

Biodiversity net gain. Good practice principles for development

Case studies

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23 Zero environmental impact goal, Corriemoillie

Details

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23.1 PROJECT SUMMARY

The project aim was to help EDF Energy deliver its net zero environmental impact goal by providing affordable low carbon to customers while having a net positive environmental impact. The goals were to manage habitat and species including:

- blanket bog, dry heath, alpine and boreal heaths
- breeding population of red-throated divers
- otters, bats, water vole, wild cat and pine marten.

The development team at EDF Energy Renewables (EDF ER) quickly established that the key long-term objective was to create the conditions that will enable the expansion and/or restoration of blanket mire.

The Corriemoillie Wind Farm site (and the wider Corriemoillie Estate) is located seven kilometres north-west of Garve in the Scottish Highlands and is being developed by EDF ER, which is a 50:50 joint venture between EDF Energy and EDF Énergies Nouvelles. The wind farm construction started in 2015 and the site became operational in December 2016. It consists of 19 turbines with a generating capacity of up to 60.8MW. The project is wholly owned and operated by EDF ER.



Figure 23.1 Restoration works (before)

The development was given approval providing an approved habitat management plan (HMP) was in place to protect and manage habitats and species within the site. The scheme was specifically required to consider:

- managing/restoring blanket bog, dry heath, alpine and boreal heaths

- opportunities to enhance the breeding population of throated divers on the Corriemoillie Estate
- the interests of otters, bats, water vole, wild cat and pine marten.

A targeted blanket mire restoration area was established over an area of 50 hectares around blanket mire core area, with the removal of 31 hectares of failed and later felled woodland and 0.8 hectares of open water. The felled areas were commercially afforested with Sitka spruce and lodgepole pine, planted in a system of ploughed ridges and furrows. Trees were mostly felled in 2013, and brash removed between 2015 and 2017. An area of about 0.5 hectares of woodland remains standing, within the restoration area.

In February 2017, field survey visits were completed and a plan for the restoration of the blanket bog was developed by specialist contractors Nevis Environmental and Highland Conservation Ltd. The plan also highlighted other constraints that needed to be avoided during the restoration works on site such as breeding birds, water voles, and dwarf birch (*Betula nana*). Highland Conservation carried out the restoration work (ie ditch blocking with dams, turf covered peat cuts, hag re-profiling) in each area.

Re-vegetating and re-profiling of eroded hags and gullies were identified as one of the main methods suitable to improve the condition of the blanket mire areas within the restoration area. This technique had not been previously mentioned in the HMP or specified in the bog restoration assessment report. This work mainly involved the stabilisation of the eroded banks using a combination of re-profiling the degree of slope to under 40 degrees and using on-site vegetation gained during this process. The methods used for peat bunds also apply as there was a need for a comprehensive approach with many of the restoration sites being suitable for both blocking the flow of water by creation of peat bunds and re-profiling of steep and eroding sides. Re-profiling works ensured that sufficient vegetation next to hags and gullies was available for re-turfing, without compromising the habitat that turves were taken from.

Restoration works started at the end of July with three specialist excavators operating on site. Works were completed by the end of August. During the works, the southern boundary of the mire restoration area was modified to increase the overall restoration area to over 55 hectares. A minimum of 778 peat bunds were created in the restoration area. Hag re-profiling was completed along at least 8400 m of gullies in both the mire habitats and afforested areas.

The bog restoration was completed in 2017, but ongoing surveys will be required to monitor how the vegetation and habitat communities change over time because of increasing water tables. This is a slow process and levels of change will only become apparent in the long term, however early signs are positive.

For the rare red-throated divers two key mitigation measures were proposed at the planning stage of the wind farm to enable divers to breed successfully. A 500 m corridor was designed into the wind farm layout to enable movement access the identified breeding loch via their preferred flyway route and minimise collision risk. In addition, a stand of conifers was retained around the breeding loch and to minimise the visual disturbance of the birds by activities on site. To encourage further breeding pairs to the site diver rafts have been scheduled for construction and will be placed on site in a suitable location before breeding pairs returning to the site to prospect for nests.

23.2 ISSUES

During the construction phase of the wind farm, the main contractors store peat as they would with many soils. This causes significant problems when trying to undertake restoration works because of mineral contamination or the drying of the peat.

In the first year of operation an exposed slope above the site experienced a land-slip during heavy rain and flash flooding. The damage required the slope to be stabilised and damage to cable trenches to be repaired. However, this incident demonstrated the value of restoring peat bog in the area.

Restoration works usually take place after the main construction of the project and supporting infrastructure has been done. An optimal solution may be to carry out restoration work when roads, crane



Figure 23.2 The use of peat dams to aid water retention to re-wet the blanket bog (after)

pads and turbine bases are being constructed. This means that peat storage and transport of peat on site is minimised and can be used to deliver restoration of the blanket bog before vegetation and peat degrade.

During construction a protection zone was set up to ensure no site workers approached the nest during activities. In the operational phase all workers were advised of the presence of a sensitive and rare bird species breeding on site. They were also informed to stop and leave their vehicles at turbines and the substation to reduce accidental disturbance.

23.3 OUTCOMES

- 55 hectares of peat bog have been restored.
- Reversing the actively drained peat should save 49 tonnes CO₂eq per year.
- Slowing or preventing the active erosion of peat should save a further 31.5 tonnes of CO₂eq per year.
- The peat bog will provide enhanced flood attenuation for communities' down-stream of the project.
- The peat bog is an internationally-threatened habitat and this work should ensure its continued protection, and for the species that depend upon it.
- The wind farm provides an income for the local community that may otherwise consider a blanket bog uneconomical to manage.
- The blanket mire restoration project supported the employment of specialist local contractors, which helped the local economy and a more reliable and committed workforce.
- The approaches used have avoided the need to transport peat around or offsite.
- The northern section of the reinstated habitats at the base of one turbine was chosen as an area to demonstrate high-level reinstatement.
- The red-throated divers have bred successfully during both construction in 2016 and the first year of operation in 2017, fledging three chicks over these two years. This is an excellent success rate and exceeds the national average of less than one chick per year.
- EDF ER have developed a project that has resulted in a BNG for the local community, while using the lessons learnt to improve the outcomes on further projects.