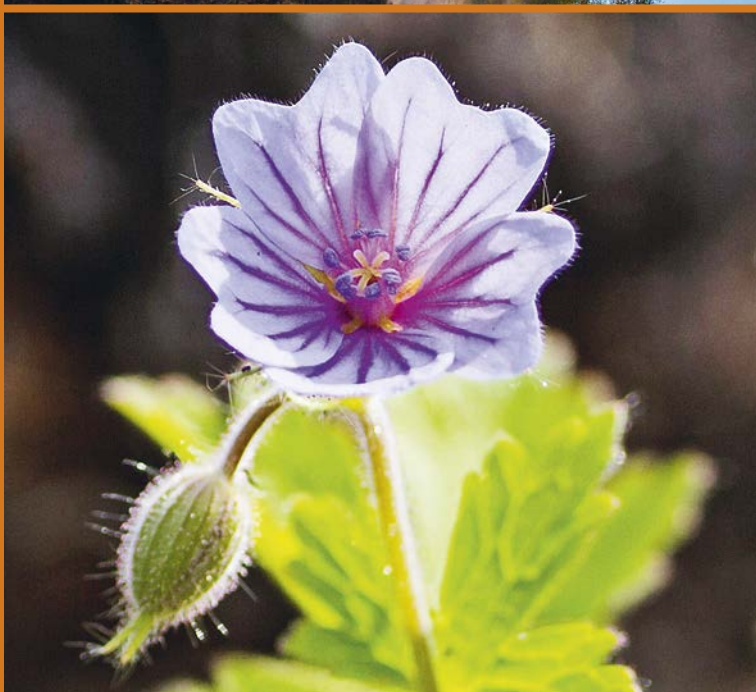




LIFE TAIGA



Fire brings
new life
to woods







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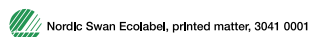
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A burning passion for good results

Life Taiga is an EU financed project which focused on controlled burning for nature conservation. In total, 14 County Administrative Boards have taken part, with the County Administrative Board of Västmanland as the project manager. The Project, which was also supported by the Swedish Environmental Protection Agency, started in 2015 and ended on the 30th of November 2020.

The announcement from the EU that the Project for controlled burning across Sweden, had been granted just over 100 million Kronor in total, came in May 2014. At the end of July in the same year, a fire, which turned out to be the largest forest fire in modern times in Sweden, broke out in Västmanland. In the autumn of 2014, many people thought that the Project should be stopped due to the fire in Västmanland.

With a combination of positive thinking, knowledgeable and enthusiastic colleagues, we worked our way through this challenge and looked to the future.

When the Project started, we all realised what a huge task lay ahead of us. Large scale controlled burning in protected sites at a national level was something we were keen to do and had planned for. Many wondered however, if we had not been a bit too ambitious. Especially as some of the partner County Administrative Boards had only little or no experience of controlled burning for nature conservation.

A strong team-spirit soon grew within the group and bridged both the geographical distances and differences in knowledge and experience. Great enthusiasm and a strong desire to get the job done became a signature of the Project. During the lifetime of Life Taiga, there has been regular feedback on the strength and drive of the team. Without the joint



Project leadership team. Niclas Bergius and Julia Carlsson, project manager and assistant project manager for Life Taiga.

efforts, the Project could not have been implemented with such good results. In total, just over 2 500 hectares have been burned, compared with the almost 2 000 hectares planned.

Thanks to the good results achieved, an application for a new, extended Life project on controlled burning for nature conservation, was sent in, in the middle of February 2021. This new application involves 17 County Administrative Boards, the Swedish Environmental Protection Agency and the Forest Service in Finland.

A huge thank-you to everyone involved for their extensive and important efforts.

Johan Wretenberg, *chairman of the steering group for Life Taiga*

Niclas Bergius, *project manager for Life Taiga*

Julia Carlsson, *assistant project manager for Life Taiga*

Examples of what we have achieved in Life Taiga

Conservation actions

- Controlled burning within 76 Natura 2000 sites.
- 12 800 metres of fencing to favour broadleaved trees after burning.
- 4.1 hectares of bare sand to favour for example the plant *Pulsatilla patens*.

Method development

- Aerial ignition using a helicopter has, with good results, been implemented at Färnebofjärden National Park on two controlled burning events covering over 500 hectares. The method involving spreading out ignition points, creates a fire with low intensity and with the help of a helicopter it is possible to ignite large areas quickly.

Management

- A long-term management strategy for the habitats included in the Project has been produced.

Access

- 21.3 kilometres of footpaths and 4.9 kilometres of board walks have improved access for visitors to the burned areas. A visitor centre adapted for users with disabilities has also been built.

Guided walks and meetings

- 85 guided walks/information meetings have been held.

Information

- An outdoor museum and two exhibitions for nature visitor centres about controlled burning for nature conservation.
- Information signs adjacent to footpaths in several burned areas.
- 15 different leaflets, lay-man's report and website with updated information.
- A long film about controlled burning.

Media

- Media attention on at least 200 occasions.

Cooperation

- Start and final seminars.
- Seminar on reindeer grazing and nature conservation burning.
- Two seminars on nature conservation burning/wildfires.
- European workshop in cooperation with our sister project Light & Fire Life in Finland.
- Study tours and exchanges with Denmark, Finland, Italy, Latvia, Norway, Spain, and USA.
- Cooperation with private contractors, which has created many jobs.
- Cooperation with the Swedish Civil Contingencies Agency and several emergency services.



Fire nurtures nature

Many plants, fungi, and animals are under threat because fires occur too rarely and in too few places in woodlands compared with the past. Fire helps to conserve and restore biodiversity. But no-one wants forest fires that are out of control.



Fire scars. From the heat of a fire, the bark on the trunks of pines can be damaged (fire scars). Old pines often survive such damage.



A black burned log. There is often lots of dead wood in a woodland that has burned. This is an important habitat for many threatened species.

In the past, woodlands burned more often. Sometimes due to lightning, slash and burn agriculture or burning for grazing. In the 1600s it is estimated that about one percent of the total wooded area burned annually. In the 1800s when woodlands became more economically valuable, slash and burn agriculture stopped and putting out all forest fires became a high priority.

A woodland continues to develop new values for many decades after a fire has taken place. If however, the woodland is not burned frequently enough, it changes.

Spruce can grow in the shade of other trees and over time, spruce takes over the woodland which becomes darker and denser. Without a new fire, trees such as pine, aspen, and sallow, which require light and space, die. The plants, fungi, and animals which require the warmer environments or the burned and damaged pine and broadleaved trees, disappear with them. Other species then take over which thrive in the denser spruce woodlands.

Old burned and dead trees, which are essential habitats for plants, lichens, fungi, and insects, break down and 'because' they are not replaced by newly burned trees. The species that thrive in the denser spruce woodland take over and the species dependent on fire disappear.

Many species are directly dependent upon fire to survive. Others are favoured indirectly by fire, such as birds which eat insects in burned trees. Some 1000 species in Sweden are at risk of extinction because there are too few lying and standing dead trees.

CONTROLLED BURNING

Protecting and caring for pine woodlands and other types of sites which are especially valuable is a part of the County Administrative Board's work. Controlled burning for nature conservation is one of several management methods included in that work.

A controlled burning event benefits species just as much as an unwanted and uncontrolled fire would do. The key differences with controlled burning for nature conservation are that they are targeted to favour the specific nature conservation values on that site, and they are controlled by nature conservationists trained in managing fires.

Controlled burning is primarily undertaken in pine-dominated woodlands with moss on the ground and where spruce has taken over to a greater or lesser extent. This is a woodland type that is called boreal taiga, and which has historically been characterised by natural forest fires.

The trees and the woodland never completely burn up. In fact, it is the mosses and the flammable layer on the ground which burns. The intensity of the fires is often relatively low.

Most of the pine trees usually survive, even if some get fire scars quite a long way up their trunks. Pines that have suffered repeated fire damage can become so impregnated with resin that the trunk can remain standing for hundreds of years even if they are dead.

All the burning events within the Life Taiga Project have taken place in Natura 2000 sites. These have already been set aside for nature conservation and the County Administrative Boards are responsible for managing them on behalf of the EU.

What happens to the animals when there is a fire?

■ Most mammals, birds and other large animals instinctively run when they smell smoke from a fire. This means they often survive. There is a lot of activity in an area before a fire is started, including the setting up of equipment and other types of preparations. In this way, many animals are frightened and run away before the fire starts. The animals which are at most risk from fire are reptiles, and amphibians and young birds.



Ignition. The fire creeps slowly along the ground towards the wind.



Control. Safety and monitoring during the controlled burning event are always the most important elements.



Burned. The burned woodland when the flames begin to die out and the smoke disperses.

Controlled burning step by step

Burning for nature conservation is always undertaken in controlled conditions. It is however a risky activity that requires careful planning and clear safety routines. If there is the slightest risk, no burning takes place.

Careful planning takes time

Nature conservationists at the County Administrative Board survey the woodlands and sites to establish where burning can have the greatest benefit. The work is often targeted at restoring life in previously burned areas, but also at making existing areas larger.

Water and boundaries

Beforehand, a hosepipe is laid out for extinguishing unwanted fires and for putting the fire out. Water is pumped from the closest water course or transported by tanker. The site to be burned, always has clear boundaries such as a lake, a wetland, a road, or a firebreak.

A hired helicopter is often on standby, which can fly over the area to check the fire and, if necessary, help with putting out the fire.

Information to all stakeholders

An important part of the preparation is informing everyone that needs to know that the County Administrative Board is planning to burn. The district

emergency services are always given plenty of notice as are SOS Alarm so that they can answer questions from people who smell burning from the site.

Time for ignition

Ignition takes place in steps within the secured boundaries. First, the fire creeps forward from the boundary towards the wind. Then new lines of fire are ignited in stages, which burn out towards the area which has already burned. Several people spread water, monitor, and keep a check on the wind direction.

When the fire has gone out

Staff remain on site to put out the fire and monitor it until there are no embers or smoke left. For several weeks if required.

Monitoring of the controlled burn

Following the fire, the County Administrative Board survey the site to see what new plants, fungi and animals have arrived.

The burning season is five months

Controlled burning for nature conservation takes place between May and September. The weather and the wind mean however, that the number of days suitable for burning are relatively few.



Burned dead wood. A woodland that has been burned with both standing and lying dead wood of different dimensions. The wood that has been killed by the fire has special characteristics. For example, the tree dies slowly, produces resin and the wood is charred.

Increased diversity with more dead wood in woodlands

The lack of dead wood in Swedish woodlands is a huge problem for many threatened plants, fungi, and animals. Through controlled burning, there are good opportunities to create large amounts of dead wood. Burning results in a wide variation of dead trees, both in terms of dimensions and species. In a burned woodland there are both standing and lying dead trees. Diversity is important because different species need different types of dead wood.



A controlled burning event is in full swing and new dead wood is created.



The three-toed woodpecker arrives very quickly after a fire to search for food.



Exit holes created by the larvae of the long-horn beetle *Arhopalus rusticus*.

Threats

The main threat to many of the species that Life Taiga wants to favour, is a lack of dead wood where birds, insects, plants, and fungi, can find a home and seek fodder. If the biodiversity is to be protected, there must be more dead wood in our woodlands.

Project actions

Controlled burning for nature conservation has primarily taken place in dense coniferous woodland with trees in different age classes. The aim with burning is to create a wide distribution of dead trees with different qualities and dimensions.

Results

The dead wood provides a new start for a long list of threatened plants, fungi, and animals. Insects seek out the trees damaged by fire and are in turn food for woodpeckers and other birds. But all the birds do not come at the same time, and they have different food preferences. The three-toed woodpecker prefers for example bark beetles, whilst the black woodpecker prefers to hack out ants from decayed trees.

The long-horn beetle *Arhopalus rusticus* is one of several hundred insect species that live in dead or damaged trees, and thus benefit from forest fires. Other examples include the long-horn beetle *Tragosoma depsarium*, the powder-post beetle and the pyrophillic daggerfly *Hormopeza obliterata*.

Many fungi also require dead wood. The species *Daldinia zocatasom* for example, lives hidden in healthy trees until a fire takes place, when it then becomes a host for fire-dependent insects that then spread the fungus to other trees.

More dead trees create new life in woodlands

- Controlled burning for nature conservation creates more dead wood in woodlands. Many threatened species can, as a result, more easily find food and a home.



Open and bright. A woodland where the smoke is slowly settling after the fire. Controlled burning for nature conservation means that the woodlands become more open and brighter because the proportion of spruce decreases and there are more broadleaved trees.

Brighter woodlands

when spruce has burned away

In woodlands that never or rarely burn, spruce takes over at the expense of pine and broadleaved trees. The result is dark and species-poor woodlands. Spruce is sensitive to fire because in contrast to pine, it has thin bark, shallow roots and the branches often reach down to the ground. Controlled burning for nature conservation is a method which opens up woodlands making them warmer and brighter. After a fire, broadleaved trees can establish and there are more berries and fungi on the ground.



Dark spruce woodland. Spruce often creates dense and dark woodlands; fire changes this.



Spruce on fire. Big flames that damage and kill many of the spruce trees.



More light for pine. A woodland that has burned where pine is favoured, and spruce is rare.

Threats

When spruce takes over, the woodland becomes dark and homogenous, and many species are unable to survive. In dense spruce woodlands, the sun does not reach the ground, which means that berries, grass, and flowers are less able to establish. Spruce also excludes pine and broadleaved trees, which results in species-poor woodlands.

Project actions

Most of the controlled burning has taken place in coniferous woodlands with a large proportion of spruce. The aim is usually to kill around two thirds of the spruce trees.

Results

The woodlands develop a more open structure after burning, where the sun can reach the ground creating a warm microclimate. The heavy shade of spruce trees is replaced by the sun-loving and more fire-tolerant pine. There is also more space for broadleaved trees such as aspen, sallow and rowan. Long-term, this changed structure favours many threatened species which have difficulty finding a home in heavily exploited plantations.

Dark and dense woodlands become lighter and open

- The aim with controlled burning is usually to kill around 30 percent of the pines and at least double that of the spruce trees.



More light and less competition. Penny bun and other ground-living mushrooms are clearly favoured by controlled burning because more light reaches the ground and competition from other plants reduces.

New life abounds

when the ground burns

Without free dwarf shrubs, mosses, and lichens, quickly cover the ground and extinguish the chance for other species to find space to establish. After a controlled burning event, many of the dwarf shrubs and most of the thick moss layer disappear, which gives rarer species the chance to establish and grow. This is especially important for the more unusual broadleaved trees such as aspen and willow, because they are important sources of food and habitat for insects and birds.

REDUCED LITTER LAYER



Low intensity fire which burns away the ground layer (litter layer).



Intensive fire, which kills many trees. Completely bare soil can also be created.



A morel fungus (*Morchella conica*), which may grow up after controlled burning.

Threats

Thick layers of mosses and lichens in combination with dense vegetation of dwarf shrubs significantly limits the habitat available for those species which need patches of bare ground. Plants cannot establish and insects cannot find places to live. A woodland with dense vegetation is also very unappealing for people.

Project actions

To create open areas with completely bare ground, the woodland is burned with a greater intensity in a smaller part of the whole area to be burned. The weather, temperature and how dry the ground is, all influence how much of the layers of mosses, lichens and dwarf shrubs disappear.

Results

A reduction in the litter layer favours plants, insects, and ground-living fungi. For example, the excellent edible penny bun and morel fungi (*Morchella conica*) pop up in large quantities after a fire. The quantity of cowberries and bilberries also usually increase massively a few years after a fire. Even cloudberries are favoured a while after burning.

Broadleaved trees find it easier to regenerate and grow if there are patches of bare ground. This is something which also favours birds and insects as they find both food and a home in broadleaved trees.

The woodland is also much nicer to walk in after burning, once the bushes and dwarf shrubs have burned away.

More habitat when the litter layer burns

- The upper layer of the soil is called the litter layer and consists of organic material which has not broken down. If the woodland has not been burned, the litter layer can become very thick and is a threat to the species which require bare ground.



Bare sand. By felling, burning, and digging, a large area with bare sand and lying dead wood has been created. These sunlit sandy areas are important habitats for insects and plants.

Sunlit sand

following burning and digging

Many rare species are dependent upon warm, sunlit sandy ground. These types of habitats host a diversity of insects and plants. Fire and other natural disturbances create large areas of bare sand which creates more habitat for these species. The creation of bare sand has taken place in two sites in Dalarna. This action has involved felling trees, burning, and digging.



Felling. Before the digging work began, the woodland was felled.



Timber. The felled trees were extracted before the burning took place.



The bee *Andrena argentata* is one of many insect species favoured by bare sand.

Threats

Large areas of sunlit sandy areas in woodlands are rare in Sweden. The ones that do exist are at risk of becoming overgrown when natural fires are less common. The special nature conservation values associated with these habitats are thus under threat.

Project actions

Actions have been implemented by the County Administrative Board of Dalarna in Haftahedarna and Skattlösberget Stormosse. Both reserves contain extensive glaciofluvial material from the ice age. The area with sand dunes at Haftahedarna is the largest above the High Coast, south of the Polar Circle.

By burning and felling trees, glades are created in the woodland. Drifting sand is then exposed by scraping off the litter and humus layer with the help of a digger. In one of the areas, seeds of the plant *Pulsatilla vernalis* were planted after scraping.

Results

In one of the Project sites, there is now a large population of *Pulsatilla vernalis*. The scraped sand and burning will help contribute to the development of an even larger population of this rare and beautiful plant.

Insects also benefit from the bare sand, where they can dig out their nests and be warmed by the sun. The bee *Andrena argentata* is one of these insects, but also sand lizard and other reptiles would be expected to thrive in the area following the management.

Shortage of sunlit sand

- Controlled burning creates the conditions which can expose natural sand, which is otherwise threatened with overgrowing.



Open and light. *Pulsatilla patens* grows in open, and virtually tree-less environments with access to patches of bare ground. By clearing, burning, and digging, a habitat that is favourable for *Pulsatilla patens* has been created in a site in Västernorrland.

Pulsatilla patens

needs light and bare ground

Pulsatilla patens is a lovely spring flower which in Sweden, is only found in Ramsele in Västernorrland and on the island of Gotland. The place where it grows, which is included in the actions for the County Administrative Board of Västernorrland, is about 700 square metres, but the work has been carried out on an area of about a hectare. The site has thus been increased in size by the removal of spruce, followed by burning. The burning reduced the depth of the humus layer and created patches of bare mineral soil which makes it easier for *Pulsatilla patens* to establish.



Clearing. The first step was to fell all the spruce in the project site.



Burning. After the spruce had been taken away, the area was burned.



Digging. Patches of the soil were removed the year after clearing and burning.

Threats

The presence of *Pulsatilla patens* is threatened by the reduction in light because of spruce taking over. To germinate, the seeds of this plant need patches of bare mineral soil where there are no other plants.

Project actions

Within the site Krången outside of Ramsele, manual felling of all broad-leaved trees and spruce has taken place within an area of 0.7 hectares. All the felled material, including the lop and top, has been taken away from the site. The area was then burned.

The following year, four small patches with bare sand were created using a digger in the same area. All to make it easier for the seeds of *Pulsatilla patens* to germinate.

Results

Before the Project actions started, 150 plants of *Pulsatilla patens* had been recorded from the proposed management area. Just outside of the management area, there were a few additional plants.

The monitoring after burning reported that all plants had, in principle, survived and were in good condition. It is now completely open with much less competition from dwarf shrubs and grass. The results so far are very positive in relation to the planned objectives.

Pulsatilla patens has been given the chance to spread

- The management actions have created the right conditions for the plant to spread into a larger area.



Enclosure. Seedlings of aspen have regenerated after burning. To protect the growing broadleaved trees from browsing by wild animals, parts of the area have been fenced with deer fencing.

Fencing reduces browsing damage on broadleaved trees

Controlled burning creates conditions for the regeneration of broadleaved trees in woodlands that have previously been dominated by conifers. One problem however, is that several species of broadleaved trees are very attractive to elk, roe deer and other browsing animals. Burned areas in four counties have therefore been fenced to protect the seedlings from browsing. The aim is to create more varied woodlands with more broadleaved trees.



Browsing. Elk and roe deer find many broad-leaved trees tasty to eat and thus they are often heavily browsed.



Difference. The picture shows the difference between inside and outside of a fence (which has now been removed).



Flowering willow is a very important source of food for pollinating insects early in the spring.

Threats

It is difficult to ensure the development of large broadleaved trees after a controlled burn due to the often heavy browsing by wild animals that occurs in our woodlands.

Project actions

To ensure good growth and survival of various broadleaved trees after burning, some parts of the areas burned needed to be fenced. The aim within the Life Taiga Project was to put up 12 200 metres of fencing divided across twelve different Natura 2000 sites distributed within four counties (Dalarna, Kronoberg, Västerbotten and Östergötland).

Results

In total, 12 800 metres of fencing have been up, which means the target has been met. The conditions for the development of species-rich broad-leaved woodlands have been improved by fencing the burned areas. Flowering broadleaved trees are an important source of food for many insects. Woodpeckers can chisel out nesting holes in broadleaved trees which are then often used by other birds.

The photo to the left, which is from an area that was burned about 20 years ago in Värmland, shows the significance of fencing for the regenerating broadleaved trees. The area to the left, was within a fence where the broadleaved trees are taller and larger than those outside of the fence, which have been browsed by elk and roe deer.

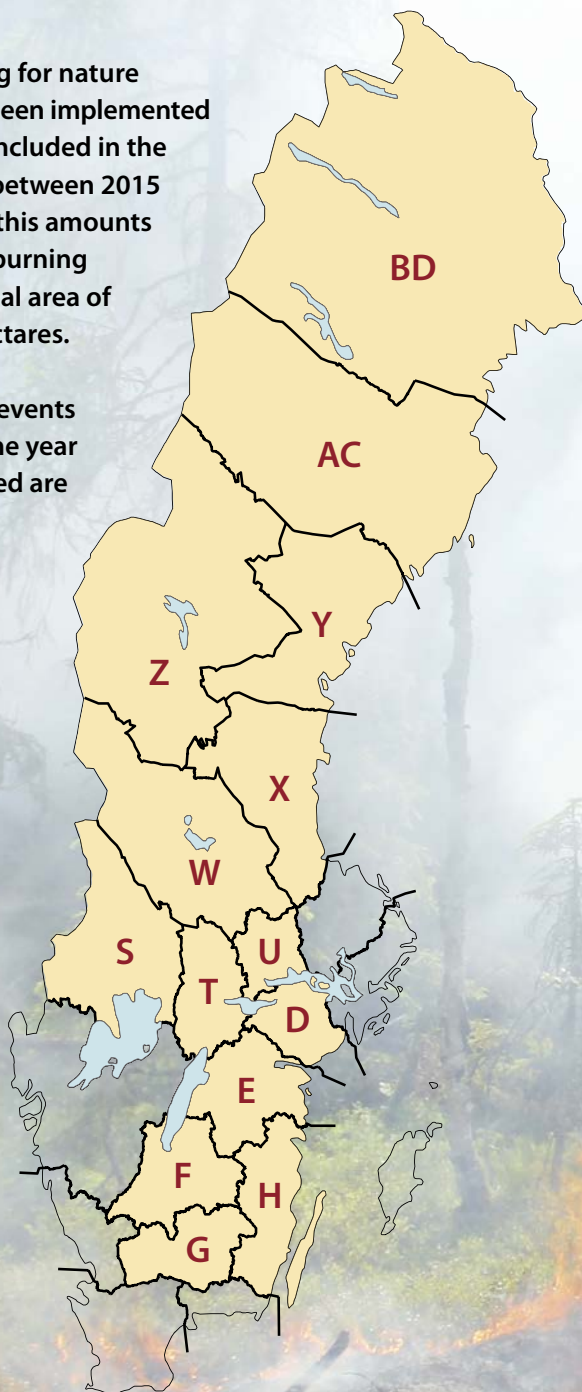
More broadleaved trees if burned areas are fenced

- By putting up fences around some of the burned sites, the important broadleaved trees are protected from browsing.

Burned sites

Controlled burning for nature conservation has been implemented in all 14 counties included in the Life Taiga Project between 2015 and 2020. In total this amounts to 135 controlled burning events across a total area of just over 2 500 hectares.

All of the burning events per county, with the year and the area burned are presented below.



Norrbotten (BD)

Tolikheden	13.9	2017
Jylkkyvaara	9.3	2018
Tervavuoma	31.9	2018
Tervavuoma	28.6	2019
Tervavuoma	19.5	2020
Tervavuoma	18.7	2020
Tolikheden	16.6	2020

Västerbotten (AC)

Sjulsmyran	31.6	2015
Tjäderberget	35.9	2016
Liksgelisen	25.7	2017
Västermark	9.7	2017
Västermark	3.4	2017
Isklinten	0.6	2018
Isklinten	2.0	2018
Isklinten	9.1	2018
Sjulsmyran	13.7	2018
Sjulsmyran	7.3	2018
Sjulsmyran	21.9	2018
Stavaliden	36.8	2018
Stavaliden	3.0	2018
Västermark	11.7	2019
Buberget	18.0	2020
Jättungsmyran	22.9	2020
Kammen	7.0	2020

Västernorrland (Y)

Helvetesbrännan	14.3	2015
Helvetesbrännan	31.5	2015
Oringsjö/Mo	6.5	2015
Jämtgaveln	40.4	2016
Krången	1.4	2016
Jämtgaveln	2.3	2017
Oringsjö/Mo	8.5	2017
Jämtgaveln	8.7	2018
Jämtgaveln	22.8	2018
Stormyran	27.7	2018
Jämtgaveln	74.7	2020
Jättjärn	5.9	2020
Stormyran	36.6	2020

Jämtland (Z)

Brötarna	4.5	2015
Brötarna	1.2	2015
Helvetesbrännan	8.6	2016
Lungsjöskogen	13.3	2018

Gävleborg (X)

Djupsjön	4.8	2015
Lomtjärn	4.1	2015
Stora Korpimäki	5.0	2015
Färnebofjärden	14.3	2016
Ålkarlstjärnarna	13.3	2016
Färnebofjärden	39.8	2017
Börningsberget	23.6	2018
Ensjölokarna	11.9	2018
Färnebofjärden	28.8	2018
Färnebofjärden	40.5	2018
Hagåsen	19.0	2018
Stensjön	8.8	2018
Sundsjöberget	50.3	2018
Färnebofjärden	451.3	2020

Dalarna (W)

Haftahederna	1.9	2015
Skattlösberg	4.6	2015
Hästingsflotten	3.3	2016
Fux-Anders	30.9	2017
Tenningbrännan	9.9	2017
Haftahederna	13.9	2018
Skattlösberg	28.7	2018
Gåsberget	7.0	2019
Haftahederna	1.0	2019
Långön	13.6	2019
Gästjärnskölen	14.3	2020
Gästjärnskölen	5.5	2020
Rensjön	36.6	2020
Skattlösberg	25.6	2020
Skissen	9.0	2020

Värmland (S)

Brattforsheden	9.2	2015
Västersjön	39.0	2015
Västersjön	30.3	2015
Brännan	12.2	2017
Fräkensjömyrarna	21.2	2019
Fräkensjömyrarna	23.4	2019
Fräkensjömyrarna	24.1	2019
Brattforsheden	4.3	2020
Västersjön	17.0	2020

Örebro (T)

Ställbergsmossen	16.2	2015
Ställbergsmossen	2.0	2015
Ställbergsmossen	2.3	2015
Ställbergsmossen	7.1	2015
Västeråsmossen	27.5	2015
Västeråsmossen	7.6	2015
Römyren	5.1	2016
Römyren	1.8	2016
Römyren	1.1	2016
Römyren	26.1	2016
Römyren	2.2	2016
Römyren	11.6	2018
Ställbergsmossen	43.7	2019
Römyren	9.9	2020

Västmanland (U)

Lappland	20.3	2016
Lappland	5.5	2017
Lappland	4.3	2017
Lappland	4.3	2017
Stora Flyten	9.9	2017
Stora Flyten	13.0	2018
Skommarmossen	4.0	2019
Stora Flyten	30.7	2019

Södermanland (D)

Fjällmossen	6.8	2015
Ormsjöbergen	5.2	2016
Fräkenkärret	13.4	2016
Fjällmossen	3.7	2019

Östergötland (E)

Kärnskogsmossen	12.6	2016
Orrkojgölarna	8.5	2017
Åsvikelandet	24.0	2017
Bibergskärren	6.7	2018
Bibergskärren	10.1	2018
Orrkojgölarna	6.7	2018

Jönköping (F)

Stolpaberg	24.0	2015
Solgen	6.7	2016
Stora och Lilla Fly	17.6	2016
Stolpaberg	20.3	2019
Nennesmo	10.1	2020

Kronoberg (G)

Våraskröv	3.7	2015
Singeltorps fly	27.1	2016
Storasjö	19.5	2016
Årshultsmyren	9.4	2016
Bockaskröv	19.4	2017
Stocksmyr	22.9	2017
Storasjö	19.3	2018
Storasjö	16.3	2018
Stocksmyr	16.8	2020
Storasjö	26.7	2020

Kalmar (H)

Allgunnen	6.7	2015
Smedjevik	10.9	2015
Allgunnen	16.5	2016
Allgunnen	19.0	2016
Bödakusten	27.3	2016
Kvarntorpet	16.0	2016
Allgunnen	0.7	2018
Björnnäset	9.4	2019
Björnnäset	5.5	2019



Fire brings life. The burned woodland looks black and lifeless, but it will soon be teeming with life.

Many species are favoured when woodlands burn

Controlled burning for nature conservation is a dramatic event for the plant and animal life on a site. But the benefit for hundreds of rare and threatened plants and animals justifies burning. Some 100 species of insects and fungi are completely dependent on fire, others are favoured by the fact that the woodlands become more open and brighter, or that there is more dead wood. Here are nine examples.

The dagger fly (*Hormopeza obliterata*)

IDENTIFYING FEATURES

A dark chubby dagger fly which is around four millimetres long.

FIRE ECOLOGY

Hormopeza obliterata can smell smoke from many tens of kilometres away and finds its way to the fire whilst it is still burning. It is classified as vulnerable in the Red Data Book.

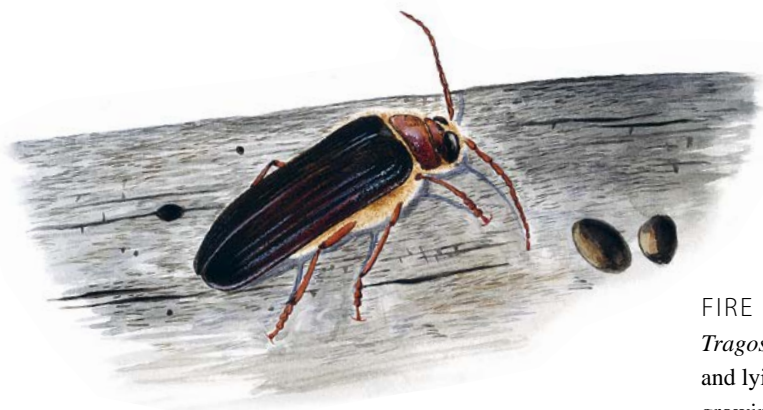
DISTRIBUTION

The species has been present for a long time in Västergötland, Västerbotten and Norrbotten, including Abisko. More recently *Hormopeza obliterata* has also been found in Dalarna, Gävleborg, Uppsala and Tyresta National Park in Stockholm. Common to all sites is that the woodland has burned.



Hormopeza obliterata is directly associated with different types of woodland fires. For its long-term survival controlled burning for nature conservation is of the utmost importance.

SPECIES FAVOURED BY FIRE



A long-horn beetle (*Tragosoma depsarium*)

IDENTIFYING FEATURES

A small dark brown shiny beetle which is between 20 and 30 millimetres long. *Tragosoma depsarium* has long backward facing antennae, large eyes, hair on the head and a barb on each side of the neck.

Likes sun and dead wood. *Tragosoma depsarium* is favoured by fire-damaged wood and is a good indicator of valuable pine woodlands.

FIRE ECOLOGY

Tragosoma depsarium is dependent upon dead standing and lying pine trees with no bark in sunny locations. Overgrowing is a problem for the species because less and less sunlight reaches the dead wood. After a fire, the beetle is favoured both by the increased amount of sunlight and new fire-damaged wood.

DISTRIBUTION

Tragosoma depsarium is distributed from the southeast to the north of Sweden. Many of the known populations live in small, isolated groups which are very vulnerable.

Powder-post beetle

(*Stephanopachys substriatus*)

IDENTIFYING FEATURES

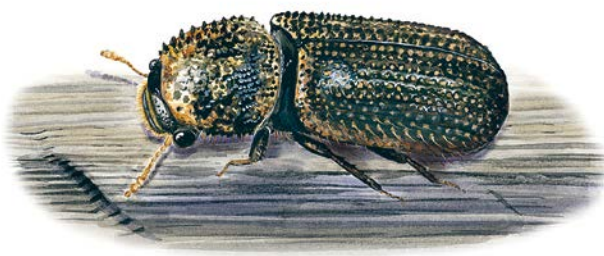
A dark brown beetle which is 4-6 millimetres long. It has a surface which is rough like a wood rasp and short antennae.

FIRE ECOLOGY

The beetle is dependent upon regular fires because it lives on fire-damaged conifers. The development of the larvae occurs primarily in newly formed fire-scars on pine, patches where the tree has been damaged under the bark.

DISTRIBUTION

The species was once spread from the southeast of Sweden all the way up to the north. Now it is only found in a few places in northern Sweden.



Increases after fire. The powder-post beetle is poor at dispersing over long distances and is therefore clearly favoured by controlled burning for nature conservation which is spread out in the landscape. The beetle has increased following the fires that have taken place in recent years.

SPECIES FAVOURED BY FIRE

Pulsatilla vernalis

IDENTIFYING FEATURES

A herb with light purple flowers that look like a bell. It grows to be roughly 10 centimetres tall and flowers from April to the middle of June, depending upon where in the country it grows.

FIRE ECOLOGY

The rhizome of *Pulsatilla vernalis*, grows straight down into the soil, which means that it survives better than many other species. When the competing plants have burned away, *Pulsatilla vernalis* gets more warmth and has a better chance of spreading.

DISTRIBUTION

Pulsatilla vernalis often grows in open heathy pine woodlands or on glacial deposits, from Skåne to southern Jämtland. It has become much rarer over the last 50 years.



Controlled burning may result in a reduced humus layer and bare ground. This means that new plants of *Pulsatilla vernalis* can more easily establish.

Geranium lanuginosum

IDENTIFYING FEATURES

A hairy herb, with bluey purple flowers, and which can grow to be up to 50 centimetres tall.

FIRE ECOLOGY

The seeds only germinate if they are heated to a temperature of 40-50 degrees Celsius. The plant therefore primarily occurs in burned areas where the seeds can lie dormant in the soil for a long time, waiting for a fire.

DISTRIBUTION

Geranium lanuginosum is very rare and is found primarily in southeastern and central Sweden. It can also be found in a few sites in the southwestern part of Sweden.



Directly after a fire, *Geranium lanuginosum* and the closely related species *Geranium bohemicum* can appear. As soon as other species start to compete for space, they disappear.

SPECIES FAVOURED BY FIRE



Food and nests. After a fire, it is easier for the black woodpecker to chisel out a nesting hole in large, old trees.

Black woodpecker (*Dryocopus martius*)

IDENTIFYING FEATURES

Black woodpecker is the largest woodpecker in Europe and has completely black plumage with a red patch on its head.

FIRE ECOLOGY

All the woodpecker species in Sweden thrive and reproduce in woodlands that have burned. After a fire, conditions are suitable for new nest sites and there are lots of insects to eat in the fire-damaged tree trunks.

DISTRIBUTION

The black woodpecker lives in coniferous, mixed, and even in pure broadleaved woodlands if they have tall, large trees. This bird is found across the whole of Sweden but has declined over the last 15 years by between 20 and 30 percent.

Three-toed woodpecker (*Picoides tridactylus*)

IDENTIFYING FEATURES

A bit smaller than a greater spotted woodpecker. The wings are almost completely black, the sides are partly grey and there is a white patch on their back.

FIRE ECOLOGY

The three-toed woodpecker completely focuses its search for food in dead or badly damaged trees. These are created in large quantities after a fire.

DISTRIBUTION

Having once been a relatively common bird, the three-toed woodpecker declined dramatically in latter part of the 1900s. It has completely disappeared from some areas.



The three-toed woodpecker is an early visitor to burned areas to search for insects in the damaged and dead trees.

SPECIES FAVOURED BY FIRE



Daldinia loculata
only forms
fruit bodies
on trees that
have been
killed by fire.

Daldinia loculata

IDENTIFYING FEATURES

A wood-living fungi which forms black fruit bodies on fire-damaged trees, often birch trees.

FIRE ECOLOGY

Newly burned areas are a requirement for *Daldinia loculata* and the whole life cycle of this species is dependent on fire. The fungus is in turn, home for several fire-dependent insects, which are under threat because there are fewer fires than in the past.

DISTRIBUTION

The species has been recorded from northern Skåne to Norrbotten.

Matsutake mushroom (*Tricholoma matsutake*)

IDENTIFYING FEATURES

Large fleshy mushroom with a sweet smell which has gained increasing attention as being good for eating. The cap is 5-20 centimetres in size.

FIRE ECOLOGY

Fire creates better conditions for the matsutake mushroom because the humus layer is thinned out and pine is favoured over spruce after a fire. The reduction in the humus layer means that the fruit bodies can more easily spread their spores.

DISTRIBUTION

Grows primarily on sandy heaths with pine from Örn-sköldsvik and further north, but it has occasionally been found in the far south of Sweden. This fungus has declined by more than 30 percent over the last 50 years.



Indicator. The matsutake mushroom primarily grows in older pine woodland and this means that it is an indicator of old woodland and that there are often other valuable plants, fungi, and animals in the area.



In May 2019, Crown Princess Victoria visited Medelpad with the County Administrative Board of Väster-norrland as her host. The walk followed footpaths which took her to where controlled burning had taken place.

Victoria's visit to a controlled burn site

The countryside in Jämtgaveln Nature Reserve, which the Crown Princess visited, is varied with woodlands, wetlands, and water courses. There are also the remains from old herders' cottages, foresters' huts, and trapping pits.

Extensive woodland affected by fire

Almost all woodland in Jämtgaveln has grown up after repeated fires during the middle of the 1800s. The landscape is thus dominated by pine.

Several controlled burns have taken place in the Nature Reserve since the 1990s so that the environment will also be naturally rich in pine in the future.

The Crown Princess was able to experience extensive woodland affected by fire on her walk through the Nature Reserve. Several local stakeholders and personnel from the County Administrative Board described the history of the site and how people have worked the area over different periods.

Information about controlled burning

John Granbo, regional project manager for Life Taiga and site manager for Jämtgaveln, met up with the whole group some way into the Reserve. He described how the County Administrative Board work with controlled burning and in the EU project Life Taiga.



Amongst the burned pines. Students, from across Sweden, visit a woodland and wetland site in the County of Örebro where the County Administrative Board had undertaken controlled burning during the summer.

Controlled burning on the timetable

In September 2016, Life Taiga was visited by some 50 sixth-form college students that wanted to learn more about controlled burning for nature conservation. The study tour was a part of the Linneus' Days, a project which has been organised annually since 1964 in different places, by the Biology Teacher's Society.

Welcomed by the local project managers

Åsa Forsberg and Kjell Store, regional project managers for Life Taiga in the County of Örebro, gathered the students together and described how they undertook a four-day long controlled burning event.

Kjell Store described that the County Administrative Board of Örebro has burned around 100 hectares of woodland in the Life Taiga

Project. Here in Römyren about 40 hectares were burned.

Documented differences

After the presentations, the students were divided up into four groups. Each group studied an area that had not been burned and one which had been burned and documented the differences they could see.

"I was sceptical about nature conservation burning and thought that one should instead take advantage of the timber," said Isak Brånstrand from Hultsfred's College. "But then I found out that the fire thins out the woodland. In addition, forest fires save a lot of plants and animals."

Fire trail in Lappland, Västmanland

To spread knowledge about controlled burning for nature conservation to the public, and show the results of specific burning events, an information trail was created in Lappland Nature Reserve in Västmanland. The trail is five kilometres long with relatively easy walking. Boardwalks and bridges have been built across the wetter parts.

More burning planned

The trail runs through two areas which were burned in 2016 and 2017, respectively. The timespan between the burning events makes it possible to study how nature develops after controlled burning. The idea is to burn more areas within the site so that it will be possible to follow the effects over time.

Information site

Along the trail, there are five signs which describe controlled burning for nature conservation and the Life Taiga Project. The ambition is that the whole site will act as an information site for controlled burning for nature conservation.

Close to Hälleskogsbrännan

Hälleskogsbrännan Nature Reserve, which was formed after the big fire in Västmanland in 2014, is only about forty kilometres from Lappland Nature Reserve. The proximity to the large, burned area, makes it possible to study differences and similarities between a controlled fire and a large wild fire. There are lots of places to visit and signs at Hälleskogsbrännan.



Walk among the burned pines. The information trail in Lappland Nature Reserve passes old sooty pines with thick bark, which protects the trees from the fire. Mats Harrysson from the County Administrative Board of Västmanland shows Bent Jepsen, the advisor and EU Commission project contact, one of the signs.

Outdoor museum and fire trail in Kalmar

As a part of the Life Taiga Project, the County Administrative Board of Kalmar has created an outdoor museum with an information trail. This provides information about the significance of controlled burning as a management method.

Signs along the trail

An information trail has been created which starts from the outdoor museum. The trail is about a kilometre long and runs through a burned area. There are signs along the trail with information about the impact of burning that can be seen in the site.

High nature conservation values

The woodlands at Allgunnen and the surrounding area are well-known for having high nature conservation values favoured by fire. Controlled burning is one of the most important management methods for this site.

Four controlled burning events have taken



With your telephone you can listen to the beetle "Larry Longicorn" describe why woodland fires are important for many species.

place on this in site within the Project. There was also a wild fire close by in 2009. More controlled burning is planned for nearby the outdoor museum soon.



Outdoor museum. The outdoor museum in Kalmar consists of a semi-open building with six information signs, each with a different theme. They are in a beautiful spot adjacent to Allgunnen Lake.





Field visit. Niclas Bergius, project manager for Life Taiga in Sweden, investigates the depth of the humus layer (fuel) with his Finnish colleague Henrik Lindberg. Jouni Penttinen, in the photo to the right, was the project manager for Light & Fire Life in Finland.

Cooperation with sister project in Finland

At the same time as Life Taiga started, a five-year project also started in Finland focusing on controlled burning for nature conservation. Light & Fire Life has been run by the Forest Service in Finland.

Similarities and differences

Finland and Sweden have similar woodlands and are both in a similar phase regarding controlled burning for nature conservation in protected woodlands.

Equally however, there are different approaches, and different experiences of burning, which provides good opportunities for discussing how the management actions can be implemented in the best and most effective way.

Field visits and seminar

Field visits have taken place in both countries with the respective project management teams. In April 2017, a European seminar was organised in Finland on the issue of controlled burning for nature conservation. The seminar was jointly organised by the Swedish and Finnish projects and gathered delegates from eight different countries.

New joint EU application

An additional result of the cooperation is that Finland and Sweden will together apply for a new larger Life project focusing on controlled burning for nature conservation.



Grand Canyon National Park was one of the main destinations when the Life Taiga Project visited the USA on their study tour. The other was the research station called Tall Timbers.

Sharing experiences with the USA

In the autumn of 2017, a study tour was made to the USA, led by Anders Granström. The aim was to gain an understanding of ‘prescribed burning’.

Burning for nature conservation in the USA differs quite a lot from the work in Sweden. The areas burned are often much larger in the USA. Another difference is that burning is implemented to get rid of the undergrowth where wild fires can become established and spread quickly.

Ignition from helicopter

The group got to see a method which had not been tried in Sweden. This involved igniting the fire from a helicopter which shoots out

ping-pong ball sized balls which self-ignite when they reach the ground.

Lots of experience to share

Long-term planning, regulations, monitoring, burning techniques, and equipment were also on the agenda. In addition, experiences were shared in relation to fire fighting, wild fires, and the importance of communication.

Ecology and biodiversity

In addition to issues related to burning, experiencing the ecology and biodiversity in the different types of woodland was extremely interesting.



Contractors. The County Administrative Boards have cooperated well with contractors around the country. Here a discussion is being had regarding watering the boundaries in Skommarmossen, Västmanland.

How does the Project impact society?

When the EU Commission finance a nature conservation project, they also want to see what impact the project has on the local economy and other parts of society. It can include how the project may have contributed to increased tourism, more jobs, new companies, or changes in attitude amongst the public.

Challenges for contractors

The controlled burning events have been undertaken by the County Administrative Board's own staff and specialist contractors. Some of the companies take the responsibility for the whole burning event, whilst others contribute by undertaking the preparatory clearing work,

checking the boundaries on the day of the burning event, and not least ensuring that the fire does not start up again in the weeks following the fire. Day as well as night.

A big challenge for the contractors is to be able to plan how much work there might be in the summer.

Controlled burning is extremely weather dependent. There are only a few days each summer when the weather conditions are optimal in relation to wind strength, direction, humidity, and ground conditions. If the weather changes during the morning and does not feel optimal at the ignition check, the burning event is stopped.



Emergency services. The head of the burning team in discussion with the emergency services before lighting the fire in Stolpaberg, County of Jönköping.

Investing in training, expensive insurance and a lot of equipment is difficult for a self-employed contractor, whilst also not knowing how much work there will be. It is also challenging to be on 'stand-by' and ready to go as soon as the weather is right during the season. This is why there are not many contractors active in this specialist area; the supply is not as great as the demand for contractors.

There have thus been controlled burns that have not taken place because there have been too few contractors in some areas of the country.

Increased support for contractors

These challenges and how the County Administrative Boards can support contractors so that they want to invest in this work, has been much discussed in the Project. A few suggestions have included hiring out the equipment, providing training and modifying the tender requirements so that more are able to tender. It is important that those who want to lead a controlled burn, can have the opportunity to job-shadow in order to gain practical experience.

Cooperation with emergency services

The cooperation with the emergency services has developed over the years. Understanding and confidence that controlled burning for nature conservation can be undertaken safely have both increased. On several occasions, the Project has been able to share their experiences with the emergency services regarding how fire behaves in woodlands and methods for lighting fires to control wild fires.

Dialogue with the public

The County Administrative Boards have been careful to engage in dialogue with the public to alleviate their concerns and justify the benefits of controlled burning. Guided walks have been undertaken during the Project for the public to describe the aim with controlled burning and to show the rare species that have returned to the woodlands following a fire.

In general, visitors have been positive about the Life Taiga Project and have gained an increased understanding for the complexity in our ecosystems and how controlled burning can contribute to more varied nature and increased species richness.



A guided walk for the public at Hästingsfott en in Dalarna about the aim with controlled burning and which species establish after the fire.

What has the Life Taiga Project meant?

Many people have contributed to Life Taiga being a successful project. Some have worked with the actual controlled burning, others have contributed with knowledge, finances, and management. Here is some feedback regarding the Project's significance for the biodiversity in woodlands, but also its benefits to society.



Johan Wretenberg, Head of Nature Conservation at the County Administrative Board of Västmanland and chair of the Life Taiga Steering Group.

Johan Wretenberg, County Administrative Board of Västmanland

“We have delivered on all levels.”

■ “Previously it was unthinkable to undertake controlled burning for nature conservation at the scale we have done,” said Johan Wretenberg. “Through Life Taiga we have started controlled burning on a large scale across the country. We have burned more than planned, developed our way of working and gained new knowledge. The Project has delivered on all levels.”

Johan Wretenberg thinks that Life Taiga and the project funds received have been important for getting these activities going. He hopes for another project period to further enhance the collaboration and develop even greater competence. He thinks that controlled burning for nature conservation is a management method that is here to stay.

“How much we can burn depends on the state funds we get for nature conservation. But this is also true for grazing, hay-cutting and other types of management.”



Anders Granström, researcher at the Swedish University of Agricultural Sciences in Umeå. He has contributed to Life Taiga with advice and training.

Anders Granström, forest fire researcher

“Tradition which needs to be kept alive.”

■ Anders Granström has participated as an observer at several of the controlled burning events. And he is happy with what he has seen. The burning has been well carried out and the results have been good.

It is positive that the target area has been achieved. But even more important according to him, is that the long-term competence has been built up, where burning is not dependent on a few people.

“Knowledge is something that goes out of date and people change jobs. The tradition of burning must therefore be created so that it is kept alive.”

Without burning, the woodlands will develop in a way that according to Anders Granström “deviates from history”.

“On medium-quality soils, which have traditionally been dominated by pine, spruce will take over if no burning takes place.”



Lars-Ove Wikars has a background as a researcher. He now works with surveys, investigations, and training.

Lars-Ove Wikars, insect researcher

“Affects structures in the long-term”

■ On behalf of the Swedish Environmental Protection Agency and various County Administrative Boards, Lars-Ove Wikars has studied how the insect fauna favoured by fire has been affected by controlled burning and wild fires.

Wild fires, which often occur on clear-felled areas and young woodlands, are important for many of the species that arrive soon after a fire. This includes some beetles, fungi, and plants. The important thing about Life Taiga Lars-Ove Wikars believes is that the Project has more long-term effects.

“By influencing the structure, the woodlands become more open, spruce is pushed out and large quantities of dead wood are created. Life Taiga contributes by recreating structures and habitats that have disappeared or will soon disappear. It is important for the conservation of biodiversity in coniferous woodlands,” says Lars-Ove Wikars.

Åsa Johansson, County Administrative Board Kalmar

“Shared experience and learning”

■ The County Administrative Board of Kalmar undertook several controlled burning events, even before Life Taiga started. Åsa Johansson thinks that with a large joint project, there is more drive to implement what is intended.

“The big benefit is that you gain experience and learn from one another.”

When many County Administrative Boards carry out burning, more people notice. Although the County Administrative Board of Kalmar has not undertaken any surveys of attitude changes, Åsa Johansson feels that there is now a greater understanding and acceptance for controlled burning as a management method amongst the public and landowners.

“Regardless of whether there will be a new project or not, we will continue with controlled burning for nature conservation. But with project funding, we can achieve much more.”



Åsa Johansson, Head of Nature Conservation Management Department at the County Administrative Board of Kalmar. A member of the Life Taiga Steering Group.

Linda Sundström, County Administrative Board Värmland

“Clarity and great commitment”

■ As in other counties, the burning in Värmland has taken place with a mix of our own staff and hired contractors. Linda Sundström thinks this mixture works well. But she points out that it is important that the County Administrative Board has a high level of competence to be able to plan the controlled burns and create good tenders for the procurement of external contractors.

An important outcome of the Project is that a network has been created at nature conservation officer level, stresses Linda Sundström.

“For example, staff from other County Administrative Boards have participated in burning events in Värmland. This means that we build up our joint knowledge, but we also make contacts which are important in other situations.”

According to Linda Sundström, the Project has worked very well. “The project management team have been clear and committed.”



Linda Sundström, Head of the Nature Conservation Department at the County Administrative Board of Värmland. A member of the Life Taiga Steering Group.



Johan Falck, a biologist who works with surveys. He now works as a burning contractor.

Johan Falck, burning contractor

“Doubted the targets would be achieved”

■ Johan Falck has been contracted by Life Taiga to plan and implement controlled burning for nature conservation and for the extinguishing work. To take on larger projects, he has taken on sub-contractors that he has trained. He is impressed by everything that has been done within the Project.

“I was doubtful that the target area for burning was possible and thought to myself this will never work. But the target area has been reached and even exceeded, and a new form of management has now been implemented at a high level.”

The result of the burning is as expected: more open and beautiful woodlands. But there have been some surprises along the way.

“For example, that silver birch can withstand ground fires really well”, said Johan Falck. “Mires and pine bogs also burn more than I thought. Traditionally there are burned stumps in these habitats.”



Henrik Lindberg, teacher and researcher at a polytechnic in Tavastehus. A member of the Light & Fire Life Steering Group.

Henrik Lindberg, Light & Fire Life, Finland

“We have not just burned woodland”

■ The Finnish sister project Light & Fire Life has worked in 69 Natura 2000 sites. Common to the projects in Sweden and Finland is the protection of endangered species. In Finland they have had a slightly different focus. Unlike Life Taiga, which was mainly about the controlled burning of woodland, other habitats have also been burned in Finland, describes Henrik Lindberg.

“We have also burned on eskers and heathlands as well as undertaken nature conservation management in other open habitats, such as coastal meadows and sand dunes. The measures have favoured plants such as *Pulsatilla patens* and breckland thyme as well as insect species.”

Henrik Lindberg has, within Light & Fire Life been responsible for the international contacts. This has involved, amongst other things, arranging a European workshop on controlled burning for nature conservation together with Life Taiga.

Leif Sandahl, Swedish Civil Contingencies Agency

“Better overall capacity”

■ The Swedish Civil Contingencies Agency sees positive synergy effects from the Project, stresses Leif Sandahl.

“Each burning event is a unique opportunity for the emergency services to learn more about controlled burning and different methods to limit a forest fire. This is why it is good if the emergency services are involved in the burning.”

According to Leif Sandahl, an exchange of knowledge between the emergency services and those involved in controlled burning for nature conservation, can be about how to cooperate in the event of forest fire, but also about gaining increased knowledge about each other’s resources.

“Life Taiga is a good example of how a better overall capacity with increased efficiency of resources can be built up in society,” said Leif Sandahl.

The Swedish Civil Contingencies Agency are keen to see another project period and have thus sent in a letter of support with the application to the EU.



Leif Sandahl, fire engineer. Works with issues around forest fires at the Swedish Civil Contingencies Agency.

Erik Hellberg Meschaks, Swedish Environmental Protection Agency

“Increasing and maintaining the area”

■ Erik Hellberg Meschaks has followed Life Taiga from the first drafts, through the application process to the EU, and the implementation of the Project. Overall, he thinks it has gone very well.

“Through Life Taiga, more woodland has been burned in protected areas in six years, than the total since the middle of the 1990s. Now it is a matter of increasing the area, maintaining it over time and ensuring that controlled burning for nature conservation becomes a common and standard management practice within nature conservation and in many counties.”

According to Erik Hellberg Meschaks, the burning that has taken place, has had a direct positive impact on protected species. But the most important thing about Life Taiga is the increased knowledge at many levels.

“Those with experience have shared their knowledge with those with less experience. But everyone involved has learned more.”



Erik Hellberg Meschaks, works at the Swedish Environmental Protection Agency, with responsibility for woodland issues.





Many plants, fungi, and animals are under threat because fires occur too rarely and in too few places in woodlands compared with the past. Fire contributes to conserving and restoring biodiversity. But no-one wants fires that are out of control.

Burning for nature conservation through Life Taiga has been undertaken in a controlled way in 76 Natura 2000 sites across Sweden. The result is more open, brighter, and more species-rich woodlands.

The Life Taiga Project has run from 2015 to 2020, financed by the EU and the Swedish Environmental Protection Agency. 14 of the County Administrative Boards have worked together, with the County Administrative Board of Västmanland as project manager and with a budget that amounted to 100 million Swedish Kronor.



Länsstyrelserna

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The management in the Project has been co-financed by the EU Life Nature Programme and the Swedish Environmental Protection Agency. The aim of the Programme is to protect and manage sites included in the Natura 2000 network.

