

Multivariate Characterization of the Swedish reindeer herding area

- What factors affect reindeer production and husbandry possibilities?

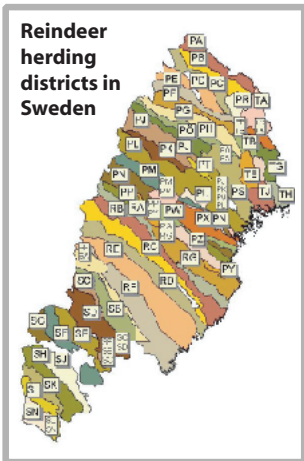


Figure 1. Swedens reindeer herding area consists of 51 herding districts ("Samí villages"), from Idre in the south to Könkämä in the north.



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The Swedish reindeer herding area covers nearly half of Sweden's land area (Fig. 1). Since reindeer graze freely on pastures, many factors affect the condition and production of reindeer (Fig. 3) and factors of large impact have today been investigated. However no survey covering the whole herding area and multiple factors have been done, and comparisons of factors regarding their impact on reindeer production have not yet been examined.

Knowledge of this will give information on potential of production and grade of optimization and utilization of heding areas and pastures. It may also give information on how large the impact will be of a new disturbance or other inflicion on the industry.

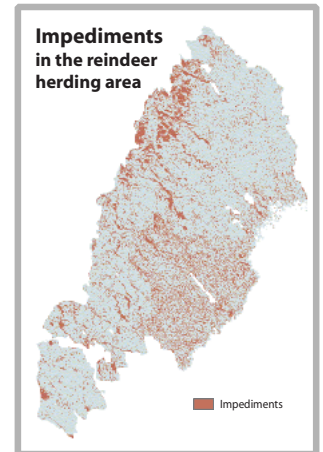


Figure 2. Impediments of the Swedish reindeer herding area.

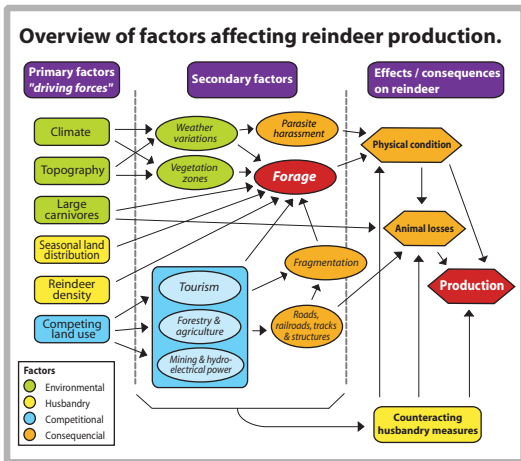


Figure 3. A sample of factors affecting reindeer production, and in what way they do so. Mostly all factors, except parasites and predators, affect the forage, which actually is the primary resource in reindeer production. The reindeer could be seen as the refiner of pastures.

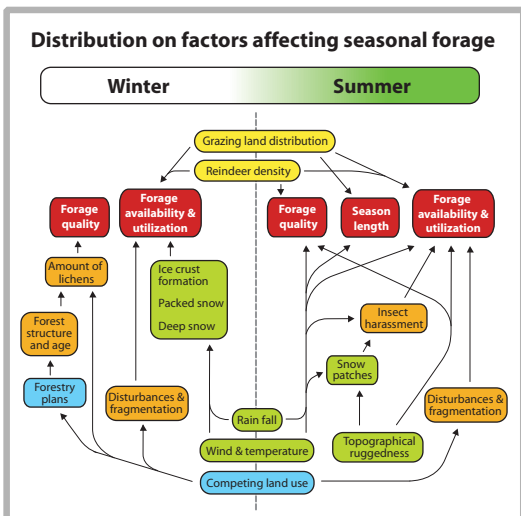


Figure 5. Some factors are relevant all year round, when others are bound to a certain season, or to the ground used a particular season. Here are some factors mentioned that affect the forage abundance, availability and quality. Season lengths differs between herding districts. Some factors can have both positive and negative impact and therefore may cause problem when analyzing them.

Aims

- Rank factors relevant to reindeer production.
- Identify limiting conditions for individual herding districts.
- Zone classification of the Swedish reindeer herding area for potential productivity, such as is available for forestry, agriculture, and horticulture.

Material & Methods

Geographic Information System - GIS

Information on large scale factors, such as topography, weather, impediments and infrastructures etc. are analyzed and displayed in a Geographic Information System (GIS) (See Fig. 2 & 4). This gives the opportunity to display the distributions of factors, as well as, calculate indices relative to location, area or other relevant criteria.

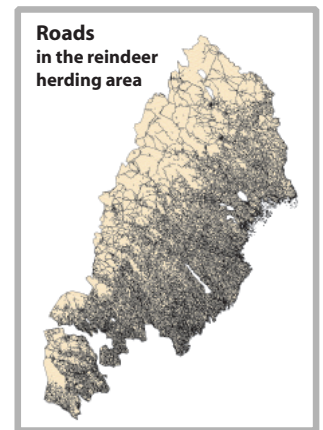


Figure 4. Roads of all types in the Swedish reindeer herding area
© Lantmäterverket 1998. From GSD - Roads from the Blue map, dnr 507-98-4720-4720

Multivariate methods

All indexed factors are analyzed using multivariate statistical methods to distinguish factors explaining variation between herding districts, and to merge correlated factors. In order to quantify their importance and impacts, conditions are related to density adjusted long term productivity information from each herding district .

Questions at issue

Distinguishing factors' seasonal impact on reindeer production (Fig. 5).
On what scale do the factors occur (Fig. 6)?
Scaling the factors to processable indices (see example Lundqvist et al., poster 6, this conference)
Identify covarying factors and reduce them into single indices.
Identify bottlenecks for individual herding districts

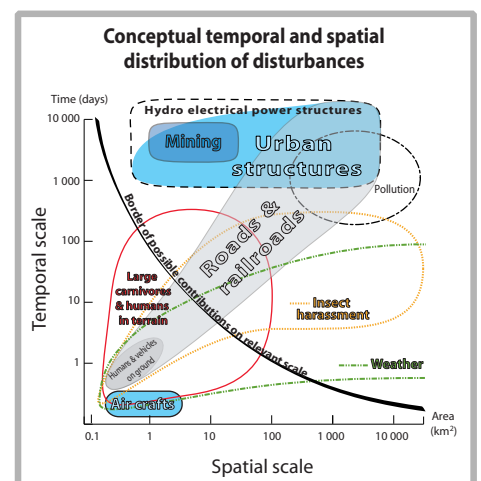


Figure 6. Disturbances may occur at different scales, both spatially and temporally. A temporally short and spatially local disturbance might be relevant if repeatedly occurring. Fragmentation is the result of longer and larger disturbances which hinder the reindeer to utilize the pastures.

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