

Spatial multicriteria framework for sustainable wind-farm planning – accounting for conflicts

Supplementary materials

Table S1. List of identified criteria and standardised scores

Table S1. Criteria, input data and standardisation of spatial indicators expressed in criteria maps.

Criteria and input data	Standardized scores for spatial indicators
<i>Wind power development</i>	
Wind resource: Wind speed at a height of 120 m (Bergström and Söderberg, 2012)	Below 5 m/s score 0, linear increase to 1 for 7 m/s and above
Electricity grid: Regional electricity grid lines (Lantmäteriet, 2020)	Safety distance of 250 m with score 0, then 1 and linear decrease to 0.01 for 30 km and beyond
Roads: National and municipal roads (STA, 2019)	Safety distance 250 m score 0, then score 1 and linear decrease to 0.01 for 3 km and beyond
Roads: Private roads (STA, 2019)	Safety distance 50 m score 0, outside no data
<i>Socio-cultural values</i>	
Residential areas: Housing (Lantmäteriet, 2020)	Safety distance of 800 m score 0, outside linear increase to 1 for 1.5 km and beyond
Outdoor recreation: World heritage sites (CAB, 2018)	Inside score 0, outside linear increase to 1 for 1000 m and beyond
Outdoor recreation: Landscape protection (SEPA, 2018b)	Inside score 0, outside linear increase to 1 for 1000 m and beyond
Outdoor recreation: ANI for recreation (SEPA, 2018b)	Inside score 0, outside linear increase to 1 for 1000 m and beyond
Outdoor recreation: Hiking trails (Lantmäteriet, 2020)	Distance of 50 m score 0.01, outside linear increase to 1 for 500 m and beyond
Outdoor recreation: Camping sites, golf courses and allotment gardens (Lantmäteriet, 2020)	Inside score 0, outside linear increase to 1 for 500 m and beyond
Cultural values: Culture reserves (SEPA, 2018b)	Inside score 0, outside score 1
Cultural values: ANI for cultural values (CAB, 2018)	Inside score 0.01, outside score 1
Cultural values: Ancient remains (SNHB, 2018)	Inside score 0, outside score 1
<i>Reindeer herding</i>	
Reindeer herding: ANI for reindeer herding (Sami Parliament, 2018)	Inside score 0.01, outside score 1
Reindeer herding: Reindeer path (Sami Parliament, 2018)	Inside buffer distance of 300 m score 0.01, outside score 1

<i>Nature conservation</i>	
Forest: Forest biotope protection (SFA, 2018)	Inside score 0, outside linear increase to 1 for 1000 m and beyond
Forest: Forest key biotopes (SEPA, 2018b, SFA, 2018)	Inside score 0.01, outside score 1
Forest: Forest core areas (CAB Västernorrland, 2020)	Inside score 0.01, outside score 1
Forest: Forest connectivity zones of green infrastructure (CAB Västernorrland, 2020)	Inside score 0.1, outside score 1
Wetlands: RAMSAR sites (SEPA, 2018b)	Inside score 0, outside score 1
Wetlands: Wetland inventory (SEPA, 2018b)	Inside score 0, outside score 1
Wetlands: Wetland connectivity zones of green infrastructure (CAB Västernorrland, 2020)	Inside score 0.1, outside score 1
Red throated diver: breeding sites (CAB, 2018)	Inside score 0.01, outside linear increase to 1 for 500 m and beyond
Golden eagle: habitat (Johansson, 2020)	Habitat suitability score ranging from 0 to 1
Other protected and valuable areas: National parks (SEPA, 2018b)	Inside score 0, outside linear increase to 1 for 1000 m and beyond
Other protected and valuable areas: Nature reserves (SEPA, 2018b)	Inside score 0, outside linear increase to 1 for 1000 m and beyond
Other protected and valuable areas: Natura 2000 Habitat Directive (SEPA, 2018b)	Inside score 0, outside linear increase to 1 for 1000 m and beyond
Other protected and valuable areas: Natura 2000 Birds Directive (SEPA, 2018b)	Inside score 0, outside linear increase to 1 for 1000 m and beyond
Other protected and valuable areas: Animal and plant protection areas (SEPA, 2018b)	Inside score 0, outside linear increase to 1 for 1000 m and beyond
Other protected and valuable areas: Other biotope protection areas (SEPA, 2018b)	Inside score 0, outside linear increase to 1 for 1000 m and beyond
Other protected and valuable areas: ANI for nature conservation (SEPA, 2018b)	Inside score 0, outside linear increase to 1 for 1000 m and beyond
Other protected and valuable areas: Sites of high nature conservation value (CAB Västernorrland, 2018)	Inside score 0.01, outside score 1
Other protected and valuable areas: Shore protection for water bodies (CAB, 2018)	Inside score 0, outside for distance of 100 m score 0, outside score 1
Other protected and valuable areas: Extended shore protection for water bodies (CAB, 2018)	Inside score 0, outside for distance of 300 m score 0, outside score 1
<i>Other land use and infrastructure</i>	
Defence: (Swedish Armed Forces, 2018)	Inside score 0, outside score 1
Infrastructure: Airports (Lantmäteriet, 2020)	Inside score 0, outside score 1
Infrastructure: Airport influence area (Lantmäteriet, 2020)	Inside score 0, outside score 1

Infrastructure: Railways and harbours (Lantmäteriet, 2020)	Safety distance of 250 m score 0, outside score 1
Other land-use: ANI for valuable substances (CAB, 2018)	Inside score 0, outside score 1
Other land-use: Fields (SEPA, 2018a)	Inside score 0, outside score 1

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