Chapter 6
Nature

Nature

1. Introduction

Nature is invaluable and underpins our economy, security, health and wellbeing yet it is not always protected.

The terms 'biodiversity' and 'nature' are often used interchangeably and refer to the variety of life forms on this planet, including humans. They also refer to how species interact with each other and the habitats in which they live. We are deeply connected to nature and rely on biodiversity for our existence yet many of us take this for granted. While having a value in its own right, biodiversity also underpins our economy, security, health and wellbeing. It plays a key role in the functioning of ecosystems, their resilience and their continuing ability to provide ecosystem services. Ecosystem services are how nature benefits us. Nature provides us with clean air and water, food and the raw materials to produce many medical treatments. It is also important to our wellbeing and affords us many opportunities for recreation (IPBES, 2018).

Human society depends on the natural world for its survival. Decisions we make now about how we produce and use food, how we use water or natural resources and the range of other benefits derived from nature, will impact on what ecosystem services will continue to be available to society. The health and integrity of the natural world also impacts on our quality of life and that of future generations.

In Ireland, the challenges of managing the modified landscape we have created over generations cannot be overstated. The most recent report on the status of Ireland's habitats and species by the National Parks and Wildlife Service (NPWS) concludes that most Irish habitats listed in the Habitats Directive have an unfavourable status and almost half are demonstrating ongoing declines (NPWS, 2019).

The role of the NPWS is wide ranging and includes: the conservation of a representative range of ecosystems to maintain and enhance populations of flora and fauna in Ireland; designating, advising and consulting on the protection of habitats and species identified for nature conservation; arranging for the implementation of National and EU legislation and policies for nature conservation and biodiversity; managing State-owned National Parks and Nature Reserves, and promoting awareness of natural heritage and biodiversity issues.[1]

2. State of Habitats and Species in an Irish and Global Context

Nature is declining globally and nationally.

The United Nations Sustainable Development Goals (SDGs) outline global efforts towards achieving sustainable development by 2030. One of the goals, SDG 15: Life on Land, aims to 'sustainably manage forests, combat desertification, halt and reverse land degradation, and halt biodiversity loss' (UN, 2015). SDG 14 Life Below Water is also relevant covering sustainable use of the marine environment (Chapter 8). The 2018 report, *Sustainable Development in the European Union*, warned of an unprecedented decline in nature globally with accelerating species extinction rates and monitored progress towards the SDGs in a European Union (EU) context (EU, 2018a). Short-term (2010-2015) and long-term (2000-2015) EU trends for the biodiversity indices in SDG 15 were assessed as follows:

- surface of terrestrial sites designated under Natura 2000 – steadily increasing since 2008 (too few data to analyse the long-term trend)
- common bird index (integrates the abundance and diversity of a selection of common bird species associated with specific habitats) – long-term overall decline but with a small annual increase in the short term
- grassland butterfly index (population trends of 17 butterfly species with data from 15 Member States, including Ireland) – both long-term and short-term severe declines after a period of stabilisation in 2000.

The European Environment Agency's assessment of the state of Europe's biodiversity (EEA, 2019) reported a similar outlook. Despite the ambitious targets that have been set, Europe's biodiversity continues to decline. It is very unlikely that policy targets will be met. The report stated that 'Europe faces persistent problems in areas such as biodiversity loss, resource use, climate change impacts and environmental risks to health and well-being'.

The *Living Planet Report* published by the World Wide Fund for Nature (WWF, 2018) pointed to the fact that biodiversity loss is continuing. It outlined that, 'without a dramatic move beyond "business as usual", the current severe decline of the natural systems that support modern societies will continue – with serious consequences for nature and people'. The latest living planet report (WWF, 2020) states that biodiversity is now being destroyed at an unprecedented rate in human history and that climate change is further accelerating changes to our natural world.

1 *National Parks and Wildlife Service https://www.npws.ie/*

The recent United Nations *Global Environment Outlook – GEO-6* report (UN Environment, 2019) stated that biodiversity is in crisis. This assessment found that biodiversity policy responses at all levels have been insufficient or too slow to reverse the decline in global biodiversity. The report asserted that the cost of inaction is large and escalating in terms of global biodiversity and that increased investment in conservation is critical. The Global Outlook Biodiversity 5 report states that humanity is now at a crossroads with regard to the legacy it leaves for future generations and that bold, interdependent actions are needed across a number of fronts to follow a pathway to a sustainable future (Secretariat of the Convention on Biological Diversity, 2020).

The *National Biodiversity Indicators: 2017 Status & Trends* report (NBDC, 2017) summarised the trends in the health of our species and habitats, as well as examining our relationship with nature. The indicators cover areas where improvements are needed to conserve nature including habitats designated under EU law that are of 'inadequate' or 'bad' status and also species protection. While awareness, knowledge and action to protect biodiversity in Ireland are growing these actions are happening too slowly for us to meet our biodiversity targets.

Protection of nature is still a key challenge. The next section outlines the overall trends and status for nature but local issues are also a problem such as site specific habitat damage, hedge cutting and protection of birds of prey (Table 6.1). These are also areas that need to be tackled and enforced in order to improve wildlife and habitat protection.

The National Parks & Wildlife Service has reported a total of 338 incidents involving birds of prey between 2007 and 2019.[2] A wide range of causes are listed, including poisoning, persecution, fence, road and turbine collisions. Incidents have been recorded in every county of Ireland. Incidents involving illegal acts or misuse of poisons. Poison incidents accounted for 71.5 per cent of such cases, while shootings accounted for 28 per cent and trapping/mutilation accounted for 0.5 per cent of such cases. All regularly breeding native Irish raptor species were confirmed to have suffered some form of poisoning, persecution or other direct anthropogenic non-habitat related cause of injury or mortality. It was also confirmed in October 2020 that a new Wildlife Crime Unit will be established within NPWS that will be involved in tackling these issues.

Table 6.1 Numbers of environmental complaints and bird of prey incident reports sent to the National Parks and Wildlife Service in 2018 and 2019 (Source: NPWS)

COMPLAINT/INCIDENT	NUMBER
Complaint[a]	
Environmental/habitat damage/ destruction	25
Habitat damage during a development	6
Habitat management	1
Animal welfare	2
Hedge cutting	455
Birds of prey incident report[b]	60

[a] *Based on complaints received through the Email address: nature.conservation@chg.gov.ie.*

[b] *Not all bird of prey incidents involved illegal activity.*

EU Member States are required to monitor habitats and species across Europe that are considered to be threatened and that are listed in the Habitats Directive (92/43/EEC). The conservation status of habitats and species is assessed at a national level, not just in protected areas. The third report on the status of habitats and species in Ireland, prepared by the National Parks and Wildlife Service (NPWS, 2019), stated that, although most of Ireland's listed habitats can be classified as having an unfavourable status, our species are doing better, with the majority having a favourable status. Freshwater species are seen to be most at risk, generally from water pollution.

2 *https://merrionstreet.ie/en/News-Room/Releases/NPWS_publishes_review_of_incidents_impacting_birds_of_prey_2007-2019.html*

3. Current Status and Trends

Sixth National Report to the Convention on Biological Diversity

Performance indicators objectively track progress towards our biodiversity commitments and targets at a time when nature is under increasing pressure.

Ireland's *6th National Report to the Convention on Biological Diversity* (DCHG, 2019a) reviewed our progress in relation to the five Strategic Goals and 20 Aichi Biodiversity Targets set out in 2011 for implementation by 2020.[3] The report found that progress towards many of our national biodiversity targets is partially effective but too slow. A 'transformational change' is needed if Ireland is to achieve the vision outlined in the National Biodiversity Action Plan 2017-2021 (DCHG, 2017).

An online indicator dashboard has been launched by the Biodiversity Indicators Partnership (BIP) to accompany the Convention on Biological Diversity (CBD) report. The BIP is a global initiative to promote the development and delivery of biodiversity indicators and it responds to requests from the CBD, Intergovernmental Science–Policy Platform on Biodiversity and Ecosystem Services (IPBES) and the United Nations (SDGs), among others. The dashboard provides an update of a country's biodiversity targets according to the Aichi Biodiversity Targets, the United Nations SDGs and any multilateral environmental agreements that are in place. Further information can be found on the BIP website.[4]

Habitat Trends

Marine, peatland, grassland and woodland habitats are under threat in Ireland.

Although Ireland naturally has a less diverse population of plants, insects and animals than mainland Europe, it has some habitats that are of EU importance, such as our peatlands. Our aquatic systems and wetlands (see Topic Box 6.1) also support populations of birds, fish and invertebrates that are of international importance.

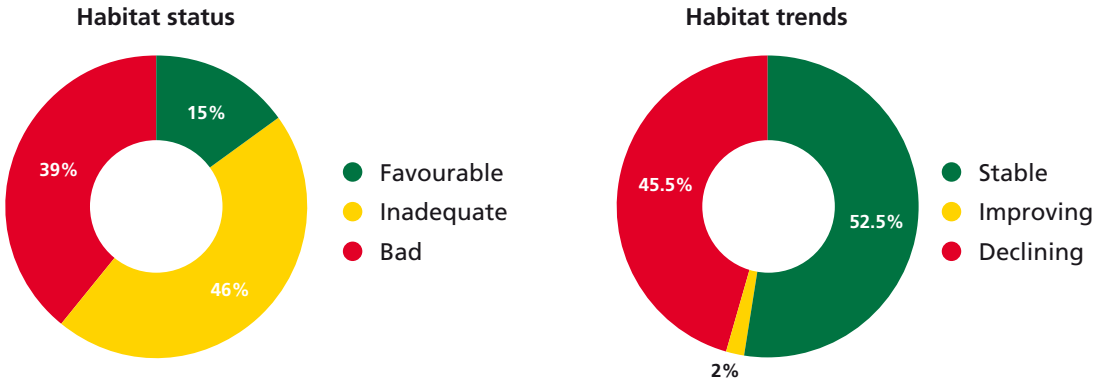
A recent report by the NPWS (2019) provided the current status of Ireland's 59 protected natural habitats and 60 protected species naturally occurring in Ireland (Figure 6.1).

Most habitats assessed in Ireland have an unfavourable status and almost half show ongoing declines, including marine, peatland, grassland and woodland habitats. Further details on peatlands, their protection and restoration is covered in Chapter 5.

3 https://www.cbd.int/sp/targets/

4 http://bipdashboard.natureserve.org/bip/SelectIndicator.html?iso=IRL&reg=Europe

Figure 6.1 Overall assessment results for the status of and trends in habitats protected under the EU Habitats Directive in Ireland (Source: NPWS Article 17 Data 2019)

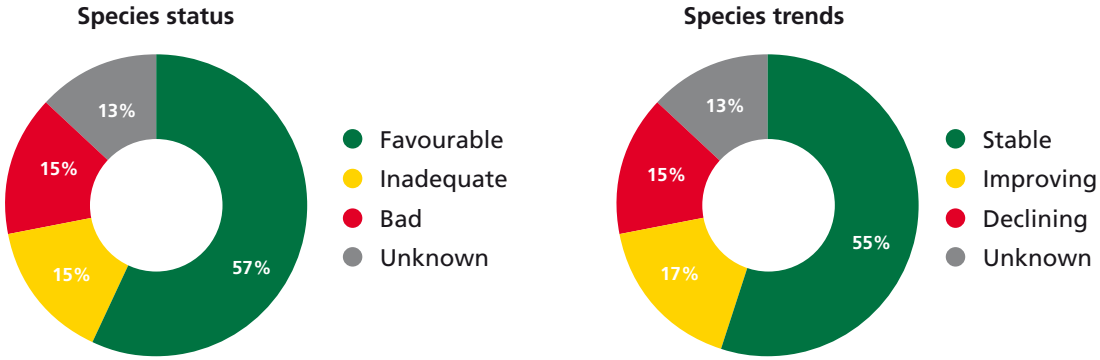


Species Trends

Some species, such as the pine marten and otter, are increasing in numbers while others, such as the freshwater pearl mussel, are in decline.

The NPWS (2019) reported that populations of 72 per cent of species protected under the EU Habitats Directive are stable or improving. Overall, 57 per cent of species assessed have a favourable conservation status (Figure 6.2). Species such as the pine marten and otter have shown an increasing trend, with the pine marten showing an increase in range. Some key species, however, are declining. One of the species of greatest concern is the pollution-sensitive freshwater pearl mussel; only a few rivers have populations that include young individuals, with populations without young individuals likely to die out (NPWS, 2019).

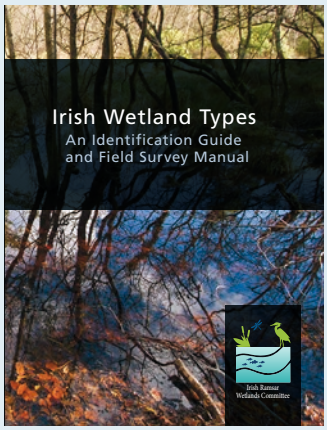
Figure 6.2 Overall assessment results for the status of and trends in species protected under the EU Habitats Directive in Ireland (Source: NPWS Article 17 Data 2019)



Topic Box 6.1 Wetlands are in Danger and Need Better Protection

Ireland's wetlands are worth protecting, not only because of the biodiversity they support, but also because of the role they play in providing essential ecosystem services such as flood attenuation and improved water quality. To understand and protect these valuable natural, cultural and economic assets, it is vital that practitioners (planners, agricultural advisors, etc.) and the public (farmers, community groups, etc.) can recognise and classify them. This will allow for more accurate wetland classification in the national landcover mapping project, for example.

Killaun bog © Tina Claffey.



Wetlands are particularly vulnerable to damaging activities such as drainage, infilling, turf cutting, nutrient enrichment, overgrazing, agricultural improvements, afforestation and the spread of invasive species. From 1990 to 2018 we lost 258,800 hectares of wetlands, an area greater than the size of County Roscommon (Coordination of Information on the Environment – CORINE – data; Chapter 5).

The Irish Wetland Bird Survey (I-WeBS), which has been running for over 25 years, is coordinated by BirdWatch Ireland and funded by the NPWS. The survey results indicate that the number of waterbirds wintering in Ireland has declined by 15 per cent from 2011/2012 to 2015/2016. More alarming is the comparison over a longer time period, which shows that our wintering waterbirds have declined by almost 500,000 individuals (40%) since the mid-1990s (Burke *et al.*, 2018).

The *Irish Wetland Types – An Identification Guide and Field Survey Manual* (IRWC, 2018) helps the non-specialist identify and record Irish wetland habitat types in the field. Published by the Environmental Protection Agency (EPA) in association with the Irish Ramsar Wetlands Committee (IRWC), it also helps to identify pressures on wetlands by using indicators of human-induced pressures, such as weirs or dams causing impoundment and alterations of the water table. The manual and associated field survey form can be accessed on the IRWC website.[5]

Birds

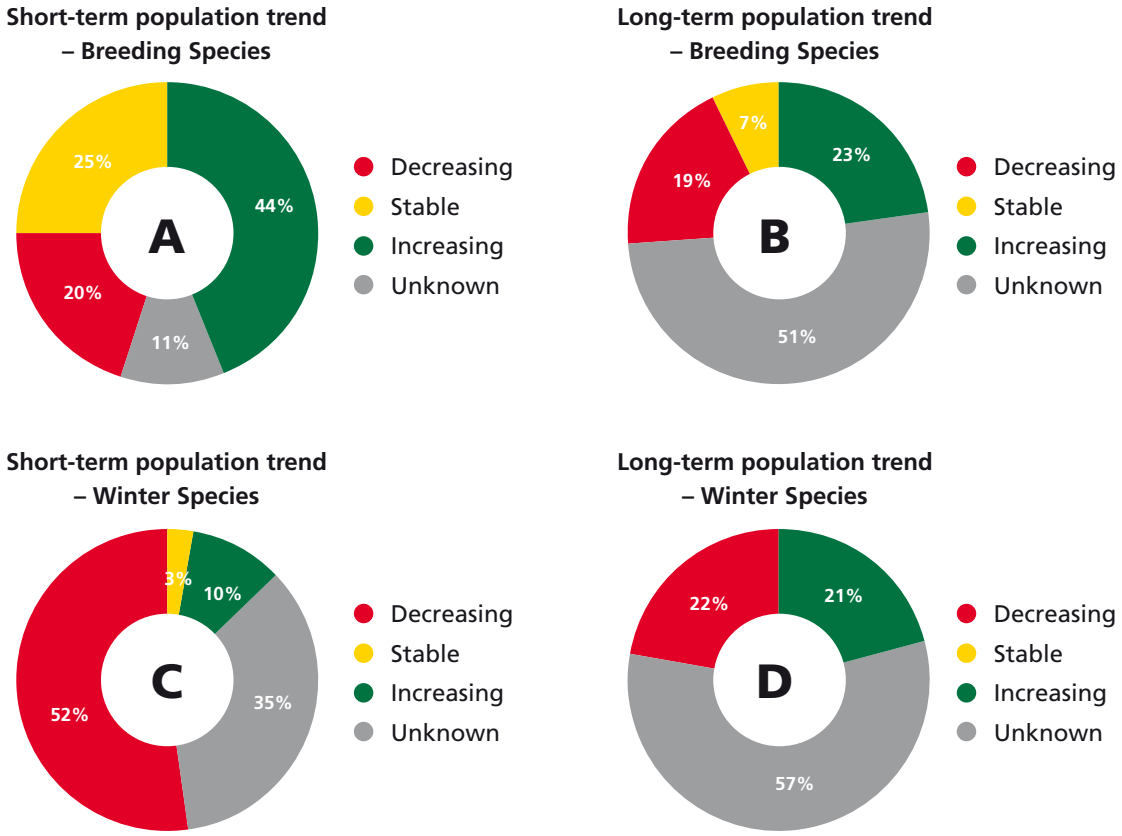
Although 30 per cent of the populations of Ireland's breeding bird species are stable or have increased, a fifth are in long-term decline and one, the corn bunting, became extinct here in the 1990s.

The protection of bird species at EU level is provided for under the Birds Directive (2009/147/EC). Under Article 12 of this Directive, Member States are obliged to report on the progress made with implementation of the Directive. This requires reporting on aspects of the status of all regularly occurring bird species both within and outside protected areas. Ireland reported on trends in bird populations in 2019.[6] The short-term (12 year) and long-term (since the early 1980s) trends in Ireland's breeding and wintering bird populations are illustrated in Figure 6.3.

5 http://irishwetlands.ie/index.php/resources/

6 https://nature-art12.eionet.europa.eu/article12/report?period=3&country=IE.

Figure 6.3 Trends in Ireland's breeding and wintering bird populations, showing short-term (12 year) and long-term (since the early 1980s) population trends (Source: NPWS Article 12 Data 2019)



The estimated proportions of breeding bird populations in each of the trend categories (Figure 6.3a and b) remain relatively unchanged. The data show that almost 20 per cent of Ireland's breeding bird species are in long-term decline, with the corn bunting becoming extinct as a breeding species since the Birds Directive came into force in Ireland. Approximately 30 per cent of breeding species populations are stable or have increased over the long term. This includes relatively recent colonists that are showing strong population growth, such as the little egret and great spotted woodpecker, as well as species such as the blackcap, bullfinch and buzzard. Some of our breeding farmland songbirds are under increasing pressures from the modernisation and intensification of agricultural practices; for example, there are estimated to be fewer than 100 breeding pairs of the whinchat and twite in Ireland. Breeding waders such as the curlew (Topic Box 6.2), lapwing, redshank and dunlin have seen a 93 per cent decline in breeding populations over the long term.

Most of the wintering species assessed (Figure 6.3c and d) are waterbirds such as geese, ducks, swans and waders that are seasonal visitors to Ireland. Ireland is an internationally important location for hundreds of thousands of visiting waterbirds every year. The populations of over half of these wintering birds are declining over the short term; this includes waders such as the curlew (a greater than 20% decline in winter visitor numbers) and duck species such as the pochard, which has suffered a 91 per cent decline over the short term (Burke *et al.*, 2018). Other priority bird species are also showing declines, such as the hen harrier, whose numbers are estimated to have declined by almost 9 per cent since 2010 (Ruddock *et al.*, 2016), and the merlin (Irish Raptor Study Group, 2018). Recently, data from the 'Hen Harrier Programme' are showing some increased breeding success of this bird of prey species in protected areas.

Ireland's wintering waterbirds may be responding to climate change as many species are showing a north-easterly shift in their range across Europe (Burke *et al.*, 2018; NPWS, 2020). Decades of land use change and habitat degradation have led to large declines in our ground nesting birds, as highlighted by the long-term declines seen in curlew, corncrake and lapwing, for example.

Topic Box 6.2 Bringing Back the Call of the Curlew

The curlew (*Numenius arquata*) is our largest wader and its call was once a familiar sound to many Irish people. It is now almost extinct as a breeding species in Ireland.

Ireland is visited by thousands of curlew every winter; however, the resident population that breeds in Ireland has decreased dramatically in number. Between 1980 and 2018 the population decreased by 96 per cent to 138 pairs (O'Donoghue *et al.*, 2019). Breeding curlew also no longer occur in areas they previously visited – there has been an estimated 78 per cent reduction in their range. This extensive loss has happened because the habitats they depend on have been lost and because of changes in how land is used. This iconic Irish species is listed as 'near threatened' on the global International Union for Conservation of Nature (IUCN) Red List of threatened species.[7]

The Curlew Conservation Programme,[8] implemented in 2017, was Ireland's response to these dramatic declines and resulted in the formation of Curlew Action Teams across the country. Local advisors, champions and nest protection officers work closely with landowners and other local interests to protect curlew habitats and breeding sites. A Curlew Task Force was also established to reverse the dramatic decline and the public have been asked to be alert to the presence of breeding curlew in their locality, particularly during spring and summer, and to report any observations to the NPWS. Knowing the locations of breeding curlew enables landowners to protect them.

*The elusive curlew (*Numenius arquata*) (Source: Colum Clarke)*

Red List Species

Species on the national Red Lists are most at risk of extinction.

'Red Lists' identify species at risk that need to be actively protected and conserved. Species are categorised into nine groups under an international system (IUCN): extinct; extinct in the wild; critically endangered; endangered; vulnerable; near threatened; least concern; data deficient; and not evaluated. Endangered species face a very high risk of extinction in the wild (IUCN, 2012). The NPWS and Northern Ireland Environment Agency (NIEA) coordinate Red Lists in Ireland and the lists are available on the NPWS website.[9] Just over 14 per cent of species assessed in Ireland are under threat of extinction (DCHG, 2017). These include the European eel, Arctic char and natterjack toad. The details from the Red List assessment presented in Ireland's '6th National Report on the Convention on Biological Diversity' are shown in Figure 6.4a (DCHG, 2019a).

New Red List assessments have been undertaken in Ireland since 2016, namely for vascular plants – also called higher plants (Wyse Jackson *et al.*, 2016); cartilaginous fish – a group of fish that includes sharks and their relatives (Clarke *et al.*, 2016) and mammals (Marnell *et al.*, 2019) (Figure 6.4b). A study published in 2019 found that one shark species, the angel shark, currently classified as critically endangered, is now nearing extinction in Irish waters (Shephard *et al.*, 2019). In addition an assessment for plecoptera (stonefiles) was published in 2020 (Feeley *et al.*, 2020) (Figure 6.4b).

The critically endangered angel shark (Squatina squatina)

7 https://www.iucnredlist.org/

8 https://www.npws.ie/farmers-and-landowners/schemes/curlew-conservation-programme

9 https://www.npws.ie/publications/red-lists

Figure 6.4a National Biodiversity Indicator: Proportion of total species assessed under various IUCN Red List threat categories (Source: Ireland's 6th National Report to the Convention on Biological Diversity, NPWS)

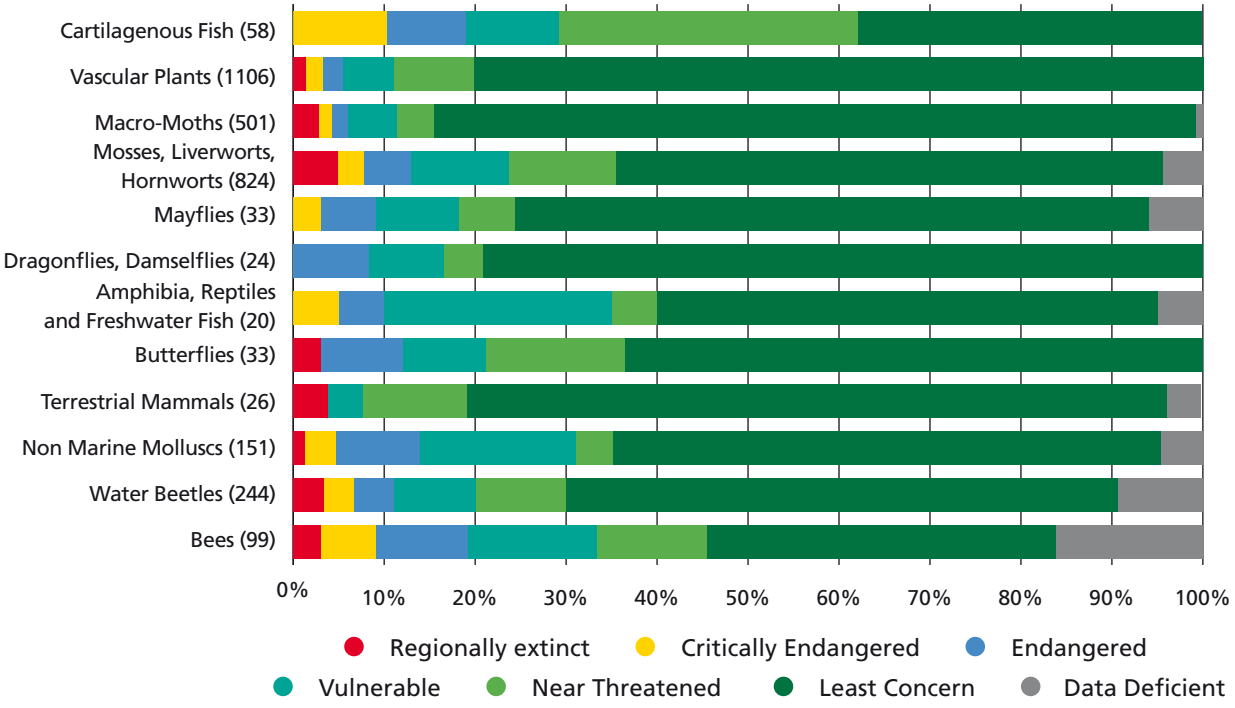
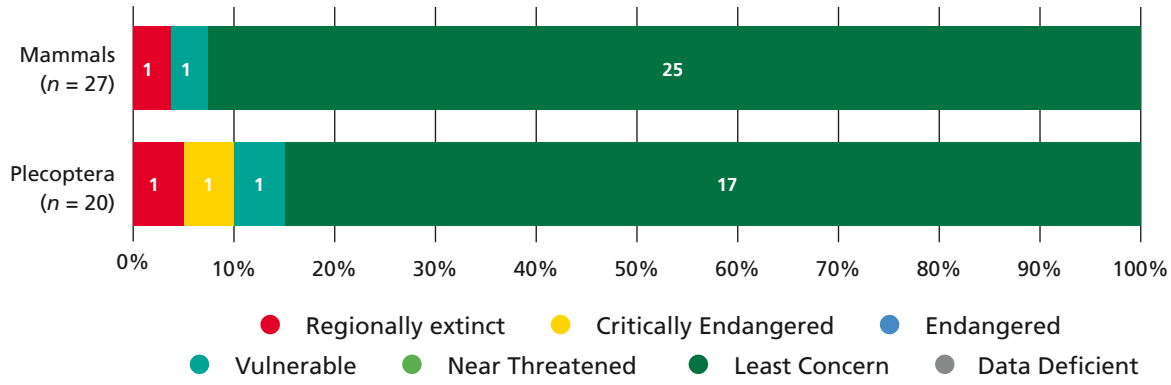


Figure 6.4b Red List conservation status of mammals and plecoptera, published in 2019 and 2020 (Sources: Marnell *et al.*, 2019; Feeley *et al.*, 2020)



4. Drivers and Pressures

Key Pressures on Ireland's Habitats and Species

Changing land use, pollution and unsustainable exploitation are degrading and fragmenting habitats and impacting species.

The main pressures on Ireland's protected habitats are agriculture and other land uses such as extraction of resources (including minerals and peat) and forestry, urbanisation, recreation and invasive species (Figure 6.5). It is likely that pressures due to climate change, agricultural system changes and invasive species will remain the same or increase unless action is taken now (DCHG, 2017).

The pressures on our protected species (Figure 6.6) are similar and can sometimes be quite specific, such as physical barriers in rivers affecting fish movement. A wide range of species are reported to be negatively affected by agricultural activities and extraction of resources (NPWS, 2019). Pollution, as illustrated in Fig 6.6, appears to impact relatively few habitats, but this is because pollution from agricultural sources and forestry is accounted for in these categories.

Figure 6.5 Percentage of habitats impacted by pressure/threat categories of medium and high importance (Source: NPWS, 2019)

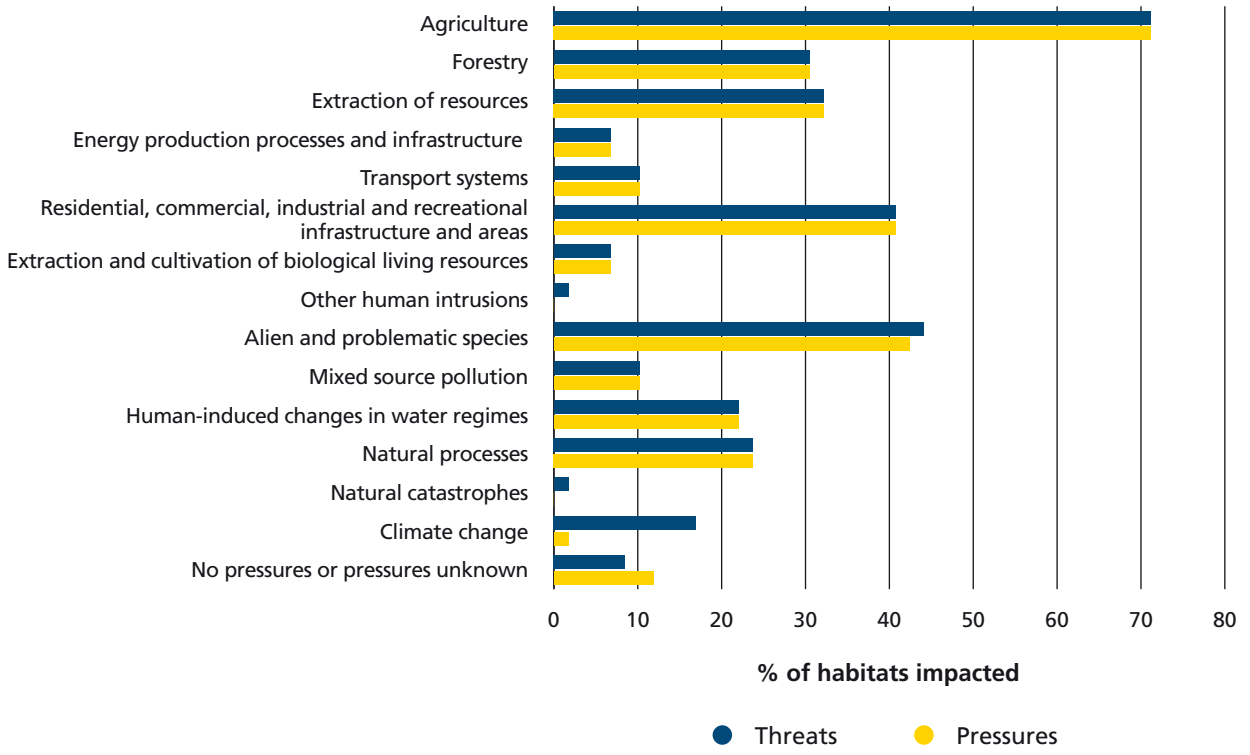
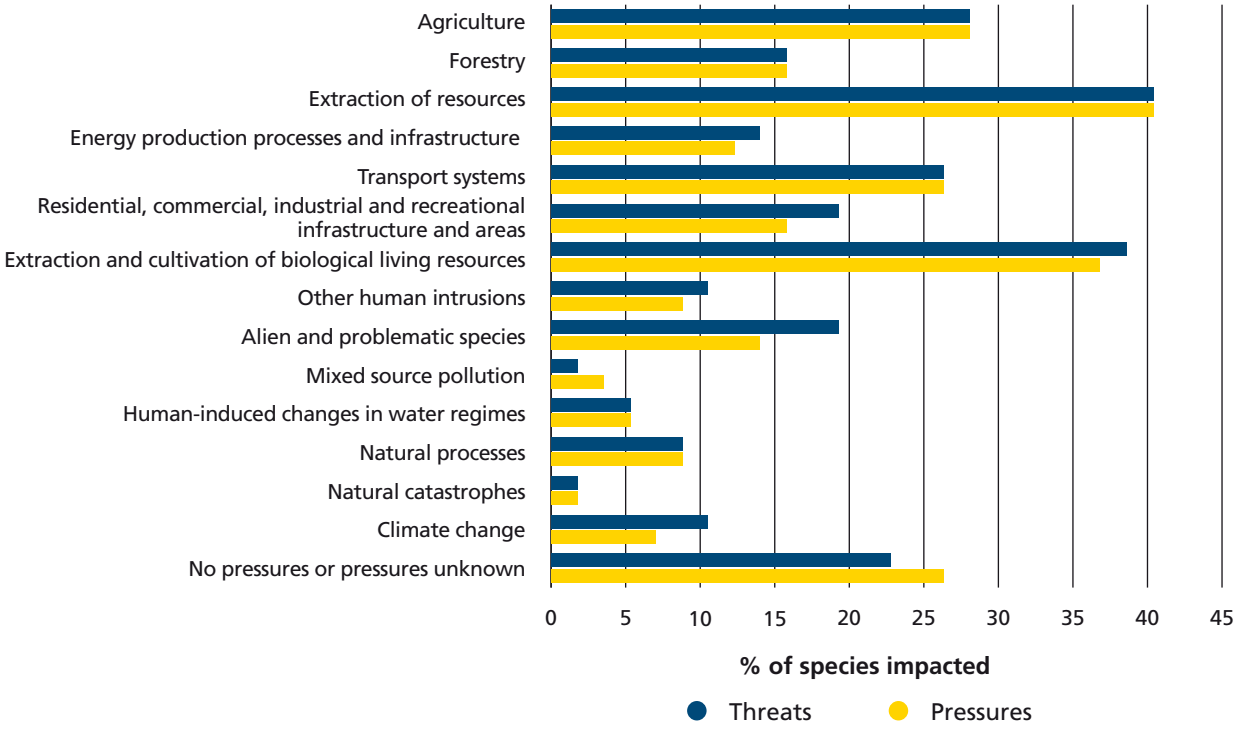


Figure 6.6 Percentage of species impacted by pressure/threat categories of medium and high importance (Source NPWS, 2019)



Human population growth, land use change, unsustainable consumption and overexploitation of resources magnify these pressures. A limited awareness of biodiversity, its benefits and its economic value to society by both the public and policymakers creates further impacts.

Agriculture

Changes in intensification of agricultural practices have impacted on biodiversity.

Drainage of land, fertiliser application, clear-felling, undergrazing and abandonment of land are known pressures that, although local in extent, may influence a much wider area, especially if they affect groundwater supplies or nearby watercourses (Chapter 13).

The decline in bees, butterflies and other insects is largely the result of monoculture and the drive for ever-increasing levels of productivity, characterised by a loss or neglect of hedgerows, farmland edges and scrub (Chapter 13). The plans for the development of a new 10-year strategy for the agriculture and food sector for the period to 2030, to follow on from Food Wise 2015, presents an opportunity to address the negative effects on the environment that have occurred in recent years with respect to biodiversity, water quality, greenhouse gas emissions and ammonia emissions. The EPA has outlined these challenges in its 2020 submission to DAFM in relation to the strategy.[10]

10 http://www.epa.ie/pubs/epasub/epasubmissionontheagri-foodstrategy2030.html

Invasive Alien Species

Threats to nature and the economy from invasive species are increasing.

Invasive alien species are species that have become problematic after they have been introduced (deliberately or accidentally) to places where they do not occur naturally. Increased trade, human movement, changes in land use and climate change mean that the risk of new invasive species arriving is high. They can have a negative impact on the economy, wildlife and habitats and are one of the top five causes of biodiversity loss across the globe (IPBES, 2019). The rate of spread of invasive species globally has not decreased in the last decade and may actually be increasing (Davis *et al.*, 2019). The National Biodiversity Action Plan (DCHG, 2017) highlighted that the occurrence and spread of invasive alien species in Ireland is increasing; indeed, the impact of invasive species on Ireland's protected species is expected to increase over the next decade (NPWS, 2019). The annual cost of invasive species to Ireland's economy is estimated to be over €200 million (Kelly *et al.*, 2013a) and this figure may increase with future introductions of invasive species.

Invasive non-native species, such as the zebra mussel, grey squirrel and Pacific oyster, have displaced species naturally occurring in Ireland and damaged ecosystems. The rhododendron continues to threaten our oak woodlands, mink threaten ground-nesting birds and an increased number of water bodies are subject to crayfish plague (Topic Box 6.3). However, the increase in pine marten numbers has resulted in grey squirrel declines in recent years.

The EU regulation on the prevention and management of the introduction and spread of invasive alien species [Regulation (EU) No 1143/2014] was enacted in 2015. This regulation, among other things, put the responsibility on Member States to complete a risk assessment of which species might be a threat to their biodiversity.

The National Biodiversity Data Centre (NBDC) maintains the National Invasive Species Database, which provides distribution information on invasive species. This work aims to facilitate the updating of risk assessments undertaken by Invasive Species Ireland (Kelly *et al.*, 2013b) and establish an early warning system to alert various stakeholders to new arrivals on the island of Ireland. Members of the public can submit records of invasive alien species and find advice on how to deal with them and prevent their spread on the NBDC website.[11]

Topic Box 6.3 Crayfish Plague and the White-clawed Crayfish

The white-clawed crayfish (*Austropotamobius pallipes*) is a protected species of crustacean that is naturally occurring in Ireland and resembles a small lobster. It is widespread in rivers and lakes in Ireland.

Ireland's crayfish are especially vulnerable to a disease from North America called crayfish plague and outbreaks can cause their populations to collapse. Ireland is seen as a European stronghold of the species but there have been several confirmed outbreaks of crayfish plague in Ireland since 2015.

The recent crayfish plague outbreaks are putting the future of this species in Ireland at risk. The Marine Institute and NPWS are undertaking a 2-year national crayfish plague surveillance programme (2018-2020) to investigate the spread of the disease (MI, 2019).

What can you do?

Those engaged in water activities should continue to be vigilant and do what they can to minimise the risk of spreading the disease. The single most effective action that can be taken is to follow the Check, Clean, Dry protocol before and after entering a watercourse: check that equipment, footwear and clothes are free from any plant material or other debris; clean them using the appropriate method; and leave them to dry for at least 48 hours. Further information on the Check, Clean, Dry protocol, as well as practical advice, can be found on the NBDC website.[12]

Any suspected sightings of non-native crayfish or large numbers of dead white-clawed crayfish should be reported to the NBDC online.[13]

11 https://www.biodiversityireland.ie/projects/invasive-species/

12 http://www.biodiversityireland.ie/projects/invasive-species/crayfish-plague/

13 https://records.biodiversityireland.ie/record/invasives

Topic Box 6.4 Tourism and Recreational Pressures

The European Commission in its 2017 Environmental Implementation Review of Ireland highlighted the opportunity to make better use of the significant potential of nature for tourism by better managing and protecting natural sites (EU, 2017).

Tourism and the public demand for access to nature creates many opportunities to showcase and nurture an appreciation for nature. The challenge is to realise these benefits without damaging nature. Fáilte Ireland's Overseas Holidaymakers Attitudes Survey[14] studied the expectations of holidaymakers in Ireland. It identified that nature is ranked fourth for exceeding expectations, with scenery ranked second. The survey results highlight our culture and landscape as Ireland's unique selling points. Biodiversity loss damages Ireland's habitats and landscapes and hence their amenity value. This makes a strong case for implementing measures to safeguard and enhance the environmental assets on which tourism depends.

Fáilte Ireland prepared an Environmental Surveying and Monitoring Strategy as part of the Wild Atlantic Way Operational Programme in 2015 (Fáilte Ireland, 2015). It describes the purpose of this strategy as 'to work with and demonstrate to our stakeholders and partners that we are committed to the sustainable development of the Wild Atlantic Way, and to be able to pre-empt and avoid environmental effects in the future should they occur'. An external monitoring group oversaw and guided the monitoring programme over its lifetime (2015-2019).

In 2018, Ireland published its tourism masterplan entitled *Experiencing the Wild Heart of Ireland* (DCHG, 2018). The plan is a product of the Department of Culture, Heritage and the Gaeltacht and Fáilte Ireland's strategic partnership, established with the shared aim of enhancing and promoting Ireland's national parks and nature reserves. The plan sets out a framework to guide the phased development of enhanced visitor centre experiences and improved visitor facilities at the parks, based on research into international best practice, and aims to strategically plan for conservation and biodiversity while balancing the impact of increasing visitor numbers to the sites.

5. Responses

The Natura 2000 Network and Beyond

EU nature directives facilitate the legal protection of habitats and species.

Implementing the EU Habitats and Birds Directives across Europe involved the creation of a network of sites for the legal protection of EU listed habitats and species (as opposed to all other nationally protected species), the Natura 2000 network.[15] The network consists of Special Protection Areas (SPAs) protected under the Birds Directive and Special Areas of Conservation (SACs) protected under the Habitats Directive.

While this network of Natura 2000 sites provides the primary means of protecting our most important and most vulnerable wildlife, the areas outside these designations also play a significant role in species and habitat protection and are afforded some legal protection through European and/or national legislation. Table 6.2 and Figures 6.7 and 6.8 outline the areas of land designated as SACs and SPAs in Ireland.

Table 6.2 Natura 2000 sites designated as SACs and SPAs in Ireland (Source: NPWS)

NATURA 2000 SITES	AREA (HA)
SACs	1,696,559
SPAs	597,227
SACs and SPAs	1,950,239[a]

[a] *Combined number does not equal the sum of the individual numbers because of overlap in the designated areas.*

14 http://www.failteireland.ie/Utility/News-Library/Latest-Overseas-Holidaymaker-Survey-Confirms-Satis.aspx

15 https://www.npws.ie/protected-sites

Figure 6.7 Areas of SAC designation in Ireland, with the inset showing the marine SACs (Source: data from NPWS)

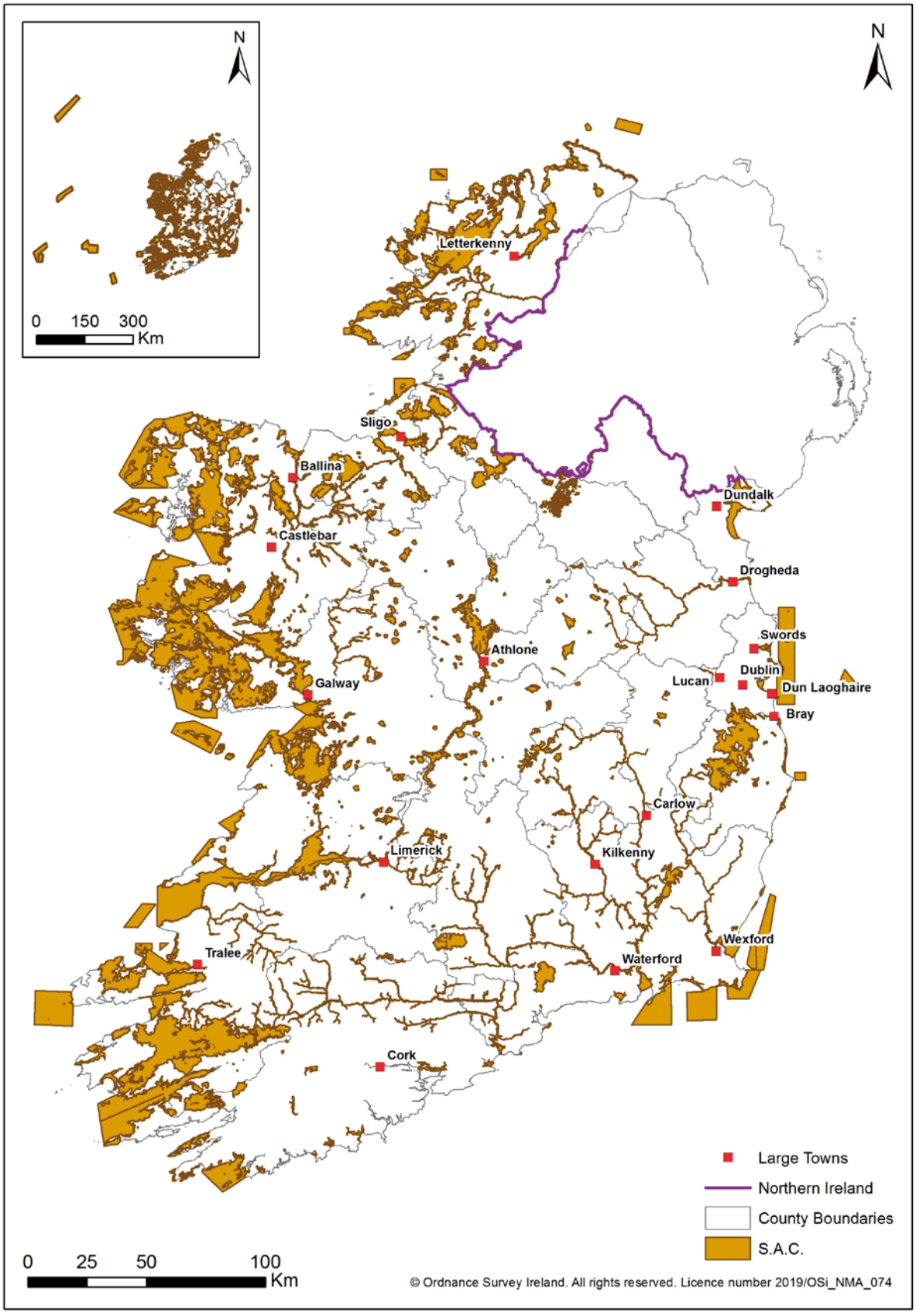
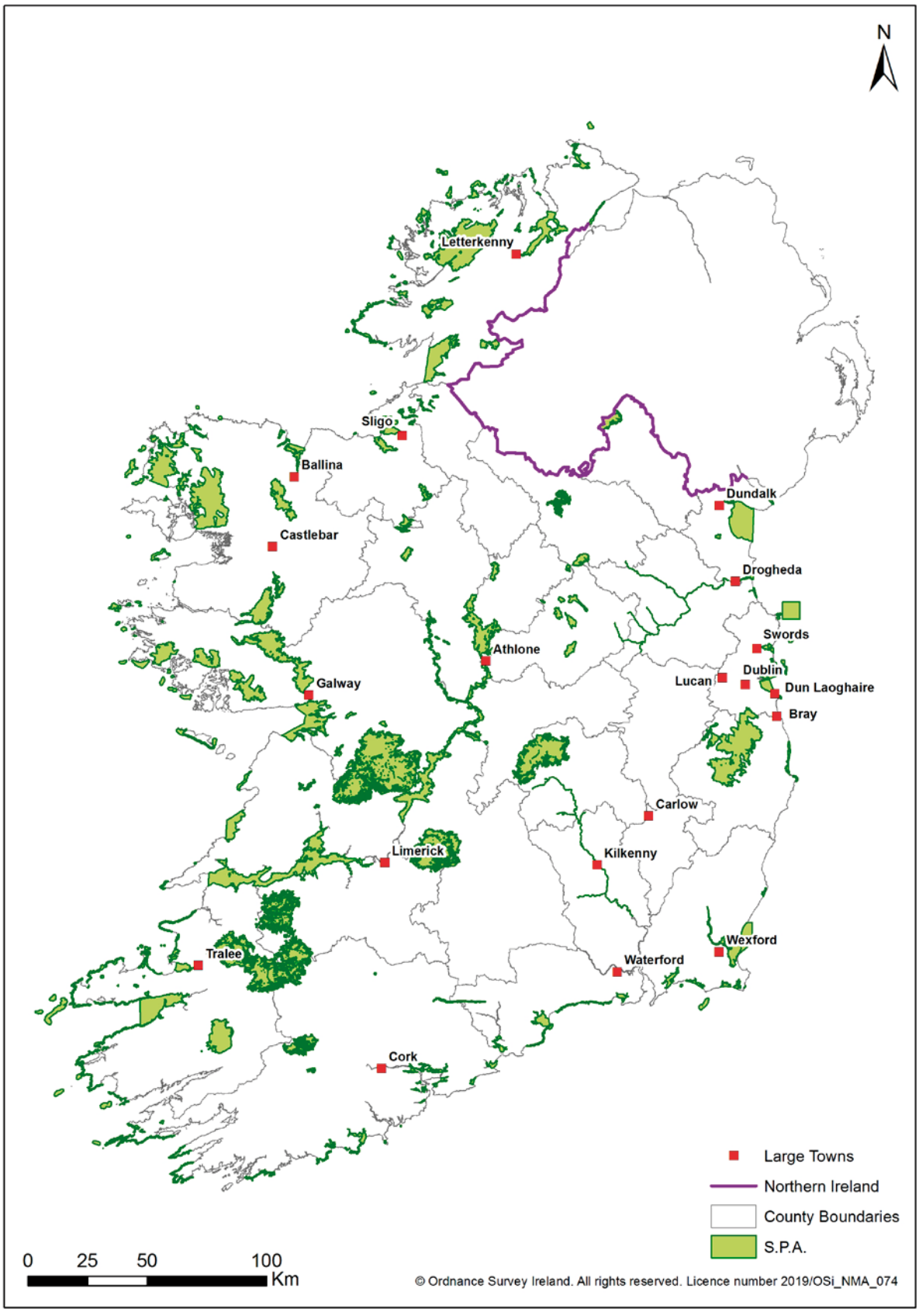


Figure 6.8 Areas of SPA designation in Ireland (Source: data from NPWS)



Designations in Ireland

Conservation and protection priority actions are designed to enhance Ireland's biodiversity.

Ireland was obliged to establish the conservation priorities, objectives and measures to maintain or restore the species and habitats present in SACs to a favourable condition by 2014. In April 2016, the European Commission called on Ireland to step up its nature protection measures by formally designating SACs and establishing conservation objectives and measures.[16] A total of 430 SACs are legally protected in Ireland, although currently a little over 40 per cent of these have yet to be formally designated by statutory instruments (DCHG, 2019a). To date, 150 of the 154 SPAs in Ireland are statutorily designated, although all share full protection under the European Communities (Birds and Natural Habitats) Regulations 2011.

In January 2019, the European Commission also urged Ireland, among other Member States, to protect the environment against alien species through implementation of the EU regulation on invasive alien species [Regulation (EU) No 1143/2014] and to step up implementation of the Marine Strategy Framework Directive (2008/56/EC) to protect marine waters.[17]

In Ireland's 2019 Environmental Implementation Review (EU, 2019), the European Commission outlined the priority actions that should be taken to protect, conserve and enhance our natural capital. These include:

- complete the Natura 2000 designation process and put in place clearly defined conservation objectives along with the necessary measures to meet those objectives
- ensure that burning in uplands (particularly in Natura 2000 areas) and hedgerow cutting are fully compatible with the requirements of the Habitats and Birds Directives
- increase efforts to manage blanket bogs
- take practical steps to address the serious decline of waders and to further develop the conservation programme for the curlew, both inside and outside protected areas.

In July 2020, the European Commission announced that it had decided to refer Ireland to the Court of Justice of the EU in relation to the designation of Special Areas of Conservation under the Habitats Directive (Directive 92/43/EEC). The Commission stated that 154 Sites of Community Importance (out of 423) had not yet been designated as SACs in the Atlantic biogeographical region, site-specific conservation objectives had not been established for 87 sites, and the necessary conservation measures had not been established at any of the 423 sites.[18]

Beyond the Natura Network

Ireland has a network of Natural Heritage Areas (NHAs), which are given protection under the Wildlife (Amendment) Act (2000). Some 140 peatlands have been designated as NHAs and there are a further 630 proposed NHAs, which are afforded limited protection before formal designation. Measures are needed to ensure that these areas can add value to the network of protected areas across the country, linking habitats and enhancing landscapes to help reverse the current decline in habitats and species. Marine Protected Areas are covered in Chapter 8 The Marine Environment.

Opportunities exist to find solutions to the decline in nature through floodwater management, the Water Framework Directive (2000/60/EC; Chapter 7), European Innovation Partnership projects (Chapter 13), agri-environment schemes and the Common Agricultural Policy (CAP; Chapter 13). CAP4Nature[19] is a set of key principles identified by independent scientists that underpins the multiple benefits that nature provides to agriculture and society. Incorporating nature-based farming solutions into Ireland's CAP Strategic Plan, being developed for implementation post-2020, can enhance farmers' livelihoods through payments for environmental public goods.

The Heritage Bill was signed into Irish law in 2018.[20] One of the issues covered under the Bill has highlighted a lack of available information about the breeding season for some species of birds in Ireland, pointing to a need for further research and discussion to gather the evidence base on which legislative decisions affecting and protecting nature are made. Under the Bill, the Minister for Culture, Heritage and the Gaeltacht has the discretion to alter the period during the year when the burning of vegetation and hedgerow cutting are allowed, under certain conditions and dependent on the presence of protected species, for a pilot phase of 2 years. The Minister decided not to alter either period in 2019 or the spring of 2020; however, the passing of this legislation has sparked concerns for some breeding bird species.

16 https://ec.europa.eu/commission/presscorner/detail/en/MEMO_16_1452

17 http://europa.eu/rapid/press-release_MEMO-19-462_en.htm

18 https://ec.europa.eu/commission/presscorner/detail/en/IP_20_1235

19 https://www.cap4nature.com

20 https://data.oireachtas.ie/ie/oireachtas/act/2018/15/eng/enacted/a1518.pdf

Prioritised Action Framework and Biodiversity Funding

Implementing national biodiversity policies requires funding and can give rise to indirect co-benefits for other sectors.

The Prioritised Action Framework (PAF) for Natura 2000 for 2014-2020 (EU, 2014) was approved by the government in 2014 and submitted to the EU. This framework identifies a range of actions needed to help improve the status of Ireland's habitats and wildlife, including conservation management strategies, more focused agri-environment schemes and habitat restoration. Ireland plans to finalise the PAF for the period 2021-2027 in 2020.

In 2017, the European Commission adopted an Action Plan for Nature, People and the Economy (EC, 2017a). The plan focused on four priority areas and comprised 15 actions to be carried out during 2019. In 2019 the Commission, in conjunction with the NPWS, hosted a workshop on strengthening investments in Natura 2000. Member States are encouraged to use the updated PAFs to maximise funding for nature protection.

A review of the amount of money spent directly on biodiversity in Ireland estimated a total spend of €1.4 billion (Morrison and Bullock, 2018) between 2010 and 2015, with an annual average spend of €250 million. Eighty-five per cent of this expenditure went towards agri-environment schemes. This figure represents less than 1 per cent of total government expenditure in Ireland.

There is now a wider understanding that nature funding needs to be included in the wider socio-economic context. While some funding streams may not be directly related to nature protection, the results can often lead to indirect co-benefits. More information about the financing of nature protection through the Natura 2000 network after 2020 can be found in the European Commission report *Opportunities for Innovative Biodiversity Financing in the EU* (EC, 2017b).

Convention on Biological Diversity and EU Biodiversity Strategy

Halting the loss of biodiversity across Europe and the degradation of ecosystem services requires more ambitious efforts.

The Convention on Biological Diversity (CBD) is a global convention under the auspices of the United Nations and came into being in 1993. It has three main objectives:

- the conservation of biological diversity
- the sustainable use of the components of biological diversity
- the fair and equitable sharing of the benefits arising out of the utilisation of genetic resources.

Ireland is a party to the CBD and as such has agreed to meet the 20 Aichi Biodiversity Targets organised under five Strategic Goals, with the overall aim of halting biodiversity loss by 2020. A post-2020 biodiversity framework will be agreed by all parties to the convention at the 15th Conference of the Parties to the United Nations CBD. The ambitions of the post-2020 global biodiversity framework are 'to implement broad-based action to bring about a transformation in society's relationship with biodiversity and to ensure that, by 2050, the shared vision of living in harmony with nature is fulfilled'.[21]

The EU Biodiversity Strategy to 2020 (EU, 2011) aims to halt the loss of biodiversity and the degradation of ecosystem services in the EU by 2020, and to restore them, as far as is feasible, while stepping up the EU contribution to averting global biodiversity loss. The strategy is seen as a building block to achieving the 2050 vision: 'By 2050, European Union biodiversity and the ecosystem services it provides – its natural capital – are protected, valued and appropriately restored for biodiversity's intrinsic value and for their essential contribution to human well-being and economic prosperity, and so that catastrophic changes caused by the loss of biodiversity are avoided'.

The mid-term review of the strategy concluded that implementation and enforcement efforts needed to become 'considerably bolder and more ambitious' (EC, 2015). At the current rate of implementation, biodiversity loss and degradation of ecosystem services will continue, with knock-on effects for humanity in the future.

The EU has published its Biodiversity Strategy for 2030.[22] The aim of this initiative is to outline the EU ambition for the post-2020 global biodiversity framework, to be adopted at the 15th Conference of the Parties to the United Nations CBD. The EU aims to put forward at the conference commitments and measures to address the main causes of biodiversity loss in the EU, which will include a follow-on of concrete implementation actions by 2021. In addition to this, the European Green Deal[23] was published in December 2019. The Green Deal aims to protect Europe's natural habitats and make Europe climate neutral. The purpose of the deal is to improve the wellbeing of people through a just and inclusive transition to a cleaner environment.

21 https://www.cbd.int/article/zero-draft-update-august-2020

22 https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12096-EU-2030-Biodiversity-Strategy

23 https://ec.europa.eu/commission/presscorner/detail/en/fs_19_6714

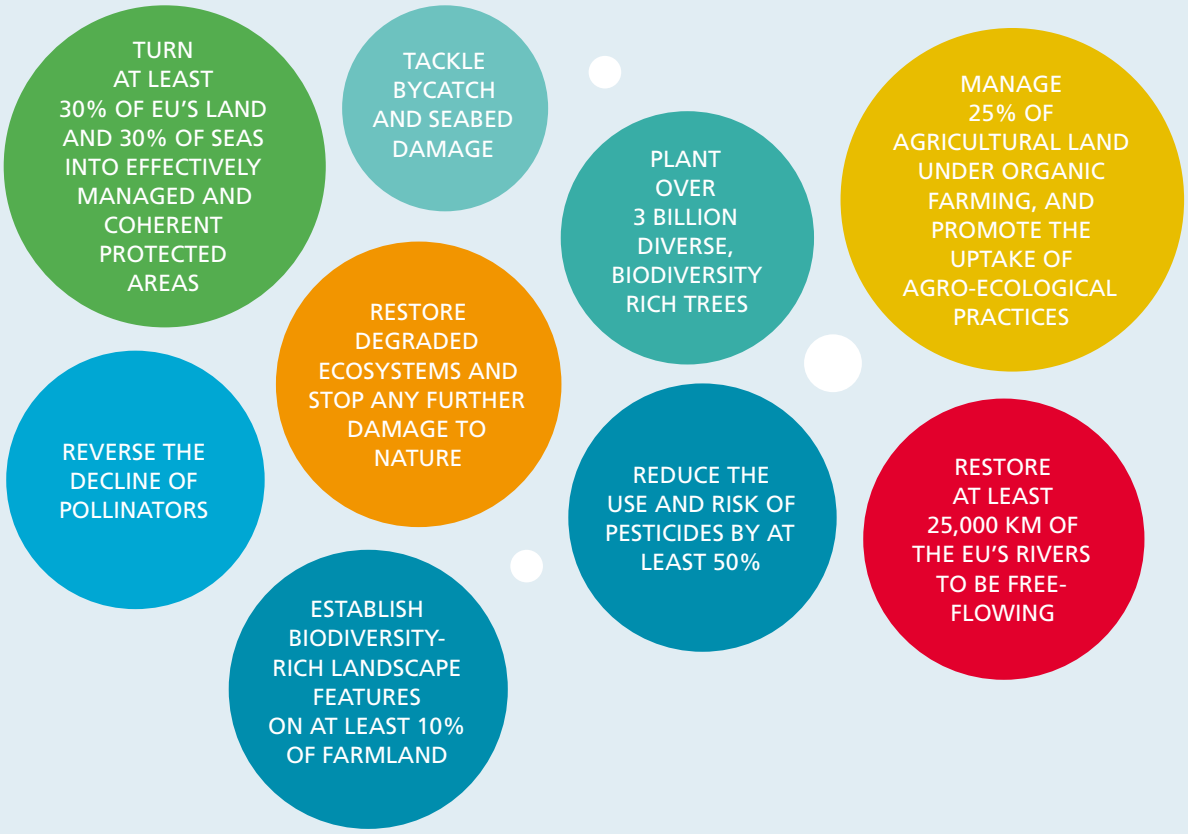
Topic Box 6.5 EU Biodiversity Strategy for 2030: Bringing Nature Back into our Lives

In 2020 the EU adopted the 2030 Biodiversity Strategy (EU, 2020a). The aim of the strategy is to put Europe's biodiversity on the path to recovery by 2030 for the benefit of the people, climate and planet. It also commits the EU to a leading role in the upcoming post-2020 global biodiversity framework as the world emerges from the COVID-19 crisis.

The strategy is a core part of the European Green Deal and it is hoped that it will support a sustainable economic recovery in a post-pandemic landscape.

The strategy builds on the existing EU Birds and Habitats Directives and the Natura 2000 network but also sets ambitious targets to achieve healthy and resilient ecosystems (Figure 6.9).

Figure 6.9 Examples of targets and commitments from the EU Biodiversity Strategy for 2030 Recreated from the EU factsheet *Bringing Nature Back into our Lives* (EU, 2020b)



The key commitments for the protection of nature by 2030 are:

1. legally protect a minimum of 30 per cent of the EU's land area and 30 per cent of the EU's sea area and integrate ecological corridors, as part of a true Trans-European Nature Network
2. strictly protect at least a third of the EU's protected areas, including all remaining EU primary and old-growth forests
3. effectively manage all protected areas, defining clear conservation objectives and measures, and monitoring them appropriately.

It is also intended that the biodiversity strategy will be closely aligned with the new Farm to Fork Strategy and the new CAP (Chapter 13).

Progress on implementation of the strategy will be reviewed by the EU in 2024.

National Biodiversity Action Plan 2017-2021 and the National Planning Framework

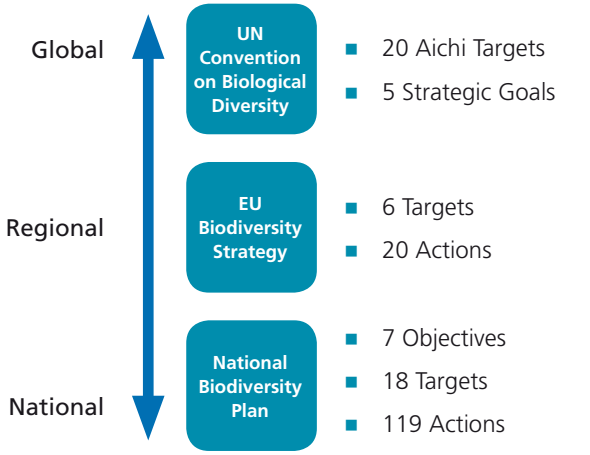
Ireland is committed to protecting our biodiversity for the benefit of all sectors of society through a series of targeted strategies and actions.

The National Biodiversity Action Plan 2017-2021 (DCHG, 2017), the third such plan for Ireland, seeks to ensure that 'biodiversity and ecosystems in Ireland are conserved and restored, delivering benefits essential for all sectors of society and that Ireland contributes to efforts to halt the loss of biodiversity and the degradation of ecosystems in the EU and globally'.

Oversight of the current plan is undertaken through the Biodiversity Working Group, a group of government departments, agencies and other bodies that have a role in carrying out the actions of the plan. The Biodiversity Working Group published an interim review of the plan in 2020 (Biodiversity Working Group, 2020), concluding that, of the 119 actions, 8 have been implemented and 98 are ongoing; for 13, there has been limited progress. Positive highlights outlined in the review include the LIFE schemes covering Raptor LIFE, Kerry LIFE and Roseate tern LIFE, curlew conservation projects, and also the DAFM funded European Innovation Partnership projects. The EIPs are local-led projects, developed with farmers and communities and covering areas such as habitat and species protection (including hen harrier, freshwater pearl mussel, corncrake) on a range of types of farmland. The review also reports that EU co-funding is contributing to restoration efforts in peatlands and more sustainable agricultural and fishing practices, resulting in greater collaboration across sectors. A positive outcome in the review is the mention that there is a shift in public opinion towards a greater appreciation of biodiversity.

Areas identified in the interim review that need more emphasis include building on the success of the Burren Programme, developing new farming models to aid both the diversification of agriculture and an appropriate reduction in intensification in some areas, developing management plans for protected habitats and species, developing restoration plans for species in severe decline, and accelerating the establishment of Marine Protected Areas. The establishment of new frameworks for private sector investment and innovation and the restructuring of legacy non-productive, badly-sited conifer plantations; especially on peatlands are also highlighted. The review also highlighted that there has been limited progress in tackling invasive species. In addition to this the Biodiversity Forum will monitor the execution of the plan. The forum has representatives from economic sectors, non-governmental organisations, academia and other stakeholders. Figure 6.10 shows how the plan fits in with global and EU biodiversity policy.

Figure 6.10 Biodiversity policies from a global scale to a national scale, adapted from Ireland's Biodiversity Sectoral Climate Change Adaptation Plan (DCHG, 2019b)



The National Planning Framework (NPF; DHPLG, 2018), a high-level strategic plan that outlines the future development and growth of Ireland up to 2040, contains biodiversity objectives. One of the policy objectives is that integrated planning for green infrastructure and ecosystem services will be incorporated into the preparation of statutory land use plans. The National Development Plan 2018-2027 (DPER, 2018) details the investment needed if Ireland is to successfully implement the NPF. The NPF aims to enhance the conservation status and improve the management of protected areas and protected species.

Biodiversity Climate Change Adaptation Plan

Adaptation choices can help protect biodiversity and ecosystem services from the impacts of a changing climate.

Ireland's Biodiversity Climate Change Sectoral Adaptation Plan (DCHG, 2019b) states that, by the end of the century, climate change is likely to become the most significant driver of biodiversity loss. The goal of the plan is to protect biodiversity from the impacts of climate change and to conserve and manage ecosystems so that they deliver services that increase the adaptive capacity of people and biodiversity. This is achieved by identifying adaptation options that will help to protect biodiversity and ecosystem services from the impacts of changing climate. Climate change has a major impact on nature through interaction with other pressures and is dealt with in more detail in Chapter 2.

Sustainable Forestry

Conserving and increasing native woodland will enhance forestry's contribution to biodiversity protection.

The European Investment Bank is investing in the forestry operations of the state-owned forestry company, Coillte, for the 2016-2020 period (EIB, 2017). This includes the replanting of existing forest stands and nurseries, as well as upgrading forest trails and infrastructure. In 2018 Coillte launched Bioclass, a tool for recording and reporting areas of biodiversity value on lands owned by Coillte. The tool will assist with the integrated planning and management of key biodiversity sites across Coillte's 440,000-hectare estate. In 2019 Coillte also established a not-for-profit entity called Coillte Nature, which will focus on the environment and recreational forests. Coillte Nature aims to deliver new woodlands so that they can be areas for biodiversity and carbon sequestration.

Measures in Ireland's Forestry Programme 2014-2020 (DAFM, 2015) include increasing the amount of native woodland in Ireland through the Native Woodland Establishment Scheme and Native Woodland Conservation Scheme.

Pollinators and bumblebees

One-third of our bee species are threatened with extinction in Ireland.

Pollinators are animals, such as bees, hoverflies, butterflies and moths, that transfer pollen from one plant to another while feeding, thereby enabling plant fertilisation and reproduction. In doing so, pollinators support a steady supply of healthy and economically valuable food for people and sustain entire ecosystems (Science for Environment Policy, 2020).

According to the National Biodiversity Data Centre (NBDC), bee species in Ireland are threatened with extinction because we have drastically reduced the amount of food (flowers) and safe nesting sites in our landscapes.[24] While some bumblebee species can be a regular sight, other species are endangered, including the great yellow bumblebee which is in severe decline in Ireland.

The All-Ireland Pollinator Plan led by the NBDC provides information about what people can do to help pollinator conservation (Stout *et al.*, 2019). The plan covers all types of habitats ranging from gardens, to schools, to road-side verges managed by local authorities, to farmland. The plan is about everybody playing their part to try 'to create an Ireland where pollinators can survive and thrive'. It also advises how people can get involved in recording sightings to help track trends in the distribution and abundance of species.

24 https://pollinators.ie/

Citizen Science

Citizen science generates valuable data that track changes in nature over time.

Citizen science is the involvement of volunteers in scientific research conducted, in whole or in part, by members of the public. It allows everybody to play their part in contributing to the evidence and data needed for nature conservation. Citizen science is now gathering wider recognition from public bodies, including the European Commission, as a tool for collecting environmental data (EC, 2017c). Citizen science is included in the EPA Strategic Plan 2016-2020 (EPA, 2016a) with the objective of engaging the public in the protection and improvement of the environment. Integrated citizen science projects that cut across thematic areas can also play a part in linking data collection for nature protection with the pressures on habitats and water quality.

National Biodiversity Data Centre

Better data strengthen the knowledge base for nature protection.

In order to manage and protect our nature we need to know how it is distributed across Ireland and how it is changing over time. The NBDC collates, manages, analyses and disseminates data on Ireland's biodiversity. The centre currently manages four million biological records representing over 16,000 species (DCHG, 2019a). Citizen science initiatives coordinated by the NBDC include structured monitoring schemes such as the Irish Butterfly Monitoring Scheme, All-Ireland Bumblebee Monitoring Scheme, Marsh Fritillary Monitoring Scheme, Dragonfly Ireland, Explore Your Shore! and Rare Plant Monitoring Scheme. The butterfly and bumblebee monitoring schemes produce annual population indices. Members of the public can also submit biodiversity records to the NBDC via their website[25] or through the mobile phone app.

25 https://www.biodiversityireland.ie

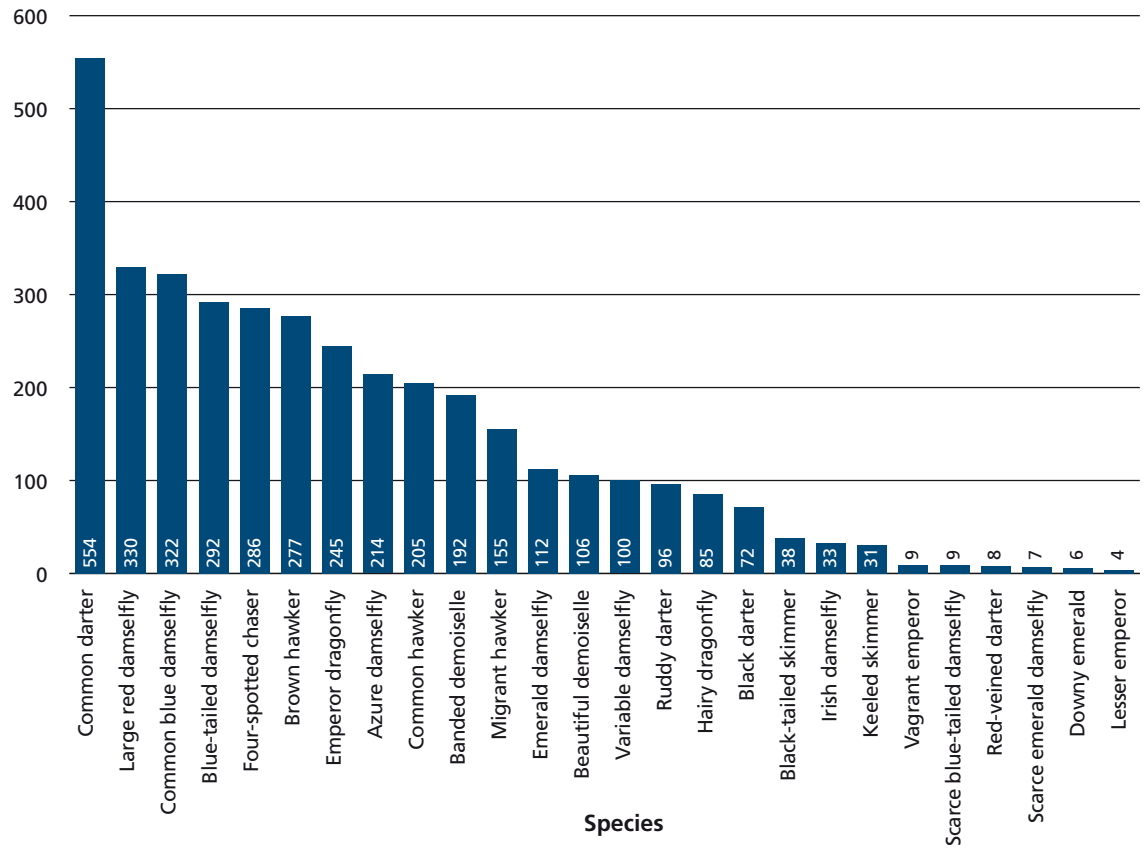
Topic Box 6.6 Dragonfly Ireland: Monitoring Dragonflies, Habitats and Water Quality Using Citizen Science

The NBDC, with support from the EPA, developed the Dragonfly Ireland 2019-2024 survey. The goal of this citizen science survey is to produce an updated Dragonfly and Damselfly Atlas for Ireland. This is a key motivator for citizen scientists who want to participate and contribute to our understanding and protection of these species. The project is also examining the use of dragonflies and damselflies as indicators of freshwater habitat and water quality.

The survey relies on volunteers to collect information on dragonflies and damselflies in freshwater habitats across Ireland. Three levels of survey are available to participants, to facilitate as wide a range of volunteer experiences as possible. These are the Dragonfly Spotter, which facilitates and encourages the collection of casual dragonfly and damselfly records; the intermediate Dragonfly Recorder; and the more detailed Dragonfly Monitor, where participants are asked to survey selected sites at least four times per annum, at least twice from late May to the end of June and at least twice from July to early September, to cover the flight period of all Irish dragonfly and damselfly species. Observations are also made of habitat and water quality, as well as noting any impacts.

The NBDC reported that by the end of 2019 it had received 2856 dragonfly and damselfly records. After validating the records, they were combined with the Northern Ireland records from the Centre for Environmental Data and Recording (CEDaR), giving 3788 records from across the island of Ireland (NBDC, 2020). Data submitted to the NBDC in 2019 are now available online.[26] Records were received for 499 out of a possible 1000 10-km-square grid squares. Records for 26 dragonfly and damselfly species were received in 2019 (Figure 6.11). Further details on the survey and how to take part are available on the NBDC website.[27]

Figure 6.11 Validated dragonfly and damselfly records received by the NBDC and CEDaR by species from January to December 2019



26 https://maps.biodiversityireland.ie

27 http://www.biodiversityireland.ie/recordbiodiversity/dragonfly-ireland-2019-2024/

Voluntary Organisations that are Linking Citizen Science and Conservation Work

Citizen science has been widely used to gather valuable observations that have helped monitor the trends in and distributions of various species in Ireland. BirdWatch Ireland, a non-governmental organisation, celebrated 50 years of conservation work in 2019.[28] It works to protect Ireland's birds and their habitats. Many of its bird surveys involve volunteers drawn from its 15,000 members and the general public. There are several ways that people can get involved in protecting birds and biodiversity, including the annual Irish Garden Bird Survey.

Other examples of citizen science in action are the bat monitoring schemes and surveys run by Bat Conservation Ireland[29] with the help of hundreds of volunteers each year. Stimulating and maintaining community involvement in citizen science projects such as these can be challenging and require a considerable amount of effort.

Topic Box 6.7 Swift Conservation Project: A Citizen Science Initiative to Help a Species of Breeding Bird That is in Decline in Ireland

The Swift Conservation Project helps to protect Ireland's declining swift populations. Full-county swift surveys have been completed in Offaly, Westmeath, Laois and Tipperary, with more under way in Meath, Sligo and Wicklow.[30] The surveys, with the support of local volunteers and Tidy Towns groups, record swift nest sites in towns and villages to establish the distribution of nesting swifts. The data collected allow planners and decision-makers to more effectively protect swifts at site level. Surveys will also be completed of swifts at Office of Public Works (OPW) Heritage Sites across Ireland. The results of these surveys will enable the OPW to more effectively manage sites where swifts are present and, in some cases, attract swifts back to sites where they have been lost.

28 www.birdwatchireland.ie

29 https://www.batconservationireland.org/get-involved/volunteer-time

30 www.swiftconservation.ie

Collaborative Action for the Natura Network project

The Interreg VA Programme, an EU funding stream, is designed to finance strategic cross-border cooperation to achieve prosperity and increased sustainability. One recently funded project under the programme was the CANN (Collaborative Action for the Natura Network) project, which covers Northern Ireland, the border region of Ireland and western Scotland. The project aims to protect endangered species and restore natural habitats on a cross-border basis. It is hoped that the project will result in an improved conservation status for over 3000 hectares of protected habitats through direct on-the-ground conservation actions.

Local Community Action

Community engagement and local projects have a big part to play in protecting nature. The Community Wetlands Forum represents community groups who undertake projects that benefit local ecosystems. Their mission statement perfectly sums up what this local work is all about: 'to support the protection, management and wise use of Ireland's wetlands for sustainable communities, by providing a network for community wetland groups to share knowledge, ideas, research, and best practice'.[31] Well-established wetland projects include the Abbeyleix Bog Project, Co. Laois, Cabragh Wetlands, Co. Tipperary, and Fenor Bog, Co. Waterford. All these projects have shown the benefits of local community engagement.[32]

The Local Authority Biodiversity Grant Scheme operated by the NPWS provides funding to assist local authority biodiversity officers (and heritage officers in local authorities without a biodiversity officer) with projects that promote actions contained in the National Biodiversity Action Plan 2017-2021. This scheme supports actions for biodiversity in local areas as engagement with communities and local authorities is crucial to the implementation of the Plan. The grants help raise awareness of biodiversity issues locally, regionally and nationally.[33] The Heritage in Schools Scheme is another project that provides local support through a panel of 160 Heritage Specialists who visit primary schools throughout the country. These specialists support the objectives of the Social, Scientific and Environmental Education (SESE) curriculum and provide an additional educational resource for teachers to cover nature projects.[34]

31 https://www.communitywetlandsforum.ie/

32 https://www.catchments.ie/sustainable-community-engagement-in-wetlands/

33 https://www.npws.ie/news/minister-noonan-announces-31-local-authorities-will-carry-out-over-50-projects-promote

34 http://www.heritageinschools.ie/

6. Research and Knowledge Base

One of the objectives of the National Biodiversity Action Plan is to 'strengthen the knowledge base for conservation, management, and sustainable use of biodiversity' (DCHG, 2017); this objective addresses the need for research to strengthen biodiversity conservation. Ireland's 6th CBD report outlines the progress made by research to fulfil this objective and is a good synopsis of activities undertaken in this area (DCHG, 2019a). The report found that the measures taken to achieve this objective have been effective.

LIFE Funding

The EU LIFE programme is the EU's funding stream for the environment and climate. The current funding period spans from 2014 to 2020 and has a budget of €3.4 billion. Details of some of the LIFE projects that have been funded in Ireland, such as Burren LIFE, Aran LIFE, Kerry LIFE and Raised Bog Restoration LIFE, were outlined in the previous state of the environment report (EPA, 2016b). The Department of Housing, Local Government and Heritage has been awarded EU LIFE funding of €5.9 million for a 5-year project on corncrake conservation called LIFE Atlantic Crex, and funding of €20.6 million for an integrated project targeting blanket bog restoration called LIFE Wild Atlantic Nature. The Department of Housing, Local Government and Heritage has also been awarded over €9 million in funding for an integrated project, Waters of LIFE, targeting work towards high status waters (see the Blue Dot programme in Chapter 7).

EPA Research

EPA-funded biodiversity research has a strong focus on ecosystem services, natural capital and Ireland's peatlands.

The EPA has a statutory role in coordinating environmental research. EPA-funded research has a strong focus on policy and is driven by national regulations and European directives. Policy-related research plays a vital role in ensuring that EU and national policies are implemented in the most cost-effective manner. Since 2016, the EPA has funded up to 50 new research projects relevant to the Nature area; a commitment of €9.5 million. These were funded mostly under the Sustainability (Natural Capital) and Water Pillars of the EPA Research Programme 2014-2020. More information on EPA-funded research can be found on the EPA website.[35]

Research on the Biodiversity Benefits of Rewetted Peatlands

Natural peatlands are biodiverse. They are under severe threat in Ireland and globally through practices such as drainage and peat extraction. The EPA-funded NEROS project (Network Monitoring Rewetted and Restored Peatlands/Organic Soils for Climate and Biodiversity Benefits; Renou-Wilson *et al.*, 2018) investigated the biodiversity and climate mitigation benefits of rewetting peatlands. A recommendation of the project is that high-resolution maps of Irish peatlands, under various management and disturbance regimes, should be developed to target priority sites for biodiversity and/or climate benefits.

Sundew

Ecosystem Services and Natural Capital

The ecosystem approach, incorporating natural capital accounting, seeks to ensure that biodiversity is recognised as part of a wider socio-economic ecological system and is considered in decision making. The ecosystem approach is a strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way.

Natural capital accounting[36] involves attributing a measurable economic and/ or ecological value to the ecosystem goods and services that provide benefits to society. Natural capital accounting has been the subject of a recent EPA funded research project 'Irish Natural Capital Accounting for Sustainable Environments: Stage 1 Feasibility Report' (Farrell and Stout, 2020). This project aims to apply Natural Capital Accounting at a pilot (catchment) scale in Ireland. This interim Report reviews natural capital accounting approaches, data requirements for the project, catchment selection, potential applications and feasibility.

The 2020 review of the National Biodiversity Action Plan notes that the integration of natural capital accounts into decision making is an area for more emphasis within the plan.

35 http://www.epa.ie/researchandeducation/research/

36 https://www.naturalcapitalireland.com/

7. Outlook

Transformative change is required to bend the curve of biodiversity loss.

To achieve the transformative change required to bend the curve of biodiversity loss, IPBES has recommended five interventions or levers (IPBES, 2019). These levers are: incentives and capacity-building; cross-sectoral cooperation; pre-emptive action; decision-making in the context of resilience and uncertainty; and environmental law and implementation. These levers are also relevant to dealing with the challenges facing biodiversity in Ireland. Environmental law and implementation is a key lever not only covering implementation of existing plans and programmes but also enforcement of existing nature protection legislation.

Clearly, continuing with a 'business-as-usual approach' will mean that nature and our wild places will continue to fragment and biodiversity will continue to decline. The global assessment of biodiversity and ecosystem services undertaken by IPBES (2019) outlined that human actions are threatening more species with global extinction now than ever before. The report asserted that transformative global changes in human society are needed.

Despite numerous positive initiatives, trends are going in the wrong direction, but the environment, and nature in general, is increasingly becoming part of the public discourse, particularly with our younger generation. Education and communication are some of the most powerful tools we have at our disposal and there is evidence that awareness of biodiversity issues is increasing. Although a study on the attitudes of Europeans towards biodiversity (EU, 2018b) reported that 82 per cent of those surveyed in Ireland have never heard of Natura 2000 and that 11 per cent have heard of it but do not know what it means, 43 per cent of those surveyed did know what biodiversity is and what it means and 97 per cent agreed to some level that biodiversity needs to be protected.

Recent successes such as the increases in pine marten and buzzard numbers[37] show that species declines can be reversed. Nature can bounce back under the right conditions. While the outlook remains challenging, we can look to such successes and learn from them as we strive to change things for the better.

37 *https://maps.biodiversityireland.ie/Species/TerrestrialDistributionMapPrintSize/11192*

8. Conclusions

The challenges involved in protecting Ireland's habitats and species are more serious than ever.

The quality of habitats and how we look after species in the environment is at a tipping point both globally and nationally. The challenges are serious and unprecedented. But they are not new. Valuing and protecting our natural environment were identified as key challenges in the 2012 and 2016 state of the environment reports.

To change path will require far more consideration of biodiversity at every step of development and in sectoral plans and policies. It will also require detailed consideration around the governance structures in place nationally to protect biodiversity. Some of the most pressing and effective steps that Ireland needs to take are outlined in the following sections.

Biodiversity Plans

Biodiversity plans are in place but must be resourced, implemented and monitored.

There is a clear gap between research, policy and policy implementation at all levels. A large body of robust peer-reviewed scientific research exists about nature protection and conservation. Ireland needs to be better at incorporating the findings of this research into biodiversity policies at national and local levels. There is no shortage of plans aimed at protecting nature but the data presented here shows that there are still ongoing declines in our habitats and some of our freshwater species, such as the freshwater pearl mussel and white-clawed crayfish. National and local plans are of great benefit when implemented and measured. Biodiversity targets must be quantifiable; it is difficult to gauge progress with intangible targets.

A key policy driver for biodiversity protection for the next decade will be the new EU Biodiversity Strategy for 2030. In launching it, the European Commission stressed that 'making nature healthy again is key to our physical and mental wellbeing and is an ally in the fight against climate change and disease outbreaks' (EC, 2020). There is now an opportunity to use this new strategy to develop a new roadmap for biodiversity protection in Ireland. This could be achieved through the development of the 4th National Biodiversity Action Plan which will need to become the key policy driver for change at national level.

There is a need to prepare a national integrated land cover and use plan, to coordinate how people, nature and food production can be supported in a sustainable manner. Such a plan should span all sectors and serve as a means of managing our response to climate change and biodiversity loss, in a coherent and consistent manner (Chapters 5 and 13).

Agricultural Policy and Biodiversity

Encourage farming practices that restore and enhance biodiversity through agricultural policies and schemes.

The review of the National Biodiversity Action Plan 2017-2021 in 2020 reports that 'in Ireland, 85% of EU protected habitats are reported as being in unfavourable status with 46% demonstrating ongoing declines. The main drivers of this decline are agricultural practices which are negatively impacting over 70% of habitats, particularly ecologically unsuitable grazing, abandonment and pollution.' (Biodiversity Working Group, 2020).

The CAP is a system of subsidies and support programmes for agriculture operated by the EU to support the long-term viability of Irish farms. Currently, under this scheme, farmers receive payments for the amount of land that is classified as being agricultural and maintained in a state suitable for grazing or cultivation.

Additionally, the national agri-environment scheme GLAS (Green, Low-Carbon, Agri-Environment Scheme) rewards farmers for managing land in a way that is beneficial to nature and GLAS Plus provides a further payment to farmers for exceptional environmental commitment on farms that have been identified as habitats for endangered birds. For example, if farmers have breeding curlews on their land, they will become a priority for access to GLAS.

Current implementation of the Basic Payment Scheme means that farmers receive no payment for land that is 'unworked', such as scrub and wetlands, which are naturally biodiverse habitats. This incentivises the clearance of such habitats to make them suitable for agriculture, in direct opposition to the environmental incentives within the CAP and GLAS. The CAP, in its current form, will reach a conclusion in 2020 and is undergoing a reform process at the time of writing this report. There will be a 1-year transitionary period ending on 31 December 2021 to ensure the continuation of the current CAP rules. It is important that this imbalance is addressed in the post-2020 CAP to protect farmland habitats.

The plans for the development of a new 10-year strategy for the agriculture and food sector for the period to 2030, to follow on from Food Wise 2015, presents an opportunity to address the negative effects on the environment that have occurred in recent years. As outlined by the EPA in its 2020 submission to DAFM in relation to the strategy, these include biodiversity, water quality, greenhouse gas emissions and ammonia emissions (Chapter 13).

Citizen Science and Education for Nature

Citizen Science and education improve people's engagement in biodiversity protection activities.

One of the objectives of the National Biodiversity Action Plan (DCHG, 2017), to 'increase awareness and appreciation of biodiversity and ecosystem services', recognises the importance of education in enhancing proactive behaviour and engaging relevant bodies in the wider community. The plan outlines the educational initiatives that various agencies and bodies are implementing around the country. The 2016 state of the environment report (EPA, 2016b) recorded an increase in public awareness of biodiversity. The trend is continuing, as borne out by the increased media coverage of the current global biodiversity crisis and the public reaction to it. It is important to capitalise on this increased interest and understanding of biodiversity issues. Education on nature for primary- and second-level school students, as well as for the wider community, needs to be a priority if we are to tackle current and future challenges. In this way, future leaders and policymakers will have a greater appreciation of the importance of nature for our continued survival.

Operating on contract to the Heritage Council, the NBDC plays an important role in increasing people's understanding of nature in Ireland and the challenges it faces. The NBDC hosts, and provides, data on species observations collected by the state and by citizen science volunteers from across the country, as well as coordinating many citizen science projects, such as the successful All-Ireland Pollinator Plan. Initiatives such as the NBDC are vital cogs in implementing the National Biodiversity Action Plan. The continuing threat of invasive alien species to our wildlife also needs to be constantly monitored and guarded against.

Strengthening Biodiversity Protection

Protecting and restoring biodiversity and ecosystems in Ireland requires careful implementation.

The urgency around improving biodiversity protection in Ireland was recognised at national level through Dáil Éireann declaring a climate and biodiversity emergency in 2019 (Dáil Éireann, 2019). The proposed Citizens' Assembly for Biodiversity presents an opportunity for inclusive stakeholder engagement with respect to our biodiversity laws and policies.

To protect nature, the Government's National Biodiversity Action Plan includes the creation of a biodiversity duty across sectors to ensure they promote biodiversity and reduce the impact of their work.

Research is ongoing into Natural Capital and Ecosystem Services approaches that seek to ensure biodiversity is considered in decision making. The review of the National Biodiversity Action Plan notes that integration of natural capital accounts into decision making is an area for more emphasis within the plan.

The Heritage Bill was signed into Irish law in 2018. It has highlighted the need for research to gather the evidence base on which legislative decisions affecting and protecting nature are made, for example, information about the breeding season for some species of birds in Ireland that could be affected by the burning of vegetation and hedgerow cutting.

Valuing Nature

People value nature and are willing to make changes to conserve it.

Perhaps the most challenging aspect of the biodiversity crisis is the fact that we need to change how we live our lives both at a societal level and at a personal level. The 2019 IPBES global assessment of biodiversity and ecosystem services summarised it as follows: 'Goals for conserving and sustainably using nature and achieving sustainability cannot be met by current trajectories, and goals for 2030 and beyond may only be achieved through transformative changes across economic, social, political and technological factors' (IPBES, 2019).

Transformative changes need to be fast-tracked and in the shorter term we can all make changes in our everyday lives that can make a difference. Avoiding the use of weedkillers and pesticides in our gardens and allowing wildflowers to thrive is a simple and effective way to welcome nature back into our homes. Such nature-friendly spaces create corridors of connectivity throughout the landscape and give nature much-needed refuge.

Community engagement and local projects, such as those mentioned in this chapter, have a big part to play in protecting nature. These projects are crucial to the implementation of the National Biodiversity Action Plan 2017-2021 and need to be supported. Local interventions are important but nationally Ireland needs to prioritise actions to protect nature and bend the curve of biodiversity loss. The five interventions or levers recommended by IPBES, as mentioned earlier in this chapter, could be the drivers for transformative change.

As a people we are rightly proud of our rivers, mountains, beaches and parks and the species that live in them. We can all play our part to help stop the decline of biodiversity.

Key Messages

Ireland needs to prioritise actions to protect nature. The challenges facing vital pollinators such as bumblebees, and the extensive loss of the curlew as a breeding bird species, should be the alarm calls needed nationally to focus on the transformative changes required in how we value and protect nature. More engagement on nature protection across stakeholder groups is needed, together with a review of governance, with solutions fast-tracked at policy and regulatory levels to protect habitats and halt biodiversity loss.

The challenges involved in protecting Ireland's habitats and species are now more serious than ever and need urgent action. But nature can bounce back under the right conditions. Implementing national biodiversity policies, such as the National Biodiversity Action Plan, requires an increased level of collaboration and coordination across multiple sectors and the whole of society. This can also give rise to indirect co-benefits for other sectors and environmental issues such as climate change and water quality.

Education, monitoring and citizen science initiatives are vital steps in protecting biodiversity. To promote more proactive and widespread engagement we need to continue to systematically survey habitats and species, track threats from invasive species and develop collaborative projects between scientists, farming sectors and the public. Regulatory aspects also need to be in place, with conservation plans for the management of Natura 2000 areas.

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