



NSW Biodiversity Offsets Policy for Major Projects

Fact sheet: Framework for Biodiversity Assessment

Introduction

The NSW Biodiversity Offsets Policy for Major Projects (the policy) clarifies and standardises biodiversity impact assessment and offsetting for major project approvals in NSW. A key principle underpinning the policy is that offset requirements should be based on a reliable and transparent assessment of biodiversity losses and gains. The Framework for Biodiversity Assessment (FBA), which is applied by accredited ecological consultants, provides this assessment process.

The FBA sets out clear instructions on what ecological consultants need to assess and quantify, including:

- the types of biodiversity values on a development and offset site
- impacts on biodiversity on a development site
- how much gain in biodiversity can be expected from an offset site.

This fact sheet outlines the major steps ecological consultants will take to determine the offset requirements for a major project under the FBA.

Assessing biodiversity values on a site

Step 1: Determine the general biodiversity condition of the site

In this step, the ecological consultant will use aerial photography, information contained in databases and on-ground surveys to identify the types of vegetation that are present on the development site and what condition they are in.

Divide map of development site into vegetation zones

The ecological consultant divides the map of the development site into areas containing different vegetation types (and areas containing no vegetation), then further divides the

vegetation types if they contain areas in significantly different condition. This process results in a map that is split into different 'vegetation zones', which are areas that contain vegetation that is of the same type and in the same broad condition.

Vegetation type and condition are often used to represent different types of biodiversity values. For example, a particular vegetation type could be a threatened ecological community or habitat for threatened species, or both.

The ecological consultant will check the veracity of this information by conducting on-ground field surveys, and will adjust the vegetation zones in the map if needed.

Assess the on-ground condition of vegetation

The ecological consultant will collect data on each vegetation zone they map, which will help assess the on-ground condition of each zone.

For each vegetation zone, the ecological consultant will take samples (the number of samples required is set out in the FBA) to estimate the following 10 vegetation attributes:

1. Native species plant richness

This is the number of different species of plants in each vegetation zone on the development site. Native plant species are also identified according to whether they occur in the upper, mid and ground cover stratum.

2. Native over-storey cover

The ecological consultant will estimate the percentage of foliage cover in each vegetation zone. Percentage foliage cover is the amount of shadow that would be cast on the ground if a light was directly overhead and provides an estimate of native over-storey cover. The ecological consultant will use a photographic guide to assist in estimating percentage foliage cover.

3. Over-storey regeneration

The ecological consultant surveys the entire zone to estimate the proportion of over-storey species that are regenerating, that is, have a diameter at breast height of 5 centimetres or less.

4. Number of trees with hollows

This is an estimate of the number of living and dead trees with at least one hollow.

5. Native mid-storey cover

The ecological consultant will estimate the percentage foliage cover of all the vegetation between a height of 1 metre and the over-storey. This will provide an estimate of native mid-storey cover.

6. Native groundcover (shrubs)

This is an estimate of the cover of all native shrubs below a height of 1 metre in each vegetation zone.

7. Native groundcover (grasses)

This is an estimate of the cover of native grasses in each vegetation zone.

8. Native ground cover (other)

This is an estimate of the cover of all other native vegetation occurring below a height of 1 metre that is not a shrub or a grass, for example herbs or ferns, in each vegetation zone.

9. Exotic plant cover

The ecological consultant will estimate the percentage foliage cover of all the exotic (not native) plants at ground level, mid-storey level and over-storey level.

10.Length of fallen logs

The total length of all fallen logs that have a diameter of more than 10 centimetres and are more than half a metre long is measured.

Assess the site value (condition/quality) of the vegetation

The consultant compares the information they collected on the 10 vegetation attributes to values in the Office of Environment and Heritage's (OEH's) Vegetation Benchmarks Database. The benchmark values reflect what would be expected for the vegetation type if there was little or no evidence of human modification.

Based on its comparison to the benchmark value, the vegetation is given a score out of 100. The better condition the vegetation is in, the higher the score, and subsequently the value of the site. Vegetation in a condition below the threshold for where an offset is required is identified at this stage.

Step 2: Assess how important the site is in the context of the broader landscape

The ecological consultant will assess the value of the site in the broader landscape and what impact the development will have on the landscape. Landscape value is a combination of three different measures:

- how much native vegetation cover is in the area around the development site
- how well-connected the development site is via vegetation corridors to surrounding vegetation
- the size of the vegetation patch on which the development site is located.

Generally, large patches of vegetation with good linkages to other large patches of vegetation have a good landscape value.

Native vegetation cover in the landscape

The ecological consultant centres two assessment circles on the proposed development site on a map containing aerial photography of the site and the surrounding landscape. The percentage of native vegetation cover within both these circles is determined by a GIS or estimated visually.

The smaller circle, which has a minimum area of 100 hectares, provides a site-scale context for the landscape. The outer circle, which has a minimum area of 1000 hectares,

provides a broader context. The size of the assessment circles can be increased for large developments.

The ecological consultant will then overlay the footprint of the development site and calculate how much the native vegetation cover will change in both assessment circles as a result of the development.

The visual interpretation will be guided by a photographic guide showing the different percentage of vegetation cover at the landscape scale.

Linear-shaped developments or developments with many fragmentation impacts

Linear-shaped developments have a footprint that extends across the landscape for more than 3.5 kilometres, such as pipelines, roads, highways and railway lines. Developments with many fragmentation impacts include wind farms or coal seam gas extraction areas that require multiple extraction points, or turbines and associated infrastructure.

Circles are not appropriate for measuring change in vegetation cover for these developments. Instead, a buffer area is mapped around the development to assess the change in vegetation cover as a result of the development.

Connection to other areas of native vegetation

The ecological consultant will assess the extent that vegetation on the development site is connected to vegetation in the surrounding landscape. Vegetation corridors include:

- vegetation that provides a link between two patches of vegetation in good condition
- vegetation in the buffer area around a stream or wetland
- areas identified as part of a state or regional biodiversity corridor in a plan approved by the Chief Executive of OEH.

The consultant will then assess any change in width of the vegetation corridors or the condition of the vegetation in them that will be caused by clearing for the development.

Patch size

The ecological consultant will look at the size of the patch of vegetation that the development site is part of. This is important because some species need a certain amount of vegetation as their habitat.

The FBA will also take into account the historical level of clearing in the landscape where the development is proposed. This means a small patch of vegetation in a highly cleared landscape can be as important as a larger patch of vegetation in a landscape that has not undergone as much clearing.

Step 3: Determine the threatened species present at the development site

The ecological consultant will identify the threatened species and populations and their habitats found on the development site. This will be done using:

- plant community types identified in Step 1
- information contained in OEH's Threatened Species Profile Database
- local data

- targeted on-ground survey for a species, or
- commissioned expert reports.

Using this information, the ecological consultant will calculate the amount of biodiversity credits, consisting of **ecosystem credits** and **species credits**, associated with impacts of the threatened species at the site.

Ecosystem credits represent species that can be predicted to be present by the type and condition of vegetation on the development site. Any impact on the relevant ecosystem will directly impact on the habitat that is used by these species.

Species credits pertain to threatened species that cannot be predicted by the vegetation present. Impacts on the relevant ecosystems on the site are less directly related to impacts on these species.

The Threatened Species Profile Database specifies which species can be calculated using ecosystem credits and those that require species credits.

Ecosystem credit species

The ecological consultant will use the Threatened Species Profile Database and information on the different vegetation zones on the development site to produce a list of threatened species that are predicted to occur, using information on:

- whether the species is known to live in the area
- whether it is associated with the vegetation type
- whether the percentage cover and condition of the vegetation are adequate for the species
- whether the vegetation patch size is large enough for the species.

Species are not predicted to occur on the development site if any of these criteria are not met.

Ecological consultants can also refine the list of threatened species predicted to occur on the development site when the site does not contain any habitat components for them.

Species credit species

The Threatened Species Profile Database also contains a list of threatened species that must be assessed to determine whether they are on, or likely to be on, the development site.

Using the database, the ecological consultant will produce a list of species that are known or are likely to occur on the development site, based on the following two criteria:

- the geographic distribution of the species is known to include the Catchment Management Authority subregion in which the site is located
- the site contains suitable habitat features for the species.

This list is then culled further by the ecological consultant. Species may be removed from the list because:

- available habitat is degraded to the point it is unlikely to be used

- an expert report states the species is unlikely to occur
- the records of species have doubtful authenticity.

The ecological consultant will conduct targeted on-ground surveys for the remaining species to confirm whether they are present. These surveys may need to be undertaken at various times throughout the year, depending on when the species is likely to be present or visible.

The consultant then draws on the map of the development site the areas where each species is likely to occur.

Assessing loss of biodiversity at a development site

Step 4: Avoid and minimise impacts on biodiversity

Before biodiversity offsets are considered, the ecological consultant needs to consider whether biodiversity impacts can be avoided or minimised. These considerations must be incorporated into the entire project life cycle, including during concept planning and design, construction and operation.

The information about the biodiversity values on the site that were collected in Steps 1–3 can be used by the proponent and the ecological consultant to avoid and minimise impacts.

The consultant must document the measures that have been taken to avoid and minimise the direct, indirect and cumulative negative impacts of the development on biodiversity, along with reasons why further avoidance and minimisation of impacts is not practicable.

Step 5: Provide information on impacts that require further consideration

Certain impacts on biodiversity values that are complicated or severe will require further consideration by the consent authority if they cannot be avoided. These include impacts:

- on critically endangered species and ecological communities
- likely to cause the extinction or significantly reduce the viability of a threatened species, population or ecological community in a subregion
- adjacent to important rivers and wetlands
- affecting species movement along important corridors
- on critical habitat.

Such impacts may be considered severe enough to prevent a project from proceeding. The ecological consultant must provide additional information on these impacts in the biodiversity assessment report. The consent authority will use this information to help determine whether these impacts should occur, or if additional offsets or modifications are required.

Step 6: Calculate the number of credits required to offset the remaining impact of the development

The ecological consultant will use software produced by OEH to determine the number of credits required to offset the impacts of the development. The software will refer to the

most current data on native vegetation and threatened species in NSW. The ecological consultant will then enter the survey data collected from the site into the software.

The software will calculate the credit requirements for the development proposal and produce a biodiversity credit report containing both the number of ecosystem credits and species credits required to appropriately offset the impacts of the development.

Calculating the ecosystem credit requirement

The ecosystem credit requirement is determined for each different vegetation type that represents a threatened ecological community or habitat for threatened ecological communities, species or populations that are present at the site.

Impacts on vegetation types on the development site that are not endangered ecological communities and do not contain any habitat for threatened ecological communities, species or populations are not required to be offset.

The **ecosystem credit requirement** is determined by:

- assessing the change in site value due to the proposed development. The change in site value will then be calculated by comparing the current site value to the predicted site value after the development occurs. For example, if the development causes an entire vegetation zone to be cleared, its site value score will be reduced to zero.
- assessing the change in landscape score. The scores for native vegetation cover, connection to other areas of native vegetation and patch size will be added together to provide an overall landscape value score for the site pre-development. The change in the landscape value of the site, as a result of the impacts of clearing or development, will then be determined
- factoring in the threatened species offset multiplier (determined at Step 3):
 - species are assigned an offset multiplier based on their ability to respond to habitat improvement as a result of management actions undertaken on an offset site
 - species that have a low response have a higher offset multiplier meaning they will require a greater number of ecosystem credits
- factoring in the area of impact.

Calculating the species credit requirement

The species credit requirement is determined by:

- the area of habitat for that species that is impacted on by the development – the greater the area, the more credits required
- the offset multiplier for the species
 - as outlined above in relation to ecosystem credit species, the less ability a species has to recover, the greater the species credit requirement will be (i.e. higher multiplier).

Consultants can use OEH software to:

- create different scenarios that modify the configuration of the development on the map

- assess ways in which the modifications affect the number of ecosystem credits and species credits required to achieve a development footprint that minimises the impact on biodiversity as much as possible.

Assessing gain in biodiversity at an offset site

An offset site (called a biobank site if a biobanking agreement is used) is assessed using the BioBanking Assessment Methodology 2014 (BBAM 2014). The BBAM 2014 uses the same methods as outlined in Steps 1–3 to determine the vegetation types, vegetation condition, landscape value and threatened species that are present.

The management actions that will be undertaken on the offset site are assumed to improve the condition of native vegetation and its habitat value. The BBAM 2014 is used to measure the predicted gain in biodiversity values after management actions have been carried out.

Management actions

There are a standard set of management actions undertaken at an offset site that lead to improved biodiversity values over time. These include managing grazing for conservation, weed control and managing human disturbance.

These actions form the basis for the management plan. Offset site owners may also undertake additional management actions such as planting vegetation or bringing hollow logs onto the site. These actions can generate additional biodiversity credits including species credits, as they are seen as further improving biodiversity values.

Offset sites in strategic locations

Calculating biodiversity gain on the offset site includes considering the strategic location of the site as an alternative to assessing the connectivity value. If an offset site is in certain strategic locations, it will receive a maximum value for connectivity. This ensures these sites will generate more biodiversity credits than sites that do not have the same strategic value.

Sites with strategic value may include:

- the buffer area of important streams and rivers
- the buffer area of important wetlands and estuarine areas
- areas identified as part of a state/regional biodiversity corridor in a plan approved by the Chief Executive of OEH.

Generating credits

The number of biodiversity credits generated at an offset site is determined by factoring in:

- the vegetation condition (site value as determined in Step 1) and the extent of improvement in condition that will be achieved through undertaking management actions
- improvement of the offset site in the context of the broader landscape (determined in Step 2) – a higher number of credits will be created for:

- increasing the extent of native vegetation cover on the site through natural regeneration or strategic planting
- increasing connectivity by linking the site with other vegetation patches
- including large intact patches of vegetation in the offset area
- the averted loss in site value, calculated by assessing the risk of decline if the offset site was not secured under a conservation measure
- the area of the offset site.

Further amendments to the FBA

The FBA will be refined at the end of the 18-month transition period as the methodology is tested through application. Refinements will not be made on an ongoing basis as this creates uncertainty for proponents and would require modifying and reissuing the credit calculator each time there is a change. However, work will be undertaken during the transitional period to improve the databases underpinning the FBA methodology. Accredited assessors will be notified of any updates that are made.

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