

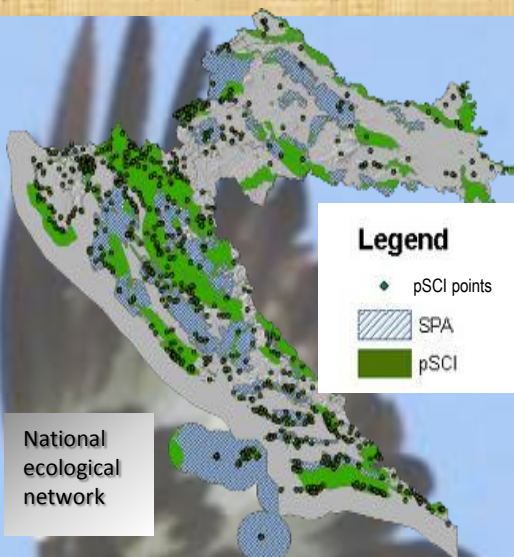
Appropriate Assessment of Plans and Projects for Croatian National Ecological Network – utilization of bird and bat impact zonation in the southern coastal part of Croatia

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INTRODUCTION:

Croatia in the process of accession to European Union established the National Ecological Network and Appropriate Assessment procedure. The National Ecological Network covers the areas of Croatia that have been identified as areas of importance for conservation or establishment of a favorable status of threatened and rare habitat types and/or wild taxa at the European (Birds Directive and the Habitats Directive and Bern Convention) and national level. National Ecological Network was a base for preparing NATURA 2000 proposal (www.natura2000.hr).

No wind farm can be built if it is not planned in spatial plan. Due to this reason, numerous locations were put into spatial plans to reserve potential location. Although these locations of wind farms are only potential, huge number of planned locations represent a big threat to biodiversity of Croatia, first of all to birds of prey and bats, which are groups of animals most endangered from wind farms (direct collision, barotrauma, alteration of flight path etc.). In the process of issuing building permits each wind farm has to pass Nature Impact Assessment (Appropriate Assessment) procedure for National Ecological Network, which is a part of Environmental Impact Assessment. For the purpose of helping authorities in the screening process, project COAST* engaged experts for birds and bats to prepare zonation maps of the COAST area.



COAST area encompassed 4 counties in Dalmatian region, whose spatial plans envisaged 75 locations for construction of the wind power plants. In Dalmatian region there are 18 internationally important bird areas (Special Protection Areas – SPA). Wind farms are planned in 12 of them. Also, in Dalmatia are 261 area important for wild taxa and habitat types (Sites of Community Importance - SCI). Wind farms are planned in 53 of them.

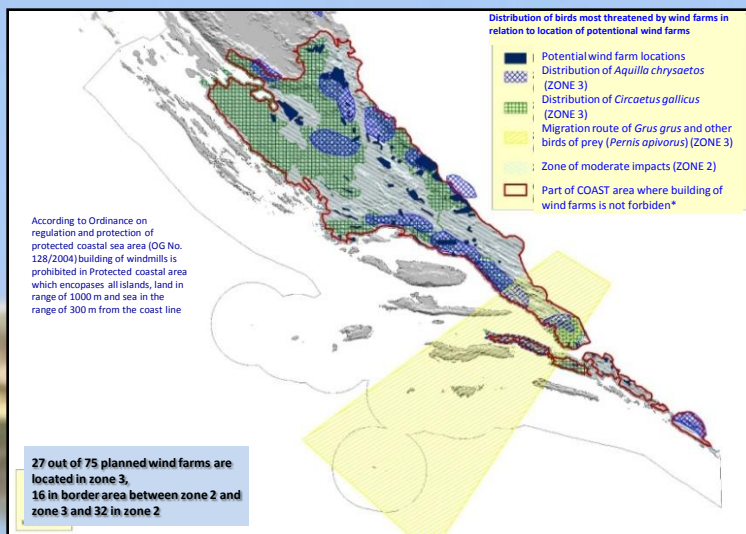


Short-toed snake-eagle

RESULTS:

ZONATION OF AREA FOR BIRDS has been made on the base of areals of known distribution for:

- birds of prey – they are especially vulnerable to wind farms due to their small populations in Croatia and their ecology (flight in the level of wind turbines, same habitats – windy plateaus and barren lands); Golden eagle (*Aquila chrysaetos*) Short-toed snake-eagle (*Circaetus gallicus*)
- migration routes for larger birds, especially Common crane (*Grus grus*) and birds of prey (e.g. Honey buzzard - *Pernis apivorus*).



1 - Zone of small impact - limited on only small areas around bigger towns.

2 - Zone of moderate impact encompasses the whole COAST area excluding the zone 3. This zone does not immediately exclude possibility of building the wind farms. Prescribing the adequate measures can lower or completely avoid negative impact. Standard research of bird fauna is obligatory for this zone. Research could also show that some locations of wind farm should be included in zone 3.

3 - Zone of large impact. This zone has potentially large impact on the most sensitive species. In this zone exists real probability that standard measures for protection of birds would not be enough and that displacement of most or all wind farms would be needed. For preparing the Impact assessment studies more intensive research would be needed as addition to standard ornithological research (details in project results).

ZONATION OF AREA FOR BATS has been made on several criteria: type of colony (nursery, hibernating, migratory), size of colony, species composition on the site and potential migration routes.

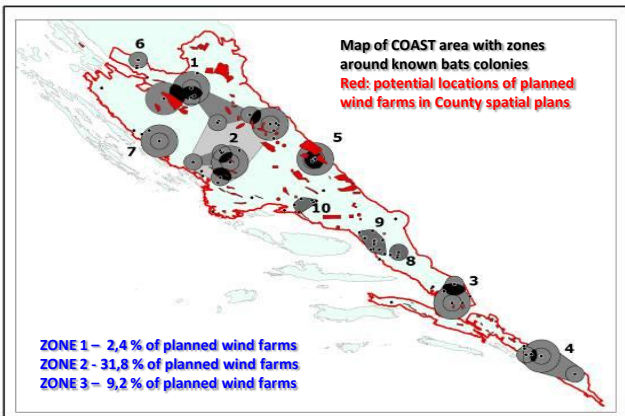
9* of 12 species of bats from the Annex II of the Habitat directive have been analyzed. These species are priority for protection and are also species that use underground shelters where they create big colonies:

Nursing colony of *M. schreibersii*

Rhinolophus ferrumequinum
Rhinolophus euryale
Rhinolophus hipposideros
Rhinolophus blasii
Miniopterus schreibersii
Myotis capaccinii
Myotis myotis
Myotis blythii oxygnathus
Myotis emarginatus

*Regarding other 3 species from Annex II HD, *Myotis daubentonii* is not present in COAST area, while for *Bombus terrestris* and *Myotis bechsteinii* only data on isolated finds exists, but no data on colonies (forest species)

On the base of these criteria, 3 zones were established: ZONE 1- minimal impact (light grey), ZONE 2 – negative impact (dark grey), ZONE 3 – significantly negative impact (black). 10 areas have been extracted for 3 zones.



For nursery, hibernating and migratory colonies, the buffer of 5 km around the caves is created, except for Schreiber's Bat for which the buffer of 10 km is created. For shelters used by bats, but which are not designated as pSCIs, the buffer of 1 km is created around them. Overlapping of buffers were analyzed on the base of expert judgment, but generally have been characterized as zone 3.

For each of 10 areas specific measures for protection of bats have been given. General measure for all 10 areas is to avoid planning of wind farms in zone 3. Also, a general measure for zone 2 is to stop completely work of wind turbines in migration period of bats. It is proposed that in this zone wind turbines not start to work under 5,5 m/s of wind speed as scientific research showed that this measure decrease bats mortality by 60%.

Guidelines for research have also been given. Analysis of cumulative effect for two sites have been made, based on 2 criteria: habitat loss (especially in vicinity of important underground shelters) and potential direct mortality during seasonal migration among known shelters details in project results) (details in project results)

CONCLUSION:

Croatia in the process of accession to European Union established the National ecological network (Ordinance on establishment of national ecological network, O.G. 109/2007) and Nature impact assessment procedure (Ordinance on nature impact assessment, O.G. 18/2009). National Ecological Network was a base for preparing NATURA 2000 proposal. Zonation in regards to the impact can be useful tool for the planning of future wind farms and for the screening of locations in Appropriate Assessment procedure. If such zonation is publicly available and early consulted, the level of risk of investment for the wind farm construction can be decreased but not completely removed. No zonation can replace need for case by case assessment in accordance with the Article 6. of the Habitat Directive.

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*COAST project: CROATIA – Conservation and Sustainable Use of Biodiversity in the Dalmatian COAST through Greening COASTal Development (UNDP-GEF) - Integration of the National Ecological Network and Natura 2000 in Coastal area management: Support to the State Institute for Nature Protection (SINP) on introduction of Nature Impact Assessment (NIA) practices in coastal areas.