A10. NON-AVIAN ECOLOGY

A10.1 INTRODUCTION

The design of the proposed Viking Wind Farm has changed since the Section 36 application and its associated Environmental Statement (ES) were submitted in spring 2009. This chapter describes how these changes would affect non-avian ecology interests.

Before reading this chapter, please first read Addendum Chapter A1, the Introduction, and Chapter A4, the Development Description. Failure to read these two chapters carefully may lead to a misunderstanding of the assessment work described in this chapter. Furthermore, because this addendum chapter is not intended to provide a complete new assessment of the issues, but instead provides a discussion of the effects of the work which has taken place since the 2009 ES was submitted, it must be read in conjunction with the ecology chapter of the 2009 Environmental Statement.

A10.2 CONSULTATION RESPONSES

A summary of consultee responses is provided in Table A10.1. A full list of all comments from statutory consultees is presented in Appendix A1.1.

Table A10.1: Summary of consultation responses

Ref	Summary of objection	Response
SEPA - Water ecology, waste and decommissioning		
SEP 4.6.5a	Siltation from development a major problem for aquatic life. Particular concern regarding sediment impacts on lochs. SEPA object due to lack of information on potential impact of sedimentation.	Extensive further consultation has been entered into with SEPA. Appendix A14.6, the Site Environmental Management Plan (SEMP), has been re-written and expanded and now provides further information and commitments on how construction activities will be managed to protect the environment.
SNH - Designated sites, birds, landscape character and visual impact		
SNH 2.1	Inadequate consideration of likely adverse effects on Sand Water SSSI and lack of proposed mitigation regarding works outwith development boundary.	The proposed improvements to the B9075 north of Sand Water would now all take place on the north side of the road, and a commitment to this effect is given in Chapter A15, Roads and Traffic. A number of works may be required outwith the development boundary, in particular improvements to road structures and junctions to enable the movement of abnormal loads, and a commitment is given to the effect that all such works will be carried out in full consultation with the Highway Authority and in accordance with normal standards, including the Design Manual for Roads and Bridges (DMRB). All such works would be relatively minor, and comparable with normal maintenance activities on the public road network.

A10.3 CHANGES IN THE POLICY CONTEXT

Scottish Planning Policy has undergone significant revision since the 2009 Section 36 application and the associated ES chapter were submitted to the Scottish Government. The former series of Scottish Planning Policy (SPP) and National Planning Policy Guidance (NPPG) documents (such as SPP 6 Renewable Energy and NPPG 14 Natural Heritage) have now been consolidated into a single Scottish Planning Policy[1] and the series of SPPs and NPPGs have now been revoked. A number of Planning Advice Notes (PANs) have also been revoked but PAN 60 (Planning for Natural Heritage) is, at least at present, being retained.

Broadly speaking, there is no material change to Government policy with regard to natural heritage interests and the revision exercise has been undertaken in line with the Scottish Government's commitment to provide a clearer and more concise statement on Scottish National Planning Policy. However, one notable addition to the new SPP is the inclusion of a paragraph on disturbance of carbon rich soils (i.e. peat) which the document states may lead to the release of stored carbon, contributing to greenhouse gas emissions. The document goes on to state that where carbon rich soils such as peat are present, an assessment of any likely impacts to such soil types should be undertaken.

The predicted effects on peat of the proposed Viking Wind Farm were assessed in detail and reported in Chapter 16 of the 2009 ES. Changes to that assessment are reported in Chapter A16 of this ES Addendum.

A10.4 CHANGES IN METHODOLOGY

No changes to the methodology have been made.

A10.5 CHANGES IN BASELINE CONDITIONS

No significant changes in the baseline conditions have occurred.

A10.6 CHANGES IN THE PROPOSED WIND FARM

A number of changes have been made to the size and layout of the proposed wind farm. A full description of these changes is provided in Addendum Chapter A4 and the background to the changes is described in the introduction, Chapter A1. In terms of non-avian ecology, the reduction of the proposed wind farm from 150 to 127 turbines, the removal of about 14km of track and the reduction in width of much of the remainder, and the removal of borrow pits, laydown areas, construction compounds and anemometers, all result in a very large reduction in the amount of land occupied by the proposed wind farm both during construction and after construction is completed. Effects on peat habitat types are much reduced, because many of the deleted parts of proposed wind farm would have been built on peat. (As stated in the 2009 ES, the ground cover in Collafirth, where all

[1] http://www.scotland.gov.uk/Topics/Built-Environment/planning/National-Planning-Policy/newSPP

development has now been deleted, is dominated by intact, active bog.) The effect on other habitats is also reduced.

A total of 18 water crossings would no longer be required.

The revised layout results in sizeable percentage reductions in the quantity of acid grassland, blanket bog/mire, semi-improved grassland, wet heath and wet heath-grassland mosaic habitats lost to the development in both the construction and operational phases. See Tables A10.2, A10.3, A10.6 and A10.7 below.

A10.7 CHANGES IN AGREED MITIGATION

In Chapter 10 of the 2009 ES, a number of mitigation techniques were outlined to remove, or reduce as much as possible, impacts to important habitats and associated non-avian ecological receptors (ornithological receptors are discussed in Addendum Chapter A11). Measures such as micro-siting of infrastructure, best practise techniques for control of pollution and sedimentation and habitat reinstatement were outlined and these mitigation techniques remain as they were described within the 2009 ES. However, the Site Environment Management Plan (which will control the environmental management of on-site operations during construction) has been extended, updated and re-written, and now contains more robust commitments to the protection of the natural environment. Please see Appendix A14.6.

Habitat compensation and the Habitat Management Plan

Habitat compensation efforts are largely focused on offsetting blanket bog habitat loss through bog restoration, as well as on protecting the favourable conservation status of bird species. The proposed measures are laid out in the revised and enlarged Habitat Management Plan, Appendix A10.9.

One of the main issues surrounding the measures outlined within the 2009 HMP was that these measures were not sufficiently extensive, and not backed up by firm commitments with land managers. Consultees wished to see evidence that the methods outlined for restoring blanket bog habitat would be carried out in practice. Therefore, VEP has continued the process (which began prior to the 2009 ES submission) of approaching land managers to obtain land management agreements in order to implement the HMP. The criteria for site selection and details of how restoration would be taken forward are described fully within the updated HMP. The agreements laid out with land managers at present would be formalised with contracts to cover the lifetime of the wind farm upon planning approval. Confidential details are provided to the appropriate authorities separately from this ES.

The purpose of this Habitat Management Plan (HMP) is to provide both the context and the planned actions to offset and compensate for potential remaining adverse effects (following avoidance and minimisation) of the construction, operation and decommissioning of the Viking Wind Farm. A secondary objective of the HMP is to alleviate the ecological impacts arising from past and present land management practices with the intention of conserving, enhancing and restoring native habitats within the vicinity of the Viking Wind Farm.

The HMP is primarily concerned with habitat management and ensuring that predicted wind farm impacts are reduced to such an extent that Favourable Conservation Status is

not significantly affected for the species and habitats under consideration (as per SNH 2006 guidance). Given the predicted impacts of the Viking Wind Farm outlined in the revised ES, the HMP has four main focuses: red-throated diver, merlin, whimbrel and blanket bog. It also includes a number of measures over and above offsetting predicted wind farm impacts that are aimed to further the conservation of these three priority bird species and one priority habitat.

This document outlines planned actions, alongside an initial work programme that summarises the steps that need to be taken, appropriate partners and suitable funding and monitoring mechanisms for the life of the wind farm. This HMP has been developed as an evolving plan that will be responsive to changes in circumstance, new information, best practice guidance and the results of its actions. It is planned that periodic progress reviews will be undertaken and that these will inform future work programmes and the techniques employed. The implementation of the HMP will draw upon a diverse range of expertise and knowledge and will be overseen by an independent advisory/monitoring group known as the Shetland Windfarm Environmental Advisory Group (SWEAG).

VEP is fully committed to providing best practice mitigation and this explicitly includes a commitment to establish, initiate and fund ongoing programmes of mitigation and enhancement work around the proposed wind farm. This commitment extends for the life of the project; a period of at least 20 years. Over time, the techniques used and the intentions of the HMP will inevitably change and evolve to reflect increased knowledge and experience arising from the project itself or from elsewhere.

A10.8 CHANGES IN THE IMPACT ASSESSMENT

Impacts on Designated Sites

Commenting on the 2009 ES, SNH objected due to potential impacts on the Sand Water SSSI. They acknowledged that '*although not directly affected by the windfarm itself or associated infrastructure within the development boundary, the Sand Water SSSI is likely to be adversely affected by other associated works outwith the development boundary*'. The potential impacts relate to changes at the A970/B9075 junction, to upgrades to the B9075 and its bridge, and to the location of a construction compound. In particular, releases of sediment and polluting materials, nutrient enrichment and possible changes to the flow reaching the Sand Water SSSI were issues of concern.

SNH suggested three changes to the plan that would address these concerns. These changes are (i) road alterations must take place on the north side of the existing B9075, so that the works do not encroach into the SSSI; (ii) construction methods, pollution prevention measures and details of water crossings and culverting to be fully agreed with SEPA, and ultimately implemented and controlled by the Ecological Clerk of Works; (iii) toilet, washroom and kitchen facilities for workers at the construction compound, near to Sand Water, to be in the form of sealed units which are regularly maintained and emptied to ensure no waste water spills from them.

VEP is happy to commit to all of these measures. Therefore no significant impacts are likely to occur on Sand Water SSSI.

Impacts on Habitats

Negative Construction Impacts

All terrestrial habitats which would be directly affected by predicted construction impacts in each of the three remaining quadrants, and changes in the area of habitat caused by 2010 design changes, are listed in Table A10.2 below. Note that this table does not total to the full area of the proposed wind farm because some elements of the development will be on previously-developed areas:

Table A10.2: Area of terrestrial habitat affected directly by predicted construction impacts and actual change from the 2009 proposals (hectares)

Habitat category	Site total	Change (+/-)
Blanket bog/mire	**170.88**	**-67.65**
Dry heath	**4.75**	**-0.07**
Wet heath	**10.65**	**-0.48**
Acid grassland	**5.54**	**-11.80**
Semi-improved grassland	**0.24**	**-0.06**
Dry heath grassland mosaic	**1.16**	**-6.75**
Wet heath grassland mosaic	**5.24**	**-2.84**

Table A10.3: Direct terrestrial habitat loss assessment

Parameter	Assessment	Change
Extent	Site wide	Remains site wide but the removal of all infrastructure from the Collafirth quadrant means that the extent is reduced.
Magnitude*	Blanket bog/mire = 170.88ha (Moderate) Heaths (wet and dry = 15.40ha (Low) Acid grassland = 5.54ha (Low) Semi-improved grassland = 0.24ha (Low) Heath/grassland mosaics = 6.40ha (Low)	Large reduction in the area of blanket bog/mire and acid grassland habitat lost directly as a result of construction activities although not enough to merit a change of magnitude category. Small reductions in the area of other habitats lost as a result of direct habitat loss
Duration	Long term	No change
Reversibility	Mainly irreversible	No change
Frequency	One-off	No change
Probability	Certain	No change

*Note that this does not total to the full area of the proposed wind farm because some elements of the development will be on previously-developed areas.

The reduction in the size of the wind farm results in reduction in direct habitat loss. Most significantly, the amount of blanket bog affected would be reduced by 23 hectares compared with the 2009 design. Habitats in the Collafirth quadrant, from which all wind farm development is entirely deleted, are dominated by intact, active bog; other quadrants all have significant areas of eroded and fragmented bog (please refer to the 2009 ES Volume 3 Chapter 10, section 10.5.3; and figures 10.07 – 10.11, which illustrate the extent of blanket bog habitats found across the site).

Table A10.4: Severance assessment

Parameter	Assessment	Change
Extent	Site wide	Remains site wide
Magnitude	Low	The removal of 14km of track means that the magnitude of severance impacts is reduced although still categorised as a 'low' magnitude impact
Duration	Long term	No change
Reversibility	Reversible	No change
Frequency	Single event	No change
Probability	Possible	No change

A reduction in the length and width of access track will reduce the severance impacts to habitats. In 2009 severance was assessed as "not significant" and so this reduction in track length will reinforce that assessment. Changes to the hydrology of blanket bog/mire systems are likely to be reduced and these are discussed in greater detail in Addendum Chapter A14 (Soils and Water).

Table A10.5: Pollution or sedimentation of aquatic habitats

Parameter	Assessment	Change
Extent	Site wide but also downstream beyond site boundary	Remains site wide
Magnitude	High	No change
Duration	Short term = event Short – medium term = recovery	No change
Reversibility	Reversible	No change
Frequency	One-off?	No change
Probability	Unlikely	The removal of 18 water crossings across the Viking study area means that the probability of severance impacts is further reduced.

Eighteen water crossings have been deleted from the Viking proposals. This is likely to reduce the likelihood of a pollution impact occurring. However, the magnitude of any such pollution event would remain high, and consequently measures to reduce the likelihood of such an event have been further developed and are described in the Site Environmental Management Plan (SEMP), Appendix A14.6.

Negative Operational Impacts

Terrestrial habitats affected directly by predicted operational impacts in each of the three remaining "quadrants", and changes in the extent to which these habitats are directly

affected following 2010 design changes, are listed in Table A10.6 below. These figures do not total to the whole site area, as noted previously. Note also that although the double-width access tracks are to be revegetated and narrowed to single-width following the end of the construction period, these restorations have not been counted back into the restored habitat figure since they are likely to remain in a modified condition compared with their original condition; and that these revised figures are based on improved certainty about the final extents of the required borrow pits, and therefore they include only the actual expected total areas of the borrow pits rather than the "areas of search" included in the figures for construction, given above, and for both construction and operation given in the 2009 ES. This is consistent with the requirements of the EIA regulations which require assessment of the likely impacts rather than always assuming "worst case".

Although these changes mean that the 2009 ES and the 2010 addendum figures are not directly comparable, the 2010 figures provide a more accurate picture of the likely effect of the proposed wind farm:

Table A10.6: Area of terrestrial habitat affected directly by predicted operational impacts and actual change from the 2009 layout (hectares)

Habitat category	Site total	Change (+/-)
Blanket bog/mire	**88.99**	**-107.67**
Dry heath	**2.3**	**-2.16**
Wet heath	**3.29**	**-6.63**
Acid grassland	**3.15**	**-11.81**
Semi-improved grassland	**0.14**	**-0.04**
Dry heath grassland mosaic	**0.74**	**-6.36**
Wet heath grassland mosaic	**3.86**	**-2.62**

Table A10.7: Direct Terrestrial Habitat Lost

Parameter	Assessment	Change
Extent	Site wide	Remains site wide but the removal of all infrastructure from the Collafirth quadrant means that the extent is reduced.
Magnitude*	Blanket bog/mire = 88.99ha (Moderate) Heaths (wet and dry) = 5.59ha (Low) Acid Grassland = 3.15ha (Low) Semi-improved grassland = 0.14ha (Low) Heath/Grassland mosaics = 4.60ha (Low)	Amount of habitat lost is reduced due to reduced size of proposed wind farm. Please see Table A10.6.
Duration	Long term	No change

Reversibility	Mainly irreversible	No change
Frequency	One-off	No change
Probability	Certain	No change

*Note that this does not total to the full area of the proposed wind farm because some elements of the development will be on previously-developed areas.

Negative Secondary Impacts

As stated within the 2009 ES, peatland habitats may be indirectly affected by habitat modification caused by excavations for turbine foundations and other structures because of the particular importance of hydrology to blanket bog habitats. The creation of cut faces through deep peat may give rise to a zone of drying peat behind them.

In Chapter 10 of the 2009 ES it was stated that the drying zone in the lower levels of peat (the 'catotelm') was unlikely to extend beyond 10m from cut faces, but that the upper levels of peat where bog vegetation is rooted (the 'acrotelm') may dry out as far as 20m from cut faces because the water flows more readily through the upper levels. However, Chapter 16, the assessment of Air and Climate effects, used much more cautious best, medium and worst case "scenarios" in calculating the possible emission of carbon from drying peat, allowing for peat drying as far as 100m back from cut faces.

Reduced drying distances are now assumed for peat in the catotelm in relation to the Air and Climate assessment, based on improved knowledge and advice from expert academic sources, and this is discussed in detail in Addendum Chapter A16. However, no change has been applied to the drying-out distance for the upper level where vegetation is present.

Notwithstanding this, the indirect habitat loss or modification which may be caused by excavations in peat would be smaller in the 2010 design because of the reduced number of turbines, tracks and other wind farm infrastructure. There is therefore no change in the assessment of "not significant".

Negative cumulative impacts

The 2009 ES stated that no significant negative cumulative impacts are predicted for habitats and this remains the case within the revised ES.

Positive construction, operational and secondary impacts

No significant positive construction or operational impacts on habitats were predicted in the 2009 ES, and this remains the case following the 2010 redesign. However, note that the Habitat Management Plan has been significantly re-worked since 2009, and major improvements to habitats (in particular restoration of peatland habitats) would stem from implementation of the HMP if the Viking Wind Farm is consented. Please refer to Addendum Appendix A10.9.

Impacts on Species

The 2009 ES stated that no significant negative impacts on otter, terrestrial invertebrates, freshwater macro-invertebrates, trout or salmon were predicted for the layout presented at that time. The 2010 design changes would further reduce the likelihood of effects on non-avian ecological receptors within and adjacent to the site. In particular, the reduction in the number of watercourse crossings is likely to further reduce any pollution or sedimentation impacts to freshwater macro-invertebrates and trout and salmon.

The Habitat Management Plan also provides for the removal of impasses and barriers to migratory salmonids within the catchments found within the study area which may increase the aquatic habitat available. The European eel (which has suffered a severe decline in recent years) may also benefit from such habitat management objectives outlined for salmonids within the revised HMP (this was not discussed in the 2009 ES). The removal of impasses and barriers may offer fish species opportunities by expanding the extent of habitat available to salmonids and the European eel. Please see the HMP, Appendix A10.9.

Reductions in impacts on terrestrial habitat are also likely to result in an associated reduction in effects on terrestrial invertebrates.

A10.9 SUMMARY AND CONCLUSIONS

The changes made to the design of the proposed Viking Wind Farm would result in reductions in impacts on terrestrial and aquatic habitats and on non-avian faunal receptors. In the main, these changes affect the extent rather than the magnitude or duration of any given impact. The removal of the Collafirth quadrant from the proposed layout is particularly important as that quadrant contained the best condition areas of intact active blanket bog.

The updated HMP provides greater detail on how VEP intend to undertake habitat compensation for blanket bog habitat and outlines the process underway to reach agreement with land owners to ensure that the commitments detailed would be implemented on the ground for the life of the wind farm should consent be given.

A10.10 REFERENCES

Scottish Government (2010). Scottish Planning Policy. Scottish Government, Edinburgh