Five Years With The Biotope Method

Quantitative Biodiversity Impact Assessment: Five Years of Using the Biotope Method

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Short methodological introduction:

- A system for quantitative biodiversity impact assessment
- A Before - After methodology
- Based on the assumption that the gains and losses of biotopes (habitats), caused by a change in land use, reflect the resulting changes in biodiversity
- Only impacts caused by the project under study (marginal impacts), are considered
- Improvement measures can be quantified and improves the performance score

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Four basic steps:

1. Determination of system boundaries
2. Classification of biotopes
3. Characterisation of biotopes
4. Collation and presentation

Four categories:

A. Biotope loss, BL
B. Critical biotope, CB
C. Rare biotope, RB
D. General biotope, GB

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Biotope loss, BL

- Areas lacking the preconditions for biological production (e.g. paved areas and buildings)

Critical biotope, CB

- Biotope that harbours, or has the potential to harbour, redlisted species

Rare biotope, RB

- Biotope which deviates from surrounding areas by high species diversity, many regionally rare species or an abundance of key features

General biotope, GB

- Remaining biotopes, i.e. those that cannot be put in any of the other categories

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Indicators:

- **Red-listed species**: Species considered to be at risk of extinction in the near future. Most countries formulate national redlists.
- **Key features:** Various structures in the landscape that create preconditions for a rich biodiversity, e.g. old trees, creeks, springs etc. National lists are common.

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Power-generating technologies with existing applications:

- Hydropower
- Nuclear power
- Wind power
- Heat generation from waste incineration
- Other, not full-scale, applications have been conducted on transmission ROWs, and the method has also been subjected to special studies in regards to biomass-fuelled electricity and heat generation

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Simplified presentation of the results for two hydropower, two nuclear power and one wind power application:

Category	Lule river HP (m^2/kWh)	Ume river HP (m^2/kWh)	Forsmark NP (m^2/kWh)	Ringhals NP (m^2/kWh)	Vattenfall WP (m^2/kWh)
Biotope Loss	150×10^{-6}	330×10^{-6}	1.4×10^{-6}	3.5×10^{-6}	$+55 \times 10^{-6}$
Critical Biotopes	-130×10^{-6}	-310×10^{-6}	-0.015×10^{-6}	-0.77×10^{-6}	-6.6×10^{-6}
Rare Biotopes	-22×10^{-6}	-310×10^{-6}	-0.015×10^{-6}	-0.93×10^{-6}	-7.9×10^{-6}
General Biotopes	2.6×10^{-6}	280×10^{-6}	-1.4×10^{-6}	-1.8×10^{-6}	-40×10^{-6}

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Problems:

- Off-site impacts
- Not fully compatible with standard EIA
- The inherent conflict between simple/quick/applicable and “correct”
- Problems in attaining basic information of sufficient quality in some post-project assessments
- Cumulative impacts
- Barriers effects, fragmentation and thresholds are not possible to evaluate in pre-project assessments

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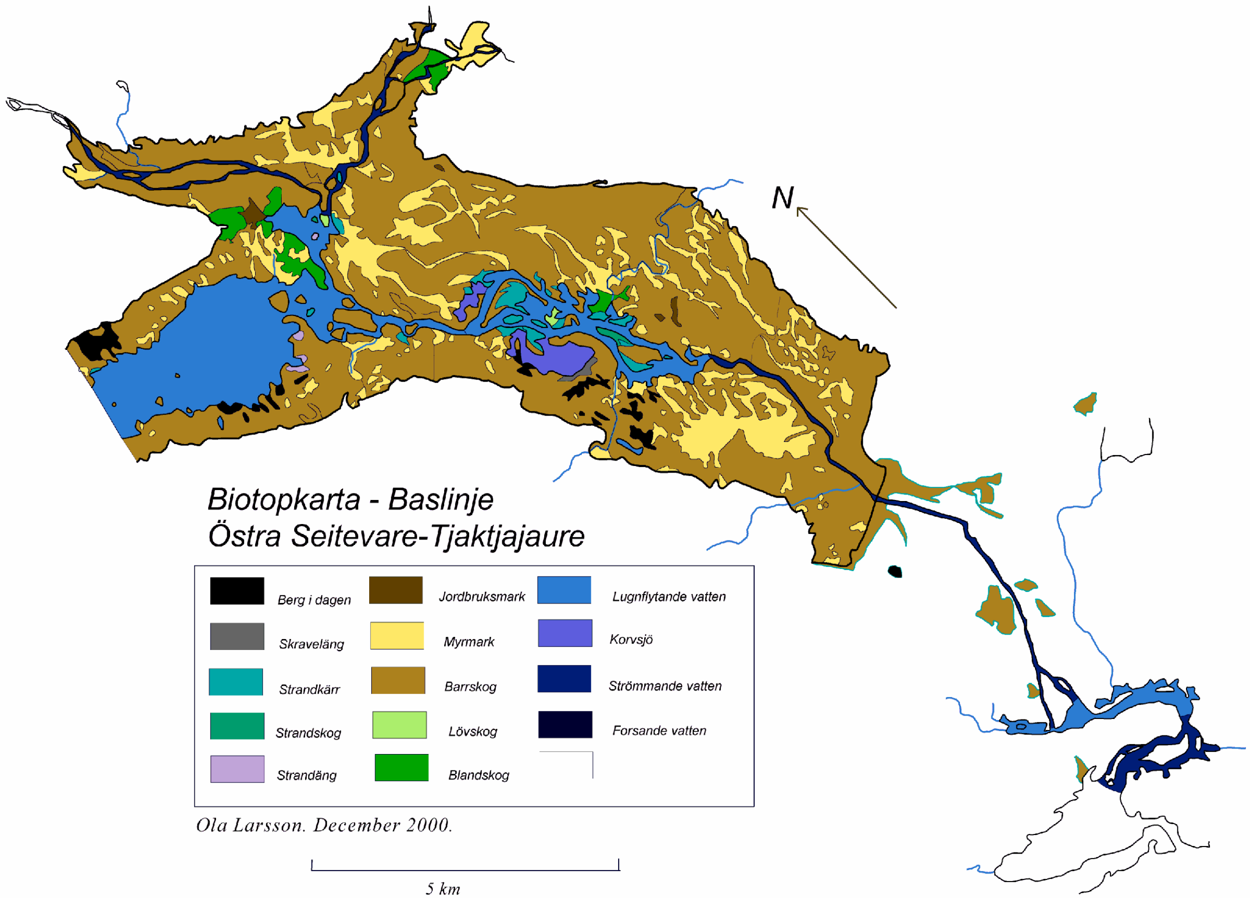
The future:

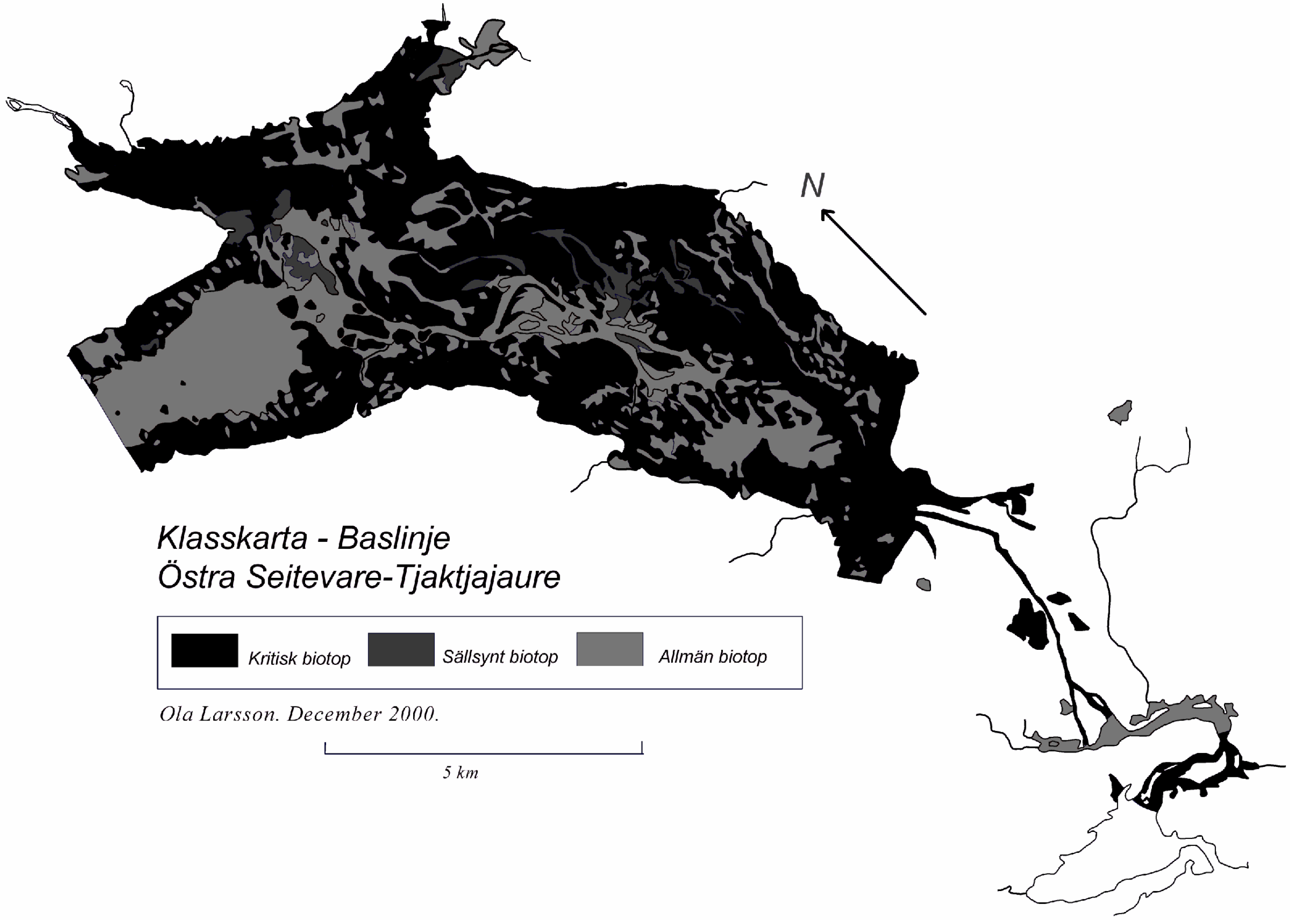
- **Improvements for use in LCI/LCA:**
  Dealing with uncertainties. Possibly with a scenario approach, leaving the reader to choose which one (s)he finds most probable.
- **Development for use in EIA:**
  The system boundaries.
  Include analyses of possible prevention and mitigation opportiunities.
  Taditional EIA biodiversity problems; fragmentation, barrier effects, edge effects, thresholds and the long-term functionality of the various biotopes/habitats.

Biotope map, before development

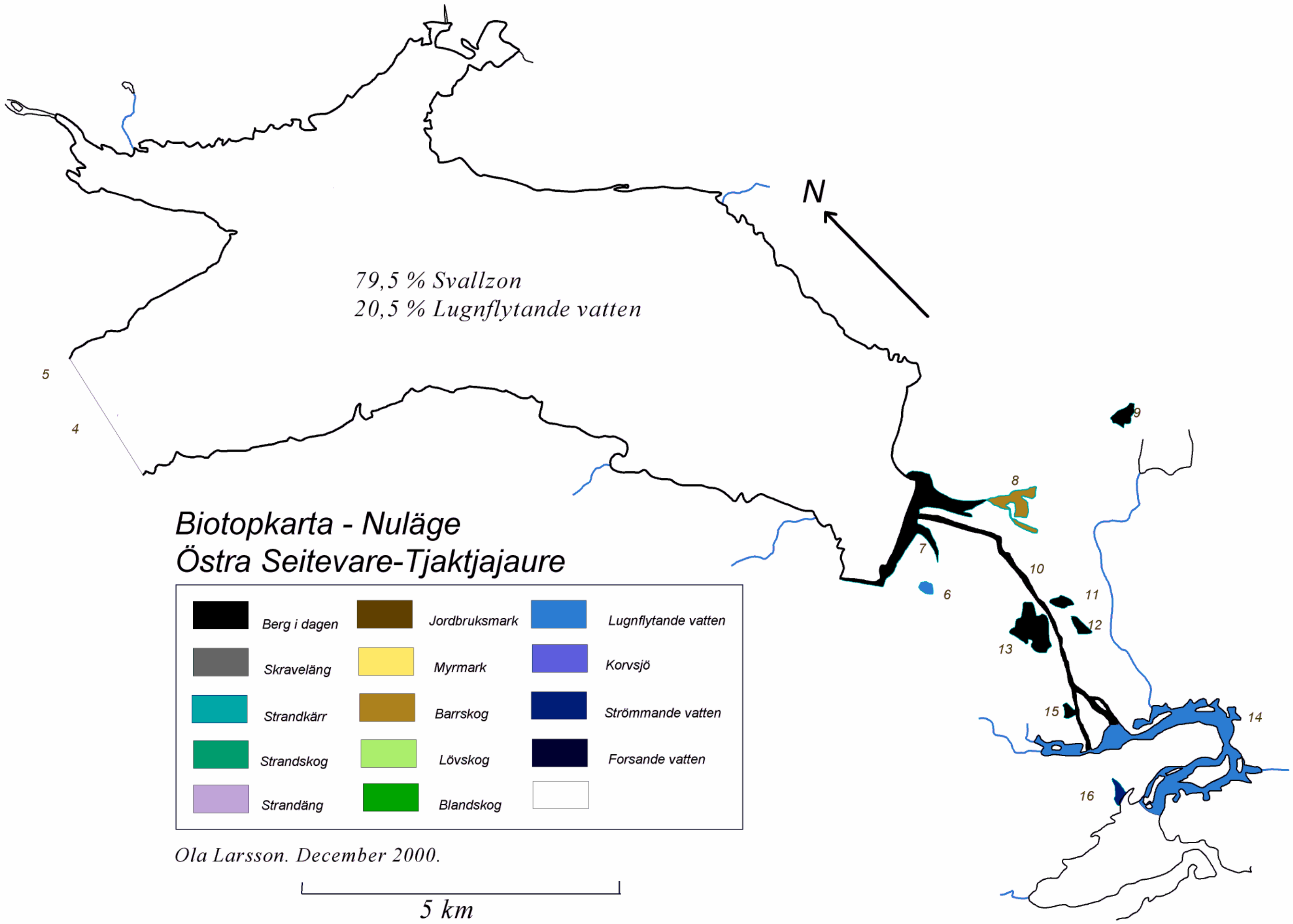


VATTENFALL

Categories, before development



Biotope map, after development



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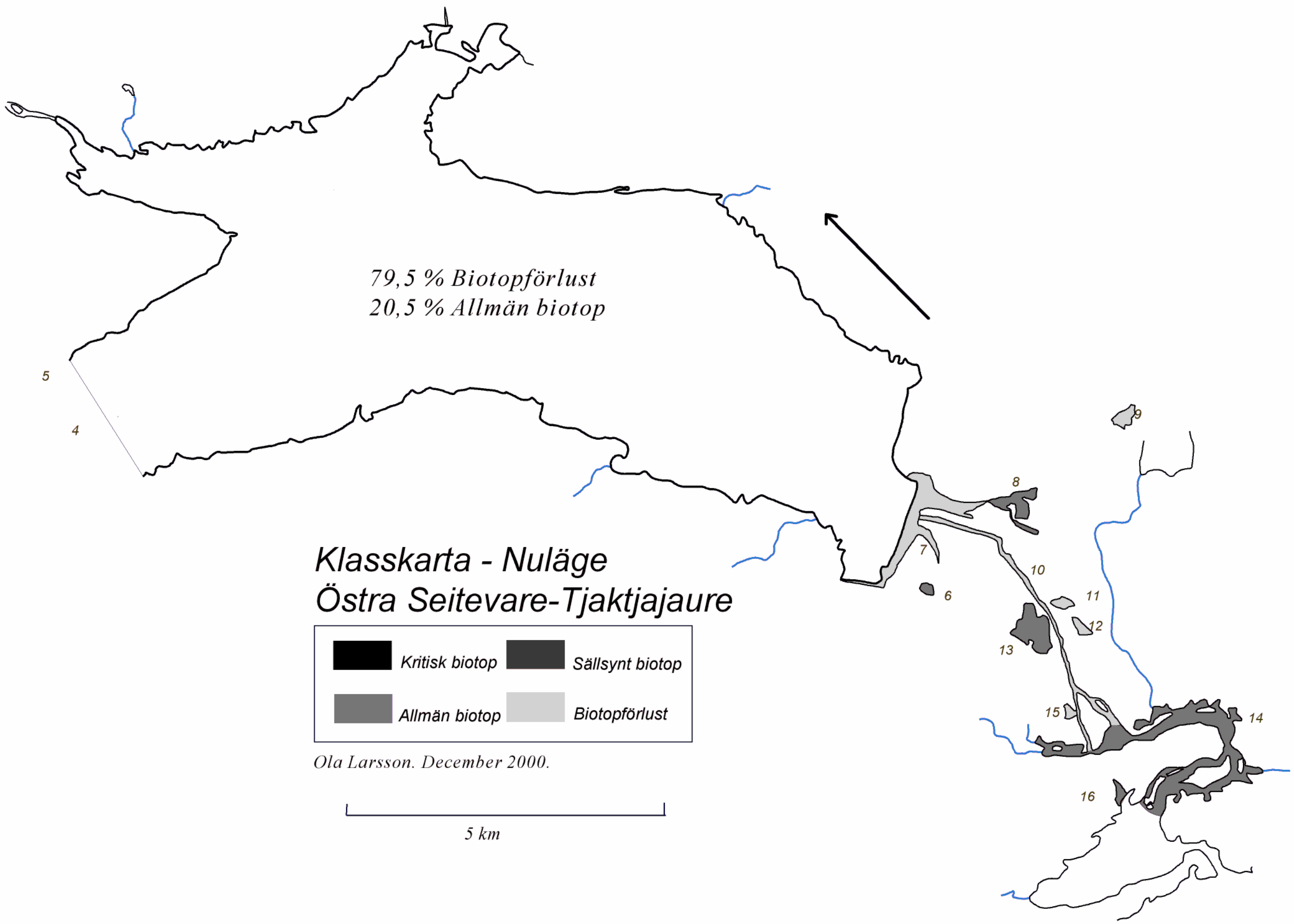
Categories, after development



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