

Guidance

ASSESSING SIGNIFICANCE OF IMPACTS FROM ONSHORE WINDFARMS ON BIRDS OUTWITH DESIGNATED AREAS

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Scope and purpose

1. The aim of this guidance is to assist SNH staff, when advising on a windfarm proposal for which an adverse impact on bird populations is predicted, in coming to a view as to whether that impact should be considered sufficiently significant for SNH to be concerned.
2. The guidance will assist when assessing windfarm proposals in the wider countryside, where impacts do not affect notified interests or qualifying features of designated sites (SSSI, SPA, SAC or Ramsar sites). The guidance takes account of the legal and policy obligations applying where designated sites are not affected, including obligations in the EU Birds and Habitats Directives, the Convention on Biological Diversity, the Scottish Biodiversity Strategy, and National Planning Guidance (NPPG 14). A separate information paper¹ is available which sets out how this guidance relates to European and national legislation and Government policy.
3. This guidance should not be used where impacts may affect SSSIs, SPAs, SACs or Ramsar sites. Different guidance applies, as these sites are under more specific legal obligations.
4. The guidance may be used whenever a windfarm proposal involves a potential impact on birds that does not affect designated sites, and that impact has been quantified or estimated in terms of the overall effect on the species populations. The general approach to judging significance may have wider applicability to other forms of development, such as forestry, and to species other than birds, but this guidance is tailored to the impacts of windfarms on birds.
5. The guidance should be used alongside the guidance in the SNH Environmental Impact Assessment Handbook and Appendix V of the SNH Local Authorities Handbook.
6. The guidance will be principally used at the stage of assessing a proposal. However, where an Environmental Impact Assessment is required, the guidance should also be referred to at scoping stage to help in identifying those bird species for which there is the potential for significant adverse impact and which therefore should be considered in some depth within the Environmental Statement.

Introduction and background

7. Recently, interest in windfarm development has intensified, resulting in impacts on habitats and species particularly in upland areas. Wind turbines may affect bird populations in a number of ways: by habitat destruction, by displacement, or by creating a risk of collision. Methodologies have been established for

¹ Assessing significance of impacts from onshore windfarms on birds outwith designated areas: basis for the guidance in European and national legislation, and Government policy. Information paper, SNH 2006.

estimating what these impacts and risks are likely to be, and guidance on these methodologies is available on the Renewables microsite.

8. But still, once an impact on bird populations has been assessed, before SNH can advise whether a proposal should be approved by the consent authority, a judgement is required by SNH as to whether that impact is of sufficient significance that SNH should be concerned about it. That judgement will depend on the conservation status and sensitivity of the species and its supporting habitats, its abundance in the area, any special ecological role fulfilled by the site in question, and the robustness of the population in the face of losses. This guidance addresses this process, helping staff to arrive at a view as to whether or not a predicted impact should be judged as causing concern.
9. A clear distinction should be drawn between such a judgement on the significance of any likely adverse effects, and the eventual judgement made as to whether SNH should object or not to the proposal. A renewable energy proposal may offer considerable public benefits, and habitat management measures may be proposed which will compensate for adverse impacts. SNH will wish to weigh all such considerations up in coming to a final view on the proposal. However that view will be founded upon the technical assessment, across all aspects of the natural heritage, of the significance of any adverse impacts.
10. This guidance should clarify the technical assessment to be undertaken in relation to impacts on bird species.

Species priorities

11. All wild bird species are subject to a general level of protection through the Wildlife & Countryside Act and the Birds Directive. There are obligations within the Birds Directive relating both to protection of species and maintenance of habitats. However, only some species are normally of concern, either because they are rare or vulnerable or they are dependent on habitats which are limited or subject to land use change. Birds on Annex 1 to the Birds Directive, regularly occurring migratory species, and birds on Schedule 1 to the Wildlife & Countryside Act are recognised in statute as requiring special conservation measures, and there are non-statutory lists (eg red and amber-listed Birds of Conservation Concern² and Species Status Assessments) which present a more comprehensive picture of birds whose populations are at some risk either generally or in parts of their range. Assessment of the impacts of a windfarm on birds normally need not consider birds outwith the above categories.
12. Moreover, some species, because of their habitat preferences and/or flight behaviour, are unlikely ever to be impacted upon by a windfarm. Species which remain wholly within woodland are unlikely to be affected, unless the woodland is to be felled, or unless there are turbines sited in clearings within the woodland. Species which normally remain close to ground are only likely to be subject to a

² The Population Status of Birds in the UK : Birds of Conservation Concern 2002-07
see JNCC Website http://www.jncc.gov.uk/PDF/Pop_status_of_birds_card.pdf

low collision risk, though there may be periods when they too fly higher and are then at risk, eg during breeding display flights or whilst being harried by competitors.

13. Fewer than 20 bird species are commonly found on proposed onshore windfarm sites, are within the above categories of birds requiring a level of special care, and utilise habitats or have flight behaviours such as to give rise to potential damaging impacts. A further 10-15 species may be encountered in specific parts of the country. All these species are listed in Tables 1a and 1b. The assessment within most windfarm Environmental Statements can therefore be limited to those species in this table which occur within or around the site. However, it is important at scoping stage to confirm that there are no other species which might, exceptionally, also merit assessment.

Table 1a
Widespread species potentially at risk of impacts from onshore wind farms.

Widespread Species	Breeding / wintering	EU Birds Directive: Annex I	EU Birds Directive: Migratory	WCA Schedule 1	BoCC Red List	Notes
Red-throated diver	Br	X	X	X		
Black-throated diver	Br	X	X	X		
Whooper swan	W	X	X	X		
Greylag goose	Br/W		X			
Pink-footed goose	W		X			
Greenland white-fronted goose	W	X	X			
Barnacle goose	W	X	X			
Red kite	Br/W	X		X		
Hen harrier	Br/W	X		X	X	
Goshawk	Br/W			X		
Golden eagle	Br/W	X		X		
Osprey	Br	X	X	X		
Merlin	Br/W	X		X		
Peregrine falcon	Br/W	X		X		
Black grouse	Br/W				X	
Golden plover	Br	X	X			
Dunlin	Br	X	X			<i>C.a. schinzii</i>
Curlew	Br		X			On priority BAP list
Greenshank	Br		X	X		
Short-eared owl	Br/W	X				

Table 1b**Restricted range species potentially at risk of impacts from onshore wind farms.**

Restricted Range Species	Breeding / wintering	EU Birds Directive: Annex I	EU Birds Directive: Migratory	WCA Schedule 1	BoCC Red List	Notes
Slavonian grebe	Br	X	X	X		
Bewick's swan	W	X	X	X		
Bean goose	W		X			
Light-bellied brent goose	W		X			
Honey buzzard	Br	X	X	X		
White-tailed eagle	Br/W	X		X	X	
Marsh harrier	Br/W	X	X	X		
Corn crane	Br	X	X	X	X	
Whimbrel	Br		X	X		
Arctic skua	Br		X			
Great skua	Br		X			
Nightjar	Br	X	X		X	
Chough	Br/W	X		X		
Scottish crossbill	Br/W	X		X	X	
Capercaillie	Br/W	X		X	X	

Favourable Conservation Status

14. The significance of any windfarm impact on a bird species will depend crucially on the conservation status of the species in the area, in terms of the robustness or fragility of its population and the adequacy of supporting habitats. SNH's response will be guided by an aim of securing the maintenance of a viable population across its natural range. This concept is encapsulated within the term 'favourable conservation status' as articulated within the Habitats Directive. In respect of a species, conservation status is taken as the sum of the influences acting on it which may affect its long-term distribution and abundance, within the geographical area of interest (which for the purposes of the Directive is the EU). While the term favourable conservation status is not used in the Birds Directive, EU court cases over recent years have progressively interpreted the concept as meaningful in a Birds Directive context. Favourable conservation status has also been used more recently within the Environmental Liability Directive as the basis of a test of environmental damage to protected species and habitats.

15. Conservation status is favourable where

- population dynamics indicate that the species is maintaining itself on a long-term basis as a viable component of its habitats; and

- the natural range of the species is not being reduced, nor is likely to be reduced for the foreseeable future; and
 - there is (and will probably continue to be) a sufficiently large habitat to maintain its populations on a long-term basis.
16. Where the interests of designated Natura sites are unaffected, there is often considerable scope for judgement as to what level of impact from a development proposal may be considered acceptable. This guidance recommends that the concept of favourable conservation status should be used, at a national or regional level, to determine whether an impact on a species is sufficiently significant to be of concern. We consider that this is a test which makes good ecological sense and maintains compatibility with the aims of European legislation and Government policy.
- 17. An impact should be judged as of concern where it would adversely affect the favourable conservation status of a species, or stop a recovering species from reaching favourable conservation status, at international or national level or regionally.**

Relevance Of Scale And Natural Heritage Zones

18. The conservation status of a species may be assessed at a number of scales, ranging from local (eg on the windfarm site) or regional to national or even international. SNH's interest is in the status at the wider spatial levels: regional, national or international. SNH will not normally object to a windfarm proposal on account of purely local impacts, if the impacts are not avoidable by reasonable means, if they do not result in any wider impact on the regional population, and provided the impacts do not affect populations protected within a designated site. It should be borne in mind, though, that there may be some localities which are of particular importance to the maintenance of a regional population, either because they are 'stronghold' areas or because they are locations which facilitate species movements in or out of the area; any impacts on populations in such areas should not be considered purely local.
19. This principle should also apply to species identified within a Local Biodiversity Action Plan; that is to say the inclusion of a species within an LBAP should not lead to SNH objecting to a proposal because of local impacts on that species, unless in SNH's judgement the status of the species regionally or nationally could be compromised by the development. In advising the consenting authority, however, SNH might well wish to draw attention to a significant local impact on a LBAP species³.
20. For breeding bird species, SNH uses Natural Heritage Zones (see Map at end⁴) as the appropriate regional biogeographical unit of assessment. These 21 zones covering Scotland have been drawn to reflect biogeographical differences

³ in terms of Appendix V of the Local Authorities Handbook as revised in 2005, this would be a category C4 response

⁴ detailed mapping is available within the SNH GIS system

Example: a Golden Eagle framework

SNH has examined the status of golden eagle within each of the 21 Natural Heritage Zones in Scotland, taking into account factors such as longevity and productivity. The outcome is a 'Golden eagle framework' which indicates the variation in susceptibility of the golden eagle population to additional impacts, from whatever cause, across Scotland.

Populations in south and east Scotland are highly susceptible to added impact; these are populations which are already limited by various causes of mortality including persecution. Populations in north and west Scotland are generally more robust, with individual pairs occupying smaller ranges and populations limited by prey availability.

Assessment of the significance of any additional collision mortality or range displacement due to a windfarm should therefore differ substantially according to which part of Scotland the windfarm is located.

between zones, with a high level of coherence within each zone. They are unrelated to administrative boundaries, either for local government or SNH Areas. The question as to whether there is an impact on a species regionally therefore may be translated into the question as to whether there is an impact within the relevant NHZ. Where the windfarm site is close to the boundary of an NHZ, it may be worth considering possible impacts on the adjacent NHZ as well.

21. For non-breeding species, consideration at a regional scale may be unimportant; usually the national scale will be more appropriate. For migratory species, patterns of migration may determine the spatial framework within which impacts should be considered. For example, corncrake migrate up the west coast of Ireland and Scotland and any impacts during migration throughout that wider region would be likely to affect the population as a whole. Similarly migratory goose populations are best viewed within the national perspective on their winter migratory destinations.

Information required to enable a view on significance

22. Windfarms can affect bird populations in three main ways as described in paragraph 7 above. There is a need to consider damage to or destruction of habitat where a windfarm will be built. If displacement is an issue, we need to know the number or proportion of the population that will eventually be displaced. Where there is a risk of collision related mortality we need to know the level of that mortality, expressed as numbers or percentages per annum. If mortality is predicted, we need to know the level of background or natural mortality and the degree to which wind farm collision mortality is additional to this background mortality. It is helpful for such information to be included within the Environmental Statement, for the species that are considered to be at potential risk from the windfarm development, as an aid to assessing the level of significance of any impacts.
23. Population models will be helpful for putting such mortality into context for some priority species (examples include golden eagles, sea eagles and wintering

geese). For wintering populations of geese, the work that SNH has undertaken for the National Goose Forum in developing population viability analyses for wintering goose populations will be invaluable, as these give levels of mortality (nationally) above which populations will be at significant risk of declining. PVAs are generally complex models, which require good long term data on numbers, as well birth and death rates; information that is generally only available for a small number of priority species. Note also that the PVA models developed so far operate at the national level only, though in theory they can be extended to regional scales, so long as good information exists on emigration and immigration rates – something that makes such models much more complex. This sort of information is unlikely to exist for many species we are interested in. However, the potential for the development of other simpler models within the context of Species Frameworks will be helpful for a number of priority species (especially breeding raptors, such as hen harrier).

24. Annex 2 provides an indication of the overview data or PVA studies which are available at a national level within SNH to assist in this process. There is a need for the information gaps, for the most commonly affected species, to be filled.

Assessing significance

25. Information should be available from the Environmental Statement on the impacts on the species in terms of added mortality, any loss of habitat and nesting or feeding territory, and any expected loss in the population. These impacts should be placed in context through information on the total population number and distribution (where known), current annual mortality, and the area of suitable habitat for the species within the NHZ. Where a PVA analysis has been possible, the predicted impacts of added mortality should be interpreted in terms of its likely and possible effects on the species population.
26. Such considerations should enable a qualitative judgement to be formed on the test expressed in paragraph 17: will the impact be such as to adversely affect the favourable conservation status of the species, or stop a recovering species from reaching favourable conservation status, at a national or regional level? Note that the nature of impacts may vary considerably according to the circumstances:
- For a species which is prone to disturbance by wind turbines, the prime impact may effectively be loss of habitat, which will translate into a reduced number of birds in the area. This on its own may not affect favourable conservation status, which reflects viability, range and adequacy of habitat to keep the population viable; it does not demand a given number of the species. However if the loss of habitat is substantial and widespread, then it should be regarded as reducing the natural range of the species.
 - For a species which is prone to collision risk, the prime impact may be added mortality, with no reduction in use of the habitat. At low levels the effect of such collision risk may be negligible in comparison with natural

mortality, but if not, then it may begin to cause a population decline which cannot be reversed unless the impact is removed.

- Where a species is already in decline, either at national or NHZ level, the test of significant adverse impact should be whether the proposal would add substantially to the difficulty of taking action to reverse the decline and reach favourable conservation status. In some circumstances minor adverse impacts from a windfarm proposal, while clearly adding to existing impacts causing a decline, may in themselves be insignificant in comparison with existing mortality or habitat changes, and in such circumstances they should not be deemed to add substantially to the existing problem.

27. In considering distribution, it is important to have regard to the gross distribution within the geographical areas, within which there may be strongholds and gaps. Change of distribution should not be used at a very local level to argue that local losses are significant. Stronghold areas should not be regarded as demanding special protection (unless are, or contribute to, designated sites for the species in question), unless they are recognised as productive, source areas which are important for the maintenance of the species within the NHZ. Usually a stronghold area will be particularly robust in withstanding a given level of impact on the species. However, the impact should not be such as to jeopardise the status of such areas as strongholds; that might constitute an impact on the viability of the species and its natural range. Outwith the main stronghold areas, there may also be marginal populations. It is important to recognise that some marginal populations may have a special ecological importance, eg in being the locations which facilitate immigration into or emigration from the region. Article 10 of the Habitats Directive refers to the need for policies which encourage the management of features of major importance for wild fauna, including those which function as stepping stones essential for migration. In such areas, any adverse impact could translate into an impact on the NHZ as a whole.

28. In order to arrive at a judgement on significance, such as to enable a view on the sensitivity of the species to impact within the area in question, information is needed on the number, trends and distribution of each species within the geographical area (usually the NHZ), and information on natural mortality and productivity where available. At present, only limited information is available, though data on species numbers within NHZs is available in the NHF Assessments. Annex 2 provides a key to information sources on some species; there is a need to develop this information base for each NHZ and for each species commonly the subject of windfarm EIA. Where full information is not available, consideration should be given to what reasonable judgements can be made on available information, taking a precautionary approach where levels of uncertainty are high.

Mitigation and Enhancement

29. When considering a windfarm proposal and any potentially significant effects, developers are required to consider mitigation and may in addition consider possible habitat enhancement measures. Mitigation and enhancement can take a number of forms, for example:

Avoidance of adverse impacts - mitigation to avoid impacts could involve redesign / micro-siting, including the removal of either individual turbines or complete clusters of turbines, to eliminate collision risks or displacement effects.

Reduction of unavoidable adverse impacts – a potentially significant effect can be reduced by shutting down the operation of the turbines during peak periods of flight activity, again either for individual or clusters of turbines.

Compensation for adverse effects which cannot be avoided or reduced - Compensation measures may be appropriate where residual environmental impacts cannot be further reduced or avoided. Compensatory measures may be undertaken on or off the development site (ie within or outwith the footprint of the windfarm proposal)⁵. The measures could include habitat works to create similar environmental conditions to those which may be impacted. It will be important to consider whether such measures are realistic and / or achievable, and the timescale of realising their environmental benefits.

Habitat enhancement measures - enhancement is not mitigation. Enhancement means there will be a net benefit to the natural heritage. Measures could include the provision of new habitats or habitat features on adjacent land, or improvements to existing management practices. Usually these will be proposed in a Habitat Management Plan which may be agreed via a planning or other voluntary agreement

30. Mitigation is best considered at an early stage. Developers should be encouraged to set out their proposed approach to mitigation in the scoping report and SNH should indicate how these will be appraised in its scoping response. Consider what aspects and level of detail in any mitigation proposal will be required in the Environmental Statement in order to demonstrate its appropriateness. For example, if the proposal is for a windfarm located within a forestry plantation, consider what information will be required to understand the impacts of the forest felling and future management, and whether this means that a forest management plan should be included as part of the proposal.

31. At the application stage, assessment of the predicted environmental effects should be judged alongside the effect of any mitigation proposed. It is important to reach a clear view of the overall impacts of the proposal taking into account any mitigation by avoidance, reduction or compensatory measures. The benefits

⁵ Note that in relation to Natura sites, Natura Casework Guidance must be followed, as there is a clear distinction between mitigation which reduces or avoids the impact on the qualifying interest of the Natura site, and compensatory measures which may offset residual impacts and will usually be outwith the site. The latter will only take place following a negative appropriate assessment, and in the absence of alternatives, on grounds of imperative reasons of over-riding public interest.

of habitat enhancement measures proposed may also be taken into account in any final judgement made by SNH, but should not obscure conclusions on the expected impacts of the proposal.

32. When evaluating mitigation measures, consideration needs to be given to:
 - Is it deliverable?
 - Will mitigation for one natural heritage aspect impact on another?
 - Has the mitigation been tried anywhere else before, if so what was the outcome?
 - Is there a need for the mitigation to be implemented and its effectiveness demonstrated before the windfarm is built?
 - What monitoring will be undertaken and how will it inform management decisions?
33. SNH will not normally consider appropriate any mitigation measures which set out to destroy or reduce the natural heritage interests so that the proposed development will not impact upon them.
34. The outcome of certain forms of mitigation action may be subject to uncertainty. It will therefore be important to consider how and when mitigation will be monitored and whether a feedback loop will be built in to enable mitigation measures to be modified to ensure aims are met.
35. SNH should ask to be consulted by the competent authority when it is considering whether to approve or amend a mitigation scheme, wherever the effects on the natural heritage are potentially significant. It is for the competent authority to ensure (enforce) that mitigation is met. SNH should advise the authority on whether an independent ecological clerk of works should be appointed to oversee and report on the mitigation schemes.
36. An increasing proportion of wind farm developments are consented and constructed with mitigation schemes and monitoring requirements as consent conditions. In order to inform future developments, it will be very important for such monitoring to be made publicly available through the Consenting Authority within agreed timescales. Such information will be the key, both for SNH and the industry, to understanding the residual effects of wind farms on the natural heritage, particularly on bird species, and to understanding the effectiveness of mitigation measures.

Cumulative effects

37. The purpose of a cumulative impact assessment is to examine if the combined effect of a number of proposals is significant, regardless of whether individual proposals have a significant effect or not. Cumulative considerations should apply at the local, NHZ and national levels, with the presumption being that most will refer to the impact at NHZ level. Further guidance on assessing cumulative effects of windfarms is published by SNH (link to document 'Assessing cumulative effects of windfarms').

38. Cumulative impacts should be viewed from the perspective of all developments (i.e. not just windfarms) but not historic land use change. The highest priority will be for species that are declining and/or not in favourable conservation status at a national or NHZ level. A current constraint on cumulative assessments is that relevant information is not yet available, although a data collation exercise by SNH is ongoing.
39. An ES should include cumulative assessments where there is a possibility of significant cumulative effect. Currently, however, it is recognised that it is unrealistic to insist on a cumulative assessment if the relevant information is not reasonably available. Until the collated data are available SNH will have to lead on developing a view on any cumulative impacts, taking account of known information from Environmental Statements.

SNH's Advice to the Decision Making Authority

40. Given the possibility that bird species can be adversely impacted by windfarm developments, SNH's advice to the consenting authority requires to set out clearly the significance of any adverse impacts. Advice should firstly be provided at the scoping stage if the application is subject to EIA, on the potential birds species which could be impacted – drawn usually from Tables 1a and 1b. Once an application has been received, our advice should take into consideration the significance of any adverse impacts alongside any mitigation proposed. This advice should also provide a context for all natural heritage impacts as well as any public benefits which may arise from the windfarm. A separate statement on any cumulative impacts should also be provided.
41. Annex 1 sets out a staged framework to guide the technical assessment for bird species to enable a conclusion on whether adverse impacts on bird interests are of concern to SNH. As noted in paragraph 9, SNH will wish to set this conclusion alongside a range of other considerations in coming to a final view on the proposal and whether SNH should object, conditionally or otherwise, to the proposal.

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Overview of assessment process

Annex 1

STAGE	STEP	SNH ROLE	GUIDANCE
Stage 1: Before submission of the Environmental Statement	Preliminary Contacts and Liaison	SNH may provide guidelines on effective communications and dialogue with developers	Provision of SNH Service Level Statement copies to competent authority and developer
	Scoping the Environmental Statement	SNH may be asked or seek to advise the developer and the competent authority on the scope of the ES in relation to bird interests	<ul style="list-style-type: none"> • Consider what bird species of interest may be affected by the proposal, refer to Tables 1a and b • Identify what baseline information is available for each species e.g. national population statistics, PVA, Species framework, breeding success, background mortality, etc • <u>Promote SNH guidance on bird impact assessment: Methology for Assessing Impacts on Ornithological Interests;</u> • Estimating Collision Risk • Survey Methods For Use In Assessing The Impacts Of Onshore Windfarms On Bird Communities –
Stage 2: Submission of Environmental Statement and consideration of Environmental information	Submission of ES and Project Application	SNH's role is that of adviser on the merits of the proposal, and on the adequacy and completeness of the ES in respect of the natural heritage and on the significance of effects on birds	To aid staff work through the technical assessment, the steps in Appendix V , Local Authorities Handbook have been adapted below.

		<p>Identifying the Natural Heritage interests - bird species.</p>	<ul style="list-style-type: none"> - What bird species have been identified and what is their conservation status?ⁱ - Has adequate information been provided ? - Have the potential impacts been correctly identified and has the survey methodology and data collection been correctly designed to provide information for assessment? - What existing information is available? - Consider breeding, foraging, roosting activities and any seasonal patterns of use.
<p>Stage 2: (continued)</p>		<p>Identify Impacts Impacts are not solely related to turbines but could occur due to ancillary buildings, roads, mineral extraction, forest felling and management, powerlines and land management practices</p> <p>SNH will take a lead on developing considerations which will identify those species and/or areas where cumulative impacts are likely to be an issue.</p>	<p>Consider impacts arising from displacement, habitat loss and collision risk during the separate phases of the windfarm i.e.</p> <ul style="list-style-type: none"> - preconstruction - construction - operation and maintenance and - decommissioning <p>What loss of habitat will occur? Will the range of the species be affected nationally or regionally? What is the predicted collision risk? Is the species suffering decline and will this additional mortality result in difficulties in reversing this decline? What factors are there already which may be impacting on the bird species, are the windfarm impacts likely to result in only minor adverse impacts in comparison to existing factors?</p> <p>Consider cumulative impacts (Link to cumulative guidance)</p>

		<p>Appraise the impacts – it will be necessary to assess impacts on any priority bird species (Tables 1a and 1b)</p> <p>SNH may negotiate or request modifications to the project or further measures to avoid or reduce or compensate for the effects on the natural heritage.</p> <p>Cumulative Impacts – take into account existing and proposed land use management activities when assessing cumulative effects</p>	<p>For each species, consideration needs to be given to:</p> <ol style="list-style-type: none"> 1. Would the windfarm adversely impact on FCS of any key species or on recovery of a species previously in decline either within the NHZ or nationally? 2. Does a species framework or PVA exist, if so are there any factors which need to be taken into account? 3. What magnitude of impact is predicted? 4. What mitigation is proposed, if any? 5. What are the residual impacts 6. Are there any cumulative impact concerns?
<p>Stage 3 Decision Making</p>		<p>Conclusion – having undertaken the technical assessment and sought advice where appropriate, the Area Officer needs to consider the implications of the assessment where a significant adverse impact on birds has been identified.</p>	<p>Is there sufficient information to arrive at a judgement? What public benefits will there be from the windfarm? Are there other significant adverse natural heritage impacts? What is the overall conclusion?</p> <p>Consider which position response is most suitable: A: Insufficient information B: Support C: Neutral Position D: Object</p>

		SNH Submission of response to the consultation	
Stage 4 Implementation	Implementation of mitigation and compensation measures including monitoring	SNH may wish to be involved in providing advice on effectiveness of mitigation, compliance and monitoring	SNH should ask to be consulted by the competent authority when it is considering whether to approve or amend a mitigation scheme, if effects on the natural heritage and birds are potentially significant. Consider whether to request that an Ecological Clerk of Works is appointed. Ask developers to ensure any monitoring work is made publicly available through the Consenting Authority.

¹ If birds are identified as qualifying features of SPA, than staff must request advice from SNH Advisory Services and refer to Natura Casework Guidance

National status information, for the widespread species in Table 1a, available to assist in assessing significance

Species	GB Population estimate	Information available
Red Throated Diver	935-1,500 (BP)	National population estimate (1994). The 2006 national survey will update figures.
Black Throated Diver	155-189 (BP)	Annual estimate of numbers (but reasonably accurate). The 2006 national survey will update figures.
Whooper Swan	5,720 (WI)	Estimate based on 5-yr mean 1994-1999. Waterbird Review Series (publ. JNCC) has detailed numbers and distribution nationally.
Greylag goose (Icelandic)	81,900 (WI)	Updated Population Viability Analysis (PVA) for Icelandic population only (published 2005). Waterbird Review Series (publ. JNCC) has detailed numbers and distribution nationally.
Pink-footed goose (Greenlandic/Icelandic)	241,000 (WI)	Updated Population Viability Analysis (PVA) for Icelandic population only (published 2005). Waterbird Review Series (publ. JNCC) has detailed numbers and distribution nationally.
Greenland white-fronted goose	20,900 (WI)	Updated Population Viability Analysis (PVA) for Icelandic population only (published 2005). Waterbird Review Series (publ. JNCC) has detailed numbers and distribution nationally.
Barnacle goose (Svalbard population)	22,000 (WI)	Updated Population Viability Analysis (PVA) for Icelandic population only (published 2005). Waterbird Review Series (publ. JNCC) has detailed numbers and distribution nationally.
Barnacle Goose (Greenland population)	45,000 (WI)	Updated Population Viability Analysis (PVA) for Icelandic population only (published 2005).
Red Kite	430 (372-490) (BP)	National survey 2000; good breeding data for the three main Scottish release areas annually.
Hen Harrier	483 (412-553) (BP)	Number per NHZ has been extracted from 1998 and 2004 surveys
Northern Goshawk	400 (BP)	Very poor population estimate (1995)
Golden Eagle	422 (BP)	Updated but unpublished figures available from National survey (2004). Species Framework (<i>draft</i>) Golden Eagle Population Model (GEPM).
Osprey	148 (BP)	Annual estimate of Scottish & UK breeding population

		(reasonable accuracy).
Merlin	1,300 (1,100-1,500) (BP)	Population estimate 1994. New national survey in progress.
Peregrine falcon	1,167 (BP)	National survey in 2003 (<i>unpublished</i>).
Black grouse	6,5100 (5,000-8,100) (BP)	National survey 1995-96. Updated national survey 2005 (<i>analysis in progress</i>).
Golden Plover	22,600 (BP)	National population estimate (poor accuracy) based on last Atlas (1989).
Dunlin (<i>Calidris alpina schinzii</i>)	9,150-9,900 (BP)	National population estimate (poor accuracy) based on last Atlas (1989).
Curlew	105,000 (BP)	Estimated national population 1985-9 (poor accuracy).
Greenshank	1,080 (720-1,480) (BP)	National survey? - best estimate (1995)
Short Eared owl	1,000-3,500 (BP)	National population estimate (poor accuracy) based on last Atlas (1989)

Key:

BP = Breeding Pairs

WI = Wintering Individuals

Numbers in brackets are 95% confidence intervals

Notes:

The data is taken from the published January 2006 Avian Population Estimates Panel data (*Population Estimates of Birds in Great Britain and the United Kingdom (Baker et al. 2006 British Birds 99: 25-44)*).

Data is given for GB only. In most cases this does not affect UK figures, as the majority of these species populations occur in Scotland. For UK figures readers are referred to the paper, as well as data sources, caveats etc. on data use. Note though that UK figures include Northern Ireland, so GB figures are considered to be more biologically meaningful. Figures are not broken down by country within APEP, although future versions may well do so.

The APEP table (for SNH staff only) can be found at the following link:

[January 2006 APEP Table](#)



Map: Natural Heritage Zones

Map of Natural Heritage Zones: Key

- 1 Shetland
- 2 Orkney and Northern Caithness
- 3 Coll, Tiree and the Western Isles
- 4 North West Scotland
- 5 The Peatlands of Caithness and Sutherland
- 6 Western Seaboard
- 7 Northern Highlands
- 8 Western Highlands
- 9 North East Coastal Plain
- 10 Central Highlands
- 11 Cairngorms Massif
- 12 North East Glens
- 13 East Lochaber
- 14 Argyll West and Islands
- 15 Loch Lomond, the Trossachs and Breadalbane
- 16 Eastern Lowlands
- 17 West Central Belt
- 18 Wigtown Machars and Outer Solway
- 19 Western Southern Uplands and Inner Solway
- 20 Border Hills
- 21 Moray Firth