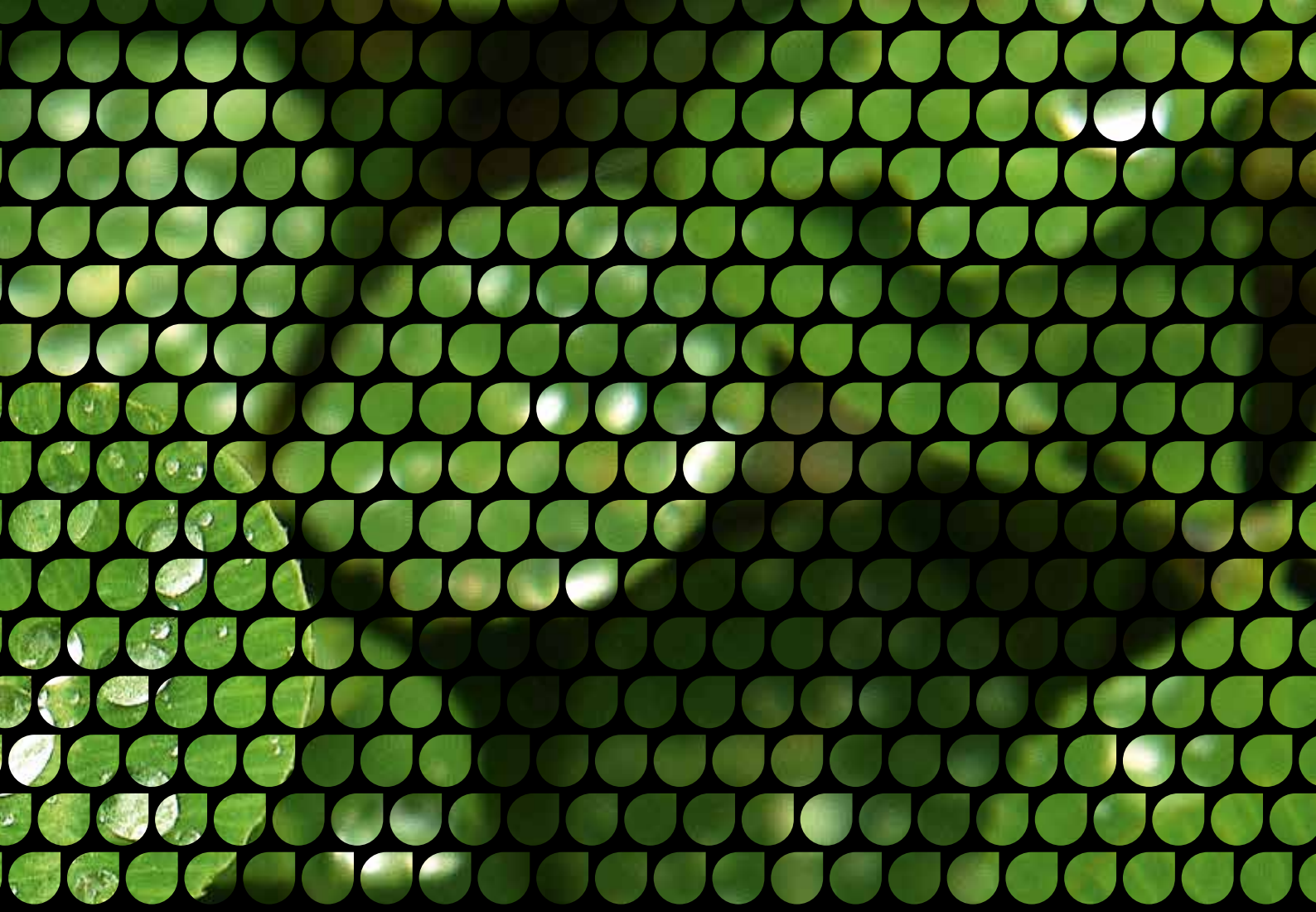


State of Nature 2016
Northern Ireland

state of nature

For its size, Northern Ireland is highly geographically diverse, and around 23,500 species can be found in its wealth of habitats[1]. Some of these species, such as the cryptic wood white butterfly, are not found anywhere else in the UK. Others, including red squirrels, pine martens and a number of freshwater invertebrates are threatened elsewhere in the UK, but occur in significant numbers here.

Much of Northern Ireland's agricultural land is grassland rather than arable, and this makes up a significant proportion of the land area. There are also other important habitats, including rivers, streams, large loughs, moors and fens. Peaty soils cover almost 15% of Northern Ireland[2], in the form of blanket bogs and lowland raised bogs; these are significant in a European context and support a rich variety of species. The long coastline is both rocky and estuarine, and it has been suggested that the surrounding seas hold about half of Northern Ireland's biodiversity[2].

New legislation brought in since the first *State of Nature* report means that the process of designating important wildlife sites and Areas of Special Scientific Interest (ASSIs) has progressed substantially. New marine legislation is also in place to provide protection to nationally important marine habitats and species. However, there is much still to be done to ensure protected sites are in favourable condition. Other challenges facing Northern Ireland's wildlife include intensive agriculture, development, invasive non-native species, unsustainable use of resources and difficulties in obtaining adequate resources for biodiversity projects and conservation initiatives.

Despite the low human population in Northern Ireland in comparison to other parts of the UK, the efforts of volunteer recorders mean we are able to present population trends for a subset of species for the first time. Monitoring activity is growing, and developing this capacity has been identified as a priority in the current Biodiversity Strategy[2].

Well-planned, evidence-based, targeted and sufficiently resourced conservation action can turn around the fortunes of our wildlife. This report celebrates a wide range of conservation projects across the six counties of Northern Ireland, including small but effective local projects, as well as those run by large organisations and government.

Results presented here demonstrate that the loss of nature in Northern Ireland continues, following a prolonged period of decline. It appears that some groups are starting to recover, including some bird and bat species, but such apparent gains are within the context of an environment that has long been impoverished; for instance, woodland cover in Northern Ireland remains among the lowest in Europe.

For guidance on how to understand the graphs and results presented in this report, please turn to pages 20–21.

- ***Over the long term, 52% of vascular plant species declined and 48% increased. This trend continued over the short term.***
- ***38% of bird species declined over the long term, while 62% increased. Over the short term, 58% of bird species declined and 42% increased.***
- ***Over 1,400 species known to occur in Northern Ireland have been assessed using modern Red List criteria. Of these, 295 (20%) are at risk of extinction from the island of Ireland.***
- ***We are indebted to the dedicated volunteers who feed data into monitoring programmes. It is only through this sharing of information that we are able to show these measures for the first time in* State of Nature 2016: Northern Ireland.**

The wider context

This report is a companion to the *State of Nature 2016* report, which makes an assessment of the fortunes of wildlife across the UK, its Crown Dependencies and Overseas Territories. We would encourage readers to refer to that report (available at **rspb.org.uk/stateofnature**) for the wider context within which the state of nature in Northern Ireland, the pressures acting upon that nature, and conservation responses required to help it, should be considered. Furthermore, our ability to measure change in nature is better at a UK scale – we can draw upon a greater volume of data, for more species and from more sources, as most biological monitoring and recording is conducted at the UK level.

That said, this *State of Nature 2016: Northern Ireland* report represents a step forward in our ability to report on Northern Ireland's biodiversity. Since the first report was published back in 2013, we have developed new country-specific metrics of change for all of the UK's four nations. The new measures for Northern Ireland, presented alongside existing national biodiversity indicators and alongside UK metrics, improve our understanding of how Northern Ireland's nature has changed, and the scale of the challenge that faces us.

A look back

A new, objective approach to measuring the depletion of nature compared to natural, undamaged ecosystems is featured in the UK report. National measures of the Biodiversity Intactness Index (BII) provide us with one way to assess the extent of the loss of nature due to human activities going back centuries[3]. BII values below 90% indicate that ecosystems may have fallen below the point at which they can reliably meet society's needs. Thus the value for Northern Ireland – 80.0% – gives great cause for concern. Of the 218 countries for which BII values have been calculated, Northern Ireland is ranked 24th from the bottom, and is ranked the lowest of the UK's four countries. England is ranked 28th lowest, with a BII value of 80.6%; Scotland is ranked 36th lowest, with a value of 81.3%; and Wales is ranked 49th lowest (still in the bottom quarter) with a value of 82.8%. The BII value for the Republic of Ireland is 77.4%, making it 15th lowest.

This measure of the degradation of natural ecosystems should, in fact, come as no great surprise given what we know of the loss of wildlife-rich habitat before we were able to measure the state of nature using the measures presented in this report. Little of this earlier loss has been quantified, but there is good qualitative knowledge of past changes and some quantitative measures. The facts are stark:

- Very little ancient woodland remains in Northern Ireland – it covers only 0.04% of the land area, compared to 2% in the rest of the UK. However, plantations of the non-native Sitka spruce have covered thousands of hectares and are responsible for the loss of large areas of upland blanket bog[4].
- Although much blanket bog remains, only 8% of lowland bog and 15% of upland bog is considered intact, due to drainage, overgrazing and, in particular, peat cutting[4].
- Northern Ireland has retained a higher coverage of semi-natural grassland than elsewhere in the UK, but as elsewhere, much has been lost since the 1950s, due to conversion to improved grassland. As a result, there has been a drastic disappearance of the rich wildlife these grasslands supported[4].

Hence, while *State of Nature 2016: Northern Ireland* focuses on recent and ongoing change, it should be remembered that there were dramatic changes prior to this. All the evidence suggests that the starting "baseline" used for the measures in this report is that of a country already much poorer in nature.

Large areas of upland blanket bog have been lost in Northern Ireland

Andy Hay (rspb-images.com)

Key findings

We show trends in species in Northern Ireland over the long term (around 1970 to 2013) and the short term (2002 to 2013). Full details of how these measures were calculated, and caveats around how they should be interpreted, are given in the UK report. The measures were based on quantitative trends in either abundance or distribution for 652 terrestrial and freshwater species.

Trends in the abundance and distribution of species

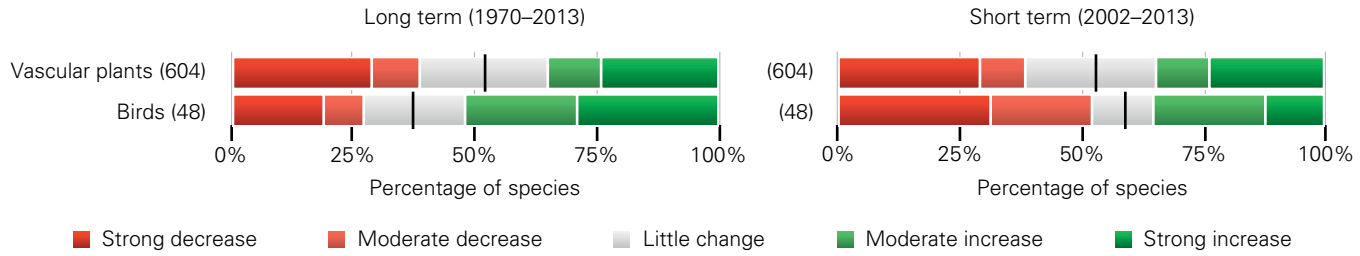


Figure 1

The percentage of species in each trend category over the long term and the short term. The line in the "little change" category shows the division between declining species on the left, and increasing species on the right. The values in brackets show the number of species assessed.

We have quantitative assessments of the change in population or distribution for terrestrial and freshwater species across two taxonomic groups: vascular plants and birds.

- Over the long term, 52% of vascular plant species declined and 48% increased. Among these, 39% showed strong or moderate declines, 26% showed little change, and 35% showed strong or moderate increases. Over the short term, this pattern was unchanged.

- 38% of bird species declined over the long term, and 62% increased. Among these, 27% showed strong or moderate declines, 21% showed little change, and 52% showed strong or moderate increases. Over the short term, this pattern has changed – 58% of species have declined and 42% have increased.

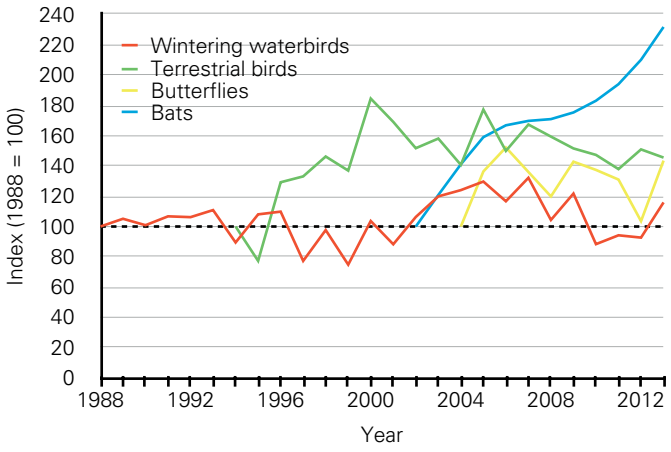


Figure 2

An index of change in the abundance of 25 waterbird species (red) from 1988–2013, 23 terrestrial bird species (green) from 1994–2013, eight butterfly species (yellow) from 2004–2013, and four bat species (blue) from 2002–2013. Butterfly data were obtained from the UK Butterfly Monitoring Scheme for Northern Ireland; bird data from the Breeding Bird Survey and Wetland Bird Survey; and bat data from the Car-based Monitoring Scheme and the All-Ireland Daubenton's Waterway Survey.

- Over the last decade, the indicator of butterflies in Northern Ireland has increased by 44%, on average. Of the eight butterfly species included in this indicator, 50% are increasing and 50% decreasing.

- The indicator of birds (not shown on graph) has increased by 22% over the long term and 3% over the short term. The long-term increase is largely driven by increasing numbers of wintering waterbirds (up 16%) and breeding terrestrial birds (up 46%). Over the short term, a number of wintering waterbirds have declined strongly.

- Mammal monitoring is limited to common bat species and otters. Overall, the indicator of common bat species shows an increase of 132% over the last decade. Otters have been surveyed twice (in 2001 and 2009)[5] and increased by 14% over that period.

Northern Ireland Red Lists

Red Lists attempt to identify species at risk of extinction, using a standardised approach that allows for comparison across species and geographic regions. Here we present Red List assessments for the island of Ireland, rather than the ones for Great Britain featured in the other country reports of *State of Nature 2016,* since Northern Ireland is part of a separate geographical land mass. These assessments have been produced collaboratively between Northern Ireland and the Republic of Ireland since 2002 and more are planned for coming years.

Combining the country-specific information provided in the newest Red Lists means that we were able to analyse data for 11 groups, covering 1,459 species. The taxa included in this assessment are bryophytes, non-marine molluscs, water beetles, bees, dragonflies, butterflies, mayflies, amphibians, reptiles, freshwater fish and terrestrial mammals.

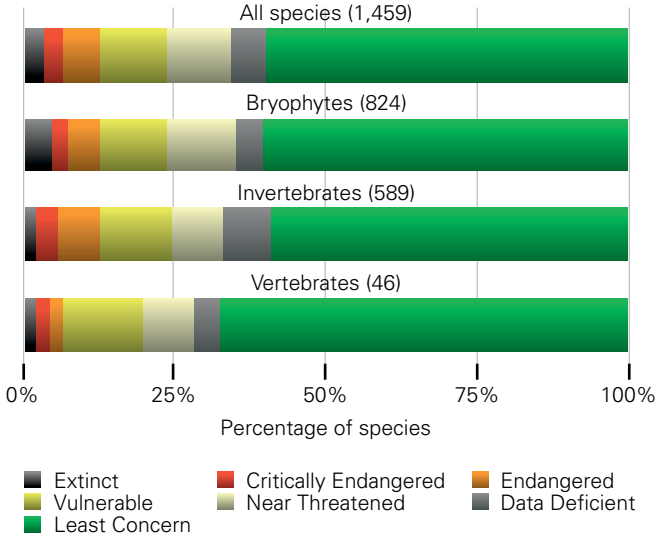


Figure 3

The percentage of species in each risk category, based on the likelihood of extinction from the island of Ireland, by broad taxonomic group. Species considered threatened with extinction are those classified as Critically Endangered, Endangered or Vulnerable in the latest IUCN Red List assessments.

- Of the terrestrial and freshwater species that have been assessed using modern IUCN Red List criteria, 295 (20%) are threatened with extinction from the island of Ireland.
- Looking in more detail, the percentage of species at risk of extinction from the island of Ireland represents 17% of vertebrates (eight species), 22% of invertebrates (132 species) and 19% of bryophytes (155 species).

Birds of conservation concern in Ireland

There has also been an all-Ireland bird assessment[6], which means that Northern Ireland's birds have been assessed alongside those of the Republic of Ireland, and as part of a separate assessment of the UK[7]. For some species, the category of concern is very different between the two assessments; where the threat level is higher on the all-Ireland assessment it is considered that this better reflects the situation in Northern Ireland than the UK assessment does.

Of the 185 species assessed in an all-Ireland context, 37 (20%) were placed on the Red list, and 90 (49%) on the Amber list. The number of red-listed species has increased by 12 and amber-listed species by five since the previous review in 2007. New additions to the Red List include six duck species, as well as a suite of passerines that have undergone population declines and/or range contractions. Populations of breeding waders continue to decline and the long-term future for these species is uncertain.

Recent declines have put the grey wagtail on the Red List

Summary of UK key findings

Since the first *State of Nature* report was published in 2013, substantial effort has been made to improve our ability to report on how wildlife is faring across Northern Ireland and the rest of the UK. Here we present a summary of the UK findings to add further context to the Northern Ireland-specific results in the rest of this report. These measures were based on quantitative trends in either abundance or distribution for 3,816 terrestrial and freshwater species over the long term and 3,794 species over the short term.

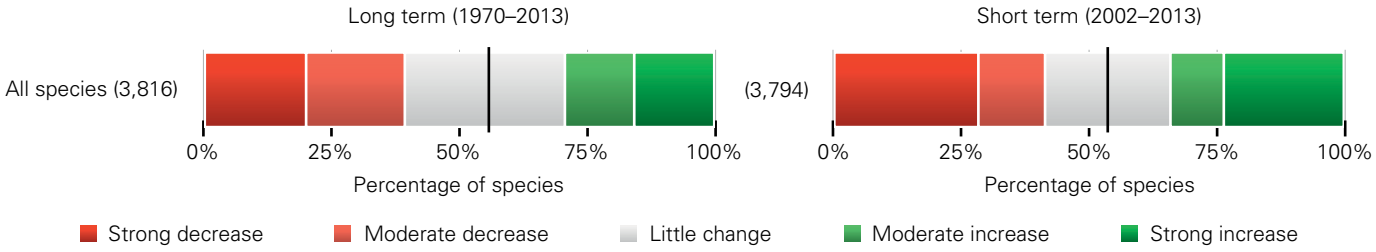


Figure 4

The percentage of species in each trend category across the UK over the long term and the short term. The line in the "little change" category shows the division between declining species on the left, and increasing species on the right. The values in brackets show the number of species assessed.

- Over the long term, 56% of species declined and 44% increased. Among these, 40% showed strong or moderate declines, 31% showed little change, and 29% showed strong or moderate increases.
- Over the short term, 53% of species declined and 47% increased. Among these, 41% showed strong or moderate declines, 25% showed little change, and 34% showed strong or moderate increases.

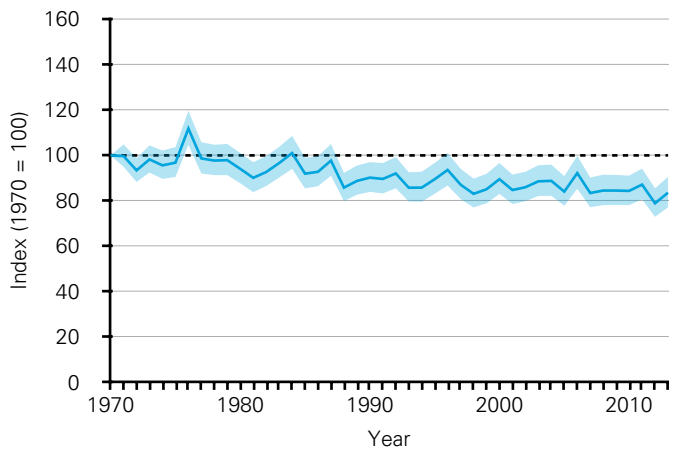


Figure 5

The Abundance and Occupancy Index shows change in the status of 2,501 terrestrial and freshwater species, based on abundance data (899 species) and occupancy data (1,602 species).

- The Abundance and Occupancy Index has fallen by 0.4% each year, on average, over our long-term period, resulting in a 16% decline in total. Over our short-term period, the decline was 0.18% per year. There was no significant difference in the rate of change over the two periods.

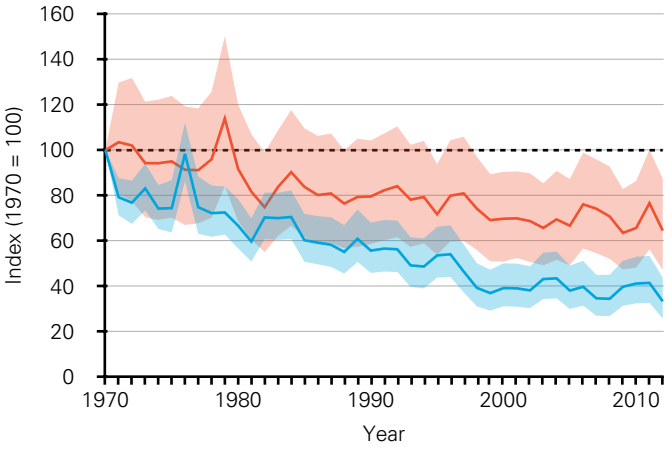


Figure 6

The UK Priority Species Indicator shows the Abundance Index (blue) for 213 priority species, and the Occupancy Index (red) for 111 priority species[8]. The shaded areas show the 95% confidence intervals.

- The official UK Priority Species Indicator reports on the trends of the UK's highest conservation priorities[8]. The indicator has two measures, one of abundance, the other of occupancy: since 1970 they have fallen by 67% and 35% respectively.
- Over our short-term period, the indicator of average abundance has fallen by 12%. Over the same short-term period, the indicator of occupancy has fallen by 6%.

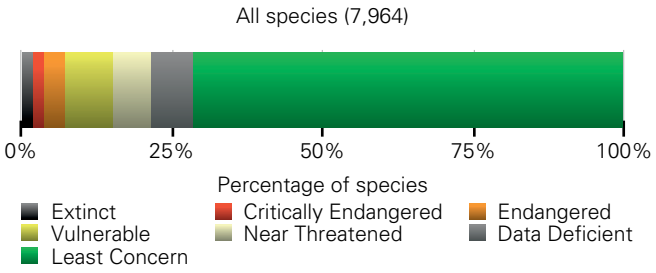


Figure 7

The percentage of species in each category, based on the likelihood of extinction from Great Britain. Species considered threatened with extinction from Great Britain are those classified as Critically Endangered, Endangered or Vulnerable in the latest IUCN Red List assessments

- Of the nearly 8,000 species assessed using modern Red List criteria, 15% are extinct or threatened with extinction from Great Britain.

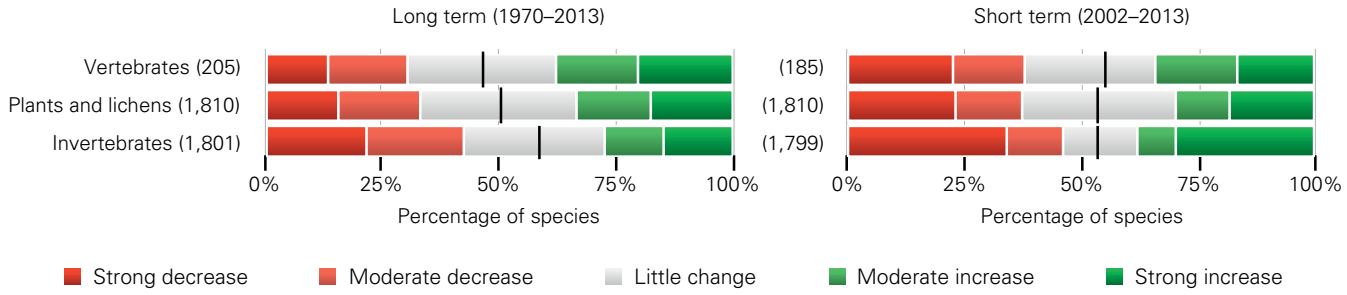


Figure 8

The percentage of species in each trend category over the long and the short term. The line in the "little change" category shows the division between declining species on the left and increasing species on the right. The values in brackets show the number of species assessed.

- Over the long term, 47% of vertebrate species declined and 53% increased. Among these, 31% showed strong or moderate declines, 31% showed little change, and 38% showed strong or moderate increases. 55% of species declined and 45% increased over the short term.

- 50% of plant and lichen species declined and 50% increased over the long term. Among these, 30% showed strong or moderate declines, 36% showed little change, and 34% showed strong or moderate increases. Over the short term, 53% of species declined and 47% increased.

- Over the long term, 59% of invertebrate species declined and 41% increased. Among these, 42% showed strong or moderate declines, 31% showed little change, and 27% showed strong or moderate increases. 54% of species declined and 46% increased over the short term.

Trends in the abundance and distribution of marine species by broad taxonomic group (not pictured)

- 34% of marine vertebrate species declined and 66% increased over the long term. Among these, 28% showed strong or moderate declines, 14% showed little change, and 58% showed strong or moderate increases. Over the short term, 46% of species declined and 54% increased.

- Over the long term, 38% of marine plant species declined and 62% increased. Among these, 6% showed strong or moderate declines, 69% showed little change, and 25% showed strong or moderate increases. 31% of species declined and 69% increased over the short term.

- 75% of marine invertebrate species declined and 25% increased over the long term. Among these, 38% showed strong or moderate declines, 49% showed little change, and 13% showed strong or moderate increases. Over the short term, 50% of species declined and 50% increased.

How are we helping nature in Northern Ireland?

In the next section we showcase projects actively conserving or promoting Northern Ireland's biodiversity in its six counties. We also look at urban and marine wildlife, and how volunteers are working towards a brighter future for local nature.

County Down

County Down is probably most famous for Strangford Lough, the largest sea-lough in Britain and Ireland, or the Mourne Mountains, whose familiar outline can be seen dominating the skyline across the area. There are many other gems, including Murlough, an extensive dune system and the first site to be designated as a National Nature Reserve in the county, and the woodlands of the Ards peninsula, which are home to pine martens and red squirrels. In this case study we focus on farmland, which covers most of the county and which is important both for food production and for wildlife.

Case study

Creating wildlife-friendly farmland for birds

Farming is one of the most important industries in Northern Ireland, and it provides numerous important benefits to society. It is also important for the many species of wildlife that have adapted to mixed agricultural systems and rely on the habitats and food they provide. Some species, such as the corncrake, have even been named for their close association with farming.

Mixed farming was once common here, with many farmers growing crops as well as producing livestock, but agricultural intensification has dramatically changed the landscape. Intensive grassland now dominates the countryside; a century ago it covered 75% of the land area, increasing to 85% 50 years ago, and 90% now[9].

As a result of this, and the more intensive use of existing arable land, there have been large-scale declines in bird species that rely on cropped land for their survival. These include the yellowhammer, tree sparrow, skylark and linnet. Yellowhammers have declined by 65% since the 1990s, with recent estimates suggesting that as few as 5,000 pairs remain in Northern Ireland[10].

Ernie Janes (rspb-images.com)

Simple conservation measures can benefit farmland birds

Although farmland wildlife faces significant challenges, there are things that farmers can do to help, either voluntarily or as part of agri-environment schemes. These include sowing seed-rich crops, managing hedgerows for wildlife and planting wildlife-friendly field margins.

RSPB Northern Ireland is working with over 60 farmers in East County Down, one of the last remaining areas in the country where arable farming exists on a large scale. We provide detailed management advice to help provide the requirements that seed eating species, such as the yellowhammer, need to survive. In doing so, we are helping to create wildlife-friendly farmland.

To date, we have proven that by introducing simple conservation measures on farmland we can dramatically improve conditions for farmland birds[11]. For example, we have seen an overall increase of 79% in yellowhammer numbers in East County Down on farms that received the most conservation management advice.

Over the coming years we will continue to work with these farmers to prove that wildlife-friendly farming can be achieved without compromising the profitability of farm businesses. In doing so, we hope that East County Down will act as a model that can be replicated across the country.

***Philip Carson**, RSPB Northern Ireland*

County Armagh

A diverse range of habitats can be found in County Armagh, ranging from rolling countryside with pockets of woodland and fen, to Lough Neagh, one of the largest lakes in the UK. Armagh is particularly important for the cryptic wood white butterfly, the only butterfly species within the UK that is exclusive to Northern Ireland. In recent years there has been a growing interest not only in monitoring, but also in carrying out specific habitat work to conserve the largest colony of this species in the UK.

Case study

Filling the gaps: linking populations of the cryptic wood white butterfly

Two types of wood white butterfly are found in the UK: the cryptic wood white in Northern Ireland and the wood white in England. Both species occur in the Republic of Ireland and Europe, but Northern Ireland holds the entire UK population of cryptic wood white butterflies. Although fairly widespread, these butterflies are confined to areas of unimproved and species-rich grassland. They are a UK priority species and recent data from the Irish Butterfly Monitoring Scheme shows them to be in decline[12].

In June 2015, the conservation team of Armagh City, Banbridge and Craigavon Borough Council joined forces with Butterfly Conservation to study the population ecology of the cryptic wood white butterfly. Previous research by Craigavon Council's conservation team had identified a nationally important population of the butterflies in a local nature reserve at Craigavon Lakes, where the butterflies were found in sheltered species-rich grassy swards. Other populations were found throughout the Craigavon district, including at nearby Oxford Island National Nature Reserve, just three miles north of the Craigavon Lake populations. Interestingly, the main food plant for the cryptic wood white at Oxford Island is greater bird's foot trefoil, whereas at Craigavon Lakes it is meadow vetchling. This suggests that the populations exist in isolation, despite being so close to each other.

The aims of the 2015 study were first to estimate the population size of cryptic wood white butterflies at the Lakes site; and second, to measure how the butterflies moved through the area. To do this, researchers regularly walked through the various colony sites, catching butterflies and marking each individual with a unique colour code, before releasing them unharmed. Each butterfly could be identified by its code if recaptured during the study, and at every "capture", detailed information was logged about the location, behaviour and condition of the butterfly.

In spite of poor weather during the flying season, over 200 butterflies were marked and the population at the Craigavon site was estimated at 659 individuals during the peak flight period. The results also indicated that the butterflies were able to disperse over 500 metres, but often moved far less than this, suggesting that they are fairly sedentary. Further work is required to confirm this.

The information gained from the research project provides essential guidance for the Council's conservation team, who hope to work across the Craigavon landscape to increase connectivity for this species.

The aim is to connect the two main colonies at Oxford Island and Craigavon Lakes, by managing a suite of suitable sites in between them specifically for the butterfly. This will encourage a more resilient and genetically diverse population of butterflies, by allowing movement and gene flow between the two apparently isolated populations. Suitable intermediate sites have already been purchased, and appropriate management is being implemented to allow future colonisation and conservation of the cryptic wood white butterfly.

For more information, please visit ***bcni.org.uk***

Danielle Shorthall
Work placement student and researcher

Marcus Malley
Conservation Officer with Armagh City, Bambridge and Craigavon Council

Cryptic wood white butterfly

County Derry/Londonderry

Derry/Londonderry is a rugged county with landscapes including the breathtaking uplands of the Sperrin Mountains, the sheer cliffs of Binevenagh and the extensive peatlands of the Moyola, Foyle and Bann Estuaries. The coastline is a key feature and includes Lough Foyle, a Ramsar and Special Protection Area (SPA) wetland that is home to large numbers of wintering wildfowl, and the dune systems of the north coast that host some of our rarest plants and invertebrates. Derry holds the catchments of several large rivers, which flow to the Atlantic, and these are designated as Special Areas of Conservation (SACs) for Atlantic salmon and otters. Vital landscape-scale surveys are carried out in a cross section of habitats and along waterways countrywide.

Case study

Using cars to monitor bats in Derry/Londonderry

Car-based monitoring of bats was first trialled in Ireland in 2003, with funding from the Heritage Council and with the assistance of the Bat Conservation Trust UK (BCT)[13]. Since 2004, the scheme has been managed by Bat Conservation Ireland (BCI) across the whole island, and it is now funded by the National Parks and Wildlife Service and the Northern Ireland Environment Agency.

The car-based scheme aims to monitor yearly trends in a number of common bat species, including the common pipistrelle, soprano pipistrelle and Leisler's bat[14], as well as the rarer Nathusius' pipistrelle[15]. In Northern Ireland, a team of two or three researchers drive along survey routes in five 30 x 30-km grid squares during July and August; two of these routes include roads in the east and south of the county. Across the island, 28 squares are surveyed annually. Each survey is conducted by driving at a slow speed (15mph) along a pre-mapped route, while recording bat sounds with an Android smartphone, using a time-expansion bat detector that slows the ultrasonic calls to an audible output. BCI provides all of the equipment needed, and the same specifications are followed across the island to allow results to be compared.

Every year, prior to the survey season, new survey teams are recruited and trained as required. Here in Northern Ireland, over 40 people have participated to date, although many have been extraordinarily dedicated and have completed the surveys for up to seven years without fail.

Other monitoring schemes underway here include the All-Ireland Daubenton's Waterways Survey, which is carried out by volunteers across Northern Ireland in August each year[16,17]. Following a protocol devised by the BCT, volunteers use bat detectors and torchlight to detect and identify Daubenton's bats flying across the water's surface at 10 points along a 1-km stretch of local waterway. These monitoring data have been used in this report's species' trends section, but unfortunately, we still have no surveillance data for our rarer bat species, such as the whiskered and Natterer's bats.

For more information, please visit ***bats-ni.org.uk*** *and* ***batconservationireland.org***

Karen Healy, *Northern Ireland Bat Group*

Niamh Roche, *Bat Conservation Ireland*

Richard Revels (rspb-images.com)

Every year, bats are surveyed across Northern Ireland

Irish lady's-tresses

Bob Gibbons (Alamy Stock Photo)

County Tyrone

A rural county of forests, mountains and farmland, Tyrone is dominated by rush pasture and both lowland and montane peatlands. Tyrone is the largest county in Northern Ireland and has several major rivers flowing through it, including the catchment of the Foyle to the north and Blackwater and Ballinderry to the south, both of which flow into Lough Neagh. Here we feature an important river catchment-scale project that aims to secure a brighter future for one of the planet's most endangered freshwater species

Case study

The Ballinderry Freshwater Pearl Mussel Rescue Project

The freshwater pearl mussel lives "hidden" in cold, fast-flowing rivers. It feeds on tiny particles and is important for filtering river water, which benefits other river wildlife. It can live for more than 100 years and is one of our longest-lived invertebrates.

The mussel has an intriguing relationship with trout; its larvae must attach to the gills of trout, where they grow for up to nine months before falling off and burying themselves into the gravel bed of the river. This complex life-cycle, coupled with its slow growth rate and inability to move large distances, makes the freshwater pearl mussel vulnerable to environmental change. The species has suffered a catastrophic decline globally and within the British Isles[18,19], which has been linked to illegal "pearl" fishing and poor water quality[20].

The Ballinderry River is one of only six rivers in Northern Ireland still home to the freshwater pearl mussel. This unique mussel has declined so significantly that without intervention it may become extinct. To save the Ballinderry mussels from extinction, the Ballinderry Rivers Trust has been running a catchment-scale project to address the issues facing them, thanks to funding from the Heritage Lottery Fund and the Northern Ireland Environment Agency (NIEA). Another aim of the project has been to raise awareness of this globally endangered species in the local community, including with local school children.

The project focuses on the upper 127km^2 of the Balinderry River catchment, with the main aim of reducing the amount of silt entering the river. The project team identified measures to reduce silt input from areas of land owned by 75 different landowners, and 73 agreed to work being done; a significant number also contributed their own time, machinery and materials.

Stock-proof fencing has now been installed along 24,000 metres of riverbank, and closing access to watering bays means that 3,000 fewer cattle have access to the river than before (alternative watering sites were provided). Erosion has also been addressed, by installing 3,500 metres of bank revetments and 4,000 metres of willow and alder planting along vulnerable banks.

Once established, in three to four years, the tree-lined riverbanks will slow the flow of flood water both in the tributaries and the main channel, bringing flood relief benefits downstream, as well as benefitting the mussels[21]. Levels of suspended and gravel silt are still being monitored and we await the results; farmers report that the riverbed appears cleaner than in previous years.

The next phase of the project is to release captive-bred juvenile mussels back into the river, from the Trust's long-running captive breeding programme. Over 550 mussels have already been released, adding a significant number to the estimated 1,500 remaining wild mussels. The Trust now plans to release more mussels into selected sites and undertake further river improvements through its new Pearl Mussels Go Wild project, which will be funded by NIEA.

To find out more, please visit ***ballinderryriver.org***

Mark Horton
Ballinderry Rivers Trust

Jeff Morgan (Alamy Stock Photo)

Freshwater pearl mussels can live for more than 100 years

County Antrim

Antrim is a county of steep wooded glens, rolling farmland and a rocky coastline. With the longest stretch of coast in the country, the county is probably most famous for its iconic landmarks, including the Giant's Causeway and Rathlin Island. Our featured project, however, sees us travelling inland, as Antrim also has some of the richest wildlife verges in the country, home to many important species of plants and invertebrates.

Case study

Don't Mow, Let it Grow

Nature is vital to our well-being, not only because of the physical and mental health benefits it offers, but also for the services, such as pollination, that it provides[22]. Causeway Coast and Glens Borough Council has been working hard across both Antrim and Derry to improve the wildlife value of its land, and to help local people and visitors to reconnect with the natural environment.

Over the past five years, the Council has worked with local community groups and organisations to develop a range of projects, including creating a nectar-rich wild flower area for both visitors and pollinators to enjoy. An area of unused grassland, complete with pollinator-friendly flowerbed, has also been opened up to provide the local community with much needed green space. In addition, the Council now has five conservation grazing paddocks on coastal sites, three of which are within Special Areas of Conservation (SACs); the grazing regime contributes directly to the positive management and protection of these sites.

Guy Rogers (rspb-images.com)

Wild flowers are excellent food sources for bees

Wild bees need pockets of flower-rich habitat across the landscape to provide them with a diverse diet and nesting areas. While common perennial wild flowers like clovers, vetches and knapweeds are excellent food sources, many bedding plants and annuals are not rich in pollen or nectar, and provide little support to our pollinators. Evidence shows that patches planted with wild flower seed mix had 25-times more flowers, 50-times more bumblebees, and 13-times more hoverflies, compared to plots where wild flower seed had not been sown[23]. Research also shows that dandelions and white clover are important for bumblebees, honeybees, solitary bees and hoverflies[24]. These results suggest that the most cost-effective way for the Council to help pollinators is to increase the wild flowers that grow naturally within the landscape, and retain or create natural nesting habitat.

As a result, the Council is embarking on a partnership project with Transport NI and the Department of Agriculture, Environment and Rural Affairs (DAERA), called Don't Mow Let it Grow. This project is funded by the Heritage Lottery Fund and Landfill Communities Fund, and will investigate how different management of road verges and amenity grassland can be used to benefit grassland species. Hopefully, it will not only change the way we manage our grasslands, but also encourage the wider public to embrace the benefits of traditional grassland management compared to short manicured grass.

To find out more, visit ***dontmowletitgrow.com***

Rachel Bain
Causeway Coast and Glens Borough Council

County Fermanagh

Wetlands, in particular those around Upper and Lower Lough Erne, are probably the most well known features of County Fermangh. These wetlands host some very important wildlife, including insects associated with emergent vegetation and good water quality, but the county also hosts many other important habitats. Thanks to Fermanagh's underlying calcareous geology, which is quite different to the acidic basalts of the rest of the country, turloughs (seasonally flooded lakes), fens, grasslands and limestone pavements can also all be found here, and these features provide homes to some of our most iconic species.

Case study

Improving the outlook for marsh fritillaries through high nature value farming

The marsh fritillary is Northern Ireland's only European protected butterfly species. Once widespread across Europe, it has suffered severe declines throughout the last century. It used to be found in all six counties, but only two main landscapes for the butterfly now remain. These consist of a network of isolated fen and sand dune sites in County Down, and a much more connected landscape of species-rich grassland in counties Fermanagh and Tyrone.

The marsh fritillary is a very mobile species by nature, and in addition to single sites it requires a well-connected landscape of suitably managed habitat if it is to thrive. Marsh fritillaries move through the landscape, regularly utilising "core" breeding sites, but also opportunistically colonising suitable "satellite" habitat between these sites.

These transitory satellite sites may only be occupied for one or two years in ten, but they provide vital stepping stones through that landscape, ensuring better connectivity and genetic resilience within marsh fritillary populations. Without this connectivity, the marsh fritillary will eventually become extinct, something that is happening to more isolated colonies in County Down.

In Fermanagh, marsh fritillaries are found at a number of designated sites, as well as in unimproved areas of the wider landscape. These vital unimproved grasslands are under threat, both from abandonment, as new generations of local people leave the area to find work elsewhere; and from agricultural improvement as those that stay fight to make this marginal farming land more profitable.

The proposed new NI Environment Farming Scheme (EFS) contains options designed to help marsh fritillaries and will provide an essential tool to help us deliver habitat management that is crucial for the butterflies' survival.

Surveying sites within the new scheme will be an essential part of monitoring progress and giving important feedback to both landowners and DAERA. We hope these more tailored options will ensure a brighter future for marsh fritillaries in Fermanagh.

For more information please see ***bcni.org.uk***

Catherine Bertrand
Butterfly Conservation

Sam Ellis

Northern Ireland's new Environment Farming Scheme could help to provide habitat for marsh fritillaries

Marsh fritillary

Andy Seely (Butterfly Conservation)

Urban wildlife

Many of the settlements in Northern Ireland are not large by UK standards, but there are several cities and large towns. The fragmentation of natural habitat is a particular problem for urban wildlife, not just in Northern Ireland; most woodlands, grasslands and water bodies in urban areas are small and not well connected, making it difficult for wildlife to survive and move around. However, one bird – the swift – has become used to breeding in the nooks and crannies of structures we build, and is strongly associated with our towns and cities.

Case study

Saving the swift – a truly urban bird

Once they have returned from Africa in spring and found a nest site, breeding swifts return to the same site every year; research here in Northern Ireland has shown that some nest sites have been in continuous use by generations of swifts for over 100 years! However, when buildings are redeveloped the holes that swifts nest in are often blocked up, leaving them without a place to breed. Sometimes whole colonies are lost because buildings are demolished.

The swift is declining, and as a result it is amber-listed as a bird of conservation concern[6,7]. This decline may be due, in part, to the loss of nest sites, so the Northern Ireland Swift Group has set out to advise individuals, organisations, businesses and government on how to save existing nest sites and create new ones. Translink, Tesco, the Crescent Arts Centre, and DAERA are just some of the organisations the NI Swift Group have worked with over the past five years. As a result of the advice given, many people have put up swift nest boxes on their houses and buildings, providing much needed nesting sites.

Thanks to birds being tagged with geolocators in Germany, Sweden, Italy and various other countries, we know where in Africa many of Europe's swifts spend the winter. However, this knowledge is missing for Europe's most westerly populations of swifts – those in Ireland. To address this, the NI Swift Group met up with the BTO, the RSPB, Birdwatch Ireland and the Northern Ireland Environment Agency in 2015 to fit geolocators to swifts from a colony in County Antrim and another from County Sligo. These tags were fitted under licence in July 2015, and by the time you are reading this report we will have retrieved data from the returning swifts, revealing where the birds spent the winter.

To find out more, visit ***saveourswifts.co.uk***

Peter Cush
Northern Ireland Swift Group

Chris Gomersall (rspb-images.com)

Swift nest sites are often destroyed when buildings are renovated or demolished

Marine wildlife

A coherent network of Marine Protected Areas (MPAs) at sea is vital to protect the UK's unique marine biodiversity. MPAs provide space for species and habitats to recover from human pressures and to adapt to climate change. Since 2013, national networks of MPAs have begun to be designated to complement existing sites of European importance. It is vital that these sites represent the full wealth of the UK's marine biodiversity; however, mobile species, including seabirds, cetaceans and seals, are currently poorly represented. Critical feeding and preening areas, which support seabird colonies, also need European protection. By 2017, five national Marine Conservation Zones (MCZs) for Northern Ireland should be protecting species such as the black guillemot and ocean quahog, as well as habitats such as seagrass meadows. However, further MPAs are needed to help those species and habitats not covered by the existing network.

Case study

New protection for ocean quahogs in Belfast Lough

Found in the North Atlantic and North Sea, the ocean quahog is a large marine clam, which holds the title of the oldest non-colonising species known to science[25]. One specimen – famously known as "Ming the Clam" – was thought to be more than 507 years old at the time of its death in 2006. However, the species is in decline[26] and needs more protection across UK waters.

Providing protection for both the species and the habitat on which it relies is a vital step towards securing an effective network of MPAs for the UK, including the seas around Northern Ireland. In 2013, the Marine Act (NI) granted the Assembly powers to designate a new form of Marine Protected Area – the Marine Conservation Zone (MCZ). New MCZs can now be designated to protect nationally important species and in the first round, DAERA has proposed an area of seabed in Outer Belfast Lough. This would protect a dense but vulnerable population of ocean quahogs.

RSPB Northern Ireland has been working closely with the Northern Ireland Marine Task Force in campaigning for the designation of Outer Belfast Lough, along with three other local MCZs to protect vulnerable species and features in Northern Irish seas. The campaign aims to engage local communities, stakeholders and political representatives in the MCZ process, and to garner support for new and better protection for Northern Ireland's seas. If successful, new MCZs could not only offer protection for species such as the ocean quahog, but provide a vital first step towards the recovery of our seas for future generations.

For more information, visit ***nimtf.org***

Dr Kenneth Bodles
RSPB Northern Ireland

Marine Conservation Zones could offer protection for the ocean quahog

Paul Kay

Vital volunteers

The conservation and future of wildlife in Northern Ireland is reliant on the work of thousands of passionate, dedicated volunteers. Each organisation that is part of the State of Nature partnership is supported by a far wider network of people who care deeply about the natural world and give their time and energy to promote and conserve it.

Case study

CEDaR: The Centre for Environmental Data and Recording

The Centre for Environmental Data and Recording (CEDaR) was established at the Ulster Museum in January 1995 and acts as the Local Records Centre for Northern Ireland. It works in partnership with the Northern Ireland Environment Agency (NIEA), National Museums Northern Ireland (NMNI) and the local recording community.

CEDaR aims to ensure that fit-for-purpose biological records are available for education, research, monitoring, nature conservation policy and commercial enquiries.

In response to a drive towards better data for the surveillance of our nature, CEDaR are actively promoting monitoring-based recording schemes such as the Breeding Bird Survey, the Northern Ireland Seal Survey, the National Plant Monitoring Scheme and the National Moth Recording Scheme. CEDaR works with a wide range of government departments, councils, universities, conservation bodies, field clubs, recording societies and individual recorders to collate and share information, as well as support local projects. Ultimately, the work of these groups and individuals results in our extensive database, populated with verified datasets.

This combined information is made available through the CEDaR information request service, feeding into impact assessments, planning applications, education and research projects, land management plans and conservation plans. CEDaR data is in constant use for important decision-making and policy development. CEDaR also provides a suite of informative websites through the Habitas project, which provide an opportunity for people to access the information they need to enhance their knowledge and enjoyment of the natural world.

The establishment of the Environmental Recorders' Group (ERG) has been crucial to the development of CEDaR, and has encouraged the flow of quality data. While ensuring the confidentiality of sensitive records, information is made available for a variety of purposes such as research, conservation, education, planning and commercial enquiries. The income generated through such commercial requests is made available to a funding programme to specifically support ERG members, and enhance future recording.

CEDaR has traditionally assisted with the training of biological recorders, but over the past few years this has become more focused on weak areas of our knowledge and difficult species groups. Since 2012, CEDaR has organised an annual programme of training courses addressing under-recording of a number of groups such as ground beetles, lichens, micro-moths and freshwater snails.

The development of partnerships has resulted in a number of activities such as BioBlitzes, recording projects, knowledge transfer opportunities and publications. CEDaR also provides a point of contact for bat enquiries, supporting the work of the Northern Ireland Bat Group and NIEA regional operations teams.

Pauline Campbell
CEDaR, Northern Ireland's Environmental Records Centre

Case study

Saving the red squirrel in the Ring of Gullion

Red squirrels face a number of threats, the most well-known of which are competition from grey squirrels and disease from the squirrel pox virus they carry. The fragmentation and loss of suitable habitat is also an issue, as are traffic accidents. As a result, the red squirrel is one of the most threatened mammals in the British Isles, and the Ring of Gullion is one of its last strongholds in Northern Ireland.

A local Red Squirrel Group was set up to conserve and promote the population of red squirrels in South Armagh and the Cooley Peninsula. The group aims to monitor the population, improve woodland, minimise the threat from grey squirrels and raise awareness of red squirrel conservation. Volunteers are always needed to help with this work.

The squirrel pox virus carried by grey squirrels is fatal to reds; it causes breathing difficulties and blindness, and eventually infected red squirrels are unable to find food and will slowly die of dehydration and starvation. In 2011, 90% of the red squirrels in County Down's Tollymore Country Park were infected with the poxvirus and subsequently died. The Red Squirrel Group collects records and sightings of both grey and red squirrels to help monitor this situation.

As part of another project to monitor red squirrels, an intern from the People's Trust for Endangered Species has been investigating the relationship between pine martens and red and grey squirrels, by analysing pine marten droppings from the Ring of Gullion and other areas. The aim is to determine the importance of both squirrel species in the diet of pine martens, as this predator has been implicated in the decline of greys in parts of Ireland. To find out more, visit ***ringofgullion.org***

Therese Hamill, *Ring of Gullion and Cooley Red Squirrel Group*

Red squirrel

Kevin Sawford (rspb-images.com)

How to interpret this report

We have included this section to help you understand the different measures presented in the *State of Nature 2016* UK and country reports and how they should be interpreted.

WHAT DATA HAVE WE USED FOR NORTHERN IRELAND?

- We have quantitative assessments of the change in population or distribution in Northern Ireland for 652 terrestrial and freshwater species. For the UK summary, we present trends in abundance and occupancy for 3,816 native terrestrial and freshwater species. These trends came from a wide range of sources. We have used all-Ireland data where appropriate for species occurring in Northern Ireland, as this allowed the consideration of a broader taxonomic scope than data from Northern Ireland alone.
- Details of the datasets behind our analyses, and the species they covered, are given online at **rspb.org.uk/stateofnature**

WHAT TIME PERIOD DOES THIS REPORT COVER?

- For Northern Irish and UK results we show trends in our species from around 1970 to 2013 (our long term period) and from 2002 to 2013 (our short term period).

WHAT ARE THE GRAPHS TELLING ME?

In each section of the report we present the relevant results for Northern Ireland or the UK to show the following:

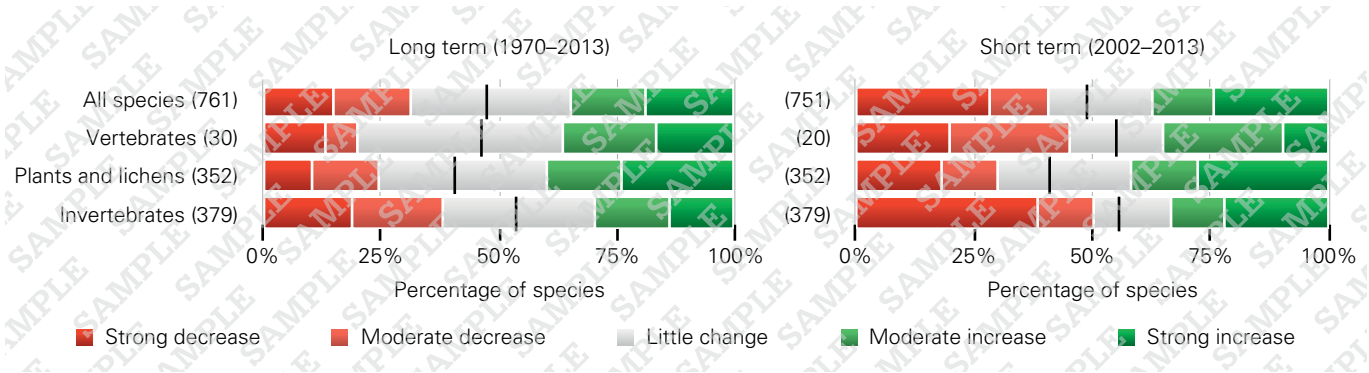
- **Categories of change**
  The percentage of species in each trend category.
- **Change over time**
  The change in the status of species at a UK level, based on abundance over the last 50 years in Northern Ireland. The UK results show this change based on abundance and occupancy data.
- **Extinction risk**
  An assessment for each species occurring in Northern Ireland, of extinction from the island of Ireland.

Further details on how these measures were calculated, and caveats around how they should be interpreted, are given on pages 74–77 of the UK report (available at **rspb.org.uk/stateofnature**).

Please note that due to the change in species composition, and in some cases data sources, our measures are not directly comparable with those presented in the first *State of Nature* report.

Categories of change

Each species was placed into one of five categories based on annual percentage changes for populations in NI and across the UK.



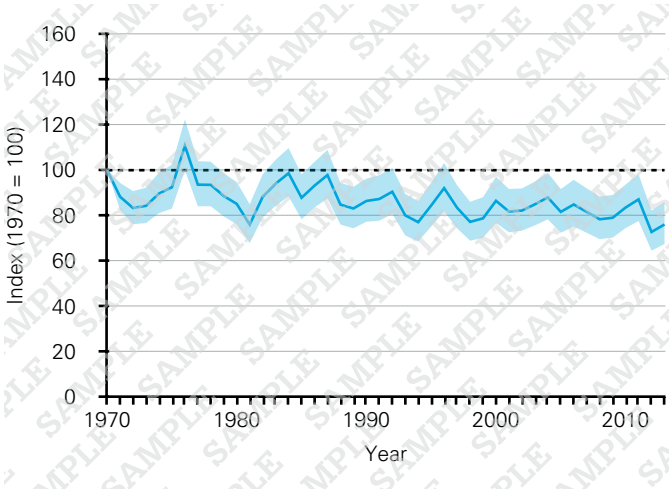
Results reported for each figure include:

- The overall percentage of species that increased and decreased in each time period. The vertical line across the white "little change" segment of the graph shows the division between declining species on the left, and increasing species on the right (this is broadly equivalent to the metric reported for the first *State of Nature* report).
- The percentage of species that showed strong or moderate changes, and those showing little change, in each time period.

Thresholds for assigning species' trends to the five categories are given on pages 74–77 of the UK report.

Change over time

These graphs combine abundance data (based on a species' population size) across species into geometric mean indicators for taxonomic groups for which data are available. In the case of the UK, the indicator also combines occupancy data (the proportion of 1-km^2 grid cells occupied by a species). This relies on the assumption that proportional changes in occupancy and distribution are equivalent (for more detail, see pages 74–77 in the UK report).



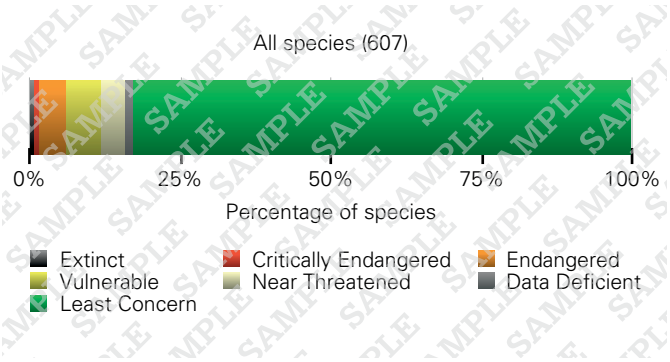
Results reported for each figure include:

- Total percentage change in the indicator over the long term and the short term.
- Annual percentage change over the long term and the short term.
- At the UK level, we assessed change over the period by comparing the rate of change of the indicators between the *prior* (~1970–2002) and *recent* (2002–2013) time series, and report the test statistic (t) and the level of significance (p).

Extinction risk

We summarised Red Lists compiled jointly by Northern Ireland and the Republic of Ireland to present the proportion of species in each threat category overall, and by different taxonomic groups.

These figures represent the ultimate threat of extinction from the island of Ireland. While the proportion of species listed as Least Concern is considerable, the number of species that are considered at risk of extinction from Ireland is worthy of note.



Results reported for each figure include:

- The overall percentage of species that occur in the island of Ireland and were assessed, that are regarded as at risk of extinction from Great Britain. This includes species that have been classified as Critically Endangered, Endangered or Vulnerable in the latest IUCN Red List assessments.

Seven-spot ladybird

Sue Kennedy (rspb-images.com)

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The Giant's Causeway, County Antrim

Alan Novelli (Alamy Stock Photo)

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The monitoring and research that underpins this report, and our wider knowledge of the state of nature in the UK, its four component countries and its Crown Dependencies and Overseas Territories, is conducted by a wide variety of organisations and thousands of individuals. We do not have space here to recognise their contributions individually, but offer our collected thanks to them all.

Conservationists and scientists from the State of Nature partners and other organisations have provided data, analyses, case studies and guidance, and have given their time to review drafts during the production of *State of Nature 2016: Northern Ireland*. In particular, we wish to thank Claire Barnett, Anne-Marie McDevitt and Richard Weyl. We would also like to thank all the photographers for the use of their images.

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Finally, we wish to thank the thousands of dedicated volunteer recorders who collect much of the data upon which our knowledge of the state of nature is based. Many are supporters of the organisations within the State of Nature partnership and contribute to systematic monitoring and recording schemes. Without their efforts, our knowledge of the health of Northern Irish nature would be just a fraction of what it is. We hope we can continue to work together with these volunteers to improve our knowledge, and thus provide an increasingly robust basis for informing future conservation efforts. Additionally we would like to thank all of the volunteers who are involved in the many conservation projects underway around Northern Ireland to address the issues facing our wildlife. Without them, the challenge would be much greater.

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A Focus On Nature
amphibian and reptile conservation
British Bryological Society
British Pteridological Society
The Marine Biological Association
marine conservation society
ZSL LET'S WORK FOR WILDLIFE
rspb giving nature a home
Predicts
ALERC
BTO Looking out for birds
A ROCHA
Butterfly Conservation
MARINE life
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Ulster Wildlife
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Documenting Ireland's Wildlife
NATURAL HISTORY MUSEUM
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The University Of Sheffield.
Bat Conservation Trust
Bumblebee Conservation Trust
THE FUNGUS CONSERVATION TRUST
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Natural Environment Research Council
BRC Biological Records Centre
BDS British Dragonfly Society
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The Mammal Society
ORCA Looking out for Whales and Dolphins
orcaweb.org.uk
Rothamsted Research
iSpot ispotnature.org
Northern Ireland Bat Group
EARTHWATCH INSTITUTE
CIEEM Chartered Institute of Ecology and Environmental Management
The Conchological Society of Great Britain & Ireland
NBN National Biodiversity Network
ballinderry rivers trust
Freshwater Habitats Trust
SHARK TRUST
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Paroli Galperti (Cuboimages)