



Guidance Note

Monitoring the impact of onshore wind farms on birds - January 2009

Introduction

1. As the number of wind farms constructed in Scotland increases the need to understand the impact that these wind farms will have on Scotland's bird populations is also increasing. In addition, as the wind farm industry searches for further development opportunities (e.g. on lower altitude or lower wind speed sites with different habitats) the need for improved understanding of impacts on birds in these areas also increases. Whilst our understanding of the interaction between some species of birds and wind turbines is improving, there is still a great deal of uncertainty and there are significant gaps in understanding which need to be resolved to enable better and quicker assessment of future proposals.
2. Thus far, the evidence for significant adverse impacts on protected species of birds from operating wind farms in Scotland is limited, due to the recent arrival of modern windfarms in the landscape and the fact that approved sites have been sensitively located due to good cooperation between the wind farm industry, SNH and other key stakeholders during the environmental impact assessment process. However, in other parts of Europe and America, adverse impacts have been identified. In Scotland it is critical to the future development of the wind farm industry that this good track record of well developed proposals is maintained and that robust data is gathered to help inform future planning decisions.
3. A number of species of birds are protected by domestic and European legislation and it is therefore particularly important that we gain a good understanding of the type and extent of impacts that wind turbines are likely to have on these birds. This includes the cumulative impact on bird populations at a national level. Many of Scotland's bird populations are of international importance and SNH has a statutory duty to promote and protect these populations of birds and their habitats. Furthermore, Scottish Ministers have a duty under Schedule 9 of the Electricity Act 1989 to preserve and conserve the fauna of Scotland and further duties under the EU Birds and Habitats Directives. In determining Section 36 applications, Scottish Ministers must have regard to all significant environmental impacts which are the result of the proposed development. This includes cumulative effects and impacts on EU designated sites (SPAs & SACs¹) and species and habitats protected by these Directives and the Wildlife & Countryside Act, 1981.

¹ Special Protection Areas (SPAs) and Special Areas of Conservation (SACs)

4. Some, but not all, wind farm planning consents will therefore require monitoring of impacts on birds to enable SNH and others to keep a track of the overall impact on birds at a national level. **Effective monitoring may require both pre-construction monitoring (to provide a baseline) and a programme of post-construction monitoring, to identify and quantify the impacts.** For simplicity, the combined monitoring required (pre and post) construction is referred to as '**post-consent monitoring**' in the rest of this document.
5. The information gathered will enable management of specific issues on the wind farm site, providing greater certainty on the effectiveness of mitigation measures and in some cases be used to inform future decisions on wind farm applications. This should lead to a greater degree of confidence in conclusions on impacts and their significance in environmental impact assessments in future.
6. At present, SNH may object to a wind farm proposal where there is significant uncertainty over possible impacts on bird populations present on site, or passing through the development area. This is particularly relevant to bird populations which are protected by European legislation. Where proposals affect Special Protection Areas (SPAs) SNH is likely to object to a proposed development when an environmental statement triggers the requirement for an appropriate assessment under The Conservation (Natural Habitats, &c.) Regulations and where such an assessment does not allow SNH to conclude that there will be no adverse effect on site integrity.
7. The collection of good quality post-consent monitoring data at consented sites should help to reduce these uncertainties in future. In time, the approach described in this guidance will be revised as sufficient data is gathered and as our understanding improves.
8. It is intended that post-consent monitoring should, in the long run, be aggregated and analysed to examine impacts of wind farms on bird populations. Such analyses are known as meta-analyses, and are a valuable means of revealing broad scale generalisations about impacts which may not be identified by single studies. Standardisation of methods (e.g. for bird surveys and carcass searching) will greatly aid this process.

What does this guidance note do ?

9. This guidance note seeks to describe:
 - the purpose of post-consent monitoring;
 - the benefits of post-consent monitoring;
 - how to determine when post-consent monitoring is required;
 - the potential role of the Ecological Clerk of Works;
 - how to define the scope of post-consent monitoring;
 - how and where to submit post-consent monitoring data;
 - who manages and analyses post-consent monitoring data;

- how to deal with commercially and environmentally sensitive information;
- disclosure and sharing of data.

The purpose of post-consent monitoring

10. Post-consent monitoring of impacts on birds generally serves one of three purposes outlined as follows:
 - 1) Monitoring which relates to the construction and management of a consented wind farm and its compliance with any planning conditions. Where a wind farm has the potential to have negative impacts on birds, but where these can be mitigated (e.g. through habitat management, selective turbine shutdowns and other techniques) monitoring is required to inform this process. In this case, the monitoring is likely to apply to a specific impact (e.g. an effect on a specific nest site or breeding area) and the scope of the monitoring required will depend on the nature of the impact and the mitigation involved. This will normally be defined in a condition attached to the planning consent. The information generated will be used by the Planning Authority to ensure that conditions are being met.

Case Study: A Mitigation Condition at a Scottish Wind Farm Site

An example of a condition taken from a recently approved wind farm is as follows:

“Unless otherwise approved in writing by the Planning Authority in consultation with SNH, the wind farm shall be constructed outwith the bird breeding season.

Reason: In order to safeguard the conservation interest of the site.”

This condition was primarily intended to protect hen harriers nesting in a nearby forest plantation where the main access track was located. Monitoring of compliance with this condition would be required.

- 2) Monitoring which improves our understanding of specific impacts on particular target species at an operating wind farm. These will usually be species that are identified during preparation of the environmental statement. While it is likely that the emphasis of such monitoring will be directed to those species of conservation importance (such as Annex 1 and Schedule 1 species), it is important that monitoring addresses species identified in the environmental statement as being affected by the development. This will normally be included as a planning condition or part of a formal planning agreement. Generally, this will address issues where there is a degree of uncertainty over the extent or significance of an impact, but where the potential impacts were not

predicted to be of such significance for SNH to object to the proposal (or where, despite an SNH objection, the proposal has been consented). In many cases the information gathered will provide a useful insight into the EIA process and will test whether or not the conclusions reached were justified. The data produced will help inform future decision-making and assessment.

This form of monitoring may also be appropriate in circumstances where considerable habitat management or habitat change (such as tree felling) is proposed.

Case study: Monitoring of Red Kites at Braes of Doune and Farr wind farms

Both the Braes of Doune and Farr wind farms were identified as having the potential to have an impact on nearby populations of the Annex 1 species Red Kite. While the potential impacts were not of sufficient concern for consent to be refused, in order to reduce uncertainty and to provide greater understanding of the ways in which Red Kites interact with wind turbines a monitoring programme focusing on potential collision risk is being undertaken at both sites. This involves monitoring flight behaviour and searching for casualties.

- 3) Voluntary monitoring, not subject to specific planning conditions or requirements, which improves our understanding of the impacts of windfarms on birds. This approach to monitoring will allow better appraisal of, for example, the possibility of breeding bird displacement; change in breeding densities or breeding success; the avoidance of wind turbines by birds and bird mortality by collecting comparable data, either at a single site or possibly across a number of wind farm sites. It could involve a comprehensive programme of monitoring at a number of wind farm sites, and is likely to encompass a wider range of species than is likely when monitoring is required as part of a planning consent.

Case Study: Displacement of breeding upland waders at wind farm sites

SNH, Scottish Government and RSPB have recently undertaken a project looking at displacement of upland breeding waders such as golden plover and curlew at a number of wind farm sites in Scotland. This work has improved our understanding of how waders respond to wind farms, though further monitoring over a longer period of time may be needed to demonstrate whether these effects change over time. Some developers have also funded such studies on a voluntary basis, which address specific issues of concern.

The benefits of post-consent monitoring

11. The information collected through post-consent monitoring will:
 - improve our understanding of how particular species of birds interact with wind turbines in particular habitats;
 - inform future Environmental Impact Assessments by making more data available (for example on collision rates and displacement);
 - remove uncertainty over the impacts of wind turbines on some species of birds;
 - inform future decisions on wind farm applications.
 - enable SNH and others to monitor cumulative impacts on bird populations at a national level, using recorded rather than predicted data.

Case study: Improved understanding of goose avoidance rates

Birds can collide with wind turbines, often with fatal consequences. However, evidence collected through post-construction monitoring of birds on wind farms in the US, Europe and elsewhere suggests that some species of birds can avoid wind turbines and that collision risks vary depending on the species and location of the turbine(s).

In 2000 SNH published guidance on '*Calculating a theoretical collision risk assuming no avoiding action*'. The avoidance factors used in the collision risk model are under constant review as our understanding of bird behaviour and confidence in the model improves. For example, the avoidance factor for grey geese has changed from 95% to 99%, following the assessment of data collected at wind farms in the US and elsewhere. Continued monitoring of birds is essential to improve this understanding and enhance the accuracy of future predictions. Improving certainty over avoidance rates will enable better assessment and quicker decisions in future by reducing uncertainty.

Determining when post-consent monitoring is required

12. In all cases, it is *essential* that SNH staff, in dialogue with the developer, their consultants, the Local Planning Authority and wider stakeholders, determine whether or not post-consent monitoring is likely to be required *as early as possible*. This is to enable developers to commission survey work early in the development process and to prevent undue delay in the planning / construction of the wind farm.
13. Where ongoing bird monitoring is required for a specific development, consent conditions can be imposed by the Planning Authority or by Scottish Ministers for Section 36 applications. Such conditions may include the formation of an Ornithological Steering Group to monitor bird survey results.
14. Monitoring that relates to specific management issues on a wind farm site (for example turbine shutdown or monitoring of nest sites) will often

be identified in a planning consent. The scope of monitoring will be determined as part of the EIA process and will normally be identified in SNH's formal response to the planning application, or in subsequent negotiation of conditions. This level of monitoring is likely to be required as a condition of planning consent.

15. Monitoring that is required to resolve uncertainties and to further our understanding about a specific impact (for example, the displacement of a particular species) may also be required. This monitoring should be negotiated between the developer, planning authority, SNH and other interested parties. The scope of such monitoring should be limited to the collection of data which will resolve a specific uncertainty relating to impacts. Such monitoring should only be required where there is a gap in understanding, or where the scale and extent of impacts is uncertain. Scottish Ministers may require such monitoring as part of Section 36 consents, where monitoring will reduce or eliminate uncertainty over impacts on the conservation status of bird populations. **Note this form of monitoring must not be viewed as mitigation in circumstances where the potential impact could be of such magnitude that SNH would object to the proposal. This is particularly relevant to impacts on Natura sites. These uncertainties should be resolved by the EIA process prior to consent.**

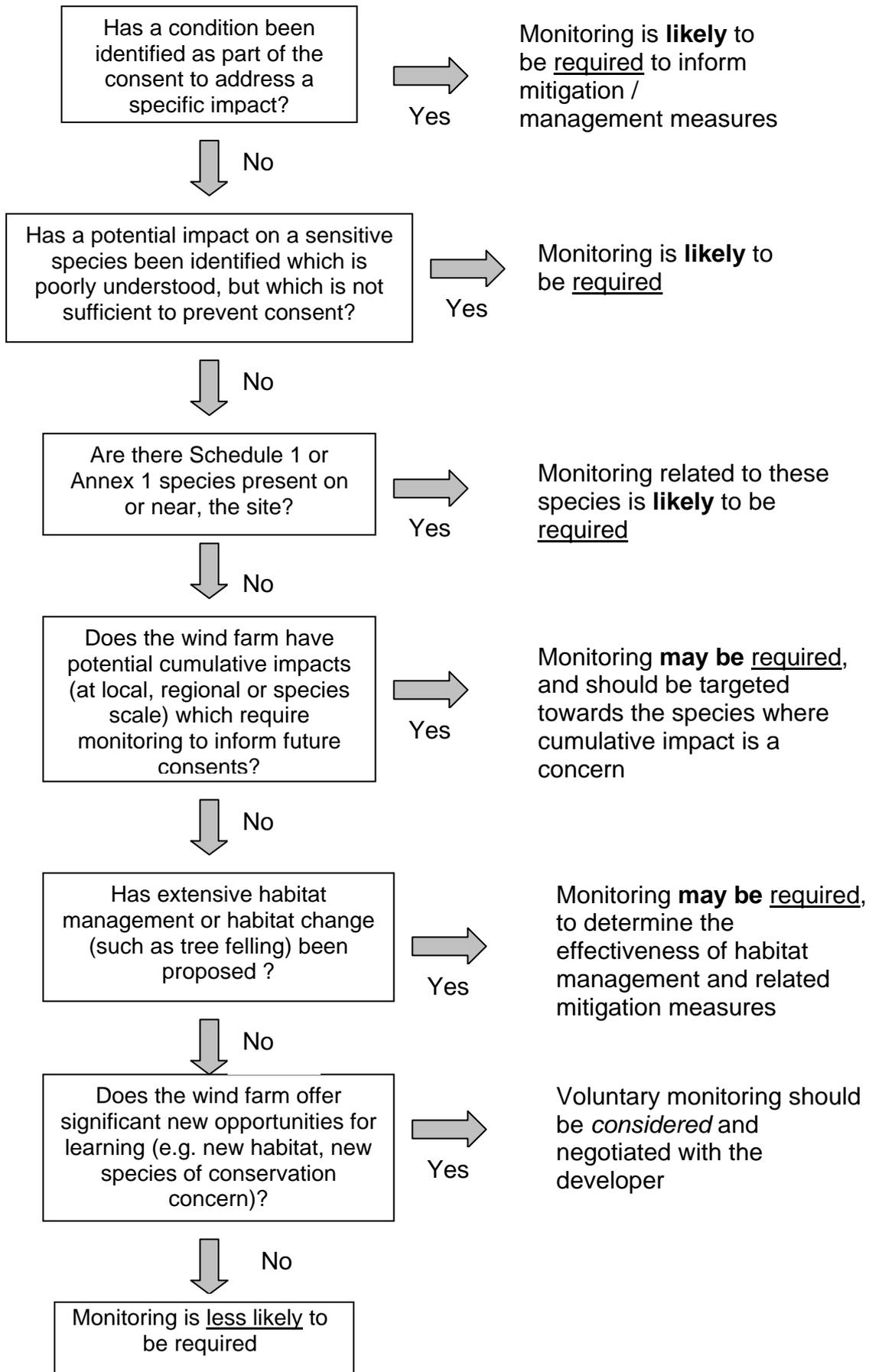
16. Voluntary monitoring is likely to be *subject to agreement between SNH and developers* where there are good opportunities to further our understanding of the impact of windfarms on birds in Scotland. Discussions before a wind farm is built or perhaps after construction should lead to agreement on the nature and format of such monitoring, and may address issues such as habitat management, bird behaviour (e.g., behavioural avoidance or behavioural displacement) or mitigation methods. This form of monitoring is unlikely to form a condition of consent or a section 75 planning agreement and it will be undertaken on a voluntary basis as it cannot be enforced upon the developer. Situations where voluntary monitoring is likely to be beneficial include:
 - wind farms which offer new opportunities to improve understanding (i.e. presence of new species, or presence of new habitat) on nationally important species likely to be susceptible to wind farm impacts;
 - wind farms in new situations or locations (e.g. coastal, offshore, forest edge) where sensitive species are present at significant levels;
 - wind farms where potentially significant impacts have been identified or where impacts are poorly understood at other wind farm sites; or
 - wind farm sites which may contribute to understanding cumulative impacts on species, when assessed in combination with existing wind farms in the surrounding area.

17. The decision tree below (see Figure 1) summarises when the different types of post-consent monitoring are likely to be required. **To allow developers time to commission any pre-construction survey work, the scope of monitoring required should be agreed as early as possible.**

The potential role of the Ecological Clerk of Works

18. There are other situations in which further monitoring during the construction of the windfarm may be required. This will generally be identified during the EIA process and may be included as a condition of consent. An Ecological Clerk of Works will often be employed to fulfil this role. Examples include:
- monitoring compliance with nature conservation laws in terms of disturbing nesting birds during the construction process;
 - monitoring specific nest locations pre and during construction and advising on mitigation as required;
 - monitoring the effectiveness of mitigation measures on the construction site, as construction progresses.
19. In all cases the monitoring requirements during construction will be site specific and these should be agreed during the EIA process.

Figure 1: Determining when post consent monitoring is likely to be required



Defining the scope of post-consent monitoring

20. The scope of monitoring required as part of a planning consent will be defined by the determining authority (either the Local Planning Authority or Scottish Government) in consultation with SNH, the developer and their consultants, and may involve wider stakeholders, such as the RSPB, where this is beneficial. The scope will be refined to provide sufficient information to meet this purpose. The aim is to provide the information required to ensure compliance with Government's statutory duty to conserve fauna and flora, and where relevant, reduce or eliminate uncertainty over impacts identified in any environmental impact assessment. The scope should be refined to achieve this aim and will not require developers to conduct monitoring which is unnecessary or irrelevant.
21. The scope of any voluntary monitoring will be defined through mutual agreement between SNH, the developer and other stakeholders as appropriate, based on the species identified on the site, their sensitivity to windfarm development and the potential to address specific issues through monitoring or even research.
22. **As baseline survey work may be required prior to construction commencing, *the scope of monitoring should be confirmed as early as possible in the development process to enable developers to commission this work and avoid undue delay after consent.***

Post-consent monitoring survey methods

23. The standardised methods to be used are described in a separate SNH document, entitled *Guidance on Methods for Monitoring Bird Populations at Onshore Wind Farms (January 2009)*. The aim of standardisation is to allow data from different sites to be compared and to allow data to be aggregated, enabling a national overview of impacts on birds to be formed. However, it is recognised that specific sites may require tailored methods. Therefore, the methods included in this document are not prescriptive and may be adapted to specific site conditions and to the scale of the wind farm.

Submitting post-consent monitoring data

24. The reporting requirements of monitoring that is required as part of a planning consent will normally be detailed in the relevant consent conditions. Data which relates to this should be submitted to the determining authority and copied to the SNH area office which handled the application at the appropriate times. Where appropriate, it may also be agreed that data will be submitted to the RSPB and other local stakeholders.

25. Monitoring data that is collected as part of a voluntary programme should be submitted to SNH or to any steering group that may be established as part of the work being undertaken.

Who manages post-consent monitoring data?

26. SNH will develop the means to collate and manage post-consent monitoring data, in conjunction with other relevant stakeholders. The Local Authority is responsible for managing planning conditions that produce monitoring data and for ensuring that compliance is achieved. For Section 36 applications, this responsibility falls to the Scottish Government.
27. Access to data held by the Scottish Government and SNH will be carefully managed. Whilst the data will be made publicly available, it is recognised that it may be necessary to protect both commercially and environmentally sensitive data. Access to data for third parties will therefore be carefully controlled.

Dissemination

28. In order to disseminate the lessons learned from post-consent monitoring SNH will, in collaboration with other stakeholders, undertake to produce an annual summary of the data received, highlighting significant impacts and key lessons learned. More detailed studies could be published in the scientific literature.

Identifying research needs

29. To inform research needs, and therefore requests for further monitoring at new windfarm sites, SNH will seek to identify within the annual summary a list of species and habitats for which further information is required. This will help inform requests for other monitoring and research work by making it clear which impacts are already well understood, and where uncertainty still exists.

Dealing with commercially and environmentally sensitive information

Commercially sensitive information

30. Data which is gathered as a result of a planning condition or planning agreement will generally be in the public domain and is unlikely to be commercially sensitive (unlike the information collected prior to consent which can offer companies a commercial advantage). SNH will therefore make this information publicly available, but will carefully control its release. This is to ensure that the data is not misused.

Environmentally sensitive information

31. SNH has produced separate guidance on publishing environmentally sensitive information on birds in environmental statements (SNH Guidance *in prep.*). Similar principles will be applied to the publication of environmentally sensitive information derived from post-consent monitoring, the underlying principle being that only information which could lead to harm to species listed on Schedule 1 of the Wildlife and Countryside Act (1981) and Annex 1 of the EU Wild Birds Directive should be contained within confidential annexes to reports. SNH will not release this data, but will make it available to relevant stakeholders where appropriate.

Disclosure and sharing of data

32. It has often proven difficult to encourage developers and their consultants to provide and share data from wind farm sites. Mindful of the need to protect commercial confidentiality in some circumstances, **SNH strongly encourages developers to share data where requested both by neighbouring developments for the purpose of cumulative impact assessment and by researchers undertaking independent research on the impacts of wind farms on birds.** This could include data collected post-construction, pre-construction and during the environmental impact assessment process.

Using steering groups to monitor progress

33. In some cases it will be desirable to establish a local steering group of relevant stakeholders to discuss and advise on progress, and monitor data and reports. Membership of such groups should be agreed through dialogue between the developer and the determining authority. SNH staff may engage in local steering groups where deemed to be appropriate.
34. It is intended to form a Scottish Windfarm Bird Monitoring Steering Group early in 2009, based on the working group that produced this guidance. For sites where it is agreed that a local steering group is not required, data should be submitted by the developer to SNH and progress will be discussed, if necessary, by the Scottish Windfarm Bird Monitoring Steering Group. This group will also review this guidance in future and will play a key role in disseminating lessons learned, data and information as required. Further details on the creation of this group will be posted on the SNH website early in 2009.

Contact

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