

Biodiversity Metric 3 case study 2: Port development

This case study demonstrates how biodiversity metric 3 can be used to quantify losses and gains in intertidal habitats associated with new infrastructure.

Overview

In this case study, a new jetty is proposed on the Thames estuary (outside of any designated site). This new jetty, along with a pier and terminal structure on the upper shore, is required for the import of raw materials. These structures will be built over the intertidal foreshore and will result in the loss of the underlying habitats.

Two scenarios for achieving a net gain in biodiversity units are presented, one of which uses 'banked' habitat which has been created in advance.

This case study demonstrates:

- ✓ Permanent losses – How to record these in the biodiversity metric 3 calculation tool.
- ✓ Different options for mitigating losses and achieving 10% net gain.
- ✓ Habitat banking - How the 'habitat created in advance' function in the biodiversity metric 3 calculation tool can be used and how creating or enhancing habitats in advance can significantly reduce the area of habitat required to deliver an overall net gain.
- ✓ Habitat trading rules – Meeting the rules relating to habitat distinctiveness.

The site

This case study is of a hypothetical new jetty over the intertidal foreshore. The total area impacted is referred to as the 'project boundary' and is defined in Figure 1 below. Development will result in the permanent loss of all intertidal habitats within the project boundary.



Figure 1. Hypothetical boundary of the proposed port development described in this case study.

Approach to biodiversity net gain assessment

Biodiversity metric 3 calculates how many biodiversity units the site scores prior to development (the baseline), how many biodiversity units will be lost because of the development and how many additional biodiversity units would need to be delivered (on-site and/or off-site) to achieve a 10% net gain relative to the baseline.

This case study presents two scenarios:

- Scenario 1: Loss of habitat within the development boundary and habitat creation off-site.
- Scenario 2: Loss of habitat within the development boundary and habitat creation in advance off-site (habitat 'banking').

Assumptions and limitations

Any impacts on habitats above mean high water would be expected to be considered within the net gain calculation but are not included here for simplicity.

For the purposes of this case study it is assumed that:

- There will be permanent loss of all habitats within the project boundary.
- The development area is not identified in a local strategy as strategically significant for these habitats (or there is no local strategy) – therefore on-site strategic significance is 'low'.

Distinctiveness trading rules - biodiversity metric 3 assigns a distinctiveness rating (very high, high, medium, low or very low) to habitats based on their nature conservation value. Loss of high distinctiveness habitats can only be mitigated by creating or enhancing the same habitat type. Loss of medium distinctiveness habitats can be mitigated by creation or enhancement of medium distinctiveness habitats in the same broad habitat or any high/very high distinctiveness habitat. Therefore:

- Coastal saltmarsh and littoral mud are assigned high distinctiveness. Loss of these habitats will therefore need to be mitigated by enhancement or creation of additional saltmarsh and littoral mud.
- Littoral coarse sediment is assigned medium distinctiveness. Loss of this habitat can be replaced by creation of or enhancement of other habitats of medium distinctiveness within the same broad habitat type (i.e. 'Intertidal sediment') or any higher distinctiveness habitat.

Baseline biodiversity units – for both scenarios

At baseline, the project boundary contains saltmarsh, littoral mud and littoral coarse sediment habitats in an area of low strategic significance for these habitats. Using biodiversity metric 3, this baseline was calculated to yield 2.37 area habitat biodiversity units (see Table 1). This baseline represents the 'reference scenario' against which losses and gains will be measured.

Table 1. Number of biodiversity units for habitats within the site at baseline.
Data extracted from biodiversity metric 3 calculation tool.

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

Post-development biodiversity units

On site - both scenarios

All habitats within the project boundary will be lost due to the port construction works, resulting in a loss of 2.37 biodiversity units.

Scenario 1: Off-site habitat creation

The developer contracts with a landowner who proposes to undertake a habitat creation scheme outside of the development boundary (off-site) but within the same Marine Plan Area (adjacent to the development in this instance). 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 (classed as low distinctiveness habitats - artificial unvegetated, unsealed surface). The action of this new tidal regime will create 0.17ha of saltmarsh and a further 0.49ha of littoral mud (both in moderate condition). These generate 0.6 biodiversity units of saltmarsh and 2.01 biodiversity units of littoral mud.

The area proposed for habitat creation is strategically significant because a local strategy has identified it as being suitable for intertidal mud and saltmarsh creation. As such, the habitats created are assigned high strategic significance within biodiversity metric 3. The spatial risk is also deemed to be low due to the habitat creation being within the same Marine Plan Area as the site of the biodiversity loss.

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 (close to the time of impact).

This generates a net gain of 0.24 biodiversity units, or an additional 10.16%, above the baseline, which delivers a net gain whilst also complying with the trading rules to replace loss of high distinctiveness habitats 'like for like', i.e. a minimum of 0.31 units of saltmarsh and 1.98 units of littoral mud (Table 2).

Table 2. Scenario 1: Off-site habitat creation. Data extracted from Biodiversity metric 3 calculation tool.

Description	Losses and gains of biodiversity units
Net change in on-site biodiversity units	-2.37
Off-site baseline biodiversity units	0
Off-site habitat creation (saltmarsh and littoral mud in moderate condition)	+2.61
Net change in off-site biodiversity units	+2.61
Total net gain in biodiversity units	+0.24
Overall net % gain/loss of biodiversity units	10.16%

Scenario 2: ‘Habitat banking’ (creation/enhancement of habitat ahead of development)

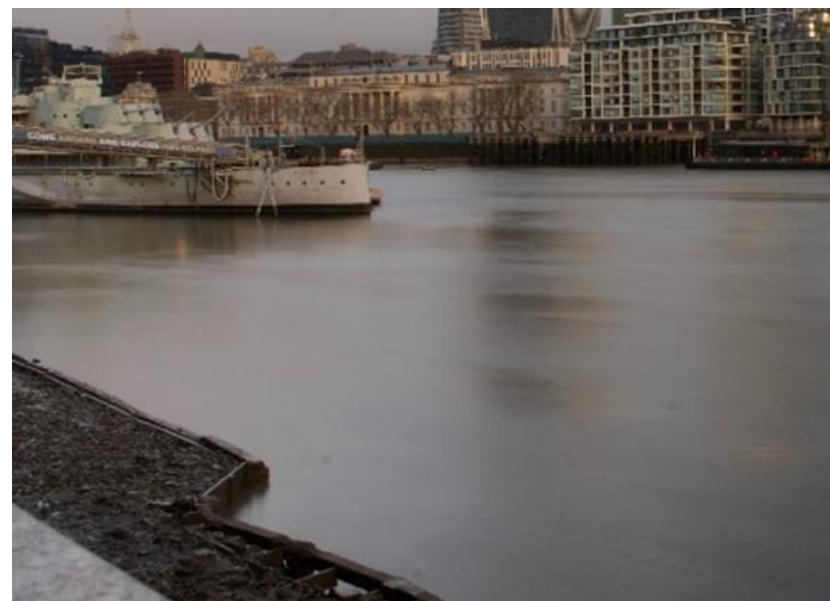
In this scenario the same habitat creation project is undertaken, but it is delivered **10 years in advance of the port development**, as part of a habitat creation strategy undertaken by the port (or another 3rd party). By creating habitat in advance, a ‘habitat bank’ is established and registered specifically to support future development ambitions.

The effect of creating the habitat so far in advance is that it significantly increases the number of biodiversity units that an area of habitat creation can deliver, as the risk factors are reduced. To reflect this in biodiversity metric 3 the ‘habitat creation in advance’ function is used to indicate how many years in advance the habitat was created. The effect of creating the habitat 10 years in advance is to reduce the area of habitat creation required to achieve a 10% net gain to 0.03ha of saltmarsh and 0.16ha of littoral mud, representing a reduction in area of habitat needed by approximately one third (Table 3).

The increased area habitat biodiversity unit value of habitat created in advance means that this habitat creation project could represent a cost-effective ‘bank’ of biodiversity units that could be used to efficiently offset not only the current project, but other future projects. It could also be made available to other developers in need of such biodiversity units for their schemes, generating additional revenues for the landowner.

Table 3. Comparison of Scenario 1 and Scenario 2, illustrating how habitat creation in advance reduces area of off-site habitat required. Data extracted from Biodiversity metric 3 calculation tool.

	Area of saltmarsh (ha)	Area of littoral mud (ha)	Total area of off-site habitat required (ha)	% net gain
Scenario 1 - creation	0.17	0.49	0.66	10.16
Scenario 2 – habitat banking	0.03	0.16	0.19	10.73



Conclusions

This case study demonstrates how 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 achieve a net gain, demonstrating the potential value in habitat banking.

There are efficiencies of scale associated with habitat creation which the developer should consider when planning the size of the habitat creation project. Small scale habitat creation designed to fit the bespoke needs of a project may be the most cost-effective option in some circumstances. However, if undertaken in advance as habitat banks on a larger scale, habitat creation projects can, generally, provide more certainty regarding habitat quality and reduced costs of creation and management over the longer term.

Where such a habitat bank produces more habitat than is required to meet one specific development's net gain obligation 'the bank' can sell the additional biodiversity units it has generated to other developers. Note: these units would be able to offset not just saltmarsh and littoral mud impacts but also any low or medium distinctiveness intertidal habitat impacts.



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Key messages / top tips

- Apply the mitigation hierarchy at the design stage to avoid impacts on high distinctiveness habitats or, if impacts are unavoidable, to minimise them as far as possible.
- Consider the location of habitat creation or enhancement. Delivering net gain in locations that are strategically significant within the same Marine Plan Area increases their biodiversity unit value and therefore reduces the area of habitat required to deliver biodiversity net gain.
- When 'banked' habitat is being used, record how many years in advance the habitat was created in the 'Habitat created in advance' function in biodiversity metric 3.
- Consider potential efficiencies of scale associated with habitat banking. Larger scale habitat creation can be more reliable and cost effective in delivering net gains over the long term and biodiversity units can also be registered as a habitat bank and sold, delivering a financial return.

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