The government of Flanders (northern part of Belgium) wants to increase its wind energy capacity. However, wind energy is not without its own potentially damaging consequences for nature conservation. Birds and bats can collide with wind turbines, or encounter the vortex wake behind the turbines. They can become disturbed in their breeding, resting, and foraging areas, or during local and seasonal migration. There is a need to prevent any adverse environmental effects. In general, it is recommended not to build wind farms close to important areas and migration routes of birds and bats. Although the possible impact for planned wind farms can be estimated, in a significant number of cases, there can be a substantial lack of data to make a reliable assessment of the potential impact.

Vulnerability map in Strategic Planning

In application of the precautionary principle and for minimizing cumulative effects, site selection at a strategic level should be the first stage in the search for new wind farm locations. Therefore, a dynamic decision-instrument concerning birds-bats and wind farm planning was designed for Flanders. See the diagram of the instrument below.

This instrument includes a GIS based vulnerability map for birds, which is made up from several component maps with important bird areas and migration routes. This map can be consulted in detail within a web application where other important maps are shown, like protected nature reserves, Natura 2000 areas, etc.

The vulnerability map shows a gradation of potential risk for significant impacts on bird populations when wind turbines should be constructed. It can be used at strategic level (local and regional spatial planning) for mapping possible wind farm locations, areas where more study will be needed, and provisional ‘no-go areas’.

Although the vulnerability map has its limitations (detailed information is not available for all areas), it can also be used as starting point for environmental impact analysis at a project level.

Component maps used for building the vulnerability map

The component maps were created from available bird distribution data (for sensitive species) with sensitivity categories.

Component maps:
- Foraging and resting areas for wildfowl (non-breeding)
- Roosting areas (non-breeding)
- Colonies (breeding)
- Meadow bird areas (breeding)
- Farmland bird areas (breeding)
- Areas with special endangered and rare birds (breeding)
- Local migration for foraging
- Local migration for roosting
- Seasonal migration

Each component map has detail information on the value of the areas, including a list of endangered species, the number of birds and percentage within the regional or international population.

Impact analysis

Possible wind farm locations should be subjected to a screening report (with all available information) en if needed (indications of possible important impact) a more extensive report with impact analysis (see diagram on the left).