Biodiversity metric 3 case study: Cabling for offshore wind development

This case study demonstrates how biodiversity metric 3 can be used to quantify losses and gains within intertidal habitats and evaluate different options to achieve biodiversity net gain.

Overview

In this 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.

Three scenarios for achieving a net gain in biodiversity units are presented using either:

1) off-site habitat enhancement.

2) off-site habitat creation.

3) off-site 'banked' habitat which has been created in advance.

This case study demonstrates

- ✓ Temporary losses[1] – How to record these in the biodiversity metric 3 calculation tool when the baseline habitats cannot be restored to their original condition, or better, within 2 years of the loss occurring.
- ✓ 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 biodiversity metric 3 rules relating to habitat distinctiveness.

The site

Four power cables coming ashore from an offshore windfarm to connect to the grid will be installed through intertidal habitats, with the trenches backfilled to reinstate the habitats across the footprint of the works. Impacts to the on-site intertidal habitats are through the trenching for the cables (each with a predicted disturbance width of 10m), associated access tracks, any required grounding of the barges, and anchor placement associated with installation vessels.[2]

This area of works is referred to as 'the Proposed Development'.

[1] Only where a habitat can be restored to the same habitat in the same or better condition within a 2-year period can this be considered as 'temporary' when using biodiversity metric 3. When this is the case, the habitat may be recorded as 'retained' within the baseline tab.

[2] Although this is a hypothetical scenario, the scale of impact and footprint are loosely based on those from Hornsea 2 offshore windfarm.

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 biodiversity baseline.

This case study presents three scenarios:

- Scenario 1: Re-creation of habitat within the development boundary & habitat enhancement off-site.
- Scenario 2: Re-creation of habitat within the development boundary & habitat creation off-site.
- Scenario 3: Re-creation of habitat within the development boundary & 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:

- All habitats within the Project Boundary will be impacted by the cable trenching workings.
- No structures will be built on the intertidal habitats, so there will be no permanent loss.
- The habitats impacted will take more than 2 years to recover to their previous condition. This cannot be considered a 'temporary' loss within biodiversity metric 3, so there is a net gain requirement.
- 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, or 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 high distinctiveness habitats. Loss of these habitats will need to be replaced 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 enhancement of other habitats of medium distinctiveness within the same broad habitat (i.e. 'Intertidal sediment') or any higher distinctiveness habitat.

Baseline biodiversity units – for all scenarios

At baseline, the proposed development 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 72.0 area habitat biodiversity units (see Table 1). This is 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	0.5	High	Moderate	Low	6.00
Littoral mud	5	High	Poor	Low	30.00
Littoral coarse sediment	3	Medium	Good	Low	36.00
Total site baseline	**8.5**				**72.00**

Post-development biodiversity units

On site - all scenarios

In each of the three post-development scenarios all the habitats within the proposed development are lost. Following installation of the cables the impacted habitats will be re-instated in the same proportions, however, the condition of the saltmarsh and littoral mud habitat is improved to 'good'.

Biodiversity metric 3 accounts for the time taken for habitats to reach 'good' condition and the difficulty of creating those habitats, resulting in the proposed re-creation of the baseline habitats yielding 47.4 biodiversity units post development, which represents a deficit of -24.6 biodiversity units relative to the baseline.

Scenario 1: Re-creation of habitat within the development boundary & enhancement of off-site habitats

In this scenario, the developer intends to deliver additional off-site habitat enhancement to achieve a net gain in biodiversity units.

The off-site location is of high strategic significance for these habitats and the spatial risk for this location meets the 'Intertidal habitats - Compensation inside the same Marine Plan Area, or deemed to be sufficiently local to the site of biodiversity loss' category, which results in a risk multiplier of x 1.0 being applied.

The developer proposes to enhance the off-site habitats from poor to good condition. For 2ha of saltmarsh and 3.3ha littoral mud, this would result in an off-site gain of 32.01 biodiversity units, resulting in an overall net gain of 7.41 biodiversity units or 10.3%.

Losses and gains in biodiversity units for Scenario 1 are summarised in Table 2.

Table 2. Scenario 1: Re-creation of habitat within the development boundary & enhancement of off-site habitats. (Data extracted from Biodiversity metric 3 calculation tool.)

Description	Losses and gains of biodiversity units
Change in on-site biodiversity units	**-24.60**
Off-site baseline biodiversity units	+36.57
Off-site habitat enhancement (saltmarsh and littoral mud in moderate condition)	+68.58
Change in off-site biodiversity units	**+32.01**
Total net gain in biodiversity units	+7.41
Overall net % gain in biodiversity units	**10.30%**

Scenario 2: Re-creation of habitat within the development boundary & habitat creation off-site

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

Within the biodiversity metric 3 calculation tool, this artificial unvegetated habitat represents zero baseline biodiversity units. Assuming the same strategic significance and spatial risk categories for the off-site habitats as in Scenario 1, conversion of this very low distinctiveness habitat to 4.4ha of saltmarsh and 4ha of littoral mud (both in moderate condition) yields 31.98 biodiversity units. This results in an overall net gain of 7.38 biodiversity units or 10.26% relative to the baseline.

Losses and gains of biodiversity units for Scenario 2 are summarised in Table 3.

Scenario 3: Restoration of habitat within the development boundary & 'habitat banking' (habitat created/enhanced ahead of development)

In Scenario 2 it was assumed that the creation of the off-site habitat occurred at the time of the impact. Alternatively, 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. The number of years in advance that the habitat creation commenced is entered in the 'habitat created in advance' column in the biodiversity metric 3 calculation tool:

Post development/ post intervention habitats

Strategic significance			Temporal risk multiplier					
icance	Strategic significance	Strategic position multiplier	Standard time to target condition/years	Habitat created in advance/years	Delay in starting habitat creation/years	Standard or adjusted time to target condition	Final time to target condition/years	Final time t target multiplie
ocal strategy	High strategic significance	1.15	7	5		Check details - Is there evidence habitat creation started and the threshold for Poor condition reached? ⚠	2	0.931
ocal strategy	High strategic significance	1.15	3	5		Check details - Is there evidence that habitat has reached target condition? ⚠	0	1.000

With the same strategic significance and spatial risk categories as scenario 2, 1.5ha of saltmarsh and 1.4ha of littoral mud habitat in moderate condition, if created 5 years prior to the losses occurring, will yield 32.24 biodiversity units. This is a net increase of 7.63 biodiversity units relative to the baseline, representing a 10.60 % net gain but with significantly less area required.

Losses and gains of biodiversity units for scenario 3 are summarised in Table 3.

Table 3. Scenarios 2 and 3: Re-creation of habitat within the development boundary & habitat creation off-site (Scenario 2) or 'habitat banking' (Scenario 3. (Data extracted from Biodiversity metric 3 calculation tool.)

	Losses and gains of biodiversity units	
Description	**Scenario 2**	**Scenario 3**
Net change in on-site biodiversity units	**-24.60**	**-24.60**
Off-site baseline biodiversity units	0	0
Off-site habitat creation (saltmarsh and littoral mud in moderate condition)	+31.98	+32.24
Net change in off-site biodiversity units	**+31.98**	**+32.24**
Total net gain in biodiversity units	+7.38	+7.63
Overall net % gain in biodiversity units	**10.26%**	**10.60%**

Conclusions

This case study demonstrates that, following a development impact, reinstating the same habitats on site will not, by itself, deliver a net gain in biodiversity units. This is due to the risk factors associated with 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 (i.e. following the trading rules which relate to habitat distinctiveness) will be required.

Comparing these 3 scenarios illustrates the variation in the amount of habitat that is required to achieve a 10% net gain, depending on whether habitat is being enhanced or created and whether that habitat has been created in advance ('banked') or not (Table 4). Habitat enhancement requires almost double the area, and habitat creation 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 has an initial upfront cost, can provide a portfolio of sites offering additional flexibility to achieve net gain in a more cost-effective way.

Table 4. Comparison of area requirements for different off-site net gain delivery options presented in scenarios 1-3. Data extracted from Biodiversity metric 3 calculation tool.

	Total area of off-site habitat required (ha)	Net gain in biodiversity units	% Net Gain
Scenario 1 - enhancement	**5.3**	7.41	10.30
Scenario 2 - creation	**8.4**	7.38	10.26
Scenario 3 – habitat banking	**2.9**	7.63	10.60

Key messages / top tips

- 'Temporary' losses of more than 2 years duration must be recorded in the biodiversity metric 3 calculation tool as having been lost and then re-created. This applies regardless of whether the re-created habitat is in the same or better condition than that which was present pre-development.
- The trading rules relating to habitat 'distinctiveness' must be met when considering which habitats will be created or enhanced in order to deliver a net gain: Losses of high distinctiveness habitat must be replaced with biodiversity units of the same habitat type. Medium distinctiveness habitats can be replaced with any medium distinctiveness habitat in the same broad habitat or any high distinctiveness habitat.
- Consider the location of habitat creation or enhancement. Delivering net gain in locations that are strategically significant for that habitat and are 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.
- Different options for delivering net gain require different areas of habitat to achieve the same % net gain. Habitat enhancement will usually require a smaller area than creation of the same habitat to achieve the same net gain. Using habitat created in advance will also require a smaller area than creating the same habitat at the time the development/loss occurs.
- 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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