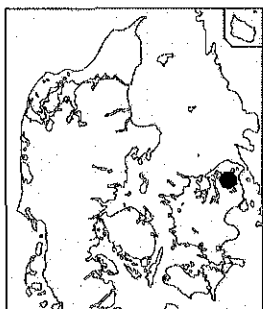


Excursion guides for the joint Pro Silva- and Nat-Man Conference August 4-8 2004 in Denmark

Friday August 6th - The Strødam Reserve



The Strødam Reserve (160 ha) is situated in the south-western part of the Grib Skov forest complex. The reserve is owned by The Jarl Foundation, and is protected by a private declaration. It is closed for the public in order to serve as an undisturbed sanctuary for plant and animal life, as well as providing protected areas for natural science projects.

The Strødam reserve was established on lands accumulated in the late 19th century by the most important financier and industrialist of the time, C. F. Tietgen to carry his summer residence. Part of the reserve was already forest, but Tietgen expanded it to the adjacent horse pastures. In 1917 Axel Jarl, a nephew of the wife of Tietgen, inherited the property and formally established the reserve in 1925. It is now owned by the Jarl Foundation, but administered by a council, Strødamudvalget, appointed by the Faculty of Science of University of Copenhagen.

The Strødam Reserve includes several landscape types, such as old pastures, fens, lakes and small ponds, but most of the reserve (125 ha) is woodland. A small forest part located north-west of the mansion, which is dominated by beech, is assumed to be ancient forest. The moister parts with alder and ash probably also have long forest continuity. Tietgen and Jarl planted the remaining forest, mainly dominated by beech, and particularly in Rankeskoven the even-aged beech trees have reached maturity and are gradually giving way to new successions. Some timber was removed from the forest particularly in the first half of the 20th century, but in recent years forestry has been limited to gradual removal of Norway spruce (*Picea abies*) and larch (*Larix europaea*), and repression of introduced species such as sycamore (*Acer pseudoplatanus*). Forest management is now reduced to gradual felling of conifers, disclosure of previously drain-piped streams, and deer control. However, the deer population is part of a freely migrating population in Grib Skov and cannot be controlled locally.

Numerous research projects have been conducted in the Strødam Reserve over the years, including mineral cycling in the forest floor, and population studies of birds. Bioacoustics (bird song) is one subject to highlight as it has been a scientific focal area of the reserve for decades. However, in recent years the increased interest in the biodiversity and dynamics of natural or unmanaged

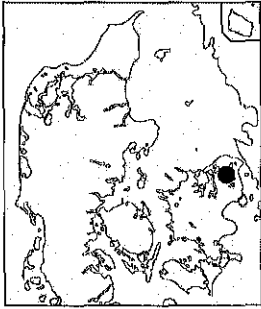
woodlands has generated several projects devoted to succession of fungi on fallen logs and succession in light gaps.

The Strødam Reserve is closed to the public in order to provide undisturbed habitats for the fauna and flora, and allow vulnerable scientific equipment to remain undisturbed as stated in the charter. However, its seclusion also provides a prerequisite for future establishment of e.g. birds that depend on large undisturbed core areas. The Strødam Reserve is suggested to be part of such a core area in a future large scale National Park in Northeast Zealand. Guided excursions are arranged every year in order to allow the public to experience the unique scenery of the reserve, and to improve the public approval of the seclusion of the reserve and the scientific work performed there. We welcome you to the Strødam Reserve.

Table 1. Overview of history and human influence on the forest stands in the Strødam Reserve

Management impacts and durations
The forest was registered as royal forest property from 1560. Before this period the forest belonged to a nobleman (Herluf Trolle).
Royal horse stud farm 1621-1764
During the 16 th century a population of fallow deer (<i>Dama dama</i>) was introduced to the forest, probably for hunting. The population is vital and growing with a present population of 800-900 individuals in the region.
Map from 1776 shows signature for closed high forest for Strødam. Large areas of forest surrounded the forest, and still do.
Map from 1801 shows that the forest is still regarded closed high forest.
Registration and map from 1863 shows a rejuvenation of the stands by natural regeneration of beech (1860-70).
In 1925 the forest is registered as protected forest with the specific purpose of scientific research in botany and zoology. There is no public access to the reserve.
1987: New plan for the forest stating that it should be a completely unmanaged forest. However, removal of conifers and sycamore maple still takes place. According to the plan, all dead wood should be left, and ditching and drainage should not be allowed. At present there is no hunting in the reserve, except for fallow deer.
1990's: Surrounding state forest areas are converted to unmanaged forest and continuous cover forest.

Friday August 6th – Grib Skov, Frederiksborg State Forest District



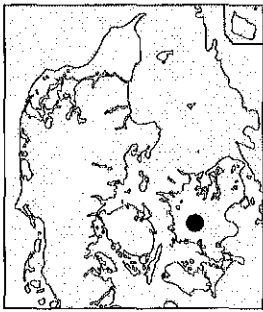
Grib Skov, which is part of Frederiksborg State Forest District (90 km²), is situated in north-west Zealand, an area characterised by large forest areas and Denmark's second-largest lake (Esrum Sø), but also a densely populated area close to the capital. Most of the woodland and the lake was formerly royal property, but is now state forest. The location close to Copenhagen makes it one of the most attractive forests for recreational activities in Denmark with an estimated annual visitor number of 400,000.

During the time of royal ownership, hunting was a major activity and resource. Names such as 'the Great Deer Park' indicate this. In years 16-1700, par force-hunting was rather popular, and this is still reflected in the layout of tracks and roads in the forest. The forests also served as grazing areas for horses from the royal horse stud farm as well as cattle from the local farms. Wood production was a second priority, and the forests gradually became more and more neglected. Around 1780, the grazing rights of the local farmers ended, while horse grazing continued for much longer. As a substitute for the lost grazing rights, parts of the forest was given to the local farmers, but the majority was kept as forest, and long stone walls were erected, marking the borderline between woodland and arable, open land. After the enclosure-period, large areas were regenerated naturally, primarily with beech, but plantings also took place, primarily Norway spruce on the poorer/wetter localities. The result was a gradual transformation to the present day forest, which is characterized by high-forest management of primarily monoculture beech and Norway spruce.

The present management plan of the forest district has the following main aims:

- To secure and increase the importance as an outdoor recreational facility
- To secure the many cultural-historical monuments in the area, and to increase the knowledge about them
- To increase the biological diversity by transformation to nature-based forest management. This includes actions to reduce the areas planted with exotic conifers, to increase the proportion of native deciduous tree species, primarily oak, to increase / restore the areas with open meadows, fens and bogs, and to increase the proportion of non-intervention natural forests
- To maintain the wood production in the forests, and the hereby related employment under consideration of the above-mentioned aims

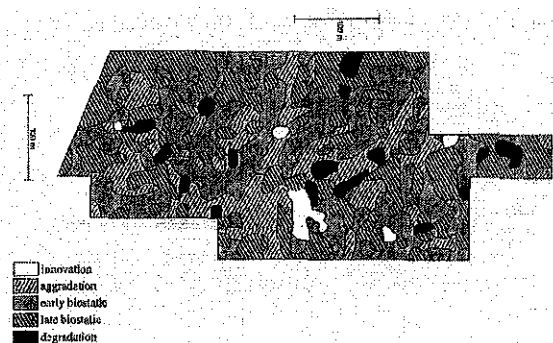
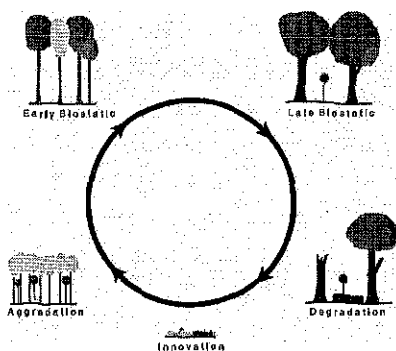
Saturday 7th August - Suserup Skov



Suserup Skov is a semi natural, mixed deciduous forest at the northern side of Lake Tystrup, central Zealand, Denmark. Annual mean temperature is 8.1° C and an annual mean precipitation is 635 mm with maximum in July to December. The physiographic setting of Suserup Skov is an undulating elevated plateau to the North and some 10-15% downward slopes toward a lower terrace along the lakeside. The low terrace consists of lacustrine soils, developed through a slow land reclamation process along the lakeside, which is caused by accumulation of organic material, inter mingled with pockets of sediments rich in clay. The elevated parts are mainly developed from glacial calcareous till. The forest comprises 19.2 ha, and consists of three parts (A, B and C) with different management history. *Part A (10.7ha)* is dominated by *Fagus sylvatica*, but *Fraxinus excelsior* and *Ulmus glabra* are also important species. A model for the dynamics occurring in this part of the forest has been proposed. Five phases were defined and mapped in the 1992-survey: Degradation (degradation phase), Innovation (regeneration phase), Aggradation (building phase), Early Biostatic (mature phase) and Late Biostatic (ageing phase). *Part B (4.9 ha)* has a history of grazing and the created open conditions resulted in an oak-dominated (*Quercus robur*) canopy layer. Sycamore maple (*Acer pseudoplatanus*) is most abundant in this part of the forest. *Part C (3.7 ha)* is situated along the lakeside, and is dominated by alder (*Alnus glutinosa*) on the wettest conditions and beech on the more elevated sites.

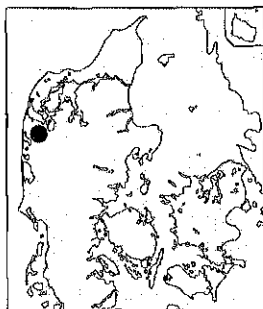
Table: Basic figures on volumes in Suserup Skov

Suserup	Living volume	Beech	Oak	Ash	Other	Dead wood volume
Part A	674 m ³ /ha	63%	17%	14%	6%	169 m ³ /ha
Part B	874 m ³ /ha	31%	42%	22%	6%	
Part C	771 m ³ /ha	39%	4%	20%	37%	



Simplified forest cycle and phase-mapping of Suserup based on the 1992-inventory.

Sunday August 8th 2004: Klosterheden State Forest District



Klosterheden State Forest District is situated in north-western Denmark and covers 20.000 ha of land, of which app. 12.000 ha is forest and the rest is heathland, tidal meadows, wetlands and sand dunes. The woodlands of Klosterheden are dominated by large-scale conifer stands, primarily Norway spruce. Today, Klosterheden State Forest district is at threshold of the change: "From plantation to forest", which includes an active transformation to nature-based forest management.

The history of Klosterheden State forest Districts took its beginning in 1880-1891 when the Danish state bought up large land areas in the area of Klosterheden (app. 2700 ha). These areas were formerly owned by local farmers and consisted of rather desolated heathlands, and drifting sand dunes. In 1886 the woodland area had increased to 146 ha, primarily by planting of *Pinus mugo*. In 1896 the woodland area had increased to 1576 ha, and more barren heathland was added to the property. *Pinus mugo* was still a dominant tree species, but other conifers were also introduced. *Pinus mugo* was the chosen species due to its ability to establish under harsh conditions. Once a more favourable forest climate was established, other species were introduced, e.g. Norway spruce and Scots pine. Some of the main problems with establishment and growth of new forest were night frosts in June and August, very low winter temperatures and the harsh, salty winds from west.

The plantings continued, and in 1924, the woodland area reached 61% of the total area. During the 20th century new species were introduced, e.g. Sitka spruce (*Picea sitchensis*), Silver fir (*Abies alba*), *Pinus nigra*, *Pinus contorta*, and *Pinus mugo var rostrata*. Deciduous species were still regarded useless, only oak was acceptable at certain well-protected sites, whereas birch and beech were considered useless. With regard to the open heathland areas it was decided that they should be maintained open, unless new sand drifts would threaten the surrounding farmland.

In the late 1970's forest fertilization programmes were initiated, in order to improve the increment and health of the conifer stands, and to make the establishment of deciduous tree species possible. Another important event was the start of an economically sustainable biofuel production, based on thinning products.

By year 2000 Klosterheden State forest district covers 7408 ha, of which 82% is woodland, and conifers still dominate the species composition (76%). The former *Pinus mugo* areas are not completely transformed into stands of Norway and Sitka spruce. The proportion of deciduous species has increased to app. 12% of the woodland area.

Wildlife:

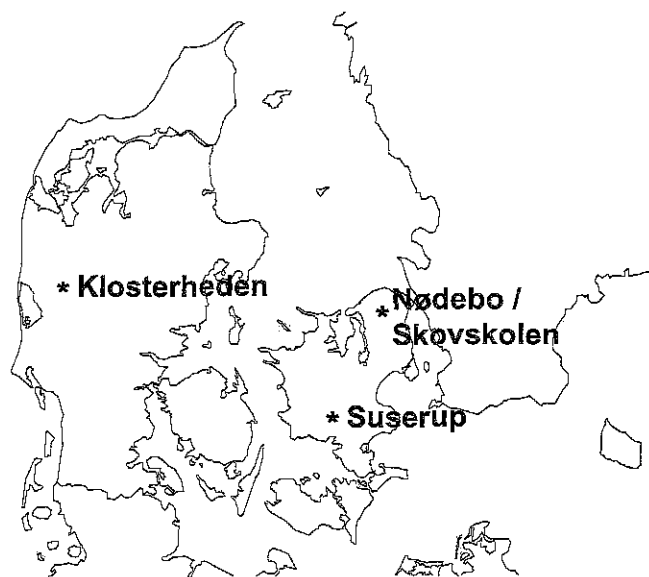
Roe deers settled in the area soon after the first plantings over 100 years ago. Red deer established as a small herd, but has grown to a considerable size of app. 300 animals. The red deer is considered

a character animal of Klosterheden, making it one of the biggest attractions of the forest. However, it is necessary to fence new plantings, to secure establishment of new trees.

The black grouse, which is now extinct in Denmark, disappeared from the forest district simultaneously with the decline in large heathland areas around 1960.

In 1999, eighteen beavers captured in Germany were released at six different sites within Klosterheden State Forest. The re-introduction was successful - at least 34 kits total have been borne during the four breeding seasons in Denmark. The beaver re-introduction project forms part of a general wetland restoration project.

Material to the excursion guide was provided by Ulrik Sjøchting, Katrine Hahn, Morten Christensen, and The Danish Forest and Nature Agency.



Place of conference: Skovskolen

**Nødebo, Nødebovej 77A
3480 Fredensborg**

Route finder: www.krak.dk

Write **Skovskolen** in the field 'Name:'
and press enter. Click on the adress
and a map (with zoom) will show up

