

How does rewetting of forest land affect biodiversity?

Type of study

Literature review

Objectives

The aim is to identify and quantify key factor implications from restoration of forest land and to assess the advantages and/or disadvantages from rewetting with the main focus on biodiversity.

Background, questions

From the beginning of the 20th century and onwards, many wetlands and swamp forests in Sweden were drained through ditching. The reason was to increase the proportion of cultivated areas and to increase forest growth, resulting in a total of 1 million ha of forest land being currently affected by draining ditches. Historically these drainage systems had a positive effect on the growth of biomass at the stand level. However, now they are instead often causing problems at the landscape level. The drainage systems prevent infiltration to the groundwater, and thus reduces the landscape water supply. Furthermore, drained peatlands account for 25% of Sweden's total climate impact. Hence, the rewetting of previously drained forest land is therefore necessary for the fulfilling of Paris Agreement objectives. The loss of habitat for endangered species associated with moist and wet forests is another difficult challenge that we are facing. Rewetting of forest land could be one possibility for restoring species habitats.

Research question

What is known in the literature about the practices and outcomes for biodiversity and climate when conducting restoration of forested wetland?

Method

The study will be conducted as a literature review focusing on:

- a) Electronic searches of key scientific databases (Scopus, Web of Science and Google Scholar);
- b) Grey literature search of organisations active in this area including webpages of environmental protection agencies and other authorities and associations working with nature conservation and restoration and/or forest and wetland restoration;
- c) Citation searches from the reference lists of the included papers will also be reviewed.

Study outcomes

The result will consist of a matrix of quantifiable indicators matching stakeholder interests and representing criteria that rewetting measures can achieve.

The study outcome will be to explain the key factors, affecting the outcome of restoration measures.

Indicators of changes due to restoration measures include (but are not limited to):

- Changes in forest structural elements (e.g. tree species composition, age and diameter distribution and occurrence of natural regeneration)
- Development of improved microhabitats for species specialists (e.g. cavities, dead wood and dead trees)

- Changes in species richness and/or community composition (plant, fungal and faunal diversity)
- Changes in the ecosystem-atmosphere exchange of greenhouse gasses (CH₄, CO₂, N₂O)

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