Case Study 4: Cabling for offshore wind

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 and be used to help evaluate different options to achieve biodiversity net gain.

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

Overview

In this hypothetical case study, power cables are coming ashore from an offshore windfarm to connect to the grid. They will cross terrestrial, intertidal, and subtidal habitats. Only the impacts on intertidal habitats are considered here for illustrative purposes, but all terrestrial and intertidal habitats would need to be considered for a real project.

This case study presents three scenarios for achieving a biodiversity net gain in 'area habitat biodiversity units', using either:

1. enhancement of off-site habitat
2. creation of off-site habitat
3. advance creation of off-site habitat for habitat 'banking'

It shows how the statutory biodiversity metric calculation tool (hereafter referred to as 'the biodiversity metric tool') can be used to calculate changes in area habitat biodiversity units associated with on-site and off-site habitat loss, creation and enhancement, to determine whether a biodiversity net gain has been achieved. Guidance on the full biodiversity net gain process can be found on the GOV.UK website.

This case study demonstrates:

- How to record losses in the biodiversity metric tool when the baseline habitats cannot be restored to their original condition within 2 years of the loss occurring.
- Different options for mitigating losses and achieving a minimum 10% biodiversity net gain.
- How to use the 'Habitat created/enhanced in advance' function in the biodiversity metric tool for 'habitat banking', and how creating or enhancing habitats in advance can significantly reduce the area of habitat required to deliver an overall biodiversity net gain.
- The meeting of habitat trading rules within the biodiversity metric tool relating to habitat distinctiveness.

The site

In this hypothetical case study, four power cables are coming ashore from an offshore windfarm to connect to the grid which will be installed through intertidal habitats, with the trenches backfilled to

reinstate the habitats across the footprint of the works. The area within the project boundary is referred to as ‘on-site’.

The on-site intertidal habitats within the project boundary will be impacted by the ~10m wide trenching for the cables, associated access tracks, any required grounding of barges, and anchor placement associated with installation vessels. Although this is a hypothetical scenario, the scale of impact and footprint are loosely based on those from Hornsea 2 offshore windfarm.

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 the site scores at baseline prior to development; how many biodiversity units will be lost; and how many additional biodiversity units would be required on-site and or off-site, to achieve a minimum 10% biodiversity net gain relative to the on-site baseline.

Only area habitat biodiversity units are used in this case study. If there had been hedgerow or watercourse habitats within the site, or where a watercourse’s riparian zone crossed the project boundary, these habitats would need to be included.

Trading rules

In a project aiming to achieve biodiversity net gain, the trading rules of the biodiversity metric tool need to be adhered to in order to achieve a biodiversity net gain. The trading rules are based on habitat ‘distinctiveness’ – which directly relates to the habitat type.

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

Biodiversity gain hierarchy

The biodiversity gain hierarchy must be followed as part of the biodiversity net gain process, prioritising on-site retention of medium and higher distinctiveness habitats, enhancing and creating habitat on-site before considering off-site options or statutory credits. See GOV.UK guidance for more information.

Temporary loss

Where a habitat is lost or impacted, but can be restored to the exact same habitat type and condition within 2 years of the impact, this habitat can be recorded as ‘retained’ in the biodiversity metric tool. Where it cannot be restored to its original state within 2 years, it needs to be recorded as ‘lost’ even if the loss is not permanent.

Approach to biodiversity net gain assessment

This case study presents three scenarios:

- Scenario 1: Re-creation of habitat on-site and habitat enhancement off-site.
- Scenario 2: Re-creation of habitat on-site and habitat creation off-site.
- Scenario 3: Re-creation of habitat on-site and habitat creation in advance off-site, known as ‘habitat ‘banking’.

Assumptions and limitations

This case study contains the following assumptions:

Habitats

- Any impacts on habitats above ‘mean high water’ are not included here for simplicity, but should also be considered for real-world projects within the biodiversity net gain calculation.
- All on-site habitats are expected to be impacted by the cable trenching workings.
- No structures will be built on the intertidal habitats, so there will be no permanent loss. However, the habitats impacted will take more than 2 years to recover to their previous condition. This cannot be considered a ‘temporary’ loss within the biodiversity metric tool, so there is a biodiversity net gain requirement.
- The targeted habitat types and conditions are expected to be reached. In practice this requires the ecological expertise of a competent person to target appropriate habitat types, as well as monitoring and oversight by a competent person.

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 on-site and off-site are used to determine strategic significance for habitats. 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 – all scenarios

At baseline, the proposed development site contains ‘saltmarshes and saline reedbeds’, ‘littoral mud’ and ‘littoral coarse sediment’ habitats in an area of low strategic significance for these habitats. 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. Using the biodiversity metric tool, this baseline was calculated to yield 72.0 area habitat biodiversity units, as shown in Table 1. Any area habitat biodiversity unit losses and gains are measured against the baseline.

Table 1. On-site baseline habitat details

Habitat type	Area (ha)	Habitat Distinctiveness	Habitat Condition	Strategic Significance	Total area habitat biodiversity units
Littoral mud	5	High	Poor	Low	30.00
Littoral coarse sediment	3	Medium	Good	Low	36.00
Saltmarshes and saline reedbeds	0.5	High	Moderate	Low	6.00
Total site baseline	8.5	-	-	-	72.00

Note: All habitat data presented in the tables of this case study are generated directly from the statutory biodiversity metric calculation tool. All photos are for illustrative purposes only.

Post-development area habitat biodiversity units

On site – all scenarios

All habitats within the proposed development are expected be lost in each of the three post-development scenarios while the cable is being constructed, and it will take more than 2 years to reinstate habitats to their original type and condition. Therefore, in order to meet the trading rules, the lost ‘saltmarshes and saline reedbeds’ and ‘littoral mud’ need to be compensated for by creating or enhancing the same habitat types, as they are high distinctiveness habitats. Whereas 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.

Once the cables have been installed, the impacted habitats will be re-instated in the same places and proportions, but with a target condition of ‘good’ for the created saltmarsh and ‘littoral mud’ habitat. This is recorded in the creation tab of the biodiversity metric tool.

The biodiversity metric tool accounts for the time taken for habitats to reach good condition and the difficulty of creating these habitats within its calculation, meaning that the proposed re-creation of the baseline habitats generate 47.40 area habitat biodiversity units post-development. Combined with the initial habitat loss, this results in a loss of 24.60 area habitat biodiversity units, meaning that additional off-site habitat creation or enhancement is required to meet trading rules and achieve a biodiversity net gain.

Scenario 1: On-site habitat re-creation and off-site enhancement

In this scenario, the developer intends to deliver additional off-site intertidal mud and saltmarsh habitat enhancement to achieve a net gain in area habitat biodiversity units. They select a location that is as close to the on-site location as possible, where the appropriate required habitat types can be delivered.

The off-site area proposed for habitat creation has:

- High strategic significance because a specified local strategy has identified it as being a priority for intertidal mud and saltmarsh.
- 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.

The developer proposes to enhance the off-site habitats from poor to good condition. For 2 ha of 'saltmarshes and saline reedbeds' and 3.3 ha of 'littoral mud', this results in an off-site gain of 32.01 area habitat biodiversity units.

Combined with the on-site values, this results in an overall net gain of 7.41 area habitat biodiversity units, or a 10.30% biodiversity net gain. Table 2 summarises the results for Scenario 1.

Table 2. Summary of Scenario 1 calculations

Calculation	Area habitat biodiversity unit outputs	Percentage change
On-site baseline	72.00	-
On-site loss	-72.00	-
On-site habitat creation	+47.40	-34.17%
Off-site baseline	36.57	-
Off-site loss	0.00	-
Off-site habitat enhancement	+68.58	-
Total on-site and off-site net change	+7.41	+10.30%

Scenario 2: On-site habitat re-creation and off-site creation

In this scenario, the developer identifies 8.4 ha of 'artificial unvegetated, unsealed surface' habitat off-site, where saltmarsh and 'littoral mud' can be created through managed realignment.

Within the biodiversity metric tool, this artificial unvegetated habitat generates zero baseline area habitat biodiversity units. This scenario assumes the same strategic significance and spatial risk categories for the off-site habitats as in Scenario 1, meaning that conversion of this very low distinctiveness habitat to 4.4 ha of 'saltmarsh and saline reedbed' habitat and 4 ha of 'littoral mud' in moderate condition yields 31.98 area habitat biodiversity units. This results in an overall net gain of 7.38 area habitat biodiversity units or 10.26% relative to the on-site baseline.

Table 3 summarises losses and gains of area habitat biodiversity units for Scenario 2.

Scenario 3: On-site habitat re-creation and off-site habitat advance creation – 'habitat banking'

In Scenario 2 above, it is assumed that the creation of the off-site habitat occurred at the time of the impact. Whereas in Scenario 3, the developer could begin to create or enhance habitat in advance of the losses occurring. This is known as 'habitat banking'.

The key benefit of creating habitat in advance is that the risk multiplier for the time to reach target condition is reduced. This is accounted for in the biodiversity metric tool by entering the number of years that the habitat will be created in advance of on-site habitat impact, into the 'habitat created in advance' column, as shown in Figure 1.

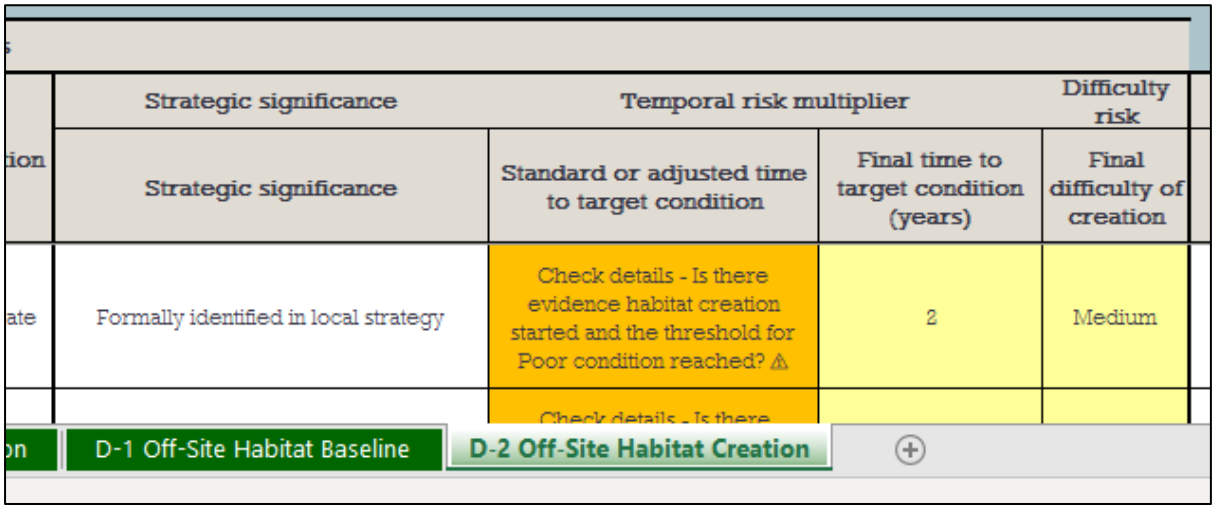

Figure 1. Screenshot of the biodiversity metric tool area habitat creation tab.

In this scenario, 1.5 ha of saltmarsh and 1.4 ha of 'littoral mud' are created in moderate condition, 5 years prior to losses occurring. Despite the strategic significance and spatial risk being the same as Scenario 2, the habitat creation will generate 32.24 area habitat biodiversity units. This is a net increase of 7.63 area habitat biodiversity units relative to the on-site baseline, representing a 10.60% net gain, using a significantly smaller area.

Scenario comparison

Table 3 summarises and compares the losses and gains of area habitat biodiversity units for Scenarios 2 and 3. This highlights that creating habitats in advance of loss in Scenario 3, results in a similar net gain in area habitat biodiversity units to Scenario 2, despite the smaller area of habitat that has been created.

Table 3. Comparison of Scenario 2 and 3 area habitat biodiversity unit outputs

Description	Scenario 2	Scenario 3
On-site baseline	72.00	72.00
On-site loss	-72.00	-72.00
On-site creation	+47.40	+47.40
Off-site baseline	0.00	0.00
Off-site habitat creation	+31.98	+32.24
Total on-site and off-site net change	+7.38	+7.63
Total net percentage change	+10.26%	+10.60%

Table 4 further highlights the difference in habitat area required to achieve biodiversity net gain for each scenario, which differ due to the approaches taken. Creation of these intertidal habitats in moderate condition on very low distinctiveness habitat (in Scenario 2) generates more biodiversity units per hectare than just enhancing these intertidal habitats to good condition (in Scenario 1), due to the difficulty and time risks associated with aiming for 'good' condition, and the lack of biodiversity value at baseline in Scenario 2. Whereas creating the same habitats in advance of the on-site development impact generates the most units per hectare in Scenario 3 relative to the other two, as the risks associated with creation are reduced.

Table 4. Comparison of area requirements for habitat delivery in Scenarios 1-3

Scenario	Off-site area required (ha)	Area habitat biodiversity unit gain	Percentage net gain
Scenario 1 – on-site creation, off-site enhancement	5.3	7.41	10.30%
Scenario 2 – on-site and off-site creation	8.4	7.38	10.26%
Scenario 3 – on-site creation, off-site advance creation – 'habitat banking'	2.9	7.63	10.60%

Conclusions

This case study demonstrates that, following a development impact, reinstating the same habitats on-site will not necessarily deliver a net gain in area habitat biodiversity units by itself. This is due to the risk factors associated with the difficulty of habitat creation and the time required to reach the target condition. Therefore, additional on-site or off-site creation or enhancement of suitable habitats may be required. The off-site habitats that are created or enhanced need to be informed by the trading rules and distinctiveness of any lost habitats, to ensure that they are being adequately compensated for – in this instance, the appropriate intertidal habitat types.

This case study also shows that the area of habitat required for biodiversity net gain varies depending on the baseline habitats present; whether habitat is being enhanced or created; the condition state that is being aimed for; and whether that habitat has been created in advance of development impact, or 'banked'.

For the habitats in this case study, enhancement to good condition requires almost double the area, and creation of habitat in moderate condition requires almost three times the area of habitat to achieve the same percentage net gain when compared to using 'banked' habitats created 5 years in advance. This demonstrates the potential value of habitat banking, which, although having an initial upfront cost, can provide a more options and flexibility for projects, allowing them to achieve net gain in a more cost-effective way.

Key messages and top tips

- In the statutory biodiversity metric calculation tool, a habitat loss is only considered to be 'temporary' when the same habitat type and condition is fully reinstated within 2 years of loss. Therefore, any loss where this is not the case is recorded as a true loss within the metric, and any re-creation of the habitat is recorded in the creation tab.
- The trading rules need to be met to achieve biodiversity net gain, and these should be considered when deciding which habitats to create or enhance, alongside other ecological context.
- On-site habitat creation and enhancement should be considered first in project planning before off-site options are explored according to the biodiversity gain hierarchy. But where off-site habitat interventions are needed, it is best practice to choose locations that are close to the on-site location. For intertidal habitats, this means within the same Marine Plan Area.
- When 'banked' habitat is being used – created or enhanced in advance of impact – record how many years in advance the habitat was created in the 'Habitat created in advance' column in the biodiversity metric tool.
- Different options for delivering biodiversity net gain require different areas of habitat to achieve the same percentage net gain. Using habitat created in advance will also require a smaller area than creating the same habitat at the time the development or loss occurs.
- Proposed habitat types require the expertise of a competent person as well as monitoring to ensure they are achieved.
- 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 generated biodiversity units can also be registered as a habitat bank and sold.

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