EU guidance on wind energy developments and Natura 2000

and

Online manual on wildlife sensitivity mapping

22/09/2020 online workshop on Maritime Spatial Planning and Offshore Wind Energy (Capacity 4MSP)

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Developing renewable energy in line with the EU nature Directives

Important to ensure that its expansion is sustainable and is achieved without significant damage to the natural environment and to Europe's natural heritage:

All plans and projects must be carried out in accordance with
- SEA Directive
- EIA Directive
- Habitats and Birds Directives

Developing renewable energy in line with the EU nature Directives

2 aspects of the 2 EU Nature Directives are to be considered in particular:

1.Developments that are likely to affect Natura 2000 sites must undergo the **step-by-step appropriate assessment procedure** and introduce necessary safeguards for the species and habitat types of EU importance (Article 6 Habitats Directive)

2.The two Directives also require that **Member States protect species of EU importance *throughout their natural range within the EU*** ie. also outside Natura 2000 sites (Article 5 of Birds Directive and Articles 12 & 13 of Habitats Directive)

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EU guidance document on wind energy developments and Natura 2000

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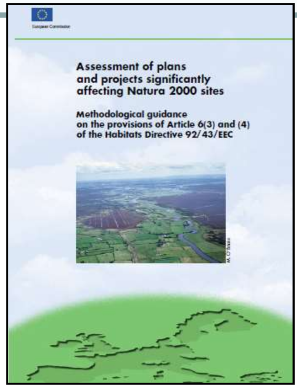
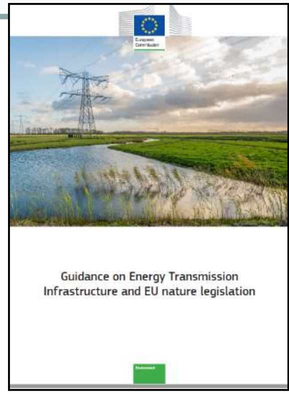
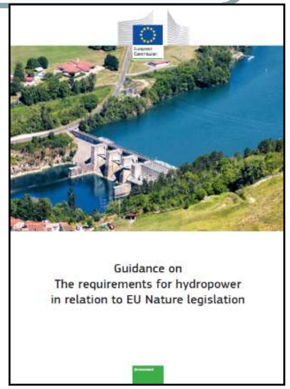
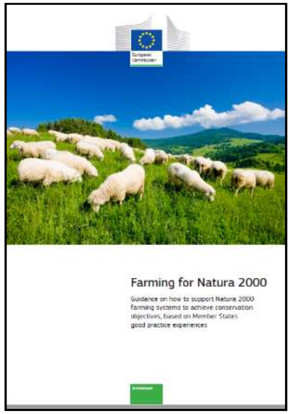
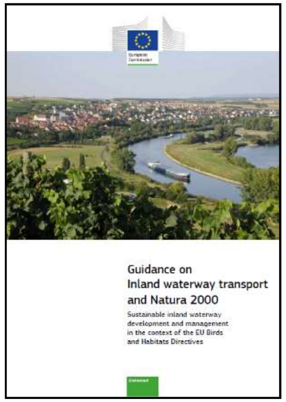
Commission guidance documents

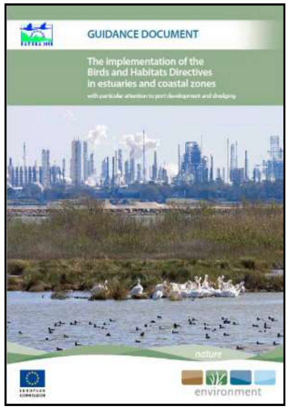


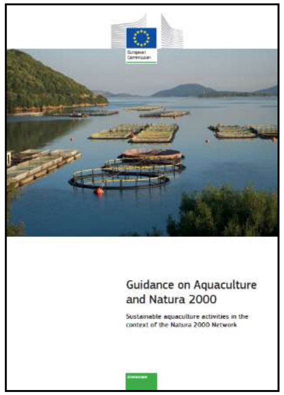


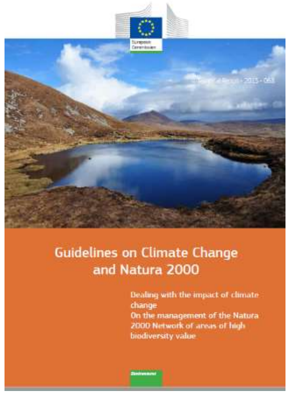


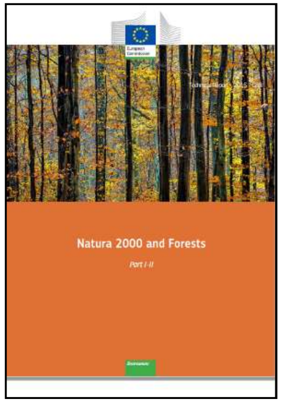




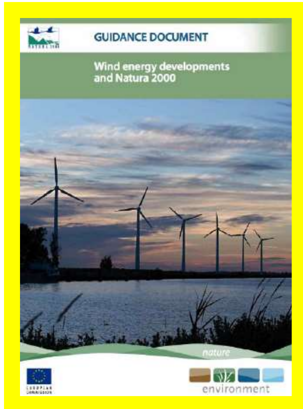








https://ec.europa.eu/environment/nature/natura2000/management/guidance_en.htm

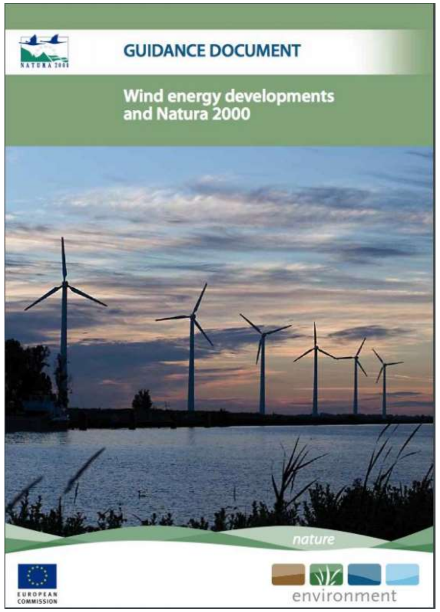


EC guidance document on: Wind energy developments and Natura 2000

- Existing guidance document (2011)
https://ec.europa.eu/environment/nature/natura2000/management/docs/Wind_farms.pdf

- Update of guidance necessary:
  - New technologies (esp. offshore)
  - More knowledge / case studies
  - Court cases → better interpretation of EU nature legislation

→ *Publication expected by end 2020.*



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Aims of the EC guidance document

➢ Provide guidance on how best to ensure that wind energy developments are compatible with Habitats and Birds Directive provisions;

➢ Promote good practice in relation to location, planning, design, construction and operation of wind farms and their associated infrastructures in order to minimise their impact on biodiversity;

Target group: competent authorities (energy, planning, nature), developers, consultants, other stakeholders (NGOs, citizens, etc.)

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Contents of the EC guidance document

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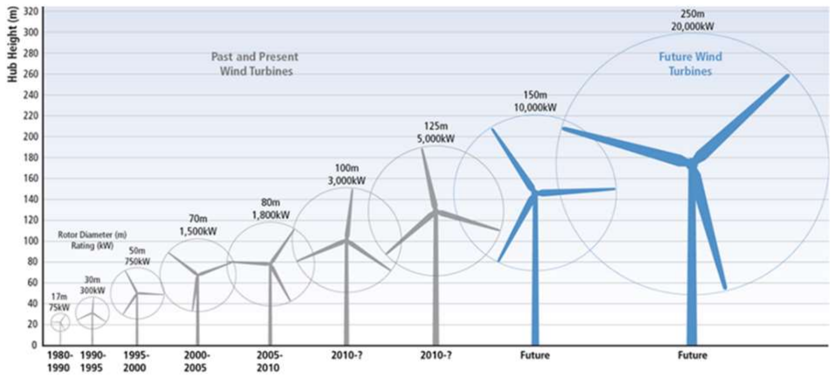
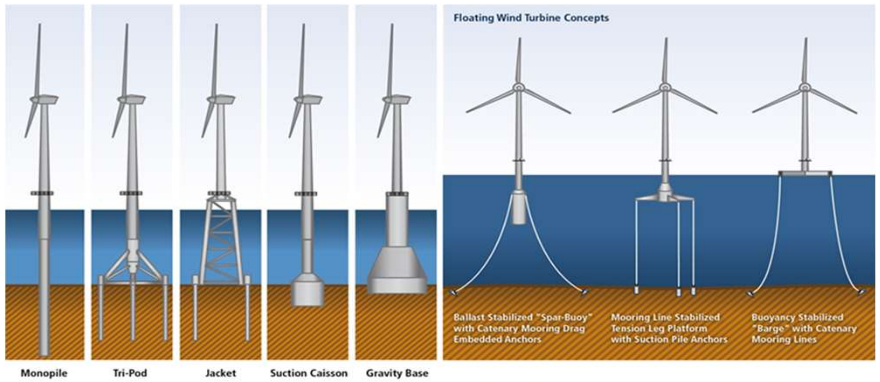
Chapter 1 – Wind energy in Europe

- **EU climate and energy framework**
- **EU policy framework for promoting renewable energy sources**
  - ➔ Renewable energy target for the EU for 2030 of at least 32% of final energy consumption
  - ➔ Overview of trends in wind energy developments





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Chapter 2 – The EU’s policy framework and legislation for nature and biodiversity

EU’s policy framework

- Green Deal
- EU biodiversity policy framework

EU’s Nature legislation

- Habitats Directive (article 6)
- Species protection provisions
- Streamlining with SEA and EIA

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Flowchart of the Art 6(3) and Art 6(4) procedure

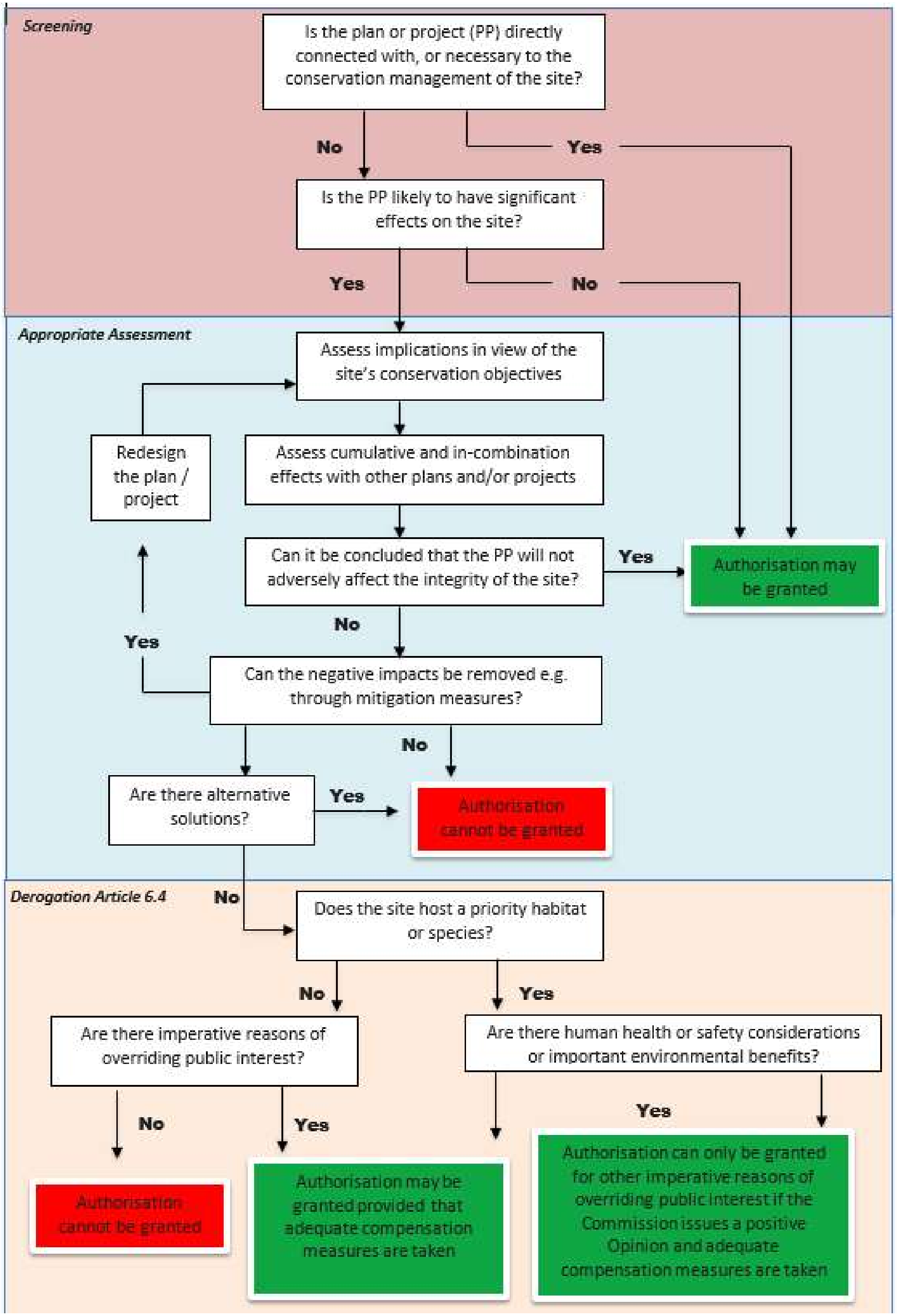
(in EC methodological guide)

→https://ec.europa.eu/environment/nature/natura2000/management/guidance_en.htm

EC Guidance 'Managing Natura 2000 sites. The provisions of Article 6 of the Habitats Directive 92/43/EEC

and EC Guidance 'Assessment of plans and projects in relation with Natura 2000 sites. Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC

provide useful clarifications for the interpretation and application of the legislation.



Chapter 3 – General approach and principles

... regarding key aspects in wind energy permitting:

- Determining significant effects (direct loss, degradation, disturbance, fragmentation)
- Establishing the content and the spatial and temporal extent of the assessment (eg. long-lived species or climate change impacts)
- Establishing a baseline: what data to use? (population size and trends, habitat area, degree of fragmentation)
- Assessing cumulative effects (recommended approaches, examples from MS)
- Dealing with uncertainty
- Public participation and stakeholder involvement (example of multi stakeholder cooperation)

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Chapter 3 – General approach and principles Examples

Box 3-2 Examples of relevant baseline ecological information

- Population size and trends, degree of isolation, seasonality, age class structure and conservation status[29]
- Habitat area, degree of fragmentation and isolation and conservation status
- Biological and ecological relationships between habitats and species (e.g. home range analysis)
- Land/sea management practices, for example, crop rotation, seasonal vegetation burning and no take fishing zones
- Environmental characteristics that link the plan or project location and Natura 2000 sites, e.g. rivers or tidal currents

Box 3-3 Examples of key information sources for impact assessments

- Natura 2000 standard data forms
- Site management plans
- Wildlife sensitivity maps
- Current and historic maps and aerial imagery, geological and hydrogeological survey information, etc.
- EU funded research project data and reports
- Relevant plans, current and historical maps, existing geological and hydrogeological survey information
- Strategic and project level environmental reports and environmental impact assessment reports, appropriate assessment reports and other documentary evidence where plans or projects have been assessed in the past
- Additional field surveys of habitats and/or species

Chapter 3 – General approach and principles
Case studies

Case Study 3-1 Guidance on spatial scope of cumulative impact assessment related to bird populations in Flanders (Belgium)

Case Study 3-2 Dealing with cumulative impact assessment for offshore wind in The Netherlands

Case Study 3-3 Applying the precautionary principle in wind energy spatial planning - the case of Capercaillie in the Black Forest (Germany) (LIFE project: LIFE98_NAT_D_005087)

Box 3-5 Examples of uncertainty in planning and permitting of a wind energy development

Chapter 4 – Strategic planning

- Ensures more efficient and integrated decision making
- Avoids or minimises conflicts at project level
- Ensures the appropriate siting of wind farms in areas of low or no conflicts with nature and wildlife (including Natura 2000 sites)
- Takes into consideration from early phase:
    - Socio-economic, environmental conditions and requirements
    - Technical feasibility of project
    - Connection to electricity grid, distance from human settlements, etc.

  → *Wildlife sensitivity mapping*

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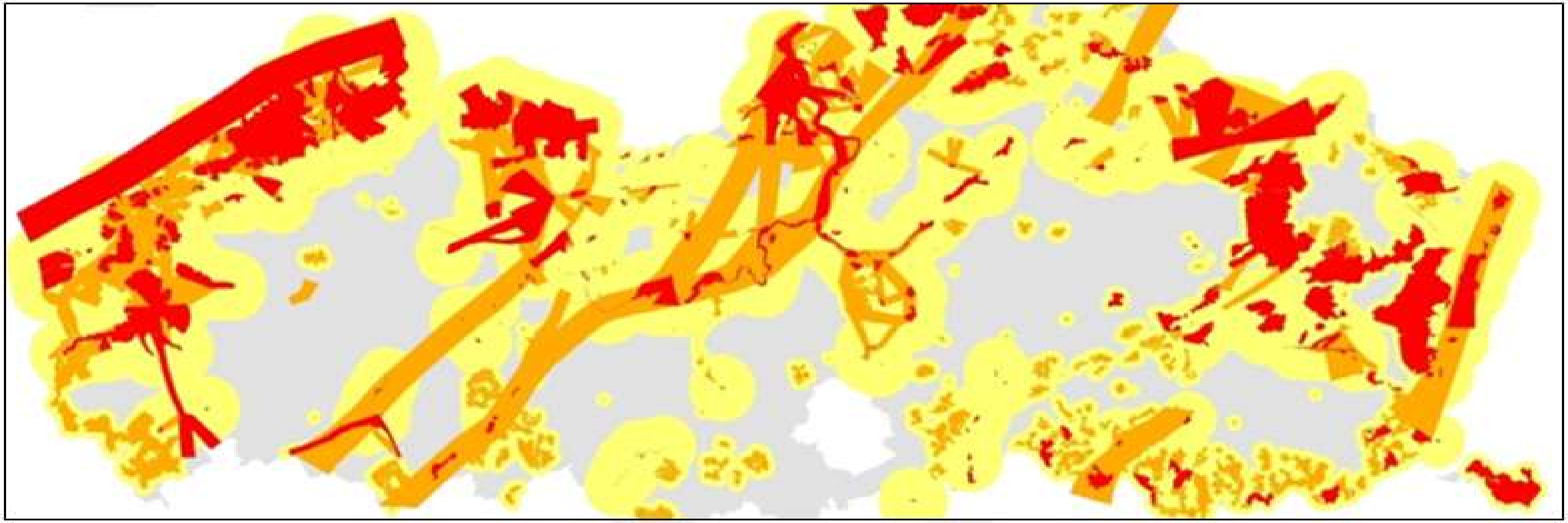

Figure 4-1 Synthesis map of bird sensitivity to wind turbines in Flanders (red: high risk; orange: medium risk; yellow: possible risk; grey: not sufficient information)

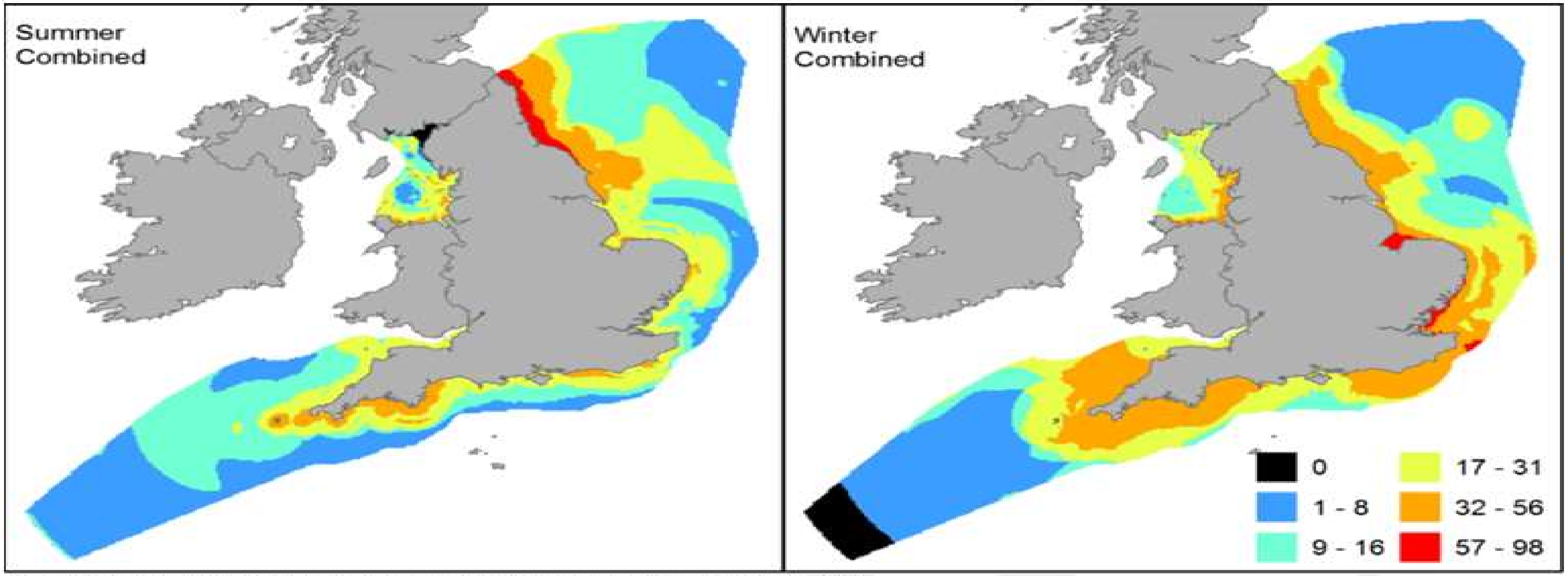

Figure 4-4 Examples of wind farm sensitivity maps from SeaMaST

Chapter 5 – Onshore wind energy

Chapter 6 – Offshore wind energy

Potential impacts on receptor groups

Receptor	Potential impacts of offshore wind energy developments
Habitats	Marine habitat loss Marine habitat disturbance and degradation Smothering from suspended sediments falling out of suspension Creation of new marine habitats Changes to physical processes from the presence of new structures Contaminant release or mobilisation of historic contaminants
Fish	Electromagnetic fields Underwater noise disturbance Reef effect
Birds	Habitat loss and degradation Disturbance and displacement Collision Barrier effect Indirect effects Attraction (e.g. roosting opportunities)
Marine mammals	Habitat loss and degradation Noise disturbance and displacement (pile-driving noise & noise from shipping/helicopters) Acoustic impairment (injuries from underwater noise) Communication masking Collision with vessels Barrier effect Reduction of fishing pressure (no fishing zones) Water quality changes (contaminants + marine waste) Electromagnetic field effects on navigation Indirect effects Reef effect
Bats	Disturbance and displacement Collision Barrier effect Barotrauma Loss or shifting of flight corridors and roost sites Indirect effects
Other species	Noise disturbance and displacement Electromagnetic fields Heat effects Creation of new habitats Water quality changes (contaminants + marine waste) Indirect effects

Types of impacts on marine mammals

Table 6-6 Types of impacts on marine mammals during the project's lifecycle for offshore wind energy developments (based on traditional fixed wind turbines)[105]

Types of impacts	Project phase				
	Pre-construction	Construction	Operation	Decommissioning	Repowering
Habitat loss and degradation		X	X	X	X
Noise disturbance and displacement	X	X	X	X	X
Acoustic impairment (injuries from underwater noise)	X	X		X	X
Communication masking	X	X	X	X	X
Collision with vessels	X	X	X	X	X
Barrier effect		X	X	X	
Reduction of fishing pressure		X	X	X	
Water quality changes (contaminants)		X	X	X	X
Electromagnetic field (EMF) effects on navigation			X	X	
Indirect effects	X	X	X	X	X
Reef effect			X	X	

Mitigation measures

- **Macro-siting**: avoiding ecologically sensitive areas (WSM)
- **Micro-siting**: turbine arrangement and location
- **Infrastructure design**: turbine number and physical specifications (incl. turbine height, lighting, foundation design, etc.)
- **Scheduling and turbine operational timing**: avoiding, reducing or phasing activities at ecologically sensitive times (e.g. increasing cut-in speeds)
- **Alternative construction methods and barriers**: harmful visual stimuli and emissions such as noise and vibration
- **Deterrents**: acoustic and visual methods

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Examples and best practices

Case Study 6-5 Permit conditions related to harbour porpoises for an offshore wind farm in Sweden

Box 6-11 Key challenges in assessing likely significant effects and marine mammals

Box 6-12 Mitigation Framework for pile driving, drilling and dredging (ACCOBAMS, 2019)

Box 6-13 Examining effects on harbour porpoises in German waters

Chapter 7: Monitoring and adaptive management

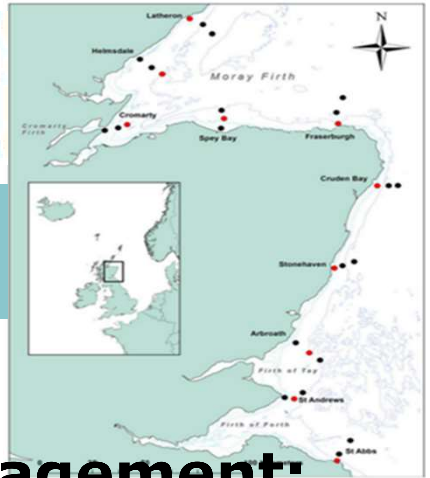
- **Examples of good practice on monitoring:**

Box 7-3 Monitoring checklist

Case Study 7-1 Pre- and post-construction studies on the effects on birds at Storrun wind farm in the mountain-region of northern Sweden

Case Study 7-3 Better utilisation and transparency of bird data collected by Transmission System Operators (TSOs)

East Coast Marine Mammal Acoustic Study (ECOMMAS)
Monitoring locations →



- **Principles and examples of adaptive management:** observe, assess, inform, act – and then repeat again!

Case Study 7-6 Examples of Adaptive Management approaches in EU Member States

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Key messages

- Climate change and biodiversity objectives can and must be addressed at the same time and reconciled.

- Planning in a strategic manner over a broad geographical area is the most effective way to minimise the impacts on nature and wildlife.
NB: appropriate assessment of maritime spatial plans should also help ensure already at that early strategic planning stage that locations for wind energy do not have an adverse impact on Natura 2000 sites.

- Appropriate siting and mitigation measures are critical and essential for any wind energy planning process.

- High quality appropriate assessment needs to be ensured. (→ good expertise, baseline, cumulative impacts, significance)

- Early cooperation with relevant authorities and stakeholders (NGOs, public) needs to be ensured.

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Online manual on wildlife sensitivity mapping

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Wildlife sensitivity maps (WSM)

WSM = maps that provide information
on the locations of sensitive wildlife populations
in a certain area.

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The added value of wildlife sensitivity maps (WSM)

By combining both the technical constraints of delivering wind energy, with wildlife sensitivity, so that conflicts can be avoided, intend to:

- Identify areas containing ecological communities sensitive to the construction and maintenance of renewable energy infrastructure
- **Inform strategic planning decisions during site selection and be used during EIA and post consent (but does NOT replace EIAs)**
- Use GIS to compare, analyse and display spatial and geographic data and employ spatial biodiversity data relating to species and/or sites
- Be a practical planning tool, integrated within relevant planning procedures (e.g. SEA)

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The Manual

- Comprehensive summation of the datasets, methodologies and GIS applications.
- **Interactive tool** → as a website.
- Links to external websites and documents for further in-depth information and examples.
- **<u>Aims:</u>**
  - Equip governments and other relevant parties with the foundational information necessary to develop robust wildlife sensitivity mapping approaches for renewable energy;
  - Not prescriptive, rather a useful resource to support effective adherence to EU nature legislation.

→ *Publicly available in October 2020.*

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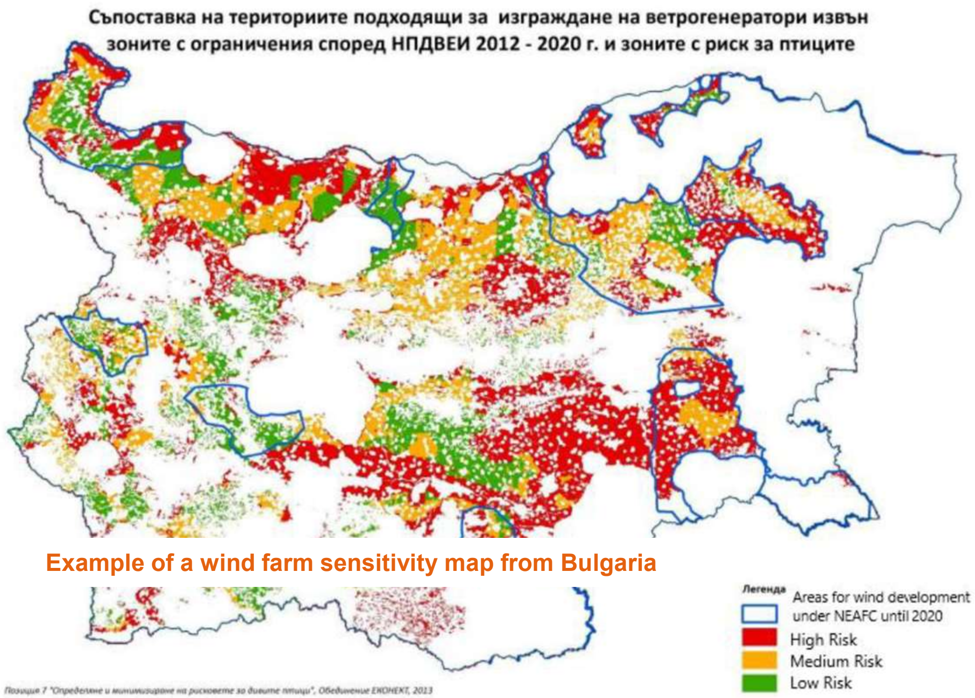
Summary of existing examples

Contains summary accounts for 26 wildlife sensitivity mapping approaches from around the world:

- Focus on wind energy and birds.
- Many of them developed by academics; only a few in consort with national agencies or other end-user groups.
- **None offers a comprehensive solution → Limited number of renewable technologies and a subset of vulnerable species and habitats.**



Example of a wind farm sensitivity map from Bulgaria

Step-by-step to WSM

1. Identify the renewable energy types to be included and the species and habitats likely to be affected
2. Compile distributional datasets on sensitive species, habitats and other relevant factors
   - ➢ Use modelling, based on habitat and landscape predictors, to forecast distribution in under sampled locations (e.g. Density Surface Modelling)
3. Develop a sensitive scoring system for species and habitats, based on identified characteristics (e.g. conservation status, species behaviour…)
4. Generating the map
5. Interpretation
   - ➢ How do the sensitivity scores relate to risk? → very high – low risk / no-go areas
   - ➢ Guidance material

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Identifying species & habitat

Wildlife Sensitivity Mapping begins with the identification of at-risk ecological features, determined by:

- **Species behaviour**: certain species are more sensitive to renewable energy development due to certain behavioural traits. E.g. degree of exposure, level of wariness, avoidance behaviour, migratory behaviour.
- **Species morphology**: certain species may be more sensitive due to their morphology. For instance, eye sight for birds.
- **Habitat characteristics**: habitat fragility, habitat dependence
- **Population dynamics**: proportion of global, regional and national population
- **Conservation status**: global, regional or national conservation status (IUCN Red List, national Red Lists, EU Nature Directives).

Processing data

Once at-risk species and habitats have been identified,
it is necessary to compare distributional data:

- Existing spatial datasets
- Use of modelling to forecast distribution in under sampled localities (e.g. Density Surface Modelling)
- Highlight data gaps

The manual includes a comprehensive catalogue of European relevant datasets, as well as explanation of the different types of data.

Assessing sensitivity

- Most WSM translate distributional data into a measure of sensitivity that can directly inform renewable energy development.
- **The simplest interpretation: collectively assign all data layers as sensitive.**
  - **buffer features to represent dispersion (for instance, known dispersal from a roost site) or in recognition of uncertainty over the accuracy of the data.**
- **Most WSM provide a gradient of sensitivity. At its simplest: No Go sites & less sensitive, secondary locations.**
- More complex mapping exercises assign sensitivity by weighting features in relation to known parameters that increase sensitivity.

Assessing sensitivity

- Common approach:
  - **Score each species or habitat for each of a number of parameters and sum these scores to produce an overall sensitivity score.**
  - If certain parameters are deemed more important, these can be weighted accordingly.
- Apply sensitivity scores to species distribution within a grid square.

Morphology / behaviour / population dynamics score (1=Low sensitivity, 2=medium sensitivity , 3=high sensitivity, 4=very high sensitivity).

Conservation score relates to IUCN Red List category: Least Concern = 0, Near Threatened = 1, Vulnerable = 2, Endangered = 3, Critically Endangered = 4.

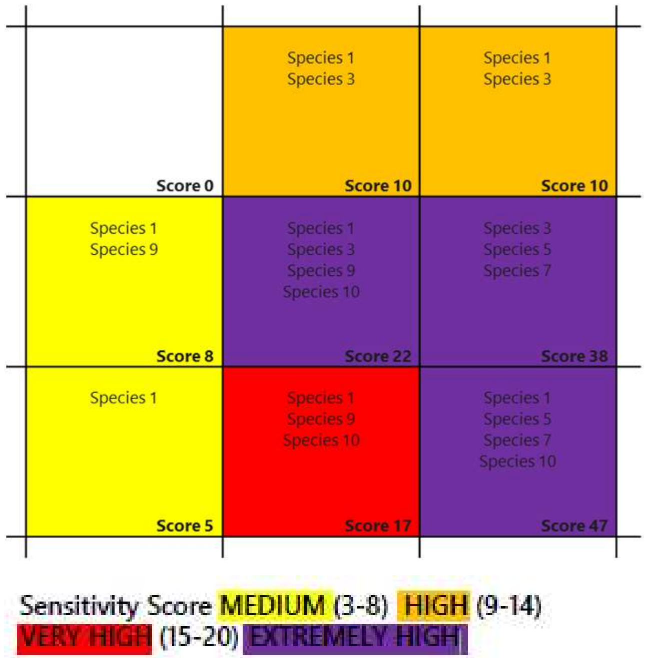
Conservation scores are doubled before being adding to morphology / behaviour / population dynamics scores.

Sensitivity Score MEDIUM (3-8) HIGH (9-14) VERY HIGH (15-20)

Any species scoring 3 or 4 for morphology / behaviour / population dynamics is automatically in HIGH category

Species	Morphology	Behaviour	Population dynamics	Conservation status	Sensitivity Score
Species 1	3	1	1	0	5
Species 2	2	2	2	0	6
Species 3	1	1	1	1	5
Species 4	4	2	1	3	13
Species 5	4	4	4	4	20
Species 6	4	3	4	0	11
Species 7	3	3	3	2	13
Species 8	3	3	4	3	16
Species 9	1	1	1	0	3
Species 10	3	3	1	1	9

Theoretical example of a sensitivity scoring system and a spatial grid weighted for summed species sensitivity scores



Recommendations

1. WSM should be a standard precursor for all renewable energy development.

2. WSM should be developed in close collaboration between all relevant stakeholders including regulatory authorities, wildlife organisations and developers.

3. Many Member States will be considering a renewable energy mix that includes elements of wind, solar and other technologies. Ideally, these different renewable energy types should be considered collectively through the same mapping

4. Exercise with sensitivity layers developed for each WSM should be undertaken at a variety of geographic scales. Planning at a large spatial scale is essential in order to strategically optimise the most appropriate development opportunities both from renewable energy perspective and a nature perspective. Where possible, maps should be developed at a regional, national or even a multinational level. However, finer scale maps, informed by additional data collection, and targeted at areas of either high development potential or high likelihood of wildlife conflict, should also be considered.

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Recommendations

5. WSM should attempt to cover all potentially impacted species and habitats of conservation concern (inclusion within the EU Nature Directives). Certain taxa will inevitably prove more difficult to assess with limited data on their distribution and incomplete knowledge on how they are impacted. Such groups will require more rudimentary analysis and a more precautionary interpretation.

6. Where possible, WSM should be designed to be compatible with existing planning tools

7. WSM should be publicly accessible, simple and intuitive to use and accompanied with clear interpretative guidance.

8. WSM should be developed in collaboration with multiple taxonomic experts to ensure the comprehensive compilation of relevant datasets.

9. Datasets relating to the Natura 2000 network should be foundational to the development of WSM in the EU. Data collected in association with Articles 12 and 17, based on a 10 x 10 km grid, provides a good basis for data generation.

Recommendations

10.WSM should be developed in such a way that new datasets or updates can readily be incorporated.

11.Data on broad habitat suitability is a useful starting point for data deficient taxa. Data (and knowledge on how best to interpret it) is much more limited for certain taxa such as bats and marine mammals.

12.WSM should utilise the best available data at the finest possible scale. They should clearly indicate levels of uncertainty, data limitations and the comparability of different datasets.

13.Wildlife Sensitivity Maps should be compatible with the relevant planning system and be accessible to all relevant users and target groups. Online platforms are a good way to present maps, enabling end user to interactively interrogate the maps and view the layers alongside other variables, such as other development locations, protected sites etc. Face-to-face promotion with planning authorities, developers and other end-users can be valuable in increasing uptake.

Thank you.

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