



**NORTH LOWTHER ENERGY INITIATIVE**  
**Technical Appendix 8.6**  
**Outline Conservation Management Plan**

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## 1. INTRODUCTION

This Outline Conservation Management Plan (OCMP) describes the proposed habitat management in relation to the North Lowther Energy Initiative (NLEI, hereafter referred to as the 'Development').

This OCMP sets out in the following sections the:

- Management Units;
- Aims, objectives and management prescriptions;
- Monitoring programme; and
- Management and monitoring timetable.

The management recommendations within this OCMP are based on the findings of the **Chapter 8: Ecology and Chapter 9: Ornithology** assessments within the NLEI Environmental Statement (ES).

No significant unmitigated effects during the operational period of the Development were predicted in ES **Chapter 8: Ecology and Chapter 9: Ornithology**. Whilst it is not necessary to mitigate or compensate for likely non-significant effects (in terms of EIA Regulations), NLEI Ltd propose to develop the OCMP as an example of best practice measure for the purposes of biodiversity enhancement. The main enhancement measures included within this OCMP include:

- **A Funded Regional Hen Harrier Project Officer:** A Project Officer will be funded for the lifetime of the Development to help implement a South Scotland Regional Hen Harrier Conservation Management Plan (RHHCMP). The primary aims of this RHHCMP are to review the current status of the hen harrier population breeding in the region, to provide context to the constraints operating in this landscape and, where possible, to undertake practical conservation management actions to enhance the hen harrier population by increasing its size and productivity. The detail of the RHHCMP has been produced by Haworth Conservation and is detailed within Annex 2 to this document.
- **Enhancement of Annex 1 Bog, Wet Heath and Dry Heath Habitats:** The area proposed for conservation management within the CMP will be considerably more than the direct habitat loss that is predicted to occur to key habitats listed above.
- **New Native Woodland Planting:** The OCMP also proposes to plant large areas of native broadleaved woodland and scrub to help enhance the habitat for black grouse, harriers and merlin and to have wider biodiversity benefits.

The measures proposed will benefit key ornithological species including ground-nesting raptors (hen harrier, merlin and short-eared owl), black grouse and curlew, with benefits also likely to be seen for other wader and raptor species.

A final CMP, which will include confirmed Management Units where the aims will apply, will be agreed with Dumfries & Galloway Council in consultation with Scottish Natural Heritage (SNH) prior to the commencement of construction of the Development.

The aim of the CMP is to bring an area under positive management measures that is equivalent to 20 times the habitat loss area (excluding commercial forestry) to ensure that an overall net benefit will be delivered for these habitats over the lifetime of the Development.

## 2. ENVIRONMENTAL IMPACT ASSESSMENT

### 2.1 Ecology

A relatively small number of habitat communities account for the majority of the Development Area, often forming mosaics. The most common and widespread communities are blanket bog, dry heath and acid grassland, with some smaller areas of wet heath, marshy grassland, and neutral grassland. Areas of semi-natural woodland are scarce within the Development Area and are mainly restricted to small fragments, often within gullies or near watercourses.

The variation in vegetation communities and composition over such a large area reflects changes in relief, soil and substrate type, soil moisture, as well as anthropogenic influences on the vegetation (e.g. muir burning, grazing and drainage). Many areas are underlain by peat of various depths and this is reflected in the presence of the true bog communities and wet heath.

#### *Wet Modified Bog and Blanket Bog*

Wet modified bog and blanket bog within the Development Area extensively covers and blankets many of the upland peaty plateaus and adjoining gentle slopes (see **ES Figure 8.2**). Wet modified bog, highlighted by the presence of National Vegetation Census (NVC) communities M25 and M20 in the survey area, has been degraded by a legacy of drainage and historical and continuing upland sheep grazing. Many areas of wet modified bog are species-poor *Molinia* grasslands with a drying mire surface in transition to acid grassland. M25 and M20 wet modified bog cover 839ha (30.78%) of the survey area.

Better quality blanket bog is present, but much less extensive, in the form of NVC types M17 and M19 blanket mire. These areas are also grazed but contain more peat forming species, such as *Sphagna*. M17 and M19 blanket bogs cover 179ha (6.56%) of the survey area.

Collectively, wet modified bog and blanket bog therefore accounts for 1,018ha (37.34%) of the survey area.

A total of 15.94ha of wet modified bog, and 6.16ha of blanket bog is predicted to be lost due to construction of the Development (Table 8-10 of **ES Chapter 8: Ecology**).

#### *Dry Heath*

Dry heath is common and extensive in certain parts of the Development Area, covering over 262ha (9.6%) of the survey area, particularly in the east (see **ES Figure 8.2**) where large tracts of *Calluna* dominated dry heath blankets the more freely draining steep slopes and summits and is managed for grouse via rotational muir burning; these areas are also grazed by sheep. The majority of dry heath present is NVC type H12, predominately of the H12a *Calluna* sub-community, but there are some substantial patches of other forms of dry heath. H12a is one of the most common dry heath communities throughout Scotland. A considerable proportion of the H12a present consists of little more than *Calluna* over a lawn of pleurocarpous mosses with a few sprigs of *Vaccinium myrtillus* (which itself can be locally absent). Locally, burning of the heath has created an intricate patchwork of H12 in different stages of recovery and development.

A total of 2.11ha of dry heath is predicted to be lost due to construction of the Development (Table 8-10 of ES Chapter 8: Ecology).

Chapter 8: Ecology concluded that within a regional/national context there will be a Negligible adverse effect on wet modified bog and blanket bog, and dry heath habitats due to habitat loss associated with the Development. Whilst mitigation is therefore not required, much of the land within the Development Area is in sub-optimal condition, and the extent of habitats showing extensive anthropogenic influences such as acid grasslands (accounting for 21% of the survey area), mean that scope for widespread habitat enhancement, tailored to be sympathetic to the requirements of birds, exists.

### 2.2 Ornithology

The Development Area hosts a number of breeding species afforded additional protection from disturbance under Schedule 1 of the Wildlife and Countryside Act 1981 (hen harrier, merlin, short-eared owl), as well as other species of conservation concern, including black grouse and curlew. Populations of some of these species are likely to reach regional (Natural Heritage Zone, NHZ) importance, and are generally in unfavourable conservation status at a NHZ level.

Chapter 9: Ornithology concludes potential significant (Moderate adverse) unmitigated disturbance effects during the construction period on hen harrier, merlin, short-eared owl and black grouse (Minor adverse for curlew), and Minor adverse effects during the operation period. The assessment details measures to mitigate significant construction effects (spatial and temporal restrictions and a Breeding Bird Protection Plan), which reduces the construction effects to Not Significant (Minor adverse). The OCMP therefore proposes enhancement measures that are beneficial to raptors and waders during the operation of the Development, and which are sympathetic to the ecological habitat management proposals.

## 3. MANAGEMENT UNITS

The OCMP comprises three potential Management Units (A, B and C) within the Development Area, in which management and monitoring works will be implemented.

### 2.1 Management Unit A – Wet Modified Bog and Blanket Bog

Management Unit A will target areas where bog habitat is currently in sub-optimal condition and has been subject to grazing, drainage and muirburning pressures. Within Unit A, the aim is to increase the proportion of *Sphagnum* mosses and dwarf shrubs, via measures including active drain blocking and managing grazing densities. Improving this habitat will be of benefit to hen harrier, merlin, short-eared owl, black grouse and curlew (as well as other species), which may be displaced or otherwise adversely affected during construction and operation of the Development.

It is the intention that Management Unit A will result in positive advantages for the species of raptors and waders known to be present, away from turbines, thereby minimising the potential of collisions with turbines.

### 2.2 Management Unit B – Dry Heath

Management Unit B will target dry heath, which if currently sub-optimal can be improved, or if currently in good condition, should be maintained appropriately. The aim for this Management Unit is to increase/maintain the abundance and structural diversity of *Calluna vulgaris* heather and other dwarf shrubs, for the benefit of

breeding hen harrier, merlin and short-eared owl. Measures undertaken within this unit will include minimising/avoiding muirburn, managing grazing effects, and predator control if considered appropriate.

### 2.3 Management Unit C – Riparian Woodland

Management Unit C will be created to increase native woodland coverage to benefit black grouse, and also hen harrier and merlin, particularly if placed near key foraging and nesting areas.

Areas of search totalling almost 300 ha have been identified close to watercourses within the Development Area in which riparian planting is proposed. These are close to black grouse activity, and of sufficient distance from proposed turbine locations to avoid displacement or collision effects. Implementation and maintenance would account for potential issues such as deer grazing, flooding and stock movements.

## 3. AIMS, OBJECTIVES AND MANAGEMENT PRESCRIPTIONS

The Aims define the general OCMP goals and the related Objectives further define the Aims into quantifiable targets. The Prescriptions detail the management works to be implemented to achieve these Aims and Objectives. Annex 1 provides an indicative timetable for the implementation of the various prescriptions.

### 3.1 Management Unit A – Wet Modified Bog and Blanket Bog

**Aim 1: Restore and enhance the blanket bog and wet modified bog and resource.**

Objective 1.1)	Increase the abundance and distribution of <i>Sphagnum</i> mosses, particularly key indicator species such as <i>Sphagnum papillosum</i> and <i>S. magellanicum</i> .
Objective 1.2)	Increase the abundance of dwarf shrubs including <i>Calluna vulgaris</i> , <i>Empetrum nigrum</i> and <i>Vaccinium myrtillus</i> .
Prescription 1.1)	Dam active drains in order that the water level is raised sufficiently to create conditions suitable for the <i>Sphagnum</i> species mentioned within Objective 1.1.
Prescription 1.2)	Manage livestock densities and agricultural grazing pressure within Management Unit A, as required, to achieve Objective 1.2. This may involve the need for some stock fencing and/or a reduction in livestock densities. An annual average stocking rate of 0.06 LU/ha/year is recommended to conserve blanket bog (SAC, 2007 <sup>1</sup> ) although it should be noted that rates can vary by 20-40% depending on soil fertility or rainfall, and so this rate should be seen as a guideline only. The critical density of sheep on blanket bog is commonly quoted as ~0.5 sheep/ha – more than this is not biologically sustainable in the long term (Cummins <i>et al.</i> 2011 <sup>2</sup> ).
Prescription 1.3)	Manage deer densities as required to achieve Objective 1.2. This will be done in a way so as to avoid conflicts with the black grouse element of the HMP, e.g. by avoiding the use of unenhanced deer fencing. Deer densities are considered to be high if they exceed a density of ~15 deer/km <sup>2</sup> (Cummins <i>et al.</i> 2011). Deer densities would also be managed in accordance with a Deer Management Plan, which will be produced prior to

<sup>1</sup> Scottish Agricultural College (2007). Conservation Grazing of Semi-natural Habitats. Technical Note TN586.

<sup>2</sup> Cummins, R., Donnelly, D., Nolan, A., Towers, W., Chapman, S., Grieve, I. and Birnie, R.V. (2011). Peat erosion and the management of peatland habitats. Scottish Natural Heritage Commissioned Report No. 410.

construction. Ongoing deer management already takes place on the site and it is anticipated that this would be amended as required to tie in with this aim.

Prescription 1.4) The following activities will be prohibited within Management Unit A, as agreed with SNH:

- Clearing out of existing ditches.
- Application of any insecticides, fungicides or molluscicides.
- Application of lime or any other substance to alter the soil acidity.
- Cutting or topping vegetation except to control injurious weed species.
- Burning of vegetation or other materials.
- Use of roll or chain-harrow.
- Planting trees.
- Carrying out any earth moving activities.
- Use for off-road vehicle activities.
- Construction of tracks, roads, yards, hardstandings or any new structures.
- Storage of materials or machinery.

### 3.2 Management Unit B - Dry Heath

#### Aim 2: Enhance foraging and nesting habitat for hen harrier

Objective 2.1) Maintain the core areas of nesting habitat for hen harrier within Management Unit B.

Objective 2.2) Enhance hen harrier foraging habitat within Management Unit B.

Prescription 2.1) Map the core areas within Management Unit B utilised by nesting hen harriers in past years. These areas should not be subject to burning or cutting.

Prescription 2.2) Manage livestock densities and agricultural grazing pressure within Management Unit B, as required, to achieve Objective 2.2. This may involve the need for some stock fencing and/or a reduction in livestock densities. An annual average stocking rate of 0.02 to 0.05 LU/ha/year is recommended to conserve heather over 20cm in height (SAC, 2007<sup>3</sup>) although it should be noted that rates can vary by 20-40% depending on soil fertility or rainfall, and so this rate should be seen as a guideline only.

Prescription 2.3) Design and implement a heather management plan to optimise the structure diversity of the habitat for hen harrier prey in Management Unit B.

### 3.3 Management Unit C – Riparian Woodland

#### Aim 3: Enhance foraging habitat and cover for black grouse and hen harriers

Objective 3.1) Planting of native woodland designed to optimise habitat for black grouse and foraging raptors.

Prescription 3.1) Plant low density native woodland to increase tree cover. Tree planting within Management Unit C will occur in coupes of <5ha and the density within coupes will be 1,100 stems per ha. The exact species mix will depend on local conditions, but may

comprise: common willow, downy birch, rowan and Scots pine. Tree planting should be undertaken during the first year of construction and be completed by the first year after final commissioning of the Development. If stock fencing is required around coupes to prevent damage from livestock, fencing will be made more visible to grouse by the use of chestnut paling, sawn softwood droppers, or orange plastic netting (see Trout and Kortland, 2012<sup>4</sup> for example). The fences will be removed as soon as practicably possible.

Prescription 3.2) Manage livestock densities and agricultural grazing pressure within Management Unit C, as required, to achieve Objective 3.1. This may involve the need for some stock fencing and/or a reduction in livestock densities. An annual average stocking rate of around 0.07 LU/ha/year is recommended for moderate fertility birchwood (SAC, 2007<sup>5</sup>) although it should be noted that rates can vary by 20-40% depending on soil fertility or rainfall, and so this rate should be seen as a guideline only.

## 4. MONITORING

Habitat monitoring, conducted by suitably qualified and experienced ecologists, will evaluate the success of restoration of blanket bog and enhancement of the wet modified bog and associated peatland habitats from over-grazing and drainage. This will be achieved by recording changes to the structure and composition of the vegetation and species abundance, evenness and diversity. A representative sample of around 40 permanent quadrats will be established within Management Unit A to gather sufficient data to inform future management and assess the trajectory of plant species and habitats.

Habitat monitoring to measure the condition of dry heath habitats will take place within Management Unit B. Surveys will monitor changes in the structural diversity of dwarf shrub heath and assess the grazing pressure on burnt/cut areas to ensure adequate regeneration occurs.

For Management Unit C, annual native woodland establishment monitoring for the first 5 years after planting would take place.

The final detailed methods will be agreed with Dumfries & Galloway Council, and SNH if required.

Habitat monitoring will commence during the first year of operation of the Development to establish the baseline and will be repeated in years 3, 5, 10 and 15 of the operational life of the Development. The frequency of monitoring thereafter will be agreed in consultation with Dumfries & Galloway Council, and SNH if required.

Black grouse surveys (following standard methodologies) will be undertaken in years 1, 2, 3, 5, 10 and 15 during the operational life of the Development within the Development Area. The main objectives of this monitoring will be to assess the status of the black grouse in the vicinity of the Development and to establish the success of the habitat management measures.

Breeding raptor and wader surveys (following standard methodologies) will be undertaken in years 1, 2, 3, 5, 10 and 15 during the operational life of the Development within the Development Area. The main objectives of this monitoring will be to assess the status of breeding raptors and waders in the vicinity of the revised Development

<sup>4</sup> Trout, R. and Kortland, K. (2012). Fence marking to reduce grouse collisions. Forestry Commission Technical Note. [http://www.forestry.gov.uk/PDF/FCTN019.pdf/\\$FILE/FCTN019.pdf](http://www.forestry.gov.uk/PDF/FCTN019.pdf/$FILE/FCTN019.pdf)

<sup>5</sup> Scottish Agricultural College (2007). Conservation Grazing of Semi-natural Habitats. Technical Note TN586.

<sup>3</sup> Scottish Agricultural College (2007). Conservation Grazing of Semi-natural Habitats. Technical Note TN586.

and to establish whether the habitat management within Management Units A and B has resulted in an increase in breeding raptor and wader territories.

Reports will be submitted to Dumfries & Galloway Council (and SNH if required) in years 1, 2, 3, 5, 10 and 15. The reports will detail management works completed to date and the results of the habitat and bird surveys. The works proposed over the next reporting period will also be discussed.

It should be noted that the OCMP is a live document, and may require alteration based on the findings from the monitoring programme, unexpected events or evolving guidance. Any proposed amendments would be put to Dumfries & Galloway Council (and SNH if required) for approval, before implementation. The implementation of the OCMP also needs to take account of the existing land management practices across the site, which will continue during construction and operation. The OCMP will need to work in tandem with these existing land uses.

**ANNEX 1 MANAGEMENT AND MONITORING TIMETABLE**

Activity	Year - 1*	2	3	4	5	6	7	8	9	10	11	12	13	14	15...
Drain Blocking (Unit A)	✓														
Tree planting (Unit C)	✓														
Livestock Management (Units A, B, C)	Continues for 25 years														
Deer Management (Units A, B, C)	Continues for 25 years														
Fencing (if required for implementation of management; Unit C)	Note, any fences should only be erected after construction is completed and should be marked to avoid black grouse collisions														
Predator Control Strategy (Units B, C)	Continues for 25 years														
Habitat Monitoring (Units A,B, C)	✓		✓		✓					✓					✓
Black Grouse Surveys	✓	✓	✓		✓					✓					✓
Breeding Raptor Surveys	✓	✓	✓		✓					✓					✓
Reporting Dumfries & Galloway Council, SNH	✓	✓	✓		✓					✓					✓



**ANNEX 2 SOUTH SCOTLAND HEN HARRIER CONSERVATION MANAGEMENT PLAN**

Produced by Haworth Conservation Ltd

## South Scotland Hen Harrier Conservation Management Plan

The Development will have up to 35 wind turbines, and associated infrastructure, with a total electricity generating capacity of up to 147 MW. The application will be submitted on behalf of North Lowther Energy Initiative (NLEI) Ltd to the Scottish Government for consent under section 36 of the Electricity Act 1989.

The commitment by NLEI Ltd to develop and implement a Conservation Management Plan (CMP) is set out above and in the ES, and is expected to be delivered through either a condition to any consent or a Section 75 Agreement. As part of the CMP there will be a Regional Hen Harrier Conservation Management Plan (the "RHHCMP") which will include the provision of a fund and management assistance within Natural Heritage Zones (NHZ) 17 and 19 (the 'study area') to enhance the conservation of breeding hen harriers.

The primary aims of this RHHCMP are to review the current status of the hen harrier population breeding in the study area, to provide context to the constraints operating in this landscape and, where possible, to undertake practical conservation management actions to enhance the hen harrier population by increasing its size and productivity.

A Project Officer will be appointed to implement the RHHCMP (detailed job description provided below). The Project Officer will be a full-time position funded by NLEI Ltd. The Project Officer will be an experienced raptor worker familiar with hen harrier conservation ecology in the South of Scotland and well-versed in the important aspects of upland landscape management. Should the proposed development receive consent, it is proposed that the Project Officer will be appointed within a timeframe to be agreed through the completion of the final CMP.

Whilst the organisation which will employ the Project Officer has not yet been determined, it is anticipated that they will be guided by an Advisory Group comprising individuals and organisations with specialist local knowledge and experience of the needs of hen harrier conservation in the study area. The Advisory Group will initially comprise representatives of Buccleuch Estates, Scottish Natural Heritage (SNH), the Royal Society for the Protection of Birds (RSPB), Forestry Commission Scotland (FCS), and local Raptor Study Groups.

Surveys detailing the distribution and breeding success of hen harriers, satellite tagging and analysis undertaken by the Project Officer during the first three years will inform the scope of future work on hen harriers in the region, and once the Advisory Group is established, they will decide how to deliver the actions in the longer term. The key benefit of this long term programme will be an enhanced understanding of the population dynamics of the hen harrier population breeding and wintering in Southern Scotland. In addition a more focussed approach to protecting breeding hen harriers and the habitats that sustain them will be encouraged by dialogue with land management interests and increased levels of public awareness. The project will build upon the initiatives and actions undertaken by the RSPB as part of the Hen Harrier LIFE project currently running for a five year period until 2019. Recommendations resulting from this LIFE project will be followed up wherever possible.

## Hen Harrier Project Officer Job Description

### Skills Required

- The post holder should be an experienced and enthusiastic raptor worker familiar with hen harrier conservation and ecology in the South of Scotland. A sound knowledge of hen harrier survey methods is also essential.
- They should also be well-versed in the important aspects of upland landscape management.
- Excellent interpersonal and communication skills, and the ability and enthusiasm to deal effectively and courteously with a wide range of people to promote hen harrier conservation and monitoring in NHZ 17 and 19.

### Principal Responsibilities

#### 1. Hen harrier monitoring

- Provide appropriate input to monitoring hen harriers in relation to the construction and operation of the windfarm.
- Liaise with local RSG workers and/or undertake field surveys for breeding hen harriers in the study area.
- Liaise with local RSG workers and/or undertake field surveys for roosting hen harriers during winter in the study area.
- Collate annual occupancy and productivity data across the study area and ensure it is submitted to the Scottish Raptor Monitoring Study database.
- Ensure that all aspects of field survey and reporting conform to the most up-to-date guidance for monitoring raptors as set out in Hardey *et al* (2009)<sup>6</sup>.
- Provide field assistance to future satellite tagging work within the study area and where appropriate assist in the collation of relevant flight data.

#### 2. Communications

- Visit and/or organise visits to primary and secondary schools to promote greater awareness, understanding and appreciation of hen harrier conservation throughout the region.
- Actively liaise with the media (print, radio, television and social) to promote greater awareness, understanding and appreciation of hen harrier conservation throughout the region.

#### 3. Monitoring environmental factors important for hen harrier conservation

- Collate weather data from all available sources.
- Collate information on recreational activity relating to potential disturbance from all available sources.
- Undertake appropriate assessments of hen harrier prey distribution and abundance.

<sup>6</sup> Hardey, J., Crick, H., Wernham, C., Riley, H., & Thompson, D. (2009): *Raptors: a field guide to survey and monitoring*. 2nd Edition Edinburgh: The Stationery Office.

- In collaboration with the local Raptor Study Groups arrange for the collection of prey remains from hen harrier nests and roost sites and ensure all prey remains are sent to an appointed expert for identification.

#### 4. *Promote positive management for hen harriers*

- Identify opportunities for biodiversity enhancement within NHZ 17 and 19, including the implementation of appropriate land management measures to encourage breeding hen harriers.
- Explore the potential for enhancing vole and small passerine populations.

#### 5. *Reporting, etc.*

- Collate, in consultation with SNH and relevant local District Councils, appropriate data on applications for windfarm development and proposals for land use change including afforestation that may impact on the hen harrier population.
- Assist in the recording and documentation all bird of prey persecution incidents.
- Produce an annual report detailing all activities undertaken throughout the year, review all sighting, tracking and breeding data on hen harriers in NHZ 17 and 19. This annual report will detail all expenditure for the year and set out the priorities and costing for the coming year. Appropriate statistical, GIS and population modelling expertise will be sourced externally as required.
- Promote and encourage links with external organisations that lead to peer reviewed scientific publications.

1. engage with local communities throughout the region and establish lines of communication;
2. plan and/or organise a programme of school visits in discussion with appropriate head teachers (following appropriate CRB checks);
3. assist with the fitting of satellite tags on juvenile hen harriers;
4. collate all relevant data including weather, hen harrier prey, breeding numbers, distribution and productivity;
5. draft the annual report and potential work programme for consideration by the Advisory Group.

## **Finances**

NLEI Ltd will provide funding for a ten-year period of the project officer which will be available for all aspects of work relating to the conservation of hen harriers in NHZ 17 and 19.

## **Indicative Work Programme**

The work programme will need to be flexible and amended each year in the light of ongoing consideration by the Advisory Group. The Advisory Group will assist in the production an Action Plan detailing the evolution of the work programme to be undertaken by the Project Officer.

In years 1-3 it is anticipated that the focus of work by the Project Officer will be to:

1. participate in annual hen harrier surveys throughout the period February- August;
2. engage with members of the Advisory Group;
3. assist with the fitting of satellite tags on juvenile hen harriers;
4. collate all relevant data including weather, hen harrier prey, breeding numbers, distribution and productivity;
5. promote the project using suitable social media;
6. draft the annual report and potential work programme for consideration by the Advisory Group.

In years 4-10 it is anticipated that the focus of work by the Project Officer will be to: