



The border posts of a wetland conservation area stand out as white points (A. Torvinen).

## CONSERVATION OF AAPA MIRES

The conservation of wetlands became a topical question in Finland in the 1970's, owing to the rapid reduction in the area of wetlands in a natural state as a result of drainage activities. A wetland conservation programme was drawn up, which included a wetland conservation network covering the whole country. According to the EU Habitat Directive, aapa mires are classified as habitats of prime importance. Finland has a special responsibility for preserving aapa mires because it lies in the middle of the European aapa mire region.

The project "Protection of aapa mires in the Lapland and in northern Ostrobothnia", supported by the EU, was started in 1997 to promote the conservation of aapa mires. The project implements the conservation by establishing statutory wetland conservation areas. In addition, the drained peatlands in the conservation areas are being restored. Nature trails with wooden walk-ways and bird-watching towers have been constructed to facilitate recreation.

## INFORMATION

The Lapland Regional  
Environment Centre  
PB 8060, FIN-96101 ROVANIEMI  
[www.vyh.fi/lap/lap.htm](http://www.vyh.fi/lap/lap.htm)

Forest and Park Service  
Natural Heritage Services  
PB 8016, FIN-96101 ROVANIEMI  
[www.metsa.fi/luo/index.htm](http://www.metsa.fi/luo/index.htm)

Forest and Park Service  
Natural Heritage Services  
PB 81, FIN-90101 OULU  
[www.metsa.fi/luo/index.htm](http://www.metsa.fi/luo/index.htm)

The North Ostrobothnia Regional Environment Centre  
PB 124, FIN-90101 OULU  
[www.vyh.fi/ppo/ppo.htm](http://www.vyh.fi/ppo/ppo.htm)

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Figure of cover: Aarno Torvinen;  
tupasvillaa aapasuolla



Aapasoiden suojeleminen Lapissa ja Pohjois-Suomella



# AAPA MIRES

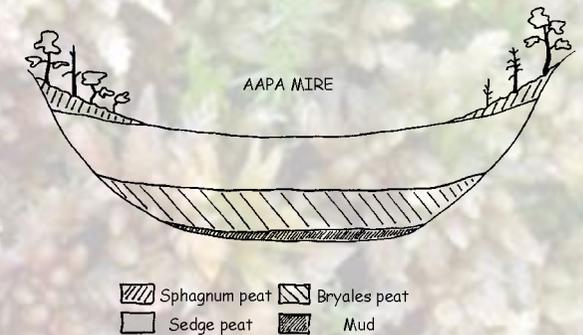
## The World of Plants

## WHAT IS AN AAPA MIRE?

The name “aapa” refers, especially in northern Finland, to a broad wetland with open areas in its centre. Aapa mires are the largest type of wetland in Finland, covering tens of thousands of hectares even.

Aapa mires are minerotrophic, i.e. they receive their nutrients from the surrounding land. In contrast, raised bogs mainly rely on precipitation for nutrients. An aapa mire can also obtain nutrients from the mineral soil underlying the mire, or via groundwater and runoff from the surrounding forested areas. The catchment area of an aapa mire is usually much larger than that of the mire itself. In the spring the snowmelt water collects in the middle of the aapa mire, and it looks more like a lake than a mire. At this time of year the middle of the bog, which is otherwise dependent only on precipitation, can also receive nutrients in runoff.

## PROFILE OF AN AAPA MIRE

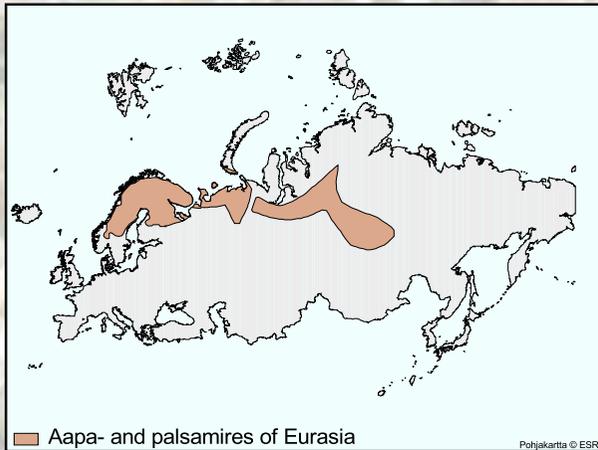


The centre of an aapa bog is usually lower than its edges. It is usually treeless, and a wet flark bog or fen. The edges of the bog consist of forested pine bogs and fens. Spruce swamps are less common. Strips of forest frequently provide some contrast to the otherwise open landscape.

At the edge of an aapa mire there is a gradual change from wetland, via paludified mineral soil sites, into upland forest. On slightly sloping land this intermediate zone can stretch for tens of meters but, if the edge is formed by steeply sloping mineral soil, the limit of the bog is sharp.



Aerial photo of an aapa mire in a natural state. Kilsaapa-Ristivuoma, in Perä-Pohjola (A. Torvinen).



## AAPA MIRES IN EUROPE

Different kinds of wetland form an essential part of nature in Finland. In fact, Finland has the largest total area of wetland in Europe, owing to its northern location and cool, humid climate. In the real aapa mire area in northern Finland, precipitation is greater than evaporation. The relatively flat topography in the north also promotes paludification.

The region where aapa mires occur covers almost half of the country. Aapa mires are especially concentrated in the north, and raised bogs (ombrogenic wetlands) are to be found in southern Finland. Aapa mires also occur in other parts of Europe, but Finland has the greatest diversity of aapa mire types.

Aapa mires play an important role in nature. They are the only breeding grounds in Europe for a number of rare species of bird, and provide a refuge for many threatened plant species.

## FORMATIONS CREATED BY THE WATER

When walking over broad aapa mires, you will see flark and string formations. These structures and shapes in the surface of the mire are formed as a result of frost heaving and the flow of snowmelt water.

A flark is the wet surface of a mire, and it can be extremely difficult to traverse. A muddy flark has no mosses at all, and even vascular plants such as the mud sedge (*Carex limosa*), great sundew (*Drosera anglica*) and bogbean (*Menyanthes trifoliata*), are rare. On muddy flarks you may occasionally find dark-shooted mosses such as *Warnstorfia procera*.



Flarks and strings on an aapa mire (A. Torvinen).

Strings are elongated hummock that line the flarks and channel the flow of water. They can be formed of clearly distinguishable *Sphagnum* tussocks up to a meter high, or bands of sedges and purple moor-grass (*Molinia coerulea*) that barely lift themselves above the surrounding mire. Strings can extend for kilometres. The strings are not common in the southern part of the aapa mire region, where the mires are covered instead by *Sphagnum* mosses and look “rather dry”. Strings provide a relatively easy route across the wet mires, that are used by many animals.



A hanging bog (A. Torvinen).

Special forms of aapa mire include the hanging bogs that occur on the chains of hills in Kainuu and eastern Finland.

The other special form of aapa mire is palsa bogs, that are to be found in the northern Lapland. Palsas are large *Sphagnum* hummocks which have a frozen centre. Because of the short and coldish summer the frozen centres of hummocks do not melt. Thus, they can be hundreds, even thousands of years old.



A palsa mire (A. Torvinen).

## ANTIQUÉ AAPA BOGS

The formation of wetlands started in Finland at the end of the last ice age about 9000 years ago, as peat started to accumulate in paludified areas. As a result of the different climatic conditions, wetlands in the southern part of the country have mainly developed into ombrogenic raised bogs, and in the north into aapa mires. Land uplift on the western coast has also increased the diversity of wetland types.

The rate of peat accumulation is nowadays about 0.6 mm a year, and the thickness of the peat layer in mires averages about 1.5 m. The peat in aapa mires does not accumulate as rapidly as that in raised bogs, and the peat layer is not as thick.



A mire with dense bog bean vegetation (A. Torvinen).

Strings and flarks have formed on the mires, about 3000 – 4000 years ago. The strings may, as a result of water pressure, move tens of centimetres yearly.

When a thick layer of peat has formed, the amount of nutrients available for plants decreases and the fertility of the mire gradually deteriorates. The fate of many aapa mires appears to be a gradual development into a raised bog. However, the large-scale flooding in the spring in northern Finland usually prevents aapa mires from developing into raised bogs. The raised bogs in the north occur in places where streams, rivers or lakes leach out the nutrients carried by the flood water.

## THE KINGDOM OF WETLAND PLANTS

A large number of peatland plant communities can be distinguished on aapa mires depending on how wet and fertile the site is. At least 75 different peatland types have been classified.

Hummocks usually have dwarf shrubs, grasses and mosses characteristic of dry sites. The most common species is *Sphagnum fuscum*, often accompanied by the *Myrica anomala*. Spruce mire hummocks are usually formed by red-stemmed feather moss (*Pleurozium schreberi*) glittering feather moss (*Hylocomium splendens*) and *Sphagnum angustifolium*.

The edges of flarks often have dense, continuous stands of *Sphagnum* spp. The sedges growing in flarks are species that can withstand waterlogging, such as slender sedge (*Carex lasiocarpa*), beaked sedge (*C. rostrata*) and mud sedge (*C. limosa*). Mosses such as *Drepanocladus* spp., Calliergon spp. and *Sphagnum majus* and *S. lindbergii* thrive in wet places. Bog bean (*Menyanthes trifoliata*) and *Eriophorum angustifolium* grow in many of the strings.



The yellow marsh saxifrage in a threatened species (A. Torvinen).



*Epipactis palustris*, which is a species of calciferous wetlands that has become rare, thrives on fens (A. Torvinen).

The diversity of peatland vegetation reaches a peak in fens which, with their many rare peatland plants, are important habitats. Many orchid species, such as *Dactylorhiza cruenta*, *D. traunsteineri* and *Malaxis monophyllos*, only grow on nutrient-rich fens.

Fens occur in areas where calcium-rich bedrock provides abundant nutrients for plants. Nowadays, fens in a natural state are mainly to be found in northern Finland, especially in the Kuusamo and Lapland Triangle area. The Lapland Triangle refers to the area between the River Torniojoki and the Kivalot hills.

## THE MARKS LEFT BY MAN ON THE AAPA MIRES

Man has exploited the aapa mires in a variety of ways. Today, they represent important areas for berry picking and hunting. In the old days, people collected “bog grass” for cattle fodder. The foundations of hay barns and hay stacks can be seen on peatland meadows.

The mires were partly flooded by damming the outflow from the mire. This killed off the *Sphagnum* mosses, leaving room for sedges and grasses to grow.

Some plants which are nowadays rare benefit from mowing. These include the yellow marsh saxifrage (*Saxifraga hirculus*) and *Schoenus ferrugineus*. Nowadays, in addition to nature’s harvest, aapa mires offer hikers a place to relax and admire the diversity of nature.



The remains of a hay barn on an aapa mire (A. Torvinen).