Wind Turbines, Sensitive Bird Populations and Peat Soils:
A Spatial Planning Guide for on-shore wind farm
developments in Lancashire, Cheshire, Greater Manchester
and Merseyside.

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Produced by the RSPB and The Wildlife Trust for Lancashire, Manchester & North
Merseyside (LWT), in partnership with Lancashire County Council, Natural England
and the Merseyside Environmental Advisory Service (EAS)
Background
The Inspectors who carried out the Examination in Public of the draft NW Regional Spatial Strategy (RSS) between December 06 to February 07, proposed that ‘Maps of broad areas where the development of particular types of renewable energy may be considered appropriate should be produced as a matter of urgency and incorporated into an early review of RSS’.

This proposal underpins the North West Regional Assembly’s (NWRA) research that is being carried out by Arup consultants.

The Secretary of State’s response is ‘In line with PPS22, we consider that an evidence-based map of broad locations for installation of renewable energy technologies would benefit planning authorities and developers. We welcome NWRA commitment to commission such a map to inform future review of the RSS.’

The RSPB, the LWT and partners are supportive of UK renewable energy targets and this Spatial Planning Guide is an attempt to help industry meet these targets by avoiding conflict over ecologically damaging proposals.

This document has been produced to provide background information to underpin a Renewable Energy Strategy for North West England. A web-link has been set up http://www.rspb.org.uk/northwestrenewables, which includes a link to this document plus the following related documents:


The maps and text in this report are to be used alongside the ‘Wind Turbines and Sensitive Bird Populations: A Spatial Planning Guide for on-shore wind farm developments in Cumbria’ document [http://www.rspb.org.uk/cumbriaspatialplanningguide](http://www.rspb.org.uk/cumbriaspatialplanningguide). The Cumbria spatial planning guide only covered bird sensitive areas and did not illustrate deep peat sensitive areas. Subsequently, a guide has been produced for deep peat soils in Cumbria (see point 2 above).

This document focuses on several important bird species that are vulnerable to the effects of renewable developments, specifically on-shore wind developments and highlights the main areas in which they are found **outside nature conservation designated sites** in Lancashire, Cheshire, Greater Manchester and Merseyside (i.e., those areas not covered by the Cumbria spatial wind document). Areas of deep peat have also been mapped.

On-shore wind is the focus of this report for several reasons:
- On-shore wind developments are being proposed/consented across the whole region in the wider countryside.
- Due to the nature of the renewable resource (i.e., wind), developments are often focussed adjacent to bird sensitive areas such as estuaries and uplands (as these areas often have high wind speeds).
- On-shore wind developments are potentially damaging to birds in an inappropriate location and/or on a large scale.

There are clearly other renewables that can also be potentially damaging to nature conservation interests (where inappropriately sited), including tidal/impoundment barrages and offshore wind farms/marine turbines. The former is likely to affect specific areas/estuaries and can be dealt with on a site-by-site basis. The latter currently fall outside the planning system1.

Biomass plantings can also be potentially damaging where high densities of arable and wetland birds of conservation concern occur. See document 3 above.

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1 Defra has recently completed consultation on a draft Marine Bill. This proposes the introduction of a marine spatial planning system in UK waters. See [http://www.defra.gov.uk/marine/legislation/index.htm](http://www.defra.gov.uk/marine/legislation/index.htm).
**How to use the ‘alert maps’**

Alert maps illustrating bird sensitive areas and deep peat sensitive areas (for on-shore wind farm developments) have been produced for Lancashire, Cheshire, Greater Manchester and Merseyside - see maps 1-5.

These alert maps 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 a renewable energy development.

**Two** levels of sensitivity have been identified:
1. **White areas** - lowest risk of impacts on nationally/ internationally important ornithological interests and deep peat soils, although detailed investigation may be necessary. 
2. **Mapped Sensitive bird and deep peat sensitive areas** - highlights alert areas where there is a higher risk of impacts on nationally/ internationally important ornithological interests and/or deep peat soils.

**Introduction**

Wind turbines 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.

Assessment of wind energy developments aim to determine whether or not the development is likely to have significant effect, either alone or in combination with other developments, to the species identified (and any other relevant species not identified in this document) in accordance with the Habitats Regulations (The Conservation (Natural Habitats, & c.) Regulations 1994, as amended).

Areas underlain by a deep peat resource should be avoided for wind farm developments due to the potential damage to fragile habitats and associated species. In addition, the loss of the carbon storage function of deep peat and the release of carbon that occurs when peat is disturbed may undermine any carbon saving benefits of renewable wind development.

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.

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2 It is important to remember that unmapped areas for sensitive bird populations and peat soils may contain other important habitats and species (eg. bats)
**Key findings - Summary**
A detailed ‘methodology and definitions’ section starts on page 12.

**Bird sensitive areas** - see map 1-4 (1 is the summary map)
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 that have been mapped to indicate areas, which are potentially ‘bird sensitive areas’ in terms of wind farm development.

The RSPB and LWT have identified ‘bird sensitive’ areas, which support important populations\(^3\) of sensitive bird species\(^4\) of conservation importance.

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

- Pink-Footed Goose
- Whooper Swan
- Bewick’s Swan

These are all wintering species, which may occur both within and outwith land designated for high nature conservation or landscape value (ie. SSSI, SAC, SPA, Ramsar, NNR, AONB, National Park). **The focus of this guide is land outwith designated sites.**

**Deep peat sensitive areas** - see map 5.
Areas underlain by peat soils have been mapped, using the best available peat soils data. Much of the mapped area supports important habitats of international/ national/ UK BAP importance. Within the mapped areas are deep peat areas (defined as having a depth of 1 metre or more of peat soil).

Windfarm development on deep peat sites should be avoided unless it can be shown not to be damaging to current or potential ecological interests. The impact of the development on the overall carbon balance should also be taken into account - see page 14.

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\(^3\) ‘Criteria for defining important populations of bird species’ are outlined on page 12
\(^4\) Refer to the ‘Criteria for defining sensitive bird species’ section on page 13
Map 1: Summary sensitivity map - Lancashire, Cheshire, Greater Manchester and Merseyside
Map 2: Bird sensitivity map: Fylde

Fylde Peninsular

Pink-footed goose
Whooper swan

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Map 3: Bird sensitivity map: South West Lancashire

South West Lancashire Mosses
- Pink-footed goose
- Whooper swan regularly flown over site
- Whooper swan

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Map 4: Bird sensitivity map: Dee area
Map 5: Deep peat sensitivity map
**Legal protection for birds and habitats within the ‘bird sensitivity’ mapped areas**

Many of the sensitive species identified may be a qualifying interest feature of a Special Protection Area (SPA). These birds are also protected when they occur (i.e. feed, roost, fly through) in areas that 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 outwith the designated area), an Appropriate Assessment will need to be undertaken in view of that site’s conservation objectives. The impact of the plan or project will also be assessed in-combination with other plans or projects in the area.

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).

**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.”

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5 Please refer to the ‘Criteria for defining sensitive species’ section on page 13
6 Please refer to point 7, under the ‘Caveats and notes’ section on page 16
Methodology and definitions

1. Sensitive bird populations
This section sets out the criteria for defining important populations of sensitive species of birds (‘bird sensitive areas’) in terms of on-shore wind farm developments in north west England.

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 (ie. recorded several times a year during the period when the birds are present) supports:

- 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 (i.e. of county importance, taken as 10% of the county population) figure is used.

It is important to note that in the case of pink-footed goose and whooper swan in Lancashire, the numbers of birds present in certain areas far exceeds the thresholds used above ie. internationally important numbers of birds are present. 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 outwith 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 should be considered as important as the bird sensitive areas themselves.
Criteria for defining ‘sensitive species’
The criteria used to determine sensitivity to wind farm developments has been based on
the ornithological assessment methodology that has been developed by Scottish Natural
Heritage (SNH) and the Scottish Branch of the British Wind Energy Association

Using these criteria, the following list of bird species has been drawn up:
- Whooper swan
- Bewick’s swan
- Pink-footed goose

Note that these species are qualifying species of the following SPA’s in the north west:
Ribble and Alt estuaries; Martin Mere, Morecambe Bay and the Upper Solway Flats and
Marshes. See (http://www.jncc.gov.uk/page-1419) for more information. Some species
fall under Annex 1 of the EU Birds Directive7 or Schedule 1 of the Wildlife and
Countryside Act, 1981 (as amended)- see Annex 2.

Referring to the ornithological assessment methodology set out above, 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.
- They feed in the area and are vulnerable to the effects of displacement by
wind turbines.
- They occur in discrete, nationally important populations in the area.

This exercise focuses on areas in which qualifying species are functionally linked to an
SPA. 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 designated
areas compared to those outwith such areas. However there are some exceptions to this.

There could be other notable populations of sensitive species that are not covered by this
planning guide.

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2. **Deep peat**

See Map 5 showing the peat resource in Lancashire, Cheshire, Greater Manchester and Merseyside. Within the illustrated areas, deep peat (defined as peat over 1 metre deep\(^8\)) will occur.

Wind farm developments on deep peat sensitive areas should be avoided where they will be damaging due to:

- Habitat loss and hydrological disruption by installing turbines.
- The loss of associated sensitive species, some of which occur in internationally or nationally important populations outwith the statutorily protected area network, for example the West Pennine Moors.
- The associated release of carbon, which significantly reduces the carbon saving benefits of renewable wind development.

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\(^8\) Paul Thomas, Natural England, Lancashire team (pers comm.)
Methods of producing the maps
The north west has been divided into areas that are known to support important populations of sensitive species vulnerable to on-shore 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 – see http://www.bto.org/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.

Under license from Natural England, National Soil Research Institute (NSRI) soils data has been used to define the peat resource. This dataset has been used because, through discussions with Natural England, it is the best available, up-to-date and regionally applicable information. Three types of deep peat resource have been mapped: Lowland raised mire, fen and blanket bog.

It is important to note that the illustrated areas show where a peat resource exists (not necessarily peat over 1 metre deep), but to determine the exact depth of peat, a site-by-site assessment will be required. Peat depths can be highly variable in a given area, subject to the underlying geology and topography.

Much of the deep peat resource identified underlies areas designated as a Site of Special Scientific Interest (SSSI), a SPA or a SAC. There are, however, some areas that are not designated for their nature conservation interests and yet support important bird populations and/or habitat communities (e.g. West Pennine Moors). Other areas identified would not qualify as a SSSI/SPA/SAC in their nature conservation importance, but nonetheless still have an important deep peat resource.

9 http://www.landis.org.uk/soilscapes/
10 Chris Lumb, Bart Donato, NE Kendal team (pers. comm.)
Caveats and notes

1. The mapped areas are **not** definitive.

2. All areas covered by existing landscape (AONB, National Park) or nature conservation designations (SSSI, SPA, SAC, Ramsar) have not been illustrated on the maps.

3. Some species – including important populations of breeding birds vulnerable to wind farms, such as raptors, and other wintering or passage birds – have **not** been included in this study because:
   - The maps identify only the most sensitive species (defined as being ‘very high’ or ‘high’ sensitivity’ - see Annex 2) occurring in important numbers (see Annex 1) have been included in this exercise.
   - If the species are known to occur wholly **within** the protected area network (eg. SPA) and/or an area designated as an AONB or National Park, these species have been excluded (for the purposes of this study) because the species largely occur within areas subject to statutory nature conservation designations.

4. 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) has produced recommended guidance on ‘Survey methods for use in assessing the impacts of on-shore wind farms on bird communities’

5. 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.

6. >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)

7. The number and species of bird flying through the north west 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.

8. 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 may be subject to change.
Distribution of Whooper Swan, Bewick’s Swan and Pink-footed Goose in inland areas of Lancashire and North Merseyside

Both whooper swan and pink-footed goose are present in substantial numbers during passage periods and in winter. In the north west, pink-footed goose distribution is typically dictated by proximity to night-time roosts on estuaries, hence geese tend to feed on pasture or stubbles within short flying distance of the estuary.

In Lancashire and North Merseyside, there are significant coastal roosts on the Lune, Wyre, Ribble and Alt Estuaries, but also inland at Martin Mere and Simonswood Moss. Whooper swans do not have the requirement to fly to coastal roosts sites and although there are wintering areas adjacent to the Ribble Estuaries, there are also inland wintering areas on agricultural land on the Fylde peninsular and south-west Lancashire.

The following report describes the distribution and occupancy levels of these species in Lancashire and North Merseyside.

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 Lancashire
The internationally co-ordinated count of wintering Icelandic birds in January 2005 located 2241 in Lancashire, 8.5% of the total population. Of these, 1980 were in the south Ribble/Martin Mere area, 110 on Lytham Moss on the north side of the Ribble, and 146 in the Pilling area of Wyre.

The presence of such large numbers of whooper swans in Lancashire is of relatively recent occurrence and has been mirrored by an equally dramatic decline in the number of wintering Bewick’s swans. Peak counts reached 100 in 1983/84, 400 in 1994/95, 1000 in 1997/98 and 1500 in 2000/01 but have been consistently above 2000 this century. The British wintering population grew by about 60% between 1986 and 2005, during which period numbers in Lancashire increased seven-fold.

Once arrived, the flocks are fairly sedentary although some limited movements between the main wintering sites do take place. The relative importance of these wintering sites, as shown in the 2005 figures cited above, is also fairly stable between years.

The vast majority, nearly 90%, of Lancashire’s whooper swans winter on agricultural land in West Lancashire district. These birds roost overnight at Martin Mere Wildfowl and Wetlands Trust reserve in Burscough, attracted there by nightly offerings of grain. The precise location of their feeding grounds is determined largely by food availability and thus to some extent by changing agricultural usage. These therefore change between years.

Smaller numbers feed on the Ribble marshes, in recent years, principally on Warton Marsh on the north side of the river and at Hesketh Bank and Hesketh Marshes on the south side. Many of these birds roost at Martin Mere but there are signs that roost sites may be becoming increasingly dispersed.

Other favoured feeding areas in south Fylde occur at Lytham Moss and the Mythop area near Blackpool, most of whose birds roost at Ream Hills or Marton Mere in Blackpool.

In the north of the Fylde peninsular whooper swans feed during the day in saltmarsh habitats, mainly at Pilling Marsh and Fluke Hall, or on agricultural land in the Pilling-Preesall-Eagland Hill area. As with the West Lancashire population, the precise location of these birds is subject to some variation between years.
Table 1: Peak counts of wintering whooper swans in Lancashire

<table>
<thead>
<tr>
<th></th>
<th>2001/02</th>
<th>2002/03</th>
<th>2003/04</th>
<th>2004/05</th>
<th>2005/06</th>
<th>2006/07</th>
</tr>
</thead>
<tbody>
<tr>
<td>Martin Mere WWT</td>
<td>1762</td>
<td>1770</td>
<td>1770</td>
<td>1900</td>
<td>1430</td>
<td>1530</td>
</tr>
<tr>
<td>Ribble</td>
<td>270</td>
<td>227</td>
<td>286</td>
<td>218</td>
<td>608</td>
<td>284</td>
</tr>
<tr>
<td>South Fylde</td>
<td>118</td>
<td>82</td>
<td>114</td>
<td>196</td>
<td>130</td>
<td>290</td>
</tr>
<tr>
<td>North Fylde</td>
<td>118</td>
<td>107</td>
<td>95</td>
<td>243</td>
<td>138</td>
<td>305</td>
</tr>
</tbody>
</table>

Average first arrival and last departure dates in Lancashire during 1981-2002 were 2 October and 3 April respectively but numbers peak during November to February, with substantial numbers remaining until mid-March.

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 Lancashire and North Merseyside
Pink-footed geese have been common in winter in Lancashire and North Merseyside (‘Lancashire’) for at least 150 years and the earliest documented record relates to February 1708 but numbers have increased substantially in the past 50 years or so. Peak counts were estimated at 4500 in the 1950s, rising to 9000 in 1965, 15000 in 1973, 30000 in 1981/82 and a record 46925 in January 2001. Since then numbers have ranged between 30000 and 40000 (see table 2).
Table 2: Peak counts of pink-footed geese at main sites and total for Lancashire & North Merseyside

<table>
<thead>
<tr>
<th></th>
<th>North Fylde</th>
<th>SW Lancs &amp; N Merseyside</th>
<th>Lancashire’ total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001/02</td>
<td>13600</td>
<td>16525</td>
<td>33180</td>
</tr>
<tr>
<td>2002/03</td>
<td>14600</td>
<td>18580</td>
<td>31645</td>
</tr>
<tr>
<td>2003/04</td>
<td>20000</td>
<td>19295</td>
<td>32640</td>
</tr>
<tr>
<td>2004/05</td>
<td>26910</td>
<td>23760</td>
<td>43950</td>
</tr>
<tr>
<td>2005/06</td>
<td>20900</td>
<td>27300</td>
<td>41860</td>
</tr>
</tbody>
</table>

Their winter range is extremely wide, extending over most of northern Fylde as far north as the saltmarshes near Lancaster and a vast area of lowland farmland and saltmarsh south of the Ribble, mainly in the districts of West Lancashire and South Ribble but extending into the Merseyside districts of Sefton, Knowsley and St. Helens.

Their choice of feeding site is more catholic than that of whooper swans but the preferred habitats are permanent grasslands (including saltmarsh and pasture) and root crop ‘stubbles’.

Unlike whooper swans they are extremely mobile during winter. Their movements between Scotland, NW England and East Anglia are documented above, but they also regularly move both between and within the two main areas of northern Fylde and the south-west of the ‘county’ as food supplies become exhausted. This may happen with some frequency, as feeding flocks in excess of 5000 are far from uncommon. As with whooper swans their distribution is largely determined by food availability with the result that, with the exception of saltmarshes and permanent pastures, usage of particular fields and localities varies significantly between years.

In contrast, the birds are extremely faithful to their roost sites to which they return each night. The major roosts occur on the shore in the Pilling area and at Barnaby’s Sands in north Fylde, at Martin Wildfowl and Wetlands Trust reserve in West Lancashire, Taylor’s Bank off Formby and Simonswood Moss near Kirkby.

The earliest returning birds are sometimes seen in late August but significant numbers begin to arrive in mid-September and most are back by mid-October. Large flocks of 1000 or so occasionally linger into April but most usually depart sometime during March.
Distribution of Whooper Swan and Bewick’s Swan in inland areas of Cheshire

Bewick’s swan

Introduction
The Shotwick area is one of the most important wintering sites in NW England & Wales.

Status and distribution in Cheshire/Flintshire
There has been a steady increase in birds wintering on the Dee during the 1990’s. Numbers have now levelled off. The main feeding areas depend on the availability of crops (brassica’s & winter barley/wheat) on the Shotwick fields and the Cheshire/Flintshire border. They also like to graze the saltmarsh grasses on Burton Marsh. During the daytime they often fly to Inner Marsh Farm to bath and drink. They roost on the pools at Inner Marsh Farm RSPB or the Shotwick Lake.

Table 3: Peak counts- Bewick’s swan

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<tr>
<td>Dee Estuary</td>
<td>70</td>
<td>92</td>
<td>101</td>
<td>63</td>
<td>50</td>
<td>75.2</td>
<td>101</td>
</tr>
</tbody>
</table>

International threshold: 200
Great Britain threshold: 81

Whooper swan

Status and distribution in Cheshire/Flintshire
Five years ago, only a handful of birds were present. Since then, a steady increase has taken place and significant numbers now occur. The main feeding area is the Shotwick fields, with lesser numbers on Burton Marsh, usually with the Bewick’s swans. They roost on Inner Marsh Farm RSPB and or the Shotwick Lake.

Table 4: Peak counts whooper swan

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</tr>
</thead>
<tbody>
<tr>
<td>Dee Estuary</td>
<td>8</td>
<td>8</td>
<td>17</td>
<td>16</td>
<td>37</td>
<td>17.2</td>
<td>37</td>
</tr>
</tbody>
</table>

International threshold: 210
Great Britain threshold: 57
References


Annex 1: Thresholds for ‘important’ populations’ (of sensitive species) for the purpose of this guidance. See bullet 6 on page 16 for definitions. An ‘important population’ has been defined as exceeding (blue shading) one of more of the following threshold criteria for the purposes of this study:

<table>
<thead>
<tr>
<th>Species</th>
<th>1% of Dee Estuary SPA population, (threshold number(^{11}))</th>
<th>1% of Morecambe Bay SPA population, (threshold number(^{11}))</th>
<th>1% of the Ribble &amp; Alt Estuaries and Martin Mere SPAs population (threshold number)</th>
<th>1% of National Population(^{12}) (threshold number(^{11}))</th>
<th>Notable population (Lancs. and North Merseyside)(^{13}) (threshold number(^{11}))</th>
<th>Notable population (Cheshire)(^{14}) (threshold number(^{11}))</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whooper Swan</td>
<td>2</td>
<td>17</td>
<td>57</td>
<td>200</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Areas which exceed the threshold(^{15})</td>
<td>North Fylde and Lune Estuary</td>
<td>South Fylde, Ribble &amp; Alt Estuaries, Martin Mere &amp; surrounding areas</td>
<td></td>
<td></td>
<td>Dee Estuary</td>
<td></td>
</tr>
<tr>
<td>Pink-footed Goose</td>
<td>200</td>
<td>200</td>
<td>2400</td>
<td>3800</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Areas which exceed the threshold(^{15})</td>
<td>North Fylde and Lune Estuary</td>
<td>South Fylde, Ribble &amp; Alt Estuaries, Martin Mere &amp; surrounding areas</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bewick’s Swan</td>
<td>1</td>
<td></td>
<td>81</td>
<td>8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Areas which exceed the threshold (^{15})</td>
<td>Dee estuary</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\(^{11}\) The threshold number is defined as the number above which an area of land is a ‘bird sensitive area.’
\(^{12}\) WeBS Waterbirds in the UK 2004/05 BTO/WWT/RSPB/JNCC. 5 year mean figure used.
\(^{13}\) 10% of the Lancashire and North Merseyside population is the criteria and is described as a ‘notable’ population.
\(^{14}\) 10% of the Cheshire population is the criteria and is described as a ‘notable’ population.
\(^{15}\) Subsequent areas exceeding the threshold number are then not listed.
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)\textsuperscript{16}. A column has been added listing types of sensitivity for each group of species.

<table>
<thead>
<tr>
<th>Sensitivity</th>
<th>Definition</th>
<th>Example species</th>
<th>Type of sensitivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>VERY HIGH</td>
<td>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)</td>
<td>Whooper swan, bewick’s swan and pink footed goose</td>
<td>Disturbance/displacement</td>
</tr>
<tr>
<td>HIGH</td>
<td>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 (&lt;300 breeding pairs in the UK). EU Birds Directive Annex 1, EU Habitats Directive priority habitat/species and/or W&amp;C Act 1981 (as amended) Schedule 1 species (if not covered above).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MEDIUM</td>
<td>Regionally important population of a species, either because of population size or distributional context. UK BAP priority species (if not covered above)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LOW</td>
<td>Any other species of conservation interest, eg. species listed on the Birds of Conservation Concern not listed above</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>