Case Study 2: Port development

The Statutory Biodiversity Metric Calculation Tool

This case study demonstrates how the statutory biodiversity metric calculation tool can quantify losses and gains in intertidal habitats associated with new infrastructure.

This document complements statutory biodiversity metric guidance and may be useful for biodiversity metric tool users such as ecologists, port developers and those reviewing similar projects.

Overview

This case study is based on a hypothetical proposal for a new jetty, pier, and terminal structure on the upper shore of the Thames estuary, located outside of any designated site. These new structures are required for the import of raw materials and will be built over the intertidal foreshore, resulting in the loss of the underlying habitats.

This case study presents two simplified scenarios where a developer is exploring options for achieving a biodiversity net gain in 'area habitat biodiversity units' using the statutory biodiversity metric calculation tool (hereafter referred to as 'the biodiversity metric tool'). One scenario offsets on-site losses with the creation of off-site habitat at the time of development, and the other offsets losses using 'banked' off-site habitat which has been created in advance. Guidance on the full biodiversity net gain process can be found on the GOV.UK website.

This case study demonstrates:

- The use of the biodiversity metric tool for a simple intertidal project to calculate biodiversity net gain.
- Different compensation options for losses, including the use of off-site habitat interventions to achieve a 10% biodiversity net gain.
- The use of the 'Habitat created/enhanced in advance' function in the biodiversity metric tool for 'habitat banking', which can reduce the area of habitat required for a biodiversity net gain.
- How to meet the trading rules within the biodiversity metric tool.

The site

In this hypothetical case study, a new jetty, pier, and terminal are proposed on-site over the intertidal foreshore within the 'project boundary' (also known as the 'red line boundary'). The site comprises saltmarsh, littoral mud and sediment habitats which have been mapped using EUNIS classifications, according to the statutory biodiversity metric User Guide. The development will result in the loss of all intertidal habitats within the project boundary.

Key biodiversity metric tool information

Key elements of the statutory biodiversity metric guidance and biodiversity net gain guidance relevant for this case study are highlighted below, but the full guidance should be referred to for more information.

The biodiversity metric tool uses habitat data inputs to calculate how many biodiversity units a site scores at 'baseline' prior to development and how many biodiversity units are generated post-development, calculating the resulting net change. It therefore shows whether a 10% net gain in biodiversity units has been achieved relative to the on-site baseline. 'On-site' is the area within the red line site boundary, and 'off-site' refers to habitat outside of this project boundary, used to contribute to the project.

Trading rules

In a project aiming to achieve biodiversity net gain, the trading rules of the biodiversity metric tool need to be met, in order to ensure that any habitat losses are compensated for with an appropriate habitat type. The trading rules are based on habitat 'distinctiveness' – which directly relates to habitat type and broad habitat.

This case study contains high distinctiveness habitats which require any losses to be compensated for by creating or enhancing the same habitat type. It also contains medium distinctiveness habitats where any losses can be compensated for by creating or enhancing habitat within the same broad habitat type, or of higher distinctiveness.

Biodiversity gain hierarchy

The biodiversity gain hierarchy should be followed as part of the biodiversity net gain process, prioritising on-site retention of medium and higher distinctiveness habitats and enhancing and creating habitat on-site before considering off-site options or statutory credits. More information can be found on the GOV.UK website.

Spatial risk multiplier

When off-site habitat interventions are being used, the location of the off-site land chosen is important because the biodiversity metric tool has a 'spatial risk multiplier' which varies based on the proximity of the off-site location to on-site. More biodiversity units are generated when the off-site location is closer to on-site, such as within the same Marine Plan Area for intertidal habitats, and the same Local Planning Authority or National Character Area for terrestrial habitats.

Approach to biodiversity net gain assessment

This case study focuses on area habitat biodiversity units only, and presents two scenarios:

- Scenario 1: Loss of habitat within the on-site development boundary and habitat creation at the time of habitat loss off-site.
- Scenario 2: Loss of habitat within the on-site development boundary and habitat creation in advance off-site, or 'habitat banking'.

Assumptions

This case study contains the following assumptions:

Habitats

- Despite other options being considered, there will be permanent loss of all habitats on-site.

- Though any impacts to habitats above mean high water need to be considered within biodiversity net gain calculations where they are present within the project boundary, they are not included in this case study for simplicity.
- The target post-intervention conditions of the proposed habitats are expected to be reached. In practice this requires the ecological expertise of a competent person to target realistic and appropriate habitat types, as well as monitoring and oversight by a competent person to ensure it is achieved.

Biodiversity metric tool multipliers

- As the site is not covered by a Local Nature Recovery Strategy (LNRS) yet, documents specified by the Local Authorities relevant to the on-site and off-site locations are used to determine strategic significance for habitats within them. This means that while the specified documents don't identify any on-site habitats as being strategically significant, some off-site habitats are considered to be strategically significant as they deliver a mapped action in a relevant local document.

Baseline area habitat biodiversity units

The on-site baseline is made up of the intertidal habitats: 'saltmarshes and saline reedbeds' and 'littoral mud' which are classed as high distinctiveness in the biodiversity metric tool, as well as 'littoral coarse sediment' which is medium distinctiveness. As prompted by the biodiversity metric tool, the competent person has checked and confirmed that the saltmarsh is not one of the types listed as Irreplaceable Habitat during their habitat survey, therefore this is recorded as not being Irreplaceable Habitat in the metric tool.

Based on the habitats present, the on-site baseline is calculated to be 2.37 area habitat biodiversity units, as shown in Table 1. Any area habitat biodiversity unit losses and gains are measured against this baseline.

Table 1. On-site baseline habitat details

Habitat type	Area (ha)	Habitat Distinctiveness	Habitat Condition	Strategic Significance	Total area biodiversity units
Littoral mud	0.11	High	Good	Low	1.98
Saltmarshes and saline reedbeds	0.026	High	Moderate	Low	0.31
Littoral coarse sediment	0.019	Medium	Poor	Low	0.08
Total	0.16	-	-	-	2.37

Post-development area habitat biodiversity units

Both scenarios: On-site

For both scenarios, all on-site habitats within the project boundary will be lost due to the port construction works. These habitats are recorded as lost in the biodiversity metric tool and the constructed jetty, pier and terminal are represented as creation of the Intertidal habitat 'artificial hard structures'. This created habitat is low distinctiveness and generates 0.21 area habitat biodiversity units. This still results in the loss of 2.16 area habitat biodiversity units.

In order to meet the trading rules, the lost 'saltmarshes and saline reedbeds' and 'littoral mud' habitats need to be compensated for by creating or enhancing the same habitat types, as they are both high distinctiveness. The loss of 'littoral coarse sediment' needs to be compensated for by creating or enhancing habitats within the same Intertidal broad habitat type, or a higher distinctiveness habitat.

Given the net loss in area habitat biodiversity units on-site, and the need to achieve biodiversity net gain and meet the trading rules, the developer decides to use habitat creation off-site to generate the biodiversity units needed.

Scenario 1: Off-site habitat creation at time of habitat loss

In this scenario, the developer contracts with a landowner who proposes to undertake a habitat creation scheme off-site, outside of the development boundary and Local Planning Authority area, but within the same Marine Plan Area.

The landowner will build a tidal exchange scheme where seawater can flood in and out via a breach in the seawall of a small area of poor-quality, low-lying coastal land, comprising the habitat 'artificial unvegetated, unsealed surface', which is very low distinctiveness and has a zero baseline biodiversity unit value.

Informed by the expertise of competent people involved in the project, the new tidal regime will create 0.13 ha of high distinctiveness 'saltmarsh and saline reedbeds' habitat and 0.49 ha of 'littoral mud', both in moderate condition. This will generate 0.46 saltmarsh and 2.01 'littoral mud' area habitat biodiversity units, respectively.

The area proposed for habitat creation has:

- High strategic significance because a specified local strategy has identified it as being suitable for intertidal mud and saltmarsh creation.
- Low spatial risk because it is located within the same Marine Plan Area as the development site where the area habitat biodiversity unit losses occur.

In Scenario 1, the habitat creation work is initiated by the landowner at or soon after the granting of planning permission for the new port and the commencement of construction – therefore close to the time of impact. This is reflected in the biodiversity metric tool by leaving the 'Habitat created in advance' and 'Delay in starting habitat creation' columns blank or filling in them in with zeroes.

The off-site habitat creation generates 2.47 area habitat biodiversity units, as shown in Table 2.

Table 2. Area habitat biodiversity units for habitat creation off-site

Habitat type	Area (ha)	Habitat distinctive-ness	Habitat condition	Strategic significance	Spatial risk	Total biodiversity units
Saltmarshes and saline reedbeds	0.13	High	Moderate	High	Low	0.46
Littoral mud	0.49	High	Moderate	High	Low	2.01
Total off-site	0.66	-	-	-	-	2.47

The off-site habitat creation therefore results in a biodiversity net gain of 0.31 area habitat biodiversity units, which is a 12.90% net gain. This delivers a biodiversity net gain whilst also complying with the trading rules.

Table 3. Summary of Scenario 1 calculations

Calculation	Area habitat biodiversity unit outputs	Percentage change
On-site baseline	2.37	-
On-site creation	+0.21	-91.26%
Off-site baseline	0.00	-
Off-site habitat creation	+2.47	-
Total on-site and off-site net change	+0.31	+12.90%

Scenario 2: Creation or enhancement of habitat ahead of impact

In Scenario 2, moderate condition ‘saltmarsh and saline reedbeds’ and ‘littoral mud’ are created off-site, like in Scenario 1, however in this instance they are created 10 years in advance of the port development. This could be part of a habitat creation strategy undertaken by the port or by another third party with the relevant expertise. By creating habitat in advance, a ‘habitat bank’ is established and registered to support future development ambitions.

The number of advance years in which the habitat is created is input into the ‘Habitat created in advance’ column within the biodiversity metric tool. Because of this early habitat creation, the risks associated with creation are reduced, so more area habitat biodiversity units are generated compared to if the same area of habitat had not been created in advance.

This means that for Scenario 2, trading rules are met, and a 13.64% biodiversity net gain is achieved due to a net increase of 0.32 area habitat biodiversity units, using a smaller area of off-site habitat than Scenario 1.

Scenario comparison

Creating or enhancing habitats in advance of impacts can significantly reduce the number of hectares of the same habitat type required to offset losses, and achieve a biodiversity net gain, as shown in Table 4.

Table 4. Comparison of habitat required to achieve biodiversity net gain

Scenario	Area of saltmarsh (ha)	Area of littoral mud (ha)	Off-site habitat area required (ha)	Percentage net gain achieved
Scenario 1 – creation at time of impact	0.13	0.49	0.62	12.90%
Scenario 2 – creation in advance	0.03	0.15	0.18	13.64%

Table 5 further shows that the biodiversity metric tool reduces the 'Time to target condition' when habitats are created in advance of impact, meaning that more units are generated for the same area of habitat. In this hypothetical table, for 0.1 ha of created habitat in moderate condition, the number of years the habitats are created in advance, and the biodiversity units generated by this are shown.

Table 5. Comparison of 'time to target condition' and area habitat biodiversity units achieved

Habitat type	Standard time to target condition (years)	Area habitat biodiversity units	Time to target condition (creation 10 years in advance)	Area habitat biodiversity units
Saltmarsh and saline reedbeds	7	0.31	0	1.20
Littoral mud	3	0.36	0	1.20

As 'saltmarsh and saline reedbeds' and 'littoral mud' typically take less than 10 years to reach moderate condition, by the time the development takes place 10 years after their creation, the habitats can be assumed to have reached the desired condition. The additional biodiversity units generated by creating habitat in advance is however capped when the standard number of years associated with its creation is reached.

By creating habitats in advance, the landowner could generate a ‘bank’ of cost-effective area habitat biodiversity units that could be used to offset current and future development projects. These could also be made available to other developers, potentially generating additional revenue for the landowner.

Conclusions

This case study demonstrates that where required, off-site habitat creation can deliver biodiversity net gain for a scheme impacting intertidal habitats. It also highlights that creating habitat in advance can significantly reduce the area of habitat required to meet the trading rules and achieve a biodiversity net gain, demonstrating the potential value in habitat banking.

If a ‘habitat bank’ produces more area habitat biodiversity units than is required to meet one specific development’s biodiversity net gain obligation, surplus area habitat biodiversity units can also be sold to other developers. In Scenario 2, the biodiversity units generated could be used to offset not just saltmarsh and ‘littoral mud’ losses but also any low or medium distinctiveness intertidal habitat impacts as per the trading rules.

Developers should consider the efficiencies of scale associated with large scale and early habitat creation when planning habitat creation projects. Small scale habitat creation designed to fit the bespoke needs of a project may be cost-effective in some circumstances. However, larger scale projects created in advance can provide more certainty in attaining desired habitat quality and can reduce overall habitat creation and management costs over the longer term. This also applies to projects involving habitat enhancement.

Key messages and top tips

- Use the biodiversity metric tool at the design stage to avoid impacts on medium and high distinctiveness habitats, in accordance with the biodiversity gain hierarchy, or if impacts are unavoidable, to minimise them as far as possible.
- Consider the location of habitat creation or enhancement. Delivering biodiversity net gain in locations that are strategically significant and or within the same Marine Plan Area increases their area biodiversity unit value and therefore reduces the area of habitat required to deliver biodiversity net gain.
- When ‘banked’ habitat is used, record how many years in advance the habitat was created in the ‘Habitat created in advance’ column in the statutory biodiversity metric calculation tool.
- Consider potential efficiencies of scale associated with habitat banking. Larger scale habitat creation can be more reliable and cost effective in delivering biodiversity net gains over the long term and biodiversity units can also be registered as a habitat bank and sold to other projects, delivering a financial return.

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