

Introduction: Aims, Scope, Structure and Key Information Sources

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1.1 The Overall Aims and Scope of This Book

The primary aim of this book is to describe, quantify and critically analyse the nature conservation approaches and practical actions that have been taken across Europe, especially in the United Kingdom (UK) and the European Union (EU), over the last 40 years or so, and to identify the key lessons that can be learned from this experience. In particular, it examines what has happened in individual EU-28 Member States (MS),¹ what has been achieved in terms of biodiversity impacts, which conservation actions were effective and why, and which were not effective or did not happen and why.

It focusses on *in situ* nature conservation, which is the protection, care, management and maintenance of ecosystems, habitats, wildlife species and populations, within their natural environments, in order to safeguard the natural conditions for their long-term permanence. It does not cover the conservation of plant and animal species that have been bred and/or domesticated for food and/or other human uses. Thus, nature conservation as considered here is broadly equivalent to the conservation of the natural elements of biodiversity, as defined by the Convention on Biological Diversity (CBD).²

Although this book covers most of continental Europe (as shown in Figure 1.1), it focusses on the EU and UK (as a former Member State) with 26 in-depth country-specific chapters for the UK and all EU Member States other than Luxembourg and Malta. The exclusion of these two countries is unfortunate, and occurred only because it was not possible to find authors for them who could take on the substantial task of providing complete chapters in the time available. However, key data on the status of habitats and species, protected areas, and some other information, are provided for all EU Member States. As space is limited, the country chapters focus on their principal territories, and associated habitats, species and biodiversity conservation challenges within the geographical area of Europe (not European jurisdiction). Therefore, outlying

territories are only briefly referred to within the main text, and are omitted where possible from Key Statistics tables and other statistics. The Portuguese archipelagos of the Azores and Madeira, and the Spanish Canary Islands, are also only briefly covered in this book, although they are part of the EU. This is primarily because these isolated islands are very different to the rest of Europe (Madeira and the Canary Islands being part of the African continent), with many unique habitats and species and different conservation challenges. Together they form the distinct Macaronesian terrestrial and marine biogeographical regions. Therefore, given the broad scope of this book and size limits, it was felt that it would not be possible to do them justice with the amount of space that is available.

Information on land cover, ecosystems, pressures and protected areas and some other key data are also provided for other European countries where available. In particular, this includes information on the following members of the European Environment Agency (EEA): Iceland, Liechtenstein, Luxembourg, Norway and Switzerland; and the six cooperating countries: Albania, Bosnia and Herzegovina, Kosovo, Montenegro, North Macedonia and Serbia.³ Data are also provided for Belarus, Moldova and Ukraine where these are available from other sources. The European parts of Kazakhstan, Russia and Turkey are not included for practical reasons and because they form a small proportion of their whole territory.

The main focus of this book and most country chapters is on events over the last 44 years or so, as there were two crucial developments in 1979: the Council of Europe's Bern Convention and the European Community's Birds Directive.⁴ Earlier events (such as the establishment of influential organisations or legislation) are also described if they have had a long-term influence. Some chapters concentrate on more recent periods, such as those following the main periods of political change in Eastern Europe in the late 1980s/early 1990s and/or since accession to the EU and the need to implement the 1992 Habitats Directive.⁵

¹ The EU-28 refers to the EU when the UK was a Member State (until 31 January 2020).

² 'Biological diversity' means the variability among living organisms from all sources including, *inter alia*, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems.

³ Reference to the EEA-39 is to the EU, UK (until it left following Brexit) and the additional member and cooperating countries.

⁴ Directive on the conservation of wild birds (79/409/EEC), which has since been codified under Directive 2009/147/EC.

⁵ Directive on the conservation of natural habitats and of wild fauna and flora (92/43/EEC).



Figure 1.1 The European territory covered in this book, which excludes the European parts of Russia and Turkey.
 Notes. BEL. = Belgium; KOS. = Kosovo; LIECH. = Liechtenstein; LUX. = Luxembourg; MACE. = North Macedonia; MONT. = Montenegro; NETH. = the Netherlands; SWITZ. = Switzerland.
 Source. pop_jop / DigitalVision Vectors / Getty Images.

Box 1.1 The general objectives of the Birds and Habitats Directives (Nature Directives) and their two main pillars of action

The Birds Directive aims to maintain the populations of all species of naturally occurring birds in their wild state in the EU 'at a level which corresponds in particular to ecological, scientific and cultural requirements, while taking account of economic and recreational requirements, or to adapt the population of these species to that level'.

The overall aim of the Habitats Directive is 'to contribute towards ensuring biodiversity through the conservation of natural habitats and of species of wild fauna and flora in the European territory of the Member States to which the Treaty applies'. More specifically, Member States shall take measures 'to maintain or restore, at favourable conservation status, natural habitats and species of wild fauna and flora of Community interest'. The measures 'shall take account of economic, social and cultural requirements and regional and local characteristics'. 'Natural habitats and species of wild fauna and flora of Community interest' comprise the habitats listed in HD Annex I, and species listed in HD Annexes II and/or IV or V.

In simple terms, favourable conservation status can be described as 'a situation where a habitat type or species is prospering (in both quality and extent/population) and with good prospects to do so in the future as well' (ETC/BD, 2011). Favourable conservation status is assessed across the whole national territory or across biogeographical or marine regions within the national territory if there is more than one such region within the Member State (see Figures 2.1 and 2.2, and Box 4.1 for details).

Whilst the term 'favourable conservation status' is not mentioned in the Birds Directive, it is implied; as such the aims of the Nature Directives are considered to be broadly analogous by the European Commission.

Both directives have two main approaches (pillars) by which they aim to achieve their objectives:

- The protection of sites of particular importance for BHD habitats and species, through the establishment of the Natura 2000 network (under the Habitats Directive), which comprises:
 - Sites of Community Importance (SCIs) designated as Special Areas of Conservation (SACs) under the Habitats Directive (for habitats listed in HD Annex I and species listed in HD Annex II); and
 - Special Protection Areas (SPAs) designated under the Birds Directive (for bird taxa listed in BD Annex I and for migratory species).
- General protection measures that apply to all birds (with some exceptions) and stricter protection for selected non-bird species (listed in HD Annexes IV or V) wherever they occur.

These are supported by complementary actions, including EU funding (with some requirements under the Habitats Directive), research to guide actions, and monitoring and reporting on the implementation of measures and their impacts on BHD habitats and species.

A large proportion of the book covers the Birds Directive (BD) and Habitats Directive (HD) as these form the cornerstone of nature conservation legislation and are hereafter referred to as the Nature Directives. Given their central importance, their aims and key provisions are outlined in Box 1.1 (with further detail provided in Section 4.2). The Birds Directive covers all naturally occurring wild birds, and requires special habitat conservation measures for 197 taxa (i.e. species and subspecies) listed in BD Annex I, as well as for other migratory species. The Habitats Directive concentrates on selected 'natural habitats and species of wild fauna and flora of Community Interest', which comprise the 233 habitats listed in HD Annex I, and 1 389 species listed in HD Annexes II and/or IV or V (which do not include any bird species).⁶

1.2 The Structure of the Book and Contents of Main Chapters

To provide context for the later chapters and analysis, the next chapter (2) outlines the key characteristics of Europe's environment and nature, and the effects of human actions on

it. Chapter 3 then identifies and summarises the main international drivers (other than the EU) of nature conservation, their objectives and their impacts on national nature conservation policies and actions, especially within the EU-28. Chapter 4 provides a more in-depth analysis of the EU's nature conservation policy and legislative framework, especially the provisions in the Nature Directives and their interpretation. Supporting policies, legislation and funds are also described as well as the development of the EU's biodiversity strategies and action plans.

Chapter 5 sets out the book's conclusions, drawing mainly from the analysis of the conservation measures and their lessons that have been identified in each of the later 26 country chapters. The conclusions are provided before the country chapters to keep them close to the overview of conservation measures, and to avoid them being tucked away and potentially out of sight.

The country chapters (6–31) cover 25 EU Member States and the UK and describe the conservation policies and practical actions that have been taken in each of them over recent decades, and their impacts. Each country chapter covers the following key topics according to the standard general structure below (with some variation where appropriate) to help provide comparable assessments of the countries' approaches and the effectiveness of their measures:

⁶ See the EEA webpage for further information on the habitats and species covered by the Nature Directives: <https://bit.ly/3ohXchQ>

Summary table of Key Statistics (see Table 1.1).

1. Outline of the ecological and biodiversity characteristics of the country, biogeographical regions, ecosystems, and habitats and associated species of particular importance.
2. The status of biodiversity:
 - Key biodiversity status indicators and trends, including the 2013–2018 Member States' conservation status assessments (see Table 1.2).
 - Pressures on biodiversity and causes of change.
3. Nature conservation governance, actors, legislation and policies, and related key historical developments.
4. Species protection and conservation measures, e.g.:
 - Basic protection legislation, and strict protection of selected species.
 - Regulation of hunting and fishing, and approaches to managing conflicts.
 - Species action/recovery plans.
 - Species re-introductions.
5. Protected areas and networks:
 - Types of protected area, their historical background, roles and interrelationships (e.g. integration of domestic protected areas and Natura 2000 network) and coverage.
 - Protected area coherence, ecological network approaches and other measures to increase protected area connectivity.
 - Approaches to protection and levels of protection.
 - Protected area management, such as governance arrangements, site management planning, involvement of stakeholders, and implementation of practical site management measures.
6. General biodiversity measures that do not relate solely to the protection of species and/or protected areas, but are broader and cross-cutting, including:
 - Tackling development impacts (e.g. approaches to spatial planning, impact assessments, mitigation and offsetting).
 - Habitat management and restoration.
 - Other topics of particular relevance to the country (e.g. pollution, tackling invasive alien species, and climate change adaptation).
7. Nature conservation costs and funding:
 - Estimates of costs.
 - Economic benefits.
 - Main funding sources, including EU, national and innovative funding.
8. Surveillance, monitoring and reporting, e.g.:
 - The main sources of biodiversity data (e.g. habitat maps and species occurrence records).
 - Approaches to monitoring and reporting on the conservation status of BHD habitats and species.
 - Wider biodiversity monitoring schemes (e.g. species and habitats covered, lead organisations, contributors and funding).
9. Future developments, including anticipated legislation, policies and plans.
10. Conclusions, including an overall integrated assessment of what has happened in the country, including key policy developments and actions, their overall impacts and the main lessons learnt.

Where possible, each country chapter delves beyond the basic statistics and government and NGO statements, to establish what actually happened. In so doing, it aims to identify the approaches that have been most successful and the causes of failure when they have not. Clearly, it is not feasible to do this for all significant nature conservation actions that have taken place in each country. Therefore, within the standardised outline structure, each chapter identifies and focusses on particularly relevant habitats or issues, or measures that the country may have championed or are novel. Thus, the book aims to provide broadly comparable chapters but also some variation in their topics and lessons.

Many of the chapters have tended to focus on terrestrial nature conservation activities. This is often because practical marine conservation has lagged behind terrestrial conservation, despite early marine conventions and policy initiatives. Therefore, there is sometimes less of a story to tell at a country level. Thankfully, momentum has grown in marine conservation in recent years, such as with the establishment of marine protected areas (MPAs). It is to be hoped that in the near future another book will be able to do justice to the subject of marine conservation and have much more action to report on.

Some readers may also be surprised to see that the subject of hunting is also covered relatively briefly in most chapters. This is because, whilst excessive hunting was a major driver of conservation initiatives, such as the Birds Directive, its impact on most species populations is now much reduced. Although some significant hunting related impacts still remain, and are therefore addressed in the relevant chapters, the main conservation needs over more recent decades have been to address broader and more significant pressures from habitat loss, degradation and fragmentation, pollution and the increasing spread of invasive alien species (IAS).

The chapters vary in length to some extent, primarily reflecting the countries' size, biogeographical diversity, and complexity of nature conservation arrangements. Thus, chapters covering countries with strongly regionalised governance have needed to devote a lot of space to describing the interactions between responsibilities at the national level and lower regional levels. The chapters also reflect the length and complexity of the history of nature conservation, and the degree to which it has been documented. Consequently the

chapter on the UK is particularly long, as nature conservation has been devolved, such that it is carried out very differently over its four ‘nations’; the effects of Brexit have also resulted in fundamental and complex changes that need to be described.

Whilst the authors have attempted to adequately cover the most important issues, limits on the length of this book have meant that it has not been possible to include some more detailed information on some topics. Some chapters have therefore provided such information as annexes, which are available as free to access online PDFs on the Cambridge University Press website, at the following address: www.cambridge.org/natureconservation.

1.3 Definitions of Key Terms, Data Sources and Limitations

1.3.1 Species Protected under the Nature Directives

For brevity, the term ‘HD habitats’ is used in this book to refer to natural habitats of Community interest listed in HD Annex I, and ‘HD species’ are species of wild fauna and flora of Community interest listed in HD Annexes II and/or IV or V. The term ‘BHD habitats and species’ is used to refer to all habitats and species that are protected under the Birds and Habitats Directives (i.e. Nature Directives), which comprise all wild native birds, and natural habitats and species of wild fauna and flora of Community interest (i.e. HD habitats and HD species).

1.3.2 Definition and Data Sources Relating to the Key Statistics Table

At the start of each chapter a standard Key Statistics table, as set out in Table 1.1, provides background information of particular relevance to nature conservation in the country. As the focus of this book is on the EU ‘mainland’, the key information mostly excludes data from the Azores, Madeira and the Canary Islands, which comprise the Macaronesian biogeographical region and Macaronesian marine region. Also, the statistics do not take into account BHD habitats and species that only occur within the Macaronesian regions. Data are also omitted from other territories of EU Member States that are outside the European continent.

The Key Statistics table includes the country’s terrestrial and marine waters area, population density, relative economic size (measured as gross domestic product (GDP) per capita) and the proportional coverage of the main types of land cover, based on CORINE land cover data (Büttner *et al.*, 2021). Unless indicated otherwise, references to land cover in the text are based on CORINE land cover data from 2018, as summarised in the chapter’s Key Statistics table. The biogeographical regions that occur in the country are also listed (see Figures 2.1 and 2.2 for boundaries). To place the statistics in context, the

land and marine water areas are also given as a percentage of the EU-28 total. Similarly, the population density and GDP statistics are also shown as a percentage of the EU-28 average. Although the UK left the EU a few years ago, the statistics are related to the EU-28 as it was, because this represents the main period covered by this book.

The number of HD habitats and species, and BD Annex I bird taxa, that occur in the country are included in the table, as well as the percentage that each comprises of the total that occur in the EU mainland. The number of habitats and species occurring in each Member State are those marked as ‘present regularly’ or ‘newly arriving species’ according to the reporting checklists compiled in June 2020 by the EEA and European Topic Centre on Biological Diversity (ETC/BD). Although the checklists take into account the results of the Member State reporting over 2013–2018, the numbers given in the table may differ slightly from the numbers that were actually reported on by each Member State. The number of habitats and species should in any case be treated as indicative as it can be difficult to decide whether or not some habitats definitely meet Annex I definitions, or if species occur sufficiently regularly to be considered as present. Habitats and species distributions are also constantly changing, as well as knowledge of them, which also varies across European countries. Despite the limitations, the proportions of HD habitats and species and BD Annex I birds that occur in each country give an indication of the importance of the country with respect to EU conservation objectives within the mainland (further discussed in Section 2.3).

Lastly, as an indication of their status, the proportion of HD habitats and species with an unfavourable conservation status (UCS) that have decreased over the short term is provided. The reason for the use of this metric as an indicator of conservation status is described in Section 1.3.3. As birds are assessed differently, their status is indicated by the proportion of breeding BD Annex I taxa that are declining.

1.3.3 The Conservation Status of Habitats and Species That Are the Focus of the Nature Directives

This book draws heavily on the surveillance that Member States are required to carry out on all BHD habitats and species, and the reports that must be produced in accordance with BD Article 12 and HD Article 17 (described further in Section 4.2). Although the monitoring and requirements as set out in the Nature Directives differ, they have been harmonised such that they now provide very similar information on the implementation of the directives and the status of habitats and species, over the same six-year period. Following a transition in the previous reporting period, reporting under the Birds and Habitats Directive coincided fully over the last reporting period, 2013–2018. Unless otherwise indicated, references to BD Article 12 and HD Article 17 data for 2013–2018 refer to the Member States’ reports as

Table 1.1 Key Statistics presented at the start of each country chapter.

Label	Description	Source
Terrestrial area (km ²)/% of EU-28*	Terrestrial area (km ²) based on the European land area given in the Natura 2000 barometer (adjusted for Portugal and Spain mainland only)	EEA ⁷
Marine waters (km ²)/% of EU-28*	For EU MS, as defined in MSFD Article 3.1, which extend to the outmost reach where the MS has and/or exercises jurisdictional rights, in accordance with UNCLOS. UK marine waters are delimited by the UK Exclusive Economic Zone (EEZ) and the UK Continental Shelf	Marine Information Systems for Europe ⁸ /UK JNCC ⁹
Population density (p/km ²)/% of EU-28*	Average persons per km ² over 2010–2019	Eurostat: 'Population on 1 January' (online data code: TPS00001)
GDP per capita (€)/% of EU-28	The ratio of real GDP to the average population of a specific year at market prices, averaged over 2010–2019	Eurostat: 'Real GDP per capita' (online data code: SDG_08_10)
Land cover (CORINE land cover classes 2018)*	% of area comprising CORINE land cover classes combined as: ART = artificial: 1.1 urban; 1.2 industry and transport; 1.3 mines, dumps and construction; 1.4 artificial vegetated areas AGR = agricultural areas: 2.1 arable; 2.2 permanent crops; 2.3 pastures (inc. unimproved and lightly improved); 2.4 heterogeneous agriculture (inc. areas with significant natural vegetation) FOR = forests: 3.1 forests, areas with native or exotic coniferous and/or broad-leaved trees (>5 m with >30% canopy closure) OSN = other semi-natural and natural areas: 3.2 scrub and/or herbaceous associations (inc. natural grasslands, heathlands, sclerophyllous vegetation, transitional woodland/shrub); 3.3 open spaces with little or no vegetation (e.g. rocky areas, sand dunes and beaches) WET = wetlands and water bodies: 4.1 inland wetlands (marshes and mires); 4.2 marine wetlands (salt marshes, salinas and intertidal flats); 5.1 inland waters (lakes and rivers, etc.)	EEA land cover and change statistics 2000–2018 ¹⁰
Biogeographical regions	Terrestrial: ALP = Alpine, ATL = Atlantic, BLS = Black Sea, BOR = Boreal, CON = Continental, MAC = Macaronesian, MED = Mediterranean, PAN = Pannonian, STE = Steppic. Marine: MATL = Atlantic, MBAL = Baltic Sea, MBLS = Black Sea, MMAC = Macaronesian, MMED = Mediterranean Sea	MS HD Article 17 reports on the EEA national summary Article 17 dashboard
Number of HD Annex I habitats/%*	HD Annex I habitats listed for the country in the checklist for Annex I habitat types (last updated: June 2020)	EEA/Eionet Reference portal for HD Article 17 reporting
Number of HD Annex II, IV and V species/%*	HD species listed for the country in the checklists for Annex II, IV and V species (last updated: June 2020)	As above
Number of BD Annex I bird taxa/%*	Breeding, winter and passage bird species and subspecies regularly occurring in the country according to the checklist for bird species (last updated: June 2020). Subpopulations distinguished in the checklist are counted together	EEA/Eionet Reference portal for BD Article 12 reporting
% HD UCS and decreasing habitats/% unknown*	% HD Annex I habitats with an unfavourable conservation status that have decreased over the short term (i.e. last two reporting periods = 2007–2018). % HD Annex I habitats with an unknown status	MS HD Article 17 reports on the EEA national summary Article 17 dashboard

⁷ www.eea.europa.eu/data-and-maps/dashboards/natura-2000-barometer

⁸ <https://water.europa.eu/marine/countries-and-regional-seas/country-profiles>

⁹ <https://jncc.gov.uk/our-work/uk-marine-protected-area-network-statistics/>

¹⁰ www.eea.europa.eu/data-and-maps/dashboards/land-cover-and-change-statistics

Table 1.1 (cont.)

Label	Description	Source
% HD UCS and decreasing species/% unknown*	% HD Annex II, IV and V species with an unfavourable conservation status that have decreased over the short term. % HD species with an unknown status	As above
% breeding BD Annex I birds decreasing/% uncertain and unknown*	% breeding BD Annex I birds that have decreased over the short term. % with uncertain or unknown trends	MS BD Article 12 reports on the EEA national summary Article 12 dashboard

Note. * Excludes areas and habitats and species within the Macaronesian terrestrial and marine biogeographical regions.

Table 1.2 Categories of EU population status of birds and EU biogeographical conservation status of HD habitats and species.

EU status	Good	Poor	Bad	Unknown
EU populations of bird species/subspecies	Secure	Near Threatened (according to IUCN Red List criteria), declining or depleted	Threatened (according to IUCN Red List criteria), i.e. Critically Endangered, Endangered, or Vulnerable	Unknown
EU biogeographical conservation status of HD habitats and species	Favourable	Unfavourable–inadequate	Unfavourable–bad	Unknown

Source. Adapted from EEA (2020).

compiled and presented by the EEA on the national summary dashboards for Article 12¹¹ and Article 17.¹²

Whilst there has been some harmonisation of the reporting under the Birds and Habitats Directives, BD Article 12 reports differ from HD Article 17 reports in two fundamental ways. Firstly, Member States provide assessments at a national level, rather than a biogeographical level. Secondly, the national assessments are in relation to each species', or subspecies', trends (i.e. increasing, stable, decreasing, uncertain or unknown), rather than an assessment of conservation status. An overall EU status assessment is then made by the ETC/BD using an agreed methodology (DG Environment, 2014). The first step assesses whether the bird species is threatened (i.e. Critically Endangered, Endangered, or Vulnerable) or Near Threatened according to IUCN regional Red List criteria (IUCN, 2012, 2019). In the second step, species that are neither threatened nor Near Threatened are categorised as 'declining' (i.e. EU-28 population or range declined by $\geq 20\%$ since 1980 with continuing decline since 2007), 'depleted' (i.e. EU-28 population or range declined by $\geq 20\%$ since 1980 but no longer declining since 2007), 'secure' or 'unknown'.

As indicated in Table 1.2, the EEA has created a common framework for summarising the results of the reporting under the Nature Directives. This framework and the categories are therefore followed in this book, although the more specific status of birds with a poor status is also referred to where

appropriate. Further information on the methods used by the EEA to assess the conservation status of BHD habitats and species is provided by Röschel *et al.* (2020).

The concept of aiming to achieve the favourable conservation status of habitats and species that was introduced in the HD has been groundbreaking, and has raised nature conservation ambitions from attempting merely to prevent extinctions and declines. Now, the long-term aim is for habitats or species to be prospering (in both quality and extent/population) and with good prospects to do so in the future as well (ETC/BD, 2011). The status of each HD habitat is assessed in relation to its natural range, area, structure and functions, species, status and future prospects. Species are assessed in relation to their range, population trend, habitat sufficiency and future prospects. Importantly, this involves assessments against the habitat's and species' previous range and area in relation to favourable reference values (ETC/BD, 2011; described further in Box 4.1). Thus, to be in favourable conservation status the habitat's or species' range and area must be at least as large as it was when the directive came into force in the Member State, and sufficient for its long-term viability. Other factors affecting the habitat's or species' future prospects must also be favourable.

Whilst this is a logical and laudable aim, it does mean that the achievement of favourable conservation status in practice tends to be a long-term objective and therefore makes a rather insensitive metric of change. This is evident from the results of the last few HD Article 17 monitoring reports (EEA, 2020; Section 5.1). Furthermore, the application of favourable reference values has been inconsistently applied by Member States (Bijlsma *et al.*, 2019), which makes it more difficult to

¹¹ www.eea.europa.eu/themes/biodiversity/state-of-nature-in-the-eu/article-12-national-summary-dashboards

¹² www.eea.europa.eu/themes/biodiversity/state-of-nature-in-the-eu/article-17-national-summary-dashboards

compare the achievement of favourable conservation status across countries. Also, it is unlikely to be feasible to regain the former reference value areas and ranges of some habitats and species, the implication being that they will never achieve a favourable status, even though they may be prospering in all other respects. To reduce these problems, and to highlight habitats and species that are of highest immediate conservation concern, this book has used the following two metrics as standard indicators of progress towards the achievement of the objectives of the Nature Directives:

- Proportion of HD habitats and HD species that have an unfavourable conservation status (UCS) and have shown short-term decreases.
- Proportion of breeding birds listed in BD Annex I that have shown short-term decreases.

Under the current Nature Directives reporting framework, ‘short-term’ refers to the last two six-year reporting periods, which cover 2007–2018. These metrics are more comparable across the Member States because they are less influenced by historic constraints and their approaches to setting reference values and interpretation of future prospects. The short-term trends also reflect what has been happening recently, rather than long-term pressures that may no longer be very relevant. The metrics for each country are included in the summary of Key Statistics table at the start of each chapter (see Table 1.1), and are compared across countries in the conclusions chapter (Table 5.1). A more detailed breakdown of the short-term trends of HD habitats and species, and breeding and wintering BD Annex I birds is also provided in each country chapter. To provide a complete picture, each chapter also briefly summarises the overall conservation status of BHD habitats and species.

It is important to note that many changes in the status and trends of BHD habitats and species between the most recent reporting period (2013–2018) and the previous monitoring periods are likely to be due to changes in methodology or improved knowledge, requiring careful interpretation. Therefore, to avoid presenting potentially misleading data, the standard status and trend tables in this book do not include the information from previous periods.

1.3.4 Protected Areas

A key aim of this book has been to compile information on protected areas in each country, to compare their coverage, types and effectiveness. The intention has been to follow the IUCN and CBD definitions of protected areas (Box 1.2), which the IUCN and the CBD Secretariat agree have the same meaning (Lopoukhine and Dias, 2012). However, the definitions leave significant room for interpretation, which has resulted in considerable variation in what is considered to be a protected area by European countries and regions within them. The country chapter authors have therefore needed to consider carefully, using the best available information, which types of listed nationally or regionally designated areas actually meet the IUCN and CBD

protected area definitions. Whilst it is clear for some protected area types, there are also many cases where it is not, and a detailed assessment would be necessary to be certain, such as was carried out in the UK (Crofts *et al.*, 2014). The protected areas listed in the country chapter tables should therefore be interpreted with caution, taking into account the available information and accompanying author’s commentary.

Where possible, the chapter authors have mainly based the tables and their analysis on national official lists of designated protected areas and their categories. Unfortunately, such national data are not always available, complete or up-to-date. These include data on internationally designated sites from the Ramsar Convention, and UNESCO for World Heritage Sites Biosphere Reserves.¹³ For Biosphere Reserves, only the core areas are included, as buffer zones and transition zones are generally not protected areas. Information on MPAs designated under the Regional Seas Conventions (described in Chapter 3) has also been obtained from the relevant websites for Helsinki Commission (HELCOM) MPAs in the Baltic Sea, MPAs under the Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR) and Specially Protected Areas of Mediterranean Importance (SPAMI) under the Barcelona Convention.¹⁴ For consistency, except where there is more recent information on significant changes, Natura 2000 data and coverage estimates are mainly taken from the June 2021 update of the EEA’s Natura 2000 barometer,¹⁵ which indicates the situation at the end of 2020.

Reference has also often been made to the listed protected areas and estimation of their coverage provided on the Protected Planet website.¹⁶ This is based on the World Database on Protected Areas (WDPA), which is a joint project between UN Environment and IUCN, and is compiled and managed by the UN Environment Programme World Conservation Monitoring Centre (UNEP-WCMC). Amongst other things, it is used for reporting to the CBD on progress towards protected area targets. The official source of European data in the WDPA is the European Nationally Designated Areas Inventory (CDDA).¹⁷ The CDDA is maintained by the EEA with support from the ETC/BD, with the data delivered by the Eionet partnership countries.¹⁸ It is important to note

¹³ Ramsar Sites: <https://rsis.ramsar.org/> World Heritage Sites: <https://whc.unesco.org/en/statesparties/> Biosphere Reserves: <https://en.unesco.org/biosphere/eu-na>

¹⁴ HELCOM: <http://mpas.helcom.fi/apex/?p=103:1> OSPAR: <https://mpa.ospar.org/home-ospar/key-figures> Barcelona Convention – Regional Activity Centre for Specially Protected Areas: www.rac-spa.org/spami

¹⁵ www.eea.europa.eu/data-and-maps/dashboards/natura-2000-barometer

¹⁶ www.protectedplanet.net/en

¹⁷ According to its former name ‘Common Database on Designated Areas’.

¹⁸ www.eea.europa.eu/data-and-maps/data/nationally-designated-areas-national-cdda-17

Box 1.2 Protected area definitions and categories**IUCN protected area definition:**

'A protected area is a clearly defined geographical space, recognised, dedicated and managed, through legal or other effective means, to achieve the long term conservation of nature with associated ecosystem services and cultural values.'

(Dudley, 2008).

CBD protected area definition:

'A geographically defined area, which is designated or regulated and managed to achieve specific conservation objectives' (CBD Article 2). This definition is further expanded upon under CBD Article 8.

CBD definition of 'Other effective area-based conservation measures' (OECMs)

'A geographically defined area other than a Protected Area, which is governed and managed in ways that achieve positive and sustained long-term outcomes for the *in situ* conservation of biodiversity, with associated ecosystem functions and services and where applicable, cultural, spiritual, socio-economic, and other locally relevant values.' (14th CBD COP, Decision 14/8, 2018).

IUCN protected area categories (adapted from Dudley, 2008 with Stolton *et al.*, 2013)

Ia Strict Nature Reserve: Category Ia are strictly protected areas set aside to protect biodiversity and also possibly geological/geomorphological features, where human visitation, use and impacts are strictly controlled and limited to ensure protection of the conservation values. Such protected areas can serve as indispensable reference areas for scientific research and monitoring.

Ib Wilderness Area: Category Ib protected areas are usually large unmodified or slightly modified areas, retaining their natural character and influence without permanent or significant human habitation, which are protected and managed so as to preserve their natural condition.

II National Park: Category II protected areas are large natural or near natural areas set aside to protect large-scale ecological processes, along with the complement of species and ecosystems characteristic of the area, which also provide a foundation for environmentally and culturally compatible, spiritual, scientific, educational, recreational and visitor opportunities.

III Natural Monument or Feature: Category III protected areas are set aside to protect a specific natural monument, which can be a landform, sea mount, submarine cavern, geological feature such as a cave or even a living feature such as an ancient grove. They are generally quite small protected areas and often have high visitor value.

IV Habitat/Species Management Area: Category IV protected areas aim to protect particular species or habitats and management reflects this priority. Many Category IV protected areas will need regular, active interventions to address the requirements of particular species or to maintain habitats, but this is not a requirement of the category.

V Protected Landscape/Seascape: A protected area where the interaction of people and nature over time has produced an area of distinct character with significant, ecological, biological, cultural and scenic value, and where safeguarding the integrity of this interaction is vital to protecting and sustaining the area and its associated nature conservation and other values.

VI Protected area with sustainable use of natural resources: Category VI protected areas conserve ecosystems and habitats together with associated cultural values and traditional natural resource management systems. They are generally large, with most of the area in a natural condition, where a proportion is under sustainable natural resource management and where low-level non-industrial use of natural resources compatible with nature conservation is seen as one of the main aims of the area.

that, whilst the CDDA includes protected areas that meet IUCN and CBD definitions, it also contains other designated sites including areas closer to the 'other effective area-based conservation measures' (OECMs) definition (Box 1.2). The CDDA is also the source used by the EEA for its protected area coverage indicator in the EU Biodiversity Strategy Dashboard. This is not directly referred to in most chapters, because it was set up after the protected area analysis had been completed using WDPA data (which were in any case based on a more up-to-date dataset at the time).

According to UNEP-WCMC (2019), records should not be submitted to the WDPA if they do not meet the IUCN or CBD definition of a protected area. However, UNEP-WCMC states that 'it cannot be guaranteed that data-providers consistently follow this standard. In part, this is because countries often have national definitions of protected areas that may not fully

align with the IUCN or CBD definition. It should therefore not be assumed that all records in the WDPA meet the IUCN or CBD definition.' In fact, it is clear from several of the national chapters in this book that some of the listed sites do not meet the definitions (e.g. in Denmark, Latvia and the UK). These are therefore pointed out by the authors and excluded from protected area coverage calculations where feasible.

To assess progress towards protected area targets, including whether the 2020 CBD Aichi Target 11 was met (i.e. 17% on land and 10% at sea), each chapter has estimated the combined area of protected areas on land and separately at sea, taking into account overlaps. The estimates are based on national and/or Protected Planet (WDPA) GIS analyses, depending on which are most up-to-date and in accordance with IUCN/CBD protected area definitions. It should be noted that the Protected Planet estimates do not directly include

Biosphere Reserves (UNEP-WCMC, 2019). Table 5.4 in the conclusions chapter provides a comparison of the Protected Planet estimates and national assessments, if available.

The protected area tables in each chapter also indicate the IUCN protected area management categories (Box 1.2) that apply to each type of protected area, where these are known. However, in the European context, the IUCN typology can be difficult to apply and by itself does not normally provide a clear picture of the role of a protected area in nature conservation. Discussion of the protected area types therefore tends to concentrate on them in terms of two key attributes: (1) the degree to which they focus on nature, and (2) their strength of protection. It is also important to bear in mind that the names used for types of protected areas can have very different meanings in different countries. For example, in some countries National Parks have a very high level of protection and may be dedicated to nature conservation objectives. But in others, such as the UK, National Parks are primarily designated on the basis of landscape and recreational considerations and have relatively weak protection levels primarily relating to restrictions on built developments.

Due to these issues, care needs to be taken in interpretation of the CDDA/WDPA and official country data on protected areas, especially their coverage estimates and management categories. This topic and its implications are discussed in the conclusions chapter (Section 5.4). It is also evident that the periodic updates of data sources on protected areas vary in their frequency, depending on the protected area type, country and institution involved. This book therefore aims only to provide an approximate ‘snapshot’ of the coverage of protected areas, and readers should refer to more up-to-date sources for definitive data.

1.3.5 Nature Conservation Costs, Benefits and Funding

Practical nature conservation is often constrained by funding limitations, for example affecting environmental authorities and the execution of their roles, but in particular practical conservation actions, such as habitat management. Therefore, another important aim of the national chapters has been to examine the costs of nature conservation in the country and to compare the costs with potentially available funds and their actual use. The sections primarily focus on funding over the last 10 years and in particular the EU Multiannual Financial Framework (MFF) for 2014–2020.

In most national chapters the information on costs has been drawn from Prioritised Action Frameworks (PAFs) that Member States prepared in accordance with the current financing arrangements for the Natura 2000 network (further discussed in Section 4.2.6). The PAFs are strategic multiannual planning tools that aim to provide a comprehensive assessment of the measures needed, and their costs, to achieve the aims of the Nature Directives through the implementation of

the Natura 2000 network. The first PAFs were completed for the 2014–2020 MFF, whilst the current PAFs were developed to help access funds from the 2021–2027 MFF.

In addition to covering the measures required to meet the conservation objectives of the sites, the PAFs also include additional needs related to species protection and wider green infrastructure¹⁹ where they contribute to the ecological coherence of the Natura 2000 network. It is therefore important to bear in mind that the costs estimated in the PAFs do not cover all nature conservation costs, although they should be a very large proportion. Comparisons of PAF cost estimates between countries also need to be carried out with caution, as Member States’ interpretation of the guidance on completion of the PAFs has varied, especially in the 2014–2020 PAFs. In particular, some have ambitiously costed the full achievement of the favourable conservation status of BHD habitats and species, whilst others have estimated what they consider to be more realistic within the funding period. They also differ in their treatment of green infrastructure and other requirements outside Natura 2000 sites.

To enable a comparison of nature conservation costs and available funding, each chapter includes a standardised funding table, which sets out the allocations of the main EU and national sources of funds for nature conservation related actions. As funding is often from national funds with co-financing from the EU, these components are separated where data allow. The main focus is on funding over the 2014–2020 MFF, but longer periods are assessed to provide a more complete picture for some funds (e.g. the EU LIFE programme), or due to data limitations. As the periods covered by the various funds differ, the funding allocations have been annualised to aid comparisons. For traditional LIFE projects, the annual allocations are based on the period over which the projects were awarded. The annualised funding amounts for Integrated LIFE projects are based on the projects’ duration. It should be noted that figures in the funding tables are rounded to the nearest €0.1 million, as a result of which rounded subtotals and totals may not correspond to the sum of the individual rows.

The main sources of information used for the funding tables are the European Commission database on the European Structural and Investment Funds (ESIF) 2014–2020²⁰ allocations as at October 2020, as well as the PAFs and websites of the individual EU funds. The ESIF database was used to ascertain the European Agriculture Fund for Rural Development (EAFRD) allocations to the Rural Development Programme measures related to Priority 4 ‘restoring, preserving and enhancing ecosystems related to agriculture and forestry’. Although

¹⁹ Defined by the European Commission as ‘a strategically planned network of natural and semi-natural areas with other environmental features designed and managed to deliver a wide range of ecosystem services’.

²⁰ <https://cohesiondata.ec.europa.eu/2014-2020/2014-2020-EAFRD-allocation-by-focus-area-EU-planne/6q2m-arif> downloaded 24 October 2020.

the RDP programming periods were extended to the end of 2022 due to the COVID-19 pandemic, the updated funding is not taken into account as it may not reflect typical funding allocations. The information on RDP allocations was not based on the PAFs because they have a narrower focus on Natura 2000 and supporting measures, whereas the table attempts to identify and include all nature conservation related funding. This is particularly important for RDP measures, because agri-environment schemes, and many of the other measures, often have substantial coverage beyond protected areas. The PAFs have generally been the information source for the other EU ESIF funds, which tend to focus funding on implementation of Natura 2000, as well as national sources of financing. Unless otherwise indicated, information on projects funded by the EU LIFE programme has been obtained from the European Commission's LIFE Database²¹ or country factsheets.²²

Where possible the total potentially available funds are calculated, to enable a comparison with the estimates of nature conservation costs. However, such comparisons need to be interpreted very cautiously as in most cases the available data on costs and funds differ in their scope and completeness. Furthermore, the data in the funding tables are mainly allocations (rather than actual spending), and the potentially available funds are not always used, for example as a result of low take-up by landowners. Also, available funding may not match, or be targeted to, the most important funding needs, as further discussed in the conclusions chapter (Section 5.6). Nevertheless, in some countries the data point to obvious gaps between available funds and requirements.

Although the costs of nature conservation are considerable, there is growing evidence that these are typically outweighed by their benefits (e.g. Martín-López *et al.*, 2018; Dasgupta, 2021). Therefore a summary is provided of key studies carried out within each country of the social, health and economic benefits of ecosystems, and the added value of nature conservation and restoration measures. However, this is a complex subject, and the estimates of such benefits can be incomplete, variable and difficult to interpret depending on the available data and methods used; therefore only a brief discussion of the issue is possible within the scope of this book.

As this book covers over 40 years of nature conservation action, some of the estimated monetary costs, funds and benefits that are quoted are sufficiently old now to be significantly different from current values due to the effects of inflation. Therefore, on the one hand, the interpretation of monetary data can be aided by providing inflation adjusted current values as well as the original value. On the other hand, this would result in long and fragmented text in some sections if all monetary values were adjusted for inflation. As the cumulative effects of inflation have not been very high since 2011 (with an increase of 11% in EU prices up to 2020), monetary values

after 2010 are not adjusted. Monetary values before 2011 are firstly presented according to their original source year, and then equivalent figures at 2020 prices are provided in brackets. The adjustments have been made using Eurostat annual Harmonised Indices of Consumer Prices for each country and the average annual euro exchange rate at the time.

To provide a consistent comparative reference, all monetary values that are not in euros are also presented in euros in brackets alongside, based on one currency exchange rate for 28 May 2021, as compiled by the European Commission. The relevant exchange rate for each currency is given as a footnote at the first relevant point in each national chapter.

1.4 Habitat and Species Names, Taxonomy and Global and European Threat Status

When an HD Annex I habitat is referred to, the corresponding code is provided alongside in parentheses. The addition of ‘*’ indicates that it is a ‘priority habitat’, according to HD Article 1. The full names of HD Annex I habitats mentioned in this book are provided in the Appendix.

The scientific bird names used in this book follow those in the 2018 List of birds of the European Union,²³ which are based on the BirdLife International *Illustrated Checklist of the Birds of the World*, Volumes 1 and 2 (del Hoyo and Collar, 2014, 2016). The taxonomy and scientific names for other species that are used in this book follow those that are recommended for HD Article 17 reports according to the latest EEA Checklists for Annex II, IV and V species,²⁴ or the IUCN Red List website for other species.²⁵

English names for species are generally based on those used by Birdlife International for birds and the IUCN Red List for other species, except where other names are much more frequently used in Europe. However, to shorten species lists, where there is no potentially similar regularly occurring species in Europe, the following components of names are omitted: Common, Western, Northern, Eurasian and European. English names are not used for plants or invertebrates unless they are very well known.

As the global threat status of species, and European threat status of birds, are frequently referred to in the text, the source for each is not repeated each time. In all cases the global threat status was taken between October 2021 and April 2022, from BirdLife International²⁶ for birds and the IUCN Red List website for other species. References to the European threat status of birds are based on BirdLife International (2021). The reference sources for the European or national status of other species are given in each chapter.

²¹ <https://webgate.ec.europa.eu/life/publicWebsite/index.cfm>

²² https://cinea.ec.europa.eu/life/life-european-countries_en

²³ https://ec.europa.eu/environment/nature/conservation/wildbirds/eu_species/index_en.htm

²⁴ https://cdr.eionet.europa.eu/help/habitats_art17/

²⁵ www.iucnredlist.org/

²⁶ <http://datazone.birdlife.org/home>

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