



Njurundakusten Conservation Park

Field guide



Njurundakusten

Njurundakusten Conservation Park is SCA's fourth conservation park and comprises 2,300 hectares. It lies in the Municipality of Sundsvall, along the southern Medelpad coastline. The park is adjacent to two marine nature reserves, Salen and Långören.

The Conservation Park comprises an elongated and sometimes narrow area along the southern Medelpad coastline. One of the ideas behind SCA's conservation parks is to strengthen existing nature conservation values. The landscape in the Conservation Park is mostly characterized by a long undeveloped stretch of coastline with flat rocks and distinctive elements of boulders and rubble. The post-glacial land uplift in the area has meant that many bays have been cut off and transformed into freshwater environments. The area features flower-rich shore meadows, pine forests, wetlands, alder swamp and shingles.

Large areas of forest in the Park show marked signs of human activity, since people have lived and farmed the forest here for a long time. The area from Lörudden and southwards was also heavily impacted by Cyclone Dagmar in December 2011, and Hurricane Ivar in December 2013. The storms caused widespread windfalls.



2,304 ha

Total area

4.3 m³/ha

Annual increment

233 m³/ha

Actual average stock

1,711 ha

Productive forest area

7,200 m³

is the **annual increment** measured over the total forest

5,000 m³

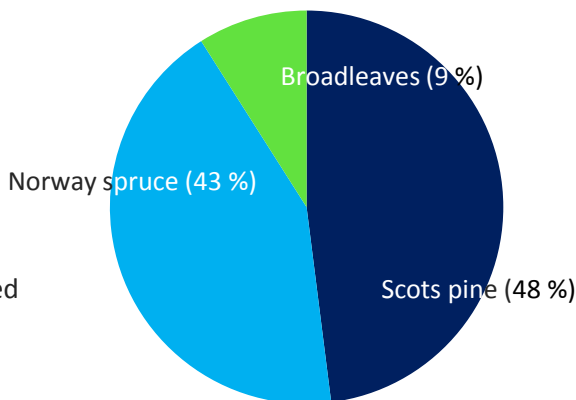
are logged annually

> 60,000

visitors per year

> 39 km

roads and trails



91 %

Conifers

9 %


Broadleaves

30

At least

insect species dependant on forest fire

Biodiversity concept



The biodiversity concept for the forests in the Conservation Park refers to measures taken to enhance or maintain favoured habitats of particular species requiring special conditions and structures that cannot be found anymore in most commercial forests. Examples include measures to maintain the species assemblages of old pine forests by curbing the spread of Norway spruce trees into these stands.

Emulating natural processes

Restoration measures are planned at different spatial scales, being landscape and stand level. The objective of implementing such measures for larger forest areas of SCA targets in particular species conservation.

Ecological landscape planning: An ecological landscape plan designates which areas, in consideration of their nature value, are to be entirely excluded from forest management and in which areas felling should be postponed. Further areas requiring alternative management methods are determined.

Planning at stand level: A prerequisite for effective restoration measures at the stand level is well executed tract planning. Tract planning includes assessing, surveying and single-object planning.

Nature conservation measures are applied at three levels: conservation areas, conservation patches and single-object protection.

Conservation areas are usually larger than one hectare in which felling is postponed, alternative (restoration) methods are used, or the whole area is set-aside. They have high conservation values and include virgin natural forests, older forests rich in broad-leaved trees and different types of swamp forests.

Conservation patches extend from 0.1 up to 1 hectare and mainly consist of edge zones, wet hollows, areas with outcrops of bedrock, rocky cliffs, etc.

Single-objects designated for protection can be among other individual trees (e.g. habitat trees or snags), tree groups and old windthrows. Single object features have an area smaller than 0.1 ha.

65 %

Set-aside forest area

1,036 ha

Priority areas for conservation

404 ha

Rocky outcrop area

10 /ha

Target for retention trees

103 ha

Mires

3 m³/ha

Average amount of Scots pine deadwood

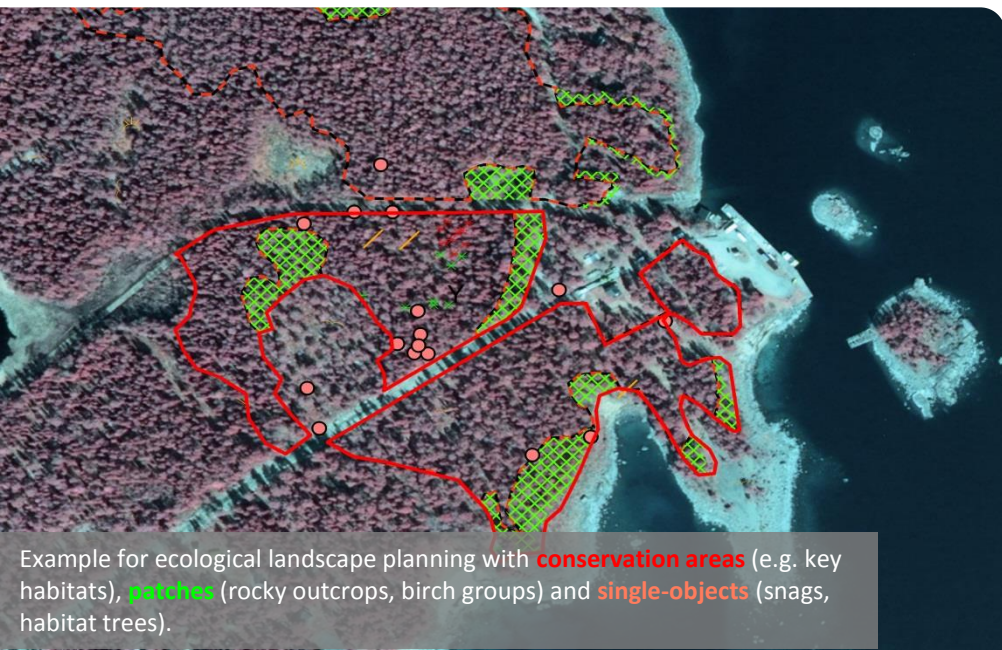
27 ha

Lakes and ponds

Target deadwood

10 % = 10 m³/ha

of Scots pine volume



Example for ecological landscape planning with **conservation areas** (e.g. key habitats), **patches** (rocky outcrops, birch groups) and **single-objects** (snags, habitat trees).

Habitat restoration

The goal of forest habitat restoration in the Conservation Park is to accelerate the redevelopment of the characteristic processes and structural features of old natural pine forests shaped by repeated low intensity forest fires. Restoration measures include the creating of lying and standing deadwood, artificial tree scars and curbing the establishment of Norway spruce through prescribed fire or combined measures.

Restoration management

Being aware of the structural features and resources required by rare or threatened species in old pine forests, restoration measures are applied for steering the development of formerly commercially managed forests towards ecologically more favourable conditions. In general it is easier to restore structural features than to recreate forests' natural functional diversity. The best way to reach the goals of habitat restoration is to attempt to replicate the disturbances that would naturally modify forest habitats. Increasing the quantities of deadwood by logging and prescribed burning make remaining trees more vulnerable to wind disturbance. Consequently natural processes can then take over creating a succession of decaying wood.

Habitat structures

To provide continuous supply of a wide range deadwood types, restoration measures may need to be repeated at intervals of 5–10 years. The diversity of restored forests does however differ from that of natural forests. Large and slowly grown decaying trees only exist where trees have been able to develop for centuries before they die. Hollow trees and other habitat structures will also develop only as stands age naturally.



Habitat structures on trees



...and management

Natural disturbances

Natural disturbances such as forest fires can initiate a continuity of decaying wood, with fire damaged trees gradually dying over the years after a fire. In forests dominated by Scots pine, fires suppress the establishment of Norway spruce. Following an intense fire, young successional stages with large amounts of deadwood will be formed. Such habitats have vanished to a large extent from commercial forest landscapes during the past decades. Fire in old pine stands can initiate the development of large decaying trees, affecting insect species assemblages in particular. Many polypore fungi will also benefit from fire damage, but the impacts occur more slowly.



Prescribed fire

Prescribed burning aims to re-introduce fire and its ecological impacts to the dynamics of forests. Forest fires provide habitats for fire-dependent species, increase the amount of charred and decaying wood, affect wood quality in living trees, and diversify the structure of forests. Prescribed fires aim to leave 25–75 % of the trees alive after the fire, and also some patches within the burnt area. Those will be moist patches showing no effects of the fire.

Tree scars

Natural forest fires rarely are intensive enough to destroy entire tree stands by spreading through the tree crowns in which course large open areas are created with high quantities of deadwood. Such less intense fires usually do not kill dominant pines, though they do significantly change the structure of the forest over the longer term. Such trees grow subsequently slower with their wood becoming more resinous. This process makes old trees bearing fire scars very resistant to fungal decay, an effect that can be emulated by artificially creating scars at the tree base with an axe or a harvester.



Integrate+ is a demonstration project funded by the German Federal Ministry of Food and Agriculture (BMEL) to establish a European network of demonstration sites for the integration of biodiversity conservation into forest management.

The Integrate+ project runs from December 2013 to December 2016 and builds on a partner network from research and practice with a focus on implementation of integrative management and enhancing transnational exchange of experiences.



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www.integrateplus.org