

Goat willow – a keystone species

Photo: Leif Öster, Sveaskog's image bank



◀ The coveted goat willow flower, which offers the first glimpse of spring.

Sweden has many different types of willow, ranging from small shrubs that grow on barren mountains to large trees in forest landscapes. Most people have probably played around with willow flower buds as children, and in Sweden there is even a children's song about them. Goat willow is the only willow that is a true tree and is found throughout Sweden. The tree itself is valuable to many different species, both for food and as a habitat. Goat willow has also been important to humans throughout history.

Sweden is home to 36 different willow species, ranging from small shrubs in the fells measuring a few centimetres to tall trees in the forest. Many species are simply called willows or *Salix*, but some have more specific names such as bay willow and goat willow. Goat willow is found throughout Sweden with the exception of barren mountains and grows both in and along the fringes of forests, as well as on farmland.

The bark is grey and rough and the large, oval shaped leaves are dark green. The species usually grows into a tree and can stand 15 metres tall, but often has multiple stems or sometimes forms a bush. Goat willow stumps grow shoots, which means that if you chop down a goat willow, new goat willow twigs will grow from the stump. Goat willow is a so-called dioecious species, which means that the male and female flowers are found on separate plants. The male tree has bright yellow stamens while the female tree has yellow-green pistils. Goat willow has a good survival strategy, as it can grow shoots even though it

may appear to have been dead for several years. This is called breaking its vegetative state, that is, it comes to life following a disturbance such as a forest fire or logging. As they age, goat willow can look more dead than alive, the trunk splits and only a few twigs with green leaves decorate the crown.

Goat willow flowers – breakfast of the year

Goat willow is a very important tree species when it comes to biological diversity. When spring comes, you can see the flower buds on goat willow twigs. They are similar to a greenhouse as they let sunlight reach the flower while the white hairs protect it from the cold. When the weather starts to get a little warmer at the beginning of May, the goat willow buds bloom, revealing their bright yellow flowers. This happens before the leaves unfurl and this early blossoming makes goat willow important to many other species. One example is when a queen bee wakes in early spring and needs to eat. Spring has not really started and there is almost

nothing to eat, except for the goat willow that has already begun flowering and offers the queen both pollen and nectar. Goat willow and other willows are an important species if humans are to enjoy fruits and berries in the autumn as many of the insects that pollinate our fruit trees and berry bushes feed on goat willow nectar in early spring. Other species that feed on goat willow later become food for the first migratory birds arriving after the winter.

A keystone species - goat willow

A keystone species is a species on which many other species depend. Pollinating insects are not the only species that benefit from goat willow, as many other species live in or on or find their food on goat willow – in both forest and farm landscapes. Other insect species lay their eggs under goat willow bark, later becoming food for woodpeckers. Almost 200 butterfly species live on goat willow during their larval phase, and 75 beetle species eat goat willow leaves, flowers and buds.

Elk happily graze on goat willow, eating the bark, branches and leaves. In winter, when snow weighs down the branches, hares happily eat goat willow shoots. Many tree fungi and lichens also live on goat willow. Two examples that will be described in greater detail below are the diamond willow fungus and lung lichen.

Diamond willow fungus – perfume of the forest

Diamond willow fungus is a white wood fungus that grows on living goat willow in older forests. The fungus is a wood decomposer, but is also believed to act as a parasite on the host tree. It releases an aniseed-like odour that can be smelled at quite a distance under the right conditions.

In some parts of Västerbotten, diamond willow fungus is referred to colloquially as the ‘nice smelling fungus’. Diamond willow fungus is found in northern Sweden and is one of five protected fungi in Sweden, which means you are not allowed to pick it. In the past,

diamond willow fungus was used as a deodorant and perfume. According to Carl von Linné, young men kept a piece of diamond willow fungus in a small pouch around their waist so as to smell nice to the opposite sex. People even placed pieces of the fungus in their linen cupboard to make their clothes and bed linen smell nice. Diamond willow fungus was also used to flavour cheese, whey cheese and rice pancakes in the past.

Lung lichen – an indicator species

Another species found on goat willow is lung lichen. It can also be found on other tree species, but is most commonly found on goat willow. When lung lichen is in a humid climate, it has a beautiful green colour, but in drier air it turns a grey-brown hue.

This lichen is a member of the group known as foliose lichen, meaning leaf-like, with a shape resembling a lung. In the past, people thought that lung lichen could cure several different lung conditions, just as kidney beans were thought to help heal the liver. This species is rare in Sweden and is called an indicator species, which means that forests where lung lichen are found often also hold other natural values.

Lung lichen and diamond willow fungus are red listed in Sweden, which means that the species are in decline and special measures are needed to ensure their long-term survival. Within forestry this means, for example, sparing stands around trees with lung lichen to maintain humidity.

Uses of goat willow and its wood

Historically, goat willow has been used for many different purposes. The bark contains tanning substances that have been used to tan leather. Goat willow bark is still used in traditional Sami handicrafts. Goat willow wood is sometimes called poacher wood in Swedish because it produces very little firewood.

Together with other types of willow, goat willow has been used as feed for livestock, especially in northern Sweden. Branches and twigs were dried and stored as winter fodder. Goat willow is called *Salix caprea* in Latin and *caprea* means goat.

The bark is also used for medicinal purposes as it contains salicylates, the same substances found in many painkillers. Salicylates are also antibacterial and in traditional medicine a decoction was made from the bark that was then used to clean wounds and to treat chills, fever and rashes. The wood is soft and light with red-brown heartwood and in the past has been used for various household items, such as butter dishes.

Photo: Sten-Olof Petterson.
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▲ Diamond willow fungus and lung lichen on goat willow.