

After-treatment of land in Sweden after finished peat harvest



Foto: Mats Henriksson, Neova

Background

In Sweden it is compulsory to have a license for commercial peat harvest. Nowadays, the license is granted according to the Environmental Act but earlier there was also a specific Peat Act regulating peat extraction for energy use. For both the licences according to the Environmental Act and for concessions for energy peat, it is a precondition that the land should receive an after-treatment when the peat harvest ends. It may be important to state that licences are never granted for peat extraction on virgin peatlands or lands of high conservation value, the areas that may be taken into peat production are always hydrologically disturbed and anthropogenically affected in some way. Preliminary after-treatment plans are stipulated already when the license is granted but the final route for after-treatment is decided in cooperation with land owners, regulatory authorities and other stakeholders before the activities are put in place.

Usually there are two major directions to follow; an after-treatment where the original hydrological conditions are sought to be established and the drainage is stopped, leading to the re-establishment of wetland conditions and the land can develop in a way that more or less resembles the conditions before actual area was drained. The other alternative is to keep the drainage system working, so that the area remains drier and may be used for forestry, agriculture or even for building. Today the direction towards wetland development is the most common route to follow.

Even though it is a legal demand that the peat extraction sites should be reclaimed when harvesting ends, the knowledge regarding this important issue is lacking. The Swedish Environmental Protection Agency funds other wetland restoration activities but the after-treatment of harvested peatland which up till now has been of significantly larger scale has not been documented in a proper and comprehensive way. The after-treatment of peat harvesting sites is completely financed by the companies and the society does not contribute with any funding in this case.

Svensk Torv (Swedish Peat), the trade association for the peat industry, has now initiated an inquiry aiming to clarify the extent and targets for after-treatment of finished harvest sites in modern time. The data collection and compilation was done by Claes Bohlin, CymBio Consult, through interviews with present and former members of the association and is estimated to cover more than 90 % of the land that has been subject to these activities over the last 10 – 15 years or are in the process to be treated and ready and meeting the requirements of the regulatory authorities the nearest two to three years.

Basic data

Collected data covers **48 objects** spread over the country. 33 objects of these are ready; the after-treatment is completed and the authorities have approved the return of the areas. The total acreage of these **33 objects is 1991 hectares**. Areas where activities right now is on-going is 15 with an acreage of **1252 hectares**, in total almost **3250 hectares**. The size of the individual objects vary widely, from a couple of hectares up to around 400 hectares. They consist of large energy peat production areas harvested by milling or harrowing with ditches on every 20 meters as well as – usually a bit smaller- areas where block cut peat has been produced and where the surface consists of wide meter deep trenches with smaller, elevated areas between them, where the peat blocks have been put to dry. On some objects after-treatment goes on in parallel with harvest operations but these areas are to great extent not covered in this material. Under "On-going treatment" we find larger coherent and more clearly defined areas that are meant to be returned to land owners in a near future or consist of very clearly limited geographical areas.

Of the **ready** areas, 1664 hectares have been used for energy peat and 327 hectares for horticultural peat or bedding peat for animals. Corresponding figures for **on-going** activities is 1102 hectares for energy and 150 hectares for horticultural and bedding peat. The geographical spread is presented in figures 1 and 2.

Figure 1

Distribution per County of *ready and approved* after-treated site area, in total 1 990 hectare

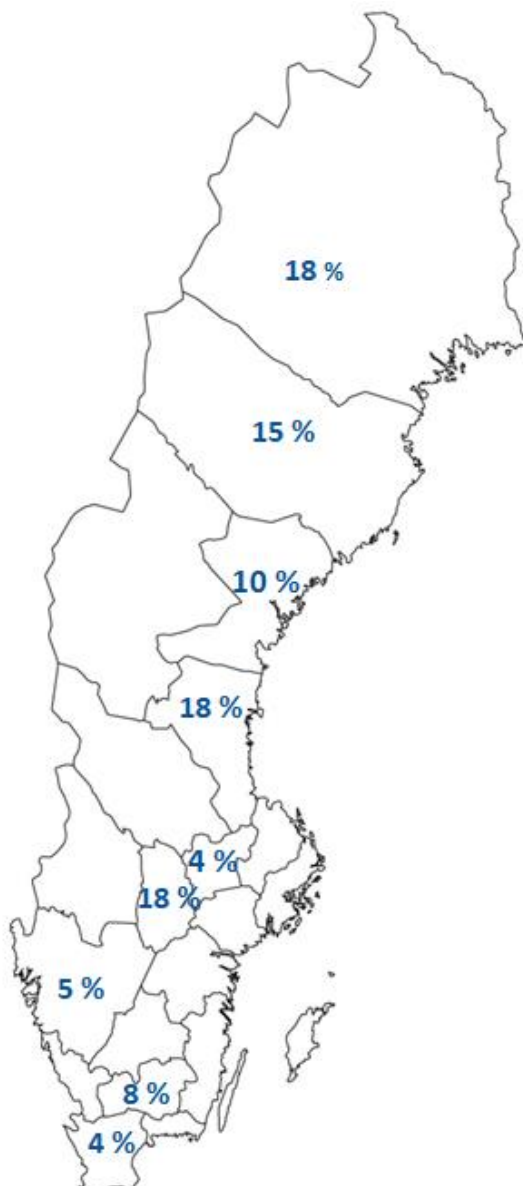
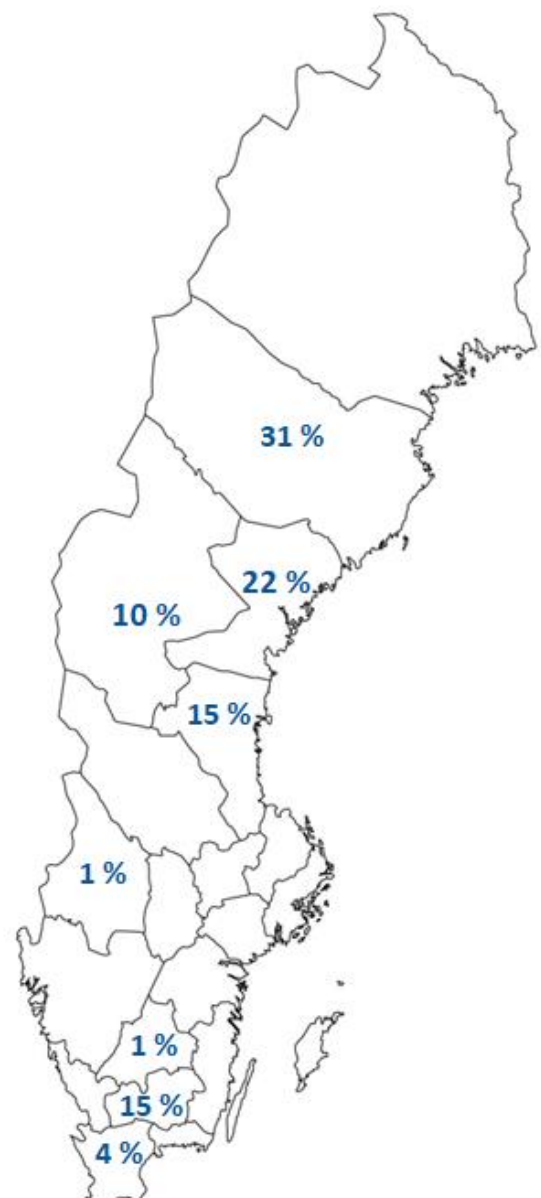


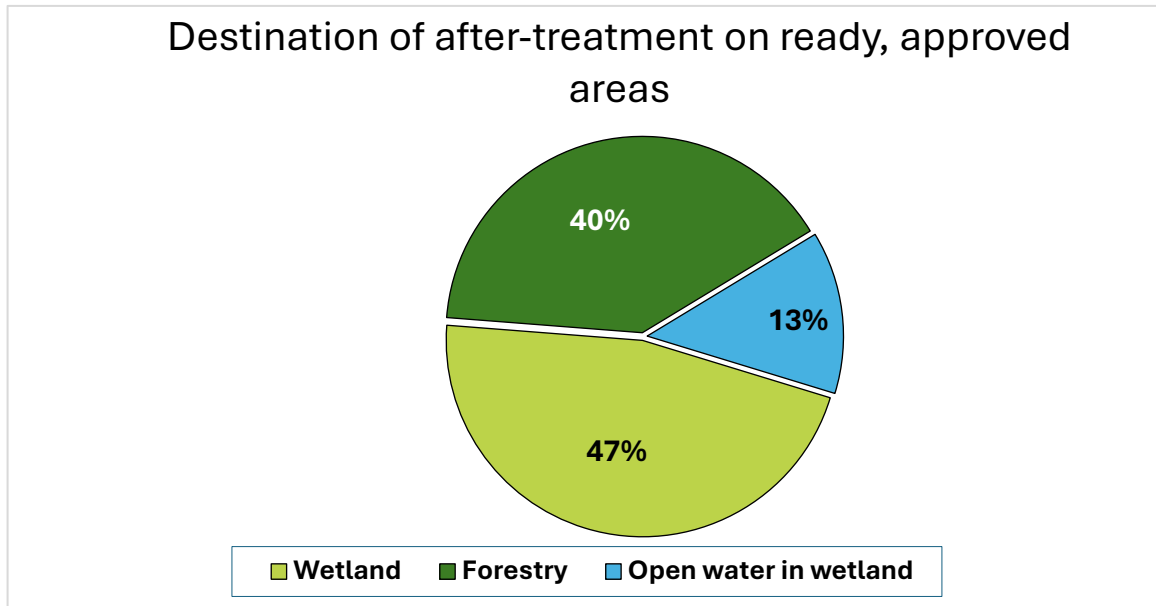
Figure 2

Distribution per County of *on-going* after-treatment, in total 1 250 hectare

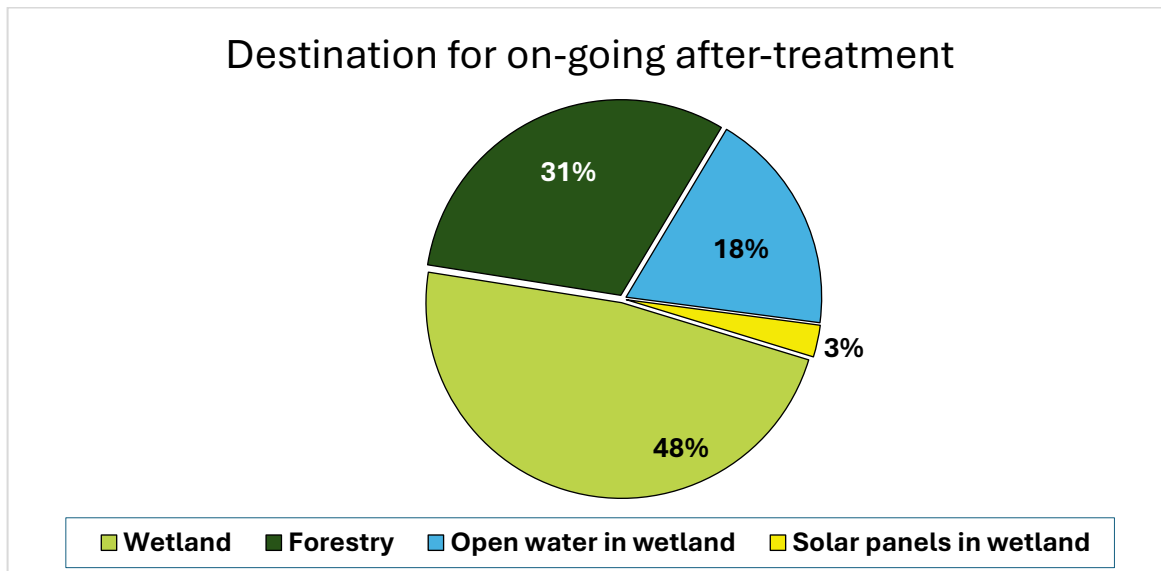


Destination for after-treatment

For the almost 2000 hectares where the after-treatment is finished and approved by the authorities, the chosen alternatives are divided according to fig. 3.



For the objects covering just over 1250 hectares where after-treatment right now is happening, the intended destination for the activities is shown in fig. 4.



Comments

If we go back a bit in time, the most common way to reclaim a peat harvest site probably was afforestation. On sites that have been in use for a long time certain areas have been abandoned when no or little peat was left and a natural colonisation of trees have occurred, due to the fact that the total area has been drained. The birch is usually the pioneering tree that spontaneously establishes itself, but pine and spruce also comes in. Especially where the mineral soil is reaching the surface, the spruce grows well. In this way a type of reclamation occurs of older harvest areas already when production is still commencing on other parts of the site. In other cases forest plants are planted and trials with fertilization have also been tested to secure a good establishment and forest production in order to increase growth and thereby carbon sequestration. To secure forest production over time it is often necessary to take measures for keeping the drainage intact. Afforestation is usually the preferred after-treatment for the land owners since this can turn a previously economical impediment into a productive forest that gives revenue to present or coming owners.

In more recent years the society's interest has been more focussed on wetland reclamation, since this type of nature sometimes is considered more valuable and underrepresented even though 15.5% of the Swedish land area is covered by peatlands with a thickness of more than 30 cm. The goal to establish a wetland can be reached through various approaches. The common goal is to create a wetter environment than during the harvesting period. The internationally acknowledged environmental certification for peat, Responsibly Produced Peat (RPP), has the target of wetland re-establishment as a goal. One simple way to achieve this is to block the drainage ditches, to achieve a wetter environment and sometimes on older objects this was more or less the only thing that was done. If the area was used for block cut peat there are the elevated areas left where the blocks dried and they have to be levelled off to obtain more uniform and natural conditions. Often the topography gives the opportunity to mix different types of nature within the same after-treatment area. The more elevated border zones can be afforested, whereas the lower parts are suited for wetland development and possible deeper hollows are left as open water areas or sometimes created as such when the area is left. Depending on size and depth they may eventually be covered by typical mire vegetation. Hydrology and pedological conditions of course influence the possible outcome and the destinations to take towards preferred habitats. Seasonal water table fluctuations, water and mineral soil chemistry, ground permeability etc all have an influence on possible flora and fauna development in the treated area. In some cases, with relatively large open water areas on nutrient rich underground former peat harvest sites have become ornithological hot-spots. In this report these open water areas are referred to as "Open water area in wetland" since there is always some kind of wetland surrounding the pool. Sometimes the water table is regulated, either by dams or large tubes with top inlets, with the intention to get more stable water levels and sometimes it is left to completely natural variations to determine the size of the open water area. Growth of wetland vegetation and possible maintenance activities will over time alter the appearance of these waters.

All in all, it can be concluded that relatively large areas have been rehabilitated through the legal demands on the licence holders. Thus the biodiversity and the transition to carbon sequestering land has been met and thereby considerably improved in comparison with the conditions that prevailed before the area was licensed for peat harvesting. One should bear in mind that peat harvest takes place on previously drained, carbon emitting, degraded peatlands.