

**ELECTRICITY ACT 1989 (SECTION 36 AND SCHEDULE 8)  
TOWN AND COUNTRY PLANNING ACT 1990 (SECTION 90)  
THE ELECTRICITY GENERATING STATIONS AND OVERHEAD LINES (INQUIRIES  
PROCEDURE) (ENGLAND AND WALES) RULES 2007**

**PUBLIC INQUIRY TO CONSIDER SECTION 36 ELECTRICITY ACT 1989 APPLICATION BY  
STEADINGS WIND FARM LIMITED FOR CONSENT AND DEEMED PLANNING PERMISSION  
TO CONSTRUCT AND OPERATE A WIND FARM AT KIRKWHELPINGTON,  
NORTHUMBERLAND (KNOWN AS STEADINGS)**

**PROOF OF EVIDENCE OF**

**WILLIAM LATIMER, BSc., MSc., PhD.**

**ECOLOGY INCLUDING ASSESSMENT OF CUMULATIVE EFFECTS**

**ON BEHALF OF STEADINGS WIND FARM LIMITED**

**BERR REFERENCE: GDBC/001/00278C**

**TYNEDALE COUNCIL REFERENCE: 20060540**

**NORTHUMBERLAND COUNCIL REFERENCE: 06/00023/CPC**

# **1. Introduction**

## **Personal Details**

- 1.1 My name is William Latimer. I hold the degrees of B.Sc. in Zoology, M.Sc. in Ecology and Ph.D in animal behaviour. Doctoral and post-doctoral research has led to a number of publications on bird and insect acoustic communication. I am a full member of the Institute of Ecology and Environmental Management (IEEM) and have been awarded the status of Chartered Environmentalist (CEnv.).
- 1.2 I have worked as a professional ecologist for over 25 years working originally for statutory (Natural England, then the Nature Conservancy Council) and non statutory nature conservation organisations (London Wildlife Trust, Surrey Wildlife Trust). At Surrey Wildlife Trust I was responsible for the management of the Trust's 24 nature reserves.
- 1.3 For the last 16 years I have worked in Environmental Consultancy, formerly with the Environmental Assessment Division at WS Atkins, working on a wide range of ecological and environmental issues related to Environmental Impact Assessment (EIA) and environmental resource management. Many of the schemes concerned the development of the transport infrastructure and the impacts of these on the environment. Other projects have related to the communications and energy sectors, an example of the former being a comparative assessment of a number of upland sites in the UK for a military communications facility and the latter including a baseline ecological study for the decommissioning programme at the UK Atomic Energy site at Dounreay and the ecology input into the EIA for the first phase of decommissioning. The study included an in-combination assessment of an adjacent windfarm.
- 1.4 Other areas of work comprised natural resource management and examples of such projects included a management plan for the Taw-Torridge Estuary in north Devon which looked in particular at issues of multiple use, river enhancement schemes for the River Wandle and River Thames in London, and contributions to habitat creation and species-protection during construction of the Millennium site on the Greenwich Peninsula.
- 1.5 Now currently employed at Faber Maunsell in Beckenham as Associate Director, I have a continued role in ecology and environmental assessment and act as technical advisor to a team of over 40 ecologists. The Environment department is currently providing ecological expertise in vegetation and species surveys and EIA to supporting planning applications by a number of key companies undertaking extensive developments of new housing and associated infrastructure.

## **Scope of Evidence**

- 1.6 This evidence presents a summary of the ecological impact assessment process undertaken as part of the EIA, indicating the iterative manner by which the final design for the windfarm has been achieved, a design which has taken into account the results of ongoing survey and developing strategies for mitigation.
- 1.7 The evidence will also consider the results of a cumulative impact assessment having regard to other developments, including other windfarms, in the area.
- 1.8 The evidence contains a synthesis of mitigation based on the EIA, its supporting specialist ecological reports, subsequent work undertaken in response to comments from consultees, and my own observations made during a site visit on the 5<sup>th</sup> and 6<sup>th</sup> of November. The site visit enabled inspections to be made of the proposed areas for the Steadings, Ray Fell and Green Rigg windfarm sites and the route options for the grid connections to Bedlington, Cramlington or Stella North substations.
- 1.9 Objections to the scheme on ecological grounds are considered.
- 1.10 This evidence is given on the understanding that it is my duty as an expert to help the Inquiry on the matters within my expertise and that this duty overrides any obligation to the persons from whom I have received instructions or by whom I am remunerated.

## **2. *Ecological Impact Assessment (EclA)***

- 2.1 The EclA has been completed adopting national guidelines for its conduct prescribed by the Department of Transport in its web-based Transport Analysis Guidance (TAG) and the guidelines of the Institute of Ecology and Environmental Management (IEEM 2006, **SWF 19.5**). The initial process of assembling information on which to base the assessment comprises preliminary data collection from a range of statutory and non-statutory consultees and completion of a Phase 1 Habitat Survey. These activities raise issues for more detailed consideration and indicate the scope of further, specialist surveys that are necessary to fully assess the ecological value of the site and to develop appropriate mitigation.
- 2.2 Further consultation with key consultees can significantly enhance this process. In the case of the Steadings Windfarm, responses from Northumberland County Council, the RSPB, English Nature (now Natural England) and the Northumberland Wildlife Trust in particular contributed to the process of further assessment. The complete list of

consultees is given in the Environmental Statement and its appended detailed reports (**SWF 1.2**). Specific issues involving more detailed studies are addressed in Chapter 2 of the Faber Maunsell report for Banks Group, Additional Ecological Assessment, December 2006. With the production of an Addendum Report in August 2007, it is considered that all responses have been adequately addressed.

## Surveys of Current Conditions

2.3 Surveys are described in the Environmental Statement (ES) and specialist reports. The following table summarises the results of the survey work which commenced in spring 2005 and continued up until August 2007.

**Table 1. Key Surveys and Results**

Survey	Reported in:	Key Results	Mitigation Proposed
Phase I Habitat Survey, August 2005	Chapter 7 of the ES, Phase Habitat Survey and Baseline Ecological Report (Faber Maunsell March 2006).	Identification of key areas of local ecological interest e.g. calcareous grassland, marshy grassland, and locations of notable plants identified.	Input into ground plan for turbine location and route alignment for access roads to minimise impact on valued ecological receptors.
Breeding birds 2006	Chapter 8 of the ES and Faber Maunsell Reports March 2006 & December 2006 (Breeding Birds)	Identification of some key areas of local ornithological interest	Input into ground plan, contribution to collision risk assessment (see below)
Migratory & wintering birds 2005, 2006	Chapter 8 of the ES, Faber Maunsell Report March 2006	Identification of some key areas	Input into ground plan, contribution to collision risk assessment (see below).
Vantage-point bird movement surveys & collision risk assessment	Faber Maunsell Reports March 2006, December 2006 & August 2007	Low collision risk demonstrated for majority of species	Movement of some wind turbine locations out of key habitat areas to minimise collision risk
Greylag goose movement survey 2005, 2006	Faber Maunsell Report, December 2006 (Additional Ecological Assessment) & August 2007	Identification of traditional flight paths from roost sites to feeding areas in the proposal site	Movement of some wind turbine locations from the traditional flight-line corridor.
Badger Survey, September 2005	Chapter 7 of the ES, Faber Maunsell Reports (Badger Assessment March 2006, Additional Ecological Assessment, December 2006 & Addendum Report,	Location of badger setts identified.	Mitigation by avoidance.

Survey	Reported in:	Key Results	Mitigation Proposed
	August 2007		
Watercourse surveys for otter & water vole 2005	Chapter 7 of the ES Faber Maunsell Reports Water Vole & Otter Assessment, March 2006 Additional Ecological Assessment, December 2006 & Addendum Report, August 2007	Presence of otters demonstrated, no holts identified. No evidence for the presence of water vole found.	Mitigation for habitat enhancements & protection. Input into design of internal access roads and watercourse crossings.
Watercourse surveys for crayfish 2005	Chapter 7 of the ES Faber Maunsell Reports March 2006 & December 2006 (Additional Ecological Assessment), August 2007	Presence of crayfish demonstrated in the Wansbeck catchment	Mitigation developed for species & habitat protection. Input into design of internal access roads and watercourse crossings.
Bat survey 2005, 2006	Chapter 7 of the ES Faber Maunsell Reports March 2006 & December 2006 (Additional Ecological Assessment), August 2007	Species present, flight-lines, foraging areas and roosts identified.	Movement of wind turbine locations to minimise collision risk, habitat creation to provide new feeding corridors.

2.4 The methods adopted for the ecological surveys utilised standard approaches and are described in the ES. The application of the SNH collision risk model (SNH 2000, 2005, **SWF 19.2 & 19.3**) merits a brief consideration here as this is a relatively new methodology for the evaluation of the particular ecological impacts relating to birds and wind turbines and is relevant to the cumulative impact assessment with respect to the three proposed windfarms.

2.5 The process is undertaken in two main stages, collection of survey information on the level of flight activity in the area which is then put into the collision risk algorithm.

2.6 Survey data are collected from key vantage points, normally positioned on the edges of the proposal site, from which it is possible to identify and track birds crossing the proposed windfarm area. Flight lines are described in terms of plan, altitude and frequency, i.e. the number of flights across the site, and registered on a map. Survey visits are undertaken so as to collect statistically valid information as required for key seasons, i.e. for birds on passage migration, breeding birds on the site, or wintering populations.

- 2.7 This information is put into a mathematical algorithm which is a mechanistic process for determining the risk of a bird being hit by a rotor assuming no avoidance behaviour. Further details of the variables required for input into the model are given in Appendix D of the Bird Assessment Report (Faber Maunsell, March 2006). The output of the model provides the number of collisions expected each based on the flight activity and the size and number of turbines, assuming no avoidance behaviour.
- 2.8 A more accurate assessment of risk is finally generated by applying a percentage avoidance factor based on the assumption that birds can, and do, take avoidance action. This factor is informed by the accumulating observations made on the responses of birds to windfarms and is generally accepted as ranging between 90 – 99% or more. The percentage of times that birds can avoid moving rotors is clearly a critical measure and is only informed by observational experience. The most recent figures (e.g. Percival 2007, **SWF 19.1**) suggest that avoidance factors in excess of 99.9% may be applicable to certain species (geese) with levels of around 98-99% for some raptor species. However, avoidance rates for other species are less well known and, until a more robust baseline of information is established, precautionary levels of 95% avoidance are generally adopted for collision risk assessments.

### **3. Key Results of Surveys**

- 3.1 The habitat surveys of the Steadings site have shown the predominant land-use type to be an agricultural field pattern of improved and semi-improved grasslands with some areas of arable land in the south of the site. These areas are of low ecological interest. Marshy grasslands are also well represented in certain areas of the site, particularly in the north west area, where, together with the complex semi-natural heathland mosaics of Lunga and Walney Craggs, they contribute to a high habitat diversity in this section of the site. Small streams and small plantation woodlands add additional local habitats with characteristic animal species associated.
- 3.2 Species surveys have recorded the presence of badgers on the site with one main sett identified in the north and what is considered to be an outlier sett in the south. Otters are known to frequent the streams on site and most probably the area around Sweethope Loughs. The native and endangered white-clawed crayfish occurs in the tributaries in the Wansbeck catchment.
- 3.3 The detailed bird surveys undertaken have recorded relatively few bird species of high ecological importance breeding on the site or present in large numbers during migration or overwintering. Species of note include goshawk which is considered to breed nearby (possibly Hawick Wood on the western edge of the site), peregrine

falcon and merlin (8 and 3 flight-line observations respectively but no breeding populations in the immediate locality) hen harrier though only one bird was observed during the winter surveys, curlew (3 breeding pairs), lapwing (15 pairs) and golden plover, observed over the site on passage migration only. Greylag geese occur mainly during the months of October and November, feeding in farmland in the south of the site.

- 3.4 Bat surveys have enabled the identification of flight corridors and the roosting sites (all buildings in the area are considered to be actual or probable roosts with the farms Crookdene, Plashetts, North Heugh and Quarry House being identified with roosting bats). A key area for noctule bat foraging was identified in the south of the site with other species, predominantly pipistrelles, but also *Myotis* species dispersed across the site, preferentially using the flight corridors provided mainly by stream courses, woodland edges and crag edges.
- 3.5 Other species of note that have been identified from consultation and the desk study of existing information include red squirrel and the pearl-bordered fritillary and large heath butterflies. Both butterflies are BAP species of conservation concern. Of these, only the large heath could, in theory, suffer some impact from the minor losses of marshy grassland. Large heath has a northern distribution in the UK occurring primarily on bogs with cotton grasses, cross-leaved heath and jointed rush, a habitat rare on the Steadings site. Reptiles, e.g. adder, common lizard which are BAP species and legally protected against killing and injury, are known to be present, mainly in the areas of suitable heathland vegetation. These areas are now excluded from the proposal site and the occurrence of reptiles in the remaining areas of agricultural pasture and arable land is considered unlikely.

#### 4. ***Ecological Evaluation***

- 4.1 The evaluation of ecological resources and receptors (those resources under potential impact) has been undertaken in the conventional manner and is described fully in the Chapter 7 of the ES and the specialist reports cited in Table 1 above. Essentially a hierarchical approach is adopted with the highest value is placed upon rare; vulnerable or declining habitats or species cited in the Annexes of the European Bird and Habitat Directives, resources for which member states must take conservation action to maintain a favourable status, generally by the notification of protected sites. Thus heaths and peatlands, cited on Annexe I of the Habitats Directive, merit a high evaluation. Birds such as peregrine, merlin, hen harrier and golden plover are listed in Annex I of the Birds Directive. Areas that are known to qualify for protection under European criteria are given legal protection under the Wildlife and Countryside Act 1981 (as amended) by the national SSSI (Site of Special Scientific Interest) network.

- 4.2 Nationally rare or decreasing habitats or species may be listed in Red Data books or be the subject of national, or local, Biodiversity Action Plans (BAP), for example, pipistrelle bats, upland calcareous grassland, wet rush-grasslands dominated by purple moor-grass. For the habitats and species listed in the BAPs there is some legislative impetus in as much as Section 74(1) of the CRoW Act 2000 (**SWF 7.9**) (as amended by the Natural Environment and Rural Communities Act 2006, **SWF 7.10**) places a duty on Ministers and Government Departments “to have regard” to the purpose of conserving biological diversity in accordance with the UN Convention on Biological Diversity 1992. The key species or habitats for which there are UK BAP targets are listed under Section 74 of the CRoW Act. In addition, Section 40 of the Natural Environment and Rural Communities Act 2006 extends to all public authorities the existing section 74 duty to “have regard to biodiversity as far as is consistent with the proper exercise of their functions”. Planning Policy Statement (PPS) No. 9 (**SWF 4.3**), encapsulates these duties required of planning authorities in respect of biodiversity.
- 4.3 The conservation status of UK bird species has been categorised into Red and Amber lists (JNCC 2002, **SWF 19.6**) denoting species of high and moderate conservation concern respectively (e.g. lapwing and curlew are placed in the Amber list). Where species and habitats are covered by legislative requirements or otherwise recognised to be of high conservation concern by being listed in the national BAP, appropriate mitigation is required.
- 4.4 Recent UK government guidance to planning authorities PPS 9 goes beyond the protection of key sites by focussing on the requirement to maintain biodiversity at all levels, at plan policy level, in planning application decisions and within and without protected sites. The emphasis on the maintenance of biodiversity and functioning ecosystems has particular resonance in the face of climate change. However, the evaluation of “biodiversity” particularly at the local level poses some difficulties where perhaps the baseline of information at the local scale is incompletely known, e.g. the size of the breeding population of golden plover in Northumberland or the extent of marshy grassland. In such cases, approximations and the application of professional judgement is necessary.

## **5. Mitigation Strategies**

- 5.1 The mitigation strategies considered below will continue to be informed by repeat surveys, in particular for the presence of protected species and other valued ecological receptors, undertaken prior to any preparatory site works and during the construction programme. Detailed mitigation strategies will be developed as necessary in consultation with Natural England and the Environment Agency. The key strategies considered below are considered in Chapters 7 and 8 of the ES (on

Ecology and Ornithology respectively), and the supporting specialist reports, Chapter 17 of the ES (Environmental Management), Chapter 18 (Land Management Proposals) and the Draft Environmental Management Plan.

### **Mitigation by Site Avoidance.**

- 5.2 The location points of the wind turbines on the site have been adjusted so as to avoid, as far as possible, areas where there are valued plant communities or notable plant species. Thus the areas of marshy grassland and heathland mosaics of Walney, Lunga Crag and Sweethope Crag have been avoided entirely, thus retaining these areas undisturbed for breeding and feeding birds. The location points for the turbines in the remainder of the site have been further refined in response to the findings of the bat surveys which have identified the traditional feeding and movement corridors within the site. Turbines have been moved to avoid close proximity to these corridors, centering the structure in open ground away from woodlands, woodland edges and watercourses.
- 5.3 Proposed turbine locations in the south of the site which formerly impinged upon the noctule bat feeding area have been re-located to the north (at distances of 0.7 & 1.3 km respectively). Similarly, the relocation of these and two other turbines in the south west of the site, and the removal entirely of turbine 15, have been of benefit to greylag geese by their removal from the traditional flight corridor. The relocation of turbines due to the presence of protected or sensitive animal species has resulted in no change to the impact evaluation on vegetation criteria or upon the other groups considered in the EIA (butterflies reliant on marshy grasslands, brown hare and red squirrel). It has been possible to locate all turbines except one at distances of over 500 metres from bat roosts. One roost remains at a distance of 410 metres from the nearest turbine (no. 17) though very few bat passes have been registered at this location. Turbine locations, following the above mitigation, are shown in the Figure.
- 5.4 Following major re-locations of turbine to achieve the required mitigation, additional fine-tuning can be achieved by "micro-siting" some other turbines (i.e. movements of up to 50 metres) to give additional clearance to flight corridors for bats in particular but also, in some locations, certain bird species (e.g. raptors gaining lift on the up-currents at Sweethope Crag). The locations of 7 turbines in particular, numbers 1, 2, 3, 13, 16, 21 & 22, can be adjusted in this way. The micro-siting of turbine 20 should minimise land-take at an areas of calcareous grassland and marshy grassland.
- 5.5 The alignment of access roads and cabling routes within the site has similarly taken account of the presence of valued plant communities, notable plant species, and

those sections of watercourse deemed to be of particular ecological interest. With the re-location of some of the turbines it has been possible also to refine the alignment of the access tracks to gain environmental benefits and locally reduce the ecological impacts. Thus, the number of watercourse crossings has been reduced by the new layout. Turbines have been sited well beyond the critical radius around badger setts.

- 5.6 All ecologically sensitive areas within the planning application boundary but outside the areas needed for essential works will be demarcated by temporary fencing during construction to avoid accidental incursions by construction staff or machinery. Strict controls in accordance with Environment Agency guidelines will be put into place to protect watercourses from accidental pollution from run-off from working areas or accidental spillages (see Ch 17 of the ES and the Environmental Management Plan).

### **Mitigation by Seasonal Avoidance.**

- 5.7 Site clearance and construction works will be seasonally organized so as to avoid damage to animals during either their breeding season, e.g. breeding birds, or during hibernation (e.g. bats, crayfish). Thus vegetation clearance in areas of bird breeding activity will be undertaken during the months of August to February while any bankside works on streams will avoid the winter months when crayfish may be in hibernation in bankside refuges. Any trees for removal will be assessed for the possible presence of roosting bats.

### **Mitigation by Habitat Engineering.**

- 5.8 All works and the watercourse crossings in particular will take account of the requirements to avoid disturbance to watercourses from pollution, bankside works or re-alignments. Each crossing will be designed in consultation with the Environment Agency. Crossings will be constructed adopting box culverts with a natural stream-bed. Crossings in the Wansbeck catchment with its resident population of white clawed crayfish will adopt particular measures. Here, crossings will retain the natural banksides where possible by an over-arching span or provide re-formed stone gabion banks that offer refuges for crayfish and other aquatic fauna. This will assist in minimising impacts on the watercourse ecosystem with resulting benefits to crayfish and otter.
- 5.9 A proposed variation in the internal access road in the vicinity of turbines 2, 4 and 5, primarily to preserve archaeological features, is favoured also on ecological criteria as the new crossing, to connect turbines 2 & 4 at a point where the stream flows in a more incised valley, will favour the retention of natural bank profiles. Where necessary, any crayfish at risk from construction of the watercourse crossings will be

removed temporarily from the working reach. Such plans would be agreed with Environment Agency and Natural England and all works would necessarily be conducted under licence from Natural England.

## **Mitigation by Habitat Creation and Management**

- 5.10 A Land Management Plan is to be prepared for the site in order to enhance appropriate ecological features within the site without adding to the risk of adverse impacts arising from, for example, bird or bat collision. Thus key flight lines for foraging bats will be reinforced with new plantings of shrubs and trees to draw bats away from the turbines. Where appropriate, such vegetation will be routinely cropped, (by hedge laying, tree coppicing or pollarding) to maintain a low habitat structure and prevent animals from flying higher into the zone of turbine blade rotation.
- 5.11 Watercourses, forming one of these foraging flight-lines, will be further enhanced by appropriate fencing to reduce damage from stock, both from grazing and poaching, and allow the development of waterside vegetation. There may be opportunities for additional enhancements, following detailed survey, relating to re-establishment of marshy grasslands in the riparian zones by providing natural stone weirs in the streams to raise local water tables and so compensate for the loss of some of the marshy-grassland habitat type to construction. Such mitigation would compensate for any loss of large heath butterfly habitat. Sections of the stream corridors will be enhanced by plantings of deciduous trees comprising species such as common sallow, alder, ash, and mountain ash. Artificial holts can be constructed in these areas to provide additional refuges for otters. These measures will provide new resting places and foraging areas for otter and badgers.
- 5.12 Where any other areas of value are necessarily lost to construction, the movement of whole turves or topsoils will be undertaken prior to the works. Receptor sites of similar geology and drainage will be identified within the site from those areas that have lost any significant degree of biodiversity to agricultural "improvements" (over 50% of the site has been subject to intensive grassland improvement with a further 30% considered semi-improved).
- 5.13 Long-term management and regulation of the grazing regime in the areas of species-rich marshy grassland and heathland mosaics that have been excluded from the development area will ensure that the dwarf shrub component of the vegetation is maintained and the structure of the vegetation remains suitable for nesting by upland bird species.

- 5.14 Further details of management, including long-term commitments, are explained in Chapter 18 of the ES, Land Management Proposals.

## **6. *Assessment of Cumulative Impacts***

### **Adjacent Wind-farm Proposals**

- 6.1 In view of two other proposed windfarms to be sited in the same region as the Steadings proposal, Ray Fell and Green Rig, a cumulative impact assessment has been requested.
- 6.2 Cumulative assessments take into account the change in the baseline status of ecological receptors due to concomitant and usually neighbouring or at least interconnected developments. These issues are more fully discussed in Chapter 6 of the Additional Ecological Assessment, December 2006.
- 6.3 The cumulative assessment undertaken in the above document has concentrated on a qualitative approach based on the information available in the respective Environmental Statements for the windfarms considered with respect to any cumulative habitat loss and cumulative displacement of bird populations. The results of the assessment are summarised in Table 2 below.

**Table 2. Principal Habitats and Species under impact from the three Proposed Windfarms.**

**Key:** X Habitat absent.  
 + Habitat present with minor habitat loss (<0.1 ha).  
 ++ Habitat present with significant losses > 0.5 ha.

Habitat/Species and Primary Designation	Steadings	Green Rig	Ray Fell
Bog (Annex 1 habitat)	X	++	++
Dry Heath (Annex 1)	X	X	++
Marshy Grassland (purple-moor grass formations – Annex 1).	+	+	++
Peregrine falcon (Annex 1 species)	No territories (0)	0	2
Hen harrier (Annex 1)	0	0	1
Merlin (Annex 1)	0	0	2 suspected
Short-eared owl (Annex 1)	0	0	2
Golden Plover (Annex 1)	0	0	13
Goshawk (Red Data)	0-1 territories	0	4-5
Grey lag goose (Red Data, Amber list)	Traditional flight line	0	Flight lines present
Lapwing (Amber list)	15 territories	8-9	27
Curlew (Amber list)	3 - 4	2 – 4	7
Kestrel (Amber list)	3 - 4	1 – 4	18
Common buzzard	2-3	2	13

6.4 The conclusions of the cumulative assessment in respect of the contribution that the Steadings windfarm would make are therefore:

- (a) Habitat loss. Different habitats are predominantly affected at each windfarm site such that there is no amplification of loss of any one habitat type due to losses in combination. Ray Fell would suffer loss of dry heath and peatland (bog) habitats, Green Rig, mainly peatland and acid grassland while the habitats mainly affected at Steadings are the less ecologically valuable improved and semi-improved agricultural grasslands. Steadings would make a minor contribution to in-combination losses of marshy grassland.
- (b) Displacement. Cumulative losses of breeding birds to displacement are a simple summation of the number territories affected by each windfarm with identification of those species where past research has shown a particular sensitivity to the visual “clutter” of windfarms or other artificial structures. For a number of upland breeding birds, with the target species selected on the basis of vulnerability to exclusion effects, there is accumulating evidence for a high degree of tolerance. For some other species however,

e.g. curlew, there are clear data on significant displacement effects (up to 500 metres). At Steadings, the exclusion of the better, more extensive, areas of heathland and wet grassland mosaics from the windfarm site, should favour the retention of the breeding curlew population.

(c) While an in-combination collision risk cannot be applied to the three windfarms together, the absence of Annexe 1 breeding bird species at Steadings, and the generally low incidence of occurrence at other times of year is suggestive of a very low contribution to the overall risk to important upland bird populations from collision mortality from the Steadings turbines.

6.5 Within the parameters described above, it was concluded that there were no significant cumulative impacts over an above those of a simple summation of impacts that could arise from each individual proposal.

6.6 The RSPB, responding to consultation on the Steadings proposal by letter (to the DTI Power Station Consents Unit, dated 14/03/07) commented on the Cumulative Impact Assessment in the December 2006 Additional Ecological Assessment. They noted the presence of a number of breeding species at levels over the significant 1% level of the County population over the three windfarms but acknowledged that these occurred “predominantly or exclusively within the Ray Estate study area”. They noted that breeding lapwing were distributed more evenly across the three windfarms and considered the 50 (approximate) breeding pairs to be in excess of the 1% County level. Population estimates are available for Northumberland in the form of logarithmic bands (Northumberland & Tyneside Bird Club 2003, **SWF 19.4**). The bandwidth for lapwing is from 1000 – 9,999 breeding pairs. While the conclusion by the RSPB that the 50 pairs at the proposed windfarm sites represents 1% of this population is not unreasonable, there is clearly a significant range of potential error to consider.

6.7 The RSPB note that it is “highly unlikely that all lapwing pairs would be displaced from within the three proposed windfarms” but continue to note that there is some equivocation over the research results with some studies showing little or no displacement, but one cited work suggesting displacements of up to 350 metres from turbines.

## **The Grid Connection**

6.8 The route of the connecting power lines to three possible electricity substations at the urban centres to the east of the windfarm site will depend on the number of windfarms gaining planning permission. The substations at Bedlington and Cramlington to the north of Newcastle, and Stella North on the river Tyne to the west of the city have been identified as probable connection facilities. The route options to these substations have been examined by a desk study which has located areas of nature conservation interest

(and other environmental designations) and the results are shown in Drawing TNEI Figure 1 (NT03613/034). The route corridors have also been assessed visually by a site inspection on the 6<sup>th</sup> of November 2007. The desk study and visual assessment has sought to identify particular habitats of ecological interest and to consider the likelihood of the power lines posing a particular collision risk to birds.

- 6.9 There are no designated statutory or non-statutory sites of nature conservation interest along the route options. The corridor to Cramlington would need to cross the valley of the River Blyth but would probably do so upstream of the reach with designated ancient woodlands along the valley. Similarly, the Stella North connection would need to cross the river Tyne but in an area with no nature conservation designations and dominated by the urban and light-industrial environment. A new line if needed would cross the river along with other existing power lines.
- 6.10 The landscape between the windfarm sites and the substations is relatively uniform, slightly undulating and dominated by mixed farming. Small scattered woodlands, small conifer plantations and a network of hedgerows are typical features. There appear to be no distinctive landforms that birds might follow in local or regional migrations. Detailed planning for the route alignment would ensure that any potentially sensitive habitats such as small woodlands were avoided; similarly the distinctive but small scale Shaftoe Crags east of Kirkwhelpton where soaring raptors may preferentially hunt on the updrafts can also be readily avoided.
- 6.11 At the route corridor options approach the fringes of the small settlements to the west of Newcastle, local power and telephone lines are a common feature in the landscape in addition to a number of high-tension power lines on metal-lattice pylons. While any new structure such as a power line provides an element of additional risk to birds in flight, the lines envisaged for the grid connections are limited in scale and carried on wooden poles, thus probably providing an enhanced visibility. A significant additional risk to birds in flight from these lines seems unlikely.

## **7. *Assessment of Residual Impacts***

- 7.1 This section considers the likely scale and magnitude of the residual impacts at Steadings, i.e. those impacts that cannot be fully mitigated and which may therefore be expressed as a result of the development in comparison to the baseline condition before construction. The assessment takes into account the probability of success of mitigation and continues to apply the precautionary principle.

## Plant species and Plant Communities

- 7.2 Site selection for the turbines and access roads has minimised losses though in some cases it has not been possible to avoid all areas of local ecological interest. These areas, primarily marshy grasslands, have been identified on the basis of a more diverse plant community though this community type is widespread throughout the county. Minor losses of this habitat type can be adequately mitigated by the proposed enhancements of stream corridors (considered further below). On the precautionary principle the impact on plant biodiversity of local interest is considered to lie between neutral and slight adverse.

## Birds

- 7.3 The site is not considered to be situated in an area of key bird importance, whether for breeding, wintering or migrating species. Following application of the collision mortality models, the residual impact, on the precautionary principle, is considered to range from neutral to slight adverse depending on the species with the exception of greylag geese for which the assessment of potential impact is moderate adverse.
- 7.4 Turbine rearrangement (one turbine removed and two repositioned further north) with respect to the habitual flight corridor for greylag geese, and for an area of bat flight activity, has resulted in a reduction of collision risk in the south-western corner of the site. In the ES the precautionary principle has been maintained however with respect to greylag geese and the assessment of moderate adverse impact has been retained, despite the mitigation provided by the movement of the turbine locations. In practice, this is likely to err on the side of over-precaution due to the following reasons.
- The ecological receptor, greylag geese, has been evaluated on the basis that the animals under potential impact belong to the migratory Icelandic population, rather than the feral UK population (the latter would attract a lower ecological value).
  - The collision risk assessment has taken all turbines in the Steadings array into the calculation of risk, rather than those few turbines in the south of the site where the geese traditionally occur,
  - The most hazardous of the turbines have been relocated to the north.
  - Emerging data from ongoing monitoring of operational windfarms indicates that a very high avoidance factor for geese of around 99.93% is applicable (Percival 2007 **SWF 19.1**).
- 7.5 For these reasons, a lower magnitude of impact might be expected during operation, should this application proceed. Monitoring of collision incidence will be undertaken to determine the need for any additional mitigation such as habitat manipulation to

either dissuade geese from entering the edge of the array or to feed elsewhere. For the present, no additional mitigation, following re-siting of the relevant turbines, is considered necessary.

## **Bats**

- 7.6 While it has been possible to make adjustments to some turbine positions to reduce the risk of bat collision, ongoing research on the impacts of wind turbines shows that bats are at risk of mortality. A residual impact of slight adverse remains for this group. Habitat enhancements may result in an improvement in the status of insect prey and therefore compensatory re-enforcement of the bat population may occur but this remains at present speculative.

## **Otters & Crayfish**

- 7.7 The ES considers that the minor losses of stream corridor habitat to access road crossings will lead to a minor adverse impact on these two species. With suitable enhancements to the riparian habitat being completed successfully and maintained over the long-term under the Land Management Plan, there is likely to be further amelioration of any potential minor adverse impact such that the overall effect is neutral.

## **Badgers**

- 7.8 In view of the minor areas of habitat loss to the footings of the turbines and access roads impacts upon the local badger population are deemed to be of the order of neutral-minor adverse. Enhancements undertaken under the Land Management Plan may improve the foraging quality of the site for badgers (e.g. riparian management) which may further reduce any residual adverse impact.

## **8. *Objections Received.***

- 8.1 No objections have been received from the statutory regulators Natural England and the Environment Agency. Northumberland County Council, having commented fully on ecological issues arising from Environmental Statement, has objected on landscape criteria only. No objections have been received from the RSPB in relation to potential impacts on birds or other sensitive receptors.
- 8.2 In a letter dated 31<sup>st</sup> of May 2006, Northumberland Wildlife Trust registered an objection based on concerns over the local impacts on biodiversity and considered that other sites may be more suitable on these grounds. The Trust considered the development would be contrary to a number of local policies for nature conservation (Policies NE26, GD10 and CS16 of the Tynedale Local Development Plans). In a

later e-mail (dated 21/03/07) the Trust indicated that it would sustain its objection based on the concerns over the cumulative impacts of all three proposed windfarm sites.

- 8.3 Since that date, the proposers and Faber Maunsell ecologists have been in consultation with the Trust regarding their concerns. It is not clear, at the time of writing, whether the Trust intends to maintain its objection.
- 8.4 No other objections on ecological criteria have been raised from relevant wildlife conservation organisations.

## **9. Summary**

- 9.1 The majority of the proposed Steadings windfarm site is dominated by agricultural habitats of relatively low ecological diversity. Where significant areas of high-value habitat are present, these have been excluded from the development site. Similarly, with respect to bird populations there are relatively few species or populations present of high ecological concern. After mitigation, ecological Impacts arising from the proposed Steadings windfarm considered to be low adverse to neutral for the majority of ecological receptors
- 9.2 The only receptor that may experience a higher level of adverse impact is the wintering population of greylag geese (figures modelled on the assumption that the birds belong to the migratory Icelandic population). In this case a precautionary impact has been ascribed, after mitigation by moving the more hazardous turbines, at a level of moderate adverse in view of modelling figures showing a possible loss of 6 birds per annum to collision (assuming a 99% avoidance factor). For the reasons discussed above, this is likely to be an overestimation of risk.
- 9.3 Ecological mitigation has been applied throughout the design of the scheme. The process will continue by repeated, and where needed, more detailed surveys prior to the onset of construction both for the purposes of species protection and to produce the detailed designs needed for new plantings, watercourse enhancements and the method statements needed for operation such as turf transplants or the creation of marshy grasslands from local works on the stream channels.
- 9.4 Management, as described in the Land Management Proposals will secure benefits for nature conservation over the long-term.
- 9.5 I conclude that, insofar as concerns ecological and ornithological impacts, there is not a sustainable basis for rejecting the Steadings proposal.

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