Biodiversity Site Mapping - Risk Screening, alignment and mitigation



Elena Barcenilla Arranz

Environmental Specialist at Statkraft Spain elena.barcenillaarranz@statkraft.com

Statkraft.com





Biodiversity Site Mapping -Risk Screening, alignment and mitigation

Annual Conference of the International Association for Impact Assessment May 2025

Elena Barcenilla Arranz Environmental Specialist

Contents

1	Introduction
2	Material site definition
3	Process to identify material sites
4	Reporting and presenting material sites results
5	Examples of Material Site
6	Conclusions



1. Introduction

Purpose of the screening

Introduction

- It is a project developed by SK and supported by a consultancy
- Purpose of the screening:

A mapping process is carried out to identify Material Sites at Statkraft sites.

<u>Material sites is a biodiversity risk screening approach and</u> <u>results – the site may not actually have material impacts.</u>

Risk categories help to prioritise assets to understand where to focus attention



2. Material Site Definition

Definitions and Exclusions

What is a Site?

Definition of a Site

In Statkraft's context, a site refers to the consented area designated for development across various energy technologies.

Statkraft has identified material sites only at its own locations for this exercise.

Hydropower Site Specificity

For hydropower, the site refers specifically to the assets within a designated catchment area.





Process to Identify Material Sites



Key principles for identification

<u>**1. Technologies impacting biodiversity and ecosystems</u></u> Identifying technologies that affect biodiversity and ecosystems is crucial for responsible development in a Statkraft context.</u>**

2. Scale of Development – by <u>MW Capacity</u>

We focus on sites with medium to high megawatt capacity, ensuring that significant energy projects are evaluated for their impact.

3. Biodiversity importance

High biodiversity risk sites are screened using the TBC's BRiSK tool, emphasizing the importance of biodiversity considerations.

TBC: The Biodiversity Consultancy **BRiSK:** Biodiversity Risk Screening Kit



1. Technologies Impacting Biodiversity and Ecosystems

Results from the Double Materiality Analysis (DMA)

Technologies included: hydro, wind, solar, gas power, biomass, BESS, district heating

Impacting/change: land-use, freshwater-use, sea-use

Infrastructure discounted:

offices, heat pumps, EV-charging stations











2. Thresholds for MW Capacity Categories

MW Capacity Categories Overview

We provide a comprehensive overview of MW capacity categories derived from public sources and internal expertise.

Scale of project or asset by MW capacity							
MW Capacity	Site Category						
< 50 MW	Small						
50-100 MW	Medium						
> 100 MW	Large						



3. Biodiversity Importance

Risk score - BRiSK Tool

The BRiSK tool has screened biodiversity risks at Statkraft sites.

Using a risk scale from Very Low to Very High, the BRiSK tool aids in evaluating biodiversity risks accurately.

This tool uses <u>sub-indicators</u>:

- Species
- Species Threat Abatement and Restoration (STAR) metric
- Areas of biodiversity importance



Sub-indicators for Biodiversity Importance

Species

Priority species based on proportion of recorded range in screen area, and critically endangered species



Species Threat Abatement and Restoration (STAR) metric

Calculated from data on the distribution, threats, and extinction risk of threatened species derived from the IUCN Red List



Areas of biodiversity importance

World Database of Protected Areas and Key Biodiversity Areas (KBAs)





BRiSK Tool – Risk categorization Species

- Categorized based on:
 - No. of CR species with range overlapping site/buffer
 - No. of priority species in the site + buffer area: species potentially meeting IFC PS6 critical habitat thresholds for:
 - Criterion 1 (CR/EN) and/or
 - Criterion 2 (restricted range)

Very Low	Low	Medium	High	Very High		
No CR SpeciesNo Priority Species	 1 – 6 CR Species No Priority Species 	 7 – 12 CR Species No Priority Species 	> 12 CR SpeciesNo Priority Species	 Priority Species present 		



BRiSK Tool STAR (Species Threat Abatement and Restoration)

- Indicates conservation potential in terms of reducing global species extinction risk
- Categorized using two global 5x5 km pixel data layers:
 - **Threat abatement:** high scores mean area **currently supports** relatively high no of threatened species, a large proportion of individual species ranges, and/or a large proportion of species that are severely threatened.
 - Good opportunity for actions to abate threats.
 - Restoration: high scores indicate area previously supported relatively high no of threatened species, a large proportion of individual species' ranges, and/or a large proportion of species that are severely threatened.
 - Good opportunity for habitat restoration.



BRiSK Tool Areas of biodiversity importance

- Categorized based on proximity of an asset to an area of biodiversity importance.
- Using:
 - World Database of Protected Areas (WDPA)
 - World Database of Key Biodiversity Areas (KBA)
 - World Database of Other Effective Area-based Conservation Measures (OECM)

Puffor Sizo	Proximity								
Buller Size	Very Low	Low	High	Very High					
10 km	No within Buffer	3 – 10 km	1 – 3 km	< 1 km	Direct overlap with location				



Asset buffer

Asset polvgon

Material Sites Identification Summary: Technologies, Capacity, and Biodiversity Risk





Results/Presenting Material Sites

Technologies are based on the DMA conclusions, and are limited to the selection of technologies with potential or actual biodiversity and ecosystem impacts; solar power, wind power, BESS, hydropower, biomass, district heating, and gas power. Please refer to the document: DMA 2024_final_(003) (In this context, BESS includes Sync Comps, and hydropower includes both large scale and run-of-river.)

Yello Gr Red cell = r	ow cell = duplicates een cell = >50 MW not screened/no GIS name			Data source:	BA Nordics - <mark>material Sit</mark> BA International - Materia BA Europe - <mark>Material Site</mark> s	e: al s									
							TBC outputs	6			Material	Sites			
CGU	201111-00		Site name to be written	in	Technology	Total installed	Biodiversity Importance	Matarial Oita		2(-)		VDA(-)		River Fragmentation	Area
Code Country	CGU Name	GIS System Name	Annual Report	▼ BA	 Technology 	MW -	Category -	Material Site	VDPA	J(S)	WDPA Names	 KBA name(s) 	 Ecological Status 	(Hydro only)	(Ha) 🔽
Spain	Aerosur	Aerosur	Aerosur	Europe	Operations Wind	54	Very High	Yes	555548 349067	04	Los Alcornocales Natural Park		Medium		525.78
IPABCBA Brazil	BMC Wind	See comments	BMC Wind	International	Operations Wind	155.12	High	Yes				_	Medium		1418
IPABCBZ Brazil	Central Eolica Boqueirao I S/A Central Eolica Boqueirao II S/A Central Eolica Jerusalem I S/A	EOL Boqueirão	Boqueirão	International	Operations Wind	80	Very High	Yes					High		2994
	Central Eolica Jerusalem II S/A Central Eolica Jerusalem III S/A Central Eolica Jerusalem IV S/A Central Eolica Jerusalem V S/A	N N													
IPABCBT Brazil	Central Eolica Jerusalem VI S/A	EOL Jerusalém	Jerusalém	International	Operations Wind	181	Very High	Yes					High		4915
EFABBBU Norway	CGU Alta	Alta	Alta	Nordics	Operations Hydropower	150	Very High	Yes					Very High	High	650.42
EFABBBK Norway	CGU Aura	Aura	Aura	Nordics	Operations Hydropower	310	Very High	Yes					High	Medium	5150.92
EEADDDD Norway	COLLEidus	Dialua	Dialuo	Nordice	Operations Hydropower	00	High	Vec			I	I	Hiah	Madium	660.04



Results/Presenting Material Sites

 Technology 	Total installed MW 🔽	Biodiversity Importance Category	Material Site 🛛
Operations Wind	54	Verv High	Yes
operations wind	04	very high	
Operations Wind	155.12	High	Yes
Operations Wind	80	Very High	Yes
Operations Wind	181	Very High	Yes
Operations Hydropower	150	Very High	Yes
Operations Hydropower	310	Very High	Yes
Operations Hudropower	00	High	Noc



Presenting Material Sites in Annual Report

Material sites					Material sites				
Country	Site name	Ecosystem Condition ¹	River fragmentation	Biodiversity sensitive areas affected ²	Country	Site name	Ecosystem Condition ¹	River fragmentation	Biodiversity sensitive areas affected ²
						Gideälven	High	High	
Hydropower						Indalsälven	Very High	Very High	
Albania	Devoll	Medium	Low			Lagan	Medium	Very Low	
Brazil	Monjolinho	Medium	High	Votouro/Kandoia IA	Sweden	Ljungan	Medium	Very High	
Chile	Los Lagos	Medium	Very Low			Skellefteälven	Medium	High	
onino -	Rucatayo	Medium	Very Low			Umeälven	Medium	High	
Germany	Erzhausen	Very Low	Medium			Ångermanälven	Very High	Very High	
	Alta	Very High	High		UK	Rheidol	Low	Low	
	Aura	High	Medium		Mind news				
	Bjølvo	High	Medium		wind power	We sloth are a	Manulau	NUA	Weelstherne N.O.D. (Netwel Festures Deserve
	Folgefonn	High	Medium		Australia	vvooistnorpe	Very Low	N/A	wooisthorpe N.C.R. (Natural Features Reserve
	Folgefonn (Langvatn)	High	Medium			Boqueirao	High	N/A	
	Grytten	High	Medium			Jerusalem	High	N/A	
	Høyanger	High	Medium			Ventos de Santa Eugenia	High	N/A	
	Innset	Very High	Very Low			Palmares	Medium	N/A	
	Jostedal & Leirdøla	Very High	Medium			Sao Fernando I	Medium	N/A	
	Kobbelv	Very High	High		Brazil	Sao Fernando II	Medium	N/A	
	Mår	High	High			Sao Fernando IV	Medium	N/A	
Norway	Nea & Nidelv	High	High			BMC Wind	Medium	N/A	
	Nore	High	High			Ventos da Lagoa	Medium	N/A	
	Rana	High	High			Ventos Do Litoral	Very Low	N/A	
	Røssåga	Very High	Low			Ventos do Sul	Very Low	N/A	
	SySima	High	Medium			Ventos dos Indios	Low	N/A	
	LangSima	High	Medium		Canada	Winnifred	Medium	N/A	
	Svartisen	Verv High	Medium		Chile	Torsa	Low	N/A	
	Tokke	Very High	High						Maintalhänge zwischen Gambach und Veitshöchheim
	Trollheim	High	Medium		Company	M/Gemburge			SAC, Laubwälder um Würzburg SAC, Odenwald und Bauland Hardheim SAC.
	Tyssefaldene	High	Medium		Germany	wurzburg			LSG innerhalb des Naturparks Bayerischer Odenwald
	Ulla-Førre	High	High				Medium	N/A	Erfatal LPA
	Vikfalli	High	Medium			Smøla	High	N/A	
	Cheves	Low	Very Low		Norway	Storheia	Very High	N/A	
Peru	Yaupi	High	Very Low						



Next steps: Reviewing outputs

Determining materiality

- Categorizing a site as Material Site does not automatically indicate that the site has material impacts.
- Verification of screening results: risk must be verified using asset-specific data and/or specialist interpretation.
- Assessing risks: identifying Key Biodiversity Features (habitat + species)
- Review biodiversity management.
- Prioritisation of assets.





5. Examples of Material Site

How to manage a material site classified as Very High?

European context



15 Material Sites in Europe

- 6 in Germany
- 6 in Spain
- 1 in Irland
- 1 in UK

 $STAR_T$ Score

• 1 in Albania



Material Sites in Spain

6 Material Sites in Spain

- 5 wind farms in operation
- 1 solar plant in operation



Faro-Farelo wind farm



Talayuela Solar Plant



Aerosur wind farm





Ribera de Navarra wind farm



Páramo de Poza wind farm



Montes de Cierzo wind farm



Material Sites in Spain

6 Material Sites in Spain

- 5 wind farms in operation
- 1 solar plant in operation



 $STAR_T$ Score



WIND FARM AEROSUR



Located in Tarifa

Cadiz, Spain

Technology Turbine ECO 74 – 1.6 MW

34 Wind turbines Total Capacity: 54 MW Started operation NOVEMBER 2004

AEROSUR Wind farm Why is it a Material Site?



PROTECTED AREAS

- o Birds migratory route in Tarifa
- o Natura 2000
- Special Protection Area (Bird Directive)
- Special Areas of Conservation (Habitat Directive)
- Natural park



Montagus harrier migration routes Fount: migracionesdeaves.org



Wind farm AEROSUR Why is it a Material Site?



16 bird species with CR, EN or VU Category*

45 species with *High* or *Very High* collision vulnerability



Egyptian vulture (*Neophron percnopterus*) **EN*, VU****



Pallid Harrier (*Circus macrourus*) **NT*, EN****



Montagus Harrier (*Circus pygargus*) **LC*, VU****



29 *IUCN Red List **Libro Rojo of Spain

Mitigation and compensation measures in AEROSUR

- Supplementary feeding of individuals
- GPS following
- Birdwatching people during daylight hours, every day of the year
- Monitoring and protecting nests (for Montagu's harrier)





WIND FARM RIBERA DE NAVARRA



Located in Tudela

Navarra, Spain

Technology Turbine GE Cypress 158 – 5.8 MW

24 Wind turbines Total Capacity: 139 MW

Started operation JUNE 2024

Ribera de Navarra Wind farm Why is it a Material Site?



PROTECTED AREAS

Near the asset:

- AICAENA (protection area for steppe birds)
- Special Areas of Conservation (Habitat Directive)
- Bardenas Reales (Natural Park)
- Natural Monuments
- Nature Reserves





Ribera de Navarra Wind farm Why is it a Material Site?

SPECIES

11 bird species with CR, EN or VU Category*

33 species with *High* or *Very High* collision vulnerability



Red kite (*Milvus milvus*) LC*, EN**

*IUCN Red List*Libro Rojo* of Spain



Cinereous vulture and Griffon vulture (*Gyps fulvus*) **LC***, **LC**** (*Aegypius monachus*) **NT***, **NT****



Mitigation and compensation measures in Ribera de Navarra

Ongoing mitigation

- Automatic Bird Detection System
- Weekly incident monitoring
- Ongoing compensation
 - Construction of water rafts for steppe birds
 - Uncultivated area in AICAENA (30 hectares)







Bird Detection System



6. Conclusions

Conclusions

The methodology of the Biodiversity Material Site project is effective to:

- Using results to identify priority areas for Biodiversity Net Gain measures.
- Effective mapping helps pinpoint biodiversity risks and guide smarter decisions.
- Implementing actions to address and remediate ongoing negative impacts.
- This helps us anticipate possible incidents.
- Prioritizing wind farms assessments where high collision-risk species are identified.
- Collaborating with local stakeholders in ecologically sensitive areas.





Thank you!

More info at statkraft.com

Elena Barcenilla Arranz (elena.barcenillaarranz@statkraft.com



Let's continue the conversation!

Message me your questions or comments in the IAIA25 app.

Elena Barcenilla Arranz

Environmental Specialist at Statkraft

Spain

Elena.barcenillaarranz@statkraft.com

Statkraft.com

