minimal exotic weed cover, minimal grazing and trampling by introduced or overabundant native herbivores, minimal soil disturbance, minimal canopy dieback, no evidence of recent fire or flood, no high-frequency burning, and evidence of recruitment of native species.

**Biodiversity Assessment Method Calculator:** the online computer program that provides decision support to assessors and proponents by applying the BAM and referred to as the BAM-C. The BAM-C contains biodiversity data from the BioNet Vegetation Classification and the Threatened Biodiversity Data Collection that the assessor is required to use in a BAM assessment. The BAM-C applies the equations used in the BAM, including those to determine the number and class of biodiversity credits required to offset the impacts of a development, or created at a biodiversity stewardship site. It is published by the Department.

**Biodiversity certification:** means biodiversity certification conferred on land under Part 8 of the BC Act.

**Biodiversity certification assessment area:** the area of land subject to assessment under the BAM for the design of future land uses. Usually correlates to a strategic planning area in a published plan or the subject lands of a planning proposal. The biodiversity certification assessment area is to be identified in the BCAR. It will include land where certification is proposed to be conferred, any surrounding or adjacent land proposed for land-based conservation measures and retained lands. Land-based conservation measures are not necessarily limited to the confines of the biodiversity certification assessment area.

**Biodiversity Certification Assessment Report (BCAR):** has the same meaning as in the BC Act.

**Biodiversity credit report:** the report produced by the BAM-C that sets out the number and class of biodiversity credits required to offset the remaining adverse impacts on biodiversity values at a development site or on land to be biodiversity certified. For biodiversity stewardship sites, the biodiversity credit report sets out the number and class of biodiversity credits that are created at that site.

**Biodiversity Development Assessment Report (BDAR):** has the same meaning as in the BC Act.

**Biodiversity offsets:** the gain in biodiversity values achieved from the implementation of management actions on areas of land, to compensate for losses to biodiversity values from the impacts of development.

**Biodiversity stewardship agreement:** has the same meaning as in the BC Act.

**Biodiversity stewardship site:** has the same meaning as in the BC Act.

**Biodiversity Stewardship Site Assessment Report (BSSAR):** the report that must be prepared in accordance with the BAM and submitted as part of an application for a biodiversity stewardship agreement.

**Biodiversity values:** has the same meaning as in the BC Act.

**Biodiversity Values Map:** means the map published in accordance with clause 7.3 of the BC Regulation. Development within an area identified on the map requires assessment using the BAM.

**BioNet Atlas:** the Department's database of flora and fauna records (formerly known as the NSW Wildlife Atlas). The BioNet Atlas contains records of plants, mammals, birds, reptiles, amphibians, some fungi, some invertebrates (such as insects and snails listed under the BC Act) and some fish.

**BioNet Vegetation Classification:** the vegetation community-level classification for use in vegetation mapping programs and regulatory biodiversity impact assessment frameworks in NSW. The BioNet Vegetation Classification is published by the Department and available at www.environment.nsw.gov.au/research/Visclassification.htm.

**Broad condition state:** areas of the same PCT that are in relatively homogeneous condition. The assessment of broad condition state is used to stratify areas of the same PCT into a vegetation zone for the purpose of determining the vegetation integrity score.

**Change in vegetation integrity score for a biodiversity stewardship site:** the difference (gain) between the estimated vegetation integrity score without management at a biodiversity stewardship site and the predicted future vegetation integrity score with management at a biodiversity stewardship site, calculated in accordance with Equation 37.

**Class of biodiversity credit:** biodiversity credits that share the same attributes (refer to Subsection 10.2.

**Clearing site:** the site proposed to be cleared of native vegetation where approval is sought under Part 5A of the LLS Act or a permit under the Vegetation SEPP.

**Clonal species:** flora species that propagate asexually at a site or have a limited degree of sexual reproduction, either within or between sites. Modes of asexual reproduction include vegetative reproduction, such as by rhizomes, root suckers or bulb replication.

**Condition attributes:** the matters assessed for composition, structure and function to determine vegetation integrity. The condition attributes for composition and structure are assessed according to growth form groups.

**Connectivity:** the measure of the degree to which an area of native vegetation is linked with other areas of vegetation.

**Critically endangered ecological community (CEEC):** an ecological community specified as critically endangered in Schedule 2 of the BC Act and/or listed under Part 13, Division 1, Subdivision A of the Commonwealth EPBC Act.

**Crown cover:** the vertical projection of the periphery of tree crowns within a designated area.

**Decision-maker:** includes consent authorities for development applications under Part 4 of the EP&A Act; the Minister for Planning and Public Spaces for activities under Part 5.1 of the EP&A Act; determining authorities for activities under Part 5 of the EP&A Act; the Native Vegetation Panel for approvals for clearing native vegetation under s.60ZF of the LLS Act and permits under clause 14 of the Vegetation SEPP; the Minister for Environment and Energy in relation to biodiversity certification under Part 8 of the BC Act and biodiversity stewardship agreements under Part 5.5 of the BC Act.

**Derived PCT:** PCTs that have changed to an alternative stable state as a consequence of land management practices since European settlement. Derived communities can have one or more structural components of the vegetation entirely removed or severely reduced (e.g. over-storey of grassy woodland) or have developed new structural components where they were previously absent (e.g. shrubby mid-storey in an open woodland system).

**Development footprint:** the area of land that is directly impacted by a proposed development, including access roads and areas used to store construction materials. The term *development footprint* is also taken to include clearing footprint, except where the reference is to a small area development or a major project development.

**Development site:** an area of land that is subject to a proposed development under the EP&A Act. The term *development site* is also taken to include clearing site, except where the reference is to a small area development or a major project development.

**Direct impacts:** impacts on biodiversity values and threatened species habitat that relate to clearing native vegetation and impacts on biodiversity values prescribed by the BC Regulation. This includes impacts from activities related to the construction or operational phase of the proposal.

**Dynamic weights:** dynamic weights are used in the calculation of vegetation integrity scores. The importance (weight) of any composition or structure attribute is taken as proportional to its contribution to the total number of native plant species or total plant foliage cover in the benchmark.

**Ecosystem credits:** a measurement of the value of threatened ecological communities, threatened species habitat for species that can be reliably predicted to occur with a PCT, and PCTs generally. Ecosystem credits measure the loss in biodiversity values at a development, activity, clearing or biodiversity certification site and the gain in biodiversity values at a biodiversity stewardship site.

**Ecotone:** a transitional area of vegetation between plant community types that displays some characteristics from each plant community type.

**Endangered ecological community (EEC):** an ecological community specified as endangered in Schedule 2 of the BC Act, or listed under Part 13, Division 1, Subdivision A of the EPBC Act.

**Ephemeral flora species:** flora species whose abundance above ground fluctuates in response to the plant life history in combination with environmental conditions and/or disturbance regimes. Fluctuations in abundance may be short-term (seasonal) or long-term (yearly to decadal). Many ephemeral species persist underground during unfavourable conditions via soil seed banks or dormant vegetative organs (bulbs, tubers, rootstocks).

**Estuarine area:** a semi-enclosed body of water having an open or intermittently open connection with the ocean, in which water levels do not vary with the ocean tide (when closed to the sea) or vary in a predictable, periodic way in response to the ocean tide at the entrance (when open to the sea).

**Expert:** a person who has the relevant experience and/or qualifications to provide expert opinion in relation to the biodiversity values to which an expert report relates.

**Extent of occurrence (EOO**): measures the spatial spread of a taxon to determine the degree to which risks from threatening factors could impact an entire population, and is not intended to be an estimate of the amount of occupied or potential habitat. The EEO is the area contained within the smallest polygon (also known as a minimum convex polygon or convex hull) which can be drawn to encompass all the known, inferred or projected sites of present known occurrence of a taxon, excluding cases of vagrancy (IUCN 2001, 2012b). The EOO polygon must not exclude any areas, discontinuities, disjunctions whether the species can occur in these areas or not. EOO

**Extreme fluctuations**: where population size or distribution area varies widely, rapidly and frequently, and typically with a variation greater than one order of magnitude (i.e., a tenfold increase or decrease). (IUCN 2001, 2012b). Populations which undergo extreme fluctuations are likely to have highly variable growth rates and are therefore exposed to higher extinction risks.

**Foliage cover:** is the percentage of the plot covered by a vertical projection of all attached plant material, regardless of whether it appears alive or dead, of all individuals of a species. This includes leaves, stems, twigs, branchlets and branches, from forb, grass and grass-like species, and any canopy overhanging the plot, even if the stem is outside the plot.

**Gain:** the increase in biodiversity values at a biodiversity stewardship site as a result of management actions at the site. Gain in biodiversity values is the basis for creating biodiversity credits at the biodiversity stewardship site.

**Geographic limitations:** where the distribution of a species within a PCT does not occur across the whole IBRA subregion. Geographic limitations include, but are not limited to, LGA zones, altitude thresholds, orientation from a significant landscape feature such as a road, river or mountain.

**Grassland:** native vegetation classified in the vegetation formation 'Grasslands' in Keith (2004). Grasslands are generally dominated by large perennial tussock grasses, lack woody plants, have broad-leaved herbs in inter-tussock spaces, and have an ecological association with fertile, heavy clay soils on flat topography in regions with low to moderate rainfall.

**Growth form:** the form that is characteristic of a particular flora species at maturity. Growth forms are set out in Appendix F.

**Habitat:** an area or areas occupied, or periodically or occasionally occupied, by a species or ecological community, including any biotic or abiotic component.

**Habitat component:** the component of habitat that is used by a threatened species for breeding, foraging or shelter.

**Habitat constraints:** Essential habitat features that must be present for the species to occupy or periodically use the subject land. Habitat constraints include, but are not limited to, caves, rocky areas, hollow bearing trees, swamps.

**Habitat surrogates:** measures of habitat that predict the occurrence of threatened species and communities. They include IBRA subregion, PCT, percent vegetation cover and vegetation condition.

**High threat weed cover:** plant cover composed of vascular plants that, if not controlled, will invade and outcompete native plant species. Also referred to as high threat weeds or high threat exotic vegetation. Plants considered to be high threat weeds are listed on the high threat weeds list published in the BAM-C

**Hollow bearing tree:** a living or dead tree that has at least one hollow. A tree is considered to contain a hollow if: (a) the entrance can be seen; (b) the entrance width is at least 5 cm; (c) the hollow appears to have depth (i.e. solid wood cannot be seen beyond the entrance); and (d) the hollow is at least 1 m above the ground. Trees must be examined from all angles.

**IBRA region:** a bioregion identified under the Interim Biogeographic Regionalisation for Australia (IBRA) system (Thackway & Cresswell 1995), which divides Australia into bioregions on the basis of their dominant landscape-scale attributes.

**IBRA subregion:** a subregion of a bioregion identified under the IBRA system.

**Impact assessment:** an assessment of the impact or likely impact of a development on biodiversity values, which is prepared in accordance with the BAM.

**Impacts on biodiversity values:** loss in biodiversity values from direct, indirect or prescribed impacts of development in accordance with Chapters 1, 6 and 7–9.

**Important habitat map:** a map approved by the Department that identifies areas of habitat that are considered to be important for the survival of a threatened species in the wild. Species that have areas of important habitat mapped are identified in the Threatened Biodiversity Data Collection.

**Important wetland:** a wetland that is listed in the *Directory of Important Wetlands in Australia* or a coastal wetland identified in *State Environmental Planning Policy (Coastal Management) 2018.*

**Indirect impacts**: impacts that occur when the proposal affects native vegetation and threatened species habitat beyond the development footprint or within retained areas (e.g. transporting weeds or pathogens, dumping rubbish). This includes impacts from activities related to the construction or operational phase of the proposal and prescribed impacts.

**Individual:** in relation to organisms, a single, mature organism that is a threatened species, or any other threatened species listed under Part 13 of the EPBC Act.

**Intrinsic rate of increase (*ir*):** an estimate of the rate of gain for an attribute at a biodiversity stewardship site from actions undertaken as part of the management plan. The intrinsic rate of increase is specified for an attribute according to the formation of the PCT being assessed (see Appendix K). Values of *ir* for each attribute are published on the front page of the BAM-C.

**Land-based conservation measure:** Under strategic biodiversity certification, a conservation measure applied to a parcel of land to secure the protection of biodiversity values, rehabilitate degraded vegetation or give effect to a change in permissible land uses.

**Landscape attributes:** in relation to the site context of the land and includes attributes such as native vegetation cover, patch size, habitat connectivity and the strategic location of a biodiversity stewardship site.

**Large tree benchmark:** the largest stem size class for a PCT, as determined by the benchmark for the PCT.

**Life cycle:** the series of stages of reproduction, growth, development, ageing and death of an organism.

**Linear-shaped development:** development that is generally narrow and extends across the landscape; for example, major roads, rail lines.

**Litter cover:** the percentage ground cover of all plant material that has detached from a plant and forms part of the litter layer on the ground surface, including leaves, seeds, twigs, branchlets and branches (<10 cm in diameter). Litter from native and exotic species (combined) is recorded for this attribute.

**Local population:** the population that occurs in the study area. Where multiple populations occur in the study area or a population occupies part of the study area, impacts on each subpopulation must be assessed separately.

**Loss of biodiversity:** the loss of biodiversity values from a development site, native vegetation clearing site or land where biodiversity certification is conferred.

**Major project:** State Significant Development under Part 4, Division 4.7 of the EP&A Act and State Significant Infrastructure under Part 5, Division 5.2 of the EP&A Act.

**Manageable high threat weeds:** A subset of high threat weeds for which there is sufficient evidence that their abundance and impact can be effectively reduced through well planned and implemented management actions. These management actions are incorporated into the 20-year management plan

**Microhabitat:** smaller parts of the habitat, a habitat component or a habitat constraint used by a threatened species.

**Minimise:** a process applied throughout the development planning and design life cycle that seeks to reduce the residual impacts of development on biodiversity values.

**More appropriate local data:** has the same meaning as set out in Subsection 1.4.2.

**Multiple fragmentation impact development:** developments such as wind farms and coal seam gas extraction that require multiple extraction points (wells) or turbines, and a network of associated development such as roads, tracks, gathering systems/flow lines and transmission lines.

**Native ground cover:** all native vegetation below 1 m in height, including all such species native to NSW (i.e. not confined to species indigenous to the area).

**Native plant species richness:** the number of different native vascular plant species that are characteristic of a PCT.

**Native vegetation:** has the same meaning as in section 1.6 of the BC Act and section 60B of the LLS Act, repeated here:

*(1) For the purposes of this Part, **native vegetation** means any of the following types of plants 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.*

*(2) A plant is native to New South Wales if it was established in New South Wales before European settlement. The regulations may authorise conclusive presumptions to be made of the species of plants native to New South Wales by adopting any relevant classification in an official database of plants that is publicly accessible.*

*(3) For the purposes of this Part, native vegetation extends to a plant that is dead or that is not native to New South Wales if:*

*(a) the plant is situated on land that is shown on the native vegetation regulatory map as category 2-vulnerable regulated land, and*

*(b) it would be native vegetation for the purposes of this Part if it were native to New South Wales.*

*(4) For the purposes of this Part, native vegetation does not extend to marine vegetation (being mangroves, seagrasses or any other species of plant that at any time in its life cycle must inhabit water other than fresh water). A declaration under Section 14.7 of the BC Act that specified vegetation is or is not marine vegetation also has effect for the purposes of this Part.*

**Native vegetation cover:** the percentage of native vegetation cover on the subject land and the surrounding buffer area. Cover estimates are based on the cover of native woody and non-woody vegetation. Native vegetation cover includes regrowth, derived native grasslands and plantations that are comprised of plants native to New South Wales

**No net loss**: refers to the standard set out in Chapter 10 that in the opinion of the Minister will result in no net loss of biodiversity in NSW.

**NSW (Mitchell) landscape:** landscapes with relatively homogeneous geomorphology, soils and broad vegetation types, mapped at a scale of 1:250,000.

**Offset rules:** those established by the BC Regulation.

**Onsite measures:** measures and strategies that are taken, or are proposed to be taken, at a development site to avoid or minimise the direct and indirect impacts of the development on biodiversity values.

**Operational Manual:** the Operational Manual published from time to time by the Department, which is a guide to assist assessors when using the BAM.

**Patch size:** an area of native vegetation that:

- occurs on the development site or biodiversity stewardship site
- includes native vegetation that has a gap of less than 100 m from the next area of native vegetation (or ≤30 m for non-woody ecosystems).

Patch size may extend onto adjoining land that is not part of the development site or biodiversity stewardship site.

**PCT classification system:** the system of classifying native vegetation approved by the NSW Plant Community Type Control Panel and described in the BioNet Vegetation Classification.

**Percent cleared value:** the percentage of a PCT that has been cleared as a proportion of its pre-1750 extent, as identified in the BioNet Vegetation Classification.

**Physiography:** includes the following attributes: morphological type, landform element and pattern, microrelief, lithology, soil surface texture, soil colour, depth and type, slope, aspect, site drainage and distance to nearest water and type. Refer to the *Native Vegetation Interim Type Standard* (DECCW 2010).

**Plant community type (PCT):** a NSW plant community type identified using the PCT classification system.

**Plot:** an area within a vegetation zone in which the vegetation integrity condition attributes are assessed.

**Population:** a group of organisms, all of the same species, occupying a particular area.

**Prescribed impact:** means the prescribed impacts identified in clause 6.1 of the BC Regulation. Prescribed impacts can be direct or indirect impacts.

**Probability of reaching benchmark:** the probability of a specific attribute or growth form group reaching benchmark condition in the vegetation zone at the end of the management timeframe.

**Protected animal:** has the same meaning as in the BC Act.

Note: Some protected animals may also be threatened species of animals, but not all threatened species of animals are protected animals.

**Proponent:** a person who intends to apply for consent or approval to carry out development (including of infrastructure), clearing or biodiversity certification.

**Proposal:** any of the following types of proposals:

- development that requires consent under Part 4 of the EP&A Act
- an activity that requires approval under Part 5, Division 5.1 (where the proponent has opted-in to the Biodiversity Offsets Scheme) of the EP&A Act
- development that requires approval under Part 5, Division 5.2 of the EP&A Act
- clearing that requires approval under Part 5A of the LLS Act; or a permit under the Vegetation SEPP
- biodiversity certification of land and related development in the case of an application for biodiversity certification under the BC Act
- a biodiversity stewardship site in the case of an application for a biodiversity stewardship agreement under the BC Act.

**Proposed conservation measure:** a conservation measure proposed to be included as an approved conservation measure in an order conferring biodiversity certification under Part 8 of the BC Act. Measures that may be proposed to be specified as an approved conservation measure are identified in section 8.3 of the BC Act.

**Reference sites:** the relatively unmodified sites that are assessed to obtain local benchmark information when benchmarks in the Vegetation Benchmarks Database are too broad or otherwise incorrect for the PCT and/or local situation. Benchmarks can also be obtained from published sources.

**Residual impact:** an impact on biodiversity values that remains after all reasonable measures have been taken to avoid, minimise or mitigate the impacts of development. Under the BAM, an offset requirement is determined for the remaining impacts on biodiversity values.

**Retained land:** land within a biodiversity certification assessment area that is neither biodiversity certified nor subject to an approved conservation measure. Existing development assessment and approval arrangements under the EP&A Act will continue to apply to this land.

**Retirement of credits:** the action taken whereby biodiversity credits created for a biobanking agreement or a biodiversity stewardship agreement are used to offset the impacts of development, clearing or biodiversity certification.

**Riparian buffer:** an area of land determined according to Appendix E.

**Risk of extinction:** the likelihood that the local population, CEEC or EEC will become extinct either in the short term or in the long term as a result of direct or indirect impacts on its viability.

**Serious and irreversible impact:** impacts likely to contribute significantly to the risk of a threatened species or ecological community becoming extinct in accordance with the principles set out in clause 6.7(2) of the BC regulation

**Site-based development:** a development other than a linear-shaped development, or a multiple fragmentation impact development.

**Site context:** the value given to landscape attributes of a development site or biodiversity stewardship site after an assessment undertaken in accordance with Chapter 3.

**Species credit species:** threatened species or components of species habitat that are identified in the Threatened Species Data Collection as requiring assessment for species credits.

**Species credits:** the class of biodiversity credits created or required for the impact on threatened species that cannot be reliably predicted to use an area of land based on habitat surrogates. Species that require species credits are listed in the Threatened Biodiversity Data Collection.

**Species polygon:** an area of land identified in Chapter 5 that contains habitat or is occupied by a threatened species.

**State significant development:** is development declared to be State significant development under the EP&A Act.

**State significant infrastructure:** is development declared to be State significant infrastructure under the EP&A Act.

**Stream order:** has the same meaning as in Appendix E.

**Subject land:** is land subject to a development, activity, clearing, biodiversity certification or a biodiversity stewardship proposal. It excludes the assessment area which surrounds the subject land (i.e. the area of land in the 1500 m buffer zone around the subject land or 500 m buffer zone for linear proposals). In the case of a biodiversity certification proposal, subject land includes the biodiversity certification assessment area.

**Suitable habitat:** habitat within an associated IBRA subregion (and geographic limitation if included) and PCT where the species is expected to occur or periodically use, that is in a condition suitable to support the species. To be classified as suitable, where a habitat constraint(s) is associated with the species, at least one is present; and for fauna species, the native vegetation cover class and patch size thresholds are met.

**Threat status class:** the extent to which a species or ecological community is threatened with extinction, or the extent to which a PCT is estimated to have been cleared (see *Percent cleared value*).

**Threatened Biodiversity Data Collection:** part of the BioNet database, published by the Department and accessible from the BioNet website at www.bionet.nsw.gov.au.

**Threat-defined locations:** geographically or ecologically distinct areas in which a single threatening event may rapidly affect species occurrences. Where two or more subpopulations occur in an area that may be threatened by one such event, they are counted as a single location. Where a subpopulation covers an area larger than what a single event is likely to impact, this is counted as two or more locations.

**Threatened ecological community (TEC):** a critically endangered ecological community, an endangered ecological community or a vulnerable ecological community listed in Schedule 2 of the BC Act, or listed under Part 13 of the EPBC Act as critically endangered, endangered or vulnerable.

**Threatened entities:** threatened species, populations and/or ecological communities listed in Schedules 1 and 2 of the BC Act, or listed under Part 13 of the EPBC Act as critically endangered, endangered or vulnerable.

**Threatened species:** critically endangered, endangered or vulnerable threatened species or populations as defined by Schedule 1 of the BC Act, or any additional threatened species or populations listed under Part 13 of the EPBC Act as critically endangered, endangered or vulnerable.

**Threatened species survey:** a targeted survey for threatened species undertaken in accordance with Section 5.3.

**Threatened species survey guidelines:** survey methods or guidelines published by the Department.

**Total length of fallen logs:** the total length of logs present in a vegetation zone that are at least 10 cm in diameter and at least 0.5 m long.

**Transect:** a line or narrow belt along which environmental data are collected.

**Tree regeneration:** the presence of living stems from the tree growth form group that are naturally regenerating and are <5 cm diameter regardless of height, occurring within a vegetation zone.

**Upland Swamp Policy:** the document *Addendum to NSW Biodiversity Offsets Policy for Major Projects: upland swamps impacted by longwall mining subsidence* as in force on the day when the BAM is published until the Secretary of the Department or anyone authorised by the Secretary, publishes any further document to be adopted by the BAM as the Upland Swamp Policy.

**Vagrant species:** refers to occasional records of species in NSW that are outside their normal distribution or habitat, including escaped animals and planted specimens.

**Vegetation Benchmarks Database:** a database of benchmarks for vegetation classes and some PCTs. The Vegetation Benchmarks Database is published by the Department and is part of the BioNet Vegetation Classification.

**Vegetation class:** a level of classification of vegetation communities, as defined in Keith (2004).

**Vegetation formation**: a broad level of vegetation classification, as defined in Keith (2004). There are 16 vegetation formations and sub-formations in NSW.

**Vegetation integrity:** the condition of native vegetation assessed for each vegetation zone against the benchmark for the PCT.

**Vegetation integrity score:** the quantitative measure of vegetation condition calculated in accordance with Equation 23 or Equation 24.

**Vegetation zone:** a relatively homogeneous area of native vegetation on a development site, clearing site, land to be biodiversity certified or biodiversity stewardship site that is the same PCT and has the same broad condition state.

**Viability:** the capacity of a species to successfully complete each stage of its life cycle under normal conditions so as to retain long-term population densities.

**Vulnerable ecological community:** an ecological community specified as vulnerable in Schedule 2 of the BC Act and/or listed under Part 13, Division 1, Subdivision A of the EPBC Act.

**Wetland:** an area of land that is wet by surface water or groundwater, or both, for long enough periods that the plants and animals in it are adapted to, and depend on, moist conditions for at least part of their life cycle. Wetlands may exhibit wet and dry phases, and may be wet permanently, cyclically or intermittently with fresh, brackish or saline water.

**Widely cultivated native species:** a variety of a native species developed in cultivation, usually for the purposes of agriculture, forestry or horticulture, and which, when reproduced retains its distinguishing features, and any native species listed on the high threat weeds list published in the BAM-C.

**Woody native vegetation:** native vegetation from species assessed in the tree growth form group and shrub growth form group.

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