

Mynydd Maen Wind Farm

Technical Appendix 6.7

Outline Habitat & Ecological
Management Plan

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Client	Renewable Energy Systems (RES) Ltd.
Project	Mynydd Maen Wind Farm, Outline Habitat & Ecological Management Plan
Version	FINAL
Project number	P24-260

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1 Introduction

Background

- 1.1 This Outline Habitat and Ecological Management Plan (OMP) has been prepared for the proposed thirteen turbine Mynydd Maen Wind Farm on behalf of Renewable Energy Systems (RES) Ltd (hereafter referred to as the Applicant). The wind farm will be located on upland moorland south of the Cwm y Glyn (Hafodyrynys) Valley, north and north-east of the Cwmcarn and Gwyddon Valleys and west of Cwmbran, extending across the County Borough boundary between Caerphilly and Torfaen (approximate central Ordnance Survey Grid Reference (OSGR) ST 256 976, hereafter referred to as 'the Site').
- 1.2 This OMP builds on measures identified in Chapters 06 Ecology and 07 Ornithology of the Environmental Statement (ES) and should be read in conjunction with these chapters and their appendices. It details management measures for ecological features, both habitats and species, listed in Section 1.9.
- 1.3 A Commons Innovation Plan covering Mynydd Maen was developed in consultation with the commoners and Torfaen County Borough Council in 2019 (TACP, 2019¹), but progress in implementing this in a sustained manner has been limited by loss of public funding for the commoners to complete the work (some cutting of the common continues to be completed to reduce bracken incursion across the heathland and some removal of self-seeded conifers is undertaken, but neither at a scale that is resulting in effective control). The Plan, as well as consultation meetings with Commoners (held in August 2023 and March 2024) have informed the measures set out in this OMP.

Scope of this document

- 1.4 This OMP describes outline management objectives for land within and surrounding the Site. Delivering against these objectives will enable the wind farm to achieve biodiversity net benefit as required under Planning Policy Wales 12.
- 1.5 The OMP has been informed by consultation with the commoners, and ecologists from Caerphilly County Borough Council (CCBC) and Torfaen County Borough Council (TCBC).
- 1.6 Should the wind farm be consented, the OMP will be developed into a more detailed plan, with input from the local authorities, the fire service² (as heather management also provides opportunities for fire control) and (subject to availability) Natural Resources Wales.
- 1.7 It is intended to implement the measures outlined in this OMP for the duration of the operation of the wind farm (although some will commence during the construction period).
- 1.8 All areas referred to for management in this OMP are shown on **Figures 1 and 2**.

Ecological Features

- 1.9 The ecological and ornithological assessments for the wind farm have identified a number of features (species and habitats) that are likely to be impacted by development. In accordance with the step-wise approach set out in Planning Policy Wales 12, wherever possible these features have been targeted for enhancement in order to offset these impacts and deliver local enhancement for key features. Relevant ecological features to this OMP are:
 - Sites of Importance for Nature Conservation (SINCs)³;
 - Dry heath habitat (this is a component of the SINCs and a priority habitat in its own right);

¹ TACP (2019) Mynydd Maen Amalgamated Commoners Innovation Project: Commons Innovation Plan.

² The local fire service are actively involved in these sorts of discussions at the local level (Steve Williams, Torfaen County Ecologist, pers comm).

³ With reference to Figure 6.8 of the ES it can be seen that these cover the entirety of the Site. The ecology chapter (chapter 06) identifies that there will be a loss of extent of dry heath from within the SINCs as a result of construction / the permanent footprint of the wind farm.

- Wet heath habitat;
- Great crested newt *Triturus cristatus* populations;
- Reptile populations;
- Kestrel *Falco tinnunculus*.

1.10 The SINC, dry heath, great crested newt and reptile features are predicted to be affected by loss of heathland extent during construction and from the footprint of the wind farm. The impacts on kestrel will be through operational phase turbine collision. These ecological features are the focus of this OMP.

Aims and Objectives

1.11 This OMP identifies a range of opportunities for enhancing the habitats within and adjacent to the wind farm, and for the maintenance or enhancement of protected species populations supported by them.

1.12 The main aims of the OMP are:

1. To increase the dry heath resource and improve its condition.
2. To reduce the area of bracken on the upper parts of the common.
3. The control of invasive (feral) trees and semi-natural scrub (where these are encroaching on heathland habitats).
4. Increasing the local pond resource to benefit the great-crested newt population.
5. Improving the condition of the wet heath through hydrological re-naturalisation.
6. Providing opportunities for nesting kestrel away from the wind farm.

1.13 The following actions are identified to achieve the above aims:

- Actions to achieve Aim 1:
 - Establish a rotational system of mechanically cutting and baling heathland to reduce even-aged stands of over-mature heather (while also creating fire breaks)⁴.
 - Removal of bales from the development area⁵.
 - Reversion of areas of semi-improved and improved grassland, scattered and continuous bracken in three areas of additional land adjacent to the northern and eastern Site boundaries to heathland habitats.
- Actions to achieve Aim 2:
 - Areas of bracken that can potentially be controlled by mechanical means have been identified by the commoners.
 - Implement a long-term programme of bracken management on the upper valley slopes (where gradient is low enough for management⁶).

⁴ Ideally these areas would be maintained through grazing. However the ability to do this will depend on whether there are additional stock that can be put out on the common. Farm payment schemes have moved from headage to hectareage payments in recent years, resulting in a general reduction in animals and under-grazing of moorland habitats.

⁵ In addition to using these bales to slow water movement off the Site (see Actions to Achieve Aim 5), these bales can be used (initially) to help revegetate areas of temporarily disturbed ground within the development area (through breaking them up and spreading them across the bare ground). Opportunities to contribute excess bales to local conservation initiatives, where they can be used in heathland recreation and for slowing down water movement should be sought.

⁶ Chemical treatment of bracken is now more complicated as the herbicide that has been most effective in controlling it (Azulox) has been banned. The use of a knapsack sprayer to control bracken is very labour intensive. Mechanical control through cutting and bruising bracken is most feasible on relatively gently-sloping ground.

- Actions to achieve Aim 3:
 - Re-survey land within the Site periodically to identify the extent to which feral trees are an issue⁷.
 - Remove the feral trees and scrub.
- Actions to achieve Aim 4:
 - Restore the existing ponds across the Site.
 - Create two new ponds within 250 m of ponds 1-3 (where use by stock and regular drying appears to be driving a population decline in great crested newt). As much as possible, decide the location of the ponds to allow the permanent or as-long-as-possible presence of water.
 - Design the ponds to be available to stock for drinking, but to also have inaccessible sections along their margins.
 - Use excavated spoil to create features that can be used by hibernating reptiles and amphibians.
 - Implement long-term management of ponds.
- Actions to achieve Aim 5:
 - Identify the main drainage ditches and dam them using clay or similar poorly permeable infill, to slow water movement off the Site.
 - Use bales produced through the heather cutting to block minor drainage ditches, to slow water movement off the Site.
 - Where wet ground and peat are exposed, spread the arisings from the cutting and baling of heather on the bare surface to stabilise it and to provide a source of heather seed.
- Actions to achieve Aim 6:
 - Erect two kestrel nest boxes mounted on mature trees or poles (as appropriate) to the east and south of the Site; south of Blaen Bran and on Mynydd Maen – areas more than 1 km from the nearest proposed turbines but close to typical foraging areas.
 - Maintain and replace these as necessary over the operational life of the wind farm.

⁷ The intention is to control feral conifer trees that are invading the heathland as opposed to (necessarily) scrub in stream valleys or on the edges of farmland.

2 Baseline Conditions

- 2.1 The wind farm area and surrounding land has been subject to Phase 1 habitat survey, National Vegetation Classification (NVC) survey, ornithological survey and protected species survey between 2020 and 2023 inclusive. The survey methods and results are detailed in Chapters 06 Ecology and 07 Ornithology (and associated appendices) of the ES.

Habitat Descriptions

Site Boundary

- 2.2 The total footprint of permanent access tracks, turbine bases and substations is 15.8 ha. Additional temporary land take will be needed for construction compounds and working areas adjoining turbine bases and access tracks. The majority of these temporarily impacted areas will be subject to restoration once construction is complete. It is estimated that this will cover an area of approximately 51.47 ha. The key habitats present on Site are summarised below and their distributions are shown on **Figure 1**.
- 2.3 Dry heath is frequent across the Site, occurring on much of the high ground and is characterised by dense cover of *Ericoid* shrubs (25% or more). On the eastern section of Mynydd Llwydd, Twyn Calch, Mynydd Twyn-glas and parts of Mynydd Maen the heath is moderately grazed and dominated by dense growth of heather *Calluna vulgaris* (where it corresponds to the H12a NVC community). To the north-west of the Site and the south of Mynydd Maen, above Cwm Carn the vegetation is lower growing, heather is rare and bilberry *Vaccinium myrtillus* is the dominant species, indicating higher grazing pressure and potentially previous burning (vegetation in these areas corresponds most closely to the H12c NVC community). Heath in the remainder of the Site is typically transitional between the two subcommunities described above with varying dominance of heather and bilberry. H12a and H12c are both included in the Annex 1 dry heath priority habitat. An example of the habitat is shown in **Photograph 1**).
- 2.4 Acid grassland (U5 NVC community, though transitional to U6 in some areas) occurs along the access route to the west of the wind farm, with a smaller area to the east of it around the mast at Mynydd Twyn-glas. A small area of grassland west of the communication masts on Mynydd Llwyd is somewhat drier (and is a good fit to the U4 NVC community). The acid grassland on Site does not conform to any priority habitat descriptions. It is heavily grazed and is of low intrinsic ecological value. An example of the habitat is shown in **Photograph 2**).
- 2.5 A dry heath / acid grassland mosaic is frequent across the Site, and covers much of the eastern and western parts of Mynydd Maen and the southern part of Mynydd Llwyd. An example of the habitat is shown in **Photograph 3**).
- 2.6 Bracken *Pteridium aquilinum* occurs as extensive stands with a thick layer of litter on sloping ground at the edges of the Site. Bracken does have value for invertebrates, breeding birds and other species groups, but its value is reduced as areas of cover become very large and dense and a litter layer accumulates. Bracken outcompetes heather reducing the extent of heathland habitats and has spread onto the open heath in places. Some work has been done to control and reduce bracken by the local commoners. An example of the bracken encroachment onto the common is shown in **Photograph 4**).
- 2.7 Mature conifer plantation (local BAP priority habitat) of Sitka spruce *Picea sitchensis* with occasional larch *Larix* spp. is present within the Site boundary above Nant Gwyddon-fach, and large blocks of conifer plantation are also directly adjacent to much of the northern and western Site boundary. Feral conifer trees are spreading (self-seeding) from the plantation habitats onto the heathland. Examples of encroaching feral trees on the common are shown in **Photograph 5**).
- 2.8 There are several ponds (local BAP priority habitat) within the Site boundary. These are typically heavily poached at the margins where they have been used for drinking by livestock and have limited marginal vegetation. An example of an existing Site pond is shown in **Photograph 6**).

- 2.9 Wet heath (Section 7 priority habitat) is present in a few localised areas, most frequently in the southern and western parts of the Site. Previous work on the Site undertaken by an ecohydrologist working on behalf of TCBC identified that the main area of bog has been modified by peat-cutting and / or peat movement, such that the original surface is broken, with areas at various elevations separated by steep slopes / sub-vertical edges (Rob Low, pers comm). Completed work to address this, as far as it was feasible to do so, involved smoothing sub-vertical edges to try to reduce hydraulic gradients. Restoration work (including damming of a ditch using wooden boards) has been carried out previously at Mynydd Llwyd (see **Photograph 7**). Various un-dammed drainage ditches are present across the Site (see **Photograph 8**).
- 2.10 Other habitats present on Site include; marshy grassland (Section 7 priority habitat, though limited in extent and species-poor), two small acid flushes (Section 7 priority habitat), improved grassland and several narrow gullies with running water (local BAP priority habitat, on slopes on the fringes of the Site). Two small patches of scattered scrub, drystone walls and species poor hedgerows / hedgerow with trees (Section 7 priority habitat) are present adjacent to the access track.

Additional Land

- 2.11 The extent of common land at Mynydd Maen will be maintained as a result of a land swap arrangement that will be the subject of a parallel planning application. Three peripheral areas will be brought into the common; an enclosed field adjacent to the access track (at the western end of the Site) (central OSGR ST 24337 98323), land at Cwm Lickey (central OSGR ST 26881 98666) and land south of Bryn Bach (central OSGR ST 26890 96778).
- 2.12 The enclosed field adjacent to the access track comprises heavily sheep-grazed poor semi-improved grassland dominated by soft rush *Juncus effusus*. It is bounded by derelict stone walls and post and wire fencing. The grassland itself is very short in most areas, with all palatable plants heavily grazed. Though soft rush dominates much of the site, the presence of species such as bilberry and sheep's sorrel *Rumex acetosella* indicate an acidic soil but species diversity is low and the field shows signs of improvement.
- 2.13 The land at Cwm Lickey comprises three fields, divided by post and wire fences with tree lines of mature beech *Fagus sylvatica* and some hawthorn *Crataegus monogyna* understory. All three fields are heavily sheep grazed with a short sward, and dense bracken encroaching from the boundaries. The northernmost field contains patches of scattered hawthorn scrub, and an area of marshy grassland that is mostly composed of soft rush. Scrub is beginning to establish along the south-western boundary.
- 2.14 The land south of Bryn Bach has a central belt of mature beech woodland with open areas of bracken and (horse and sheep) grazed grassland to the east and west, and areas of scattered scrub. A shallow stream flows through the centre of the woodland. There are two grazed pasture fields in the western part of the site, both have a short (heavily grazed) sward and are bounded by mature beech trees and a derelict stone wall. Towards the east of the site there is another patch of grazed grassland that is similarly heavily sheep grazed.
- 2.15 There is the potential for two of the areas (the enclosed field adjacent to the access track and the land at Cwm Lickey) to be managed back to a more valuable habitat for biodiversity, due to the acid indicator species present in the sward; however, this will be a long term objective. These fields are therefore unlikely to contribute to mitigating loss of heathland or the extent of SINC habitat on the Site in the short term. However, there is potential for them to contribute to the biodiversity net benefit solution and deliver valuable habitats longer term.

Fauna

Site Boundary

- 2.16 Protected and priority species that occur within the site boundary include a small population of great crested newt associated with ponds 1-3 (a medium population of great crested newt was also recorded in Pond 15, approximately 160 m from the access route) and populations of common

reptiles. Bat activity and diversity within the Site boundary is unremarkable, and baseline survey did not result in regular records of horseshoe bat species.

- 2.17 Features of the breeding bird community of the Site and adjacent areas of upland moorland include a small population of red grouse *Lagopus scotica*, which is at the southern end of its natural range, and kestrel *Falco tinnunculus*, which uses the area extensively for foraging (activity suggests the Site is within the territory of a locally breeding pair). Other raptors use the area seasonally, such as hen harrier *Circus cyaneus* or commute across it relatively regularly, such as red kite *Milvus milvus*. Goshawk *Accipiter gentilis* and long-eared owl *Asio otus* breed in conifer plantations within adjacent valleys. Nightjar *Caprimulgus europaeus* breed in clear fell in adjacent valleys, and forage low to the ground over the Site. A range of breeding passerine species typical of upland moorland and moorland fringe habitats are also present, including skylark *Alauda arvensis*, meadow pipit *Anthus pratensis*, stonechat *Saxicola rubicola* and whinchat *Saxicola rubetra*.

Additional Land

- 2.18 The areas of additional land have not been subject to detailed protected species surveys. However, they have little potential to be of importance to any protected species due to the low ecological value of most of the habitats present (with the exception of the woodland and hedgerows in the land south of Bryn Bach, which are likely to support foraging and possibly roosting bats and have potential to support dormouse *Muscardinus avellanarius*).

Future Baseline

- 2.19 The Site comprises common land on an open, relatively flat ridge. Within the wind farm this is mainly characterised by a mixture of acid grassland and heather moorland, the westerly areas of which are grazed (by sheep and cattle) and the north-easterly and easterly parts more lightly grazed (the sheep tend to stay further west). Beyond the wind farm area, on sloping ground, the habitats become more structurally diverse, with stands of bracken, areas of heather and grassland occurring in a mosaic and some woodland habitats. To the west of the Site, in areas adjoining the access track, the sward is short and heavily grazed.
- 2.20 The vegetation structure on the common is a product of a combination of grazing (with some overgrazed and some under grazed areas) and occasional burning. In the absence of the proposed wind farm development it is likely that land management will remain consistent and the condition of the heath vegetation will decline. The Commons Innovation Plan covering Mynydd Maen was developed in consultation with the commoners and Torfaen County Borough Council in 2019 (TACP, 2019), but progress in implementing this in a sustained manner has been limited by loss of public funding for the commoners to complete the work (some cutting of the common continues to be completed to reduce bracken incursion across the heathland and some removal of self-seeded conifers is undertaken, but neither at a scale that is resulting in effective control). Stock numbers are currently below levels necessary to maintain vegetation in favourable condition, parts of the open ground are being colonised by stands of bracken and other areas (mainly to the south of the Site boundary) by conifers. In the absence of intervention, the condition of the common will continue to decline.
- 2.21 Of the protected species recorded, it would appear that there is potential for the great crested newt population to decline to local extinction. The potential of ponds 1-3 to continue to support the species reduced between 2021 and 2023, with no suitable plants for egg laying noted at the ponds in 2023. The ponds also dry regularly (during the Spring as well as later in the year), further limiting the potential for successful breeding.
- 2.22 Similarly, without land management to benefit them, red grouse, a species at the southern end of its range, may decline further (and become locally extinct).
- 2.23 Other bird species such as red kite will continue to increase in abundance. Populations of species that breed within adjacent conifer plantation (such as goshawk and nightjar) will vary in response to the felling cycle.

3 Aims, Objectives and Recommended Actions

Roles and Responsibilities

- 3.1 The Applicant will be responsible for meeting the commitments made in the (detailed) HMP, which will be based on the objectives and principles set out in this OMP. These activities will be managed by the commoners, or in the event this is not possible, contractors employed by the Applicant.
- 3.2 It is envisaged that the implementation of the detailed HMP will be a condition of the planning consent for the wind farm, following agreement of the (detailed) HMP post-consent by the consenting authority in consultation with appropriate consultees, notably NRW, CCBC and TCBC.
- 3.3 Management actions and monitoring results will be reviewed periodically by a HMP Stakeholder Group. The precise remit and structure of the Stakeholder Group will be agreed post-consent but at this stage it is considered that, as a minimum, the following organisations are likely to be represented:
- The Applicant
 - The Commoners
 - NRW
 - CCBC
 - TCBC

Management objectives

- 3.4 Guidance published by Scottish Natural Heritage (SNH, 2016⁸) states that an HMP should *“incorporate flexibility and be subject to periodic review. This will ensure that works/actions can be altered in response to monitoring results over time, evolving guidance or unexpected events. Any alterations would be subject to approval of the HMP steering group.”*
- 3.5 In situations when habitat management activities are implemented but there may be some uncertainties about their effects, monitoring is the process undertaken to measure and evaluate the effects of the management, and inform future management decisions. Relevant, appropriately timed monitoring is therefore important to enable the success of the HMP tasks to be determined and to identify opportunities for further development of habitat management tasks.
- 3.6 Monitoring objectives are outlined for each conservation feature in the sections below. Each monitoring objective will be ‘SMART’ (acronym explained below) and cost effective:
- S – Specifically address the feature;
 - M – Measurable, i.e., quantified (for example, in terms of definitive numbers of individuals or proportionate growth of a population);
 - A – Achievable;
 - R – Relevant, and in compliance with, the overarching HMP aims (which encompass legal, policy and best practice requirements); and
 - T – Time-based to ensure that success rates or alternatively remedial actions can be ascertained.
- 3.7 Monitoring results will be reported to the HMP Stakeholder Group. Reporting of monitoring results and the review of management prescriptions will be undertaken by suitably qualified and experienced ecologists. The HMP Stakeholder Group will be responsible for reviewing the results of the monitoring and agreeing amended management prescriptions if necessary.

⁸ Scottish Natural Heritage. (2016). Planning for development: what to consider and include in habitat management plans. SNH, Inverness.

Management Measures

3.8 Proposed management measures are set out in Table 1 for each of the objectives identified in Section 1.12.

Table 1: Proposed management measures

Objective	Management Measure
Aim 1: Increase the dry heath resource and improve its condition	
Create a mosaic of mixed age heather moorland and increase the extent of dry heath habitat	<p>Undertake a pre-management baseline survey to look at the height and uniformity of heather within the management area (shown on Figure 2).</p> <p>Plan and implement a rotational cutting regime, including agreement of the timing, size of area to be cut each year, and height of the cut of the heather areas⁹. The aim is to establish patchworks of mixed age heather in areas where over-mature stands currently dominate, with a minimum of 100 ha of over-mature, even-aged heather managed per year.</p> <p>Bale and remove heather from the cut areas.</p> <p>Increase the extent of heather moorland on the upper ground through reducing bracken, scrub and feral tree incursion (detailed in following sections).</p> <p>Harrow and seed (with heather) acid grassland in the western part of the Site (to the west of the wind farm) and enclosed pasture fields on the northern moorland edge with a view to reinstating areas of heather moorland¹⁰.</p> <p>Following establishment implement a low-density grazing regime alongside cutting (as necessary) to maintain and enhance the habitat long-term.</p> <p>Monitor changes in habitat type over time using remote technology and vegetation survey.</p>
Aim 2: Reduce the area of bracken on the upper parts of the hill	
Allow areas currently under bracken to revert to dry heath	<p>Undertake a pre-management baseline survey to map the extent of bracken within the management areas (shown on Figure 2).</p> <p>Confirm the extent of bracken that can be controlled mechanically (based on terrain / angle of slope) in discussion with the commoners.</p> <p>Implement a cutting regime.</p> <p>Monitor changes in habitat type over time using remote technology and vegetation survey.</p>

⁹ These measures are likely to benefit red grouse through providing young heather shoots for foraging birds.

¹⁰ This measure is likely to provide further foraging resource for kestrel (as the habitat will have greater potential to support ground-nesting passerines and small mammals) and will also provide additional reptile habitat.

Aim 3: Control of invasive (feral) trees and semi-natural scrub	
Prevent loss of moorland habitats to woodland and scrub	<p>Undertake a pre-management baseline survey to map the extent of scrub and feral trees within the management area (shown on Figure 2).</p> <p>Fell feral trees manually or mechanically. Remove the felled trees and remove from the Site.</p> <p>Monitor changes in habitat type over time using remote technology and vegetation survey.</p>
Aim 4: Increase the local pond resource	
Restore existing ponds, create new ponds and manage them for biodiversity	<p>The works below provide a summary of pond restoration and creation works that will be detailed further in the NRW great crested newt mitigation licence and detailed HMP that will be sought and produced once the scheme has been consented.</p> <p>Restore existing ponds 2-3 (see Figure 2) by scraping sediment from most of the pond, creating deeper areas in the southern half of the pond and leaving shallower areas in the northern part as a reservoir for wildlife and to allow access for livestock to drink. Steepen the southern banks of the ponds and pile rocks along the southern margins to limit livestock use of that area.</p> <p>Dredge and de-silt other Site ponds, which do not currently support great crested newt, as required.</p> <p>Silt removed from the ponds should be deposited a suitable distance from the pond to prevent run-off back into it. Pond dredging and de-silting should be completed in mid-winter (mid-December to mid-February) under the watching brief of a suitably experienced and licensed ecologist.</p> <p>Use excavated spoil (from construction), along with other material, to create features close to the ponds that are suitable for use by amphibians and reptiles as hibernacula.</p>

	<p>Create two new ponds within 250 m of ponds 2-3 (see Figure 2)¹¹, where use by stock and regular drying appears to be driving a great crested newt population decline. Create three further ponds as part of the restoration of the on-Site borrow pits (see Figures 1 and 2) and further ponds in the land swap areas outside of the site boundary providing additional resources for the species¹².</p> <p>Design waterbodies to limit livestock use to a proportion of their edges. This can be done through design (some steep sides / rocks piled along some margins along with establishment of gorse / thorn scrub and varying depths).</p> <p>Ponds to have scalloped edges (to increase micro-habitats), sub-surface bars and deeper areas, and areas of shallow gently profiled edges to maximise biodiversity value. Design and depth will be dictated by location (e.g. soil depth) and will need to be confirmed at the detailed habitat management plan stage. The two new ponds to be a minimum of 10 m diameter. The three further ponds at the borrow pit location and further ponds in the swap land to be a minimum of 3-4 m diameter if created in clusters, or larger (a minimum of approximately 10 m diameter) if isolated.</p> <p>Use excavated spoil, along with other material, to create features close to the ponds that are suitable for use by amphibians and reptiles as hibernacula.</p> <p>Identify long-term management actions to prevent widespread scrub incursion and keep the ponds open.</p>
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¹¹ This is within the ranging distance of individual animals, and would allow natural colonisation by the local population, increasing its resilience.

¹² The ponds would also provide invertebrate rich feeding areas and drinking resources for red grouse, and the hibernacula would provide opportunities for reptiles.

Aim 5. Improve the condition of the wet heath through hydrological re-naturalisation.	
<p>Prevent further loss of wet heath habitat (as a result of rapid run-off of water)</p>	<p>Identify the main drainage ditches present on Site. The existing wet heath areas on Site are shown on Figures 1 and 2.</p> <p>Dam the main ditches at regular intervals using clay or similar poorly permeable infill, with the aim of increasing transient water storage, and reducing short-term storm run-off response.</p> <p>Dam smaller ditches with heather bales produced through cutting and baling of even-aged over-mature heather (under ‘Aim 1: Increase the dry heath resource and improve its condition’).</p> <p>Where wet ground and peat have been exposed, spread the arisings from the cutting and baling of heather (under ‘Aim 1: Increase the dry heath resource and improve its condition’) on the bear surface to stabilise it and to provide a source of heather seed. This should be done as far as is possible without driving heavy vehicles onto the wet heath and further disturbing the surface (so may only be possible towards the edges of each area).</p> <p>Reinstate and elevate sections of track through the wet heath (at approximate OSGR ST 25920 96624) which has sunken through vehicle use, causing vehicles to drive around it through the wet heath. Install physical barriers to restrict vehicle access to the wet heath.</p>
Aim 6. Provide opportunities for nesting kestrel away from the wind farm	
<p>Help draw kestrel away from the wind farm, reducing potential for collision, and provide alternative nest sites elsewhere in the local area.</p>	<p>Install two kestrel nest boxes (at locations agreed with local landowners, shown on Figure 2) to the east and south of the Site; south of Blaen Bran and on Mynydd Maen Common (between the Cwm Carn and Gwyddon Valleys).</p> <p>The box in land south of Blaen Bran to be mounted on a mature tree (precise location to be agreed between the suitably qualified and experienced ecologist and the landowner), on the edge of semi-improved grassland which is to be reverted to moorland.</p> <p>The box on Mynydd Maen Common to be pole-mounted (precise location to be agreed between the suitably qualified and experienced ecologist and the landowner) within existing moorland.</p> <p>Install a kestrel nest box at a suitable Country Park (CP) site elsewhere in Caerphilly County Borough (likely Sirhowy CP)¹³. The location and mounting position (i.e. tree or pole mounting) will be agreed between the suitably qualified and experienced ecologist, the ecologist from CCBC and the Country Park head ranger. All parties will give consideration to public safety and to the safety of those erecting, maintaining or replacing the boxes when selecting their precise locations.</p>

¹³ This has been agreed in principle with the ecologist at CCBC (Erica Dixon) and the head ranger (Jon Hole).

4 Monitoring

- 4.1 Monitoring will be undertaken to determine the effectiveness of the management and assess the need to alter management prescriptions. It will inform decisions such as the intensity of bracken control needed over time, when and how much scrub and feral tree removal is needed, and whether the kestrel boxes need replacement.
- 4.2 During the first five years of operation of the wind farm, vegetation monitoring will be undertaken on an annual basis. This is likely to be achieved through a mixture of remote techniques (to capture aerial imagery) and field survey. The extent of cut heather moorland and bracken will be mapped, and the degree of regeneration noted. Feral trees and scrub will be identified and ponds inspected to ensure they are holding water and are being managed appropriately. Following five years, and on the assumption that objectives are being achieved, the frequency of monitoring will be reviewed.
- 4.3 The condition of the (existing and newly created) on-Site ponds and the great crested newt population they support will be monitored as prescribed in the great crested newt mitigation licence that will be sought following consent of the scheme. This is likely to involve dredging of one or two ponds per year on an annual cycle, alongside monitoring of the great crested newt population in at least years 1, 2, 3, 5 and 10 post-construction.
- 4.4 Measures to identify the success of habitat management for reptiles (likely through a qualitative assessment of habitat structure in combination with re-survey by a specialist herpetological surveyor) will also be proposed to a frequency and specification agreed with the surveyor during the first five years of operation, then reviewed.
- 4.5 Occupancy and condition of the kestrel boxes will be monitored annually for the first five years of operation, after which there will be a review of all monitoring commitments. The annual inspections will be conducted in late winter (late January or February), during dry, calm weather (to avoid flushing any birds present into adverse weather), to ensure they are clean, clear of nesting materials (that may have been added by other species) and secure, ahead of the breeding season. If the condition of a box has deteriorated and has become unsuitable, it should be replaced during the winter (September to February). The applicant will be responsible for arranging installation and maintenance of the Bryn Bach and Mynydd Maen boxes.
- 4.6 For the nest box at a CP in Caerphilly County Borough, a one-off fee for installation and subsequent maintenance and monitoring of the nest box will be agreed and paid by the Applicant to CCBC. CCBC will be responsible for the installation and maintenance of the box.
- 4.7 The results of monitoring will be reported back to the HMP stakeholder group at an agreed frequency, via a videoconference and / or report.

5 Photographs

Photograph 1: Dry heath (with even-aged over-mature heather) at Mynydd Llwyd / Twyn Calch



Photograph 2: Acid grassland in the western part of the Site



Photograph 3: Dry heath / acid grassland mosaic in the western part of the Site



Photograph 4: Bracken encroachment onto the common at Mynydd Maen



Photograph 5: Feral trees at Twyn Calch



Photograph 6: 'Pond 3', in the western part of the Site



Photograph 7: Wet heath at Mynydd Llwyd (with wooden dams from previous restoration work)



Photograph 8: A drainage ditch in the western part of the Site



6 Figures

(overleaf)