



# Biodiversity

The value of our natural heritage is reflected in the abundance and diversity of our wildlife and habitats. The state of our biodiversity is a cumulative measure of the relative state of our air, water and land environments. This chapter provides information on the extent of valuable nature conservation areas, and the condition of habitats and species, including wild birds, in the wider countryside.

<b>UK Biodiversity Action Plan</b>	<b>108</b>
<b>Driving Forces and Pressures</b>	<b>110</b>
<b>Biodiversity Indicators</b>	<b>112</b>
<b>Key Challenges</b>	<b>121</b>



Biodiversity describes the vast range of living organisms on earth. The Convention on Biological Diversity which was signed by over 150 countries, including the United Kingdom, during the Rio Earth Summit of 1992 defined biological diversity as:

*“The variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems.”*

## UK Biodiversity Action Plan

Each signatory country was required to develop national plans, strategies or programmes for the conservation or sustainable use of biological diversity. In 1994, the UK Government launched its UK Biodiversity Action Plan and in 1995 set up the UK Biodiversity Steering Group. This devised a framework for identifying species and habitat types of conservation concern and established UK priorities and targets along with guidelines for local action.

In 2002, the publication of the Northern Ireland Biodiversity Strategy<sup>68</sup> committed Government to recognising biodiversity within its policies and establishing delivery mechanisms. To raise the profile of biodiversity action, the European Commission produced its Communication on "Halting the loss of biodiversity by 2010 – and beyond" in 2006. This sets out ten priority objectives and a detailed action plan containing more than 150 concrete and measurable action points. In Northern Ireland, the Government has a target to reduce significantly the loss of biodiversity by 2010 and to halt the loss of biodiversity by 2016<sup>69</sup>.


Although part of the United Kingdom biodiversity process, Northern Ireland uniquely forms a biogeographic unit with the Republic of Ireland with continuity of the air, water and land environments. To address this a number of issues are being tackled at an all-island level including information gathering, establishing conservation priorities and delivering conservation programmes e.g. species action plans and work on invasive species. For its size Northern Ireland has a particularly diverse range of habitats and species.

Northern Ireland **priority habitats** are of particular importance for our native biodiversity and require conservation action. Some of these, such as lakes, fens, bogs, wet grasslands and some marine and coastal habitats are particularly well represented in Northern Ireland. Others, such as native woodlands are comparatively poorly represented but nonetheless are important for biodiversity. Detailed information relating to Northern Ireland priority habitats is available at [www.ehsni.gov.uk/biodiversity/hap\\_uk/hap\\_ni.htm](http://www.ehsni.gov.uk/biodiversity/hap_uk/hap_ni.htm).

Northern Ireland **priority species** are considered to require conservation action because they have declined, are rare or of significance at UK, Ireland or European level. Detailed information relating to these is available at [www.ehsni.gov.uk/biodiversity/sap\\_uk/priority\\_species.htm](http://www.ehsni.gov.uk/biodiversity/sap_uk/priority_species.htm)

Habitats and species are protected in Northern Ireland through the use of statutory designations. A summary is given in Table BD1.

Table BD1: Summary of Site Designations (2005)

Designation	No of Sites	Description
Area of Special Scientific Interest (ASSI)	224	Sites of special value for their plant, animal, geological or physiographical features. ASSIs are designated under the <i>Environment (Northern Ireland) Order 2002</i> . Certain operations in these areas, such as reseeded, may require prior consent from EHS.
Special Areas of Conservation (SAC)* 	52	These protect some of the most seriously threatened habitats and species across Europe. They are designated under the <i>Conservation (Natural Habitats, etc) Regulations (Northern Ireland) 1995</i> which transposes the <i>Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora</i> (the Habitats Directive) in Northern Ireland.
Special Protection Areas (SPA)* 	12	These are classified for the protection of internationally important bird populations under <i>Council Directive 79/409 on the conservation of wild birds</i> (the Birds Directive) and protected in Northern Ireland by the <i>Conservation (Natural Habitats, etc) Regulations (Northern Ireland) 1995</i> .
Ramsar Sites 	19	These are internationally designated sites under the RAMSAR Convention for wetland habitats and species. Most are of particular significance to wetland birds.
Statutory Nature Reserves 	48	These are areas of importance for flora, fauna, geological or other special feature for conservation purposes and to provide the opportunity for research. They are designated under the <i>Nature Conservation and Amenity Lands (Northern Ireland) Order 1985</i> .
Marine Nature Reserves 	1	These are areas of importance for marine flora, fauna, geological or other special feature for conservation purposes and to provide the opportunity for research. They are designated under the <i>Nature Conservation and Amenity Lands (Northern Ireland) Order 1985</i> .
Sites of Local Nature Conservation Importance (SLNCIs)	134	These are important local sites of substantive biodiversity or geological value which have been adopted into Area Plans. Special planning policies apply to SLNCIs.

\* SAC and SPA sites are often collectively referred to as Natura 2000 sites.

## Driving Forces and Pressures

Human impacts are the main pressures affecting biodiversity in Northern Ireland – agriculture, fisheries, housing and development, tourism and renewable energy. Certain non-native species can also have major impacts on our biodiversity. Any of these forces may be exacerbated by climate change.

The last century has seen both the decline in numbers and the loss of species as a result of impacts on their habitats. In the last few decades there has been a substantial change in our **agricultural methods**, driven by the need to produce more food and reforms to the Common Agricultural Policy. This has resulted in a general increase in stocking rates, especially of sheep, and to overgrazing across the whole island of Ireland, especially in upland areas<sup>70</sup>.

Other effects of modern farming practices have been to reduce the environmental value of many areas as wildlife and semi-natural habitats through such activities as increased land drainage, land reclamation, increased fertilisation, increased silage making and removal of features such as hedgerows and ditches.

Modern living has resulted in a decline in water and soil quality, variable air quality and modification of the coast. A growing **economy and population** is placing increasing pressure on our countryside to provide more housing and associated infrastructure. Since the 1950s, 41,000 hectares of countryside has been lost to urban development<sup>71</sup>, with an unquantified loss of biodiversity.

**Tourism activities** and intensity may have the effect of degrading fragile habitats and disturbing species if they are in close proximity to the site of interest. Recreational facilities whether for residents and visitors alike can place pressure on our wildlife and their habitats, unless properly managed.

Currently the **fishing industry** is in decline, but it may impact on our environment. Without suitable controls, fishing may cause both physical disturbance to the seabed and alter the community ecology, for example by removing predators and competitors and reducing juvenile or breeding populations. Management of fishing and aquaculture activities is necessary to ensure sustainable use of this resource.

The Bern Convention, the Habitats Directive and the Convention on Biological Diversity place requirements on the UK to limit or inhibit the entry of **non-native species** and this is implemented in Northern Ireland through the Wildlife Order (NI) 1985 and its amendments. In addition, the Northern Ireland Biodiversity Strategy recognised the need for action to mitigate the impact of invasive species on an all-Ireland basis<sup>72</sup>.

Introduced species can have a range of benefits such as new crop or pasture species. However in other cases they can be invasive and impact negatively on the native environment and economy by predation, competition or the spread of disease. It is widely considered that invasive species are the second biggest threat to biodiversity after habitat destruction<sup>73</sup>.

Current non-native species in Northern Ireland which are causing a problem include grey squirrel, rhododendron in woodland and heath and the zebra mussel (see Box BD1).

#### Box BD1: Invasive Species – Zebra Mussel



The zebra mussel (*Dreissena polymorpha*) originated from the Caspian and Black Sea Region and spread throughout Europe in the late 1700s. These shellfish live in lakes and feed by filtering small food particles from the water. In nutrient-rich lakes they can establish in vast numbers and change the way the lakes function ecologically.

Zebra mussels were first discovered in Northern Ireland in 1994 probably arriving attached to the hulls of second hand boats imported from England. Since their introduction, they have spread to over 50 lakes across Ireland including Lough Erne and Lough Neagh.

Zebra mussels cause a wide range of economic and ecological impacts. In Northern Ireland they have been responsible for blocking water intake pipes at Killyhelvin water treatment works at Enniskillen resulting in necessary modifications costing in the region of £100,000. Zebra mussels can upset the delicate balance of the food chain causing changes in fish populations by decreasing the amount of zooplankton available for fish, and lead to toxic algal blooms. They can attach themselves to and smother native mussel species and, in the case of Lough Erne, are causing large declines of native swan and duck mussels.

## BIODIVERSITY INDICATORS

### Policy and Legislative Context

Protection of priority habitats and species is provided under European Directives, national and local legislation. These include the EC Habitats Directive, EC Birds Directive, the Conservation (Natural Habitats, etc) Regulations (Northern Ireland) 1995, the Environment (Northern Ireland) Order 2002, the Nature Conservation and Amenity Lands (Northern Ireland) Order 1985 and the Wildlife (Northern Ireland) Order 1985.

This protection is mainly afforded through the designation of networks of statutory sites (see table BD1). In addition some species of plants and animals also benefit from various levels of protection under both the Wildlife (Northern Ireland) Order 1985 and the Conservation (Natural Habitats, etc) Regulations (Northern Ireland) 1995.

*Planning Policy Statement 2 Planning and Nature Conservation* (under review) contains planning policy for statutory designated sites and Sites of Local Nature Conservation Importance (SLNCIs). In addition a range of other policies and legislation detailed in other sections particularly air and climate, water and land management and landscape directly benefit biodiversity.



Grey Squirrel

## Indicator BD1: Nature Conservation Designations

### Extent of Designated Areas and Condition of Selection Features (1998-2005)

Many areas in Northern Ireland have been designated to protect their nature conservation value. The different types of designation are given in Table BD1. Sites are often protected by more than one designation and include land, freshwater, coastal and marine areas.

### Policy

Designated sites fulfil the requirements of European Birds and Habitats Directives, Ramsar Convention and Nature Conservation and Amenity Lands (Northern Ireland) Order 1985. Sites are designated on the basis of their 'selection feature(s)', such as a particular species or habitat, which are monitored against a set of attributes which define favourable condition. The condition of each site selection feature is monitored and reported on every six years.

### Data

The extent of designated sites is given below:

**Table BD2: Extent of Nature Conservation Designated Sites (2005)**

(Source EHS)

Designation	Area (Hectares)
Areas of Special Scientific Interest	93,130
Special Areas for Conservation	65,943
Special Protection Areas	72,549
Ramsar	77,400

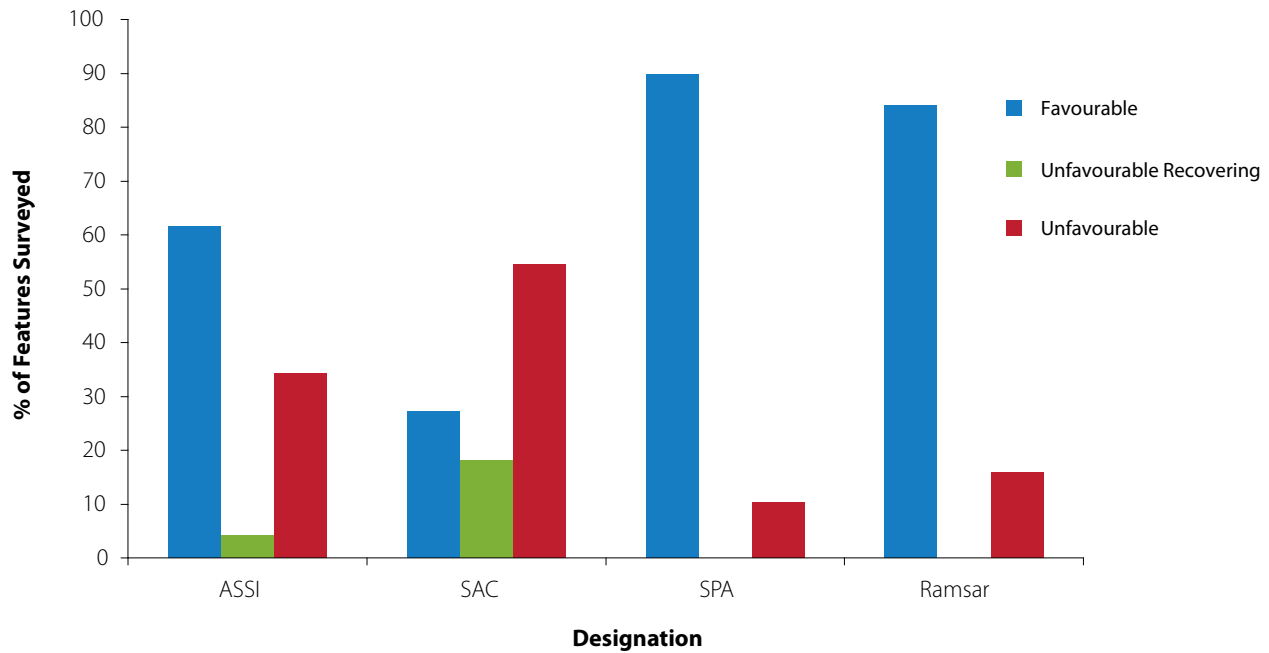
The total land area of Northern Ireland is 14,160 km<sup>2</sup> (1,416,000 ha). Therefore approximately 6.6% of the land area of Northern Ireland is designated as ASSI for nature conservation, including earth science, interest. There is a great deal of overlap between the various designations. The total area of sea (below mean low water) which had been designated by the end of 2005 is estimated at 26,032 ha. This figure includes an area of open sea (approx. 1,095 ha) of Strangford Lough Marine Nature Reserve which is not covered by any other designation.

The condition of selection features can be reported as any one of the following categories: favourable, unfavourable, unfavourable recovering, unfavourable declining, unfavourable partially destroyed, or unfavourable destroyed. Due to the lack of historical data, the only categories currently used in Northern Ireland for habitats and species are: 'favourable', 'unfavourable' and 'unfavourable recovering'.

The data relate to the condition of specific selection features for the designation and not to the area/extent of features. The data used to assess status are good, but are not yet comprehensive for all sites.

**Figure BD1: Condition of Features within Designated Areas (1998 – 2005)**

(Source EHS)



Data relating to Areas of Special Scientific Interest collected in the period 1998-2005 show that over 60% of features are in favourable condition. This includes over 80% of bird features and approximately 34% of non-bird features (habitats and non-bird species). For Special Protection Areas and Ramsar sites the percentage of features in favourable condition was 90% and 84% respectively. However, less than 30% of Special Areas of Conservation features were in favourable condition.

**Comment**

The data on condition show that the state of our designated sites for nature conservation is of variable quality, and a significant proportion of features at our most valuable sites are in unfavourable condition.

## Indicator BD2: Priority Habitats

### Status of Priority Habitats listed under the Northern Ireland Biodiversity Strategy (2002-2005)

The status and trends in priority habitats provide an indicator of habitat changes in Northern Ireland.

#### Policy

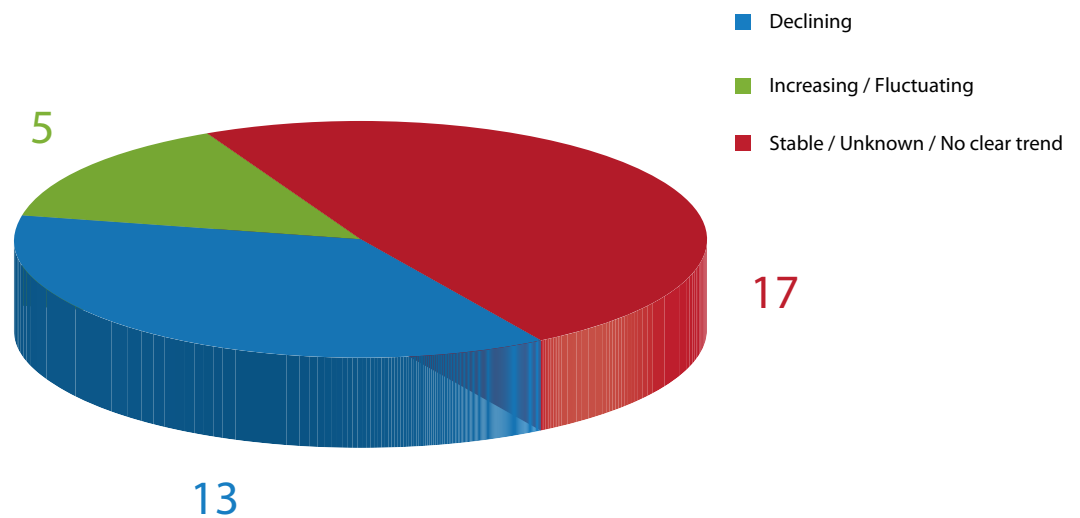
The Northern Ireland Biodiversity Strategy has set goals designed to protect and enhance biodiversity in Northern Ireland, including a target to halt the loss of biodiversity by 2016. Northern Ireland has 37 of the 45 priority habitats identified at a UK level, plus an additional 3 Northern Ireland priority habitats.

#### Data

Thirty five of the UK priority habitats occurring in Northern Ireland were reported on in 2005 as part of the 3-yearly reporting cycle which began in 1999 and was repeated in 2002. The data that are available are considered to be robust, but are yet to comprehensively cover all habitats. The status of those 35 habitats in Northern Ireland in 2005 as compared with their status in 2002 is shown below.

**Figure BD2: Status of Northern Ireland Priority Habitats (2005)**

(Source EHS)



Thirteen priority habitats show decline, including lowland meadow, species rich hedgerows, blanket bog, coastal sand dunes and fens. Habitat loss is threatened by changes in land use and degradation (see [Land and Landscape Management](#)), and through more indirect impacts such as excessive nutrient run-off (see [Water](#)) and atmospheric nitrogen pollution (see [Air and Climate](#)).

Five habitats showing an increase in status are cereal field margins, mixed ashwoods, oakwood and wet woodland. This is thought to be a consequence of changes in agricultural and woodland management such as that described in indicators LL3 and LL4. Seagrass beds are also probably increasing. Seventeen habitats are either stable or the trend is unknown. This includes most marine and freshwater habitats.

## Comments

The monitoring programme for these habitats is at a relatively early stage. As a result, information on the conservation status and trends is not currently available for many habitats in Northern Ireland (up to 25% of relevant habitats). Plans are in place to improve the monitoring programme.

### Indicator BD3: Priority Species

#### Status of Priority Species listed under the Northern Ireland Biodiversity Strategy (2002-2005)

The status of priority species provides an indicator of change for a wide range of ecosystems and natural processes throughout the UK and thus an indirect indicator of biodiversity. Changes in populations of species provide an early warning system to adverse pressures and other trends in the wider countryside.

Marsh Fritillary Butterfly



Red Squirrel



#### Policy

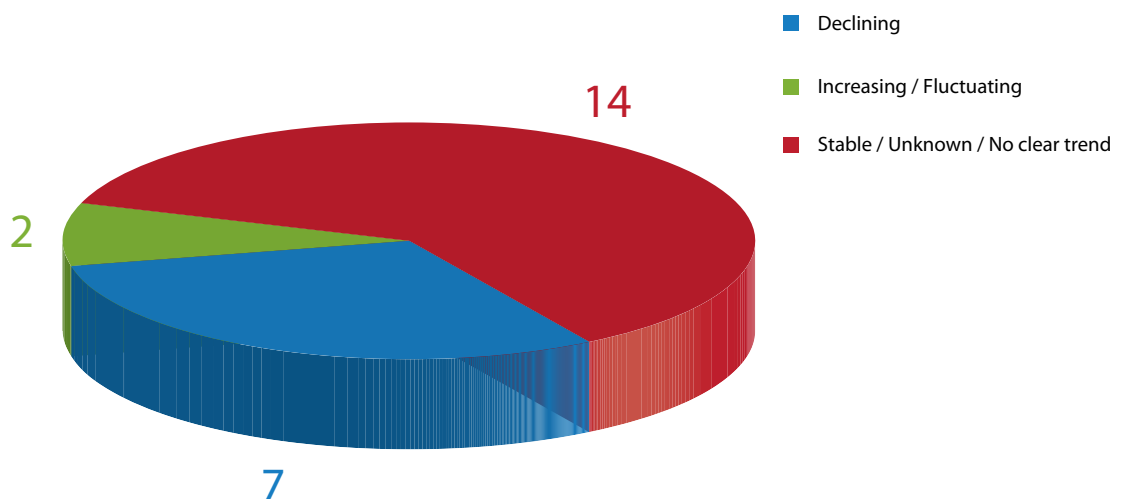
The Northern Ireland Biodiversity Strategy has set goals designed to protect and enhance biodiversity in Northern Ireland, including a target to halt the loss of biodiversity by 2016.

#### Data

A total of 88 of UK priority species which occur in Northern Ireland were reported on as part of the 2005 UK Biodiversity Action Plan reporting round. The results illustrated below are based on species status in 2005 compared to that in 2002.

Figure BD3: Status of Northern Ireland Priority Species (2005)

(Source EHS)



For 58 species there were insufficient data to report on changes in the species status in Northern Ireland. Of the remaining species, 7 are considered lost from Northern Ireland including two beetles which were confined in the UK to sandy shores of Lough Neagh. This may be due, in part, to the decline in extent and quality of suitable habitat. Seven species are considered to be declining. These include species which have been impacted by a range of factors including habitat deterioration (marsh fritillary butterfly), introduced species (red squirrel) and over-fishing (common skate). For some species, such as the pollan, further action is required to ensure its conservation status.

## Comments

The data which are available are considered robust, however, the lack of datasets or baseline information for many species prevents reporting trends for the 271 Northern Ireland priority species. In 2004, over a third of these species were thought to be stable or increasing, although over 50% were classed as declining. Targeted systematic monitoring of Northern Ireland priority species is required to improve data sets in future and enable the assessment of trends.

## Indicator BD4: Wild Birds

### Trends in Populations of Wild Birds (1994-2005)

Populations of wild birds are a good indicator of the broad state of the health of the countryside and biodiversity because they move between a wide range of habitats and a large volume of long-term data has been collected.

### Policy

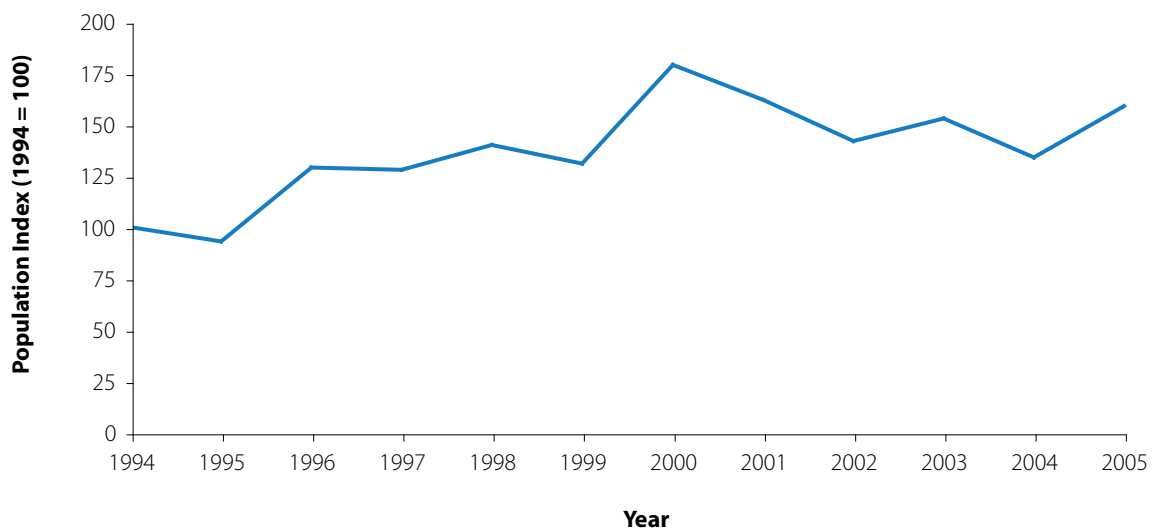
The UK Breeding Bird Survey aims to improve the geographical scope of UK bird monitoring by including all habitats and, therefore, more species of breeding birds. The results are being increasingly used to set conservation priorities by governments and non-governmental organisations.

### Data

Figure BD4 has been prepared from the Breeding Bird Survey<sup>74</sup> data. The survey is undertaken annually at nearly 3,000 sites across the UK. Survey sites are randomly selected 1x1km square grids of the National Grid, and 120 squares were surveyed in Northern Ireland in 2005.

In Northern Ireland information on trends is only available for the twenty-four most common species. The data for these species are statistically robust, but it is recognised that the data do not cover all species.

**Figure BD4: Wild Bird Populations (1994 – 2005)** (Source Breeding Bird Survey)



*Note: 1994 populations are used as a baseline and given an arbitrary index value of 100. All subsequent population changes are measured against this*

## Comments

The Breeding Bird Survey is well established at UK level but there would be benefit in increased cover in Northern Ireland. Most of the bird populations, which are declining in the rest of the UK, cannot be monitored effectively in Northern Ireland due to the relatively small number of squares surveyed which does not allow a statistical analysis of the differences from year to year for these species. An assessment made of all Northern Ireland bird species in 2004 concluded that 22 species had declined more than 1% a year over the previous 25 years ([www.ehsni.gov.uk/biodiversity/sap\\_uk/priority\\_species.htm](http://www.ehsni.gov.uk/biodiversity/sap_uk/priority_species.htm)). Only one of these species is included in the wild bird population trends presented here.



Dunnoch



Ring Ouzel

## Key Challenges

The extent of nature conservation designations in Northern Ireland does not yet include all top quality sites, or adequate representation of the most vulnerable or threatened habitats, species and earth science features. A priority, risk-based, list of sites has been drawn up to direct the declaration programme for Areas of Special Scientific Interest to address this shortfall.

For designated sites, there are robust systems of biodiversity data recording and reporting in place in Northern Ireland, largely as a result of European and national regulatory reporting requirements. At the current time, however, it is not possible to give a comprehensive assessment of all aspects of biodiversity of Northern Ireland, as monitoring programmes are part way through reporting cycles.

Available baseline information on indicators suggests that the coverage and condition of our designated sites needs to be improved significantly. A range of pressures arising from the key challenges facing the air, water and land environments, will all, in combination, impact on our biodiversity.



Common Seal

Monitoring of priority habitats and species is in its early stages. The reporting of species and habitats is related to trend information, i.e., whether they are increasing, stable, or declining in area and/or condition, and this relies on there being previous information available against which to compare. Information provided in this area will increase as each 3 yearly monitoring round is completed.

The Breeding Bird Survey currently does not cover a large enough sample area of Northern Ireland for some of the more widespread and vulnerable birds to be fully assessed. It will be necessary to target the monitoring of breeding birds to provide a better indicator of the state of the wild bird populations in Northern Ireland in future.

Pressures include pollution from emissions, especially nutrients, to air and water, as well as changes to land, especially agricultural land management practices and the loss of semi-natural habitats. Pollution, coastal management and fishing may also impact on the marine environment. All of these pressures have the potential to affect the status of many of our most valuable habitats and species.

The future impacts of climate change may result in both opportunities and threats to biodiversity in Northern Ireland. It is likely to exacerbate many of the pressures already affecting our flora and fauna, as well as creating new impacts.

The Northern Ireland Biodiversity Strategy provides the focus for working in partnership to protect and enhance our biodiversity.

## REFERENCES

- 68 Northern Ireland Biodiversity Strategy, Department of the Environment, 2002
- 69 Programme for Government 2008-2011. Northern Ireland Executive 2008
- 70 Biodiversity in Northern Ireland: Recommendations to Government for a Biodiversity Strategy (NIBG)
- 71 Recommendations to Government for a Biodiversity Strategy, Northern Ireland Biodiversity Group, 2000
- 72 Environment and Heritage Service and the National Parks and Wildlife Service in the Republic of Ireland - "Invasive Species in Ireland" 2006.
- 73 See [www.ehsni.gov.uk/biodiversity/sap\\_uk/invasive.htm](http://www.ehsni.gov.uk/biodiversity/sap_uk/invasive.htm)
- 74 See [www.bto.org/survey/index.htm](http://www.bto.org/survey/index.htm)