

# REVIEWING AND MITIGATING THE IMPACTS OF RENEWABLE ENERGY DEVELOPMENTS ON SPECIES AND HABITATS PROTECTED UNDER THE BIRDS AND HABITATS DIRECTIVES

Promotion event Cyprus, 15/01/2020  
Kim Driesen



Partnership for  
nature and people



**NIRÁS**



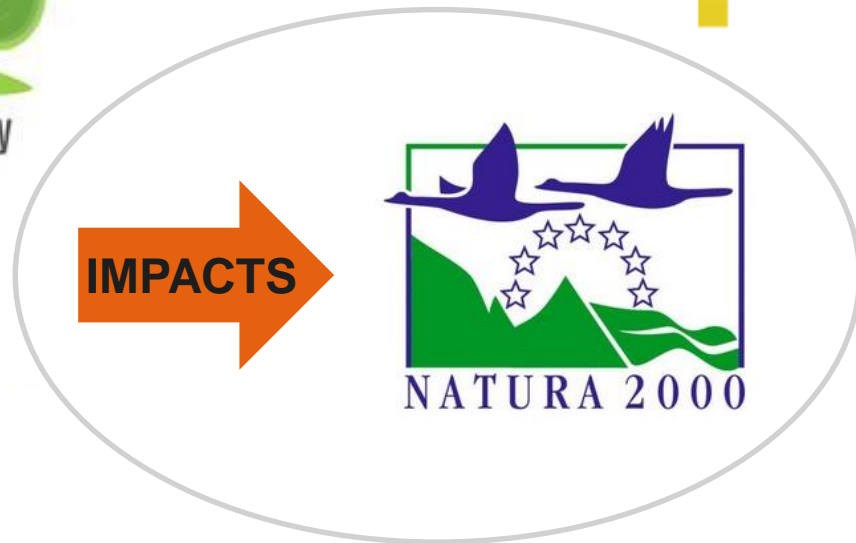
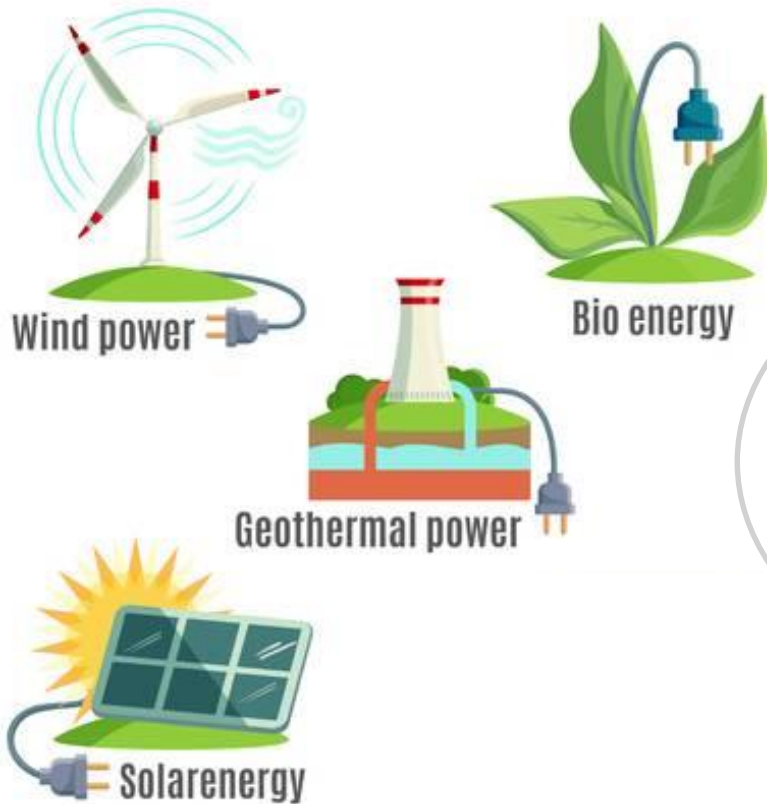
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# GENERAL INTRODUCTION TO THE PROJECT



# Objectives



**HOW TO MITIGATE?**

# Scope of study

## 1. Renewable energy developments

- **wind, solar, ocean, geothermal and bioenergy** (hydropower and transport infrastructure are excluded)
- whole life cycle: construction, operation and decommissioning

## 2. Habitats and species protected under the EU legislation

- Main focus on birds, bats and marine mammals
- Also coastal and marine habitats, terrestrial habitats, and other species groups if relevant
- Not only focused on Natura 2000 sites but also on Annex IV species

## 3. Planning and Permitting procedure

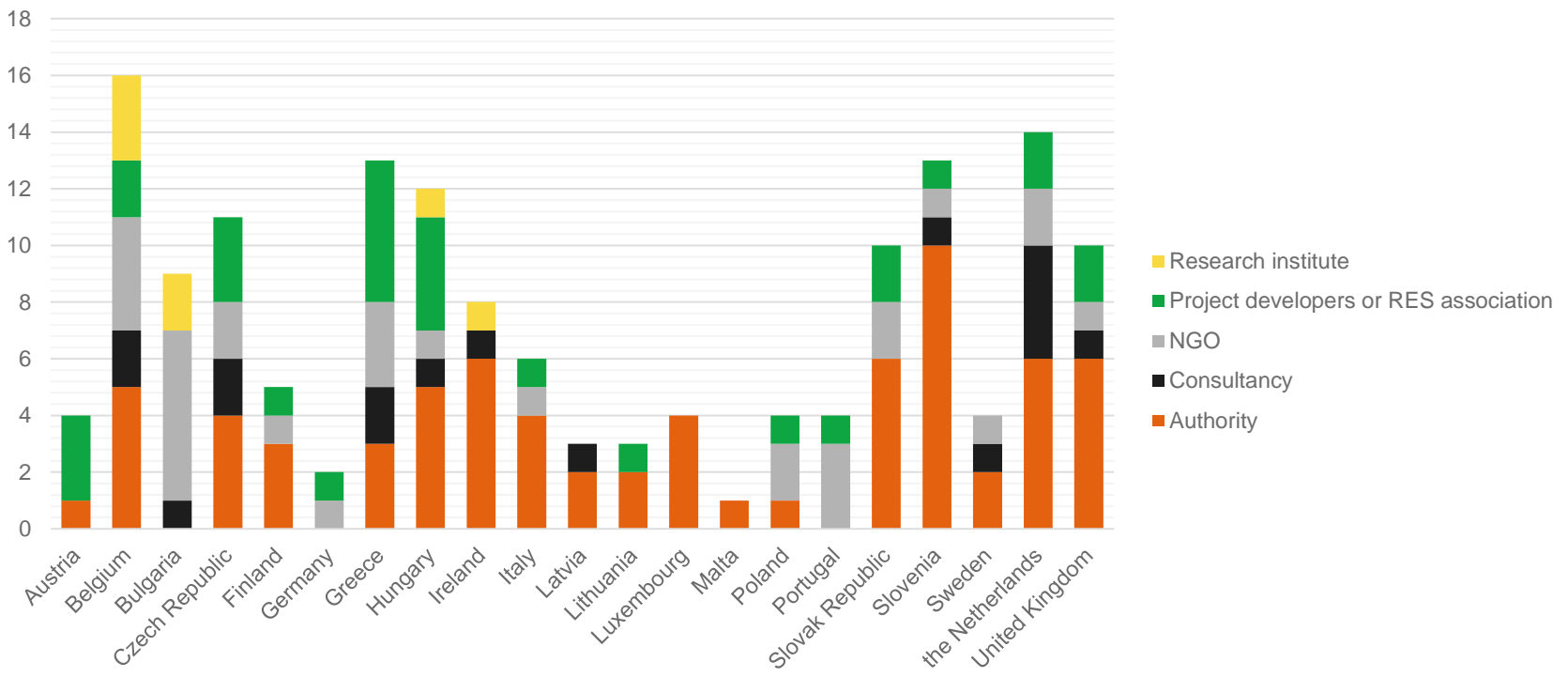
# How?

1. Stakeholder consultation: analysis of shortcomings/challenges/solutions:
  - Telephonic interviews and in-depth workshops in all EU Member States (05/2018 – 02/2019)
2. Update of the 2011 EU “Guidance on wind energy developments and Natura 2000”
3. Development of a toolkit for the preparation of wildlife sensitivity maps
4. Review of impacts of solar, geothermal and ocean energy on habitats and species and to identify available mitigation options
5. Review of impacts of bioenergy developments on protected habitats and species

# MAIN FINDINGS OF STAKEHOLDER CONSULTATION

# Stakeholder consultation: facts and figures

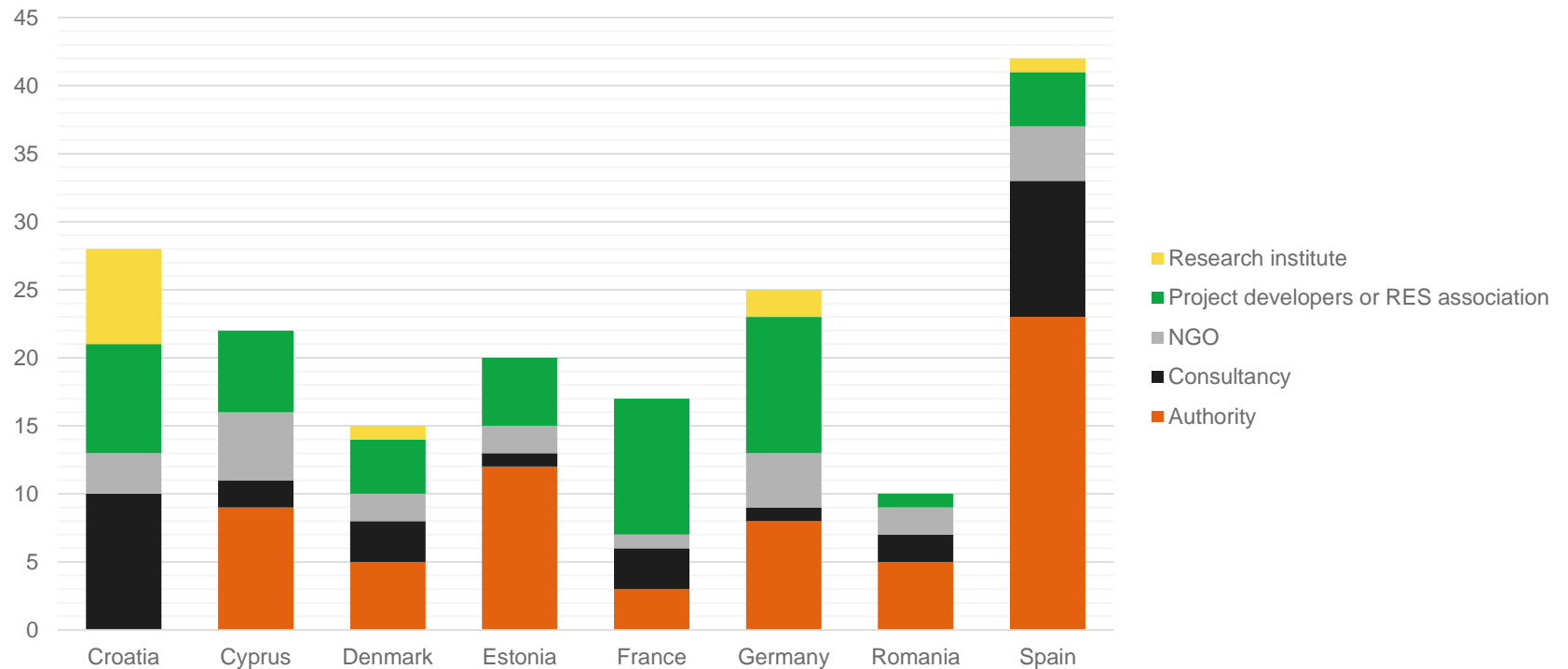
Performed telephonic interviews / MS



Total = 156 stakeholders telephonically interviewed

# Stakeholder consultation: facts and figures

Participants workshops / MS

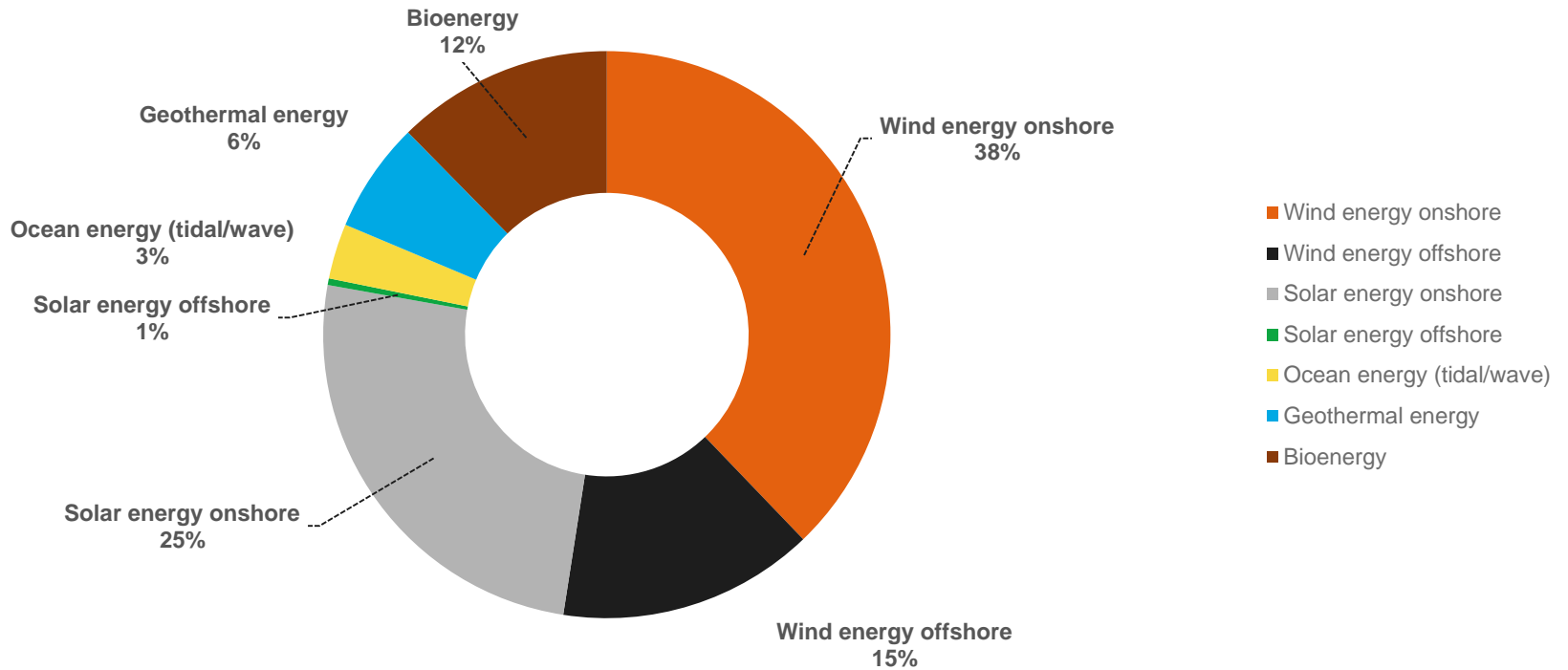


Total = 179 participants present at workshops



# Stakeholder consultation: facts and figures

Ratio of RES categories being subject of interviews/workshops



# Stakeholder consultation

- Planning and permitting
- Impacts
- Significance
- Mitigation measures
- Cumulative impacts
- Data and post monitoring
- Governance
- EC Guidance

# Significance

1. All (!) stakeholders consider this as a very difficult issue; many discussions
2. First step: estimating mortality → how?
3. Second step: impact on population → at which scale? critical threshold values? 'Conservation objectives' not always clear
4. Precautionary principle: eternal conflicts....; discussions related to terminology such as 'reasonable scientific certainty/doubt'
5. Worst case scenario is recommended for being compliant with precautionary principle, but this can become very unrealistic
6. Link with post-monitoring: start with very strict conditions and soften them based on findings (adaptive management)

# Cumulative impacts

Lack of:

1. 'Agreed' methodologies
2. Understanding on how impacts (might) accumulate
3. Clarity on scope:
  - Planned ⇔ Approved
  - Only wind projects ⇔ Also other developments (such as energy grid infrastructure, fisheries...)
4. Clarity on spatial scope e.g. only regional, national or also transboundary?
5. Data of other projects/plans
  - No one is keeping records
  - Promoters reluctant to release confidential data



# Data and post monitoring

1. Good quality data is often lacking → time required for baseline surveys
2. Post monitoring is almost always imposed, generally for a 3-year period
3. Post monitoring **data are rarely interpreted and used** for underpinning new planning and permitting; this is due to:
  - Lack of resources at the side of the authorities
  - Confidentiality of data at the side of promoters
4. Some have developed specific **post monitoring protocols**
5. Responsibility for post monitoring is generally left to the promotor, but for offshore wind in Belgium, the Ministry has taken over (promoters only pay a fee)

# EC GUIDANCE ON WIND ENERGY AND N2000

# Structure EC Guidance

1. Wind energy in Europe
2. The EU's policy framework and legislation for nature and biodiversity
3. General approach and principles

## **ONSHORE**

4. Significant effects
5. Strategic planning
6. Monitoring and adaptive management

## **OFFSHORE**

7. Significant effects
8. Strategic planning
9. Monitoring and adaptive management

# Structure EC Guidance

## Chapter 1: Wind energy in Europe

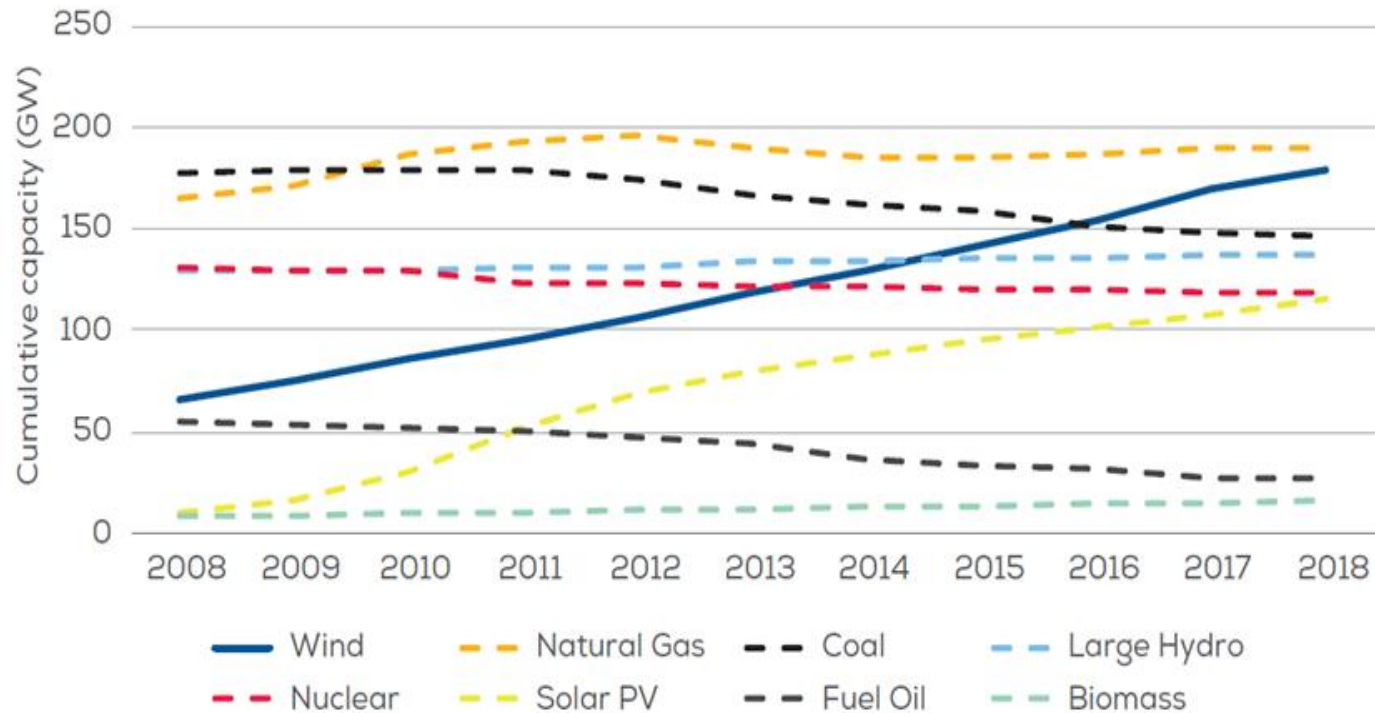
- Ambitious targets to decarbonize the economies set by the EU:
  - 20% of energy production from RES by 2020
  - A renewable share of at least 32% of gross EU energy consumption by 2030
- On track for 2020, however:
  - > 30% RES consumption in FI/SE/LV ⇔ < 5% in MT/LU/NL



# Structure EC Guidance

## Chapter 1: Wind energy in Europe

Total power generation capacity in the European Union 2008-2018

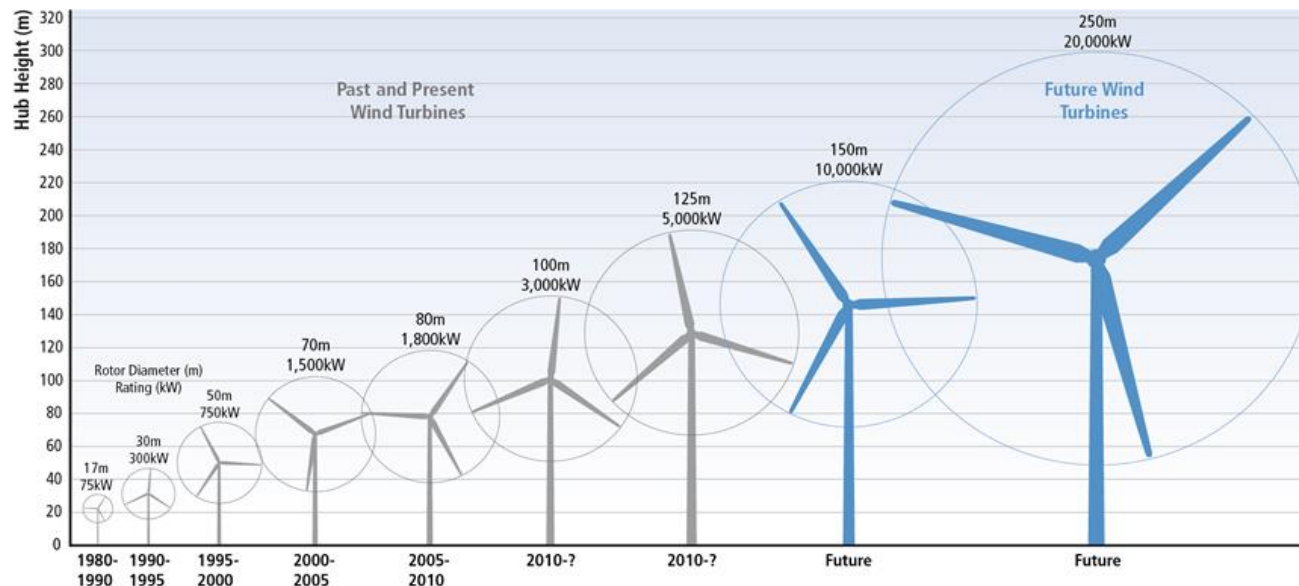


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# Structure EC Guidance

## Chapter 1: Wind energy in Europe

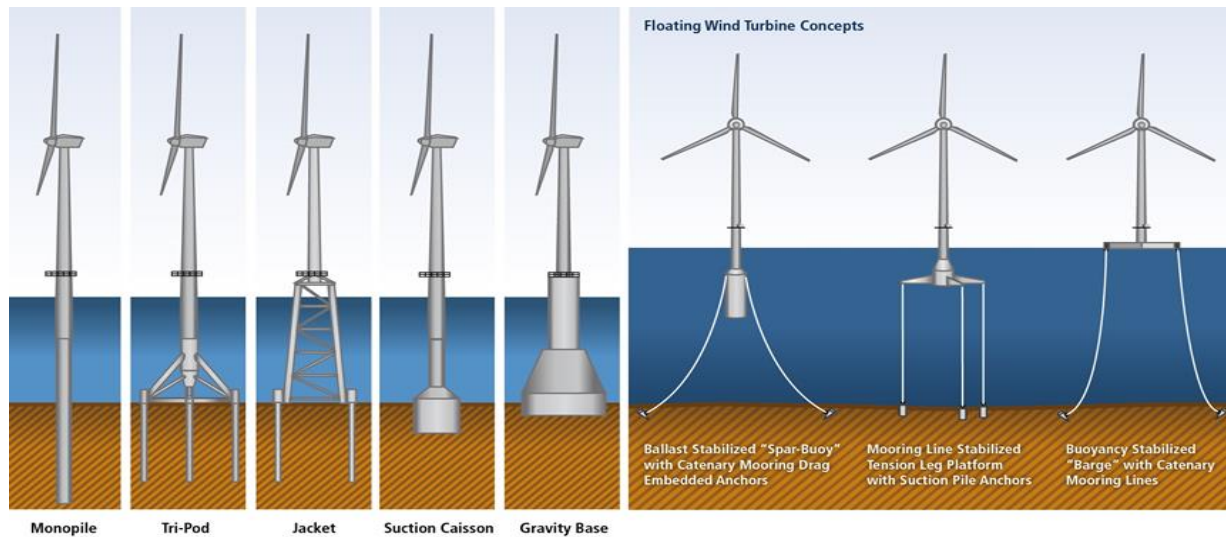
- The EU policy framework for promoting renewable energy sources
  - Climate neutral energy sector in 2050 → doubling of wind capacity is needed
- Trends in wind energy developments



# Structure EC Guidance

## Chapter 1: Wind energy in Europe

- Trends in wind energy developments
  - Foundation design



Source: Edenhofer *et al.*, 2011.

- Multiple-use developments

# Structure EC Guidance

## Chapter 2: The EU's policy framework and legislation for nature and biodiversity

- EU biodiversity policy framework
  - Step-by-step approach for wind farm developments potentially affecting Natura 2000 sites
    - Stage 1: screening
    - Stage 2: appropriate assessment
    - Stage 3: derogation
  - Based on:
    - EC Guidance 'Managing Natura 2000 sites. The provisions of Article 6 of the Habitats Directive 92/43/EEC (updated June 2019) (EC, 2019a)
    - 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 (updated XXX) (EC, 2019b)
- Both to consult for a correct interpretation and application of the legislation.

# Structure EC Guidance

## Chapter 2: The EU's policy framework and legislation for nature and biodiversity

- Species protection provisions
    - Mainly Art 12 and Art 16 of Habitats Directive
  - Based on:
    - EC Guidance document on the strict protection of animal species of Community interest under the Habitats Directive 92/43/EEC (updated XXX) (EC, 2019c)
- Recommended to consult for a correct interpretation and application of the legislation.

# Structure EC Guidance

## Chapter 3: General approach and principles

- Strategic planning (incl. wildlife sensitivity mapping)
- What is a significant effect?
- Establishing the content and the spatial and temporal extent of the assessment (scoping)
- Establishing a baseline
- Assessing cumulative effects + recommendations
- Stakeholder participation

# Structure EC Guidance

Significant effects (onshore: chapter 4 & offshore: chapter 7)

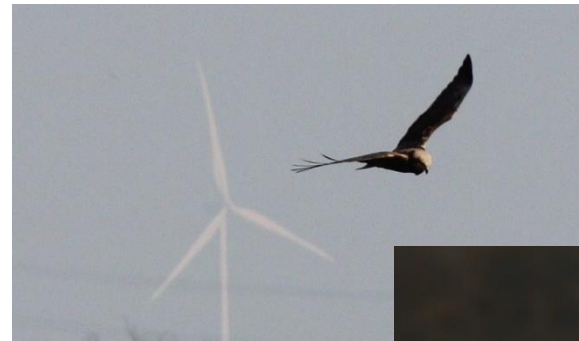
## For each receptor group:

- Identification of the key effect groups, related to life cycle phase of the wind energy development
- Guidance on required baseline data and survey approaches
- Overview of how significance is assessed
  - Key uncertainties in determining significance
- Effectiveness of mitigation measures

# Structure EC Guidance

Significant effects (onshore: chapter 4 & offshore: chapter 7)

The **potentially affected receptor groups** are divided in the following categories:





# Structure EC Guidance

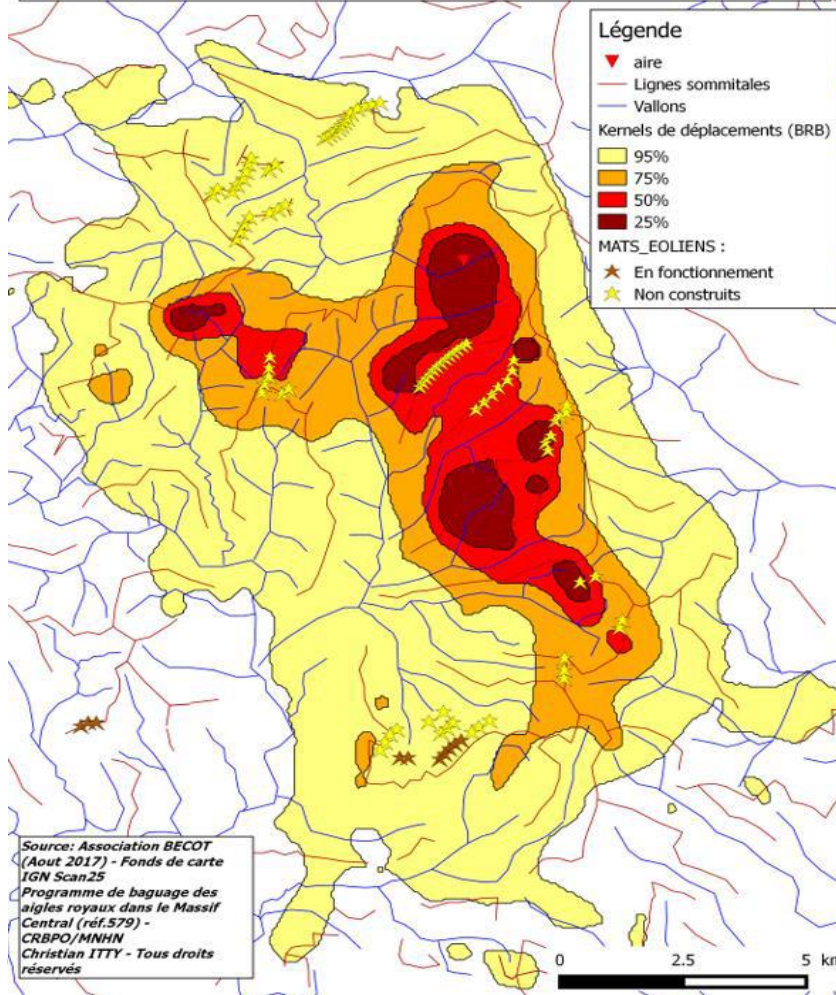
Significant effects (onshore: chapter 4 & offshore: chapter 7)

## Main potential impact groups:

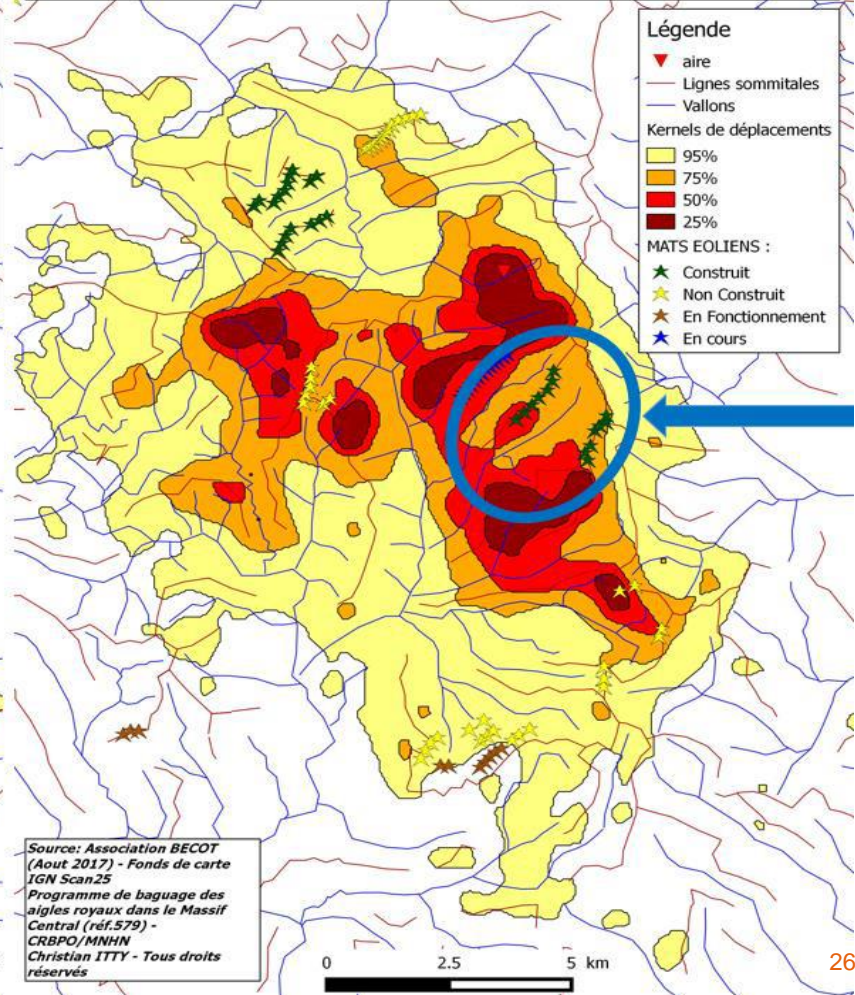
- Habitat loss and degradation
- Habitat fragmentation
- Habitat disturbance
- Collision
- Barrier effect
- Barotrauma (for bats)
- Loss of flight corridors and roost sites
- Acoustic impairment (injuries from underwater noise)
- Habitat creation
- ...

# Illustration of displacement effect

Domaine vital défini à l'aide de kernels de déplacements pour le mâle adulte territorial d'aigle royal du couple H6, du 01 octobre 2014 au 30 juin 2015 (année sans reproduction, avant construction des premiers parcs éoliens au coeur du domaine vital)



Domaine vital défini à l'aide de kernels de déplacements pour le mâle adulte territorial d'aigle royal du couple H6, du 01 octobre 2016 au 30 juin 2017 (année sans reproduction, après construction des premiers parcs éoliens au coeur du domaine vital)



# Structure EC Guidance

Significant effects (onshore: chapter 4 & offshore: chapter 7)

## Main types of measures:

- Macro-siting: avoiding ecologically sensitive areas
- Micro-siting: turbine arrangement and location
- Infrastructure design: turbine number and physical specifications (incl. turbine height, lighting, foundation design...)
- Scheduling and turbine operational timing: avoiding, reducing or phasing activities at ecologically sensitive times (e.g. increasing cut-in speeds)
- Deterrents: acoustic and visual methods
- Habitat management to dissuade and lure species away from turbines

# Structure EC Guidance

## Mitigation of noise of pile driving on marine mammals, Germany

Standard procedure: noise mitigation techniques:

- Deterrence of porpoises before piling starts
- Check if porpoises are within 750 m with a C-POD
- Gradual increase of noise intensity of piling
- Threshold of 160 dB SEL and 190 dB L<sub>peak</sub> within 750 m
- Max. 180 min
- Use of bubble curtain



# Structure EC Guidance

Significant effects (onshore: chapter 4 & offshore: chapter 7)



Reducing collision risk of Tern by repowering Zeebrugge Wind farm, Belgium

# Structure EC Guidance

Strategic planning (onshore: chapter 5 & offshore: chapter 8)

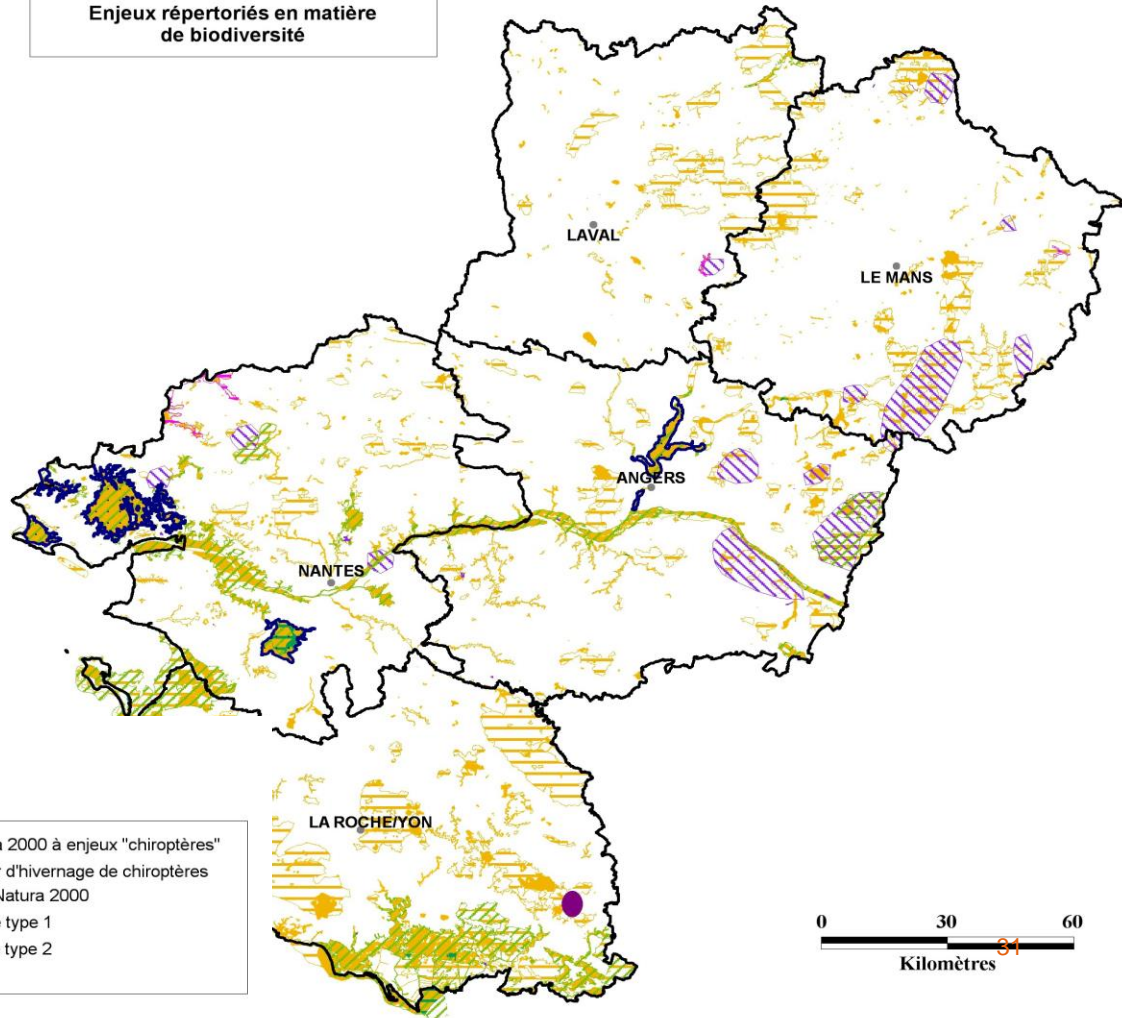
- The importance and advantages of strategic planning:
  - For offshore, also in the context of EU marine spatial planning legislation
- Examples given of strategic approaches to avoid significant effects (including wildlife sensitivity mapping)

# Good practices

Pays de la Loire, France

Schéma régional éolien terrestre  
des Pays de la Loire  
Enjeux répertoriés en matière  
de biodiversité

Strategic planning  
onshore – ‘Schéma  
Régional Eolien’



	Réserve naturelle nationale		Site Natura 2000 à enjeux "chiroptères"
	Réserve naturelle régionale		Site majeur d'hivernage de chiroptères
	Arrêté de protection de biotope		Autre site Natura 2000
	Réserve biologique		ZNIEFF de type 1
	Sites Natura 2000 à enjeux "oiseaux"		ZNIEFF de type 2
			Ramsar

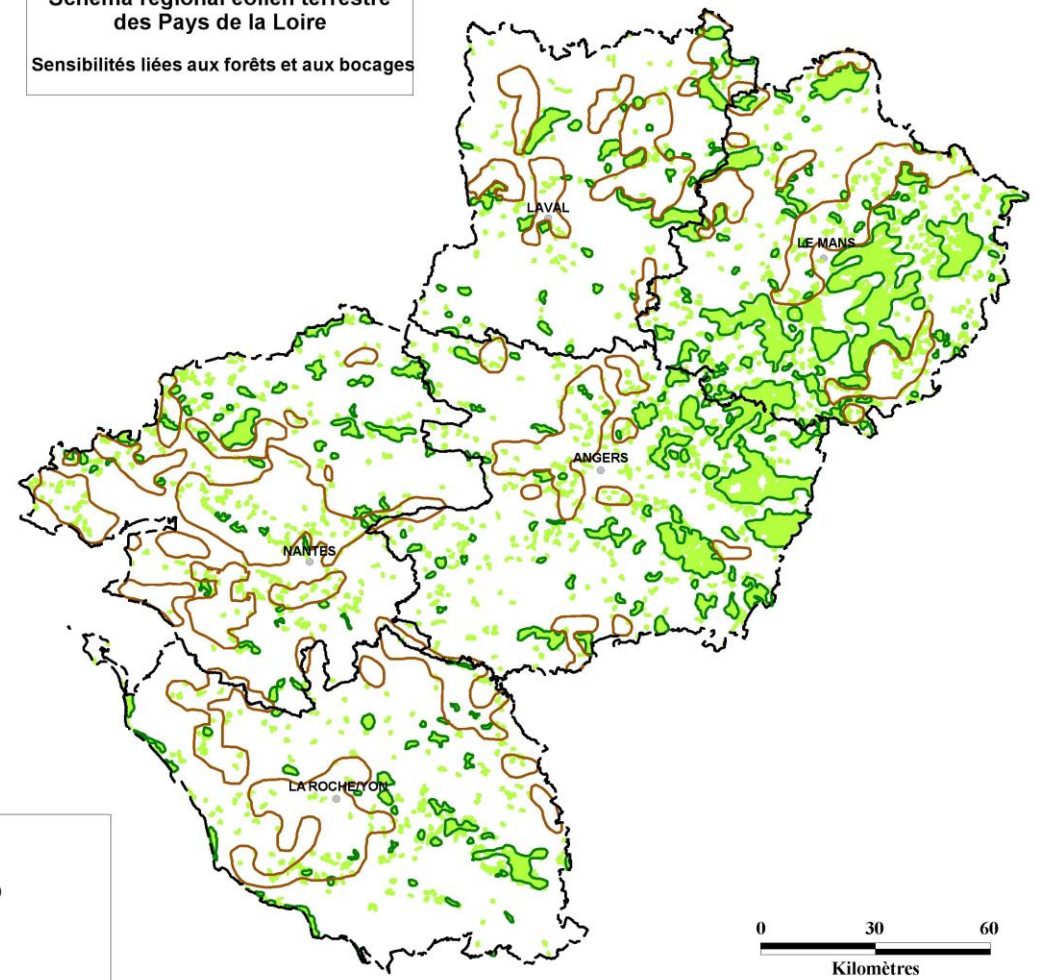
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# Good practices




Pays de la Loire, France

Strategic planning  
onshore – ‘Schéma  
Régional Eolien’

Schéma régional éolien terrestre  
des Pays de la Loire  
Sensibilités liées aux forêts et aux bocages



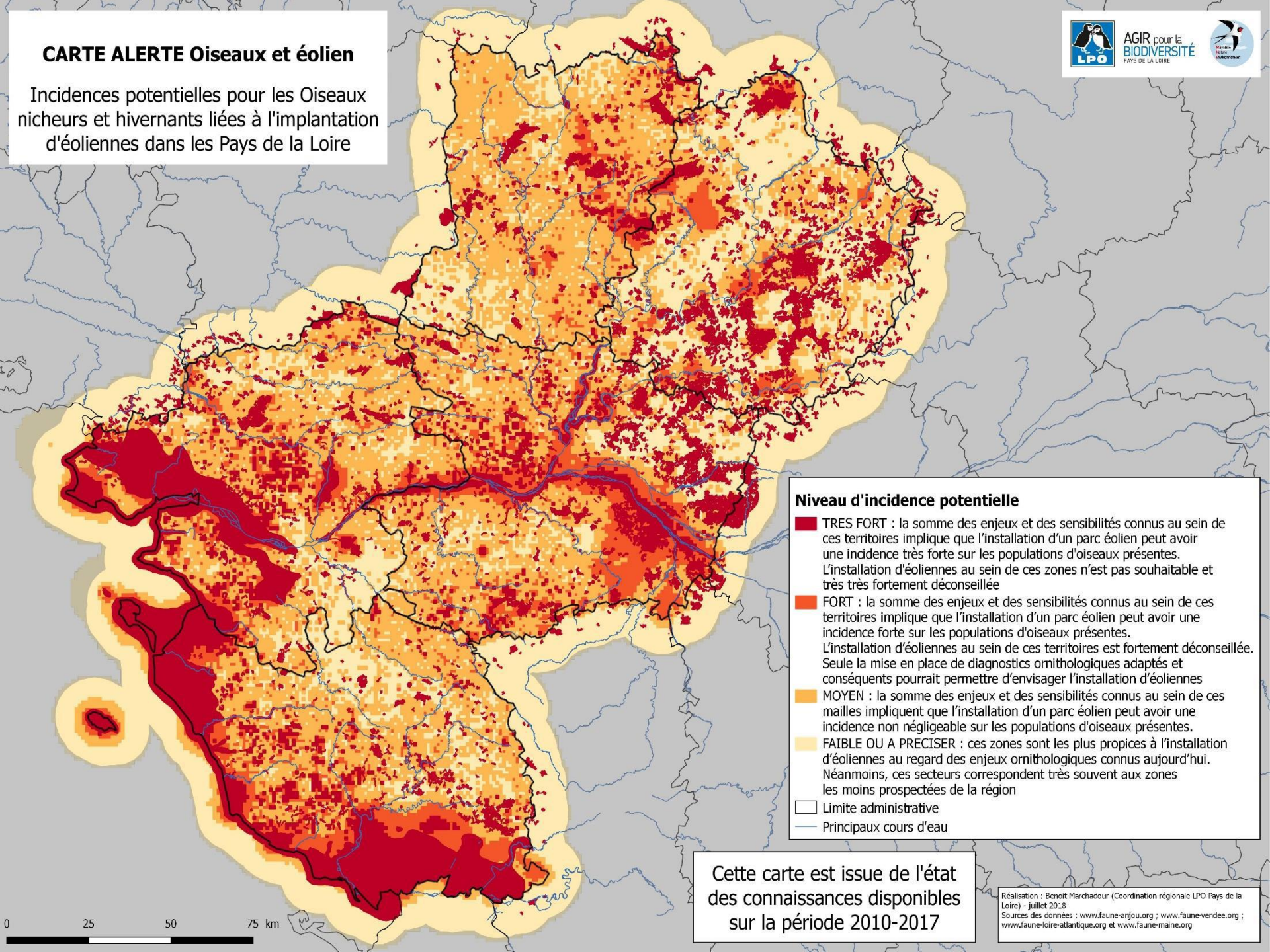
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	Massifs forestiers de plus de 25 ha
	Massifs forestiers de plus de 25 ha (identifiés dans l'étude LPO 2010) représentant un enjeu pour les chauve-souris et l'avifaune
	Bocages représentant un enjeu pour les chauve-souris



## CARTE ALERTE Oiseaux et éolien

Incidences potentielles pour les Oiseaux nicheurs et hivernants liées à l'implantation d'éoliennes dans les Pays de la Loire



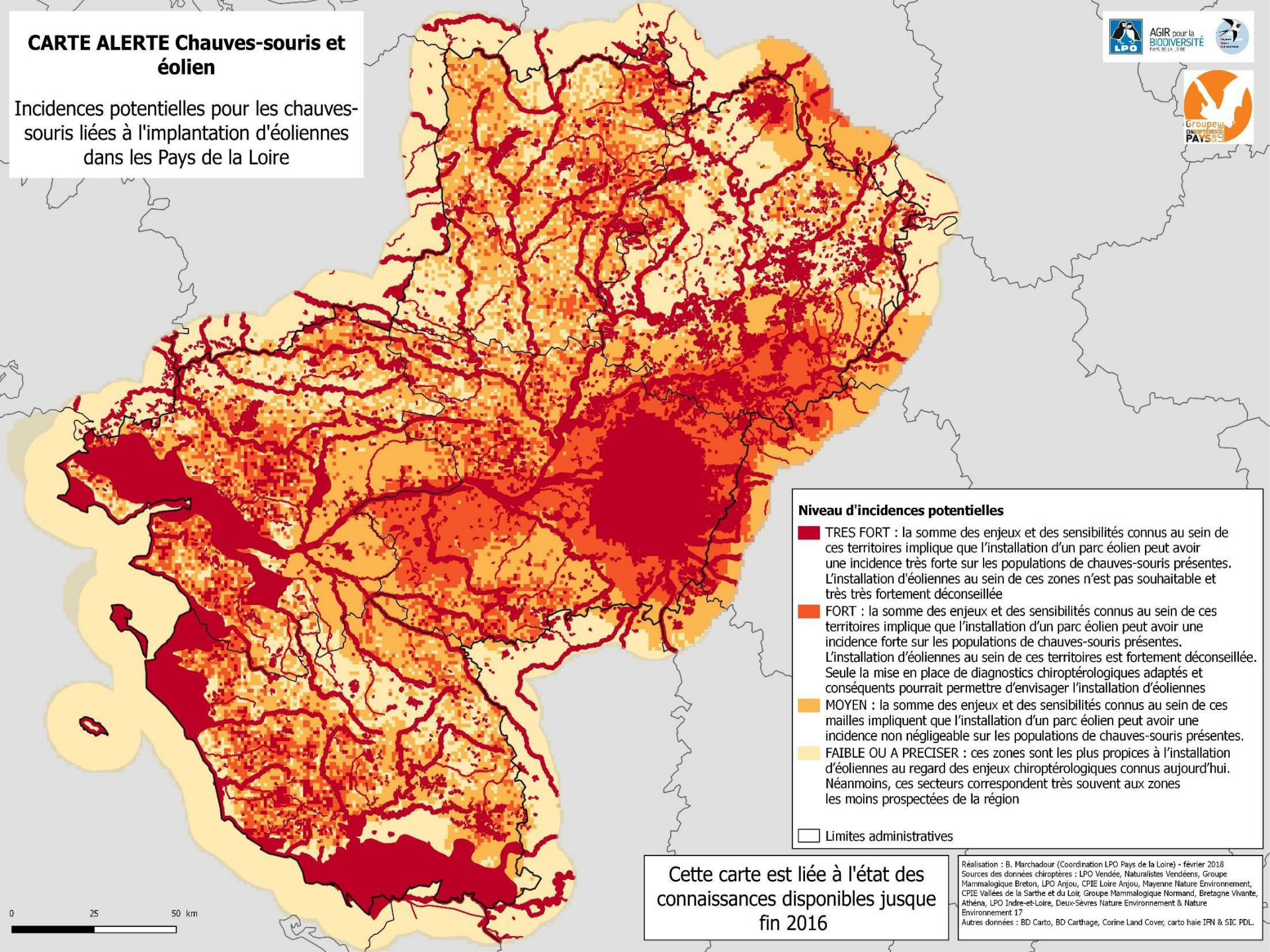
### Niveau d'incidence potentielle

- TRES FORT** : la somme des enjeux et des sensibilités connus au sein de ces territoires implique que l'installation d'un parc éolien peut avoir une incidence très forte sur les populations d'oiseaux présentes. L'installation d'éoliennes au sein de ces zones n'est pas souhaitable et très très fortement déconseillée
  - FORT** : la somme des enjeux et des sensibilités connus au sein de ces territoires implique que l'installation d'un parc éolien peut avoir une incidence forte sur les populations d'oiseaux présentes. L'installation d'éoliennes au sein de ces territoires est fortement déconseillée. Seule la mise en place de diagnostics ornithologiques adaptés et conséquents pourrait permettre d'envisager l'installation d'éoliennes
  - MOYEN** : la somme des enjeux et des sensibilités connus au sein de ces mailles implique que l'installation d'un parc éolien peut avoir une incidence non négligeable sur les populations d'oiseaux présentes.
  - FAIBLE OU A PRECISER** : ces zones sont les plus propices à l'installation d'éoliennes au regard des enjeux ornithologiques connus aujourd'hui. Néanmoins, ces secteurs correspondent très souvent aux zones les moins prospectées de la région
- Limite administrative  
— Principaux cours d'eau

Cette carte est issue de l'état des connaissances disponibles sur la période 2010-2017

# CARTE ALERTE Chauves-souris et éolien

Incidences potentielles pour les chauves-souris liées à l'implantation d'éoliennes dans les Pays de la Loire



## Niveau d'incidences potentielles

- TRES FORT** : la somme des enjeux et des sensibilités connus au sein de ces territoires implique que l'installation d'un parc éolien peut avoir une incidence très forte sur les populations de chauves-souris présentes. L'installation d'éoliennes au sein de ces zones n'est pas souhaitable et très très fortement déconseillée
- FORT** : la somme des enjeux et des sensibilités connus au sein de ces territoires implique que l'installation d'un parc éolien peut avoir une incidence forte sur les populations de chauves-souris présentes. L'installation d'éoliennes au sein de ces territoires est fortement déconseillée. Seule la mise en place de diagnostics chiroptérologiques adaptés et conséquents pourrait permettre d'envisager l'installation d'éoliennes
- MOYEN** : la somme des enjeux et des sensibilités connus au sein de ces mailles impliquent que l'installation d'un parc éolien peut avoir une incidence non négligeable sur les populations de chauves-souris présentes.
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□ Limites administratives

Cette carte est liée à l'état des connaissances disponibles jusque fin 2016

Réalisation : B. Marchadour (Coordination LPO Pays de la Loire) - février 2018  
Sources des données chiroptères : LPO Vendée, Naturalistes Vendéens, Groupe Mammalogique Breton, LPO Anjou, CPIE Loire Anjou, Mayenne Nature Environnement, CPIE Vallées de la Sarthe et du Loir, Groupe Mammalogique Normand, Bretagne Vivante, Athéna, LPO Indre-et-Loire, Deux-Sèvres Nature Environnement & Nature Environnement 17  
Autres données : BD Cartho, BD Carthage, Corine Land Cover, carto haie IFN & SIC PDL.

# Structure EC Guidance

Monitoring and adaptive management (onshore: chapter 6 & offshore: chapter 9)

- Examples of good practice on monitoring (e.g. bird/bat carcass searching);
- Principles of adaptive management, not as an alternative to the precautionary principle, but as a safeguarding tool to complement it

# MANUAL ON WILDLIFE SENSITIVITY MAPPING

# Wildlife Sensitivity Maps (WSM)

= maps that provide information on the locations of sensitive wildlife populations in a certain area, that can be used to inform strategic planning procedures

WSM intend to:

- identify areas containing ecological communities sensitive to the construction and maintenance of RES
- inform strategic planning decisions during site selection (e.g. SEA) and be used during EIA (NOT replace EIAs)
- utilise GIS to compare, analyse and display spatial and geographic data and employ spatial biodiversity data relating to species and/or sites

Most approaches go further than simply displaying spatial datasets and assign sensitivity values.

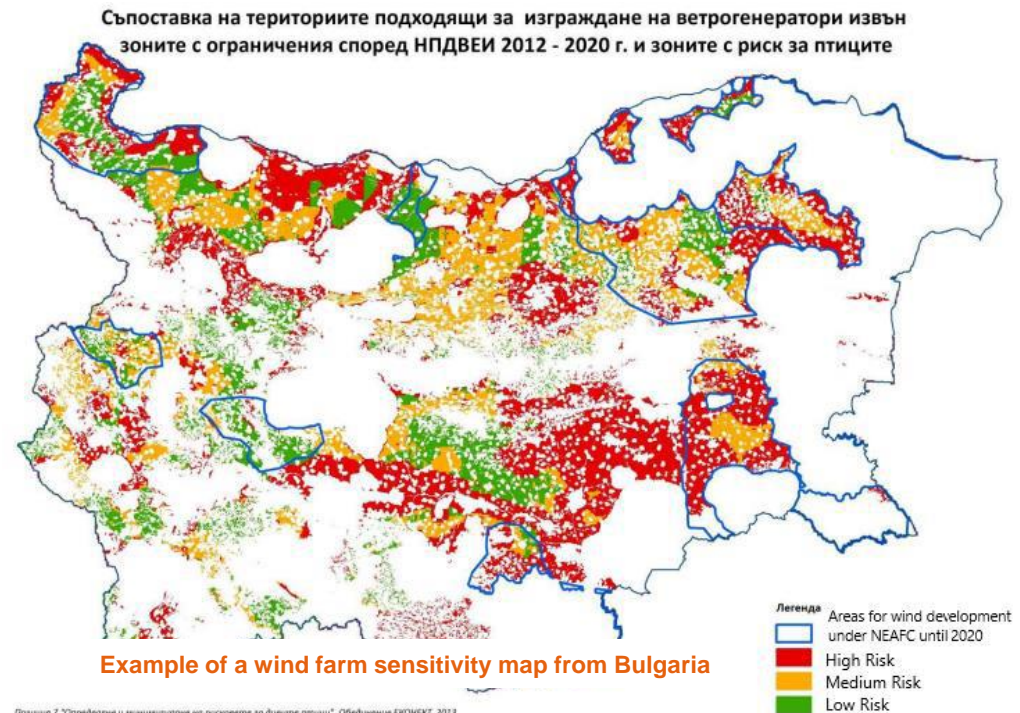
# The Manual on WSM

- Comprehensive summation of the datasets, methodologies and GIS applications
- Interactive tool → as a website
- Links to external websites and documents
- Aim:
  - Equip governments and other relevant parties to develop WSM for RES
  - Support effective adherence to EU nature legislation



# The Manual on WSM

- Contains summary accounts for 26 WSM 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 offer a comprehensive solution → limited number of renewable technologies and a subset of vulnerable species and habitats



# 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 based on 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



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. 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.
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 (e.g. bats) 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,

# Recommendations

7. WSM should be publicly accessible, simple and intuitive to use and accompanied with clear interpretative guidance.
8. WSM should be developed in such a way that new datasets or updates can readily be incorporated.
9. 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.
10. 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.
11. 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.

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