

Forest Life

2002-2007



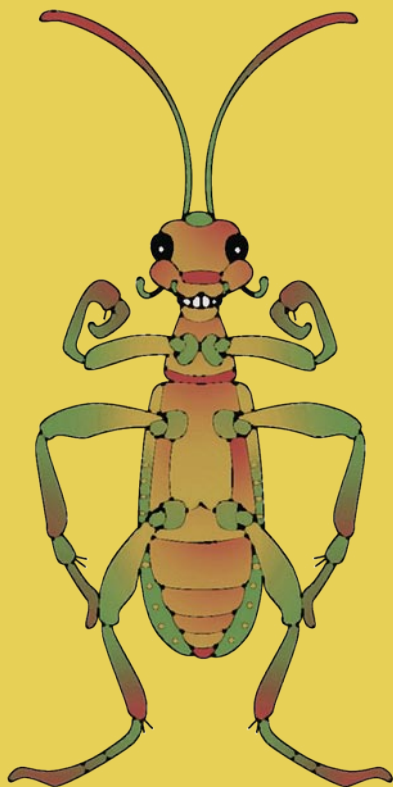


Forest Life

Restoration of Boreal Forests and Forest-Covered Mires 2002-2007

LIFE Nature project supported by the European Union

Final Report

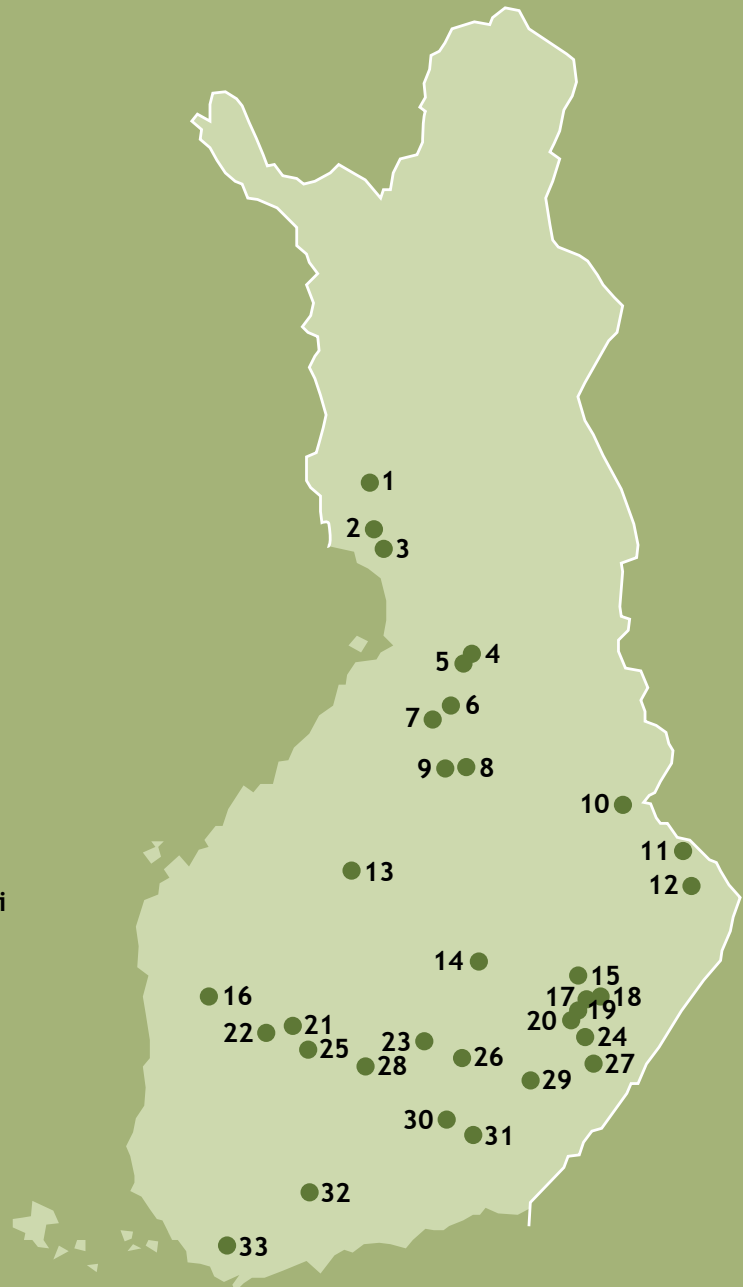


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Forest Life

LIFE Nature is a European Union funding programme for nature conservation. It was set up to support the protection, management and utilisation of Natura 2000 sites.

The network of Natura 2000 sites across the European Union is aimed at protecting natural habitats and species classified under the Habitats Directive. Approx. 200 European habitat types and approx. 700 species are listed in the Habitats Directive.

The Forest Life project involved ecological restoration of forests and mires, management of White-backed Woodpecker forests and esker forests, and removal of unused logging roads. Measures were carried out on 33 Natura 2000 sites, all of which are conservation areas owned by the State of Finland. In addition, the Aarnikotka Forest, located on the Repovesi Natura 2000 site and owned by the UPM Kymmene Corporation, was included in the project. Information on restoration and LIFE Nature funding was disseminated to the public by means of various media and events.

Besides natural forests and mires, the Natura 2000 sites included in the project comprise areas that are former commercial forests. Restoration measures speeded up the recovery of the structure of natural boreal forests and of the hydrology of natural forest-covered mires in these areas. Restoration will help to maintain the diversity of organisms in the Natura 2000 areas also in the future.

The project was carried out by Metsähallitus in cooperation with the University of Joensuu, the Karelian Brigade of the Finnish Defence Forces, WWF Finland and the UPM Kymmene Corporation. The total budget of the project was 3.7 million euros, 50% of which was financed by the European Union. Besides ecological effects, the project had a significant employment effect.



Finnish forest landscape. Photo: Lentokuva Vallas Oy

Land Acquisition

290 hectares of the central parts of the Kolovesi-Vaaluvirta-Pyttyselkä Natura 2000 site were purchased by the state to be designated as a statutory conservation area in order to improve the ecological integrity of the Natura 2000 site. Besides natural boreal forests and forest-covered mires, the purchased area also had forests where a sustainable supply of decaying wood needed to be initiated by restoration. Part of the national funding for the project was directed towards the acquisition of areas for restoration (90 hectares).

Training in Ecological Restoration

Large-scale ecological restoration of forests and mires was a relatively new method of conserving biodiversity at the time the Forest Life project was launched, though such methods had been introduced through various small-scale restoration experiments since the late 1980s.

During the years 2003 and 2004, over 300 forest workers and a number of other forestry employees as well as supervisors of natural heritage services were trained for practical restoration work. The training, largely carried out as field training, focused on the objectives of restoration and on how these objectives are achieved. Forest workers have actively participated in the development of restoration methods.



Forestry workers of Metsähallitus Forestry performed the majority of the restoration work. Photo: Maarit Similä

Ecological Restoration

The restoration work was preceded by making inventories of the structure of the tree stock in each area and by assessing the need for restoration measures in forests and mires. Based on the field visits, restoration plans were drawn up for 30 Natura 2000 sites to form the basis for the practical work.

Forests

Former commercial forests within conservation areas often lack decaying wood almost entirely and their tree stock is of a uniform age. Due to the lack of decaying wood, dead-wood species and hole-nesting birds are also scarce. Hundreds of different species of polypores, insects and mosses depend on dead wood, and a large proportion of them are today threatened. Occasional wildfires are typical of boreal coniferous forests and therefore a lot of the species have in the course of time also adapted to making use of trees killed by fires. Since wildfires can today be effectively suppressed, species depending on them are becoming threatened. Through forest restoration, decaying wood can be produced and areas can be treated with controlled burning.

In mature forests, a sustainable supply of decaying wood was initiated by felling, girdling and blowing up trees on 2700 hectares. 350 hectares of forests were treated with controlled burning. Through the increase of decaying wood and the controlled burns, small gaps in the forest canopy were also created, which will encourage a more varied age structure of the tree stock as new seedlings gradually appear in clearings.

In young forests, large clumps of trees were felled or girdled around deciduous trees, so that the growth of deciduous trees would be speeded up through increased light. Small clearings using this method were created on 2800 hectares in order to promote the structural diversity of forests.



White-backed Woodpecker forest. Photo: Timo Laine

White-backed Woodpecker Forests

The White-backed Woodpecker breeds and feeds in lush, well-lit deciduous forests. Decaying wood is an essential element of these forests because that is where insect larvae, which woodpeckers feed on, live. 200 hectares of White-backed Woodpecker forests on the Natura 2000 sites of Linnansaari, Puulavesi and Kuijärvi-Sonnenanen were managed by removing spruces and small rowans from deciduous forests in order to increase the amount of light in them. Decaying wood was increased by both girdling and felling birches.

Esker Forests

Forests growing on eskers are sunny and dry. Wildfires used to be frequent in Finnish esker forests. Since wildfires are today effectively suppressed and since a lot of the esker forests have been turned into commercial forests, sunny habitats have decreased. This has had a detrimental effect on plants, such as the Breckland Thyme (*Thymus serpyllum*), that require such habitats. In turn, insects have also suffered, including *Apion atomarium* (a seed weevil) and *Merrifieldia leucodactylia* (a moth) that use the Breckland Thyme as their host plant.

The esker forests on the Maakylä-Räyskälä Natura 2000 site were becoming overgrown. Therefore hundreds of hectares of sunny habitats were recovered by small-scale controlled burning, by making small clearings and by increasing decaying wood.



An excavator doing restoration work in a forest-covered mire. Photo: Maarit Similä

Mires

Mires that today belong to conservation areas but used to be commercial forests often contain areas with drainage ditches. Natural forest-covered mires have become scarce especially in southern and western Finland, and there are very few of them in conservation areas. Forest-covered mires however provide a habitat for a number of bird, insect and cryptogam species. Through the restoration of the hydrology of drained mires, the natural features of mires, such as the formation of peat and typical mire species, will be recovered.

Drainage ditches of forest-covered mires on an area totalling around 400 hectares on ten Natura 2000 sites were dammed and filled. Thus water will return to its natural course and the drained area will become a mire again.

Removing Unused Logging Roads

Forests are fragmented by networks of logging roads. When forests are turned into conservation areas, unused roads that are no longer needed for logging can be removed and thus unnecessary motor traffic in conservation areas can be reduced.

On the Maakylä-Räyskälä Natura 2000 site, 1 km of unused logging roads were removed, and on the Rokua Natura 2000 site, 2 km of such roads were removed. Roads in the Rokua area were blocked from traffic by felling trees across them in conjunction with the forest restoration process. In the Maakylä-Räyskälä area, the surface of the roads was ripped with an excavator and the soil was then levelled out to follow the contours of the terrain. The growth of tree seedlings on the road tracks is thus speeded up as seeds will germinate better in tilled soil.



Photo: Maarit Similä

Monitoring of Restoration

Photo monitoring of the restored forests and mires will over the years reveal the effects of the restoration. The restored areas were photographed before the restoration and photo monitoring has been continued after the restoration.



White-backed Woodpecker forest. Photo: Timo Laine

Redirecting the water flow in mires to be restored by filling and damming drainage ditches is often very challenging. Aftercare monitoring of the restored mires is carried out to ensure that the measures have been technically successful and that mire vegetation is reviving in the restored mires. Aftercare monitoring shows that the recovery process has been successfully initiated in forest-covered mires, e.g. in spruce mires.

Changes in the structure of the tree stock are being monitored through a forest monitoring network, comprising 17 Natura 2000 sites that were restored during the project. Monitoring focuses on the decaying process of dead trees and the growth of tree seedlings in small forest openings. The tree stock was surveyed before and immediately after the restoration work. Surveys will be carried out again after five years from the restoration, when the first evidence of changes will be obtained.



Tragosoma depsarium (a longhorn beetle) lives on large fallen Scots pines. Photo: Petri Martikainen

The aspen is often slow to regenerate in the old-growth forests of conservation areas because aspen seedlings require open woodland and plenty of light. In addition, elks, hares and voles browse on young aspens. As mature aspens die and are not replaced by younger trees, the sustainable supply of decaying aspen is in danger of being discontinued in several conservation areas.



Fungi and burnt wood side by side. Photo: Maarit Similä

The Kakonsalo Natura 2000 site in eastern Finland still has plenty of old living and dead aspens and thus also supports species of beetles and polypores that depend on the aspen. An experiment was made there to determine whether decaying aspen brought to the conservation area would attract these species. The species soon colonised the aspen logs transported to the area, proving that they can be helped by transferring decaying wood to their habitat.

Species feeding or growing on decaying wood, such as beetles and polypores, play a significant role in the decaying process of dead trees. The development of beetle species on dead trees is being monitored in areas where the amount of decaying wood was increased. As soon as a year after the restoration, the number of different beetle species that depend on decaying wood was considerably higher in these areas than in the surrounding forests.



The larva of *Boros schneideri* (a beetle) is so flat that it is almost transparent. Photo: Petri Martikainen

Wildfires attract beetles, including threatened species, immediately after the fire has broken out. Beetle species seeking their way to burnt forests were monitored on nine Natura 2000 sites throughout Finland during the years 2005 and 2006. Restoration burning is of considerable importance in safeguarding the survival of threatened species in conservation areas. Burning is a quick way of providing suitable habitats for these species.



An adult *Boros schneideri*. Photo: Petri Martikainen

On the basis of monitoring, the occurrence of threatened beetle species that favour or depend on fires is governed by the location of the burning site. The further east in the country the burning site is, the faster threatened species appear there and there is also a greater variety of them. Eastern Finland has a shorter history of forest use and more conservation areas than southern Finland. The extensive forests of Russia are also located nearby.

The larvae of *Boros schneideri*, a beetle that lives on pine snags that have died recently, feed on the dark fungal growth under the bark of the dead trees. There is a strong population of *Boros schneideri* on the Ruunaa Natura 2000 site, whereas in Patvinsuo it only occurs on those pine heaths where the sustainable supply of decaying pine is good. Whether *Boros schneideri* can make use of pine snags resulting from restoration is being monitored on the Natura 2000 sites of Patvinsuo and Ruunaa.



The Breckland Thyme (*Thymus serpyllum*) grows in sunny habitats. Photo: Terhi Rytteri

The monitoring of polypores on the Natura 2000 sites of Haapasuo, Keurunmäki-Haavikkolehto, Mujejärvi and Repovesi showed that felled trees are first colonised by *Trichaptum* species and other pioneer species. The most demanding, threatened species of polypores usually grow on wood where decay is well advanced. The ecological succession of these species on dead trees requires a longer time and therefore monitoring will be continued for several decades.



Antrodia mellita (a polypore). Photo: Heikki Räsänen

On the managed sunny slopes of eskers on the Maakylä-Räyskälä site, the Breckland Thyme spread to the cleared and burnt areas. Species of insects using the Breckland Thyme as their host plant also benefit from this. There had been only a few earlier sightings of the rarest insects spotted now during monitoring, either in Finland or the whole world. A diversity of threatened aculeate species was found on the sands, and demanding sand beetles became more abundant in the monitored areas. The results of the management encourage further management measures on the sunny slopes of eskers and in the habitats of the Breckland Thyme, which has become rare.

The winter movements and breeding status of the White-backed Woodpecker were monitored on the Natura 2000 sites of Linnansaari, Kujjärvi-Sonnanen and Puulavesi after management measures had been carried out in the forests providing a habitat for the species. The monitoring proved that the management measures of White-backed Woodpecker forests had been directed at appropriate Natura 2000 sites. The measures had improved the feeding and breeding conditions of the White-backed Woodpecker, since one new breeding occurrence was found on the Linnansaari Natura 2000 site and, judging from the spoor, White-backed Woodpeckers have also discovered the managed forests on the Puulavesi Natura 2000 site.

Increasing Awareness of Ecological Restoration and LIFE Nature

Awareness of the Forest Life project, ecological restoration and LIFE Nature funding programme was increased by means of web pages, brochures, the press, the radio, the television and public information events. The project was featured by various media on more than 150 occasions. While forest burning appeared to be of prime interest to the media, other restoration methods also attracted plenty of coverage. Restoration is thus also becoming better known to the general public.

A restoration-themed nature trail was built on the Hevonniemi Natura 2000 site, introducing visitors for example to a small forest clearing and a filled drainage ditch. Information boards about restoration were erected in many other conservation areas. The objectives and various methods of restoration are presented by the DVD film 'Back to Nature', which is shown at visitor and nature centres.

Coordinator

Metsähallitus, Natural Heritage Services, Southern Finland



METSÄHALLITUS

Cooperation partners

WWF Finland

UPM-Kymmene

Karelia Brigade/Finnish Defence Forces

University of Joensuu

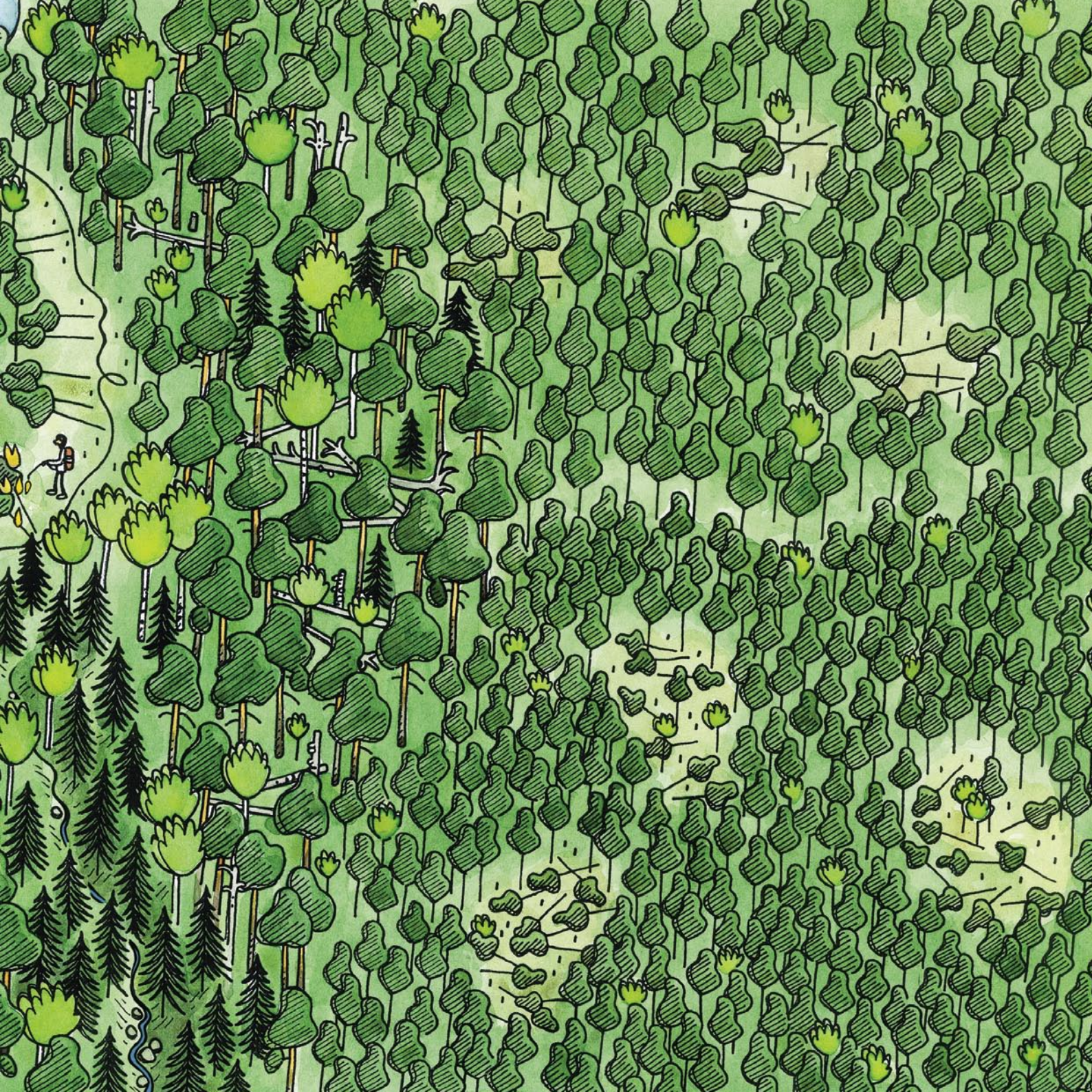
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