

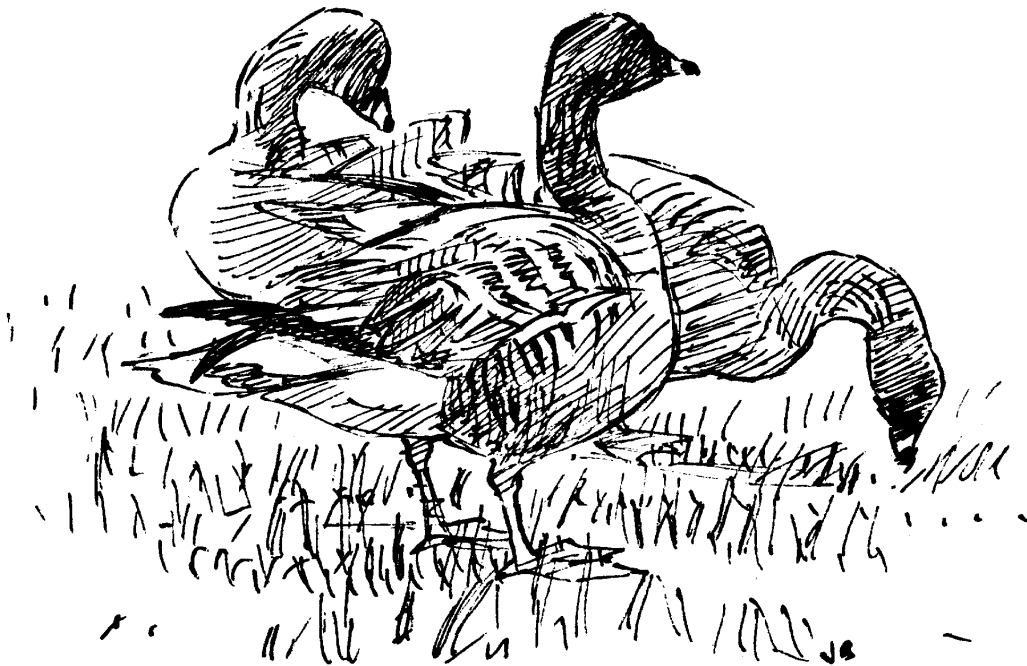


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for people
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Wind Turbines and Sensitive Bird Populations: **A Spatial Planning Guide for on-shore wind farm developments in Cumbria**

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Introduction

Wind energy developments have the potential to cause harm to bird species through direct habitat loss or damage, disturbance and displacement of species from feeding, nesting and migration and direct collision with turbines.

This document focuses on several important bird species that are vulnerable to the effects of on shore wind energy developments and highlights the main areas in which they are found in Cumbria in four bird sensitivity maps. These have been developed to trigger detailed consultations between developers, local authorities, statutory agencies and other agencies. The document helps to highlight areas where detailed ecological survey work will be necessary, on a site-by-site basis, to determine whether or not a site could be appropriate for wind energy development.

Wind energy developers need to determine whether or not there would be a likely significant effect, alone or cumulatively with other developments, to the species identified (and any other relevant species not identified in this document) in accordance with the Habitats Regulations Assessment.

This document forms part of the biodiversity evidence base for Cumbria's Local Development Frameworks and the Cumbria Wind Energy Supplementary Planning Document.

It is **NOT** intended that this document in any way negates the need to carry out thorough ecological surveys on a site-by-site basis, following the best available guidance and consultation with the relevant nature conservation organisations.

Key findings

The RSPB have identified 'bird sensitive' areas, which support **important populations**¹ of **sensitive bird species**² of conservation importance.

The bird species that meet these criteria (for the purposes of this study) are:

- Pink Footed Goose
- Greylag Goose (Icelandic population)
- Whooper Swan
- Hen Harrier

These are all wintering species, which may occur both within and out with land designated for high nature conservation or landscape value (ie. SSSI, SAC, SPA, Ramsar,

¹ 'Criteria for defining important populations' of bird species have been defined on page 10

² Refer to the 'Criteria for defining sensitive bird species' section on page 10-12

NNR, AONB, National Park). Please note that some species, which meet these criteria, have been excluded for reasons explained in the 'caveats and notes' section below.

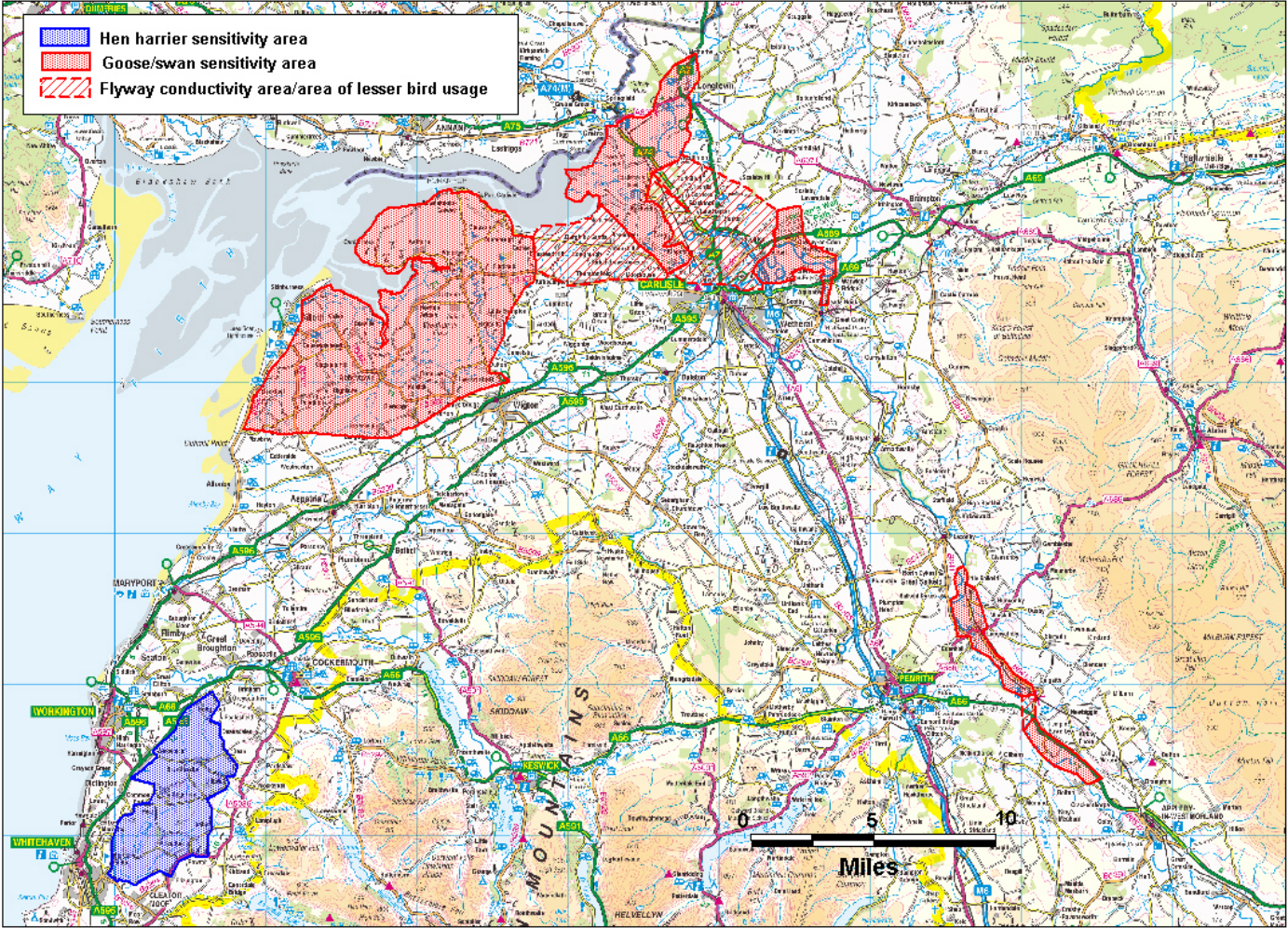
The guide includes description sheets setting out the distribution of the whooper swan, greylag goose and pink-footed goose in inland areas, outlining the status and distribution of each species and area profiles. Separate papers are available for hen harrier from Natural England (Kendal office).

Areas of sensitivity have been mapped (**bird sensitivity maps**) which highlight the areas known to support important populations of sensitive species. The maps are designed to be used as a **guide and a trigger for consultations** to highlight specific areas of Cumbria that have been mapped to indicate areas which are potentially 'bird sensitive areas' in terms of wind farm development.

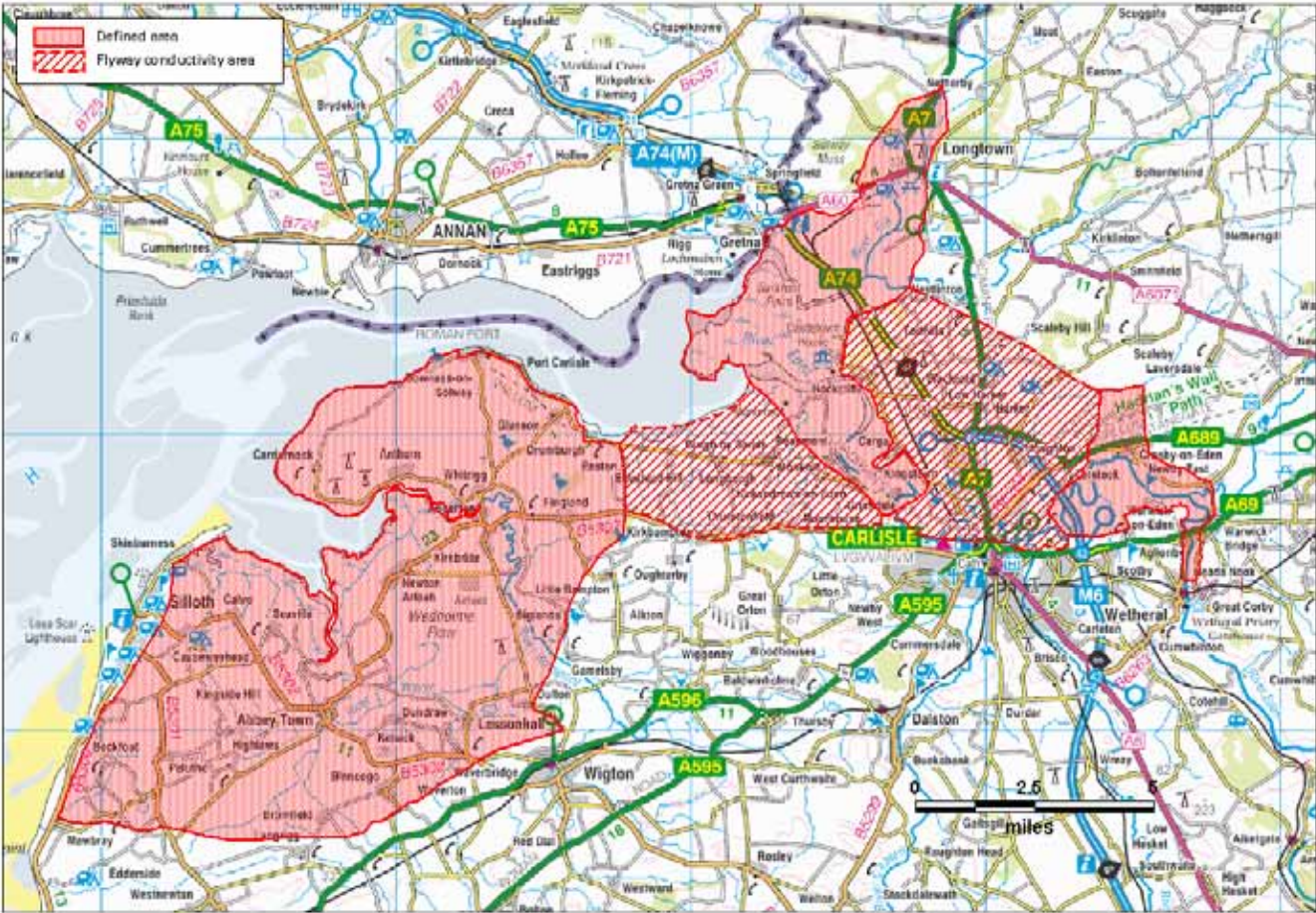
The areas that have been mapped are:

- Map 1: Summary bird sensitivity map- Cumbria
- Map 2: Outer south Solway/ Inner South Solway/ Lower Esk/ Lower Eden
- Map 3: Middle Eden
- Map 4: West Cumbria hen harrier wintering sites

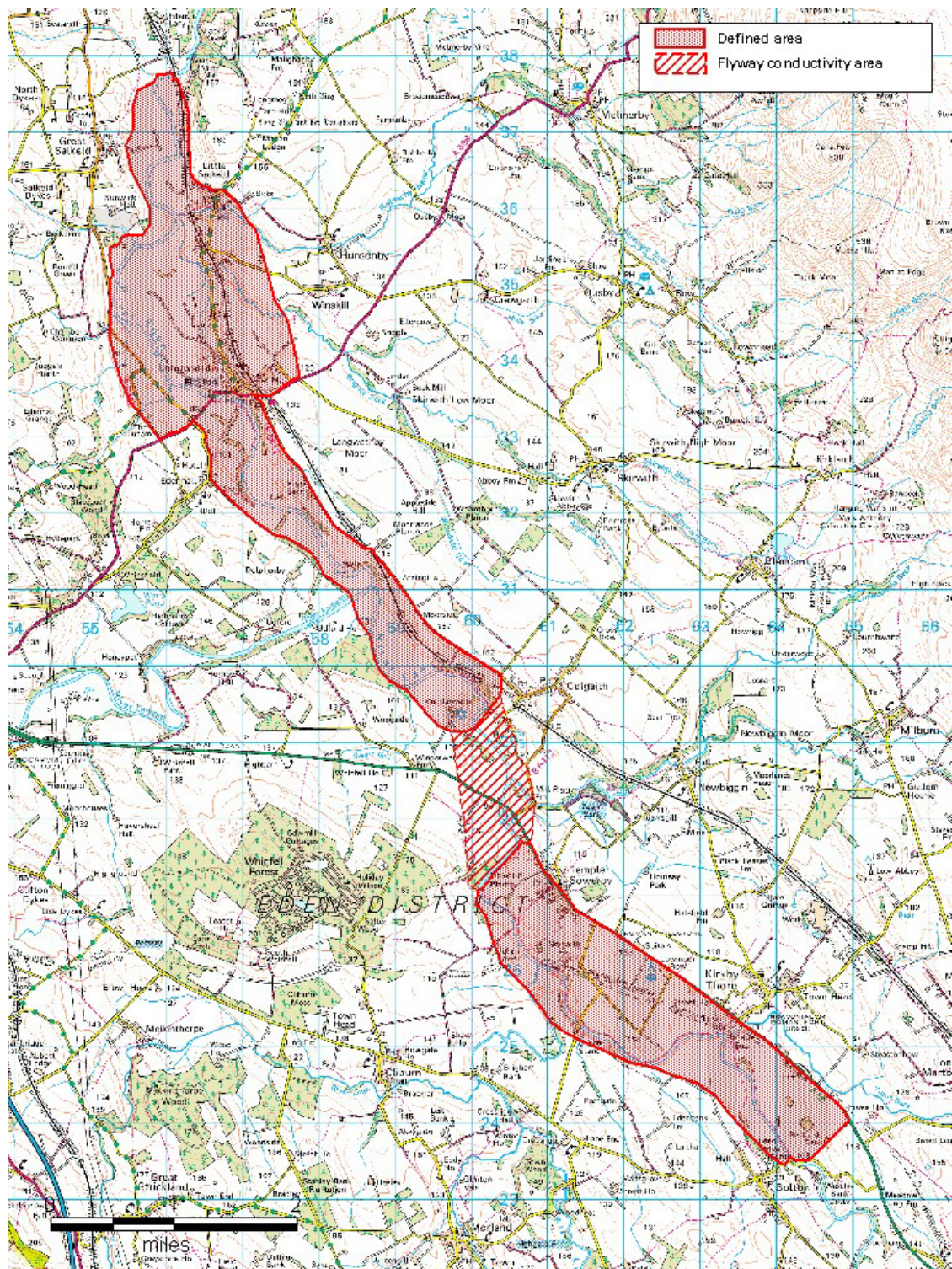
Map 1: Summary bird sensitivity map- Cumbria



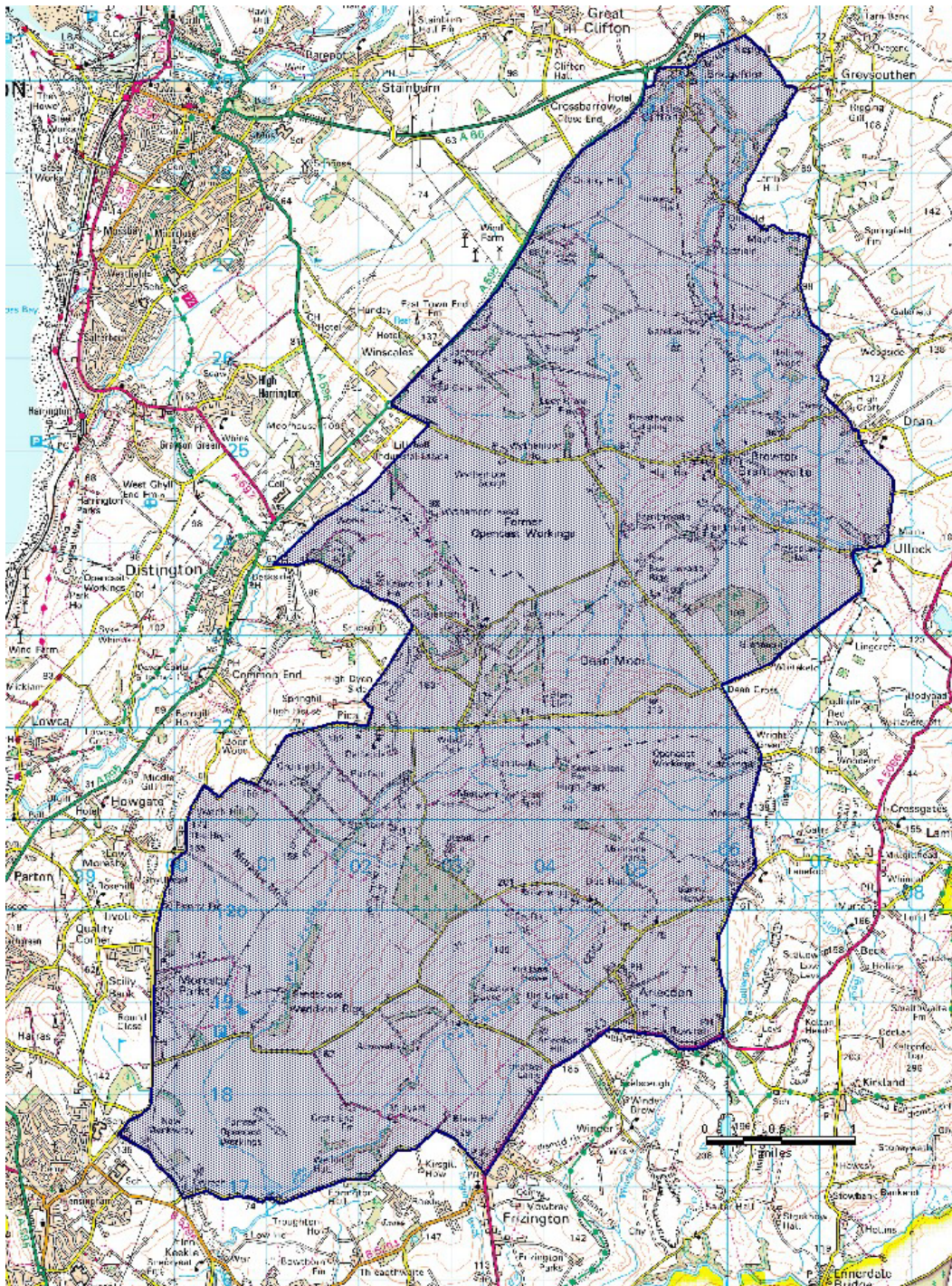
Map 2 : Outer south Solway/ Inner South Solway/ Lower Esk/ Lower Eden



Map 3: Middle Eden



Map 4: West Cumbria hen harrier wintering sites



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Legal protection for birds and habitats within the 'bird sensitivity' mapped areas

Many of the sensitive species³ identified may be qualifying species of a Special Protection Area (SPA). These birds are also protected when they occur (ie. feed, roost, fly through) in areas which are 'functionally linked' to an SPA. In many situations, a proposed development within a 'bird sensitive area' will need to be considered under the Conservation (Natural Habitats, &c.) Regulations 1994 (the Habitats Regulations). If there is a likelihood of a significant effect on the SPA (within or out with the designated area), an Appropriate Assessment will need to be undertaken if a proposed development is likely to have a significant effect on the site's conservation objectives and integrity. The impact of the plan, programme or project must be assessed in-combination with other plans, programmes or projects in the area in order to take account of in-combination and cumulative effects.

Some of the sensitive species chosen are also listed under annex 1 of the EU Birds Directive and are Schedule 1 species under the Wildlife and Countryside Act 1981 (as amended).⁴

The role of the Habitats Regulations Assessment

In many situations, a proposed development within a 'bird sensitive area' will need to be considered under the Conservation (Natural Habitats, &c.) Regulations 1994 (the Habitats Regulations). For international sites, and features that they support, new wind energy schemes need to demonstrate that they will not adversely affect their conservation value. Schemes should not cause harm to habitats and species outside a designated site that may adversely affect the integrity of a site, or cause a significant decline in the size, distribution, structure or function of a population of a species for which a site was designated. In accordance with the Habitats Regulations, an assessment needs to be carried out for each new development to determine if it would have a likely significant effect, alone or in-combination with other plans or projects, on sites or features associated with an international designation. If likely significant effect is determined, developers are expected to provide relevant information to the Local Planning Authority to enable it to carry out an Appropriate Assessment.

The role of the NERC Act

It should be noted that under the Natural Environment and Rural Communities Act (NERC) 2006, Section 40, Part 3, "*Every public authority must, in exercising its functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity.*"

³ Please refer to the 'Criteria for defining sensitive species' section on page 10-12

⁴ Please refer to point 7, under the 'Caveats and notes' section on page 13 and 14

Methodology and definitions

This section sets out the criteria for defining important populations of sensitive species of birds and 'bird sensitive areas' in terms of **on-shore** windfarm development in Cumbria. Please refer to annex 1 for important populations thresholds and annex 2 for definitions of sensitive species.

Criteria for defining 'important populations'

Birds are highly mobile and are recorded over a wide area, so the threshold for inclusion for an 'important population' is taken to be a complex of fields or a discreet area of land which *regularly* supports (ie. recorded several times a year during the period when the birds are present):

- 1% of the *relevant* SPA population (ie. to which a population is functionally linked) based on the 5 year mean figure **OR**
- If this is not applicable, then a 1% of the national population threshold (nationally important) is used **OR**
- If this is not applicable, a *regularly* (ie. recorded several times a year during the period when the birds are present) occurring population present in a *notable* concentration (ie. of county importance, taken as 10% of the Cumbrian population) figure is used.

The figures used in Annex 1 show the situation in 2007. It should be noted that the data used for defining important populations is updated annually, so this exercise is based upon current knowledge and distributions and this may be subject to change. Many of these species occur in areas that straddle the protected area network (SPA, SAC, Ramsar, SSSI). Areas out with the protected area network may well be 'functionally linked' to an SPA. An example of this is the situation whereby birds spend part of their time within an SPA and part of their time feeding in outlying areas. In many cases, such species are also qualifying species of the SPA. It must be stressed that many of the bird sensitive areas are functionally linked to each other by established bird flyways, which are marked on each map and should be considered as important as the bird sensitive areas themselves.

Criteria for defining 'sensitive species'

The criteria set out in annex 2 have been used to determine sensitivity to wind farm developments.

Using these criteria, the following list of bird species has been drawn up:

- Whooper swan;
- Pink footed goose;
- Icelandic greylag goose (not feral birds);
- Hen harrier

Note that these species are qualifying species of the following SPA's in Cumbria (<http://www.jncc.gov.uk/page-1419>) and some fall under Annex 1 of the EU Birds Directive⁵ or Schedule 1 of the Wildlife and Countryside Act, 1981 (as amended)- see annex 2.

Species	Qualifying species of which Cumbria SPA's
Whooper swan	Upper Solway Flats and Marshes
Pink footed goose	Morecambe Bay, Upper Solway Flats and Marshes
Greylag goose (Icelandic origin)	n/a
Hen harrier	Breeding in the North Pennine Moors and Newcastleton SPAs

Note that the first two species listed are those that winter or pass through Cumbria, largely between the months of September and March. Referring to annex 2, these species are defined as having 'very high' sensitivity to wind farm developments for several reasons:

- They are a cited interest of SPA's and SSSI's.
- They are large with low manoeuvrability and are vulnerable to collision (swans and geese);
- They feed in the area and are vulnerable to the effects of displacement by wind turbines (all species listed);
- They occur in discrete, nationally important (except Icelandic greylag geese) populations in the area.

Hen harriers have been included for the following (additional) reasons:

- Hen harriers winter in a discrete area of West Cumbria (see map 4) in internationally important numbers- see annex 1. The West Cumbria foothills roost complex is the third biggest roost site in northern England;
- The roost complex and associated foraging areas are vulnerable to change.

Icelandic greylag geese are defined as having a 'medium' sensitivity to windfarm developments in annex 1, due to their lower nature conservation status than whooper swan or pink footed goose.

This guide focuses on areas in which qualifying species are functionally linked to an SPA because, in spatial planning terms, it is these areas which are most vulnerable to change due to the comparative strength of the planning/ regulatory system in statutory

⁵ Council Directive 79/409/EEC on the Conservation of Wild Birds

designated areas compared to those out with such areas. However there are some exceptions to this.

One exception is the 'Middle Eden valley' sensitive area (illustrated in map 3), which supports notable populations of whooper swan (35 birds, 5 year mean figure), not known to be functionally linked to an SPA.

Other exceptions are wintering hen harrier and Icelandic greylag goose, as these occur in internationally important/ notable populations respectively, but are not linked to a specific, adjacent SPA.

There could be other notable populations of sensitive species that are not covered by this planning guide and these are listed in the 'caveats and notes' section below.

Methods of producing the maps

Cumbria has been divided into areas that are known to support important populations of sensitive species known to be vulnerable to wind farm developments.

Each area has been defined by using the best available data and through consulting with expert bird recorders active in each area. Typically, such bird recorders are surveying the areas in question through monitoring schemes such as the Wetland Bird Survey (WeBS) and therefore have intimate knowledge of how birds use the area.

The same methodology has been used to map flyways between bird sensitivity areas, to acknowledge the fact that birds move between suitable areas to feed/roost/ loaf and assemble before migration. It must be stressed that many of the bird sensitive areas are functionally linked to each other by established bird flyways and should be considered as important as the bird sensitive areas themselves.

Caveats and notes

1. The mapped areas are **not** definitive.
2. All areas covered by landscape or nature conservation designations have not been illustrated on the maps.
3. Species **not** covered by this study include:
 - Important populations of breeding birds vulnerable to wind farms, for example raptors, black grouse;
 - Other wintering or passage birds;
 - The barnacle goose distribution (*Svalbard* population) has **not** been mapped because this species occupy fields usually only 1-2 fields inland from the Upper Solway Flats and Marshes SPA (ie. within the Solway Coast AONB) and spend most time actually on the estuary itself. Please note that this study only relates to the English side of the Solway estuary.
 - Confidential hen harrier roosting sites holding less than nationally important numbers of birds (ie. out with the West Cumbrian population)
4. The maps do **not** cover the species listed above because either:
 - Only the most sensitive species (defined as being 'very high,' 'high' or 'medium' sensitivity' - see annex 2) occurring in important numbers (see annex 1) have been included in this exercise **and/or**
 - Species known to occur wholly *within* the protected area network (eg. SPA) and/ or an area designated as an AONB or National Park. For the purposes of this study, these species have been excluded because the species largely occur within areas subject to statutory nature conservation designations. An example is barnacle goose.
5. Various species have not been included in this study, but they must **not** be overlooked and need to be included in a site-by-site assessment (usually through the Environmental Impact Assessment or **EIA**, process). Scottish Natural Heritage (SNH) have produced recommended guidance on '*Survey methods for use in assessing the impacts of on-shore wind farms on bird communities*' which developers are encouraged to use through the Cumbria Wind Energy Supplementary Planning Document. This is available to download from http://www.snh.org.uk/pdfs/strategy/renewable/bird_survey.pdf
6. The Wildlife and Countryside Act 1981 (as amended) makes it an offence (with exception to species listed in Schedule 2) to intentionally kill, injure, or take any wild bird or their eggs or nests. Special penalties are available for offences related to birds listed on Schedule 1 (for example peregrine falcon), for which there are additional offences of disturbing these birds at their nests, or their dependent young.
7. >1% international population= internationally important; >1% national population= nationally important (note that if an annex 1

species is present in nationally important numbers, it would qualify as being internationally important under Article 4 (1) of the Directive ie. it would qualify for designation as an SPA)

8. The number and species of bird flying over Cumbria especially during periods of migration (for example geese) are not accurately known, so it cannot be assumed that important populations of birds will only occur within the mapped areas.
9. Note that the data used for defining important populations is updated annually, so that this exercise is based upon current knowledge and distributions and this maybe subject to change.

Distribution of Whooper Swan, Greylag Goose and Pink-footed Goose in inland areas of Cumbria.

Both whooper swan and pink-footed goose are present in substantial numbers during passage periods and in winter in Cumbria. Typically, pink-footed goose distribution is dictated by proximity to nighttime roosts on the Solway Estuary, hence geese tend to feed on pasture or stubbles within short flying distance of the estuary. Whooper swans do not have the requirement to fly to coastal roosts sites and although there are wintering areas adjacent to the Solway Estuary, there are also inland wintering areas in the Eden and Esk Valleys. Migratory Greylag Geese of Icelandic origin winter in one area of the Eden Valley centred around Langwathby and are thought to be sedentary through the winter.

The following report and maps describe the distribution and occupancy levels of these species in Cumbria.

Whooper Swan

Introduction

Most whooper swans wintering in Britain and Ireland are from the Icelandic breeding population. This population winters almost exclusively here and in Iceland itself with small numbers in countries around the southern North Sea. The North European mainland population winters in Scandinavia, northern Germany and the Low Countries with only small numbers recorded in Britain (Robinson et al 2004).

The most recent census of wintering Icelandic Whooper Swans in Iceland, Great Britain and Ireland in January 2005 recorded 26,366 swans. This represents a 26% increase since the 2000 census and a 66% increase since 1995 (Worden 2006).

During the early part of the 20th century, Whooper Swans fed on aquatic vegetation in coastal or freshwater habitats through out their winter range. Since the 1960s there has been a change in foraging habits in favour of intensively managed agricultural land, notably improved pasture, winter stubbles and root crops (Robinson et al 2004). The choice of particular pasture fields may be related to the availability of nearby freshwater for drinking and to whether stock are present. Birds rarely mix with sheep or cattle (F. Mawby & D. Hickson pers. com.).

Birds may move to roost on estuary mudflats or salt marshes or on the sea itself at coastal sites, but on moonlit nights they may stay inland. Inland feeders probably move to roost on adjacent still freshwaters or rivers at dusk.

Status and distribution in Cumbria

Of the 26,366 swans counted in the January 2005 international survey, 287 were counted in Cumbria (1.1%). Co-ordinated counts through out the winter of 2006/07 recorded a maximum of 364 birds in March 2007. This may reflect better coverage than the 2005 survey rather than a real increase.

Table 1: Total number of Whooper Swans Counted in Cumbria in 2006/07

Oct	Nov	Dec	Jan	Feb	Mar
nc	118	310	313	331	364

In Cumbria there are regular wintering areas around the Solway Estuary and inland in the lower Esk Valley at Longtown, the lower Eden Valley east of Carlisle and the middle Eden Valley east of Penrith. These birds are all feeding on either improved pastures or winter stubbles and roosting nearby.

Passage birds occur in the Morecambe Bay estuaries of the Kent and Lune, along the west coast, notably at Walney Island, the Duddon Estuary and less frequently at Siddick Pond, Workington. Occasionally they are recorded on inland lakes throughout the county where the duration of stay is normally very short. Bassenthwaite Lake is a regular haunt. Exceptions are Tindale Tarn in the north Pennines and Linskelfield Tarn near Cockermouth where small numbers can linger.

(A small wintering population centred on the southern lakes of Windermere, Grasmere and Elterwater from at least the late 1930s through to at least the early 1960s and perhaps more sporadically up to the mid 1980s, has now disappeared as a result of changed feeding habits. This is also true of a small flock which frequented Tarn House Tarn, Kirkby Stephen and surrounding waters at the head of the Eden/Lune catchments.).

Other than the five yearly national mid winter count of Whooper swans initiated in 1985, (coverage has been generally incomplete in Cumbria for these counts), there has been no co-ordinated counting of swans in the county until the current winter. Because distribution is not necessarily wetland orientated the monthly national "Wetland Bird Survey" (WeBS) counts do not include all the regular wintering areas.

Table 2 lists the highest counts since 1995 from either WeBS counts or from casual records supplied to the Cumbria Bird Club for the main wintering resorts. (These figures should be taken as minimum maxima for each site but should not be summed to give county totals as they were not co-ordinated counts.

Table 2: Maximum counts by winter at the main Cumbrian feeding locations 1995/96 onwards.

Area	1995 1996	1996 1997	1997 1998	1998 1999	1999 2000	2000 2001	2001 2002	2002 2003	2003 2004	2004 2005	2005 2006	2006 2007
Longtown Complex	38	8	12	4			5	13	29	25	31	24
Inner Solway / Lower Esk		36		140		45	18	15		74	80	45
Inner Solway / Lower Eden	98	98	80	80	179	195	85	144	345	168	98	134
Middle Solway	9	12	6	11	8	28	14	11	14	43	42	18
Outer Solway	87	70	74	115	154	120	220	102	130	114	166	195
Lower Eden floodplain	28			100		60		12	24	24	19	40
Middle Eden floodplain	24		88	58	50	35	17	20	36	43	43	31

Blanks = no count but does not imply absence.

The whole Solway Estuary within existing WeBS count boundaries qualifies as internationally important (qualifying level - five year mean peak 210) and nationally important (qualifying level - five year mean peak 57) with a five-year peak mean of 438. However Whooper Swans often occur outside WeBS boundaries, but because they are mobile within wintering areas it is not possible to say particular fields are of importance. Nevertheless the areas adjacent to the estuary defined as the inner and outer south Solway in this report would qualify as nationally important.

Area profiles for regular sites

Longtown Complex

The favoured feeding area is the pastures and stubble north of the A7 road north of Longtown. Birds are known to roost on Oakbank Ponds and regularly use Arthuret pools to the southwest of Longtown. Swans are present all winter.

Inner South Solway/ Lower Esk

The pastures north of the River Esk and to the south of Mossband Hall are the most regularly used area. Fields to the east of Rockcliffe Cross on the south Side of the Esk are also used as is the north side of Rockcliffe Marsh. The River Esk and Esk Channel are probable roost sites. Swans are present all winter

Inner South Solway/Lower Eden

Swans concentrate on the fields adjacent to the River Eden and are predominantly found on the north/northeast side of the river. They have also been located in the small field systems adjacent to Grinsdale, Beaumont and Sandsfield on the south/south west side of the river and on Burgh Marsh. Favoured locations are the improved pastures adjacent to

Demesne Marsh and the pastures and stubbles opposite Beaumont. Large numbers fed on brassica tops inland of the sea wall at Demesne in the winter of 2003/04. Birds also use the River Eden and Eden Channel and the south side of the adjacent Rockcliffe Marsh and these are the main roosting areas. Swans are present all winter.

Middle South Solway

This is an area of relatively low and sporadic usage centred on the pastures of North Plains Farm, Bowness-on-Solway.

Outer South Solway

This area generally holds the highest number of swans and in contrast to other areas the birds can fragment into small flocks and be more widely dispersed. Birds are predominantly on improved pastures but will utilise arable stubbles. The availability of stubbles may be a key determiner of distribution particularly in the west of the area towards Silloth and Mawbray. The core area of usage throughout the winter is to the east of Moricambe Bay as far as Whitriggles and is centred around Kirkbride, Newton Arlosh and Wampool. Newton Marsh and the saltmarshes and pastures either side of the Wampool Channel are also used. Smaller satellite flocks are centred between Wedholme Hill and Lessonhall to the south, Abbeytown, also to the south and alongside the Waver north and west of Lessonhall. The area to the east of Silloth around Blackdyke has regular usage but not through out the winter and the southwest of the area tends to have more sporadic occupation around Pelutho, Aspatria, Mawbray and Holme St Cuthbert. The main roost is just up river of Anthorn and flights to and from roosts occur in the half-light of dawn and dusk. The estuary is also used whether there be tidal water or not, particularly in autumn though often with much floodwater around, birds can roost in widely dispersed locations inland. Swans are present all winter.

Lower Eden floodplain

A flock of between 20 and 70 birds favours the floodplain of the River Eden between Aglionby Grange/Park Broom and Warwick Bridge. Swans utilise the improved pastures to the north and east of the river at Newby and Crosby-on Eden and south of the river at Warwick Holme where they favour the fields south of the flood embankment and are difficult to locate. The Rickerby-Linstock area to the west appears to have been vacated since the mid 1990s. The roost is assumed to be the River Eden itself in the vicinity of the feeding areas and birds are present all winter.

Middle Eden floodplain

This inland area is again centred on a portion of the River Eden Floodplain from Langwathby in the west to Bolton west of Appleby in the east. In recent years birds have preferred the pastures between Bolton and Ousenstand, where occupation is throughout the winter. Satellite groups at Watersmeet east of Langwathby and sporadically at Julian Bower north of the new Kirkby Thore bypass are not as regular. The once favoured area adjacent to the girder bridge at Langwathby is still used but much less regularly. There

are records of swans on a pond adjacent to the Gypsum works at Kirkby Thore to the north but this is considered to be extralimital. Like the Lower Eden area, the roost is assumed to be the River Eden in the vicinity of the feeding areas and birds are present all winter.

Interchange between areas

There is likely to be interchange between adjacent favoured areas, within areas, and from out with Cumbria. This is evidenced by fluctuating numbers at some sites.

Birds in the adjacent areas of the Inner Solway at the entries of the Esk and Eden almost certainly move between each area as do birds from the Inner Solway/Lower Esk to the Longtown complex and from the Inner Solway/Lower Eden to the Lower Eden floodplain. It is not clear what the extent of interchange between the outer Solway area and other Solway areas is but there appears to be considerable movement within the outer Solway area itself. Colour ringed birds from this area were not seen at other South Solway sites during the 2005/06 winter suggesting some degree of “area” fidelity within the Solway area (D. Hickson pers comm.). The Mid Eden flock also exhibits some movement between sites within it’s area. The favoured areas on the South Solway are also adjacent to the substantial flocks on the north side of the estuary. Interchange could well occur with the Inner Solway flocks and the Longtown complex. If it occurs with the outer Solway flock it is likely to be at night as there are very few records of birds in flight across the estuary itself.

Colour ringed Swans have also been located in Cumbria and in Ireland in the same winter.

Table 3: Importance of administrative districts for winter and passage distribution of Whooper Swans within Cumbria

District	South Lakeland	Eden	Carlisle	Allerdale	Copeland	Lake District
Winter		Moderate	High	High		
Passage	Moderate	Moderate	High	High	Moderate	Moderate

Greylag Goose

Introduction

Icelandic breeding greylag geese winter almost entirely in Britain. Small numbers remain in Iceland and the Faroe Islands (where small numbers also breed) with others in Ireland and southern Norway.

Co-ordinated counts of this population commenced in 1960 and from then until about 1990 increased from around 30 000 to 110 000 birds. Since then the population had fallen to about 80 000 by 2000 (Hearn et al 2004) but has since risen to near 1990 levels again (Banks et al 2006).

In the 1950s most birds wintered in southern Scotland but the majority now remain in north and northeast Scotland where they first make land fall in autumn. As winter progresses some move to southern Scotland with small numbers reaching England and Ireland. Preferred feeding habitats are primarily agricultural with pastures, stubbles, cereals and root crops favoured.

Accurate population monitoring is confounded by the presence of a large population of re-established birds descended from introductions made in the 1960s and 1970s. These occur as separate populations away from migratory populations but also within areas favoured by Icelandic birds and intermixing does occur.

In England the situation is complicated by the presence of re-established birds. Northumberland and Cumbria hold the bulk of the English Icelandic population with small numbers now known to occur in Yorkshire through the presence of colour marked birds.

Status and distribution in Cumbria

In common with the three main Northumberland sites, numbers at the only major Cumbrian sites in the Eden Valley have declined in recent years to the extent that the area around Aglionby and Crosby on Eden to the east of Carlisle is now largely vacated, (though some Icelandic birds may be present here amongst re-established birds). The area around Langwathby, which held some 1000 – 2000 birds in the 1970s now holds the only substantial population. This area is not covered by a WeBS count and because of the dispersed nature of the population within the area it is not always possible to be sure the whole population has been located during a targeted count. Counts have been done on an irregular basis since 1997 and the results, together with a count from 1986 are presented in table 1. (These figures should be taken as minimum maxima for each winter and will include re-established birds).

Table 1: Maximum counts by winter at the mid Eden wintering area.

1985	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
1986	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
2160			1023	1295	2425	1900		1150	900	535	340	575

Because of the confusion with re-established birds a figure for a total for England is impossible to assess. Nevertheless with a decline at the main Northumberland resorts which combined may have held 800 birds in the 1980s to perhaps only 500 by 2000 it is possible that the mid Eden area might hold over half of the current English wintering population. In British terms the area may have held about 2.5% of the population in 1999/2000 but may have declined more recently to around 0.5%. With a qualifying level of an average peak count per year over the last 5 years of 1000 birds, the area no longer qualifies as international important as it did in the late 1990s. With the five-year mean peak now at 700 it also just fails to reach the qualifying level of 819 birds to be of national importance.

Small numbers occur on the Solway and Kent Estuaries but again status is confounded by the presence of re-established birds.

Area Profiles for regular sites

Mid Eden Valley

The area regularly used stretches from Little Salkeld in the northwest to Culgaith in the southeast. Fields adjacent to the river are most favoured but flocks do move away from the floodplain and the undulating nature of the valley in this area can make them difficult to locate. Favoured areas are the floodplain between Little Salkeld and Langwathby and between Pea Foot, Culgaith and Watersmeet where the River Eamont meets the River Eden.

Flocks of over 200 at Ormside to the south, Kirkoswald to the north and Ullswater and the Lowther valley to the west are thought more likely to be of re-established origin. The roosting behaviour of the Icelandic flock is not fully known but it is thought that they roost on the River Eden itself or on nearby Whins Pond to the west.

Other areas

The lower River Eden floodplain between Warwick Bridge and the M6 east of Carlisle held high numbers of Geese as far back as 1990 when 750 were recorded in January of that year. The area still holds greylags with up to 200 present. Doubtless these may include some Icelandic birds on occasion but the area seems to have declined in importance as a resort generally.

A small population of presumed Icelandic geese wintered in the north Morecambe Bay area up to at least the mid 1960s. The area used included the Kent Estuary within Cumbria. Since the introduction of feral birds to the area from the that point on, the status of the Icelandic birds has become confused. Behavioural differences and the presence of the occasional Scottish ringed bird suggest that the population of 200 – 400 birds which graze the saltmarshes around Leighton Moss and roost on the pools on the saltmarsh may be of Icelandic origin. These birds also flight to the Lune and Kent estuaries but numbers are generally low on the Kent (Wilson 2004).

The south Solway has never been a major resort for Greylag Geese. Up to 500 birds were reported from the Moricambe Bay saltmarshes in the first half of the twentieth century and birds still occur in Moricambe Bay and on Rockcliffe Marsh. Again this is likely to include re-established birds. A group of 800 in Moricambe Bay in April 1999 could have involved Icelandic birds and the estuary sees its heaviest usage during the late winter/spring passage period.

Table 2: Importance of administrative districts for winter and passage distribution of Icelandic Greylag Geese within Cumbria

District	South Lakeland	Eden	Carlisle	Allerdale	Copeland	Lake District
Winter	Low	High	Low			
Passage			Moderate			

Pink-footed Goose

Introduction

The Iceland/Greenland breeding population of pink-footed goose winters almost entirely within Britain with only small numbers in Ireland. From 1960 when co-ordinated censusing began until the mid 1980s the population more than doubled from fewer than 50,000 to about 100,000 birds. It then more than doubled again to around 250 000 birds by the mid 1990s (Mitchell & Hearn 2004), then stabilised for the next five winters before increasing again to an estimated 292,154 in 2004/05 (Banks et al 2006).

The British wintering population is concentrated in eastern Scotland, on the Solway Firth, on the estuaries of the Lancashire coast and on the Norfolk coast. Large numbers occur in early autumn in east central Scotland after arrival from the north, before redistributing within east Scotland and to wintering areas to the South. Return migration through Britain of birds at the southern limit begins in late winter and departure from Britain begins in mid April. Favoured feeding areas are improved grasslands, stubbles, cereals and root crops with nearby estuaries or freshwaters used as roosts (Mitchell & Hearn 2004).

Status and distribution in Cumbria

Large numbers of pink-footed geese pass high over Cumbria on their way south from September onwards. The south Solway Estuary and adjacent farmland is however the only major Cumbrian wintering area. As the Solway estuary is shared with Scotland the details and totals given below are for the whole estuary.

Prior to the 20th century the species was uncommon but by the 1930s geese could be found at the eastern end of the estuary and since then the inner Firth has always been considered a major wintering and passage resort. Arriving from the end of September onwards, peak counts tend to be in autumn and especially spring, reflecting the importance of the area as a staging site. The main roosts are on the Blackshaw and Priestsides Banks on the Scottish side, on the sandbanks off Rockcliffe Marsh in both Scotland and England and in Moricambe Bay at the western end of the inner Firth on the English side. From these night roosts, birds flight inland to feed by day on pastures or stubbles. However it is known that they will roost inland, particularly during strong winds or when floodwater is present and there is recent evidence that this is now become habitual particularly around Lochmaben on the Scottish side and along the Esk floodplain in Cumbria.

Since 1987/88 co-ordinated monthly dawn roost counts have been carried out on the inner Solway with counts prior to that less regular. In common with the bio-geographic population trend, numbers increased from the 1960s to the mid 1990s but then declined

in the late 1990s. The peak count was of 28850 birds in March 1991. The five-year peak count mean for the period 2002/03 to 2006/07 was 15376.

These counts show a consistent seasonal pattern of usage. From mid September to mid October the estuary is a staging area for geese moving to Lancashire and more recently Norfolk. These birds are primarily on the Scottish side and along the River Esk towards Longtown. Numbers are low in November with a small increase through December probably involving more northerly distributed Scottish birds moving south as feeding conditions deteriorate further north. Numbers increase more significantly from mid to late January as more Scottish birds move south in search of better foraging opportunities and birds from Lancashire begin to head north on return migration. Numbers peak in February and early March when geese feed inland on fields all around the estuary. When the shooting season ends on 20th February they tend to move to feed on the saltmarshes of Kirkconnel Merse and Caerlaverock on the Scottish side and Rockcliffe Marsh and Moricambe Bay on the Cumbrian side.

**Table 1: Numbers of Pink-footed Geese on the Solway Firth
1987/1988 – 2006/2007 (from co-ordinated WWT Grey goose roost counts)**

	October	November	December	January	February	March	April
Season 1987\88	2855	2673	8863	10970	8290	11498	1214
Season 1988\89	3331	1507	3037	3405	9116	9190	2848
Season 1989\90	3592	2990	5646	4500	17000	no count	501
Season 1990\91	4730	3150	7140	22435	17800	28850	5872
Season 1991\92	4443	2940	6556	7055	11880	18935	2420
Season 1992\93	3847	1695	5556	3967	12567	10023	3193
Season 1993\94	4247	547	2365	6955	17470	3080	2450
Season 1994\95	2712	6059	1582	19108	20202	1736	2016
Season 1995\96	3939	4886	2791	12740	22523	16709	9730
Season 1996\97	5429	3160	9546	15625	13649	19586	3959
Season 1997\98	6482	2257	3523	13430	17971	6303	1625
Season 1998\99	3710	1587	2289	4524	15570	11072	2600
Season 1999\00	750	861	852	4175	6569	6534	1840
Season 2000\01	2541	969	4960	14612	8093	nc	nc
Season 2001\02	586	979	647	2635	5227	2916	1250
Season 2002\03	3401	2213	2300	5812	15207	6450	3354
Season 2003\04	2683	3398	2589	5209	15870	15910	2880
Season 2004\05	1482	5062	2986	3460	7860	8272	3526
Season 2005\06	890	1244	3150	9519	13680	13170	2700
Season 2006/07	1465	1018	3430	840	23813	11250	4915

The Solway Estuary as a whole is of national and international importance for this species, the five year peak mean exceeding the 2400 threshold applied to both levels of importance.

Area Profiles for regular sites

Lower Esk Valley

Geese utilise the valley as far north as Penton where 1500 were feeding in January 1999. The particularly favoured area is centred on Longtown. At least 1000 were in potato fields and pastures in January 2005.

The flight line to and from the Solway roost follows the valley floor.

Inner South Solway/ Lower Esk/Lower Eden

The area of most usage is the saltmarsh of Rockcliffe Marsh itself. Numbers peak in the late winter/early spring and as many as 9500 were recorded in March 1999. Up to 2500 have also been recorded on nearby Burgh Marsh on the Cumbrian side of the estuary in February 2004. In January and February flocks of several hundred use the pastures adjacent to the marshes at Rockcliffe Cross, Mossband Hall and Easton and again later in the winter as grass is in short supply on the marshes. The north east part of this area is contiguous with foraging areas southwest of Longtown. Birds flight to roost off Rockcliffe Marsh Point.

Middle South Solway

The pastures of the RSPB nature reserve at North Plain Farm, Bowness on Solway attract substantial numbers of geese, particularly in the late winter/early spring. The peak count was 4800 in February 1991 and counts of up to 3000 are regular. Lesser numbers also feed in fields to the south of Bowness Common at Rogerscough and Millrigg. The area is contiguous for goose usage with the northern part of the Outer Solway and the western part of the Inner Solway. Birds roost on the estuary off Cardurnock.

Outer South Solway

The saltmarshes to the west and south of Moricambe Bay are the most important areas and like elsewhere on the Solway numbers peak in late winter/early spring. These marshes held up to 10000 birds in March 1991 and February and March 1996. More recent peaks have included 6500 on Newton Marsh in February 2003 and 5500 in March of 2004 and 2005. High numbers of up to 5000 also occur inland of the marshes, particularly around Anthorn, Whitrigg, Kirkbride and Newton Arlosh. Further away from the estuary, as many as 2500 have been recorded around Abbeytown in February and March 2004 and 1000 further south at Holme Dub in February 2000. Flocks numbering in the low hundreds are regular in the Lessonhall area south of Wedholme Flow. The roosting area is in Moricambe Bay.

Lower Eden floodplain

Birds feed in fields adjacent to the river Eden east of the M6 motorway bridge as far as Park Broom on the north side and Aglionby Grange on the south side. They also favour fields immediately west of the M6 bridge on the north side of the river. Away from the floodplain flocks utilise fields between Crosby-on-Eden and Walby. About 4500 birds were recorded around Crosby-on-Eden in February 1986 and 3500 in January 1995 and 1996 in fields by the river. In more recent years peak counts have involved 2000 in January 1999 and again in January 2004 both in the floodplain. The floodplain has only recently been counted for the WeBS survey and the peak count for 2005/06 was 1000 in January and for 2006/07, 1200 in December. The fields north of Crosby-on-Eden are not systematically counted but have had regular usage in the latter winter.

The presumed night roost for these birds is on the mudflats and estuary off Rockcliffe Marsh and the flight path to and from the roost appears to be directly over Carlisle.

Other areas

The Duddon Estuary has held up between 100 and 1000 birds in most years from 1990, mostly in December, January or February. Exceptionally 2000 were present in February 1999. Favoured areas are adjacent to Hodbarrow lagoon on the west side of the estuary and on fields between Roanhead and Park Farms south of Askam-in-Furness. There appears to be no prolonged occupation and this usage is likely to be associated with birds heading back north from the Lancashire coast sites.

The Irt/Mite/Esk complex of estuaries is also a stop off site but much more sporadically. Occasional high numbers have been recorded, e.g. 1000 in December 1981 and a remarkable 5000 in December 1998.

The northern Morecambe Bay estuaries of the Kent and Lune along with Walney Island have sporadically held up to 200 passage birds for several days but with no on going occupation.

Small numbers are regular amongst the Icelandic Greylag flock in the Eden valley but a maximum of 91 in the mid winter of 2000/01 was exceptional.

Inland records of birds flying over during passage movements are common. Birds on the ground are much less so. Rarely a flock is grounded by poor weather as was likely the case in February 2007 when 200 associated with re-established Greylags in fields adjacent to Ullswater.

Table 2: Importance of administrative districts for winter and passage distribution of Icelandic Pink-footed Geese within Cumbria

District	South Lakeland	Eden	Carlisle	Allerdale	Copeland	Lake District
Winter	Low	Low	High	High	Low	
Passage	Moderate	Low	High	High	Moderate	

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Annex 1: Thresholds for ‘important’ populations’ (of sensitive species) for the purposes of this guidance

An ‘important population’ has been defined as the following for the purposes of this study: 1% of the *relevant* SPA population (to which the population is functionally linked) based on the 5 year mean figure **OR if this is not applicable** then a 1% of the national population threshold is used **OR if this is not applicable** then a regularly (ie. recorded several times a year during the period when the birds are present) occurring *notable* population (10% of the Cumbria population).

Species	1% of Upper Solway Flats and Marshes SPA population, where functionally linked (threshold number⁶)	1% of National Population⁷ (threshold number⁸)	Notable population⁹ (threshold number¹⁰)
Whooper Swan	4	57	36
	Inner Solway Middle Solway Outer Solway		Middle Eden Floodplain Lower Eden Floodplain
Pink-footed Goose	153	2400	1537
	Lower Esk Valley Lower Eden Floodplain Inner Solway Middle Solway Outer Solway		
Greylag Goose (Icelandic race)		819	70
			Middle Eden Floodplain
Hen Harrier		7	1
		West Cumbria Foothills	

⁶ The threshold number is defined as the number above which an area of land is a ‘bird sensitive area.’

⁷ WeBS Waterbirds in the UK 2004/05 BTO/WWT/RSPB/JNCC

⁸ The threshold number is defined as the number above which an area of land is a ‘bird sensitive area.’

⁹ 10% of the Cumbrian population is one of the criteria chosen to define a County Wildlife Site and is described as a ‘notable’ population.

¹⁰ The threshold number is defined as the number above which an area of land is a ‘bird sensitive area.’

Annex 2: Definition of terms relating to ‘sensitive species’ of bird

This table has been based on the ornithological assessment methodology that has been developed by Scottish Natural Heritage (SNH) and the Scottish Branch of the Wind Energy Association (BWEA). A column has been added listing types of sensitivity for each group of species ¹¹.

Sensitivity	Definition	Example species	Type of sensitivity
VERY HIGH	Cited interest of SPA’s, SAC’s and SSSI’s. Cited means mentioned in the citation text for the site as a species for which the site is designated (SPA’s/SAC’s) or notified (SSSI’s)	Whooper swan, pink footed goose, barnacle goose	Disturbance/ displacement Collision
HIGH	Other species that contribute to the integrity of an SPA or SSSI. A local population of more than 1% of the national population of a species. Ecologically sensitive species, eg. large birds of prey or rare birds (<300 breeding pairs in the UK). EU Birds Directive Annex 1, EU Habitats Directive priority habitat/ species and/or W&C Act 1981 (as amended) Schedule 1 species (if not covered above).	Hen harrier	Not listed, but birds at nationally important winter roost sites are considered vulnerable to disturbance/ displacement (RSPB staff, pers. comm.)
MEDIUM	Regionally important population of a species, either because of population size or distributional context. UK BAP priority species (if not covered above)	Icelandic greylag goose	Disturbance/ displacement Collision
LOW	Any other species of conservation interest, eg. species listed on the Birds of Conservation Concern not listed above		

¹¹ Langston and Pullan, ‘Windfarms and birds’ Birdlife International, 2003