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Review of Favourable Conservation Status and Birds Directive Article 2 interpretation within the European Union

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NATURAL ENGLAND

Foreword

Natural England commission a range of reports from external contractors to provide evidence and advice to assist us in delivering our duties. The views in this report are those of the authors and do not necessarily represent those of Natural England.

Background

The Birds and Habitat Directives are cornerstones of biodiversity conservation in the UK and across the European Union. At the core of both Directives lies the objective of achieving sufficient area and quality of habitats and sufficiently large populations of species that will ensure their survival into the medium to long term.

Natural England commissioned this study to better understand how the Birds and Habitats Directives are being implemented across European Union Member States, and to identify examples of good practice that could benefit our approach in England. In particular, Natural England was interested in:

- understanding the practices and underpinning assumptions that other Member States have used in interpreting Favourable Conservation Status (FCS) and setting associated Favourable Reference Values (FRVs) under the Habitats Directive; and
- understanding the practices and assumptions that other Member States have used in determining appropriate population levels and wider habitat requirements for wild birds (in compliance with the Birds Directive).

The approach taken by this study involved focussing on ten Member States that were considered to represent a diversity of experience and practice in implementing the Directives. The methods involved an extensive literature review and semi-structured interviews with officials and experts based on questions specified by Natural England.

The results of this research will assist Natural England in developing its own approaches and advice relating to implementation of the Birds and Habitats Directives.

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Standard disclaimer

EXECUTIVE SUMMARY

The Birds and Habitat Directives form the cornerstone of EU action on biodiversity and establish a robust approach towards the protection of European habitat types and species. At the core of both Directives lies the objective of achieving sufficient area and quality of habitats and sufficiently large populations of species that will ensure their survival into the medium to long term. The Habitats Directive requires Member States to achieve and maintain Favourable Conservation Status (FCS) for those habitat and species identified to be of Community interest[1] through designation of important sites and adoption of protection measures in the wider countryside. The Birds Directive requires Member States to take measures to maintain bird populations at a level which corresponds to their "*ecological, scientific and cultural requirements*" and to ensure sufficient extent and quality of habitat for all species of birds. An understanding of how these concepts have been interpreted and implemented by each of the Member States is important for policy-makers as, for example, greater uniformity in the ways that Member States interpret these concepts could improve the quality of biodiversity reporting at the European level.

This study was commissioned to assist Natural England in developing its own approaches and advice on the topic of UK reporting under the Birds and Habitats Directives. In particular, Natural England was interested in:

- understanding the practices and underpinning assumptions that other Member States have used in interpreting FCS and setting associated Favourable Reference Values (FRVs), in particular with regards to widespread species with extensive populations outside Natura 2000 sites; and
- understanding the practices and assumptions that other Member States have used in determining appropriate population levels and wider habitat requirements for wild birds (in compliance with the Birds Directive).

The approach taken by this study focused on ten Member States that were considered to represent a range of approaches (Austria, Belgium (Flanders), Denmark, Estonia, France, Germany, Ireland, Italy, the Netherlands and Sweden). The results are based on an extensive literature review and semi-structured interviews with officials and experts based on five key questions specified by Natural England.

The extent to which an ecological basis is used for assessing species conservation status

Important differences exist in the interpretation of conservation status amongst the Member States in question, in particular regarding the manner in which FRVs are established. FRVs define the species range and population, or habitat area, at which the overall conservation status of the species can be considered favourable. According to the European Commission, they should be no less than the situation when the Directive came into force in the country concerned. Most Member States examined established the FRVs as the levels when the Habitats Directive came into force (e.g. 1994 for Ireland or 1995 for Sweden) even if there had been subsequent declines since then. This contrasts with the approach taken for some species by the UK which – in the case of species that have declined since 1994 – deems the FRV in 1994 to have been insufficient. A more extreme position is adopted by Denmark, which assumes that most of the species were

[1] I.e. those listed in Annexes I, II, IV or V.

in Unfavourable Conservation Status (UFC) when the Directive came into force and has generally set the FRVs higher than the 1994 levels.

The Belgian region of Flanders was notable in its consistent consideration of minimum viable populations in the assessment of a species conservation status. In cases where species-specific research had not been carried out, a threshold of 5,000 individuals in a functionally connected population was adopted in accordance with a recent scientific paper on the topic. Elsewhere, debate in the scientific literature about the correct threshold to use has deterred some Member States in using this approach as the basis of their assessments.

Approaches used in setting Favourable Reference Values for widespread species

In general, most Member States examined assume that widespread species are in FCS. Data constraints from when the Directive came into force have meant that numerous Member States have adopted the populations and ranges recorded in 2007, during the first full assessment under the Habitats Directive, as the FRVs.

Impacts of projects outside protected areas on European Protected Species

Species protection measures for European Protected Species (those listed on Annex IV of the Habitats Directive) demonstrated variation between Member States. In four of the Member States (Germany, Estonia, Flanders and France) individual specimens did not necessarily have to be protected provided it could be demonstrated that local and national conservation status would not be adversely affected. An alternative approach is adopted by Sweden, which does adopt strict protection of each individual specimen. As a result, developments which are foreseen to result in the death of the individuals or loss of breeding and roosting sites are frequently refused permission and required to find alternative locations.

Approaches to setting appropriate populations of wild birds and extent/quality of habitat

In five of the Member States examined (Denmark, Flanders, Italy, the Netherlands and Sweden), appropriate population levels for wild birds within their territory have been established. There is little consistency in the manner in which these were established and adopted. The most scientific and rigorous approach took place in Italy, adopting a strong ecological basis, which takes into account estimated minimum viable populations. The methods used for developing the appropriate population levels of wild birds according to historic levels are often based on pragmatic considerations rather than scientific rigour and Member States have adopted significantly different approaches to selecting the baseline year. The sufficiency and extent and quality of bird habitat outside SPAs are very poorly considered.

Consideration of FRVs and appropriate levels of wild bird populations in SAC and SPA management

Four Member States (Denmark, Flanders, Ireland and Italy) indicated that there has been some consideration of FRVs and appropriate bird populations in conservation objectives. However in most cases, there is no co-ordinated approach to ensure that SACs and SPAs are adequately contributing to national objectives at the national level. The notable exception is Flanders, which has established regional conservation objectives that in turn provide a framework for setting conservation objectives for Natura 2000 sites and areas outside them.

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LIST OF ACRONYMS

AT	Austria
ATL	Atlantic Biogeographical Region
BfN	Bundesamt für Naturschutz (German Federal Agency for Nature Conservation)
CON	Continental Biogeographical Region
DE	Germany
DK	Denmark
EE	Estonia
EIA	Environmental Impact Assessment
ETC-BD	European Topic Centre on Biological Diversity
FCS	Favourable Conservation Status
FL	Flanders
FR	France
FRA	Favourable Reference Area
FRP	Favourable Reference Population
FRR	Favourable Reference Range
FRV	Favourable Reference Value
IE	Ireland
IT	Italy
MVP	Minimum Viable Population
NL	The Netherlands
PVA	Population Viability Analysis
SAC	Special Area of Conservation
SDF	Standard Data From
SE	Sweden
SPA	Special Protection Area
UFC	Unfavourable Conservation Status

1 INTRODUCTION

1.1 Context of this study

The Birds and Habitat Directives form the cornerstone of EU action on biodiversity and establish a robust approach towards the protection of European habitat types and species. At the core of both Directives lies the objective of achieving the habitat quality and sufficiency of species populations that will ensure their healthy functioning and secure their longevity into the foreseeable future. The terms used by the two Directives, separated by 13 years in their adoption, to define these objectives are subtly different, however, and differ in their level of requirements placed on Member States to report on progress. As a consequence, there are two parallel systems in the EU for reporting on the status of species and habitats.

The Habitats Directive requires Member States to achieve and maintain Favourable Conservation Status (FCS) for those habitat and species identified to be of Community interest[2] through designation of important sites and adoption of protection measures in the wider countryside. Although the Directive defines the concept of FCS in broad ecological terms, EU regulatory and reporting requirements demand a high level of interpretation and judgement by Member States, who must report on the conservation status of the habitats and species within its borders every six years. To facilitate this Member States subsequently agreed to establish Favourable Reference Values (FRVs) for their species and habitats and to use these as a comparative basis for establishing their current conservation status.

The Birds Directive requires Member States to take measures to maintain bird populations at a level which corresponds to their "*ecological, scientific and cultural requirements*" and to ensure sufficient extent and quality of habitat for all species of birds. The interpretation of these terms by the Member States influences the way in which species and habitat protection measures are implemented across the EU. Although the Directive establishes only limited reporting requirements on Member States to outline the measures taken to fulfil the Directives' objectives, Member States have agreed to report on the size and trends of bird populations but stopped short of including requirements to asses and report on conservation status.

An understanding of how these concepts have been interpreted and implemented is important for policy-makers at the European scale. For habitats and species covered by the Habitats Directive, all data on their conservation status provided by the Member States are collated to provide an overview of their conservation status at the European level. A greater degree of uniformity between the ways in which Member States have interpreted these concepts will improve the quality of data at the European level.

[2] I.e. those listed in Annexes I, II, IV or V.

1.2 Objectives

This study has been commissioned to assist Natural England in developing its own approaches and advice on the topic of UK reporting under the Birds and Habitats Directives. In particular, Natural England is interested in:

- understanding the practices and underpinning assumptions that other Member States have used in interpreting FCS and setting associated favourable reference values, in particular with regards to widespread species with extensive populations outside Natura 2000 sites;
- understanding the practices and assumptions that other Member States have used in determining appropriate population levels and wider habitat requirements for wild birds (in compliance with the Birds Directive).

Additionally, Natural England is seeking a greater understanding of how other Member States have assessed the impact of projects on FCS outside protected areas and the approaches to mitigation and compensatory measures that have been adopted.

Specifically, this report addresses as far as available information allows, the following questions:

(i) To what extent has any European country used an ecological basis (e.g. taking account of sufficiency of suitable habitat; relating population size and/or extent to habitat availability; or using population viability analyses) to determine whether the conservation status of a European Protected Species is favourable?

(ii) More specifically, what approaches have other countries used in setting favourable reference values for widespread species (i.e. those that occur widely outside designated sites)?

(iii) How have other countries assessed projects outside designated sites (in particular Natura 2000 sites) in terms of impacts on FCS, and what approaches to mitigation or compensation have been used?

(iv) What approaches and assumptions have been used by EU Member States in determining (a) appropriate population levels of wild birds; and (b) sufficient extent and quality of bird habitat outside of Special Protection Areas (SPAs), as required under Articles 2 and 3 of the EU Birds Directive?

(v) How have conservation objectives for Special Areas of Conservation (SACs) and SPAs specifically taken account of reference values determined, respectively, for FCS under the Habitats Directive and bird populations considered compliant with Birds Directive requirements.

1.3 Approach taken by the study

This study has been carried out by reviewing relevant literature and through targeted phone interviews with key contacts at national and European level. As described below, this analysis was carried out in two steps: firstly through an overview analysis of all Member states, followed by an in depth analysis of selected Member States of interest.

Step 1. Overview of approaches taken by Member States

This firstly involved an analysis of readily available existing literature and interviews with representatives leading on this topic at the European level: the lead on Article 17 and Article 12 reporting at DG Environment (Angelika Rubin), the lead co-ordinator at the European Topic Centre on Biodiversity (Doug Evans) and the Project manager for Biodiversity and Ecosystems at the EEA responsible for ReportNet (Carlos Romão). In addition an initial request for information on questions (i), (ii), (iv) an (v) was made to Member State officials on the list of the DG Environment established Working Group on Reporting.

In addition, because available literature and information request responses from Member States on the methodologies were sparse, the Article 17 database[3] for the reporting period 2001-2006 (containing the Member State information on the species and habitats assessments) was also analysed to gain an overview of the way FCS was assessed across the EU. This provided an insight into the proportion of species to which the Member States had (a) established a FRV and (b) assessed the quality of their data as either moderate or good (see Annex 1 for a summary of the results). As a consequence of this analysis, and with agreement from Natural England, ten Member States were selected for further analysis based on interviews with Member State officials and other national experts. The Member States were selected on the basis of a combination of factors, including:

- the use of innovative methodologies with respect to the research questions;
- high rates of FRV development and good data quality;
- availability and accessibility of Member State desk officers and literature on methodologies and;
- the need to ensure a relatively even geographic distribution of Member States across the EU.

On this basis, the following ten Member States were selected for detailed examination:

1. *Flanders*: innovative approaches largely developed from the last reporting period.
2. *Ireland*: in the process of developing a large number of new methodologies.
3. *Denmark*: detailed methodological papers (including in English) and the use of minimum viable populations in setting FRVs.
4. *Italy*: large amount of work on assessing status and appropriate populations of wild birds.
5. *The Netherlands*: innovative approaches incorporating minimum viable populations largely developed since the last reporting period.
6. *Estonia*: 100% establishment of FRVs according to the Article 17 database.
7. *Sweden*: response from desk officers and evidence of having established interesting approaches.
8. *Austria*: response from desk officers.
9. *France*: available literature (in French).
10. *Germany*: literature is available (in German) and has been cited by a number of experts as having developed an interesting approach.

Step 2. In-depth analysis of the Members States of interest

[3] http://www.eea.europa.eu/data-and-maps/data/article-17-database-habitats-directive-92-43-eec

Member State officials from each of the Member States were contacted and asked to participate in a semi-structured interview (see Annex 2 for questions). Of the ten Member States approached, three (Austria, Germany and France) were only able to provide limited information due to the commitment of having to complete Article 17 national reports by mid-2013. Despite contacting several of the key officials on a regular basis, we were only able to receive partial responses on many of the questions. This proved to be a common issue for several of the Member States. A secondary constraint was the ability to locate and contact the relevant individuals who are sufficiently authoritative to provide responses on the different questions. In particular, it was discovered that the key experts responsible for Article 17 reporting under the Habitats Directive were not sufficiently aware of protection measures implementing Article 12 to answer question (iii) or, frequently, question (iv) on reporting under the Birds Directive. See Annex 1 for a summary of the quality of the responses for each question. Annex 3 contains the full results of the literature review and interviews with officials from the Member States.

Limitations of the methodology

While every effort has been made to contact the most relevant national experts with an overview of the process, it should be noted that these results will inevitably reflect the experience of those interviewed. It was beyond the scope of this study to contact experts covering *all* species and the results do not, therefore, represent a complete picture of the process carried out in the Member States. Instead, we focussed on understanding the methodology for assessing species of bats and of Great Crested Newt *(Triturus cristatus*) where possible, as requested in the terms of reference of this study. These results should therefore not be seen as a definitive representation of how conservation status is assessed across the EU, but rather an indication of the underlying concepts and assumptions made by the examined Member States. Annex 5 provides the details of all of those who were interviewed for the study.

Sections 3 to 6 below summarise the results of the semi-structured interviews with relevant experts from the ten selected Member States supported by a review of relevant literature. The report adopts the following structure:

Section 2 provides an overview of the Birds and Habitat Directives, outlining the protection measures, reporting requirements and an explanation of key terms.

Section 3 provides a summary of the Member States' approaches to assessing conservation status and to setting FRVs for widespread species - **Questions (i) and (ii).**

Section 4 presents the findings on how Member States have assessed the impact of projects on the conservation status of species outside protected areas and describes any mitigation and compensatory measures that have been adopted - **Question (iii).**

Section 5 outlines how Member States have determined appropriate population levels and wider habitat requirements for wild birds in compliance with the Birds Directive - **Question (iv).**

Section 6 summarises how conservation objectives for Natura 2000 sites have specifically taken account of reference values determined under the Birds and Habitats Directives - **Question (v).**

Section 7 provides a summary of the key findings.

2 OVERVIEW OF THE BIRDS AND HABITATS DIRECTIVES

2.1 Background

2.1.1 Overall aims of the Birds and Habitats Directives

The EU has a relatively robust regulatory framework for biodiversity, which over the past 30 years has played an important role in requiring Member States to take strong measures to protect their natural heritage. At the heart of this framework lie two important pieces of legislation: Council Directive 2009/147/EU on the conservation of wild birds (Birds Directive) adopted in 1979 and Council Directive 92/43/EEC on the conservation of natural habitats and wild flora and fauna (Habitats Directive) adopted in 1992.

Specifically, the Birds Directive aims to maintain the population of all species of naturally occurring birds in the wild state in the European territory at "*a level which corresponds to ecological, scientific and cultural requirements, while taking account of economic and recreational requirements*" (Article 2). Under Article 3 Member States are required to take measures to preserve, maintain or re-establish a sufficient diversity and area of habitats for these species. Member States must also take appropriate steps to avoid pollution, deterioration or disturbances to those bird species requiring special protection areas as listed in Annex I (Article 4(4)).

The overall aim of the Habitats Directive, as stated in Article 2(1) "*shall be to contribute towards ensuring bio-diversity through the conservation of natural habitats and of wild fauna and flora in the European territory of the Member States to which the Treaty applies*." Article 2(2) then states that "*Measures taken pursuant to this Directive shall be designed to maintain or restore, at favourable conservation status, natural habitats and species of wild fauna and flora of Community interest*." The general principles and criteria that define favourable conservation status (FCS) are outlined in Article 1 (and described further below).

Both Directives require two main types of action (sometime referred to as pillars); firstly, the protection and conservation management of sites that are particularly important for EU biodiversity, and secondly the strict protection of certain species wherever they occur.

Another important feature of both Directives is the requirement for Member States to report on their implementation to the European Commission at regular intervals. The Directives both give indications on how reporting is expected to be carried out which now governs the actions of Member States regarding the way in which data are collected and analysed.

2.1.2 Protection and management of sites in the Natura 2000 network

The principal measure required by Member States to achieve the aims of the Directives is the protection and management of Special Areas of Conservation (SACs) designated by Member States under Article 4 of the Habitats Directive (for habitats and species of Community interest), and Special Protection Areas (SPAs) designated under Article 4 of the Birds Directive (for birds listed in Annex I of the Directive and for migratory species). These SACs and SPAs are combined under Article 3 of the Habitats Directive with the intention of forming "*a coherent ecological network"* referred to as the Natura 2000 network. The reference to a coherent ecological network here is important because it implies that conservation measures for sites should not be considered in isolation, and measures may be required in the wider environment to maintain ecological connectivity amongst the Natura 2000.

The requirements for conservation management of habitats under the Birds Directive are rather general and vaguely defined. Article 3(3b) is of most relevance, but this merely states that the preservation, maintenance and re-establishment of biotopes and habitats shall include amongst other primary measures the "*upkeep and management in accordance with the ecological needs of habitats inside and outside the protected zones*". Conservation management measures that must be taken by Members States in SACs are outlined in Article 6(1) of the Habitats Directive. Reference is again made to "*ecological requirements"* and the concept of preparing site management plans is suggested. Further clarification is provided in a European Commission report on Natura 2000 site management (European Commission, 2000), which notes that Member States (in accordance with the principles of subsidiarity) may decide upon which measures are appropriate.

Neither the Birds nor the Habitats Directives define the meaning of "*ecological requirements*", and their identification is the responsibility of Members States. However, the European Commission's guidance on Article 6 of the Habitats Directive (European Commission, 2000) notes that ecological requirements should include all the abiotic and biotic requirements needed to ensure FCS (e.g. air, water, soil and vegetation). Requirements need to be defined from scientific knowledge for each habitat and species according to the conditions at each site.

Under Article 6(2) Member States are required to take preventive measures to avoid deterioration and disturbances connected with a predictable event. These measures apply only to the species and habitats of Community Interest for which the sites have been designated, and should also be implemented, if necessary, outside the sites (European Commission 2000).

Articles 6(3) and 6(4) aim to assess and control projects on Natura sites that are not necessary for the management of the Natura features. Under these Articles projects will normally only be permitted if it has been ascertained by an appropriate assessment that they will have no adverse effect on the integrity of the site. Further guidance on the application of these measures is included within the European Commission guidance document on Natura 2000 management and in more specific guidance on Appropriate Assessment (European Commission, 2001). These measures have generally been well implemented in Member States as a result of the Commission's guidance and a number of legal cases that have clarified and strengthened the legal basis of Natura 2000 site protection[4].

2.1.3 Strict protection measures for species

The second type of action within both Directives is species protection measures. Those under the Habitats Directives are of particular relevance to this study and are therefore described in some detail below. The Habitats Directive so-called '2nd pillar', as laid out in under Articles 12 to 16, relates specifically to the strict protection of listed species (as well as their breeding sites and resting places) wherever they occur. In contrast to Article 6, which is limited to the Natura 2000 network, these measures apply to the whole of the territory to which the Directive applies and therefore covers instances where the species occur outside Natura 2000 protected sites. A distinction can be made between those provisions establishing a "*system of strict protection*" for species listed in Annex IV (Articles 12 & 13) and measures to control the exploitation of

[4] For example, see *Nature and Biodiversity cases ruling of the European Court of Justice 2006* http://ec.europa.eu/environment/nature/legislation/caselaw/index_en.htm

species listed in Annex V (Articles 14 & 15). In this report, our focus with respect to protection measures under Article 12 is on species listed under Annex IV.

While there are similarities between both pillars of the Directive, it should be noted that the 1st pillar requires restoration and improvement of sites as well as maintenance, while the 2nd pillar is more preventative in nature, requiring Member States to avoid and prevent those situations which could adversely affect the conservation status of a species.

An important component of the 2nd pillar of the Directive is Article 12, which addresses the specific question of the protection of animal species listed in Annex IV(a). Strict protection measures adopted under Article 12 should aim to fulfil the main objective of the Directive set out in Article 2 by contributing to the maintenance or restoration, at FCS, of Annex IV(a) species of Community interest. Under points (a), (b) and (c) of Article 12(1) only ***deliberate***[5] acts are prohibited and are to be avoided, whereas under point (d), prohibiting the deterioration or destruction of breeding sites and resting places, a deliberate act is not required as a necessary precondition. This results in a stricter protection regime for these areas, which are considered of prime importance to the life cycle of animals; i.e. all deterioration or destruction of breeding sites or resting places is to be effectively prohibited.

Annex IV(a) encompasses large, wide-ranging vertebrates to small invertebrates with very small home ranges. Some of these species benefit from the habitat provisions set out in Article 12(1)(d) while others do not and require the measures relating to pressures (a)(b)(c) (see Box 2.1).

Box 2.1 Text of Article 12 of the Habitats Directive on the strict protection of animal species

1. Member States shall take the requisite measures to establish a system of strict protection for the animal species listed in Annex IV(a) in their natural range, prohibiting:
   a) all forms of deliberate capture or killing of specimens of these species in the wild;
   b) deliberate disturbance of these species, particularly during the period of breeding, rearing, hibernation and migration;
   c) deliberate destruction or taking of eggs from the wild; and
   d) deterioration or destruction of breeding sites or resting places.
2. For these species, Member States shall prohibit the keeping, transport and sale or exchange, and offering for sale or exchange, of specimens taken from the wild, except for those taken legally before this Directive is implemented.
3. The prohibition referred to in paragraph 1 (a) and (b) and paragraph 2 shall apply to all stages of life of the animals to which this Article applies.
4. Member States shall establish a system to monitor the incidental capture and killing of the animal species listed in Annex IV(a). In the light of the information gathered, Member States shall take further research or conservation measures as required to ensure that incidental capture and killing does not have a significant negative impact on the species concerned.

Source: Council Directive 92/43/1992

[5] The word 'deliberate' covers not only situations where a certain result is directly intended but also those in which the result is *not* directly intended but the person ought to have taken into account the consequences that could follow from a given action.

The Commission considers that the full and effective implementation of Article 12 requires, on the one hand, the establishment of a coherent legal framework, i.e. the adoption of specific laws, regulations or administrative measures to effectively prohibit the activities indicated in Article 12(1), and, on the other hand, the application of concrete measures to *effectively* enforce these provision on the ground for the protection of Annex IV(a) species.

A fundamental question is therefore what measures must be taken to protect species listed on Annex IV of the Habitats Directive, as practical measures are not described in the Directive. Subsequent European Commission guidance on the application of Article 12 (European Commission, 2007) provides some clarification on this issue, noting that "*The definition, adoption and implementation of such measures fall within the competence of national authorities. The Habitats Directive thus enables the Member States to implement its provisions in a proportionate and appropriate manner, an approach that underlies all the provisions of the Habitats Directive, including Articles 12 and 16*".

Thus, it is the responsibility of national authorities to define the measures necessary to implement the prohibitive measures set out in Article 12 and to ensure the strict protection of animal species. But measures taken by the Member States should adequately address the objective pursued, (i.e. maintaining and restoring favourable conservation status, while also taking account of economic, social and cultural requirements and regional and local characteristics (Article 2(3)). To establish that the measures taken are contributing to this objective it is necessary to have adequate scientific knowledge and monitoring underway. As stated in the Commission guidance "*The circle is closed when the results of the surveillance of conservation status show that the measures chosen are actually appropriate and effective in the field*".

Importantly the guidance also clearly indicates that measures should be taken on a "*species by species basis*".

2.2 Objective setting and reporting under the Habitats Directive (92/43/EEC)

2.2.1 Reporting requirements

The strongest requirements for reporting on the status of species and habitats in the EU were introduced under the Habitats Directive in 1992. Under HD Article 11, Member States are required to undertake surveillance of the conservation status of the natural habitats and species of Community interest (i.e. those listed in Annexes I, II, IV and V), with particular regard to priority natural habitats types and priority species. Article 17 of the Directive requires Member States to produce a report every six years to outline the measures taken to implement the Directive, the main results of the surveillance referred to in Article 11 and an evaluation of the impact of measures taken on the conservation status of the habitats listed in Annex I and species listed in Annex II. Assessments under Article 17 should nevertheless cover *all* the habitats and species listed in the Annexes (including IV and V) and not just those within the Natura 2000 network.

Reporting under the first six-year period after the implementation of the Directive, 1994-2000, focused on progress of the legal transposition and implementation of the Directive, the establishment of the Natura 2000 network and administrative aspects.[6] The second reporting period, 2001-2006, was therefore the first

[6] http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2003:0845:FIN:EN:PDF

in which the conservation status of the habitats and species of Community interest were assessed. The European Commission produced a guidance document in 2006 to assist Member States to complete the reporting process (ETC/BD, 2006). An updated document has been produced for the third reporting period, 2007-2012 (ETC/BD, 2011).

2.2.2 The concept of Favourable Conservation Status

An important concept that was introduced in the Habitats Directive is 'favourable conservation status' (FCS), which habitats and species of Community interest must achieve. FCS is defined in Article 1 of the Habitats Directive (see Box 2.2). In simple terms, FCS 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).

Box 2.2 Definition of favourable conservation status for habitats and species under the Habitats Directive

Under Article 1(e), the conservation status of a natural habitat will be taken as 'favourable' when:

- its natural *range* and *areas* it covers within that range are stable or increasing, and
- the specific *structure and functions* which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future; and
- the conservation status of its *typical species* is favourable as defined in (i).

Under Article 1(i), the conservation status of a species will be taken as 'favourable' when:

- *population dynamics* data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats, and
- the natural *range* of the species is neither being reduced nor is likely to be reduced in the foreseeable future; and
- there is and will probably continue to be, a *sufficiently large habitat* to maintain its population on a long-term basis.

Source: Council Directive 92/43/1992 (Emphasis added)

The target of the Directive is defined in positive terms oriented towards a favourable situation that is defined, reached and maintained. Therefore, it is more than just about avoiding extinctions; a species or habitat type that is not directly threatened with a risk of extinction could still be considered to be in Unfavourable Conservation Status (UFC) if it is not shown to be prospering and with good prospects to do so into the future.

FCS is assessed across the whole national territory, or across biogeographical or marine regions if there are more than one such region within the country. It is especially important to note that it should be assessed for species and habitats both within the Natura 2000 network and across the wider countryside.

For reporting under Article 17, three classes of Conservation Status have been adopted: Favourable (FV), Unfavourable-Inadequate (U1) and Unfavourable-Bad (U2). In this respect, Favourable effectively represents a situation where the habitat or species can be expected to prosper without any further changes to existing management or policies. Unfavourable-Inadequate (U1) describes situations where a change in management or policy is required to return the habitat type or species to favourable status but there is no risk of

extinction in the foreseeable future, while Unfavourable-Bad is for species or habitat types in serious danger of becoming extinct (at least regionally).
The term 'conservation status' is also used in the context of Red Data Books or Red Lists of threatened species, either at global, regional scale or national scales. Used in this context, conservation status refers to an assessment of the relative risk of extinction of a habitat type or species, i.e. the distance from the least favourable scenario. In contrast, the three categories of Conservation Status under the Article 17 reporting refer to the distance from a defined favourable situation.

It should be noted that in the original Natura 2000 Standard Data Form (SDF) used the term 'conservation status' for describing the condition of each habitat type and species present at an individual site (rather than at the scale of a whole country or biogeographical region as is the case for Article 17 reporting). In the revised SDF, the term 'conservation status' is replaced with 'degree of conservation' to avoid any confusion between the terms. The European Commission guidelines (ETC/BD, 2011) recommend that the phrase 'Favourable Conservation Status' is not used to describe a single feature on a site.

Some Member States (e.g. Austria, Germany, United Kingdom) have developed methods for the evaluation of features (habitat types or species) at a local (site) scale, often using an indicator-based assessment (ETC/BD, 2011; JNCC, 2006). When the majority of occurrences of a habitat or species are covered by such methods, an aggregation of the results can directly give assessments of "area" and "structure and function" for habitat types and "population" and "habitat for the species" for species of the conservation status assessment at a biogeographical level (JNCC, 2006).

2.2.3 Favourable Reference Values

A key concept in the assessment of Conservation Status for habitats and species in the methods developed by these guidance documents is the establishment of Favourable Reference Values (FRVs) against which current status can be compared. Member States are encouraged to identify appropriate reference range and areas for habitats listed in Annex I and appropriate range and population for species listed in Annexes II, IV and V. These levels are used to evaluate whether the actual range, area and population are deemed to be 'favourable' or 'unfavourable'; and if 'unfavourable', whether the status is 'inadequate' or 'bad'. These values should be based purely on scientific grounds. They should also be based on evidence; but where understanding of the biology is insufficient or data are not available, expert judgement can be used as a starting point until further data becomes available.

The three FRVs were not defined in the Directive but subsequently agreed through discussions with the Scientific Working Group (Habitats), the Habitats Committee and workshops with Member States (ETC/BD, 2011).

Favourable Reference Range (FRR) for habitat types and species is defined as:

- *Range within which all significant ecological variations of the habitat/species are included for a given biogeographical region and which is sufficiently large to allow the long-term survival of the habitat/species.*

The guidance stipulates that the FRV must be *at least* the range (in size and configuration) as when the Directive came into force. If this range is deemed to be insufficient to support a favourable status, the reference for favourable range should be increased.

Member States are requested to consider the following factors when setting the FRR:

- current range;
- potential extent of range taking into account physical and ecological conditions;
- historic range and causes of change;
- area required for viability of species, including connectivity and migration issues; and
- variability including genetics.

Favourable Reference Population (FRP) – for species only, is defined as:

- *Population in a given biogeographical region considered the minimum necessary to ensure the long-term viability of the species; favourable reference value must be at least the size of the population when the Directive came into force; information on historic distribution/population may be found useful when defining the favourable reference population; 'best expert judgement' may be used to define it in absence of other data.*

Subsequent EU guidance has clarified that FRPs should exceed MVP (ETC/BD, 2011)[7]. In determining FRP, Member States can use information based on historic distribution and abundances, biological and ecological conditions, migration routes and modes of dispersal, and the population size capable of accommodating natural fluctuations. Where population viability assessments or evaluation of carrying capacity have been made, these can be used to inform the FRP.

Favourable Reference Area (FRA), for habitats only, is defined as:

- *Total surface area in a given biogeographical region considered the minimum necessary to ensure the long-term viability of the habitat type. The area should include necessary areas for restoration or development for those habitat types for which the present coverage is not sufficient to ensure long-term viability.*

The FRA must be at least the surface area when the Directive came into force. The FRA is often difficult to establish as the limited theoretical work available on minimum area required for long-term viability of habitat types is based on single sites rather than for a network of sites (ETC/BD, 2011). The guidance suggests the use of historic distribution and causes of change, potential natural vegetation, natural variation, actual distribution and variation, and requirements of typical species to assist setting the FRA.

Member States are only required to report on the status of a species or habitat across a biogeographical region *within* its territory. It is the role of the European Commission (though the European Topic Centre on

[7] https://circabc.europa.eu/sd/a/2c12cea2-f827-4bdb-bb56-3731c9fd8b40/Art17%20-%20Guidelines-final.pdf (p. 18)

Biological Diversity (ETC-BD)) to interpret the assessments from the Member States and provide an overall assessment of the conservation status across the biogeographic zone.

Note that the Directive came into force in different years for different countries, depending on when they entered the EU, meaning the year establishing the minimum favourable reference value will vary for the Member States.

2.2.4 Assessment of conservation status

The methodology for assessing conservation status of habitats and species was set out in the Guidance Document by the European Topic Centre on Biological Diversity (2006) and updated in 2011 (ETC/BD, 2011). The overall conclusion on conservation status for each species is made through the assessment of four separate parameters:

1. range;
2. population;
3. habitat for the species; and
4. future prospects.

Each parameter is to be assessed as either:

- Favourable
- Unfavourable-Inadequate; or
- Unfavourable-Bad.

Where information is very limited, and it is not possible to make a judgement, the Member State may report the parameter as 'Unknown'. However, as the Commission prefers that this judgement is avoided where possible, Member States are requested to place emphasis on expert opinion for species where data are lacking or incomplete.

For range, population and habitat for the species, the Member States are requested to provide information on the quality of the information used to calculate the actual values under the following headings:

- 'Good' e.g. based on extensive surveys;
- 'Moderate' e.g. based on partial data with some extrapolation; or
- 'Poor' e.g. based on very incomplete data or on expert judgement.

2.3 Reporting under the Birds Directive (2009/147/EU)

Obligations for reporting on biodiversity first originated under the Birds Directive of 1979 which requires Member States to produce a report every three years on the implementation of national provisions taken under the Directive (Article 12). Although the Directive does not specify that Member States must report on the conservation status of the species specifically, it stipulates that Member States must take measures to maintain the population of all species of naturally occurring birds, corresponding to ecological and scientific requirements, and ensure sufficient diversity and area of habitats for all species of birds. These requirements

(under Articles 2 and 3) imply that Member States must first define what these levels are, despite no provisions in the Directive on how this is to be done.

Until 2007, reporting under Article 12 primarily reflected the strict legal interpretation of the Birds Directive, with Member States reporting on the progress in implementing the Directive. In 2008, Member States agreed to explore new reporting procedures which would deliver data on the actual state and trends of bird populations, in a manner similar to the reporting under Article 17 of the Habitats Directive (European Commission, 2011).

The two main changes are:

- The change from a process-oriented exercise to one focussed on outcomes, primarily status and trends of bird populations.
- A change from a three-year reporting period to a six-year reporting period, largely synchronised with reporting under Article 17 of the Habitats Directive.

Member States are expected to report under this new format by the 31st December 2013. The new reporting has two parts:

1. *General reporting format*, which retains some reporting on progress implementing the Directive but encourages use of external links to other sources of information (e.g. work carried out for the protection of bird populations) to keep the text to a minimum.
2. *Reporting on the size and trends of individual bird species' populations and distributions*, which also includes reporting of threats and pressures affecting species for which SPAs have been classified.

The new guidelines (European Commission, 2011) for reporting under Article 12, include the concept of 'range', which is defined much the same way as for the reporting under Article 17 of the Habitats Directive – i.e. as "*the outer limits of the overall area in which a species is found at present. It can be considered as an envelope within which areas actually occupied occur*".

A summary of the information required under the second part of the reporting format is provided in Box 2.3.

Box 2.3 The bird species status and trends report format

The bird species status and trends report format comprises the following eight sections:

1. *Species information* – name(s) and season in which data are collected.
2. *Population size* - usually reported as minimum and maximum numbers of breeding pairs.
3. *Population trend* - both short term (12 years) and long term (since c. 1980).
4. *Breeding distribution map and range size* – usually sourced from national bird atlases.
5. *Breeding range trend* – both short term (12 years) and long term (since c. 1980).
6. *Progress in work related to international Species Action Plans (SAPs), Management Plans (MPs) and Brief Management Statements (BMSs)* – a summary of Member State actions to date.
7. *Main pressures and threats* – principal factors for species requiring SPAs only.
8. *SPA coverage and conservation measures* – a summary of conservation measures to address the pressures and threats faced.

Source: European Commission (2011)

3 INTERPRETATION OF ARTICLE 17 REPORTING UNDER THE HABITATS DIRECTIVE

The first guidance on reporting under Article 17 (ETC/BD, 2006) was produced in order to harmonise reporting across the EU and accompanied the reporting format adopted by the Scientific Working Group of the Habitats Committee. Although it establishes the principles on which Member States were expected to base their assessments of conservation status, it allows for substantial flexibility in interpretation and was non-binding in nature. At the time of writing, the 2000-2006 reporting period was the only period in which Member States had assessed and reported on the conservation status of the habitats and species of Community interest within their territory. The follow-up Member State reports were due in mid-2013.

A number of Member States provided transparent methodologies including Denmark (Søgaard et al, 2007) and the UK (JNCC, 2007; see Annex 4 for a summary of the UK approach). However, these approaches have not been summarised and compared before. Language barriers appear to have been an issue as the methodologies have been focussed for use by experts at the national level and therefore most frequently are in their national languages.

Note that this study has focussed on species assessments. However, in a number of cases, responses were obtained for the assessment of conservation status of habitats and we have therefore included these below (see Section 3.1.3).

The question of how European countries have used an ecological basis to determine conservation status of a species has two components:

1. the processes Member States have used to establish FRVs against which the current situation is assessed; and
2. the principles and assumptions that underpin the determination of conservation status.

FRV setting is an integral part of the assessments and, in many cases, is where ecological factors are considered against which the current level is assessed. For this reason, we include a review of the setting of FRVs in general terms in the response to Question (i) (i.e. how Member States have considered ecological factors in the assessment of conservation status; see Section 3.1) and look specifically at the question of how Member States have established FRVs for *widespread* species in Section 3.2.

3.1 Ecological basis for Favourable Conservation Status assessments and setting Favourable Reference Values

The results show that the methodologies for assessing conservation status can vary considerably within a Member State depending on the species in question; very specific FRVs may be established for certain species, while only very general FRVs are identified for others (e.g. based on the assumed levels when the Directive entered into force or assessments made by expert opinion). A number of Member States have nevertheless attempted to standardise the methodology in a manner that is consistent across taxonomic groups. None of the Member States, for which data have been collected to date on this question, applied a method identical to that of the UK (see Annex 4). See Table 3.1 for an overview of the approaches taken by the Member States for which responses were obtained.

Table 3.1 Summary of Member States' approaches to setting FRVs and assessing conservation status

Member State	Use of ecological factors in conservation status assessment
Austria	Very few population estimates are available for many species in 1994, and therefore experts judge whether the FRPs should be equal to or greater than the current level, taking into account recent trends between 2007 and 2012. For range, FRR is mainly based on historical ranges as close as possible to 1994 (but no earlier than 1950).
Flanders (Belgium)	FRP is set as the minimum population size of 5,000 individuals that are functionally connected (or the 1994 levels – whichever is larger). Exceptions are made for species with large generation spans with isolated meta-populations of less than 5,000 individuals provided the total sum is 5,000, and for rare species with large-scale migration patterns where the meta-population may range across borders. For range, 1994 levels are adopted unless judged to be insufficient to maintain healthy populations.
Denmark	In the absence of detailed research and where the monitoring is capable of estimating population numbers, the presence of 500 functionally connected mature individuals at the biogeographical region level was taken as the minimum FRP. FRPs set on basis of short-term trends (2000-2012 in the absence of long-term trend data), Minimum Viable Population (MVP), where known, and habitat for species (if range is favourable then it is assumed that the habitat is also sufficient). An assumption is made that 1994 levels were in UFC and therefore FRVs are generally set higher than these levels.
Estonia	Expert opinion is used to judge conservation status with no central guiding principles provided to experts. Upcoming Species Action Plans will provide a basis for assessing conservation status based on population dynamics, biological data and threats to the species.
Germany	FRVs have been set at the 1994 levels unless it is known that large losses have occurred since then. However, lack of data for 1994 means these levels are estimated. Scientific considerations are rarely considered in the setting of FRVs; instead objectives are set based on achievable targets within political and geographical constraints.
Ireland	FRVs have been set at the 1994 levels. In most cases, however, the absence of reliable data for 1994 results in FRVs set at the most recent assessment level (i.e. 2007) except where it was deemed to be insufficient or where there were known to be large decreases since 1994, in which case the FRVs are set higher than the most recent assessment level.
Italy	The assessment of conservation status was interpreted as ensuring the persistence of the species in the medium-long term based on expert opinion. Where populations had decreased since 1994, these were considered to be in UFC. If a population had less than 500 individuals at the biogeographical region level it could still considered to be in FCS provided it had either increased since 1994, or had a restricted but expanding range and there were no concrete risks of extinction in the medium term.
The Netherlands	Species experts judge whether the 1994 population levels were sufficient to be considered the FRP. If not, upper and lower estimates are made on basis of key factors (such as sufficient geographic distribution to avoid extinction through stochastic events). For many vertebrates, a minimum MVP size of 500 reproductive units (i.e. approx. 1,000 adults) is set. For a species to be in FCS, the lower estimate of species population estimate must be higher than the lower FRP estimate. This system was developed to deal with uncertainty in developing population estimates and in the setting of FRP. FRR is mainly based on the area and distribution required to accommodate the FRP as well as the actual and historical distribution.
Sweden	Where data exists, conservation status is established on the basis of sufficiency of suitable habitats and degree of connectivity. In the vast majority of cases, however, FRPs were set as those in 1995 (when the Habitats Directive came into force).

3.1.1 Understanding of Favourable Conservation Status (FCS)

The overall understanding of what constitutes FCS can be subtly different between the Member States. A general distinction can be made between those Member States which have focussed on ensuring range and population are at least at the level when the Directive came into force (i.e. the minimum requirement under the European Topic Centre on Biological Diversity guidance (ETC/BD, 2011)) and those which have taken extra steps to ensure the FRV represent a sufficient range and population to ensure long-term survival of the species.

The differences in interpretation of FCS by Ireland and Denmark demonstrate this point. In Ireland, a species was deemed to be in FCS if its population or range was equal to or above its value in 1994 – in line with the minimum requirements of the guidelines – meaning that the 1994 values became the FRVs. (Note: in many cases, lack of data for 1994 in Ireland resulted in the FRVs set at the most recent assessment level (i.e. 2007) except where it was deemed to be insufficient or where there were known to be large decreases since 1994).

In Denmark, it was assumed that most of the values in 1994 would have been in UFC - as the species were selected on the basis of being threatened - therefore it is rare that the 1994 level is taken to be the FRV. Instead, species experts describe how much further Denmark needs to go to achieve FCS compared to the current status, considering aspects such as short-term trends (2000-2012), MVP (if known) and sufficiency of habitat. Conservation status is considered at the biogeographical zone level.

3.1.2 Assessment of the population parameter

The Habitats Directive sets out to ensure that species are capable of maintaining themselves on a long-term basis as a viable component of their habitats within the context of the biogeographical region in which it occurs. A critical issue, therefore, is population size; as a population decreases in size, its continuation in its environment becomes increasingly likely to be compromised by a series of factors affecting survival and reproduction (Soulé, 1987; cited in Brambilla et al, 2010). The identification of Minimum Viable Population size (MVP) has therefore become popular in conservation biology as a means of establishing the threshold after which extinction becomes more likely (see Box 3.1).

Box 3.1 Theory of Minimum Viable Population (MVP) size

Identification of the minimum number of individuals expected to ensure the long-term persistence of a species or population has become an important aspect of conservation planning. This approach, known as Population Viability Analysis (PVA), typically utilises demographic models to explore the impact of demographic, environmental, genetic and other factors on the dynamics of wildlife populations. Often these are used to estimate a Minimum Viable Population (MVP), i.e. the smallest number of individuals required for a population to have a specified probability of persisting in its natural environment (Shaffer, 1981; cited in Traill et al, 2010). This is referred to as an *empirical* MVP (as they are often derived by empirical simulation) and are mostly probabilistic estimates of population persistence over a stipulated period (by arbitrary convention at least 90% certainty of persistence for at least 100 years) (Shaffer, 1981; cited in Traill et al, 2010). Alternatively, *evolutionary* MVP describes a population size sufficient to retain evolutionary potential in perpetuity i.e. the smallest population size where the loss of quantitative genetic variation (due to genetic drift) is matched by the gains through mutation (Franklin, 1980 (cited in Traill et al, 2010); Franklin and Frankham, 1998). Taking these definitions of the two MVP types, the evolutionary MVP can be expected to be larger than the empirical MVP.

There has been debate about the appropriate value for the effective population size (N_e) required for a population to retain its evolutionary potential (Franklin & Frankham, 1998; Lande, 1995). The disagreements have centred on the rate of effective mutations (i.e. the proportion of mutations that contribute to genetic stability); assumptions of low effective mutation rates (10%) result in a N_e of 5,000 (Lande, 1995) while Franklin and Frankham (1998) assume higher effective mutation rates that suggest that 500-1,000 individuals are sufficient to maintain evolutionary potential. The first meta-analysis of research dating from the 1970s into MVPs by Traill et al (2007) derived a cross-species frequency distribution of MVP with a median of 4,169 individuals (95% CI = 3,577-5,129).

While the Commission guidance encourages the use of PVAs, it acknowledges that in many cases they will not be readily available for most species, and where available, studies often refer to entire populations of a species which may exceed the border of the country or biogeographical region being assessed (ETC/BD, 2011). According to the Directive, the population of a species cannot be lower than the level present when the Directive came into force. Although the definition of FRP suggests that the FRP be set as the '*minimum necessary to ensure the long-term viability of the species*', i.e. a very similar concept to the MVP, the guidance advises that FRP should in fact be *higher* than the MVP, and that MVP estimates should act therefore only as a guide. This apparent divergence could be because Member States are expected to recognise the associated range of uncertainty inherent in population viability analyses (through for example, differences between a modelled / 'ideal' population and a real population, such as fluctuations in population size, unequal sex ratios, family size variation greater than a Poisson distribution and overlapping generations) as outlined by Traill et al (2010) (D. Evans, ETC-BD, *pers. comm*.). Alternatively, it could refer to the need to maintain evolutionary potential in perpetuity i.e. evolutionary MVP rather than empirical MVP. Clearly it would be useful to resolve this ambiguity in time for the next reporting period.

While a number of Member States have used MVP to determine conservation status or to establish FRVs, the approaches and assumptions have been different in all cases. The most prominent distinction is whether Member States adopted between 500-1,000 sexually mature adults as the likely MVP (Franklin & Frankham, 1998; Soulé and Wilcox, 1980) or if they have taken into account more recent reviews of MVP which indicate

that the figure for many species is likely to be between 3,577 and 5,129 individuals (Traill et al, 2007) and adopted the higher level of 5,000 (Lande, 1995).

The approach that appears to have been most consistently applied within a Member State is that adopted by Flanders, which sets an MVP for each species of Community interest which underpins the setting of FRPs (Mergeay, 2013). It is based on the findings of Traill et al (2007; 2010) which asserts that the number of individuals required to have an acceptable probability of enduring environmental fluctuations and catastrophic events is often thousands, rather than hundreds (see Box 3.2).

Box 3.2 Use of minimum population sizes in the setting of FRVs in Flanders

In Flanders, there are two main approaches to the setting of FRVs. For widespread species, the methodology is based on the concept of genetic stability, based on Traill et al (2007; 2010). The number of individuals present at the Flanders level must be at least 5,000 adult individuals. Although the individuals will, in most likelihood, be distributed across the region in localised populations, occurring in group sizes smaller than the reference value, FCS is met if these populations are functionally connected; i.e. resulting in regular exchange of genetic material between the sub-populations. Nevertheless, in cases where large but clearly isolated populations together reach the 5,000 threshold value (such as two populations of at least 2,500 individuals each - e.g. European Tree Frog *Hyla arborea*), this may still be considered in FCS, provided local populations meet specified conditions. The minimum population size of such local populations is a function of the generation span (i.e. the time it takes for individuals to reproduce). The longer the generation time, the smaller the local population size is permitted be, but the more of these smaller populations required. For example, *Triturus cristatus*, which has a reasonably long generation time, can have up to four isolated populations of circa 1,250 individuals (or two populations of 2,500 individuals or three population of 1,667 individuals etc.) adding up to 5,000 individuals at the regional level in order for the species as whole to considered to be in FCS at the regional level (see Mergeay, 2013 for further details of the methodology). These values, which have been set for each species, are currently being reviewed and the revised results will not be ready for the 2013 reports.

Rarer species, for which there are less than 5,000 individuals overall at the regional level, are generally judged to be in unfavourable conservation status at a regional level. This approach is deemed appropriate for species with low dispersal ability (e.g. amphibians, insects). For larger mammals with larger migration patterns, the real meta population could range across a region much larger than Flanders and it is not always possible to reach the FRP in Flanders alone. In these cases, if there are less than 5,000 individuals within Flanders and the population is not decreasing then it can still be considered in FCS. This system was used for several of the bat species.

Sources: the Flanders Case Study (see Annex 3) and Mergeay (2013)

Flanders is alone amongst the Member States analysed to have consistently adopted the use of MVPs in the assessment of conservation status, with the exception of animals with large ranges outside of the Flanders region. In addition, they have set the MVP at around 5,000 individuals, based on the most recent research, rather than 500 reproductive units. The Netherlands, in its 2013 reporting round (Ottburg and van Swaay, 2013 in press) has adopted a hybrid approach by setting the FRP as the level of 1994, except in cases where they deem this level to be insufficient (based on a range of ecological factors; see Box 3.3). Under this scenario, a new FRP has to be set, using an MVP based either on ensuring 500 reproductive units or on the

findings of Traill et al (2010) of approximately 5,000 individuals. For certain fish species, the guidance refers to Pouwels et al (2002), which specifically examined the viability of freshwater and anadromous fish in the Netherlands using LARCH.

Box 3.3 The use of MVP in the Netherlands in the setting of FRVs

Setting of FRP in the current 2013 reporting round is carried out by species experts in three steps, described below:

Step 1: The first step is to evaluate if the 1994 value was sufficient to ensure a sustainable survival of the population (based on number of mature individuals)? Experts justify their response on the basis of the following factors:

- migratory routes and dispersal capabilities (including internationally);
- gene flow and clines including genetic variation;
- sufficient population to survive natural fluctuations and to enable a healthy population structure;
- historical distribution and densities and causes of change; and
- the susceptibility to catastrophes.

Step 2: If the answer to the first question is 'NO', reasonable upper and lower limits (based on fluctuations) are set, specifying the numbers of mature individuals required based on the FRR, taking into consideration the minimal geographical distribution required to ensure long-term survival of the species in the case of local extinctions through stochastic events. In their response, experts should consider the factors above (in Step 1). For species that historically were significantly more widespread than in 1994, then the experts are asked to select several key areas (by species) which should be reinstated with viable populations in order for FRP to be met.

For many vertebrates, the rule of Soule and Wilcox (1980) is used, indicating that the minimum viable population size of 500 reproductive units at the national level should be present (therefore the number of adult animals for the species of approximately 1,000 individuals). If the 500 reproductive units represent a single connected population, then the population was generally considered in FCS. However, in some cases, it may have been judged that a species requires five such populations (e.g. based on factors such as historical ranges or how recently changes have occurred, e.g. Common Spadefoot Toad *Pelobates fuscus*). This is more likely with river species that are disconnected from each other, so as to mitigate against catastrophic events. For other organisms the methodology of Pouwels et al (2002) (for selected species fish) or Traill et al (2007) is adopted, the latter requiring greater numbers present to ensure MVP.

Step 3: the FRP is set as the number of mature individuals or accepted different unit, possibly with a margin. If the answer in Step 1 answer was 'YES' , then the 1994 population can be taken as the FRP value. If the answer was 'NO' the FRP is the suggested value (or margin) from step 2.

Source: Ottburg and van Swaay (2013)

The Netherlands have also adopted an approach to deal the uncertainty around population estimates when assessing conservation status. Population estimates are given higher and lower margins. In order for the

species to be considered in favourable conservation status, the lower estimate must exceed the FRP. For example, the population of the Sea Lamprey (*Petromyzon marinus*) was estimated to be between 5,000-10,000 individuals. As the FRP is judged to have been 10,000 the population was considered to be unfavourable-bad conservation status (5,000 is more than 25% under 10,000).

If some cases, upper and lower margins are also specified for the setting of FRPs reflecting the uncertainty in the literature regarding MVPs and to show their potential variation, which could be very significant (see Box 3.3). In general in these cases, the lower level is used as the FRP against which the population estimate is measured. For instance, the Common Noctule (*Nyctalus noctula*) was estimated to have a population between 4,000-6,000 individuals. As the FRP is judged to be 6,000-8,000, the population was considered to be in unfavourable bad conservation status (as 4,000 is more than 25% below 6.000). Similarly the Serotine Bat (*Eptesicus serotinus*) was estimated to have a population between 25,000-40,000 individuals. With an FRP of 30,000 (30,000-50,000) it was given an unfavourable-inadequate conservation status (note: it was Favourable in 1994, but had decreased since then).

The use of MVP, while generally considered useful, can create a number of issues, e.g.:

- The generation of species-specific MVPs requires adequate data which only exists in exceptional circumstances for highly studied species; all other species MVPs are based on generic MVP figures (ie not species-specific) taken from the literature.
- In order to assess conservation status, there needs to be good data to produce population estimates, which in many cases are lacking.

The requirement for detailed monitoring regarding the actual numbers of individuals is a significant issue. In Denmark, for instance, the monitoring system produces population estimates in only a very limited number of cases (i.e. for Fire-Bellied Toad and several vascular plants). Most of the monitoring in Denmark is presence/absence (i.e. range) rather than population and it is not realistic to expect that accurate population estimates will be possible even for the next reporting period. The lack of data to produce population estimates is a recurring theme for most of the Member States. In Denmark, there has been a move away from adopting MVP in the current reporting round following the publication of Traill et al (2007) which appears to cast doubt over previous methods being used (see Box 3.4).

Box 3.4. The use of MVP in Denmark in the 2007 reporting period

In 2007, where possible, Denmark attempted to use MVP at a biogeographical region level within Denmark, requiring the occurrence of population of a certain minimum size. In the absence of species specific analysis, the 2007 assessment used the theoretical level of 500 sexually mature individuals as guidance (based on Shaffer, 1981; cited in Søgaard et al, 2007). Each population did not require the presence of 500 individuals provided that the separate groups are functionally connected. If these separate meta-populations added up to 500 individuals at the biogeographcial zone level, the population parameter was considered to be favourable.

Where species specific literature was available, this was used. For instance, for Otter (*Lutra lutra*) a theoretical calculation of the MVP assessed it to be between 1,200 and 1,600 Otters (Wansink and Ringenaldus, 1991). This estimate was, however, based on the recommendation for an actual population of 500 sexually mature individuals in order to sustain sufficient genetic variation (Shaffer, 1981).

The level of detail provided in the Danish guidance varies between the species. For Fire-bellied Toad (*Bombina bombina*), for instance, the guidance specifies that a minimum of 1,000 adult individuals is required to obtain a viable population. It also specifies that increasing the suitable habitats with key features is required. As there were 2,500 individuals in 25 populations that are not connected, it was considered to be in UFC. This figure is taken in the absence of specific information, but this is now likely to be deemed to be outdated and insufficient and the authors of the report believe that a MVP of 5,000 should be adopted as a consequence of the findings of Traill et al (2007). Consequently, the 2013 assessment does not contain an MVP in the absence of a consensus or guidance on which figures to use.

Source: Denmark Case Study (see Annex 3)

In Italy, MVP was mentioned as a consideration in species assessments. Nevertheless, a species could be deemed to be in FCS even where the population is below the typical MVP recommended figures, if all parameters are considered to be favourable or expanding, and have not experienced a decline since 1994. For instance, there are estimated to be less than 500 Otter (*Lutra lutra*) individuals at the national level and the species is therefore classified under the Red List as Endangered. However, as the Otter is expanding its range in Italy, has numbers that are stable and greater than in 1994 and has favourable habitat conditions with no risk of extinction in the medium term, the species is considered to be in FCS.[8]

3.1.3 Assessment of the conservation of habitats

While the focus of this study is on species, two Member States (IE and NL) provided responses on how the conservation status of habitats is assessed.

In Ireland, a flexible approach is adopted to assessing habitat conservation status. In general, the 1994 levels are taken to be the Favourable Reference Area (FRA), unless it is known that these levels were already insufficient (such as highly fragmented old oak woodlands and lowland hay meadows) (Lynn & Weir, 2012). As there is insufficient information on the area of many of the habitats in 1994, the FRA is set as the current value unless it is deemed to be insufficient or if there have been known losses in area since 1994. Nevertheless, different approaches are taken for different habitats. In the case of Yew (*Taxus baccata*) forest, which has a restricted range, there are a limited number of places where it could naturally exist. Therefore the FRA is limited to those areas identified through research of where it is likely to have occurred and includes those areas where restoration projects have been initiated. For raised bog (currently 1% of original resource), Ireland added the current area of degraded raised bog to the current area of active raised bog and set this as the FRA. Nevertheless restoration of some areas of degraded bog will not be feasible[9] and therefore new areas suitable for restoration will have to be found elsewhere before the habitat will be considered in FCS.

[8] Note the wording in the Directive which states that population dynamics data should indicate that the species concerned is maintaining itself on a long-term basis.

[9] The feasibility for restoration was often related to the topography of the bog rather than other constraints.

The Netherlands adopt a particular approach for establishing the conservation status of habitats based on typical species. A distinction was made between three types of critical species:

- Exclusive: only occurs in that habitat type.
- Characteristic: always occurs in the habitat type but can also occur in other habitats.
- Constant: occurs both in and out of the habitat type but indicates good habitat conditions.

The conservation status of the first two species types is considered the most important in determining the conservation status of the habitat type. For assessing FRA, the conservation status of all three typical species is used, with the third species type representing an indicator of good quality.

3.2 Setting of Favourable Reference Values (FRVs) for widespread species

3.2.1 Context

Many European Protected Species have experienced large declines in populations in recent years and often continue to be threatened by ongoing pressures. Nevertheless, certain Member States are likely to remain relative strongholds for particular species. In these cases, the species may still occur in relatively large numbers and remain widely distributed across the countryside, albeit often in reduced numbers and range than was historically the case. The establishment of FRVs for species in these circumstances, therefore, plays a role in maintaining the species in areas that constitute a relative stronghold and is particularly important for the protection of the species at the European level.

For the purpose of this report, therefore, we use the term 'widespread' to refer to those European Protected Species that are both widely distributed across the countryside (including outside of protected areas) and occur in relatively large populations; i.e. do not appear to be threatened with extinction within the Member State in question. We exclude from the use of the term those species that are dispersed across the countryside but exist in very small and threatened populations.

The potential for controversy regarding widespread species is self-evident, as they are more likely to be present in areas of interest for development. They may also suffer from a public perception of their relative abundance and a lack of understanding of both recent declines and their importance at a European scale. With these considerations in mind, Natural England has asked for an overview of how Member States across the EU have established FRVs for widespread species within their own territories.

3.2.2 Analysis of approaches to setting FRVs for widespread species

According to the Commission's guidance document which defines favourable reference range, population and area, FRVs must be *at least* the value as that when the Directive came into force. For the Member States analysed in detail, this was 1994, with the only exceptions being Sweden (1995) and Estonia (2004).

In the simplest of scenarios, therefore, Member States have set the levels as those when the Directive came into force. In Germany, for instance, the FRV is only set higher than the 1994 level if it is know that there had been large decreases before 1994 – although this is less likely for widespread species. For Sweden, if no data are available for 1995, then the current values are assumed to have been the same as those in 1995 as widespread species are assumed to already be in FCS.

For three countries – Austria, Ireland and Italy – the FRVs for widespread species were mostly set at the current values (or those reported in 2007) as little or no data were available for 1994. Therefore, an assumption is again made that widespread species are in FCS. In Ireland, if there has been a decline since 1994, then it is assumed only that FRP is larger than the current level but still equal to the 1994 level – providing that the 1994 level was considered by expert opinion to be viable. Note that a decline in species abundance or distribution before 1994 level may have resulted in an FRV set above the 1994 level (see Box 3.5).

Box 3.5 Setting of FRVs where large declines in abundance are experienced before 1994 - Ireland

In the setting of FRVs of Otter (*Lutra lutra*), the authorities recognised that the 2007 population estimate (6,416 individuals) was 7.8% below the 1991 population survey estimate and 23.6 % below the 1982 figure. Given the significant decrease in status before 1994 and the extensive network of SACs now designated for the Otter, it was decided that a more ambitious target is justified and can be achieved. Consequently, the target for the otter population is to return all SACs to the status that was recorded within the Chapman & Chapman (1982) survey, while simultaneously ensuring that no further loss of status occurs outside SACs.

Source: D. Lynn, Department of Arts, Heritage and the Gaeltacht, *pers. comm*

See Table 3.2 for an overview of the approaches taken by the Member States for which responses were obtained. Note that the countries set FRVs at the biogeographical region scale within their country if there were more than one such region within their territory (see Box 3.6).

Table 3.2 Setting FRVs for widespread species

Member State	FRVs for widespread species
Austria	In general, FRVs are taken to be the current status (i.e. 2012) for range and population. An assumption is made that widespread species are already in FCS.
Belgium (Flanders)	FRR: often taken to be its current range (data do not exist for most species in 1994), which was often the whole of FL. FRP: no specific FRP are set (as further scientific research would be required) and therefore operators are applied to indicate whether FRP should be equal or greater than existing value. In assessments, Flanders adopts the MVP of 5,000 adult individuals that must be present at the Flanders level for widespread/rare species to be considered in FCS.
Denmark	DK adopts the same process for both widespread and rare species. They do not set actual specified FRVs, but use operators to indicate how much further is needed to meet FRV compared to the latest monitoring data for both biogeographical regions. It is rare that the 1994 level is taken to be the FRV as they judge most of these values to have been in UFC.
Estonia	FRR has been set as the whole of the terrestrial territory. The FRP has not yet been set for most species, including widespread species, but will be informed by forthcoming Species Action Plans.
France	Some FRVs established by using the IUCN Red List criteria in reverse.
Germany	For widespread species, FRVs are generally set at the 1994 values, except where it is known that big losses have occurred *before* then, in which case the FRV is set higher than in 1994. FRVs are proposed by the Lände and agreed at biogeographical region level with the German Federal Agency for Nature Conservation (BfN) and other Lände within that region. Monitoring regimes also report at biogeographical region level.
Ireland	In many cases there are no data for 1994, so the FRVs were often set as current range value if there was no evidence of decline since the Directive came into force. In some instances, fragmentation or recent losses were accounted for and the FRV was therefore set as higher than the current value (Lynn & Weir, 2012).
Italy	For widespread species, the FRVs were set as the current values as data were often not available for 1994. No FRVs were set higher than the levels estimated for 1994.
The Netherlands	Both FRR and FRP are set as the current levels, assuming that the actual situation more or less equals 1994, as figures may not be exactly the same over the reporting periods due to a lack of data completeness. In general (common) widespread species are considered to have been favourable in 1994 (and in the present day) unless there have been large declines since 1994. In cases of a serious decline in the species since 1994 and the levels in 1994 were considered to have been favourable, the FRV is set as the 1994 levels. For species that may occur in the whole country, or the whole Dutch part of the North Sea, the FRR is set as the entire territory. For species that only occur in specific areas (e.g. all the higher grounds of the Netherlands or all rivers) this specific part is set as FRR.
Sweden	If the species is widespread, it is assumed that it is in FCS and the FRV will be the same as when they joined the EU (i.e. 1995). If no data are available from 1995, the FRR is taken to be the current value. For FRPs, the vast majority were set as those in 1995.

Box 3.6 The setting of FRVs within a country with two biogeographical regions - Denmark

The assessment of conservation status for Otter (*Lutra lutra*) in Denmark demonstrates an example of how Denmark addresses setting of FRVs across its two biographical regions; Atlantic (ATL) to the west of the Jutland peninsula (left of the line splitting the peninsula in Figures a and b) and Continental (CON) which includes everything to the east of this line. For range, the distribution map (Figure a) shows the squares (10X10 km) where Otter has been positively identified, showing the distribution across almost all of the ATL squares compared to less than half in the CON region. The FRR is calculated (using the Range Tool offered by ETC on The Article 17 Portal). From this, it is concluded that FRR in the ATL region is approximately 13,222 km² i.e. covering the whole of the region and FRR>>18,204 km² (calculated range in CON) as shown in Figure b.

Population

Denmark is not able to report the number of individuals within its territory. Instead the number of positive localities/stations for Otters is used as relative measure of otter numbers. The monitoring program includes a total of approximately 1,250 stations of which 345 and 349 have identified the presence in ATL and CON regions respectively. From this it was concluded that FRP≈345 localities (ATL) and FRP>349 localities (CON). The ATL region is shown to be in FCS as it is widespread whereas it is known that the range of the CON population should be significantly larger given the species' absence in much of its former distribution.

Figure a. Otter distribution map (Denmark)

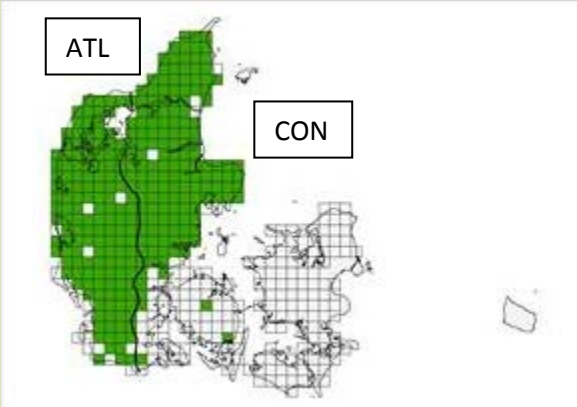
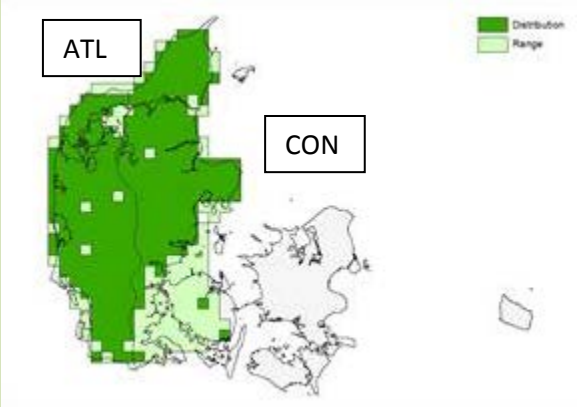


Figure b. Otter range map (Denmark)



4 IMPACTS OF PROJECTS OUTSIDE DESIGNATED SITES ON EUROPEAN PROTECTED SPECIES

This section of the report addresses how countries have assessed projects outside designated sites in terms of the impact on conservation status and their approaches to mitigation or compensation. This relates to the implementation of Articles 12 to 16 regarding the strict protection of species listed in Annex IV of the Habitats Directive. See Table 4.1 for an overview of the approaches taken by the Member States for which responses were obtained.

In most countries measures taken to protect species listed on Annex IV appear to be based on a literal translation of the Habitats Directive and adopt a strict approach to the protection of all individuals of the species, as is the typical practical outcome in the UK. However, the responses received from Flanders, Estonia, France and the Netherlands describe some practices that differ from those typically followed in the UK, and therefore these are described in detail below.

Table 4.1 Summary of approaches to assess projects' impacts on FCS for species outside designated sites

Member State	Approaches
Flanders (Belgium)	The assessment of the impact of projects on species is carried out on a case-by-case basis but should consider the conservation goals for the species set out in Paelinckx et al (2009). A decision is made on the basis of the existing conservation status of the species at the Flanders level and on the potential impact of the planned development on the species' local population and conservation status at the Flanders level. When a decision is taken that a development may go ahead, this may include the killing of individuals or destruction of nesting or breeding sites. Compensation measures may include translocation or offsetting depending on the conservation status of the species at the Flanders level.
Estonia	The means of protecting species outside Natura 2000 in Estonia is by the designation of limited conservation areas designed specifically for the species in question, within which projects and developments that are judged to negatively impact the conservation status of the species are not permitted. The impact of large activities planned within a limited-conservation area on the status of habitats and species has to be evaluated through an EIA; for small projects the relevant authority must be alerted a month in advance of any plans. No information was provided on how the assessments take place. Not every individual specimen is protected provided that the FCS of local and national populations are maintained.
France	Assessment of local conservation status is done on a case-by case basis; which involves a combination of field research to estimate current population levels and an analysis of population trends, the quality of the habitat and landscape and the species requirements. Each individual specimen does not have to be protected but the integrity of the overall population must be maintained and the local conservation status should not be adversely affected.
Germany	Where a development is likely to impact on a European Protected Species, an assessment has to be carried out evaluating the impacts. If only a single individual has been recorded, then protection is not required unless a species is known to be difficult to observe in the wild (i.e. a single individual may identify a population). Full protection is afforded for important features such as a breeding site.[10]

[10] http://www.ffh-anhang4.bfn.de/

Member State	Approaches
The Netherlands	Before the project takes place, the developer must commission an assessment on the impact of the development on protected habitats and species. This must consider the presence/absence of the species, the area covered, the size of the population and assessment of whether the project will affect the functionality of the breeding and resting sites.
Sweden	Individual specimens of are strictly protected. No development can go ahead which is foreseen to result in the death of the individuals or loss of breeding and roosting sites. In circumstances where a rare species in UFC are found (e.g. Barbastelle Bats), large infrastructure projects with likely negative impacts (such as wind farms), are not permitted and have been re-sited on numerous occasions. For widespread species in FCS such as the Northern Bat, households are often permitted to carry out renovation work during winter months when bats move from homes to damper and colder sites to hibernate.

4.1 Flanders (Belgium)

Summary of the approach in Flanders (Belgium)

- *The measures taken to minimise the impact of developments on European protected species depend on the conservation status of the species in Flanders as a whole. When a decision is taken that a development may go ahead, this may include the killing of individuals or destruction of nesting or breeding sites. For the European Protected Species, the mitigation hierarchy is applied[11] and adequate compensation is provided for any losses, which may include translocation or offsetting.*
- *Any decision is made on the basis of the impact of the planned development may have on both the conservation status at the Flanders level and on the local population and should take into consideration the conservation goals for the species set out in a Flanders-wide publication (Paelinckx et al, 2009). For species in UFC, the mitigation hierarchy and accompanied measures will be applied more stringently.*
- *Flanders is currently developing Species Protection Plans for all the species currently in UFC with the intention of specifying the measures that need to be taken in the case of developments impacting on the species. In addition, Flanders intends to develop a requirement for appropriate assessments for projects likely to impact species outside protected areas.*

The measures required to be taken to minimise the impact of developments on European protected species occurring outside Natura 2000 sites in Flanders depend to a large degree on the conservation status of the species in Flanders as a whole. In cases where a species is in FCS in Flanders, certain preconditions must be met to ensure that the development does not adversely impact on the local conservation status. The conservation goals at the scale of Flanders are described in Paelinckx et al (2009). This document also contains the measures to be taken for obtaining the FCS for each species. These measures may include:

- Ensuring the longevity of all existing populations.
- Maintenance of key habitat features and absence of disturbance.
- Maintenance of the current range and distribution of the species.

[11] The mitigation hierarchy is described by the Business and Biodiversity Offsetting Programme as: Avoidance, Minimisation, Restoration/Rehabilitation and Offsetting (http://bbop.forest-trends.org/pages/mitigation_hierarchy)

While Paelinckx et al (2009) does not specify what needs to happen with respect to developments impacting species outside protected areas; it can be used as a reference to help determine what measures need to be taken in such cases. In cases where the species has a UFC, and the mitigation hierarchy has been followed, these requirements are used to ensure adequate compensation (e.g. through the translocation of specimens or re-creation of nesting sites through biodiversity offsetting) takes place. For species in UFC, Species Protection Plans (the first of which are currently in preparation) establish the measures required to bring the species to FCS. These Species Protection Plans build on the regional conservation goals for Flanders, further defining what is needed at more local scales. The plans should contain measures that need to be taken in case of developments potentially impacting on species.

Appropriate assessment can currently only be applied to impacts on a Special Area of Conservation (SAC). However, when developing Species Protection Plans, the equivalent of appropriate assessments can be included as a necessary measure if developments are expected to impact on the species. In addition, for species of Flemish and European interest, derogations need to be obtained when these species occur within a planned development site. If needed, such derogations can contain requirements for businesses to compensate or limit damage to individuals of the species outside the SAC network. Such compensation only concerns individuals and their nest sites, breeding and resting places.

As an example, if developments are planned at a site hosting a population of Great Crested Newt (*Triturus cristatus*), a study is required to assess whether the local conservation status (considering both the numbers of individuals and the quality of the habitat) will be impacted. How the local conservation status is assessed will depend on the species and should take into consideration the conservation goals for the species set out in a Flanders-wide publication (Paelinckx et al, 2009). If no impacts are expected, a derogation to allow development can be provided without further conditions. This derogation may include the killing of individuals of the species. This decision is made on the basis of the condition of a species at the Flanders level and what the impact of the planned development may have both on the conservation status at the Flanders level and on the local population. If an impact is foreseen, the derogation can either be withheld, prohibiting the development or granted provided specified conditions are met. In the latter case, it must be clarified that no alternatives exist and any impacts must compensated, either through biodiversity offsetting or translocation of the individuals present. The intention is to further clarify these issues with the development of appropriate assessments for species in the future, in parallel to the Species Protection Plans described above.

The delineation of a local population is judged based on species ecology and the surrounding landscape in relation to the development; thus it is pragmatic and on a case-by-case basis rather than strictly on the scientific definition of a population.

4.2 Estonia

Summary of the approach in Estonia:

- *Estonia approaches species protection by prioritising those species that are of particular importance in Estonia, while maintaining sufficient protection for all species listed in Annexes II and IV of the Habitats Directive. It achieves this by recognising three categories of species in need of protection reflecting their level of priority; ranging from Category I (species at risk of extinction in the Estonian wild) to Category III (species that are not rare but experiencing pressures).*
- *Estonia ensures the protection of these species by identifying the key sites required to guarantee FCS of the species at the national level. For Category I species, all known sites must be protected; for Category II and III species, a minimum of 50% and 10% of the species' known sites respectively must be protected. However, very little protection is afforded to sites that are unknown to the authorities and not placed on a centrally held register (e.g. lofts in domestic homes).*
- *All specimens of animals, plant and fungi species listed under Categories I and II are strictly protected. The Ministry of the Environment is required to identify vertebrate species listed on Category III that may be killed outside of areas delimited for the purpose of protection of the species.The gathering of wild fungi and invertebrate specimens listed in Category III can be gathered provided this* 'does not pose a danger to the species' population in the habitat'.
- *Compensation measures are only required for large projects that require an EIA that have impacts in one of the protected areas, limited-conservation zones or species protected sites. Species Action Plans are being developed, which will define the threshold at which a site is considered to require protection (e.g. the number of pairs present).*

The restrictions placed on the habitats of Annex IV species depend on many factors, including the relative abundance of the species within Estonia, the type of development and the type of habitat in which the species occurs. Species Action Plans are being developed, which will define the threshold at which a site is considered to require protection (e.g. the number of pairs present that makes an area important). With respect to habitats, particular restrictions apply in forests and on coastal meadows. For instance, the Forestry Act establishes restrictions on logging in forest areas that do not apply to other habitats.

Under the Estonian Nature Conservation Act[12], species that require protection are divided into Categories I, II and III, where Category I contains those that require most protection and Category III those that require least protection. These categories include *all* species under Annexes II and IV. Species that are rare in Estonia and at risk of extinction in the Estonian wild are included under Category I, while Category III – which affords a lower degree of protection - contains species that are more common in Estonia even if they are rare at the European scale. In short, this method facilitates prioritisation of those species which are of particular importance in Estonia, while maintaining sufficient protection for all species listed in Annexes II and IV of the Habitats Directive. The conservation status of the species is used to determine whether a species should be in Category I or II. The level of protection for each category is specified under the Nature Conservation Act

[12] Article 30 of the Nature Conservation Act 2004 http://www.legaltext.ee/et/andmebaas/tekst.asp?loc=text&dok=X90008K3&keel=en&pg=1&ptyyp=RT&tyyp=X&query=looduskaitseseadus

(see Box 4.1). For instance, for Category I species, all known habitats are protected by the formation of protected areas and species protection sites.

The Ministry of the Environment is required to identify vertebrate species listed on Category III that may be killed outside of areas delimited for the purpose of protection of the species. The gathering of wild fungi and invertebrate specimens listed in Category III (including Annex II and IV species) is allowed to the extent that this does not pose a danger to the species population in the habitat.[13] However, this process is under review as it currently leaves too much to interpretation and has caused controversy. Currently, five of the Annex IV protected plant species are in the Estonian Category III, meaning that not every individual specimen is protected. However, the legislation is in the process of being changed to rectify this issue by moving these species to Categories I or II and those affording them strict protection. In addition, a number of non-Annex IV species will be moved to Categories I or II. This change is expected to be in force in first half of year 2014.

For species outside national protected areas (i.e. national parks, nature reserves and landscape reserves), a measure[14] is provided to designate 'limited-conservation areas' to ensure the FCS of species that are not covered by other parts of the Act. These are designated to protect a national protected object type without a delimited area designed specifically to implement the Habitats Directive. The impact of activities planned within a limited-conservation area on the status of habitats and species has to be evaluated through an EIA (for large projects) or subjected to a 'notification of limited-conservation areas' process whereby the owner of the site must notify the relevant authority a month in advance of any planned works.[15] The relevant authority must assess the impacts and prohibit any activities which are likely to endanger the FCS of the protected species and habitats for which the limited conservation area was formed including the destruction or harming of the habitats and significant disturbance of protected species. Alternatively, a species protection site can be established, which is an area located outside of a protected area which may be one of the features listed in the Act (typically an area surrounding an eagles nest but also including sites for plants, fungi and other species). In contrast to other protected areas which have a range of protection values in addition to species (such as habitats, landscapes, processes etc.), species protection sites (which appear on the Environmental Register) have a very species-specific regime with the sole objective of protecting the species targeted.

[13] Article 55, Nature Conservation Act. While the English wording refers to the "preservation of the species in the habitat", in Estonian it reads as "species population in the habitat". However, this is under review as it currently leaves too much to interpretation and has caused conflicts.

[14] Article 30, Nature Conservation Act.

[15] As outlined in Article 33 of the Nature Conservation Act 2004.

Box 4.1 Ensuring favourable conservation status of species in Estonia for the three national protection categories

According to Art. 48 of the Nature Conservation Act, the national protection categories require the following measures:

1. "*The protection of all known habitats of species in the Protected Category I shall be ensured by formation of protected areas and limited-conservation areas or determination of species protection sites.*
2. *The protection of at least 50 percent of known habitats of the Protected Category II entered in the environmental register shall be ensured by formation of protected areas and limited-conservation areas or determination of species protection sites based on the representativity of the areas and sites.*
3. *The protection of at least 10 percent of known habitats of the Protected Category III entered in the environmental register shall be ensured by formation of protected areas and limited-conservation areas or determination of species protection sites based on the representativity of the areas and sites.*
4. *In habitats of species in the Protected Categories II and III which have not been differentiated, individual specimens of such species shall be protected*."

The application of these percentages depends on the conservation status of the species in question; if the species is not in FCS, the percentage can be higher than the minimum values set by the legislation.

The scale of development is also very important as it determines the level of intervention open to the authorities to reduce impacts on protected species. For large-scale developments that require an Environmental Impact Assessment (EIA), an impact assessment has to be carried out to identify potential impacts on species of Community interest. In the case that permission for such a development is granted and significant impacts on protected species are expected, then compensation measures will be required. For projects which do not require an EIA, there are no measures in Estonia to require compensation for loss of habitat outside of Natura. In species protection areas and limited-conservation areas, no actions which are likely to significantly impact the species are permitted and therefore there is no need for compensation measures. However, for small- scale projects, such as loft conversions, the authorities are very limited in the restrictions they can place on developments unless the sites have been specifically identified within a centrally held register (known as the Environmental Register).

The type of habitat in which the species occurs may also influence the protection of species outside Natura 2000 sites. For instance, valuable forest habitats receive protection from logging under the Forest Act, which outlines a process to specify whether or not the logging can be permitted. However, no compensation measures are required if logging is permitted.

Bats: Most of the problems for bats relate to forest management rather than building developments. Breeding sites are held in the Environmental Register, and the Environment Board must consider any actions in these sites. There is a new action plan for bats, in which the pressures are included. All bat species are classified as Category II.

4.3 France

No official from the French Ministry or relevant authority was available to provide input within the time of the project. These results were provided by Rénald Boulnois of the environmental consultancy BIOTOPE who regularly assess the impact of projects on the conservation status of European Protected Species and therefore reflect the experience of one particular organisation. **These results have not been approved by a representative of the French Ministry or relevant authority and should only be taken as an indicative account of how projects are assessed in France.**

The key features of the approach taken by France are as follows:

- *Guidance is provided on interpreting the spirit of the legislation but there are no obligatory protocols about how to assess species or to determine conservation status. The methodology used to assess local conservation status is therefore done on a case-by case with respect to each development. This often involves a combination of field research to estimate current population levels and an analysis of previous years' data in the bibliography or discussion with local experts to establish population trends, considering also the quality of the habitat and landscape and the species requirements.*
- *In cases where there is no other information other than those collected in the field, other factors are used to interpret whether the number is favourable considering the other factors. IUCN conservation status is also used even if it doesn't always correlate with its protected status.*
- *Each individual specimen does not have to be protected but the integrity of the overall population must be maintained and the local conservation status should not be adversely affected. The mitigation hierarchy of impacts (i.e. to avoid, reduce, offset) is adopted and offsets are preferentially carried out in the local area.*

The French law states that any project that impacts on the European Protected Species must ensure "*the good completion of the life-cycle of the species*" which – in practice - is interpreted by BIOTOPE as "*the good completion of the life-cycle of the population of the species that is present in the study area*". The study area is interpreted to be not just the project area but the whole of the habitat used by the local population of the species. Each individual specimen does not have to be protected but the integrity of the overall population must be maintained and the local conservation status should not be adversely affected. The mitigation hierarchy of impacts (i.e. to avoid, reduce, offset) is adopted and offsets are preferentially carried out in the local area.

Assessing a species' local conservation status is done on a case-by case with respect to each development. Guidance is provided on interpreting the spirit of the legislation but there are no obligatory protocols about how to count the species or to determine conservation status, with the exception of the Grand Hamster D'Alsace (*Cricetus cricetus*) (an Annex IV species). Local conservation status has to be assessed through combination of field research to estimate current population levels. This must be compared with previous years data in the bibliography or discussion with local experts to see if the population has been stable or declining, considering also the evolution of the habitat and the landscape and the species requirements.

For certain rare species, more time and resources tend to be available and standardised protocols are often already in existence; e.g. mark and capture protocol etc. For lower priority species (e.g. Hedgehog *Erinaceus*

europaeus and Red Squirrel *Sciurius vulgaris*) BIOTOPE will normally adopt informal and less scientific approaches to assess conservation status (e.g. assessing the carrying capacity of the local habitat in order to estimate population numbers) due to time and resources constraints.

In cases where there is no other information other than those collected in the field, and therefore, they need to interpret whether the number is favourable considering the other factors. However, the consultants are free to develop their own methodology. IUCN conservation status is also used even if it doesn't always correlate with its protected status.

The approaches adopt to assess conservation status nevertheless depend on the species in question and the methods available. For instance, the Natterjack Toad (*Bufo calamita*) is very widespread and often present in artificial landscapes and quarries, but the process to assess conservation status is well established. The factors considered are the number of females and/or spawn observed, the quality of the habitat and the body mass index.

4.4 The Netherlands

Key features of this approach are:

- *Before the project takes place, the developer must commission an assessment on the impact, of the development, on protected habitats and species. This must consider the presence/absence of the species, the area covered, the size of the population and assessment of whether the project will affect the functionality of the breeding and resting sites.*
- *The assessment should establish and map out the size and location of the local population in order to determine the likely number of individuals to be impacted. Depending on the size of the project, it may be necessary to determine the presence or absence of individuals up to about one kilometre around the project area.*
- *Assessments are made of whether mitigation and compensation measures are adequate, with more stringent measures being required for species in UFC.*

The Flora and Fauna Act (2002) governs species protection and the regulation of hunting. Before any development on a site takes place, the developer must commission an assessment on the impact of the development on protected habitats and species (see Box 4.3 for example of Great Crested Newt). This must include an assessment of the impact on the individuals present as well as the impact on the species' local and national conservation status. If the development is likely to negatively impact on local conservation status, mitigation and/or compensation measures will be required to be put in place. These studies are examined by the Government Service for Land and Water Management (DLG), who will assess whether the mitigation and compensation measures are sufficient.[16]

[16] http://www.dienstlandelijkgebied.nl/en

Box 4.3 Assessment of conservation status of Great Crested Newt in the Netherlands

In order to determine impact of a project on Great Crested Newt, the following questions have to be considered:

- Is the Great Crested Newt present?
- What is the area inhabited by the local population?
- What is the size and conservation status of the population affected by the proposed project?
- Is the functionality of the breeding sites and permanent resting places likely to be affected by the project?
- What elements of the activity can/should be mitigated or compensated?
- How successful are these measures likely to be?
- What further measures should be taken to fulfill the duty of care?
- Are there no satisfactory alternative solutions? The answer must be substantiated.
- What legal requirement is causing the work to be performed? The answer must be substantiated.

To evaluate the impact of the project on the conservation status of the Great Crested Newt, the assessment should establish and map out the size and location of the local population in order to determine the likely number of individuals to be impacted. Depending on the size of the project, it may be necessary to determine the presence or absence of individuals up to about one kilometre around the project area. The study should consider that small changes to key habitat can result in large losses in individuals.

The determination of the impact on local conservation status should also consider the potential cumulative effects of other possible activities in the area. Consultation of the National Database on Flora and Fauna, which provides up to 15 years distribution data, is recommended to help assess local conservation status.

If a species is in UFC, then tougher measures are required. Documentation of the measures that have been taken for the 20 most common species for which measures have been required is available on the Dutch website.[17] These documents contain technical detail such as the type of activities and the time of year to avoid, how to create suitable habitat for species etc.

Although a robust system is in place to protect all species, the system relies on strict enforcement to ensure its functioning. Unless authorities are alerted to a possible conflict between developments and the presence of protected species, developers often do not ask for permission before a development begins. One interviewee suggested that many of the compensation measures are very often very simple, e.g. the putting up of bat boxes in order to replace much larger loft habitats that have been destroyed (see Box 4.4).

[17] http://www.drloket.nl/onderwerpen/vergunning-en-ontheffing/dossiers/dossier/flora-en-faunawet-ruimtelijke-ingrepen

Box 4.4 Protection of Common Pipistrelle (*Pipistrellus pipistrellus*) roosts in households in the Netherlands

For small projects that do not require EIAs, such as home renovations, the households responsible must submit an impact assessment detailing the likely impact of the development. The competent authority, before granting permission, must be satisfied that the development will not adversely affect the conservation status of the local population, and can prescribe mitigation or compensatory measures to be taken. The Common Pipistrelle (*Pipistrellus pipistrellus*), a widespread species in FCS, is the species for which this process is most used for. Indeed, a potential weakness is that the same protection measures are used for common species as for much rarer and endangered species.

4.5 Sweden

Summary of the approach in Sweden

- *Individual specimens of are strictly protected. Developments which are foreseen to result in the death of the individuals or loss of breeding and roosting sites are frequently refused permission and alternative locations have to be found.*
- *For widespread species of bat in FCS, households are often permitted to carry out renovation work during winter months when bats are not present, without the need for compensation measures.*

Both bats and newts have created issues with respect to planning laws and restricting development. Initially, when the law was first implemented, a strict interpretation was taken of Article 12, prohibiting any disturbance of roosting or breeding sites of protected species listed in Annex IV of the Habitats Directive. Subsequent changes to practice have resulted in greater flexibility; for instance allowing the movement of newt populations by the creation of new ponds in neighbouring sites. The law implementing the Habitats Directive, including Article 12, is the Species Protection Act[18].

Bats: Even for common species in Sweden that are in FCS, such as Northern Bats (*Eptesicus nilssonii*), the renovation of homes in a manner that damages the site is strictly prohibited and there are only very few cases where permission has been granted. In theory, according to the law, these roosting sites should not be altered in any way, but in practice households are permitted to carry out renovation work during winter months when bats move from homes to damper and colder sites to hibernate. Compensatory measures are not used in such cases. The only requirement in these circumstances is species identification. Only in extreme situations would a derogation to alter a roosting site be allowed, usually only for common species and not for threatened such as Barbastelle Bats (*Barbastella barbastellus*). Nevertheless, some exceptions have been made even for rare bats. For instance, a family was recently allowed to move a population of 500 of Pipistrelle Bats (*Pipistrellus pipistrellus*) – which are extremely rare with only 2 populations in Sweden – from their home to a neighbouring roosting site. It is worth noting that a significant threat to bat species relates to the loss of foraging through conversion of pasture to forestry, which does not require an impact assessment and is not covered by the species protection measures.

In theory, no development can go ahead which is foreseen to result in the death of the individuals or loss of breeding and roosting sites. When a development is in planning stage, distribution data are used to inform

[18] http://www.notisum.se/rnp/sls/lag/20070845.htm

the EIA process. In circumstances where a rare species of bat in UFC are found (e.g. Barbastelle Bats), large infrastructure projects with likely negative impacts, such as wind farms, cannot be constructed and have to be re-sited. This has happened on several occasions. In the case of a high population of common species in FCS, such as Northern Bats, that would be greatly impacted by a development, it is thought that developments could be allowed to go ahead with the condition of suitable mitigation measures being applied such as stopping the turbines in particular areas or times of the year or regular monitoring. While these measures have been suggested in the past, no case studies were known by the contact at SLU where these mitigation measures have in fact been implemented.

Great Crested Newts: A similar strict approach is taken for Great Crested Newts, with all individuals protected and compensated for if unavoidable impacts occur, irrespective of the conservation status of the population. This is leading to substantial requirements for newt surveying, habitat creation and translocation measures in some areas where the species is relatively widespread (such as Gothenburg city)[19].

[19] Jorgen Sundin, SEPA pers comm.

5 APPROACHES TO DETERMINE APPROPRIATE POPULATION LEVELS OF WILD BIRDS AND SUFFICIENT EXTENT AND QUALITY OF BIRD HABITAT

Eight Member States provided information on approaches to setting appropriate population levels (AT, FL, DE, DK, EE, IT, NL and SE). Italy has undertaken the most rigorous approach to identifying appropriate populations levels of birds following a strong ecological rationale based on demographic trends, current population size and the MVP concept. Goals from other Member States often take a more pragmatic approach based on historical levels with less consideration to the biological requirements of the species. Of the eight responses, Austria and Estonia have the least developed approaches and do not set appropriate population targets for wild birds. Table 5.1 provides a summary of the responses.

Table 5.1 Summary of approaches adopted to set appropriate wild bird populations and sufficient extent and quality of bird habitat outside of SPAs.

Member State	Approaches adopted
Austria	No definitions developed for appropriate levels of wild bird populations or sufficient extent and quality of bird habitat.
Flanders (Belgium)	Population targets set for all Annex I species by analysing population data from mid-1970s to 2007: if trend negative during this period, 1970s value was adopted as target; if positive, then maintaining numbers at 2007 value became the target. Range data and the changes in the availability of suitable habitat for each species since the mid-1970s is provided and where possible species are allocated a range reference value.
Denmark	Populations targets established by analysing fluctuations in bird populations over past 20-30 years (where good quality data exist) with the lower limit of this fluctuation established as the target (assuming the population is judged by experts to be in FCS).
Estonia	No appropriate bird population target levels are set except for certain highly threatened species. However, forthcoming Species Action Plans are expected to establish the ecological conditions considered necessary to achieve FCS.
Germany	National legislation requires the Lände to assess the status of bird populations; to date only a limited number have produced evaluation matrices to assess conservation status. No details of these were found for this study.
Italy	The FRVs for birds have been investigated through analysis commissioned by the Ministry of Environment but are non-binding and are used by the Regions at their own discretion. The study to define FRVs for populations of wild birds has been based on demographic trends, current population size and MVP concept. For species with more than 2,500 pairs and a widespread distribution, FRV is defined in terms of breeding density at national and local scales. For species with restricted ranges, FRVs were established for individual populations (47 in total belonging to 21 species).
The Netherlands	For stable or increasing populations, the target is set as the average breeding population in the year 1999 and 2003. For declining populations, a target level somewhere between 1981 and 2003 (most commonly the mid-1990s) is selected on the basis of what is considered to be realistic and achievable through restoration measures.
Sweden	In 2007, FRVs for wild birds under Annex I were established using 1995 values as the minimum, with higher levels set if this appeared to be necessary according to IUCN Red List guidance. An estimation of carrying capacity of remaining habitats is also carried out.

5.1 Italy

Italy has produced a very thorough analysis defining FRVs of Italian bird species included in Annex I of the Birds Directive based on the framework set out for the Habitats Directives. The approach is based on demographic trends, current population size and the MVP concept. FRVs based on population viability analysis (PVA) were provided for populations of less than 2,500 pairs. For widespread species with more than 2,500 pairs, the FRV is expressed in terms of breeding density at different spatial scales (national and local) (e.g. Cory's Shearwater *Calonectris diamedea*, Black-crowned Night Heron *Nycticorax nycticorax*, and Little Egret *Egretta garzetta*).

The PVA method of establishing FRVs, which considers factors such as breeding success and mortality rates, allows for a degree of flexibility depending on the current status of a population in order to reflect the specific challenges of reaching FCS. This flexibility is demonstrated by the setting of FRVs for the Eleonora's Falcon (*Falco eleonorae*), an endemic Mediterranean bird of prey, which occurs in two populations in Italy; a small population in Sicily (~176 pairs) and a relatively larger population in Sardinia (~500 pairs). Using all known productivity values in Italy, the mean annual productivity was estimated to be 1.26 (± 0.39 SD) fledglings per pair. The Sardinian population, which has good chances for long-term survival given current average productivity, would face a high risk of extinction were its productivity to fall to 1.1 or less – a circumstance which has occurred already in Italy. In this situation, the MVP (*P = 1%*) would be 900 pairs. Thus reaching this number of pairs would guarantee survival even under scenarios slightly less favourable than the current situation and is therefore proposed as the FRP for the Sardinian population. The Sicilian population, on the other hand, shows a relatively high (>10%) probability of extinction over the next 100 years. Using the average productivity recorded in Italy, the MVP (*P = 1%*) would be about 320 pairs, providing the productivity does not dip below 1.26. Given that the current population is significantly below this figure, this level of risk has been accepted and recognised as its FRP, acknowledging that it would represent a much better chance of survival than the current situation despite representing a higher level of risk of extinction than the FRP for the Sardinian population (Brambilla et al, 2010).

The FRVs set by these studies, which were commissioned by the Federal Ministry of Environment, Land and Sea and carried out by the BirdLife Italian partner (LIPU), are nevertheless non-binding and are used by relevant authorities at their own discretion. An attempt will be made to continue the progress made on reporting on the conservation status of birds, but this requires a process of co-operation with the regions. There is particular sensitivity over the assessment of conservation status of bird species for which derogations have been granted to allow limited hunting.

5.2 Denmark

In 2006, Denmark assessed the conservation status of breeding and migratory wild birds within its territory using criteria similar to those which it applies to species under the Habitats Directive. As of 2006, Denmark had assessed the conservation status of 41 bird species on Annex I of the Birds Directive and 33 species of regularly occurring migratory birds (Pihl et al, 2006).

The criteria for assessing conservation status on a national scale are developed on the basis of the three overall criteria following those defined in the Habitats Directive:

- viable populations, which are stable or increasing;
- distribution [range] area is stable or increasing; and
- areas of suitable habitat that are stable or increasing.

For each species, a set of specific criteria were established which are to be improved upon in time after results of further monitoring are made available. The long term objective is to "*maintain the known population sizes of bird species, which are in a favourable conservation status*" (Søgaard et al, 2007).

Appropriate levels of bird populations were set by analysing the fluctuations in bird populations over the period for which data of sufficient quality exist (typically covering the past 20-30 years). The levels were set by establishing the lower limit of this fluctuation as the target level, with the assumption that this level must be sufficient to maintain adequate population levels if the population now remains in FCS. No additional work was carried out to establish if this was genetically sufficient in the long-term. An assumption was made that most species have been in FCS over the last 30 years and that minimum levels for this period are sufficient provided that the species is either *stable or increasing* in numbers. This is also a pragmatic decision as it would be more practical to ensure the population remains either stable or increasing compared to this lower baseline. Nevertheless, the guidance attempts to set the number of breeding pairs that must be present, the distribution and areas of occurrence and the state of the habitat that must be met in order for the species to be considered in FCS.

The Ministry of Environment is developing conservation plans for each of the SPAs and is investigating whether there is sufficient habitat at the protected area level. These consider the targets set for the species in the 2006 report (Pihl et al, 2006) but focus on maintaining conservation status at the local rather than at the national level.

No work has been done on sufficient extent and quality of bird habitat outside of SPAs, and only a very limited number of species action plans covering species outside protected areas have been developed. Nevertheless, BirdLife International Denmark has developed action plans for a number of species such as Golden Plover (*Pluvialis apricaria*), Red Kite (*Milvus milvus*) and certain saltmarsh waders (including Dunlin *Calidris alpina* and Bar-tailed Godwit *Limosa lapponica*). Although these have not been adopted at the national level, they are used to some extent by national government as the basis for delivering management measures.

The appropriate levels set in the 2006 report (Pihl et al, 2006) are not referred to in recent publications such as a recent report on bird trends 2004-2011 (Pihl et al, 2013), nor is any assessment made of their conservation status.

5.3 Flanders (Belgium)

In 2007, the Flanders government commissioned a report of the conservation status of all the birds on Annex I of the Bird Directive and their habitat types. This resulted in Flanders establishing population level targets for all Annex I breeding bird species over their entire territory, not just in SPAs (Paelinckx et al, 2009). Progress made towards the target is due to be reported every year, operating as an indicator of progress on

biodiversity. Although Flanders cannot be certain if these targets are adequate, each reporting cycle results in an evaluation and, if needed, adjustment of the conservation goals.

The targets were set as follows:

1. A reference period from just before the Birds Directive came into force (mid-1970s) was established.
2. The population of the reference period was compared to the 2007 population.
3. For species with a negative trend in this period, the 1970s population value was set as the goal.
4. For species with a positive trend, the 2007 value is set as the target population. A decision was taken to specify that the target population could not be higher than its current level if the trend has been positive.

The selection of the mid-1970s as a reference period was made for practical reasons, as Flanders did not have good quality data before the 1970s. Nevertheless, Flanders is confident that only a few species (e.g. Corncrake – *Crex crex*) experienced declines in numbers before the 1970s. For a significant majority of the species, population declines began after the 1970s. Therefore, setting this period as a baseline is deemed to be likely to refer to species with a FCS in terms of population size.

The assessment also considered data on the home range (which is larger than the distribution) and the changes in the number of habitats since the mid-1970s for each species. The changes were identified by a combination of information on distribution and local knowledge about the changes to the habitat. They also used a Belgian study from the 1970s to identify land use and habitat types and compared this to modern data. For some species, the 1970s habitat extent and quality was set as a reference value, e.g. for Black Woodpecker (*Dryocopus martius*), based on which there should be a minimum home range of 7,000km^2 (i.e. its current distribution over the country) and a minimum population of 850 breeding pairs occurring within its typical habitat. It should be noted that Flanders does not attempt to define the minimum amount of typical habitat required, because there is inadequate data on habitat area requirements.

5.4 The Netherlands

The Netherlands has established population targets for each bird species in Annex I of the Birds Directive, using two approaches. For *declining* populations, a level somewhere between 1981 and 2003 is selected on the basis of setting a target that is considered to be realistic and can be reached through feasible restoration measures. For this reason, a target equivalent to the population levels in the 1990s is most commonly set; i.e. if the declines have been very significant then it is considered unlikely that population levels equivalent to those of the 1980s can still be achieved.

For *stable or increasing* populations, the target is set as the average breeding population between the years 1999 and 2003. This time period was chosen for stable populations as it represented the most recent five-year period for which a complete dataset of all sites was available. In addition, if an earlier time period had been chosen, species whose populations had increased since that date would have had lower targets than their current population levels. Attempts are made to ensure a more ecological basis to setting target values although no details were provided on how this has been done.

No specific levels are set for bird species habitat requirements, but it is led by the population goals. If the population level is below the national target then this will dictate if habitat restoration is required to return

it to the population goal. This translates into site level goals. There is no instrument for restoring habitat outside of SPAs – except for farmland birds and where it could contribute to the National Ecological Network.

5.5 Sweden

In advance of the 2007 reporting, Sweden established FRVs for the Annex I species of the Birds Directive in a manner similar to that adopted for species under the Habitats Directive; i.e. establishing FRR and FRP for the 67 species relevant to Sweden. Population levels in 1995 (when Sweden entered the EU), were set as the minimum allowable value for the FRVs. PVAs were not carried out to establish if 1995 levels are adequate, but higher levels were set if this appeared to be necessary according to IUCN Red List guidance (e.g. 1,000 breeding pairs used for some species as a guide). Every species was assessed to determine the carrying capacity of the remaining habitat (e.g. the number of nesting sites that locations can support), taking into account landscape change. Due to political considerations, however, these FRVs have not been used officially in conservation management.

Discussions are ongoing with respect to the future assessments. They intend to use the BirdLife approach – which is a modified IUCN Red List system measuring the risk of extinction – rather than persisting with the FCS system of setting positive objectives. This system measures the decline in population over three generations (over a minimum 10 years) to indicate extinction risk. An exception is made (under Criteria C of the regional guidance[20]) for species that have undergone very large declines but have more than 20,000 mature individuals present. As an example, Salmon (*Salmo salar*) has experienced 95% declines in the last 100 years but is currently stable at 50,000 individuals and therefore considered of least concern (no bird example was provided by the expert). Sweden is considering the possibility of using the Red List criteria to set minimum levels to be maintained for bird species; thus it would be accepting a lower level of biodiversity but at least ensuring that the risk of extinction is being managed.

5.6 Estonia

Estonia is in the process of developing Species Action Plans for most species of Community interest including bird species. These plans should, in theory, establish the FRPs for species based on an appropriate indicator (e.g. the minimum number of individuals or the number of populations). For certain highly threatened species in Estonia (classified as Category I species) such as Golden Eagle (*Aquila chrysaetos*), White-tailed Eagle (*Haliaeetus albicilla*) and Lesser and Greater Spotter Eagles (*Aquila pomarina* and *Aquila clanga*), experts have been able to provide FRPs due to extensive research of population dynamics.[21] The University of Tartu published two articles on how to judge conservation status, which was used as a basis for the assessments carried out before Estonia joined the EU (Lõhmus et al, 2001; Lõhmus, 2001). Estonia is at the edge of the distribution for many species and many species are migratory, so assessment of FRP will rely to a large extent on expert judgement in each case. State monitoring is being increasingly harmonised with monitoring under the Habitats Directive.

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20 http://www.iucn.org/about/work/programmes/species/our_work/the_iucn_red_list/resources/guidelines_application/

21 The interviewee was not able to produce these studies to provide more details.

6 CONSIDERATION OF FRVS AND APPROPRIATE BIRD POPULATIONS IN CONSERVATION OBJECTIVES FOR NATURA 2000 SITES

Out of the eight responses for this question, only Austria and the Netherlands responded definitively that national goals are not considered at protected site level; in Sweden SPA objectives do not consider the national target but no response has been given for SACs. In Flanders, Estonia, Denmark and Ireland there has been some consideration of FRVs and appropriate bird populations while in Italy, only certain SPAs have taken into account appropriate bird population figures but incorporation into SPA targets is not obligatory. See Table 6.1 for an overview of approaches taken by Member States for which responses were obtained.

Table 6.1 Summary of approaches by Member States to consider FRVs and appropriate bird populations in conservation objectives for Natura 2000 sites.

Member State	Approaches adopted
Flanders (Belgium)	Sets regional conservation objectives which are translated into goals for SACs and SPAs. These are prioritised for their relative importance with respect to the proportion of the population or distribution of the species or habitat that they hold.
Denmark	Management plans are being finalised for all SACs (expect for recently designated marine sites) in which the objectives are expected to refer to FCS. SPAs focus on maintaining conservation status at the local rather than at the national level.
Estonia	Management plans are currently being finalised for Natura 2000, which are expected to take into consideration the conservation status of the species.
Ireland	Work carried out to establish the desired function and structure of habitats has helped significantly in establishing the goals for SACs, although it is not clear if the FRV values themselves are being used to set site level conservation objectives. If there was a loss of area or population since the directive came into force then the target is to restore to the required figures.
Italy	Conservation objectives at site level do not typically refer to the national FRVs. SPAs may adopt goals based on detailed analysis of MVPs of bird species on Annex I of the Birds Directive (see above) but these are not mandatory.
Sweden	As no national objectives for population or habitat for birds are currently adopted, these are not considered in the setting of objectives at SPA level which are therefore site specific.

Flanders appears to have the most developed system of integration of targets between regional (i.e. Flanders) and local levels. Recognising that a gap exists between the need to ensure FCS for species and habitats at the Member State level and the formulation of conservation objectives at the protected site level, Flanders has adopted a system which starts with the setting of regional conservation objectives before site level objectives are formulated (Louette et al, 2011). These regional conservation objectives have the advantage of providing a framework for setting conservation objectives within and outside the Natura 2000 protected areas. Given that most of the species and habitats assessments were in UFC, the framework proposes a 42% increase in area for habitats and active conservation measures for 78% of the species.

Flanders attempts to avoid tensions with stakeholders and reduce the pressures from policy makers by first establishing conservation goals at the regional level with the input of high level stakeholders in order to temper discussions about conservation objectives and their implementation at the Natura 2000 level (Louette et al, 2011). In cases where regional conservation objectives are not met, the objectives are translated into conservation objectives for each SPA and SAC. These regional conservation goals prioritise

the SACs and SPAs for their importance with respect to the relative amount of the population held within them (if data are available) or the proportion of their distribution. Although consultations at the regional level result in the final decision on regional targets, consultation at the local level helps establish local conservation goals which in turn influences the regional discussions. From 2019, there will be an evaluation of the regional conservation goals; if they have to be adapted, then this will affect the local SAC and SPA goals which will also have to be reviewed. In addition, Flanders (represented and endorsed by all sectors) has committed itself to realise 70% of the conservation objectives that have been established under this system by 2020 as part of a long-term agreement (Vlaanderen in Actie, 2009).

In Estonia, conservation objectives at the site level of SACs and SPAs have, in certain cases, taken account of FRVs. Management plans are currently being finalised for Natura 2000, and these should in theory take into consideration the conservation status of the species. There are already Protection Rules set at national level which identify the species and habitat types that should be present at the individual sites and the types of management measures and prohibited actions, but these do not quantify the amount of each habitat and species that need to be present. These do not necessarily correlate with FRVs.

Ireland is behind in the setting of objectives, although work carried out to establish the desired function and structure of habitats has helped significantly in establishing the goals for SACs. It is not clear if the FRV values themselves are being used to set site level conservation objectives. For many species, the monitoring commissioned for Article 17 reports has added to the knowledge of the location of sites, thus informing the updating of new FRVs (e.g. *Vertigo geyeri, V. angustior and V. moulinsiana*). The new data about the conservation status of species has been downscaled from the national to the local level and is being used to inform the development of goals for the SACs.

In Italy, according to the Ministry for the Environment, no efforts have been made to relate conservation objectives at site level for SACs to the national FRVs. For birds, some SPAs may have adopted goals based on detailed analysis of MVPs of bird species on Annex I of the Birds Directive in Italy (see above) although these are not mandatory objectives and remain at the discretion of the relevant regional authority.

Denmark has developed management plans including baseline data, objectives and conservation measures for all SACs (expect for a few more recently designated marine N2000 sites). The objectives refer to FCS, and when finalised will include a species habitat assessment system for relevant species for designation of sites. With respect to SPAs, the Ministry of Environment is developing conservation plans for each SPA and is investigating whether there is sufficient habitat at the protected area level. These consider the targets set for the species in a 2006 report (Pihl et al, 2006) but focus on maintaining conservation status at the local rather than at the national level.

In Sweden, as no national objectives for population or habitat for birds are currently adopted, these are not considered in the setting of objectives at SPA level. SPA level objectives are therefore site specific.

7 CONCLUSIONS

The sections below present the main conclusions from the five key questions that form the basis of this study. It should be noted that it was beyond the scope of this study to contact experts in charge of assessments of *each* species and the results presented inevitably reflect the experience of those interviewed. Therefore the results should not be taken to represent the full picture of the interpretation and implementation of the concepts of Favourable Conservation Status (FCS) in the Member States in question.

7.1 The extent to which an ecological basis is used for assessing species conservation status

Q (i): "To what extent has any European country used an ecological basis (e.g. taking account of sufficiency of suitable habitat; relating population size and/or extent to habitat availability; or using population viability analyses) to determine whether the conservation status of a European Protected Species is favourable?"

- **The interpretation itself of FCS is not the same in all countries which has implications for how the Favourable Reference Values (FRVs) are established**. In Ireland, for instance, a species was generally deemed to be in FCS if its population or range was equal to or above its value in 1994 – in line with the minimum requirements of the guidelines – meaning that the 1994 values became the FRVs. In contrast, Denmark, for example, assumes that most of the species were in Unfavourable Conservation Status (UFC) when the Directive came into force and has generally set the FRVs higher than the 1994 levels.

- **Five of the Member States that provided responses (AT, DE, IE, NL, SE) sought to establish FRVs as the levels when the Directive came into force (i.e. 1994 or 1995 for SE)**. However, there are constraints on estimating these values, and the Member States differ in their approach to dealing with them.

    - In Austria, Germany and Ireland, establishing the range and the population of many species when the Directive came into force is problematic due to constraints on data. In Austria and Ireland**,** the FRVs are instead often set at the levels recorded in the recent assessment levels (either 2007 or 2012 depending on quality of data) unless it is known that there have been large decreases since 1994, in which case the FRVs are set at higher levels**.** For Germany, data on 1994 levels are mostly lacking, and therefore FRVs are often estimated based on pragmatic concerns based on achievable targets within political and geographical constraints. Nevertheless, for certain well-studied species, both Ireland and Germany indicated that if it is clear that in 1994 the levels were insufficient, or a species was documented to have suffered large declines before 1994, then the FRVs are set higher at higher levels.

    - For the Netherlands, experts judged whether the 1994 levels for range and population were sufficient based on a range of specified key factors (see Annex 3). If not, **new FRVs are set based on expert assessment of the key factors**. **For Favourable Reference Populations (FRPs) for vertebrates, a minimum viable population (MVP) of 500 mature individuals was established**.

- It is noteworthy that in these approaches, the trend since 1994 is not normally used to evaluate whether the 1994 level was sufficient (as is done in the UK). Instead, if there have been declines since 1994, the FRVs are set as the 1994 levels and operators are used to indicate the proximity to the targets. In the UK, a decline since 1994 is taken to indicate that the 1994 levels were insufficient and the FRVs should be set higher. This constitutes an important difference in the interpretation of FCS.

- Three out of the ten Member States/Regions (DK, FL, NL) that provided responses have used estimates of minimum viable populations (MVPs) to support conservation status assessments. Flanders adopts a minimum number of 5,000 functionally connected adult individuals which must be present in Flanders for a species to be considered in FCS (an exception is made for animals with large ranges that extend outside of the region, such as certain species of bats). Lower MVPs have been adopted in Denmark (500-1,000 mature individuals) and the Netherlands (500 mature individuals), reflecting a debate in the scientific community about the appropriate levels of MVP to adopt in conservation objective setting (Franklin & Frankham, 1998; Lande, 1995). As a consequence of new findings suggesting that a better indicator of MVP is more likely to be 5,000 individuals (Traill et al, 2007), Denmark has only used MVPs where species-specific literature was available and even in these cases, it is only used a guide for the assessments (Denmark does not set numerical FRVs). For all three Member States, where MVPs are used to help establish FRVs, the FRVs adopted are always higher than the population levels when the Directive came into force.

7.2 Approaches used in setting Favourable Reference Values for widespread species

Q (ii) "What approaches have other countries used in setting favourable reference values for widespread species (i.e. those that occur widely outside designated sites)?"

- Five of the Member States/Regions (AT, IE, IT, NL, SE) assume that widespread species are in FCS and, where data on range and population of the species when the Directive came into force are absent, use the most recent assessment levels as the FRVs.

- Flanders and Estonia adopt the current range as the Favourable Reference Range (FRR) which was often the whole of the country/region. No specific Favourable Reference Populations (FRP) are set (as further scientific research would be required) and therefore operators are applied to indicate whether FRP should be equal or greater than the existing value. Flanders requires a minimum of 5,000 adult individuals to be present within the region for any species to be considered in FCS.

- Denmark does not set numerical FRVs, but instead uses operators to indicate how much further is required to achieve FCS compared to the latest data based on expert opinion. It is rare that the 1994 level is used as a reference point for FCS as they judge most of these values to have been in UFC. This approach is adopted for both widespread and rare species.

- In Germany and Ireland, if it is known that there have been declines *before* 1994 (when the Directive came into force) for rare or widespread species, then the FRV is set higher than 1994. For some species in Ireland, fragmentation or recent losses were accounted for and the FRV was therefore set above the current value (Lynn & Weir, 2012).

7.3 Impacts of projects outside protected on European Protected Species

Q (iii) "How have other countries assessed projects outside designated sites (in particular Natura 2000 sites) in terms of impacts on FCS, and what approaches to mitigation or compensation have been used?"

- The Member State officials provided only limited information on how the impacts of projects on the FCS of European Protected Species (those listed on Annex IV of the Habitats Directive) are assessed, often citing the need to take it on a case-by-case basis. However, in the cases of Germany, Estonia, Flanders and France, each individual specimen does not have to be protected provided the integrity of the overall population is maintained and the local conservation status is not adversely affected. The exception is Sweden, which adopts a strict protection of each individual specimen.

- In France, the methodology used to assess local conservation status often involves a combination of field research to estimate current population levels, an analysis of population trends and an evaluation of the quality of the habitat and landscape and the species requirements. For rare species, a higher degree of standardisation of methods is normally required, while for widespread species it is more common for informal approaches to be used.

- In Flanders, the assessment of the impacts of projects on local conservation status should take into consideration the conservation goals for the species set out in '*Regional targets for habitats and species of European Habitats and Birds Directives for Flanders*' (Paelinckx et al, 2009). For species in unfavourable conservation status, the mitigation hierarchy, and accompanied measures, is applied more stringently.

- An innovative approach is adopted by Estonia which splits its protected species into three categories: with Category I representing those species that are most endangered at the national level and in need of the greatest level of protection (whereby each individual specimen is protected), and Category III representing species that have been reduced to a point where they could be endangered if causal factors continue operating (whereby each individual specimen is not protected, including some animals listed on Annex IV of the Habitats Directive). Category II represents those species whose range or population levels in Estonia are currently in decline.

- In Sweden, individual specimens of protected species are strictly protected. No development can go ahead which is foreseen to result in the death of the individuals or loss of breeding and roosting sites. In circumstances where a rare species in UFC are found (e.g. Barbastelle Bats), large infrastructure projects with likely negative impacts (such as wind farms), are not permitted and are frequently required to find alternative sites. For widespread species in FCS, such as the Northern Bat, households are often permitted to carry out renovation work during winter months when bats move from homes to damper and colder sites to hibernate.

7.4 Approaches to setting appropriate populations of wild birds and extent/quality of habitat

Q (iv) "What approaches and assumptions have been used by EU Member States in determining (a) appropriate population levels of wild birds; and (b) sufficient extent and quality of bird habitat outside of Special Protection Areas (SPAs), as required under Articles 2 and 3 of the EU Birds Directive?"

- **At least five Member States have established appropriate population levels for wild birds within their territory**. Italy is notable for having undertaken the most rigorous approach, adopting a strong ecological basis which takes into account estimated MVPs. Four other Member States (DK, FL, NL and SE) have developed targets based on historic levels (ranging from the 1970s to the present day). Attempts were made by three Member States (DK, SE and IT) to take into consideration guidance for reporting under the Habitats Directive in the establishment of these values for bird species.

- **The methods used for developing the appropriate population levels of wild birds based on historic levels are often based on pragmatic considerations rather than scientific rigour and Member States have adopted significantly different approaches to selecting the baseline year**. For instance, in the Netherlands, the year on which the appropriate population levels are based was selected on the basis of it representing a realistic target given geographical and political constraints. Appropriate levels of bird populations in Denmark were set by analysing the fluctuations in bird populations over the period for which data of sufficient quality exist (typically covering the past 20-30 years). The levels were set by establishing the lower limit of this fluctuation as the target level, with the assumption that, provided the species is either stable or increasing in numbers, this minimum level must be sufficient to maintain adequate levels of population levels, and that it would be more practical to ensure the population was either stable or increasing from that point. Flanders, on the other hand, adopts the population value during the mid-1970s (or 2007 – whichever was larger) as the target, as this is thought to be before most species experienced steep population declines.

- **The setting of appropriate population levels for birds is a politically difficult issue and the levels are increasingly not used by governments.** This is due, in part, to the fact that reporting on the conservation status of the bird species is not a legal requirement. Denmark and Sweden have phased out the use of the quantified population targets in favour of less specific goals. Sweden, for instance, is considering using the Red List criteria as a minimum level to be maintained for bird species; thus it would be accepting a lower level of biodiversity but at least ensuring that risk of extinction is being managed. The most scientifically robust estimates of appropriate bird populations (in Italy) are non-binding and are only used by regional authorities at their own discretion. Austria has not set any targets.

- **Sufficient extent and quality of bird habitat outside SPAs are less well considered.** Nevertheless, Flanders provides data on range and the changes in the availability of suitable habitats for each species since the mid-1970s and in some cases has allocated a species a range reference value based on historical values.

7.5 Consideration of FRVs and appropriate levels of wild bird populations in SAC and SPA management

Q (v) "How have conservation objectives for Special Areas of Conservation (SACs) and SPAs specifically taken account of reference values determined, respectively, for FCS under the Habitats Directive and bird populations considered compliant with Birds Directive requirements."

- Out of the eight responses to this question, four Member States indicated that there has been some consideration of FRVs and appropriate bird populations in conservation objectives (DK, FL, IE,

IT). In Italy, appropriate bird population figures have informed the setting of conservation objectives at certain SPAs but this is not obligatory. Only Austria and the Netherlands responded definitively that national goals are not considered in site level objective setting. In Sweden SPA objectives do not consider the national target but no response has been given for SACs.

- Flanders has the most developed system of integration of targets between regional (i.e. Flanders) and local levels and has published the approach in the scientific literature (Louette et al, 2011). The system establishes regional conservation objectives, which then provide a framework for setting conservation objectives for Natura 2000 sites and areas outside them. Given that most of the species and habitats assessments were in UFC, the framework proposes a 42% increase in area for habitats and active conservation measures for 78% of the species.

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ANNEX 1: OVERVIEW OF THE QUALITY OF REPORTING IN THE 2007 REPORTING PHASE

As a large number of gaps exist in responses and available literature from Member States on the methodologies used to evaluate Conservation Status, we analysed the Article 17 database for the reporting period 2001-2006 (containing the Member State information on the species and habitats assessments) to give a brief overview of the way FCS as assessed across the EU. Two parameters were looked at:

- the degree to which Member States have set Favourable Reference Values; and
- the quality of the data used in the compiling the assessments as reported by the Member States (see Section 1.2.3).

The setting of FRVs is a vital component in evaluating Conservation Status (see Section 1 above). Nevertheless, Member States have not always set reference values, either due to lack of data or lack of confidence that the values will provide useful information. Table A1.1 provides an overview of the percentage of species assessments that have also been provided with a reference value. It also provides an overview of the data quality used to assess the conservation status, providing the percentages of species assessments of good or moderate quality.

Table A1.1 Use of reference values and quality of data in species assessments (2007).

Member State	No. of assess-ments	% of species assessments with a reference value		% of species assessments of good or moderate quality	
		Range	Population	Range	Population
Austria	291	80%	80%	72%	34%
Belgium	137	88%	78%	85%	75%
Cyprus	50	52%	38%	38%	42%
Czech R.	259	100%	98%	88%	83%
Germany	484	96%	99%	79%	76%
Denmark	112	78%	55%	78%	52%
Estonia	97	100%	100%	90%	73%
Greece	247	46%	39%	35%	36%
Spain	651	19%	11%	49%	48%
Finland	150	94%	87%	85%	78%
France	663	68%	34%	68%	48%
Hungary	208	100%	98%	72%	63%
Ireland	73	78%	55%	64%	49%
Italy	576	69%	67%	86%	79%
Lithuania	103	100%	100%	53%	50%
Luxembourg	63	95%	43%	94%	92%
Latvia	113	100%	100%	76%	71%
Malta	61	0%	0%	48%	48%
Netherlands	121	70%	68%	55%	51%
Poland	283	74%	54%	53%	38%
Portugal	468	56%	28%	69%	28%
Sweden	264	94%	93%	86%	68%
Slovenia	336	87%	33%	65%	41%
Slovakia	326	100%	100%	64%	62%
UK	93	76%	65%	83%	57%

Table A1.1 provides some interesting insights into the way conservation status was assessed in the different Member States. For instance, the Member States with the highest proportion of FRVs set for species appear to be predominately – though not exclusively –eastern countries: *Czech Republic, Germany, Estonia, Hungary, Lithuania, Latvia, Slovakia* and *Sweden*. Of these, *Estonia, the Czech Republic* and *Sweden* had greater than 85% of their assessments of range based on good or moderate data, while *the Czech Republic* and *Germany* were in the top five best results for quality of population data[22].

[22] Note: a possible explanation for the differences has been offered by D. Lynn (Ireland) who suggests that the numbers are skewed by the extra burden of monitoring a large number of marine species in a greater expanse of ocean.

ANNEX 2: RESPONSES FROM THE IN-DEPTH CASE STUDIES

Overview of the quality of responses from the in-depth case studies

Every effort was made to contact the most relevant experts or government officials with an overview of the process in each of the ten Member States. Nevertheless, it was not always possible to make contact with the most relevant contacts or to always conduct a full length interview, in part due the timing of the study coinciding with the deadline of the reporting period under Article 17 of the Habitats Directive. Table A2.1 provides an overview of the quality of the results obtained.

TableA2.1 An overview of the quality of responses obtained from the 10 Member States.

MS	(i) Ecological basis	(ii) FRV setting	(iii) Species protection	(iv) Birds	(v) SACs/SPAs targets
Austria	P	P	P	C	P
Belgium (FL)	C	C	C	C	C
Germany	P	P	P	N	N
Denmark	C	C	N	C	P
Estonia	C	C	C	C	C
France	P	P	P	N	N
Ireland	P	C	P	N	C
Italy	C	C	P	C	C
Netherlands	C	C	C	C	C
Sweden	P	P	C	C	P

C = complete response; P = partial response (i.e. some data obtained but likely that certain information are missing); N = no response.

ANNEX 3: MEMBER STATE PROFILES

Austria

(i) The extent to which an ecological basis is used for assessing species Conservation Status

Manner in which assessments consider ecological factors

No data provided during the interview.

(ii) Approaches used in setting FRVs for widespread species (i.e. those that occur widely outside designated sites).

How Favourable Reference Values (FRVs) are set

Favourable Reference Range

FRR is mainly based on historical data through the use of past and present distribution maps. If the restoration of sites could result in the return of a species, these are included within the FRR; if not, they are excluded. Data are selected as close as possible to the reporting period, most of all from 1990. The oldest data accepted are from the 1950s.

Favourable Reference Population

Experts judge whether the FRP should be equal to or greater than the current population level, taking into account the trend between 2007 and 2012. There are no data available on the population levels for any species for 1994. The FRVs are currently being updated since the last reporting but no strict guidance exists on the setting of the values. FRVs for widespread species set at their current status (i.e. 2012). If good data were available in 2007, then this level is generally used instead.

(iii) How projects or developments outside designated sites are assessed in terms of their impacts on FCS of a species of Community interest and the approaches applied to mitigation or compensation.

Species protection measures implementing Art. 16 are in place to protect species outside protected areas, although these are poorly enforced.

(iv) Approaches and assumptions used to determine (a) appropriate population levels of wild birds and (b) sufficient extent and quality of bird habitat outside of SPAs.

No attempt has been made to determine either appropriate population levels of wild birds or sufficient extent and quality of bird habitat.

(v) How conservation objectives for SACs and SPAs have taken account of FRVs (under the Habitats Directive) and appropriate bird populations (compliant with Birds Directive requirements).

Natura 2000 sites do not generally consider FRV in the setting of conservation objectives, but do take the overall conservation status of a species or habitat into account.

Interviewees, role and expertise:

- Thomas Ellmauer, Environment Agency Austria (Unweltbundesamt)
  Responsible for co-ordinating the Article 17 reporting for Austria.

- Michael Dvorak, Researcher, BirdLife Austria
  Responsible for producing Article 12 report under the Birds Directive for Austria.

Belgium (Flanders)

(i) The extent to which an ecological basis is used for assessing species Conservation Status

Manner in which assessments consider ecological factors

For widespread species, the population must be both stable and contain a minimum number of individuals (referring to sufficient genetic diversity – see below) to be considered in FCS. For scarcer species, where trend data are substantially more difficult to find (Flanders has still to implement monitoring schemes for many species), Flanders (FL) uses only the number of individuals as a guide to the conservation status of the species.

Range

For many groups of species in FL, atlas distribution data are available which gives an idea of the current distribution of species. FL has not mapped the FRR for any species (unless it is equal to the actual range, which is often the case). FL has used historical ranges as evidence that it is possible for species to have a greater range. In reality, the only timeframe that is used is 1994 – setting any other time period is inevitably arbitrary. If a species has always been very rare in FL (i.e. even in periods long before 1994), then this suggests that either FL is not a suitable location for the species or it is by definition restricted to specific areas or habitats. In these cases, FRVs are still indicated as (much) larger than the actual values, but in future reporting rounds this general approach may be considered not feasible and revised.

For scarce species with restricted ranges, assessors evaluated whether it was possible for viable populations of the species to exist within the current range. If not, assessors evaluated if possibilities exist for species to reach FCS by increasing the existing range. In such cases, the FRR is marked as larger than the existing range of the species. To date there have been no examples for species where an increase of range to reach FRP was not possible from an ecological point of view (for habitat types there are examples where all suitable environmental conditions are already occupied by the habitat type in which case the FRR and FRA were considered as equal to the current values).

Population

Flanders establishes the minimum number of individuals and number of populations per species that must be present in the region in order for the population to be considered favourable. This is based on the concept of genetic stability, elaborated in a document by Mergeay (2013) (in Flemish only).

There are two general approaches adopted. For widespread species, the number of individuals must be at least 5,000 adults at the regional level. Although the individuals will, in most likelihood, be distributed across the region in localised populations, occurring in group sizes smaller than the reference value, FCS is achieved if these populations are functionally connected resulting in regular exchange of genetic material between the sub-populations. Nevertheless, in cases where large but clearly isolated populations together reach the 5,000 threshold value (e.g. 2 meta populations of 2,500 individuals each as is the case for the European Tree Frog *Hyla arborea*), this may still be considered in FCS, based on analysis on which the reference values for local populations are based. The minimum population size of local meta populations, and thus the total amount of these populations, is a function of the generation span (i.e. time it takes for individuals to reproduce). The longer the generation time, the smaller the local meta population size is permitted to be, but more of these smaller populations are required. For example, *Triturus cristatus*, which has a reasonably

long generation time, can have up to four isolated populations of circa 1,250 individuals (adding up to 5,000 individuals at the regional level) in order for the species as a whole to be considered in FCS at the regional level (see Mergeay, 2013 for the further details of the methodology). These values, which have been set for each species, are based on the concept of genetic stability and are currently being reviewed, although the results will not be ready for 2013 reports.

Rarer species, i.e. those for which there are less than 5,000 individuals overall at the regional level, are generally judged to be in unfavourable conservation status at a regional level. This applies particularly to species with low dispersal ability (e.g. amphibians, insects). For larger mammals with more widespread migration patterns, the real meta population could occur within a region much larger than FL. In these cases it is not always possible to reach the FRP in FL alone; if there are less than 5,000 individuals within FL, and the population is not decreasing, then it can still be considered in FCS. This system was used for several of the bat species.

(ii) Approaches used in setting FRVs for widespread species (i.e. those that occur widely outside designated sites).

How Favourable Reference Values (FRVs) are set

Range

For widespread species, FRR was often taken to be the current range (data did not exist for most species in 1994), which - allowing for gaps of 50km between distribution points – was often the whole of Flanders.

Population

FL applies operators (=, >, >>) to indicate whether the FRP should be equal to, greater than or much greater than the current population size. FL needs more research to be scientifically able to specify real FRP or FRR values.

(iii) How projects or developments outside designated sites are assessed in terms of their impacts on FCS of a species of Community interest and the approaches applied to mitigation or compensation.

The measures required to be taken to minimise the impact of developments on European protected species occurring outside Natura 2000 sites in Flanders depend, to a large degree, on the conservation status of the species in Flanders as a whole. In cases where a species is in favourable conservation status in Flanders, certain preconditions must be met to ensure that the development does not adversely impact on the local conservation status. The conservation goals at the scale of Flanders are described in Paelinckx et al (2009). This document also contains the measures to be taken for obtaining the favourable conservation status for each species. These measures may include:

- Ensuring the longevity of all existing populations.
- Maintenance of key habitat features and absence of disturbance.
- Maintenance of the current range and distribution of the species.

While Paelinckx et al (2009) does not specify what needs to happen with respect to developments impacting species outside protected areas; it can be used as a reference to help determine what measures need to be taken in such cases. In cases where the conservation status is unfavourable, and the mitigation hierarchy has been followed, these requirements are used to ensure adequate compensation (e.g. through the

translocation of specimens or re-creation of nesting sites through biodiversity offsetting) takes place. For species in unfavourable conservation status, Species Protection Plans (the first of which are currently in preparation) establish the measures required to bring the species to favourable conservation status. These Species Protection Plans build on the regional conservation goals for Flanders, further defining what is needed at more local scales. The plans should contain measures that need to be taken in case of developments potentially impacting on species.

Appropriate assessment can currently only be applied to impacts on an SAC. However, when developing Species Protection Plans, the equivalent of appropriate assessments can be included as a necessary measure if developments are expected to impact on the species. In addition, for species of Flemish and European interest, derogations need to be obtained when these species occur within a planned development site. If needed, such derogations can contain requirements for businesses to compensate or limit damage to individuals of the species outside the SAC network. Such compensation only concerns individuals and their nest sites, breeding and resting places.

As an example, if developments are planned at a site hosting a population of Great Crested Newt (*Triturus cristatus*), a study is required to assess whether the local conservation status (considering both the numbers of individuals and the quality of the habitat) will be impacted. How the local conservation status is assessed will depend on the species and should take into consideration the conservation goals for the species set out in a Flanders-wide publication (Paelinckx et al, 2009). If no impacts are expected, a derogation to allow development can be provided without further conditions. This derogation may include the killing of individuals of the species. This decision is made of the basis of the condition of a species at the Flanders level and what the impact of the planned development may have both on the conservation status at the Flanders level and on the local population. If an impact is foreseen, the derogation can either be withheld, prohibiting the development or granted provided specified conditions are met. In the latter case, it must be clarified that no alternatives exist and any impacts must compensated, either biodiversity offsetting or translocation of the individuals present. The intention is to further clarify these issues with the development of appropriate assessments for species in the future, in parallel to the Species Protection Plans described above.

The delineation of a local population is judged based on species ecology and the surrounding landscape in relation to the development; thus it is pragmatic and on a case-by-case basis rather than strictly on the scientific definition of population.

Box A3.1 Conservation goals of Great Crested Newts for Flanders

Conservation goals

Extend the current area, extension of the current population and strengthening the remaining populations aiming for minimum 50 adult individuals per population that small, nearby water features propagate in one or more.

Improve the quality of the habitat of the current populations

- Water habitat: reduce eutrophication, remove fish, improve submerged vegetation presence.
- Land habitat: improve appropriate vegetation near water habitats
- Remove barriers to migration
- Construction or repair of deep pools that do not dry up in the summer in the vicinity of existing populations.

Quantification of the proposed goals
As a result of applying the methods for the quantification of the proposed conservation goals, there is no additional surface habitat for this species would be required.
Source: Paelinckx et al (2009)

(iv) Approaches and assumptions used to determine (a) appropriate population levels of wild birds and (b) sufficient extent and quality of bird habitat outside of SPAs.

In 2007, the Flanders government commissioned a report of the conservation status of all the birds on Annex I of the Birds Directive and their habitat types. This resulted in Flanders establishing population level targets for all Annex I Breeding Bird species over the entirety of their territories, not just in SPAs (Paelinckx et al, 2009). Progress made towards the target is due to be reported every year, operating as an indicator of progress on biodiversity; (e.g. for the Bittern (*Bottaurus stellaris*) the proposed target is 80 breeding pairs). Although Flanders cannot be certain if these targets are adequate, each reporting cycle results in an evaluation and, if needed, adjustment of the conservation goals.

How the targets were set:

- A reference period from just before the Birds Directive came into force (mid-1970s) was established.
- The population of the reference period was compared to the 2007 population.
- For species with a negative trend in this period, the 1970s population value was set as the goal.
- For species with a positive trend, the 2007 value is set as the target population. A political decision was taken to specify that the target population could not be higher than its current level if the trend has been positive.

The selection of the mid-1970s as a reference period was made for practical reasons, as Flanders did not have good data before the 1970s. Nevertheless, Flanders is confident that for a few species (e.g. Corncrake – *Crex crex*) experienced declines in numbers before the 1970s. For the vast majority of the species, population decline began after the 1970s. Therefore, setting this period as a baseline would appear to refer to a favourable conservation status.

The assessment also considered data on the home range (which is larger than the distribution) and the changes in the number of habitats in that period for each species. The changes were identified by a combination of information on distribution, and local knowledge about the changes to the habitat. They also used a Belgian study from the 1970s to identify land use and habitat types and compared this to modern data. For some species, the 1970s habitat extent and quality was set as a reference value, e.g. for Black Woodpecker (*Dryocopus martius*), it was said there should be a minimum home range of 7,000km2 (i.e. its current distribution over the country) and a minimum population of 850 breeding pairs occurring within its typical habitat. Note that Flanders does not attempt to define the minimum amount of typical habitat required, based on a lack of habitat area requirement data.

(v) How conservation objectives for SACs and SPAs have taken account of FRVs (under the Habitats Directive) and appropriate bird populations (compliant with Birds Directive requirements).

Conservation goals – which are rarely specified on a quantitative basis - are set at the regional (FL) level with the input of high level stakeholders. These regional conservation goals prioritise the SACs and SPAs for their

importance with respect to the relative amount of the population (if data are available) or of the distribution grid cells.

Nevertheless, a degree of 'bottom-up' decision making for the setting of local conservation goals for SACs and SPAs also occurs. Although consultation at the regional level has the final say, consultation at the local level helps establish local conservation goals which in turn influences the regional discussions. Evaluation matrices – which have been developed to assess local conservation status - consist of a) local population sizes for FV local status (these are now under reconsideration) and b) criteria to assess the local status of the habitat of the species.

From 2019, there will be an evaluation of the regional conservation goals; if they have to be adapted, then this will affect the local SAC and SPA goals which will also have to be reviewed.

Interviewees, role and expertise:

- Desiré Paelinckx, INBO (Research Institute for Nature and Forests)
  Co-ordinator of the Article 17 reporting.
- Anny Anselin, INBO (Research Institute for Nature and Forests)
  Co-ordinates the reporting of the Birds Directive for FL and is responsible for co-ordinating with Waloonie Region and federal Belgian government officials to create the Belgium report, alongside with Belgian BirdLife. Also responsible for the monitoring projects under the Birds Directive.
- Geert De Knijf, INBO (Research Institute for Nature and Forests)
  Co-ordinates the reporting of the Habitats Directive, particularly species for Flanders and is responsible for co-ordinating with the Walloon Region the Belgium report. Co-ordinates also the monitoring of the Habitats Directive species in Flanders. Expertise in monitoring of dragonflies.
- Dries Adriaens, INBO (Research Institute for Nature and Forests)
  Expertise in the monitoring of amphibians.
- Sarah Roggeman, Policy Species Advisor, Agency for Nature and Forests
  Implementing specific species protection (Article 12-16 Habitats Directive).
- Hans Vangossum, Agency for Nature and Forests
  Implementation of specific species protection (Article 12-16 Habitats Directive).

Denmark

(i) The extent to which an ecological basis is used for assessing species Conservation Status

In 2007, Denmark attempted to set specific criteria on the number of individuals, the viability of populations, the distribution of occurrences, and the size or number of suitable habitats which must be met in order for the species to be considered in FCS (Søgaard et al, 2007).

A number of features of this approach are noteworthy. In 2007, Denmark reported at each biogeographical region and at a very detailed level. For instance, where possible, Denmark attempted to use Minimum Viable Population (MVP) at a biogeographical region level, requiring the occurrence of population of a certain minimum size. In the absence of species specific analysis, the 2007 assessment uses the theoretical level of 500 sexually mature individuals as guidance (based on Shaffer, 1981). Each individual occurrence does not require the presence of 500 individuals provided that the separate groups are functionally connected. If these separate meta-populations added up to 500 individuals at the biogeographcial region level, the population parameter could be considered to be favourable.

Where species specific literature was available, this was used. For instance, for Otter (*Lutra lutra*) a theoretical calculation of the MVP was assessed to be between 1,200 and 1,600 Otters (Wansink & Ringenaldus, 1991). This estimate was still, however, based on the recommendation for an actual population of 500 sexually mature individuals in order to sustain sufficient genetic variation (Shaffer, 1981).

The level of detail provided in the guidance varies between the species. For Fire-bellied Toad (*Bombina bombina*), for instance, the guidance specifies that a minimum of 1,000 adult individuals is required to obtain a viable population. It also specifies that increasing the suitable habitats with key features (in this case the Fen Orchid) is required. As there were 2,500 individuals in 25 populations that are not connected, it was considered to be in UFC. This figure is taken in the absence of specific information, but this is now likely to be deemed outdated and insufficient, and the authors of the report believe that the new findings of Traill et al (2010) should be adopted.

There is also the significant issue that this method requires detailed monitoring regarding the actual numbers of individuals. However, in only a very limited number of cases (in Denmark, for Fire-Bellied Toad and several vascular plants), the monitoring system gave population estimates.

For Pond Bat (*Myotis dasycneme*), on the other hand, MVP is unknown but the population is taken to be favourable if the number of individuals in known hibernating sites of four named locations in Denmark are stable or increasing. The guidance assumes that the current population in Jutland (where the species is predominately restricted to)[23] is viable while the number, area and length of suitable hibernating sites must be stable or increasing.

Accurate numbers of individuals are available for only a very limited number of species. Most of the monitoring is presence/absence (i.e. range) rather than population. Therefore they use the number of localities or available habitat (e.g. ponds or trees for insects) as population analysis rather than

[23] It also occurs in smaller numbers on the islands of Funen, Lolland-Falster and Bornholm.

individuals. It is not realistic to expect that accurate estimates of populations will be possible even for the next reporting period.

The geographical range of each individual species is related to regions and provinces, and the current number of habitats is estimated. The criterion is often that the species must be found in a stable or increasing number of localities. In certain cases, a specific number of sites is specified for the species, based on the number required to prevent a reduction in the geographical range. This estimate is primarily based on historic information for the species in question. It was not possible to give a more precise statement or calculation of the occurrence required from the data available.

The 2007 guidance also identifies the specific habitat features that need to be provided, and whether they are currently sufficient. The concept of 'size' of habitat is relative and is understood within the biological demands made by each individual species. Therefore, Denmark uses the concept of 'carrying capacity' to describe the number of individuals which can be supported by a given resource, e.g. food. The size of the habitat is also considered within the analysis at a local level with series of parameters selected on the basis of the biology of the species and ease of measurement. While size is normally described as the area of the habitat, in other cases it may be a number (e.g. of small ponds) or length of key features (e.g. streams). Distinctions can also be made between breeding, foraging and wintering sites for certain species.

(ii) Approaches used in setting FRVs for widespread species (i.e. those that occur widely outside designated sites).

Denmark do not set actual specified FRVs, but rather use operators compared to the latest data to describe how much further DK needs to go to meet FRV. Experts consider aspects such as short-term trends (2000-2012) (long-term trends are very scarce in DK other than for birds), MVP (if possible but only for a very limited number of species), habitat for species (if the range is favourable, then it is judged that the habitat for species if also favourable; there are no methods to determine this other than for extremely specialised species). They judge most of the values in 1994 to have been in UFC as they species were selected on the basis of being threatened, therefore it is rare that the 1994 level is taken to be the FRV.

This process is used for all species (i.e. both widespread and restricted in distribution). FRVs are set for both biogeographical regions.

(iii) How projects or developments outside designated sites are assessed in terms of their impacts on FCS of a species of Community interest and the approaches applied to mitigation or compensation.

The Wildlife Management Act and the Nature Protection Act implement these measures as well as more recent legislation. An accompanying report to the Article 17 report will refer to species protection measures.

(iv) Approaches and assumptions used to determine (a) appropriate population levels of wild birds and (b) sufficient extent and quality of bird habitat outside of SPAs.

In 2007, Denmark assessed the conservation status of breeding and migratory wild birds within its territory using criteria similar to those which it applies to species under the Habitats Directive. As of

2007, Denmark had assessed the conservation status for 41 bird species on Annex I of the Birds Directive and for 33 species of regularly occurring migratory birds (Pihl et al, 2006). The criteria for the conservation status on a national scale are developed on the basis of the three overall criteria based on those defined in the Habitats Directive:

- viable populations, which are stable or increasing;
- distribution [range] area is stable or increasing; and
- areas of suitable habitat are stable or increasing.

For each species, a set of specific criteria were established which are to be improved upon in time after results of further monitoring are made available. While no FRVs are established, the long term objective is to "*maintain the known population sizes of bird species, which are in a favourable conservation status*" (Søgaard et al, 2007).

Appropriate levels of bird populations established by Pihl et al (2006) were set by analysing the fluctuations in bird populations over the period for which data of sufficient quality exist (typically covering the past 20-30 years for many species). The levels were set by establishing the lower limit of this fluctuation as the target level, with the assumption that it must be sufficient to maintain adequate levels of population levels, and that it would be more practical to ensure the population was either stable or increasing from that point. No additional work was carried to establish if this was genetically sufficient in the long-term. An assumption was made that most species have been in FCS over the last 30 years and that minimum levels for this period is sufficient provided that species is either stable or increasing in numbers. Nevertheless, for each species of bird, the guidance attempts to set the number of breeding pairs that must be present, the distribution and areas of occurrence and the state of the habitat that must be met in order for the species to be considered in FCS (Pihl, S., *pers. comm.*)

The overall national conservation status for breeding birds are assessed on the basis of the local status of the birds based on the results from the monitoring programmes, while the status for migratory species is assessed from the trend in the whole Danish population.

No work has been done on sufficient extent and quality of bird habitat outside of SPAs. The Ministry of Environment is developing conservation plans for each of the SPAs and is investigating whether there is sufficient habitat at the protected area level. These consider the targets set for the species in the 2006 report (Pihl et al, 2006) but focus on maintaining conservation status at the local rather than at the national level. Only a very limited number of species action plans covering species outside protected areas have been developed. Nevertheless, BirdLife International Denmark has carried out action plans for a number of species such as Golden Plover (*Pluvialis apricaria*), Red Kite (*Milvus milvus*) and certain saltmarsh waders (including Dunlin *Calidris alpina* and Bar-tailed Godwit *Limosa lapponica*). Although these have not been adopted at the national level, they are to an extent used by national government as the basis for delivering actions.

The appropriate levels set in the 2006 report (Pihl et al, 2006) are not referred to in recent publications such as a recent report on bird trends 2004-2011 (Pihl et al, 2013), nor is any assessment made of their conservation status.

(v) How conservation objectives for SACs and SPAs have taken account of FRVs (under the Habitats Directive) and appropriate bird populations (compliant with Birds Directive requirements).

Denmark has developed a management plan including baseline data, objectives and measures for all SACs (expect some few more recently designated marine N2000 sites). The objectives refer to FCS and when finalised will include a species habitat assessment system for relevant species for designation of sites.

With respect to SPAs, the Ministry of Environment is developing conservation plans for each SPA and is investigating whether there is sufficient habitat at the protected area level. These consider the targets set for the species in a 2006 report (Pihl et al, 2006) but focus on maintaining conservation status at the local rather than at the national level.

Interviewees, role and expertise:

- Stefan Pihl, Forest and Landscape Engineer, Aarhus University
  Co-ordinates monitoring of breeding bird and wintering birds and is co-leading the Article 12 reporting under the Birds Directive.
- Bjarne Søgaard, Aarhus University
  Co-ordinator of the Article 17 reporting methodology.

Setting of FRVs for Otter (Lutra lutra) in Denmark (2013 reporting period)

For the setting of favourable reference values for range (FRR) and population (FRP) of Otter in Denmark operators are used (≈, >, >>, x OR Approximately equal to, more than, much more than, unknown) compared to the most recent data on the positive localities as population units based on expert judgments.

Range

From the distribution map (Fig. 1) with positive squares of 10X10 km, the range of Otter in the Atlantic and Continental biogeographical region of DK are calculated (using the recommended Range Tool offered by ETC on The Article 17 Portal using a gap distance of 90 km. From this, it is concluded that FRR≈13,222 km² (calculated range in ATL) and FRR>>18,204 km² (calculated range in CON).

Population

Denmark are not able to report the number of individuals (using the standard method). Instead they replace number of individuals with number of positive localities/stations for otters as population unit. The monitoring program includes a total of approximately 1,250 stations of which 345 and 349 were positive in ATL and CON regions respectively. From this it was concluded that FRP≈345 localities (ATL) and FRR>349 localities (CON). The ATL population (to the left of the line splitting the Jutland peninsula) is shown to be in FCS as it is widespread whereas it is know that the range of the CON population should be significantly larger given the species' absence in much of its former distribution.

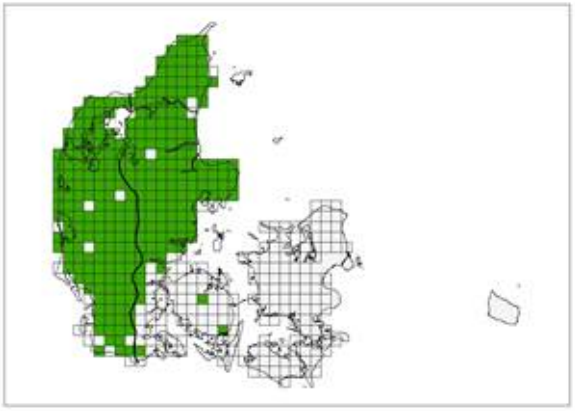

Fig. 1: Lutra – DK distribution map 2012

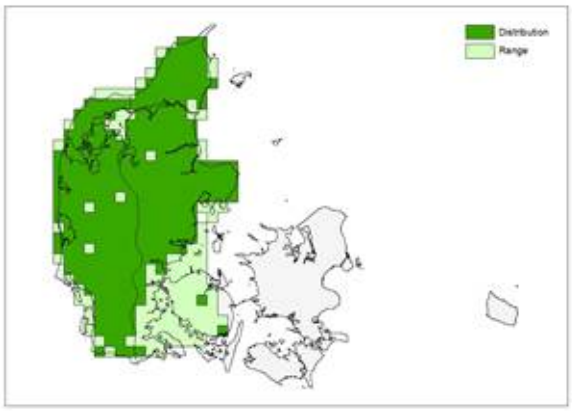

Fig. 2: Lutra – DK Range Map 2012 (gap 90 km)

The main threats and pressures have been listed as Roads/motorways, leisure fishing (both moderate) and pollution to surface waters (low).

Estonia

(i) The extent to which an ecological basis is used for assessing species Conservation Status

In 2007, all the assessments were based on expert opinion due to a lack of relevant studies and information. In 2013, new Species Action Plans - which are still in the process of being developed and approved - will form a more robust and transparent basis for assessing Conservation Status. According to Article 49 of the Nature Conservation Act 2004 (amended 29.12.2011)[24], the Action Plans must include the following information:

1. biological data, population dynamics data and information on the range of the species;
2. conditions for guaranteeing the Favourable Conservation Status of an endangered species;
3. threats to the species;
4. the objective for conservation or management;
5. the priority of measures for achieving a Favourable Conservation Status or management of the species, and a schedule for application thereof.

Where there are sufficient data, species targets are established which will also form the basis of the Conservation Status assessments. The factors on which the targets are based are species specific but will in general consider factors such as carrying capacity, availability of habitats, connectivity between sites, minimum viable populations, historical distribution and population trends.

Examples:

Population trends of Grey seal (*Halichoerus grypus*) are assessed in the Baltic Sea in general (as well as for the Estonian maritime economic zone) based on monitoring data from state monitoring programs harmonized with other Baltic Sea countries. The monitoring is carried out by aerial censusing of seals in 10 permanent monitoring areas. Trend data are available from 1999 to the present. To assess the Conservation Status, the limiting factors for the trend are analysed, such as availability of breeding islets etc.

Lady's-slipper orchid (*Cypripedium calceolus*): since 1994, population trends have been assessed by a state monitoring program of 46 permanent monitoring sites. At present, the species is in FCS and a target has been set to maintain or improve the current status. In numbers this means that the number of populations should not decrease below a certain number, of which at least 15% must be large populations.

Bat species: No methodology exists to assess the size of the population, but population trends are assessed based on the monitoring data from permanent monitoring sites. The bat monitoring system (2001-2012) is based on 8 transect stations which gives trends for four species of bat; three of which show positive trends and one whose trend is stable, although there is insufficient data to provide an accurate assessment of trends. As a consequence of a shortage of population data, it is not possible for overall status to be FV according to the matrix provided in the guidance.

24 http://www.legaltext.ee/et/andmebaas/tekst.asp?loc=text&dok=X90008K3&keel=en&pg=1&ptyyp=RT&tyyp=X&query=looduskaitseseadus

(ii) Approaches used in setting FRVs for widespread species (i.e. those that occur widely outside designated sites).

Range

For widespread species - e.g. Brown Long-eared Bat (*Plecotus auritus*) – FRR has been set as the whole of the terrestrial territory. For rare species, for which there have not been specific studies, FRR is based on expert opinion although no guiding principles appear to have been dictated to the experts at the national level.

Bats: The methodologies to set FRVs in the 2007 report for bat species are not clear to the experts working on bat conservation status for the current report as no internal guidance was provided. FRR have only been set for widespread bat species such as the Brown Long-eared Bat, which is taken to be the whole of the terrestrial territory. For rarer species, current range is calculated through the Range Tool based on distribution data on the past 12 years. Previous distribution maps were based on expert opinion, and therefore are not being used for comparison between the reporting periods. Many of the breeding sites have not yet been visited and therefore the actual range (and by extension the FRP based on when the Directive came into force in Estonia in 2004) is likely to be higher than the current range in the range maps. The predicted ranges are nevertheless validated by experts before the FRVs are published.

Population

There have been only few concrete studies which specify the FRP (e.g. see Great Crested Newt *Triturus cristatus*, Common Spadefoot Toad *Pelobates fuscus* and Large White-faced Darter *Leucorrhinia pectoralis*). In other cases, the FRP is established by the expert judgement.

Bats: Estonia does not have sufficient means to assess bat population size and therefore it has not yet been possible to set FRP. Significant cuts made to monitoring funding in the past year are restricting the amount of data available.

(iii) How projects or developments outside designated sites are assessed in terms of their impacts on FCS of a species of Community interest and the approaches applied to mitigation or compensation.

The restrictions placed on the habitats of Annex IV species depend on many factors, including the relative abundance of the species within Estonia, the type of development and the type of habitat in which the species occurs. Species Action Plans are being developed, which will define the threshold at which a site is considered to require protection (e.g. the number of pairs present that makes an area important). With respect to habitats, particular restrictions apply in forests and on coastal meadows. For instance, the Forestry Act establishes restrictions on logging in forest areas that do not apply to other habitats.

Under the Estonian Nature Conservation Act[25], species that require protection are divided into Categories I, II and III, where Category I contains those that require most protection and Category III those that require least protection (see Box 3.2). These categories include *all* species under Annexes II and IV. Species that are rare in Estonia and at risk of extinction in the Estonian wild are included under Category I, while Category III

25 http://www.legaltext.ee/et/andmebaas/tekst.asp?loc=text&dok=X90008K3&keel=en&pg=1&ptyyp=RT&tyyp=X&query=looduskaitseseadus

– which affords a lower degree of protection - contains species that are more common Estonia even if they are rare at the European scale. In short, this method facilitates prioritisation of those species which are of particular importance in Estonia, while maintaining sufficient protection for all species listed in Annexes II and IV of the Habitats Directive. The conservation status of the species is used to determine whether a species should be in Category I or II. The level of protection for each category is specified under the Nature Conservation Act (see Box A3.2). For instance, for Category I species, all known habitats are protected by the formation of protected areas and species protection sites.

The Ministry of the Environment is required to identify vertebrate species listed on Category III that may be killed outside of areas delimited for the purpose of protection of the species. The gathering of wild fungi and invertebrate specimens listed in Category III (including Annex II and IV species) is allowed to the extent that this does not pose a danger to the species population in the habitat.[26] However, this process is under review as it currently leaves too much to interpretation and has caused controversy. Currently, five of the Annex IV protected plant species are in the Estonian Category III, meaning that not every individual specimen is protected. However, the legislation is in the process of being changed to rectify this issue by moving these species to Categories I or II and those affording them strict protection. In addition, a number of non-Annex IV species will be moved to Categories I or II. This change is expected to be in force in first half of year 2014.

For species outside protected areas, (referring to national protected areas including national parks, nature reserves and landscape reserves) a measure is provided[27] to designate 'Limited-conservation areas' to ensure the favourable conservation status of species that are not covered by other parts of the Act. These are designated to protect a national protected object type without a delimited area designed specifically to implement the Habitats Directive. The impact of activities planned within a limited-conservation area on the status of habitats and species has to be evaluated through an EIA or subjected to a 'notification of limited-conservation areas' process as outlined in Art. 33. Alternatively, a species protection site can be established, which is an area located outside of a protected area which may be one of the features listed in the Act (typically an area surrounding eagles nest but includes sites for plants, fungi and other species). In contrast to other protected areas which have a range of protection values in addition to species (such as habitats, landscapes, processes etc.), species protection sites (which appear on the Environmental Register) have a very species-specific regime with the sole objective of protecting the species targeted.

[26] Article 55, Nature Conservation Act. While the English wording refers to the "preservation of the species in the habitat", in Estonian it reads as "species population in the habitat". However, this is under review as it currently leaves too much to interpretation and has caused conflicts.

[27] Article 30, Nature Conservation Act.

Box A3.2 Ensuring favourable conservation status of species in Estonia for the 3 national protection categories

According to Art. 48 of the Nature Conservation Act, the following:

1. "*The protection of all known habitats of species in the protected category I shall be ensured by formation of protected areas and limited-conservation areas or determination of species protection sites.*
2. *The protection of at least 50 percent of known habitats of the protected category II entered in the environmental register shall be ensured by formation of protected areas and limited-conservation areas or determination of species protection sites based on the representativity of the areas and sites.*
3. *The protection of at least 10 percent of known habitats of the protected category III entered in the environmental register shall be ensured by formation of protected areas and limited-conservation areas or determination of species protection sites based on the representativity of the areas and sites.*
4. *In habitats of species in the protected categories II and III which have not been differentiated, individual specimens of such species shall be protected*."

The application of these percentages depends on the Conservation Status of the species in question; if the species is not in FCS, the percentage can be higher than the minimum values set by the legislation.

The scale of development is also very important as it determines the level of intervention open to the authorities to reduce impacts on protected species. For large-scale developments that require an EIA, an impact assessment has to be carried out to identify potential impacts on species of Community interest. In the case that permission for such a development is granted and significant impacts on protected species are expected, then compensation measures will be required. For projects which do not require an EIA, there are no measures in Estonia to require compensation for loss of habitat outside of Natura 2000 sites. In species protection areas and limited-conservation areas, no actions which are likely to significantly impact the species are permitted and therefore there is no need for compensation measures. However, for small scale projects, such as loft conversions, the authorities are very limited in the restrictions they can place on developments unless the sites have been specifically identified within a centrally held register (known as the Environmental Register).

The type of habitat in which the species occurs may also influence the protection of species outside Natura 2000 sites. For instance, valuable forest habitats receive protection from logging under the Forest Act, which outlines a process to specify whether or not the logging can be permitted. However, no compensation measures are required if logging is permitted.

Bats: Most of the problems for bats are in forest management rather than building developments. Breeding sites are held in the Environmental Register, and the Environment Board must consider any actions in these sites. There is a new action plan for bats, in which the pressures are included. All bat species are classified as Category II.

Box A3.3 Method of categorising the level of protection required for national and European protected species in Estonia

According to the Article 46 of the Nature Conservation Act, Category I species include:

1. "*species which are rare in Estonia, are located within restricted geographical areas, in few habitats, in isolation or whose population is thinly scattered over a more extensive range;*"

2. "*species which are in danger of disappearance, whose population been reduced as a result of human activity, whose habitats have been damaged to a critical point and whose extinction in the Estonian wild is likely if the adverse impact of the danger factors continue.*"

Category II species include the following:

1. *"species which are in danger due to their small or reducing populations and whose range in Estonia is reducing due to overexploitation, destruction or damaging of habitats;*

2. *species which are likely to exposed to danger of being destroyed if the existing environmental factors continue operating*."

The following shall be included in the protected category III:

1. *"species whose population is endangered by the destruction or damaging of habitats and has been reduced to a point where they are believed to move into the endangered category if the causal factors continue operating;*

2. *species which were included in the protected category I or II but which, due to application of necessary protective measures, do not experience a danger of destruction*."

(iv) <u>Approaches and assumptions used to determine (a) appropriate population levels of wild birds and (b) sufficient extent and quality of bird habitat outside of SPAs.</u>

Estonia is in the process of developing Species Action Plans for most species of Community interest including bird species. These plans should, in theory, establish the FRPs for species based on an appropriate indicator (e.g. the minimum number of individuals or the number of populations). For certain highly threatened species in Estonia (classified as Category I species) such as Golden Eagle (*Aquila chrysaetos*), White-tailed Eagle (*Haliaeetus albicilla*) and Lesser and Greater Spotter Eagles (*Aquila pomarina* and *Aquila clanga*), the experts have been able to provide FRPs due to extensive research of population dynamics.[28] The University of Tartu published two articles on how to judge conservation status, which was used as a basis for the assessments carried out before Estonia joined the EU (Lõhmus et al, 2001; Lõhmus, 2001). Estonia is at the edge of the distribution for many species and many species are migratory, so assessment of FRP will rely to a large extent on expert judgement in each case. State monitoring is being increasingly harmonised with monitoring under the Habitats Directive.

The guidance for the Species Action Plans requests the species experts to :
"*[provide] an indication of what the FCS should be: e.g. how many populations (for plants), no. of Estonian population, no. of breeding pairs, no. of ponds in which populations exists etc. Experts are asked to explain*

[28] The interviewee was not able to produce these studies to provide more details.

why these are selected and to provide a list of ecological conditions that are considered to be essential to achieving FCS or to ensure the long-term viability of the species."

(v) <u>How conservation objectives for SACs and SPAs have taken account of FRVs (under the Habitats Directive) and appropriate bird populations (compliant with Birds Directive requirements).</u>

In some cases, conservation objectives at the site level of SACs and SPAs have taken account of FRVs. Management plans are currently being finalised for Natura 2000, and these should in theory take into consideration the Conservation Status of the species. There are already Protection Rules set at national level which identify the species and habitat types that should be present at the individual sites and the types of management measures and prohibited actions, but these do not quantify the amount of each habitat and species that need to be present. These do not necessarily correlate with FRVs.

For every Natura 2000 site, they would like to have area based management plans. For species of Category I protection level, there is generally data regarding their abundance, and efforts are prioritised towards these species. In general, numerical targets are not set except for Category I species for which there is much greater degree of information. So there is a greater degree of target setting for these species; for animals – individuals.

Interviewees, role and expertise:

- <u>Herdis Fridolin, Nature Conservation Department, Ministry of the Environment</u>
  Senior officer, responsible for compiling the Article 17 reports.
- <u>Meelis Leivits, the Environment Board (Keskkonnaamet)</u>
  Oversees the action plan and conservation status reporting for bats.
- <u>Murel Truu, the Environment Board, (Keskkonnaamet)</u>
  Overall responsibility for species action plans.
- <u>Üllar Rammul, Nature Conservation Department, Ministry of the Environment</u>
  Policy officer on conservation of birds, responsible for the Birds Report to the European Commission.

France

(i) The extent to which an ecological basis is used for assessing species Conservation Status

Manner in which assessments consider ecological factors

The efforts in France are hampered by a lack of trend data for many of the species with the exception of large mammals for which good data exists. Therefore, much of the assessment is based on expert judgement. At times, the IUCN Red List data on extinction is used as a guideline for the setting of FRPs.

(ii) Approaches used in setting FRVs for widespread species (i.e. those that occur widely outside designated sites).

How Favourable Reference Values (FRVs) are set

The estimation of a minimum viable population, based on complete time series data and an understanding of the parameters affecting the demographics of a population of some interest in defining the favorable reference population. Unfortunately for many species, it is likely that this type of data set does not exist and the FRP must then rely on other methods of estimation. The existence of alternative methods and complementary approaches may contribute to the estimation of the FRP (Sanderson, 2006). Thus, the population size will allow the maintenance of ecological functions that the species and its environment and social dynamics specific to the species (combinations for breeding, migration, etc.). In cases where data are available and sufficiently documented to be usable, the historical approach may also provide a good basis for estimating the FRP.

(iii) How projects or developments outside designated sites are assessed in terms of their impacts on FCS of a species of Community interest and the approaches applied to mitigation or compensation.

The key features of the approach taken by France are as follows:

- Each individual specimen does not have to be protected but the integrity of the overall population that must be maintained; i.e. local favourable conservation status.
- No strict guidance is provided to assess local conservation status and it is entrusted to the contractors to develop a methodology. This often involves a combination of field research to estimate current populations levels and an analysis of previous years' data in the bibliography or discussion with local experts to establish population trends, considering also the evolution of the habitat and the landscape and the species requirements. In cases where there are no other information other than those collected in the field, and therefore, they need to interpret whether the number is favourable considering the other factors. IUCN conservation status is also used even if it doesn't always correlate with its protected status.

There are two laws regarding species protection in France, which predate the Habitat Directive and therefore include species that are not Annex IV. There are different levels of protection. For lesser protected species, the individuals in all parts of the life-cycles are protected (e.g. the Common Toad) but not the habitat (e.g. ponds where they are not present). For other species, including Annex IV

species, both the individuals and the breeding and resting sites are protected. The French law states that any project must ensure "*the good completion of the life-cycle of the species*" which is interpreted by BIOTOPE – an organisation that carries out assessments where developments are likely to impact on protected species - "*as the good completion of the life-cycle of the population of the species that is present in the study area*". The study area is interpreted to be larger than the project area in order to study the whole of the habitat of the population and therefore includes the local population. The mitigation hierarchy of impacts (i.e. to avoid, reduce, offset) is adopted where offsets are preferentially carried out in the local area. Each individual specimen does not have to be protected but it is the integrity of the overall population that must be maintained; i.e. local favourable conservation status.

Assessing local conservation status is done case-by case with respect to each development. For very rare species, more time and resources are provided and detailed protocols exist; e.g. mark and capture methods; capture protocol etc. However, for more common species (e.g. Hedgehog, Red Squirrel, Blue Tits) less time is available, and therefore need to interpret the carrying capacity of the local habitat in order to extrapolate the population numbers. This is a less scientific methodology.

The Natterjack Toad is very common and often present in artificial landscapes and quarries. But it is easy to count the population. The factors considered are the number of females, counting spawn, quality of the habitat, body mass index, and extrapolation of key factors to estimate the population.

Guidance is provided on interpreting the spirit of the legislation but there are no obligatory protocols about how to count the species, with the exception of the Grand Hamster D'Alsace (*Cricetus cricetus*) (an Annex IV species).

Local conservation status has to be assessed through combination of field research to estimate current population levels. This must be compared with previous years data in the bibliography or discussion with local experts to see if the population has been stable or declining, considering also the evolution of the habitat and the landscape and the species requirements. In cases where there are no other information other than those collected in the field, and therefore, they need to interpret whether the number is favourable considering the other factors. However, the consultants are free to develop their own methodology. The consultants prefer this flexible framework as it allows adaptation. IUCN conservation status is also used even if it doesn't always correlate with its protected status.

Where a protected species does have to be destroyed, the legal framework adopts very strictly Article 16 of the Habitats Directive, including the offsetting of the species. There are a lot of administrative steps to undertake. There is no legal framework for offsetting governing how offsetting should be carried out.

(iv) Approaches and assumptions used to determine (a) appropriate population levels of wild birds and (b) sufficient extent and quality of bird habitat outside of SPAs.

No response given.

(v) How conservation objectives for SACs and SPAs have taken account of FRVs (under the Habitats Directive) and appropriate bird populations (compliant with Birds Directive requirements).

No response given.

Interviewees, role and expertise:

- Julien Touruolt, Muséum national d'Histoire naturelle
  Co-author of the methodology for the assessment of conservation status for Article 17 reporting.

- Rénald Boulnois, Biotope Consultancy

  Consultant working on the assessment of the impact of projects on the conservation status of European Protected Species.

Germany

(i) The extent to which an ecological basis is used for assessing species Conservation Status

In Germany, the reporting on FCS is heavily dependent on the Federal system of Lände. Each of the Lände produce a report to the German Federal Agency for Nature Conservation (BfN) in which they provide their own proposals for the FRVs and other reporting requirements for their own territory. The BfN then prepare the proposals for the FRVs at each of the three biogeographical region levels (Atlantic, Continental and Alpine). At each of the biogeographical region conferences, which are held before the end of the reporting period bringing together relevant experts from each of the Lände the FRV and the conservation status assessments are agreed. Separate seminars are held for the assessment of marine (including coastal) and forestry habitats and species. There is no real methodological or scientific process in the establishment of the FRVs. Lände are asked to give trend data, which is often available for the Red List species, but these trends do not focus on 1994 (usually longer) and therefore not always useful. The quality of the data varies between the Lände and species. All the Lände have used a pragmatic rather than ecological approach.

In theory, the range and population of the species in 1994 forms a baseline, but in reality they didn't have much data and instead this is usually estimated. Instead, the FRVs are based on pragmatic considerations i.e. realistic improvements based on available budgets. However, it is likely that a scientific and ecological identification of the FRVs would be higher than those currently established.

It is broadly agreed (by the BfN and the Lände) that the methodology for setting the FRVs is inadequate and should be reviewed within the coming year for the next reporting period.

Between the last reporting period and the upcoming one, Germany has established a new monitoring regime for habitats and species under the Habitats Directive. For widespread species, this is based on the monitoring of at least 63 sites per species/habitat per biogeographical region. Most of this system is now operational with the exception of the Alpine biogeographical region. Assessments are made via conferences (five days long) where the data from each of the four biogeographical regions are discussed and the

conservation status agreed upon. A fifth conference is held for forest habitats which makes use of the Forest Inventory Data which involves different stakeholders. This dataset holds data on 22,000 plots but not all of it falls into Annex I habitats and therefore requires adapting before it can be used.

Nevertheless, even 63 sites across the country represent a low a statistical power and do not provide a sufficiently robust assessment.

A big data gap is in the determination of characteristic species for habitats as it is too expensive and, according to the Lände, impractical. Therefore, they have had to make certain assumptions based on other data.

Manner in which assessments consider ecological factors

For bats**,** Schnitter (2006) recommends that summer colonies, winter sites and hunting areas are evaluated separately. Population criterion is presence of suckling female offspring (or number per colony). A more differentiated analysis of population structure is currently not possible. It is recommended that population trend is measured using at least a 6 year period (i.e. the time between Article 17 reports).

(ii) Approaches used in setting FRVs for widespread species (i.e. those that occur widely outside designated sites).

Broadly, for widespread species, the FRVs have been set at the levels from 1994, except in cases where it is known that there had been big losses by then, in which case the FRV is set higher than the 1994 levels. There was only very limited guidance provided in the setting of the FRVs. For instance, if a species was very rare and susceptible to extinction through random events, then it would certainly be classified as unfavourable. For some rare species, very little data exist on their historical range and thus it is very difficult to know what the natural extent of the range/population would have been. Population structure, where data existed, was used. There have been very few scientific models and approaches to establishing a FRV.

A stratified system is used to select the 63 sites for monitoring, with sites distributed according to the proportion that they are present across Lände. The FRVs are politically sensitive and thus not entirely based solely on scientific considerations.

(iii) How projects or developments outside designated sites are assessed in terms of their impacts on FCS of a species of Community interest and the approaches applied to mitigation or compensation.

For Annex IV species, there is a Federal order on how the species are to be protected, known as the "*Bundesartenschutzverordnung*". Species are given the same level of protection as those given to species under CITES. Nevertheless, species management programmes are the responsibility of the Lände.

Where a development is likely to impact on a European Protected Species, an assessment has to be carried out evaluating the impacts. In general, if only a single individual has been recorded, then there is no need for protection. Full protection is afforded for important features such as a breeding site.[29] However, if a species

[29] http://www.ffh-anhang4.bfn.de/

is known to be very difficult to observe in the wild, a single individual may be taken to indicate the presence of a population; for other species (e.g. amphibians) one individual may not be enough to be considered a full population.

The conservation status and extinction risk of the species also play a part. Species protection measures have the responsibility to ensure the continuation of the species in its habitat.

(iv) Approaches and assumptions used to determine (a) appropriate population levels of wild birds and (b) sufficient extent and quality of bird habitat outside of SPAs.

In the national framework law on nature protection (Bundesnaturschutzgesetz – Article 6), there is a requirement to assess the status of the bird population but it is at the very early stages of implementation, as it must also be transposed into law at the Lände level. Some of the Lände have, nevertheless, created their own evaluation matrices to assess conservation status of wild bird populations.

There will, however, be no additional reporting in the German report other than that required by the Commission.

(v) How conservation objectives for SACs and SPAs have taken account of FRVs (under the Habitats Directive) and appropriate bird populations (compliant with Birds Directive requirements).

There has been very little integration of FRVs into the conservation objectives at the site levels. Unlike the NL, there is no top-down-bottom-up planning at the national level. Lände set conservation objectives in their own way and planning is generally carried out from the perspective of the site; e.g. mapping potential areas of restoration and setting goals. An attempt was made to set objectives at the biogeographical zone level, but this approach failed due to a preference from the Lände to set objectives themselves. The differences in approaches to schemes such as agri-environment schemes – where Lände have responsibility for writing RDPs and thus identifying most suitable measures - also means that the same means of achieving objectives are not always available across the country.

Interviewees, role and expertise:

- Axel Ssymank, Bundesamt für Naturschutz, (Federal Agency for Nature Conservation (BfN)) Responsible for co-ordinating the Article 17 reports.

- Götz Ellwanger, Bundesamt für Naturschutz, (Federal Agency for Nature Conservation (BfN)) Responsible for co-ordinating the Article 17 reports.

Ireland

(i) The extent to which an ecological basis is used for assessing species Conservation Status

Manner in which assessments consider ecological factors

Range

In 2007, most of the species data was 'baseline' and the current range value was generally set as the FRR if there was no evidence of decline since the Directive came into force. In some instances, fragmentation or recent losses were accounted for and the FRR was set as higher than the current range (Lynn & Weir, 2012).

For those species dependent on habitat that has been heavily fragmented (e.g. fish species whose movement is blocked by weirs; the Natterjack Toad (*Epidalea calamita*) whose populations are isolated due to breaks in the habitat) or for habitats themselves considered highly fragmented (e.g. hay meadows) the range was assumed to be unfavourable and the FRV was set as greater than the current level.

The analysis used the raw distribution data of each species and utilised the range tool to develop a convex hull polygon envelope around the distribution points. This was then judged by experts to interpret whether it is realistic, with an audit trail provided for any changes to the map. For widespread species, the results from the range tool are in all likelihood acceptable, but scare species are likely to require significant clipping of the range. Ireland uses a 20km gap.

For many of the habitats, Ireland may not have data dating back to 1994. Setting FRV for range is based on expert judgement of whether the range and area have changed since the Directive; if it hasn't and it appears to be sufficient, then it is set as the baseline. If more information becomes available between reporting periods, the baseline is updated rather than indicating that there has been a change in the area/range.

Population

A similar methodology is used for determining FRP as that adopted for FRR. In many cases, data are not available for population levels in 1994, and therefore where current populations are in good condition and habitat appears stable and in good condition in the recent past, it is assumed this was the extent and condition of habitat in 1994. If data are available and show that there has been a decline since 1994, or this is the judgement of the experts in the absence of adequate data, then it is assumed that FRP is larger than the current level.

Most estimates for population size (individuals) will require a certain degree of extrapolation (e.g. from sub-samples or carrying capacity land-use types). Estimated error should be provided (Lynn & Weir, 2012).

For some species, where particular knowledge is available about the viability of a population (e.g. lack of recruitment in Freshwater Pearl Mussel (*Margaritifera margaritifera*)) then the current population level was considered unfavourable regardless of how many individuals there are. In addition, if was deemed that the range needed to be bigger, then it was assumed that more populations were required to fill these gaps. Factors that were considered included recent trends and occasionally viability assessments (although if it is present, it was generally considered viable). If it was evident that a species was in UFC, and good historic data existed to show it had been in better condition in the past then the historic value would likely have been used (e.g. Atlantic Salmon). For many species, where these data do not exist, it was nonetheless clear that the numbers were insufficient to be viable; in this case, the FRP was simply set as greater than current

levels. A precautionary principle was used with a view to ensuring the conservation of the species in question.

Area

The areas covered by some habitats, even when the Directive came into force was not considered sufficient to ensure the long-term viability of the habitat, e.g. highly fragmented Old Oak Woodlands and Lowland Hay Meadows (Lynn & Weir, 2012). For many of the habitats, Ireland may not have data dating back to 1994. Setting FRV for range and area is based on expert opinion of whether the area have changed since the Directive; if it hasn't and it appears to be sufficient; then it is set as the baseline. If more information becomes available between reporting periods, the baseline is updated rather than indicating that there has been a change in the range.

For older woodland, Ireland attempted to estimate a minimum area per a 10 km square that it would have to be achieved. For the case of Yew forest, which has a restricted range, there are a limited number of places where it would exist but where restoration projects have been initiated based on sound science and these areas of these proposed restoration sites have been included in the FRA. For raised bog (currently 1% of original resource), Ireland added the current area of degraded raised bog to current area of active raised bog and set this as the FRA; nevertheless it may mean that restoration of some areas of degraded bog will not be feasible and therefore these areas will have to be found elsewhere.

Good monitoring programmes (car-sects) are carried out in every 10km block in Ireland but this level of detail is not necessarily replicated for roof roosts. For most of the species, range and distribution data are good, but poor data exists on population size. Estimation of population is based on landscape modelling. For species which cannot be detected by bat detector (e.g. Natterer's), a genetic sampling programme may be proposed.

(ii) Approaches used in setting FRVs for widespread species (i.e. those that occur widely outside designated sites).

For widespread species, the FRVs are set as the current levels of range and population, or at the 1994 levels if known.

(iii) How projects or developments outside designated sites are assessed in terms of their impacts on FCS of a species of Community interest and the approaches applied to mitigation or compensation.

For species listed under Annex IV of the Habitats Directive, Threat Response Plans must be developed outlining how the long-term future of the species will be preserved.

For bats, see NPWS (2009) and Kelleher and Marnell (2006).

Guidelines for proportionate mitigation. The definition of common, rare and rarest species requires regional interpretation.

Low	Roost status	Mitigation/compensation requirement (depending on impact)
	Feeding perches of common/rarer species	Flexibility over provision of bat-boxes, access to new buildings etc. No conditions about timing or monitoring
	Individual bats of common species	
	Small numbers of common species. Not a maternity site	
	Feeding perches of Annex II species	Provision of new roost facilities where possible. Need not be exactly like-for-like, but should be suitable, based on species' requirements. Minimal timing constraints or monitoring requirements
	Small numbers of rarer species. Not a maternity site	
	Hibernation sites for small numbers of common/rarer species	Timing constraints. More or less like-for-like replacement. Bats not to be left without a roost and must be given time to find the replacement. Monitoring for 2 years preferred.
	Maternity sites of common species	
Conservation significance		
	Maternity sites of rarer species	Timing constraints. Like-for-like replacement as a minimum. No destruction of former roost until replacement completed and usage demonstrated. Monitoring for at least 2 years.
	Significant hibernation sites for rarer/rarest species or all species assemblages	
	Sites meeting SAC guidelines	Oppose interference with existing roosts or seek improved roost provision. Timing constraints. No destruction of former roost until replacement completed and significant usage demonstrated. Monitoring for as long as possible.
	Maternity sites of rarest species	
High		

Source: Kelleher and Marnell (2006)

(iv) Approaches and assumptions used to determine (a) appropriate population levels of wild birds and (b) sufficient extent and quality of bird habitat outside of SPAs.

The interviewee did not have this data to hand. However, a Bird Atlas is due in the near future which should shed light on these questions.

(v) How conservation objectives for SACs and SPAs have taken account of FRVs (under the Habitats Directive) and appropriate bird populations (compliant with Birds Directive requirements).

Ireland is behind in the setting of objectives and the work done to establish function and structure of habitats has helped very significantly in determining what the goals for SACs should be. Ireland is therefore using the monitoring commissioned for Article 17 reports downscaled from national to the local level, which is supporting the development of goals of the SACs.

Interviewees, role and expertise:

- Deirdre Lynn, Project Officer, National Parks and Wildlife Service
  Responsible for delivery of the Article 17 reports under the Habitats Directive and the commissioning of the monitoring to support the report.

Italy

Background

The reporting under Article 17 of the Habitats Directive in Italy falls under the competence of the Ministero dell'Ambiente e della Tutela del Territorio e del Mare[30] at national level (here thereto referred to as the Ministry of Environment), who in turn commission ISPRA - an independent research institute – to carry out the assessments and set Favourable Reference Values. Monitoring is carried out by the regions, who supply the data on request to the national government, who provide the data to ISPRA. ISPRA in turn oversee the reporting process including the commissioning of experts through the various Scientific Societies (e.g. for mammals, butterflies etc.) to integrate the data and, in many cases, carry out the assessments.

For the 2nd reporting phase in 2007, the information used in the Italian report was based predominately on data from Natura 2000 sites, particularly for habitats, with only limited information on species from outside Natura 2000 areas. This was a pragmatic choice as these were the only data readily available and uniformly distributed across the national territory (Ministerio dell'Ambiente e della Tutela del Territorio e del Mare, 2008). Since then, greater efforts have been made to ensure more structured monitoring, including in areas outside protected sites, and improved integration of data sources. As a consequence, it will be difficult to compare the data generated for the 3rd reporting phase in 2013 with those used in the 2007 report. For instance, in 2007, the reporting of range was based solely on expert opinion, while in 2013 the range tool was used as outlined in the most recent guidance. Therefore, for much of the data, 2013 will be considered the baseline against which future trends will be reported.

[30] Ministry of the Environment and Protection of the Terrestrial and Marine Environments.

(i) The extent to which an ecological basis is used for assessing species Conservation Status

Manner in which assessments consider ecological factors

Although Italy has a very large number of species of Community interest, there are very few national monitoring schemes and in no cases have population viability analysis been used. Instead, conservation status is assessed through expert opinion via workshops attended by the main national scientific institutions for the relevant taxonomic groups. The organisation responsible for carrying out the assessment, ISPRA, host the workshops or meetings with individual experts for some species, where they presented data on ragne and population collated from around Italy (frequently from the regional authorities). The experts then determined what they thought were the likely current population and range values for Italy and compared these again the FRVs (usually via operators rather than setting numerical FRVs) to determine conservation status. All relevant experts in Italy were involved and the assessment was based on a large amount of information (e.g. 3,000 distribution maps provided by the regional authorities that were merged and integrated with addiational data, providing the most precise and updated compilation of data on species and habitats of community ever produced in Italy). The main limitation is that - given the very high number of species and habitats in Italy, and the limited level of knowledge on some groups – it was not always possible to define explicit range and population values.

There has also been a Red List evaluation in Italy during the same period, which to an extent has informed the process, although the experts had to be reminded about the distrinctions between the processes. In Italy, the assessment of conservation status was interpreted more with respect to the trends and to the probabilities of persistence of the species in the medium term, while also taking into account the changes since the 1994 levels.

Some attention was paid to genetic stability theory in the assessment of conservation status. Nevertheless, a population that has less than 500 individuals at the national level does not necessarily signify that the species was indicated as being in UFC. For instance, the Otter (*Lutra lutra*) is below the 500 individuals threshold at the national level and therefore classified under the Red List as Endangered, whereas in the Article 17 reporting it was deemed to be in FCS as it the population is increasing, with favourable habitat conditions and at a level that is higher than in 1994. The Italian interpretation of the Article 17 reporting is that the process differs from a Red List analysis of the risks of extinction and can also take into account the changes and trends since the Directive came into force.

For bat species, the populations were estimated based on capture-release release data; e.g. based on how often certain species are caught. From this data, they estimated its relative abundance and whether its trend is decreasing, stable or increasing, although it was acknowledged that these data are insufficient for an adequate assessment of conservation assessment.

For range, if the species has shown a reduction in the range occupied since 1994, then it was considered to be in UFC. However, in the case of a species which may be restricted in range, but does not show any decrease in population levels and no risk of extinction was expected, then the range could be evaluated as being in FCS, as long as the range does not appear to be a limiting factor; e.g. Sicilian Shrew (*Crocidura sicula*).

(ii) Approaches used in setting FRVs for widespread species (i.e. those that occur widely outside designated sites).

Range

Frequently for widespread species the current value was assumed to be approximately equal to the FRV. If the species has shown a reduction in the range occupied since 1994, then it was below the range and would be in UFC.

Population

A judgement was made as to whether the 1994 levels were sufficient based on general information about trends and population size. Only for the Brown Bear (*Ursus arctos*) in the Alps, which has been reintroduced, has a numerical FRP of 50 individuals been set, based on the MVP threshold indicated in the feasibility study produced for the translocation. There was also one species, the Montecristo's goat (*Capra hircus*) which is an introduced species, for which the FRV has been set as below the present level.

In most cases, no numerical values were attributed to the FRVs. Instead, the experts applied mathematical operators (>, >>, =, <) to indicate whether the current value is greater than, much greater than, equal to or less than the FRV (defined as a level of range or population that could sustain a population in the medium-long term, according to the methodology on page 21 of the guidance). For widespread species, the current value was in most cases assumed to be approximately equal to the FRV

There was a lack of clarity about the habitat for species. In their understanding, if the habitat per se is a limiting factor for the species in the near to medium future. E.g. freshwater species where pollution is a problem and cannot move to another area, then despite the range and population which may be high, then this may still be an issue. E.g. an abundant species whose range may be constrained by lack of habitat.

(iii) How projects or developments outside designated sites are assessed in terms of their impacts on FCS of a species of Community interest and the approaches applied to mitigation or compensation.

Regions and autonomous provinces have responsibility for implementing measures under Articles 12-16 of the Habitats Directive relating to the protection of species. The national government is responsible for producing:

- Plans of actions
- Guidelines
- Scientific studies on specific species. (Ministerio dell'Ambiente e della Tutela del Territorio e del Mare, 2008)

It is thought, however, that some regions have introduced legislation to ensure species protection outside protected areas.

Italy takes a strict interpretation of species protection measures in the Habitat Directive.

Bats: Most are in Annex II and the competence will be Ministry of Environment. In order to capture a bat, permissions must be authorisation from the Government with an opinion from ISPRA. The interpretation is quite strictly interpreteted. If a species of Community interest, authorisation is needed from the Ministry of Environment; and if not from the regional authority. If a household wants to disturb bats, they have to

inform the provincial administration, whose wildlife service has to do the work, no private sector group is allowed to do the work. Guidance is available about what to do.

If there is an edible Dormouse causing problems, then the provincial authority must be informed and will carry out the work to remove it.

Compensation: For the evaluation of the impact of windfarms on bats, ISPRA has to give an opinion which is considered.

(iv) Approaches and assumptions used to determine (a) appropriate population levels of wild birds and (b) sufficient extent and quality of bird habitat outside of SPAs.

Italy have produced very thorough analysis defining FRVs of Italian bird species included in Annex I of the Birds Directive based on the framework set out for the Habitats Directives. The approach is based on demographic trends, current population size and the minimum viable population concept. FRVs based on population viability analysis (PVA) were provided for populations of less than 2,500 pairs. For widespread species with more than 2,500 pairs, the FRV was expressed in terms of breeding density at different spatial scales (national and local).

The PVA method of establishing FRVs, which considers factors such as breeding success and mortality rates, allows for a degree of flexibility depending on the current status of a population in order to reflect the specific challenges of reaching FCS. This flexibility is demonstrated by the setting of FRVs for the Eleonora's Falcon (*Falco eleonorae*), an endemic Mediterranean bird of prey, which occurs in two populations in Italy; a small population in Sicily (~176 pairs) and a relatively larger population in Sardinia (~500 pairs). Using all known productivity values in Italy, the mean productivity was estimated to be 1.26 (± 0.39 SD) fledglings per pair. The Sardinian population, which has good chances for long-term survival given current average productivity, would face a high risk of extinction were its productivity to fall to 1.1 or less – a circumstance which has occurred already in Italy. In this situation, the MVP (*P = 1%*) would be 900 pairs. Thus reaching this number of pairs would guarantee survival even under scenarios slightly less favourable than the current situation and is therefore proposed as the FRP for the Sardinian population. The Sicilian population, on the other hand, shows a relatively high (>10%) probability of extinction of the next 100 years. Using the average productivity recorded in Italy, the MVP (*P = 1%*) would be about 320 pairs, providing the productivity does not dip below 1.26. Given that the current population is significantly below this figure, this level of risk has been accepted and recognised as its FRP, acknowledging that it would represent a much better chance of survival than the current situation despite representing a higher level of risk of extinction than the FRP for the Sardinian population (Brambilla et al, 2010).

The FRVs set by these studies, which were commissioned by the Ministry of Environment, are nevertheless are non-binding and are used by relevant authorities at their own discretion. BirdLife, who carried out the assessments, are investigating how to use the results for the new Article 12 reporting under the Birds Directive. An attempt will be made to continue the progress made to report conservation status of birds, but this requires a process of co-operation with the regions, in particular with respect to sensitivities regarding establishing the conservation status of bird species for which derogations have been granted to allow limited hunting. Regions in which these species are regularly hunted certain are often reluctant to make public the conservation status in case objections are made to continuing hunting practices.

(v) How conservation objectives for SACs and SPAs have taken account of FRVs (under the Habitats Directive) and appropriate bird populations (compliant with Birds Directive requirements).

According to the Ministry for the Environment, no efforts have been made to relate conservation objectives at site level for SACs to the national FRVs. For birds, some SPAs may have adopted goals based on detailed analysis of minimum viable populations of bird species on Annex I of the Birds Directive in Italy carried out in 2008 (see below) although these are not mandatory objectives and remain at the discretion of the relevant regional authority.

Interviewees, role and expertise:

- Eleonora Bianchi, Policy Advisor, Ministry of Environment
  Desk officer at the Federal Ministry responsible for overseeing the Article 17 reports under the Habitats Directive.
- Selected experts involved in the reporting process

Netherlands

(i) The extent to which an ecological basis is used for assessing species Conservation Status.

Manner in which assessments consider ecological factors

The Netherlands attempts to ensure a strong ecological basis in the setting of FRVs and for the assessments. When an assessment is made, experts will consider the MVP, incorporating numerous factors including genetic stability, inter-connectivity between populations, dispersal behaviour and the number of reproductive individuals.

For more widespread species or rare species where the actual population is unknown, upper and lower estimates are given. In order for the population to be favourable, the lower limit must be above the FRP.

For common widespread species the FRP is set as approximately equal to the current levels unless there is clear evidence that there has been a serious decline in the population since 1994. This is done on the basis that of an incomplete dataset of historical levels in 1994. Note: if there had been a serious decline in the species since 1994 and the levels in 1994 were considered to have been favourable, the FRV is set as the 1994 levels rather than the current levels.

In the 2013 report, an effort was made to establish minimum viable populations, and took 500 reproductive units as the minimum number for larger animals such as mammals. This is for regional meta-populations.

(ii) Approaches used in setting FRVs for widespread species (i.e. those that occur widely outside designated sites).

The first task was to check if the 1994 value was sufficient. If so then, the 1994 level becomes the FRV. If a range was given, then the lower level becomes the FRV. If 1994 is not considered sufficient, the expert will determine what the value should be to sustain a population, giving upper and lower levels. For widespread

species (e.g. *Rana temporaria*) 1994 population levels are as used as the FRP as they are present in all grids in numerous quantities. The FRV is reported is set approximately equal to the current levels in these cases as it is not always possible to have a complete dataset within the reporting period.

How Favourable Reference Values (FRVs) are set

Population

Setting of FRP is carried out by experts in three steps, with the following instructions (Ottburg & van Swaay, 2013):

Step 1: Is the 1994 value sufficient to ensure a sustainable survival of the population (based on number of mature individuals)? Experts should justify their response on the basis of the following factors:

- migratory routes and dispersal capabilities (including internationally);
- gene flow and clines including genetic variation;
- sufficiently large to survive natural fluctuations and to enable a healthy population structure;
- historical distribution and densities and causes of change; and
- the susceptibility to catastrophes.

Step 2: If the answer to the first question is 'NO', reasonable upper and lower limits (based on fluctuation) are set, establishing the exact numbers of mature individuals based on the FRR, taking into consideration the minimal geographical distribution required to ensure long-term survival of the species in the case of local extinctions through stochastic events. In their response, experts should consider the factors above (in Step 1).

In principle, the FRP should be sufficient to ensure an adequate geographical distribution of the species to avoid the extinction of the species through local stochastic events or catastrophes. For species that historically were significantly more widespread than in 1994, the experts are asked to select several key areas (by species) which should be reinstated with viable populations in order for FRP to be met.

For many vertebrates, therefore, the rule of Soule and Wilcox (1980) is used, indicating that the minimum viable population size of 500 reproductive units at the national level should be present (therefore the number of adult animals for the species of approximately 1,000 individuals). If the 500 reproductive units represent a single connected population, then the population was generally considered in FCS. However, in some cases, it may have been judged that a species requires five such populations (e.g. based on factors such as historical ranges or how recently changes have occurred, e.g. Common Spadefoot Toad *Pelobates fuscus*). This may frequently happen with river species that are disconnected from each other, so as to mitigate against catastrophic events. For other organisms the methodology of Pouwels et al (2002) (for selected species fish) or Traill et al (2007) is adopted.

If possible, upper and lower margins are specified. When it comes to the scientific reliability margins of the estimate of the population size, the minimum size is seen as the FRP. The margins are given to reflect the uncertainty in the literature regarding minimum viable population sizes and to show the potential variation as this could be very significant in some cases. In general, the lower level is used as the FRP against which the population estimate is measured. However, if there is a species that experiences large natural variations from year to year (e.g. Willowherb Hawkmoth (*Proserpinus proserpina*)), the minimum value is an outlier

down and the FRP is higher than the lowest value of the range.

Step 3: the FRP is set as the number of mature individuals or accepted different unit, possibly with a margin. If in step 1 'YES' is answered (i.e. the 1994 value sufficient to ensure a sustainable survival of the population), then the 1994 can be taken as the FRP value. If the answer in step one is 'NO', the FRP is taken to be the suggested value (or margin) from step 2.

For common widespread species the FRP is set as approximately equal to the current levels unless there is clear evidence that there has been a serious decline in the population since 1994. This is done on the basis that of an incomplete dataset of historical levels in 1994. Note: if there had been a serious decline in the species since 1994 and the levels in 1994 were considered to have been favourable, the FRV is set as the 1994 levels rather than the current levels. Although FRVs have been specified in draft, the Dutch Government decided not to report the FRVs and to use operators in their stead in the 2013 report.

As mentioned above the Netherlands adopted an approach to deal the uncertainty around population estimates when assessing conservation status. Population estimates are given higher and lower margins. In order for the species to be considered in favourable conservation status, the lower estimate must exceed the FRP. For example, the population of the Sea Lamprey (*Petromyzon marinus*) was estimated to be between 5,000-10,000 individuals. As the FRP is judged to have been 10,000 the population was considered to be unfavourable-bad conservation status (5,000 is more than 25% under 10,000).

If some cases, upper and lower margins are also specified for the setting of FRPs reflecting the uncertainty in the literature regarding MVPs and to show their potential variation, which could be very significant (see Box 3.3). In general in these cases, the lower level is used as the FRP against which the population estimate is measured. For instance, the Common Noctule (*Nyctalus noctula*) was estimated to have a population between 4,000-6,000 individuals. As the FRP is judged to be 6,000-8,000, the population was considered to be in unfavourable bad conservation status (as 4,000 is more than 25% below 6.000). Similarly the Serotine Bat (*Eptesicus serotinus*) was estimated to have a population between 25,000-40,000 individuals. With an FRP of 30,000 (30,000-50,000) it was given an unfavourable-inadequate conservation status (note: it was Favourable in 1994, but had decreased since then).

Range

The 1994 levels were taken to be the FRR and expert opinion was used to determine whether this was adequate. The steps the experts were asked to follow are as follows:

Step 4: Does the 1994 value ensure a sustainable survival of the population?

Justify the answer on the basis of the factors listed below:

- historical range and causes of change;
- area necessary for viability of the species, including the bridging connection and migration problems (incl. outside national borders);
- current range; and
- potential expansion of the range, taking into account physical and environmental conditions such as climate, geology, soil, altitude, sufficient to accommodate FRR.

Step 5: If the answer to the first question is 'NO': Determine a scientific margin, marked with exact numbers in 10x10 km grid, with a minimum of sustainable survival of the species geographically dispersed guaranteed.

Justify the answer on the basis of the factors listed in step 4. In principle, the FRR must be sufficient to ensure a reduced vulnerability to catastrophes through geographical distribution to ensure long-term survival of the species. For species that historically were significantly more widespread than in 1994, the aim is to select several key areas by species in determining the FRR. It is important in this respect that the FRR is large enough for the whole population Dutch FRP. For migratory fish species that reproduce in freshwater but live mostly in marine environments (shad, river lamprey, salmon and lamprey), their migration routes are recorded according to the guidelines in the FRR.

Step 6: Set the FRR fixed (number of 10x10 km grids).

If in step 4 'YES' is answered, then this is the FRR value from 1994. If in step 4 'NO' is answered, the FRR is the suggested value (or margin) from step 5. If it is known that the species follows permanent migration routes, these are included in accordance with the guidelines in the FRR. This is the case with the salmon and lamprey. However, for many of the bats migration routes are not known.

Step 7: What should happen in the Netherlands to achieve the FRR (range) and FRP (population) to achieve or maintain FCS? Experts are asked to specify:

- the effort required to achieve FCS;
- whether it is feasible via deployed or existing policy; what are the limiting factors to achieve the FRR and FRP;
- how are the limiting factors resolved? For example, surface habitat, habitat quality, improved functional connectivity etc., distinguishing between range and population.

Step 8: Are there any known/published data related to the species sensitivity to climate change? If yes, experts are asked to provide a reference and describe the estimated impact. If not, a best professional judgment with arguments is given. This assumes an average increase in temperature of 1.5 ¢ in 2050.

Area

The Netherlands adopt a particular approach for setting FRA based on typical species and assessing whether a habitat is in FCS. A distinction was made between 3 types of critical species:

- Exclusive: only occurs in that habitat type.
- Characteristic: always occurs but can also occur outside.
- Constant: occurs both in and out but indicates good habitat conditions.

The conservation status of the first two species types is considered the most important in determining the FRA of the habitat type. For assessing the conservation status all three typical species are used as the third is an indicator of good quality.

(iii) How projects or developments outside designated sites are assessed in terms of their impacts on FCS of a species of Community interest and the approaches applied to mitigation or compensation.

How Article 12, 13 and 16 of the Habitats Directive have been implemented

The Netherlands adopts a quite strict protection of individuals of protected species. There are two laws in the Netherlands implementing the Birds and Habitats Directives; one for establishing Natura 2000 protected areas (Nature Conservation Act, 2002) and a separate law governing species protection and the regulation of hunting (the Flora and Fauna Act 2002). A quite literal interpretation of the Birds and Habitats Directive is taken in the law governing species protection. (See bats example below).

Is Favourable Conservation Status is a consideration when granting derogations under Art 16?

Before any development on a site takes place the developer must carry out an assessment on the impact of the development on protected habitats and species. This much must include an assessment of the impact on the individuals present as well as the impact on the species' overall national Conservation Status. If the development is likely to negatively impact on overall Conservation Status, mitigation and/or compensation measures will be required to be put in place. The overall Conservation Status must not be affected. These studies are examined by the Government Service for Land and Water Management (DLG), who will assess whether the mitigation and compensation measures are sufficient.[31]

Where derogation are granted, what measures for mitigation/compensation are in place?

If a species is in UFC, then tougher measures are required. With numerous cases built up since implementation, there is accumulated experience and the setting of precedence. Documentation of the measures that have been taken for the 20 most common species for which measures have been required is available on the Dutch website.[32] These documents contain technical detail such as the type of activities and the time of year to avoid, how to create suitable habitat for species etc.

Bats: The Flora and Fauna Act 2002, the law implementing Articles 12 and 16 in the Netherlands, adopts a relatively strict interpretation of the Habitats Directive. For small projects that do not require Environmental Impact Assessments, such as home renovations, the households responsible must submit an impact assessment detailing the likely impact of the development. The competent authority, before granting permission, must be satisfied that the development will not adversely affect the conservation status of the local population, and can prescribe mitigation or compensatory measures to be taken. The Common Pipistrelle (*Pipistrellus pipistrellus*), a widespread species in FCS, is the species for which this process is most used for. Indeed, a potential weakness is that the same protection measures are used for common species as for much rarer and endangered species.

Although a robust system is in place to protect all species, the system relies on strict enforcement to ensure its functioning. Unless authorities are alerted to a possible conflict between developments and the presence of protected species, developers often do not ask for permission before a development begins. One interviewee suggested that many of the compensatory actions under the Act are never implemented as there is no enforcement and many of the compensation measures are very often very simple, e.g. the putting up of bat boxes in order to replace much larger loft habitats that have been destroyed.

[31] http://www.dienstlandelijkgebied.nl/en

[32] http://www.drloket.nl/onderwerpen/vergunning-en-ontheffing/dossiers/dossier/flora-en-faunawet-ruimtelijke-ingrepen

(iv) Approaches and assumptions used to determine (a) appropriate population levels of wild birds and (b) sufficient extent and quality of bird habitat outside of SPAs.

The Netherlands have established population targets for each bird species in Annex I of the Birds Directive. For stable populations, the target is set as the average breeding population in the year 1999 and 2003. This time period was chosen for stable populations as it represented the most recent 5-year period for which a complete data set of all sites was available (the study began in 2005 and it takes about 2 years to collect, process and validate all bird count data). If an earlier period had been chosen, species whose populations had increased since that date would have had lower targets than their current population levels.

For declining populations, a level somewhere between 1981 and 2003 is selected on the basis of setting a target that is realistic and that can be reached by restoration measures. For this reason, a target equivalent to the population present in the 1990s is most commonly set; i.e. if the declines have been very significant then it is unlikely that populations from the 1980s can any longer be achieved. Nevertheless, attempts are made to ensure a more ecological basis to setting target values.

No specific levels are set for habitat for the birds, but it is led by the population goals. If the population level is below the national target then this will dictate if restoration is required to return it to the population goal. This translates to goals at the site level. There is no instrument for restoring habitat outside of SPAs – except for farmland birds and the Ecological Network.

(v) How conservation objectives for SACs and SPAs have taken account of FRVs (under the Habitats Directive) and appropriate bird populations (compliant with Birds Directive requirements).

To date, there is no consideration of FRVs in the conservation objectives of SACs. Many widespread species occur outside SACs. Once there is greater confidence about the validity of the FRVs, the Netherlands may create national targets (which may be lower than the FRP based on practicality), and then they could look at how much is required from the site. In SACs, the conservation goals do not specify targets in terms of individuals, but rather focus on maintaining or increasing numbers of individuals. These targets are based on the potential of each site rather than on FRVs.

For SPAs, they have set values for potential number of breeding pairs at a site (see question (v)).

Interviewees, role and expertise:

- Annemiek Adams, Ministry of Economic Affairs
  Officer at the Ministry responsible for overseeing the Article 17 reporting process under the Habitats Directive and Article 12 under the Birds Directive.
- Eduard Osieck, Ministry of Economic Affairs
  Officer at the Ministry oversaw work on target setting for birds.
- Jeroen Ostendorf, Ministry of Economic Affairs
  Officer at the Ministry specialising on species protection measures.
- Chris van Swaay, Vlinderstichting (Dutch Butterfly Conservation)
  Contractor jointly responsible for producing the Article 17 methodology and reporting on conservation status in the 2013 period under the Habitats Directive.

Setting of FRVs for Triturus cristatus in the Netherlands (2013 reporting period)

Source: (Ottburg & van Swaay, 2013)

Step 1: Is the 1994 value sufficient to ensure a sustainable survival of the population (based on number of mature individuals)?

The number of newts around 1994 is estimated at 40,000 to 500,000 adults, which roughly occur east of the line Groningen-Cadzand. These numbers conform to several geographically dispersed metapopulations, each with at least 500 reproductive units (Pouwels et al, 2002). This number was determined as follows:

- Estimated number of grid squares: 1000
- 1-10 pools per kilometre square with a between 10-100 adults (average 50)
- Minimum density: 2 × 20 = 40, max Density: 10 × 50 = 500 per km2.
- Population Size min: 1000 × 40 = 40,000
- Population size max: 1000 × 500 = 500,000

Step 2: If the answer to the first question is 'No', reasonable upper and lower limits (based on fluctuation) are set, giving exact numbers of mature individuals based on the FRR.

Not applicable

Step 3: Set the FRP fixed (basically in number of mature individuals or accepted different unit), possibly with a margin.

40,000 to 500,000 adults

Step 4: Does the 1994 value ensure a sustainable survival of the population?

The Great Crested Newt is spread across the southern, central and eastern parts of the Netherlands, with an exception being the presence of the species in the South Holland dunes. In 1994 it occurred in the entire potential range. This situation was sustainable.

Step 5: If the answer to the first question is no: Determine a scientific margin, marked with minimum number of 10x10 km-grids, to ensure sustainable survival of the species geographically dispersed.

Not applicable

Step 6: Set the FRR fixed (number of 10x10 km pens).

177 grids of 10x10 km without padding.

Step 7: What should happen in the Netherlands to the FRR (range) and FRP (population) to achieve or maintain FCS?

A positive development is the designation of protected areas under Natura 2000. Strengthening the Great Crested Newts population is done primarily by the construction of pools, but the presence and management of land suitable habitat is also of great importance. Newly dug ponds are often

populated by newts within several years. Some useful measures for this species include:

- the construction of pools at low acidification sensitive soils, such as (former) land within 500 meters of existing populations;
- maintaining low dynamic waters in the river;
- preventing acidification and eutrophication;
- restoring land habitats such as hedgerows, hedges and bushes; and
- restore original groundwater and seepage situations.

Step 8: Are there any known/published data related to the species sensitivity to climate change? If yes, provide a reference and describe the estimated impact. If not, provide a best professional judgment with arguments, assuming an average increase in temperature of 1.5 ¢ in 2050.

No major impact of climate change on the Great Crested Newts is expected in the Netherlands.

Sweden

(i) The extent to which an ecological basis is used for assessing species Conservation Status

Manner in which assessments consider ecological factors

For a few rare species for which they have good knowledge of what constitutes suitable habitat and good monitoring of the total population is in place (e.g. Scarce Fritillary *Euphydryas maturna*), Sweden takes into account both the sufficiency of suitable habitats and fragmentation. This is also the case for the Great Crested Newt, which is not particularly rare in Sweden. Although monitoring is not as good as for Scarce Fritillary, good knowledge exists of its habitat requirements. PVA has been carried out for the large carnivores, but how the analyses will be used to determine conservation status is unclear.

Bats: they know well the distribution and population numbers of bats in Sweden. There have been no population viability analysis undertaken in Sweden nor are there data on habitat availability. Bat abundance figures come from line transects which have been ongoing for approximately 15-20 years for the common species, and obtaining a rough national population estimate through extrapolation using availability of forest habitats. The monitoring programme is insufficient to give data on trends as it is not sufficiently systematic. The FRP was set as the level for which Sweden joined the EU (1995). Species distribution data is known quite well as a consequence of developments for wind farms, e.g. Barbestelle Bats, which are rare but widespread. Northern Bat is the most common and widespread.

(ii) Approaches used in setting FRVs for widespread species (i.e. those that occur widely outside designated sites).

How Favourable Reference Values (FRVs) are set

Range

If the species is widespread, it is assumed that it the range is in FCS and the FRV will be the same as

when they joined the EU (1995 in the case of Sweden). If no data are available from 1995, the FRR is taken to be the current value.

Population

In the vast majority of cases, the FRPs were set as those in 1995. For certain species (Dragonflies, Vertigo spp, etc.) data were very limited on range and population; in particular modern data. Work was carried out to bring together information from these species (e.g. from the 1960s to the current day) and modernising the data sets, to compensate for a lack of modern data. Expert judgement was used to determine the FRVs based on used trend data (which in itself was based on expert judgement). For some ecosystems, such as freshwater habitats, there has been a reduction of pressures by 1995, so it is unlikely that much has been lost since then. For terrestrial (butterflies and wood weevil beetles), there were better data available.

For the large carnivores and seals (Grey and Harbour Seals), the SLU were not allowed to set the FRVs due to the political nature of these species. For example, for Wolf (*Canis lupus*) no status was given in 2007 due to political sensitivity surrounding the species.

In 2007, a range of parameters were used; such as the number of populations, or number of localities in which the species was present such as streams, lakes etc. These reporting units were easier to use and to follow up. The Swedish staff have found it much harder to use the number of individuals.

Great Crested Newt: In 1995, it was estimated that there were approximately 2000 ponds/localities. Following a more thorough analysis, they established that this was a huge underestimate, and that 2,000 individuals were in the CON region alone.

(iii) How projects or developments outside designated sites are assessed in terms of their impacts on FCS of a species of Community interest and the approaches applied to mitigation or compensation.

Both bats and newts have created issues with respect to planning laws and restricting development. Initially, when the law was first implemented, a strict interpretation was taken of Article 12, prohibiting any disturbance of roosting or breeding sites of protected species listed in Annex IV(a) of the Habitats Directive. Subsequent changes to practice have resulted in greater flexibility; for instance allowing the movement of newt populations by the creation of new ponds in neighbouring sites. The law implementing the Habitats Directive, including Article 12, is the Species Protection Act[33].

Bats: Even for common species in Sweden that are in FCS, such as Northern Bats (*Eptesicus nilssonii*), the renovation of homes in a manner that damages the site is strictly prohibited and there are only very few cases where permission has been granted. In theory, according to the law, these roosting sites should not be altered in any way, but in practice households are permitted to carry out renovation work during winter months when bats move from homes to damper and colder sites to

[33] http://www.notisum.se/rnp/sls/lag/20070845.htm

hibernate. Compensatory measures are not used in such cases. The only requirement in these circumstances is species identification. Only in extreme situations would a derogation to alter a roosting site be allowed, usually only for common species and not for threatened such as Barbastelle Bats (*Barbastella barbastellus*). Nevertheless, some exceptions have been made even for rare bats. For instance, a family was recently allowed to move a population of 500 of Pipistrelle Bats (*Pipistrellus pipistrellus*) – which are extremely rare with only 2 populations in Sweden – from their home to a neighbouring roosting site. It is worth noting that a significant threat to bat species relates to the loss of foraging through conversion of pasture to forestry, which does not require an impact assessment and is not covered by the species protection measures.

In theory, no development can go ahead which is foreseen to result in the death of the individuals or loss of breeding and roosting sites. When a development is in planning stage, distribution data are used to inform the EIA process. In circumstances where a rare species of bat in UFC are found (e.g. Barbastelle Bats), large infrastructure projects with likely negative impacts, such as wind farms, cannot be constructed and have to be re-sited. This has happened on several occasions. In the case of a high population of common species in FCS, such as Northern Bats, that would be greatly impacted by a development, it is thought that developments could be allowed to go ahead with the condition of suitable mitigation measures being applied such as stopping the turbines in particular areas or times of the year or regular monitoring. While these measures have been suggested in the past, no case studies were known by the contact at SLU where these mitigation measures have in fact been implemented.

A similar strict approach is taken for Great Crested Newts, with all individuals protected and compensated for if unavoidable impacts occur, irrespective of the conservation status of the population. This is leading to substantial requirements for newt surveying, habitat creation and translocation measures in some areas where the species is relatively widespread (such as Gothenburg city)[34].

(iv) Approaches and assumptions used to determine (a) appropriate population levels of wild birds and (b) sufficient extent and quality of bird habitat outside of SPAs.

In advance of the 2007 reporting, Sweden established FRVs for the Annex I species of the Birds Directive in a manner similar to that adopted for species under the Habitats Directive; i.e. establishing FRR and FRP for the 67 species relevant to Sweden. 1995, when SE entered EU, was set as the minimum allowable value for the FRVs. They used IUCN Red List guidance (e.g. 1,000 breeding pairs used for some species used a guide) – but did not carry out PVA. Attempts were made to raise the figure as high as possible and then every species was examined to determine how many breeding pairs that may be supported within the remaining habitat sites (i.e. carrying capacity such as the number of nesting sites), taking into account landscape change. Due to political considerations, however, these FRVs have not been used officially in conservation management.

Discussions are ongoing with respect to the future assessments. They intend to use the BirdLife approach – which is a modified IUCN Red List system measuring the risk of extinction – rather than

[34] Jorgen Sundin, SEPA pers comm.

persisting with the FCS system of setting positive objectives. This system measures the decline in population over three generations (over a minimum 10 years) to indicate extinction risk. An exception is made (under Criteria C of the regional guidance[35]) for species with 20,000 mature individuals with a very large decline. As an example, Salmon (*Salmo salar*) has experienced 95% declines in the last 100 years but is currently stable at 50,000 individuals and therefore considered of least concern. Sweden is considering the possibility of using the Red List criteria as a minimum level to be maintained for bird species; thus it would be accepting a lower level of biodiversity but at least ensuring that risk of extinction is being managed.

(v) How conservation objectives for SACs and SPAs have taken account of FRVs (under the Habitats Directive) and appropriate bird populations (compliant with Birds Directive requirements).

For birds, as no national objective for population or habitat for birds are currently adopted, these are not considered in the setting of objectives at SPA level. SPA level objectives are therefore site specific. No response was given regarding SACs.

Interviewees, role and expertise:

- Mikael Svensson Swedish University of Agricultural Sciences (SLU)
  Responsible for development of species reporting and bird monitoring.

- Jonny de Jong, Swedish University of Agricultural Sciencies (SLU)
  Researches landscape ecology connected to forestry and landuse and co-ordinates bat monitoring and surveys.

35 http://www.iucn.org/about/work/programmes/species/our_work/the_iucn_red_list/resources/guidelines_application/

ANNEX 4: THE UK APPROACH

This section sets out the main elements of the UK approach to assess conservation status of species of Community interest. It is included here to provide a benchmark against which the methods and approaches of the other Member States can be compared. It is based on JNCC (2007).

Reporting under the Habitats Directive

Range: setting FRR and assessing status

Range status assessment in the UK involves a measure of the geographical limits of the species distribution across the UK, informed by an estimate of current surface area, trends in surface area and the FRR. The extent of occurrence for species conservation status assessments was calculated using an 'Alpha-Hull' algorithm at a 10km square resolution. An alpha hull comprises a series of polygons[36], allowing holes within the outline shape. A parameter α determines how tightly polygons are fitted around the distribution points. These values are set to reflect the dispersal behaviour of individual species.

In order to determine a FRV for an individual species range, its range in 1994 was used as a preliminary baseline. Where 1994 data were not available, the nearest and most recent alternative was considered. While no presumption was made as to whether the range was favourable or not at that time, consideration was given as to whether the range was sufficiently large to support a long-term viable population of the species.

In the absence of detailed modelling, defining FRVs has been problematic. To overcome this, current trend data were used as an indicator. In case of an increasing or stable trend, the FRR was deemed likely to be equal to the 1994 estimate. Exceptions included where the trend is attributed to introduction programmes only, increased survey effort or where the 1994 range was a risk from stochastic event and the reported increase was not sufficient to eliminate this risk suitably.

The status of range was determined according to the rules of the EC's general evaluation matrix in Annex C of the guidance (ETC/BD, 2006). See Table A4.1 below.

Table A4.1. Criteria for determination of conservation status of range

Parameter	Conservation Status			
	Favourable ('green')	**Unfavourable - Inadequate ('amber')**	**Unfavourable - Bad ('red')**	**Unknown (insufficient information to make an assessment)**
Range	Stable (loss and expansion in balance) or increasing AND Not smaller than the 'favourable reference range'	Any other combination	Large decline: Equivalent to a loss of more than 1% per year since 1994 OR More than 10% below favourable reference range	No or insufficient reliable information available

Source: JNCC (2007) based on European Commission (2006)

[36] Any shape consisting of straight lines that are joined to form a closed chain or circuit.

Population: setting FRP and assessing status

In order to determine a FRP for an individual species population, 1994 was used as a preliminary baseline. While no presumption was made as to whether the population was favourable or not at that time, consideration was given as to whether the population was viable. Viability was defined as:

'*the condition that a habitat or species needs to be in to perpetuate itself indefinitely over time under the likely conditions of future land and water management*.'

Population viability analyses were not carried out for the reporting in 2007 due to time and resource constraints. Instead, current trend data were used as an indicator for determining viability. Preliminary interpretations were made depending on whether populations had increased, decreased or remained stable since 1994. Decisions were then informed by population structure (where deviations from the norm were taken to indicate that populations are not viable), conservation management and vulnerability to stochastic events. A decision tree was created to assist in the assessment of FRP. In cases of increasing or stable trend, the FRP would be set equal to the 1994 levels except for particular circumstances. These exceptions included where trend attributed to introduction programme only, increased survey effort, the 1994 population level was at risk from stochastic events or if there remained inadequacies in population structure.

Overall determination of conservation status for species follows the EC assessment procedure; thus if any parameter is considered Unfavourable-Bad (i.e. either range, population, habitat or future prospects), the overall conclusion will be reported as Unfavourable-Bad regardless of the condition of the other parameters. Similarly with Unfavourable-Inadequate. See Table A4.2 below.

Table A4.2 Criteria for determination of conservation status of population

Parameter	Conservation Status			
	Favourable ('green')	**Unfavourable - Inadequate ('amber')**	**Unfavourable - Bad ('red')**	**Unknown (insufficient information to make an assessment)**
Population	Population(s) above 'favourable reference population' AND Reproduction, mortality and age structure not deviating from normal (if data available)	Any other combination	Large decline: Equivalent to a loss of more than 1% per year (indicative value MS may deviate from if duly justified) within period specified by MS AND below 'favourable reference population' OR More than 25% below favourable reference population OR Reproduction, mortality and age structure strongly deviating from normal (if data available)	No or insufficient reliable information available

Source: JNCC (2007) based on European Commission (2006)

Habitat for the species: determining status

Habitat status assessment for a species includes an estimate of the area of habitat currently used, the trend in habitat (area and quality), and the area of 'suitable' habitat required to support a favourable (long-term viable) population of the species. The UK has found this parameter very difficult to assess due to insufficient data.

For instance, habitat area has been reported as Unknown for all but a few species due to very few attempts to provide quantitative area estimates at a UK level. Quantitative data on habitat trends at a species specific level were similarly lacking except for some generalist species for which the Countryside Survey data could be used. Therefore, most post-1994 trends reported have been based on expert opinion informed by contextual information.

Table A4.3 Criteria for determination of conservation status of habitat for the species

Parameter	Conservation Status			
	Favourable ('green')	**Unfavourable - Inadequate ('amber')**	**Unfavourable - Bad ('red')**	**Unknown (insufficient information to make an assessment)**
Habitat for the species	Area of habitat is sufficiently large (and stable or increasing) AND Habitat quality is suitable for the long term survival of the species	Any other combination	Area of habitat is clearly not sufficiently large to ensure the long term survival of the species OR Habitat quality is bad, clearly not allowing long term survival of the species	No or insufficient reliable information available

Source: JNCC (2007) based on European Commission (2006)

Since area estimates were rarely available, current trend and information on current habitat quality were essential to the assessment outcome. The results from the Common Standards Monitoring of protected sites were also used to help inform decisions on whether habitat quality was sufficient for long-term survival.

Future prospects: assessment of status for species

This comprises an initial judgement regarding whether prospects are good, poor or bad; and the conclusion as to whether it is Favourable, Unfavourable-Inadequate, Unfavourable-Bad or Unknown). As no definition is provided as the definition for the timescale to be considered, the UK decided to assess future prospects on the basis of two reporting periods, i.e. 12 years.

Information on legislative protection, policy, conservation action (planned and established) and threats were used to inform the decision on a species prospects.

ANNEX 5: REPRESENTATIVES INTERVIEWED

AUSTRIA			
Michael Dvorak	Birdlife Austria	michael.dvorak@birdlife.at Tel: +43 1 523 46 5130	Responsible for producing Article 12 report under the Birds Directive for Austria.
Thomas Ellmauer	Federal Environment Agency (Umweltbundesamt)	thomas.ellmauer@umweltbundesamt.at Tel: +43 1 31304 5867	Responsible for co-ordinating the Article 17 reporting for Austria.
BELGIUM (FLANDERS)			
Desire Paelinckx	Research Institute for Nature and Forests (INBO)	Desire.PAELINCKX@inbo.be Tel: +32 478 24 09 85	Co-ordinator of the Article 17 reporting.
Anny Anselin	Research Institute for Nature and Forests (INBO)	anny.anselin@inbo.be Tel: +32 2 525 02 07	Co-ordinates the reporting of the Birds Directive for FL and is responsible for co-ordinating with Waloonie Region and Federal Belgian government officials to create the Belgium report.
Dries Adriaens	Research Institute for Nature and Forests (INBO)	dries.adriaens@inbo.be Tel: +32 2 525 02 02	Expertise in the monitoring of amphibians.
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Murel Truu	Environment Board (Keskkonnaamet)	murel.truu@keskkonnaamet.ee Tel: +372 530 22335	Overall responsibility for species action plans.
Üllar Rammul	Nature Conservation Department, Ministry of the Environment	yllar.rammul@envir.ee Tel: +372 6262881	Policy officer on conservation of birds, responsible for the Birds Report to the European Commission.

EU			
Angelika Rubin	Unit B3 - Nature, DG Environment	Angelika.Rubin@ec.europa.eu Tel: +32 2 2962234	Responsible for designing and building up outcome based information-flows and reporting-systems that show the current state of species, habitats and sites of EU-importance, based on the reporting obligations of the nature directives.
Doug Evans	European Topic Centre for Biodiversity (ETC-BD)	evans@mnhn.fr	Oversees the analysis of all the Member States' Article 17 reports under the Habitats Directive which forms the basis of the European Commission's composite report.
Carlos Romão	Eureopean Environment Agency (EEA)	Carlos.romao@eea.europa.eu Tel: +45 33 36 72 09	Co-ordinating the EEA's support for Art 12 and 17, processing the data (via Reportnet - a series of modules, data dictionary of the all MS involved, Central Data Repository - where MS deliver their data).
FRANCE			
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ITALY			
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