

NATURAL HISTORY SOCIETY OF NORTHUMBRIA

PROOF OF EVIDENCE

In preparing development plans, planning authorities should seek to ...

(ix) Enhance as well as protect biodiversity, natural habitats, the historic environment and landscape, and townscape character.

(x) Address, on the basis of sound science, the causes and impacts of climate change, the management of pollution hazards, the safeguarding of natural resources, and the minimisation of impacts from the management and use of resources.

(Planning Policy Statement 1, paragraph 27 ‘Delivering sustainable development’.)

The Government’s overall aim is to protect the countryside for the sake of its intrinsic character and beauty, the diversity of its landscapes, heritage and wildlife, the wealth of its natural resources and so that it may be enjoyed by all.

All development in rural areas should be well designed and inclusive, in keeping and scale with its location, and sensitive to the character of the countryside and local distinctiveness.

(Planning Policy Statement 7, paragraphs 1: iv & vi, ‘Key Principles’.)

1. The Natural History Society of Northumbria, founded in 1829, now has upwards of 800 members. Its objects are ‘the encouragement by every means of the study of natural history in all its branches and the conservation of the natural environment in the North East of England, including its geology, flora and fauna’. It is to further the second of these that the Society objects to the proposals for wind farms at Green Rigg, Steadings and Ray. We approve of the sustainable harnessing of windpower and do not habitually object to windfarms, in fact have never done so before. But we feel strongly that all three of these particular proposed windfarms will do more harm to the environment than good.

2. Carbon balance.

2.1 The Society recognises the severe threat to human beings and to flora and fauna throughout the world of global warming, principally caused by the longstanding and continuing human use of carbon fossil fuels, destruction of forests and secondary destruction of peat soils, all releasing carbon dioxide and other greenhouse gases into the atmosphere. It therefore strongly supports the government’s intention to save energy and produce it by sustainable means (Energy White Paper, 2007). Production is not sustainable where the total energy used to create the means of production outweighs the output. Where the difference between the use and the output of energy is small, other factors become crucial in determining whether the proposed means of generation is acceptable. We believe that to be the situation in the case before this Inquiry.

2.2 We contend that, in assessing the contribution these particular windfarms may be able to make to sustainable energy production, it is essential to calculate both the predicted output of the turbines (in terms of equivalent carbon fuel saved during the lifetime of the turbines) and the total cost in terms of carbon fuel consumption of their manufacture, transport, erection, servicing and decommissioning and all the associated works. It is the difference between these two figures that must be the basis for all assessments of the value of the windfarms to be set against their disadvantages. Their gross output of electricity or their output as a proportion of national energy production are inappropriate figures to use in such assessments. Nor is the financial cost (or the comparison of monetary cost with that of other means of energy production) relevant to the sustainability of the project. It is the net carbon cost or benefit that matters.

2.3 The calculated output of the turbines needs to take into account the loss of power resulting from the electrical resistance of the cabling connecting them to the grid and to the distant point of consumption. The carbon cost needs to include the carbon fuels used in the whole construction and decommissioning processes and in the getting and refining of the raw materials, the manufacture of the turbines themselves (whether in the UK or abroad), of the vehicles and other equipment used (and partly worn out) in all transport, mining, road making, and workforce movements throughout the life of the windfarms and, in addition, the loss into the atmosphere of carbon from the felling of trees and from damaged peat bogs.

2.4 Data on the predicted output of the turbines should include the raw results of the anemometer readings, not simply the interpretations made by the applicants.

2.5 The Society does not have the expertise or detailed information required to make the calculation of the carbon cost or benefit of these projects. We maintain that making this calculation is the duty and responsibility of the applicants and that their figures, in great detail, should be presented to the Inquiry at an early stage.

2.6 We base our case for these contentions on the Government's Energy White Paper *Meeting the Energy Challenge* and *Public Policy Statement 22* (Renewable Energy) where saving energy (nationally and internationally) is properly regarded as just as important as producing it in a sustainable way.

The starting point for our energy policy is to save energy. It is often the cheapest way of reducing carbon emissions, certainly in the short term. (Meeting the Energy Challenge, page 9 paragraph 5).

2.7. The power lines to be used to connect the turbines to the grid have not been defined. Three matters concern us. The loss of energy in long cables has been mentioned in paragraph 2.3 as a factor in the calculation of the carbon-balance efficiency of the windfarms. Another is the risk of ice or snow damaging cables (especially low-diameter cables) at times of peak demand thus reducing the long-term efficiency and usefulness of the windfarm. The third is the very significant risk of bird strikes on cables that span areas of open moorland where birds often fly at low altitudes in conditions of poor visibility. Swans, buzzards, other raptors, and grouse are among the species particularly at risk from this hazard. Burying cables

underground would carry a heavy risk of damaging blanket bog by creating additional drainage channels, and in the case of Steadings windfarm would be a further factor damaging the mediaeval landscape (see section 10 below).

3. The objections of the Northumberland Wildlife Trust and the Royal Society for the Protection of Birds

3.1. The Society fully supports the objections of the Trust to all three windfarm proposals, as set out in the letters from Matt Lambert (Conservation Officer) objecting to the Ray Wind Farm on 19 January 2006 and 23 February 2006; to the Steadings Wind Farm on 31 May 2006; and to Green Rigg Windfarm on 29 September 2006. It also fully supports the objections of the RSPB to the Ray Wind Farm, as set out in the letter by Anna Moody (Conservation Officer) in her letter dated 17 February 2006. We recognise that certain ameliorating changes to the proposed developments have been made since these letters were written (such as the withdrawal of turbines from Ottercops Moss and near Thockrington and Colt Crag Reservoir), but the objections to all other aspects of the proposals remain valid.

3.2. The Trust objects to the Ray Wind Farm on the grounds that it will have an adverse impact on the buffer zone between two Red Squirrel Reserves and on European-protected habitats such as blanket bog and species such as the hen harrier. Matt Lambert's letter of 23 February 2006 cites the infringements of national and local policies involved. Similarly the Trust objected to the Steadings proposal on the grounds that it would damage wildlife habitats and in particular mires and species rich grasslands; would harm protected species (otter, white-clawed crayfish, large heath butterfly and several Annex 1 bird species); and that the mitigation proposed could not compensate for the damage. Again the infringed policies were listed. The Trust's objections to Green Rigg were similar, with emphasis on loss of blanket bog and the risk of bird collisions.

3.3. The RSBP objects to the Ray Wind Farm on grounds that can be briefly stated as (a) inadequate proposals to protect birds listed in Schedule 1 of the Wildlife and Countryside Act (1981, as amended), and other birds, from disturbance during the nesting season;

(b) understatement of the importance of the site for birds;

(c) failure to consider the impact of grid-connection power lines on birds;

(d) failure to recognise that the ES field vole survey was carried out in a year (2005) when numbers were at a low point in the population cycle; in more typical year, or years when vole numbers are high, the greater abundance of predators would increase the collision risks beyond those estimated in the ES;

(e) the methods used in the raptor survey well ill-defined, and certain excluded sightings were not recorded;

(f) the importance of the hen harrier was understated, as was the potential collision risk for displaying birds and juveniles;

(g) there were a number of flaws in the plans for mitigation.

3.4. We support these objections and comment further on some of them below.

4. Problems related to the Steadings Borrow Pit and the site road near Bavington Crags.

4.1 Threat to the White-clawed Crayfish in River Wansbeck. In certain weather conditions, or as a result of accident or human error, there is a risk of pollution of the Vicarage Burn from the Steadings “Borrow Pit” at Great Bavington (at approximately NY983812). This burn drains to the River Wansbeck where there is one of the few remaining populations of the endangered and designated White-clawed Crayfish. The Borrow Pit is in effect proposed as a limestone quarry at almost the highest point in the district (and thus incidentally with panoramic mutual visibility to and from a very large surrounding area). In windy conditions such an exposed site is certain to distribute alkaline limestone dust over the area with subsequent waterborne transmission to the local watercourses. Such dust also poses a risk to some elements of the local flora, which is particularly rich in scarce or rare plants (see paragraph 7).

4.2 Diesel exhaust from the quarry and from extremely numerous lorry movements passing close to this point will also pollute the air over a prolonged period with a significant risk to pollution-sensitive lichens and rare plants on the nearby crags including the Great Bavington SSSI. Potential fuel and oil spillages will flow down roads, draining into the local soil and watercourses, here and elsewhere.

5. Risk to blanket bog.

5.1 Blanket Bog is a priority habitat under the UK Biodiversity Action Plan and under European legislation. The proposed access roads for the Ray and Green Rigg windfarms will inevitably increase drainage of areas of bog where they cross peatland or drain adjacent ground. We are not satisfied that the proposed attempts to avoid this can succeed. Drainage of peat bog dries it, preventing the continued growth of the peat and leading to its gradual breakdown and loss (releasing carbon dioxide and methane into the atmosphere). It also severely diminishes its biodiversity.

5.2 We are particularly concerned about the blanket bog in the northern part of the Ray Windfarm (access roads to turbines 1, 2-3, 4-5, 4-10 and 11) and at Green Rigg (roads to turbines 1, 4-7, 8-3-9, and 8-11).

6. Risks to watercourses.

6.1 We are concerned about the potential pollution of watercourses both during the construction and decommissioning phases and also from road water run-off throughout the life of the developments. The risk of limestone dust pollution from the Steadings borrow pit is set out at paragraph 4.1. Throughout the Steadings windfarm the use of limestone for road-making will create widespread dust and run-off pollution which will find its way into local watercourses. Pollution of burns is a significant risk at Green Rigg (particularly of the flush and Curtis Burn from the access roads between turbines 17 & 18 and 8 & 11). We are not satisfied that sufficient precautions will be taken to prevent pollution of the tributaries of the Ottercops Burn and upper reaches of the Wansbeck (at risk from road stone quarrying at the Ray Borrow Pit near turbine 3) and the Lisle Burn and Ray Burn from nearby borrow pit quarries.

6.2 Small Burn marsh (NY951809) is the residue (after conifer plantation) of the once extensive and species rich Cranberry Moss. The burn will be crossed near the eastern upper limit of the marsh by the access road to Steadings turbine 22. The burn and marsh still have a moderately rich and scarce flora and pollution or other interference with it would be most undesirable. No measures to prevent this are mentioned in the proposals.

7. Risks to local flora

7.1 The botanical impacts of the developments appear to have been based on phase 1 habitat surveys and have not taken sufficiently into account the risks to individual rare, scarce and threatened plant species that have been recorded in the area. The whin sill outcrops (of quartz-dolerite) are a characteristic feature of Northumberland, barely represented elsewhere in Britain. The rock is mildly basic and poor in nutrients and the whin sill flora is accordingly special to the region.

... a distinguished flora, with several nationally rare or scarce species as well as local rarities. It is also distinctive to Northumberland ... (Lunn, A. *The New Naturalist: Northumberland*, 2004, p.182).

It is increasingly under threat from quarrying and overgrazing. In some places, such as Great Bavington, the whin outcrops in close proximity to limestone, providing a potentially particularly rich and scarce local flora.

7.2 No adequate lichen survey has been done in any of the windfarm sites. I am grateful to Dr Janet Simkin for supplying the only available list of the lichens (found by Oliver Gilbert and John Skinner in 1965-1980) in the Great Bavington area, but without precise locations, all of which are characteristic of whin rocks and are nationally and locally uncommon, though not rare: — *Aspicilia caesiocinerea*, *Lecanora gangaleoides*, *Miriquidica leucophaea*, *Neofuscelia loxodes*, *N. verruculifera*, *Pertusaria pseudocorallina*, *Candelariella coralliza*. In addition she has provided recent and much more extensive survey results for the Great and Little Whanney Crag, indicating that a rich lichen and bryophyte flora is present on at least some of the whin outcrops in the district. This can be made available to the Inquiry if required.

The whin crags and rock outcrops remote from previous air pollution are the sites where scarce lichens are most liable to be affected by the introduction of new sources of traffic pollution (especially sulphur dioxide). Quarry dust is another particular risk near borrow pits, particularly the Steadings borrow pit at Great Bavington, and to some extent also where new road works are close to lichen sites. Limestone dust greatly impoverishes lichen biodiversity (as shown downwind of the Weardale cement works) as does dust from whinstone quarrying (as at Barrasford in Northumberland) – (information supplied by Dr Janet Simkin). It may be concluded that the existing diversity of the lichen flora in the Great Bavington area and to a lesser extent near other whin outcrops such as Sweethope Crag, will be significantly impoverished by the proposed the quarrying and roadworks.

7.3 The whin crags near Great Bavington have a particularly rich and scarce flora for which a portion is designated a SSSI. The flora extends to other nearby crags outside the SSSI however, including the portions of Bavington Crag that lie just south

and north of the proposed Steadings borrow pit quarry. The flora of these crags are at grave risk of damage by dust pollution from the quarry and road works as well as from vehicle exhaust pollution during the period of heavy vehicle movements during the construction and decommissioning phases of the project. The attached list of the most relevant scarce or rare plants recorded in the 10km square NY98 (NHSN 1 / Appendix) is derived from Swan's *Flora of Northumberland* (1993) and from the list extracted from the county records by Dr Quentin Groom in July 2005 and supplied with the Steadings Environmental Statement. Although the exact locations for some of the plants are not recorded, the list contains several well-documented species, particularly in the Great Bavington district, that are at risk from the Steadings project (most notably the Annual Knawel, Maiden Pink, Wild Chives, the Hairy Stonecrop and the Mountain Pansy), and others are at risk from the Ray Windfarm.

7.4 The attached plant list also includes a few plants present in the 5km square NY9579, particularly the nationally rare Spignel *Meum athamanticum*. The historically important sole site for this plant in the north of England would have been at risk from the Steadings turbines near Thockrington now omitted from the proposals. It is essential that no return to the original plan for these southernmost turbines be permitted.

8. Bat surveys. We are not satisfied with the bat survey reports. Bat roosts are notably absent from the ecological surveys. Were any attempts made to get information about roosts? We are also surprised by the absence of records of the Brown Long-eared Bat in the ecological surveys. We are aware of roosts for this species at NY9286 (within foraging range of the northwestern Ray turbines) and NY0090 (barely within range of the Ray site). Permission for the development should be refused in the absence of a complete bat survey.

9. Bird Surveys.

9.1 We are broadly satisfied with the design and conduct of the bird surveys in the three Environmental Statements, but do not agree with their conclusions on the impacts the developments will have or on the effects of the proposed mitigation.

9.2 We believe that the importance of some bird species in the area, and of the risks to them, have been ignored or underestimated. The Raven is scarcely mentioned. This species is well recorded from the Ray estate and I have personally seen it both there (near Ray Fell) and near Great Bavington. It is a Red Data List species for the County. It is notoriously wary and unlikely to remain as a potential breeding species if the developments go ahead. The importance of the area for breeding and wintering skylarks and for wintering thrushes (fieldfares and redwings) is also underestimated.

9.3 We also believe that the impacts of the windfarms and associated developments upon some species have been underestimated. The effects of both the wind turbines and of any increased tree belts on breeding waders is likely to be greater than suggested. Waders, such as curlews and golden plover tend to avoid nesting within 200-400 metres of tree belts or woods that might conceal raptors or other predators. The concept of providing extra planting as mitigation for raptors and

squirrels is likely therefore to have an adverse effect on waders. Without mitigation, the effects of the developments on raptors are admitted by the applicants to be adverse.

9.4 Buzzards, lapwings, curlews, golden plovers, starlings, skylarks, redwings, fieldfares and ravens are all species that commonly fly at the heights of the turbine blades (45-125m). Lapwings, golden plovers, starlings and the thrushes commonly do so in flocks where the attention of some individuals may be concentrated on flock formation rather than on unfamiliar dangers in the surroundings. We believe that these species in some weather conditions (wind with cloud, or with glare from low sun) would be at risk from collisions.

9.5 The variation in behaviour of some species has not been taken into account. The hen harrier commonly hunts at low altitudes, but during mating displays it undertakes elaborate flights at higher altitudes, with its attention potentially diverted from unfamiliar dangers. The skylark's high altitude song flights are well known; ravens, lapwings and other birds have different but comparable behaviours. The presence of turbines presents potential risks to such birds in any but very clear weather conditions. The daily or seasonal migration flights of some species in low cloud would be at risk. This presents particular problems for geese, whooper swans and migratory ducks near Sweethope and Colt Crag reservoirs, and to daily starling movements, and both daily and seasonal migrations of thrush flocks. None of the mitigation measures do or could limit these risks. A further factor to be considered in assessing collision risk is the lighting of turbines at night. If this is required for aircraft safety it could potentially lure birds to the turbines as is well-known to occur in the case of lighthouses on migration routes. The disastrous effect of lighting a turbine on migrating birds was reported from Sweden where 50 migrating passerine birds were killed by collision with a deliberately lit turbine in one night (J. Karlsson. *Interactions between birds and aerogenerators*. Lund: Ekologihuset, 1983; quoted by Percival, 2000, pp 8-15).

9.6. The presence of hen harriers, with reports of display behaviour, is of far greater importance than the Environmental Statements for all three windfarm sites suggest. Only about ten pairs of hen harriers breed annually in England, and these are under heavy pressure from game shooting interests, despite being listed in the highest levels of protective UK and European legislation. The presence of even one pair of displaying hen harriers carries a high potential for future breeding, if they remain undisturbed. The building works, the subsequent disturbance by the wind turbines (whether or not actual collision occurs) and the more frequent human access to the Ray Estate would all put the continued presence of this rare and heavily protected breeding species at great risk. If successful breeding were to occur, juvenile birds would be at particular risk of collisions with the turbines.

If significant harm [to biodiversity and geological conservation interests] cannot be prevented, adequately mitigated against, or compensated for, then planning permission should be refused.

(Planning Policy Statement 9. Paragraph 1.(vi) 'Key Principles'.)

10: The mediaeval landscape.

Planning authorities should continue to ensure that the quality and character of the wider countryside is protected and, where possible, enhanced.
(*Planning Policy Statement 7. Paragraph 15 ‘Countryside protection and development in the countryside’.*)

10.1 The Society takes an interest in the history of the interaction between man and the wildlife habitats – an aspect of ‘the natural history of man’. With this in mind we wish to draw attention to the remarkably unchanged ‘mediaeval landscape’ that extends over a very large proportion of the Steadings site and significant parts of the Ray site. We are not aware of a comparable area of this size in this region with such widespread discernible rig and furrow, old field-boundaries and the sites of mediaeval settlements of which relatively few have been overbuilt by more recent buildings. In concentrating on individual sites the archaeological reports have failed to emphasise the rarity and value of the area as a whole as a site of special archaeological importance. While every British landscape is a palimpsest, in this one the 14th century ‘manuscript’ is particularly easily legible and complete. Its survival seems to be principally the result of the adverse climate change in the 14th century (perhaps together with the Scottish wars of that period) which left a formerly well populated arable farmland fit only for pasture, which it remains today. Changes have of course occurred since then, but the windfarm developments would impose the greatest transformation to affect the district since mediaeval times. Although the turbines themselves may be removed in the future, the road system will create irreversible changes in landscape and drainage as well as damaging individual structures, many of which probably remain undiscovered.

10.2 The site of Steadings turbine 22, the adjacent anemometer tower and their access road (NY9580) may be taken as an example. The archaeological report includes a local site (numbered 33 on Banks Drawing HJB 639 / PA21a) but fails to mention that the eastern part of the field is a pasture with well preserved rig and furrow extending up and down the hillside, while the low-lying western part has no rig and furrow. The abrupt line between them follows a raised linear structure extending N-S across the field, surely a mediaeval field wall, which passes close to the west side of site 33. The typical S-shaped termination of the rigs abuts on this feature. Importantly the proposed site access road lies very close to these structures. A preliminary amateur interpretation strongly suggests that we have here a well preserved mediaeval arable field and the wall separating it from the marsh below and a related small building. The opportunity for future study of the detailed natural-historical archaeology of the cultivated and marsh components and of the old hedge/wall at this unspoiled site would be severely compromised by the proposed developments.

11. We conclude

that the applications for all three developments ought to be refused on the following grounds

- a. the probability that the ratio of carbon use to carbon savings is likely to be high for all three windfarms;
- b. the damage to blanket bog is likely to be significant and irreversible at Ray and Green Rigg;
- c. the risk of pollution damage to watercourses is likely to be high at Steadings and moderate at Ray and Green Rigg;
- d. the risk of pollution damage to rare plants is unacceptable at Steadings and significant at Ray and Green Rigg;
- e. the bat survey information is incomplete at all three windfarm sites;
- f. the risk of collision and impaired breeding success for several bird species (some of them with the highest conservation status) is likely to be higher than stated by the applicants at Ray and Green Rigg and significant at Steadings; the mitigation measures proposed for raptors are likely to have an adverse effect on breeding waders;
- g. the damage to the mediaeval landscape at Steadings would be so severe as to be unacceptable and at Ray it would also be significant.

References

Government Publications

Meeting the Energy Challenge HM Government's Energy White Paper (2007)

Public Policy Statement 7 (Sustainable Development in Rural Areas)

Public Policy Statement 9 (Biodiversity and Geological Conservation)

Public Policy Statement 22 (Renewable Energy)

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