



NSW Biodiversity Offsets Policy for Major Projects

Fact sheet: How the Framework for Biodiversity Assessment assesses loss and gain

Introduction

The NSW Biodiversity Offsets Policy for Major Projects (the policy) is being introduced to clarify, standardise and improve biodiversity offsetting for major project approvals under the NSW planning system. 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 to be applied by accredited ecological consultants, will provide 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 at a development site
- how much gain in biodiversity can be expected from an offset site.

This factsheet 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 a combination of aerial photography, information contained in databases and on-ground surveys to identify the types of vegetation that are present at 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'. Each zone contains 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 a threatened species, or both.

The ecological consultant will 'ground-truth' this information via on-ground field surveys and will review and adjust the vegetation zones in the map if needed.

Assess the on-ground condition of vegetation

The ecological consultant will next conduct on-ground field surveys on the development site. They will collect data on each vegetation zone which will help assess its on-ground condition.

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 at over-storey, mid-storey or ground levels.

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 is used to provide an estimate of native over-storey cover. The ecological consultant will also use a photographic guide to assist in estimating percentage foliage cover.

3. Over-storey regeneration

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

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 m and the over-storey. This will provide an estimate of native mid-storey cover.

6. Native ground cover (shrubs)

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

7. Native ground cover (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 m 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, mid-storey and over-storey levels.

10. Length of fallen logs

The total length of all fallen logs that have a diameter of more than 10 cm 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 held 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 it had 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 value of the site.

Vegetation in a condition below the threshold for where an offset is required is identified in this step.

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

In this step, 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 surrounding 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 ha, provides a site-scale context for the landscape. The outer circle, which has a minimum area of 1000 ha, 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 the assessment circles as a result of the development.

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

Linear-shaped developments

Linear-shaped developments have a footprint that extends across the landscape for more than 3.5 km, such as pipelines, roads, highways and railway lines.

Circles are not appropriate for measuring change in vegetation cover for this type of development. The method therefore requires mapping a buffer area on either side of 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 surrounding 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 (none have yet been identified).

The consultant will then assess any change in the width of the vegetation corridors or the condition of the vegetation within 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 size patch to use a piece 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 habitat found at the development site. This will be done using:

- plant community types identified in Step 1
- information contained in OEHS's Threatened Species Profile Database
- local data
- targeted on-ground surveys for a species
- commissioned expert reports.

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

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

Species credits pertain to threatened species that cannot be predicted by the vegetation present. Impacts on the relevant ecosystems at 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 which require species credits.

Ecosystem credit species

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

- 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 is adequate for the species
- whether the vegetation patch size is large enough for the species.

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

Ecological consultants can also refine the list of threatened species predicted to occur at the development site. When the site does not contain any habitat components for the species, the ecological consultant can remove it from the list.

Species credit species

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

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

- the geographic distribution of the species includes the Catchment Management Authority subregion in which the site is located, and
- 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 then conduct targeted on-ground surveys for the remaining species to confirm whether they are present at the development site. These surveys may need

to be undertaken at various times of 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 at the site that were collected in Steps 1-3 can be used by the proponent and the ecological consultant to avoid and minimise impacts of the major project. 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: Calculate the number of credits required to offset the remaining impact of the development

The ecological consultant will use a decision support tool produced by OEH to determine the number of credits required to offset the impacts of the development. The decision support tool 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 decision support tool.

The decision support tool will calculate the credit requirements for the development proposal and produce a biodiversity credit report. The credit report will contain information on 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 at 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 is completed. 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 each of the three measures outlined in Step 2 (native vegetation cover, connection to other areas of native vegetation and patch size) will be added 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 in Step 3)
 - species are assigned an offset multiplier based on their known ability to respond to habitat improvement as a result of management actions undertaken at an offset site
 - species that have a low response have a higher offset multiplier this means 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 according to:

- 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 the decision support tool to:

- create different scenarios that modify the configuration of the development on the map
- assess how 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 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 FBA can be 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 management of grazing for conservation, weed control, management of human disturbance and others.

These management 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 additional management actions can generate additional biodiversity credits, including species credits, as they are seen as further improving biodiversity values.

Offset sites in strategic locations

Calculation of biodiversity gain at 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 method 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 of mapped biodiversity corridors
- areas that are mapped as important habitat for the survival of threatened species in the wild.

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 at 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 benefit of including vegetation in moderate to good condition under a conservation measure such as a biobanking agreement
- the area of the offset site.

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