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nature guide

Nordmaling - Fredrika

LOkala NAturvårds satsningen

tempelleden.se – nature guide

e-guide to the nature along the Temple Trail
available for download at:

http://tempelleden.se/

The Temple Trail passes through several wilderness areas with weak or non-existing signals from mobile networks. Therefore this e-guide does not need the Internet. When coverage is available, however, smart web links take you to web-maps of geographic locations and other useful information. With a GPS (smart phone or other device) the e-guide can guide you all the way regardless of the signal strength of the Internet.

As a complement to the e-guide is also two map layers for applications that read KML format (Google maps and similar applications).

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The author is solely responsible for the content
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Nature along the trail from Coast to Inland


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202
0
30
km

The temple trail

The temple trail is centrally located on the Scandinavian Peninsula and stretches from the Gulf of Bothnia at Nordmaling to the Temple hill at Fredrika village. The trail runs along River Lögdeälven and Lake Viskasjön, through narrow soil ravines and vast woodlands. The total length of the trail is about one hundred and thirteen kilometers. The temple trail connects Nordmaling municipality and Fredrika village, and contributes to maintain ancient cultural links between the valley of River Lögdeälven and the woods around Lake Viskasjön.

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eleven nature areas

The surroundings of the temple trail offers nature for all senses, with water, forests and geological formations as the main elements.

The guide describes eleven areas of nature that are passed along the trail. The focus of the descriptions is on nature and its history, and the ecology.

For further information please browse the following pages in this e-guide, and the online maps on:
http://www.tempelleden.se/map/

The e-guide starts on the next page →

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① the rising delta

The River's delta is both ecologically valuable and geologically interesting. But it is constantly changing due to land uplift: In 100 years it will be further out in the sea, and 10,000 years ago, it was located many kilometers upstream the current delta.

2,000 years of land uplift

In a coastal forest near the municipality of Nordmaling you will find the starting point of the Temple Trail [63.55795,19.42280]. Here is the mouth of River Lögdeälven and a delta

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with several delta channels. The widest channel is deep and leads with ease a boat to the river's mainstream [63.55461, 19.44300]. A few kilometers further upstream the many meander-curves on the coastal plain appears. After nearly twenty kilometers of meandering the river straightens out again, in Lögdeälvens water richest rapids, Kodalsforsen rapids.

View over the uplifted river delta, today covered by coniferous forest.

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The boat-trip, or walk, from the sea to the Kodalsforsen rapids, is also a journey from a newborn river delta to a 2,000 years old delta: About 2,000 years ago the river delta was located near upstream the Kodalsforsen rapids (when the rapids were still buried in soil). However, the land uplift was fast and forced the river down in its own delta, in pace with the uplift. Both the rapids and meander-curves downstream began to form.

Also they who moves further upstream will meet the uplifted river delta. But then even older deltas which are raised even higher from the sea level. The oldest delta is 10,000 years old, and during that time it has risen 240 meters above sea level. Click here to read more about the oldest delta (p67). Old delta surfaces are filled with pink on the maps that begin on page 88.

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Wild beaches

In the northern part of the delta, you can stroll through a leafy coastal forest and find newborn sandy beaches. In this area there are also sand dunes. The northern part of the delta is most easily reached via a dirt road that starts in the village of Mo, follows the river on its northern side, and then goes under the E4 and the Bothnia Line.

At the river delta of Lögdeälven.

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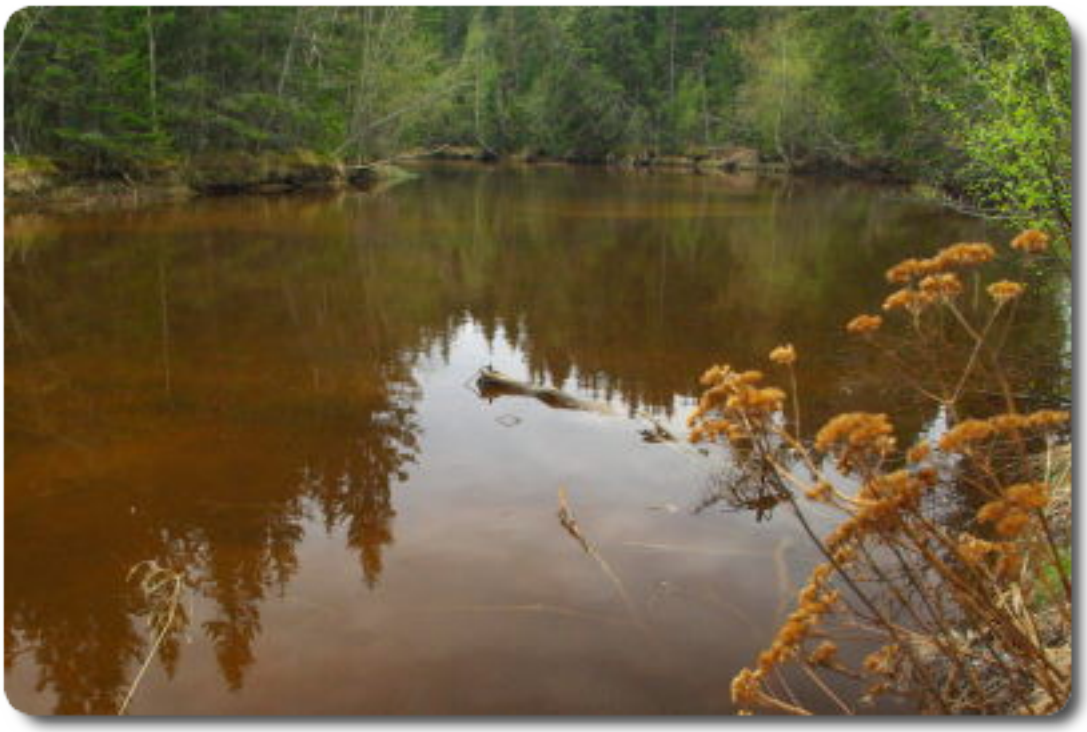
Channels

In the delta the river branches out into channels. At present most water flows in a channel to the east [63.55461,19.44300]. But until year 1969 the river was prevented to flow freely through the delta: Rows of wooden poles along the banks steered the flow straight out, to facilitate timber floating and timber sorting [63.55069,19.44699].



One of the channels in the river delta.

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Resting site for migratory birds

Large sandbars are located at the outer parts of the river delta. Whooper swans, cranes and various species of ducks are examples of birds that rest there during spring and fall.

The delta in the past

The map from 1794 (below) shows that the river delta went east and was pretty close to the gray rocks of Römyrberget. Today the delta is pointing south, considerably further from Römyrberget.

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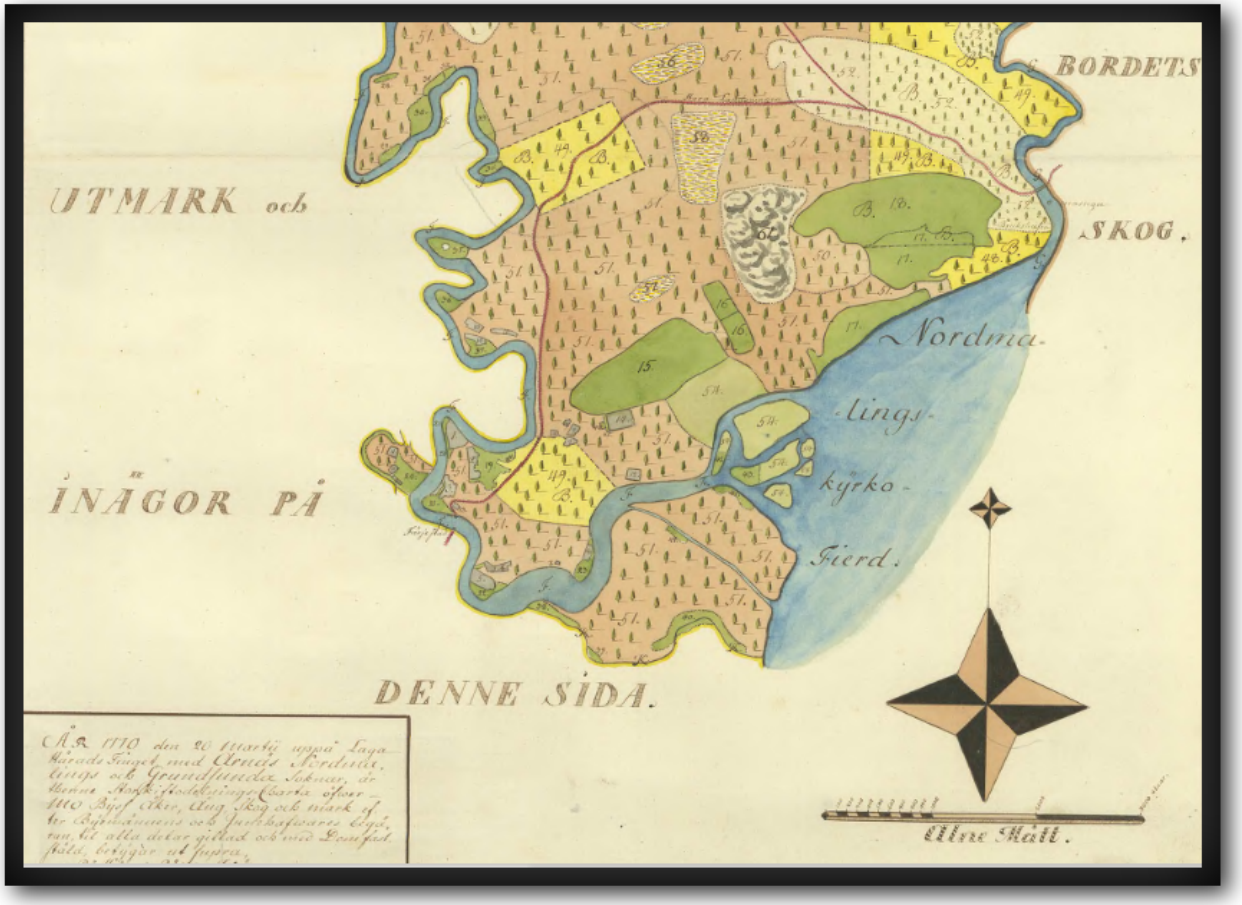

From an old map of the delta in 1794.
Image Source: Historiska kartor. © Lantmäteriet.

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② coastal plain and caves

On the coastal plain there are many beautiful meander-curves. And where the plain ends, the valley of River Lögdeälven opens up in a hill-ridge with many tunnel caves.

The cloverleaf

Closest to the coast, lies a plain and one of the most pronounced meander-landscapes along River Lögdeälven. As seen from above the river is forming a shape that resembles a cloverleaf. More than twenty major meanders prolongs the river ten kilometers.

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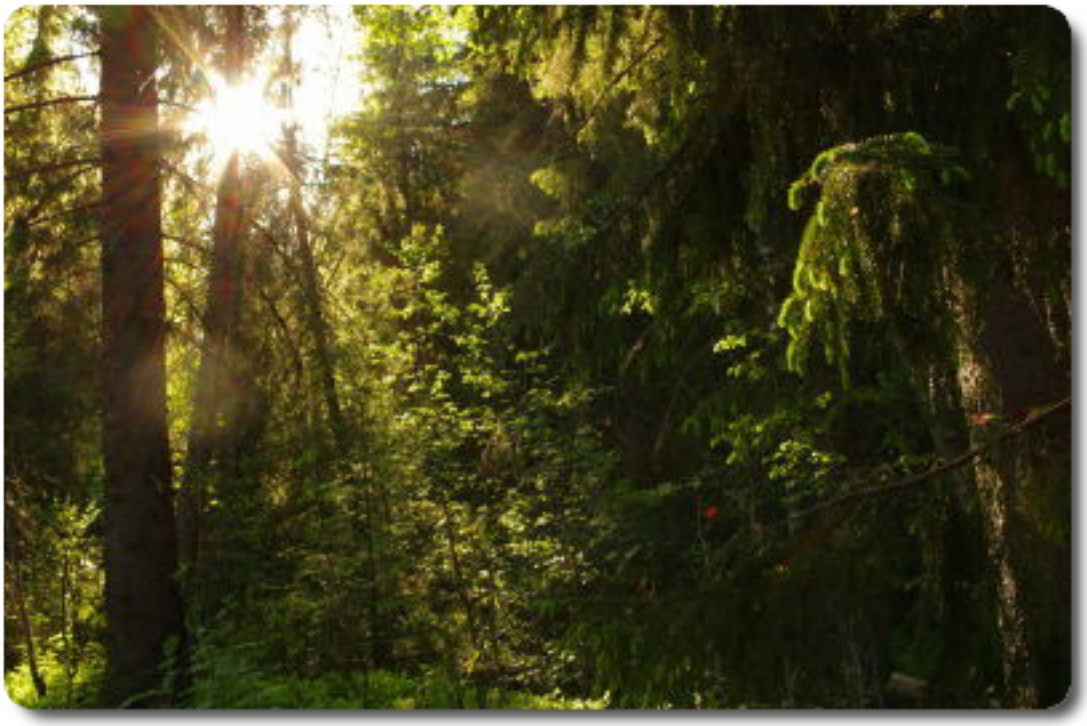
The villages of Mo and Lögdeå are both more than 500 years old and lies close to the cloverleaf. During centuries both villages have witnessed the consequences of the lateral river erosion. Already in the 1600s surveyor Jacob Christroffersson documented that farmers lost significant arable land due to the river's erosion. Also salmon fishing was reported to have been adversely affected by erosion during the 1600s.



Spruce forest within the nature reserve of Ålidberget.

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The meander curves nearby the villages of Mo and Lögdeå were formed because the landscape is flat and the soil consists of soft soil that is sensitive to water erosion. In flat landscapes, the water erosion of soil can almost only occur laterally.

Ålidberget, nature reserve

Downstream the Kodalsforsen rapids the trail goes through Ålidberget's nature reserve[63.57516, 19.36963]. The reserve gives the forest a chance to grow until it reaches its full age. The reserve therefore needs very little maintenance. Only in a few small areas, pine and spruce saplings will be cleared away, in order to leave space to broad-leafed trees, like birches, aspens and alders. Within a few hundred years, the forest have reached its real maturity and

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great natural values have been established within the reserve.

The steep hillside and the caves

The coastal plain is interrupted by a steep hillside (called “Nordmalingsbranten”). Here the traces of land uplift can bee seen in the form of tunnel caves. These caves were formed by wave forces as the ancient sea was beating against weak zones in the rock, more than 6000 years ago.

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View from the hill just above the tunnel cave of Tjuv-Ante.
Photo location: 63.59400, 19.37909

The cave of Tjuv-Ante is one of the most visited tunnel caves in the area. [63.59319, 19.38029]. The cave is deep and spacious for being a tunnel cave. Just above the cave there is picnic area with great views of the coastal plain [63.59400, 19.37909]. And a stone's throw west of the picnic area is a large rubble field, which is another evidence

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of how sea waves affected the steep hillside by the plain.

Stairs leading down to the cave-hall where Ante once lived.

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③ heaths and gullies

Along the trail between the villages of Hyngelsböle and Genberg,
there are many deep gullies, high soil mounds and wide river terraces.
Common for all of these landforms
is that they were created with a wink
and will be washed very soon
- on the geologic time-scale.
There are many ancient canyons made of bedrock. In contrast, the valley of River Lögdeälven is one of a few large valleys in the world which shows a variety of sculptures in soil rather than rock.

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The moist environments in gullies often develop a rich flora and fauna. The picture shows the slope towards the bottom of the gully of Sågbäcken Brook. [the gully of Sågbäcken Brook meets the river at 63.60988,19.28728]

Scars in the deep soils – gullies

As soon as the soils emerged from the sea due to land uplift, running water started to form gullies (soil ravines). Where the soil is soft and deep, near the river, the gullies have

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become particularly large. The gully of Sågbäcken Brook is the longest (5 km). The number of small ravines are very large in the area.

The moist environments in gullies often develop a rich flora and fauna.

Storfall rapids and the heath

Storfall rapids are impressive, with a high total drop height. The rapids began to form for about 5000 years ago, when the ground had been raised above the sea level due to land uplift.

During low flows, smoothed bedrock and small holes in the bedrock – so called potholes – are visible in the rapids. The potholes are formed in the center of long lasting whirlpools.

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On the north side of the rapids are several levels of river terraces that mark the different heights of the river before the rapids were formed. The ages of these old riverbeds vary between 5000 and 7000 years.

A large pine-forest heath lies about 40 meters above the Storfall rapids. This very flat surface marks the river delta of Lögdeälven and the sea level about 7000 years ago.

The meadows and the peaks

Along some stretches of the river, dozens of meters of the original river banks have been washed away, so that the river level is not much lower than surrounding land. In the past, such low lands were indispensable for the farmers. Here the ground was fertile and gave winter-hay to the livestock. On the higher levels in the valley, most often nearby

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the the farmhouses, grains and vegetables were cultivated instead of hay. On these fields the manure from the livestock was spread out. One can therefore say that the river created fertile meadows - giving food to the livestock - which in turn fertilized the fields - which gave bread and vegetables to the population. Today, no hay are produced on the meadows near the river. Instead, thriving young forests grows there.

There are still some minor remains of the massive soil-layer that once stood atop the fertile meadows (i.e. before the meadows were formed). These remains often have the form of conical mounds. Such mounds have names as Nilapiken (Peak of Nila) and Höglandskyrkan (the Highland Church) and Sockertoppen (the Sugar loaf).

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Krokänget is a low-lying tongue of land, within a meander-curve. Formerly Krokänget gave hay to the livestock, which in turn gave manure to the fields with grains and vegetables higher up on the valley side.[photo location: 63.68558, 19.11368]

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④ the former archipelago

At the village of Nygård the river valley is narrow. The main esker Lögdeälvsåsen is located on the western side of the river, and on the east side are high hills.

About 10 000 years ago, these highest hills were not hills but rather remote islands in the ancient Ancylus sea.

The islands were outermost in a vast archipelago. The mainland and the mouth of River Lögdeälvens were barely visible at the horizon nearly thirty kilometers inland in a northwesterly direction.

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The highest coastline

Near the villages of Nygård and Genberg is a 10,000 years old coastline, high up in the hills. It is the highest coastline along the Temple Trail, and one of the very highest traces of the sea in Sweden, about 275 meters above sea level.

Some of the highest traces of coastline in Sweden are located about 275 meters above current sea level on the hills nearby the villages of Nygård and Genberg.

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A particularly evident trace of the highest coastline is located just below the hilltop of Stor-Rundeln hill [63.697, 19.1385]. The glacial till (soil) that was formed during the Ice Age is still being preserved and untouched on the top. But the just below the hilltop, the ancient sea reached with great force and washed away all the soil. Bare stone and bedrock thus became exposed all around the hilltop.

The Esker Lögdeälvsåsen

A narrow, high ridge of sand and rounded stones appear among the gullies in Nygård village. The ridge is part of the Esker Lögdeälvsåsen which is a very long geological formation along River Lögdeälven. The ridge was formed 10,000 to 15,000 years ago, when sand and stones settled near the mouth of a very large melt-water tunnel

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beneath the inland ice sheet.

A small path runs along the top of the esker in Nygård village. The esker was formed 10,000 to 15,000 years ago, at the mouth of a very large meltwater tunnel under the inland ice sheet.

From the bridge in Nygård village, one can walk along the ridge of the esker. The esker is very steep and up to 35 meters high. Although the esker is located far below the highest coastline, it is very well preserved.

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That is because the sea wave forces were very weak where the esker lies, on the bottom of the narrow valley.

Pitfalls and archaeological findings on the Esker's ridge in Nygård, bear witness that people have lived on the ridge for a long time, perhaps as far back as the Stone Age.

The spring and the oxbow lake

Flarkogen is an oxbow lake which gets water from a little spring [63.72955,19.05569]. The water comes from a layer of water-permeable sand, which acts as a natural filter for organic material and bacteria. The temperature of the water is about 5 degrees Celsius all year round. At least in some years the Flarkogen oxbow lake plays a role as a protected nursery for river dwelling fishes like bass and pike.

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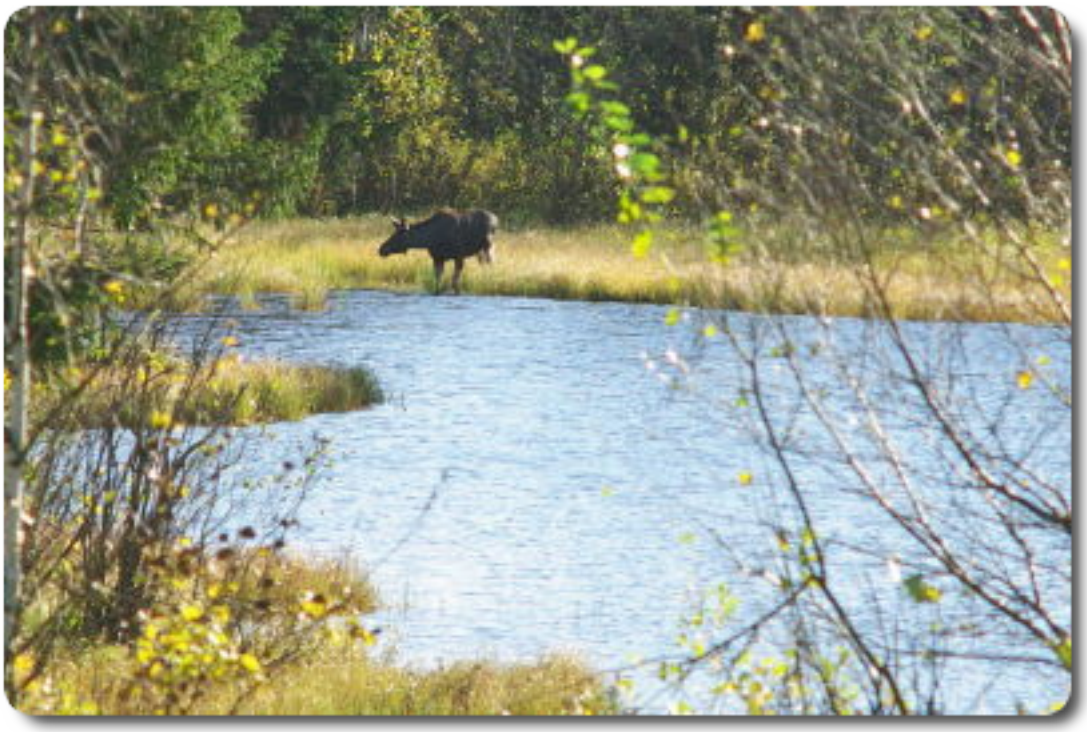

Flarkogen is an abandoned riverbed, which gets water from a nearby spring.[at: 63.72955,19.05569].
Also seen in the picture is a moose.

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⑤ the lower meanders

The lower meanders are located upstream the Nordsjö Rapids. The trail follows the beautiful northern side of the river.

The trail passes thirteen meander-curves and several abandoned river channels. At the village of Nordsjö the trail goes through a vibrant agricultural landscape.

The oxbow lakes

Between the villages of Norrfors and Nordsjö the river is eroded between 25 and 40 meters in the loose soil. But the erosion

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will not go deeper than that as long as the river runs over the rocks in the Nordsjö Rapids. Therefore, the river is digging sideways only, creating flat meadows, oxbow lakes and meander-curves.

Nordsjö Rapids.

Two oxbow lakes are located near the trail about 1 km upstream Nordsjö Rapids. An additional oxbow lake is passed closer to Norrfors village. On the west side of the

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river are several oxbow lakes in various stages of drying up and overgrowth.

The wild beaches

The northernmost wild beach among the lower meanders is located on a tongue of land about 3 km downstream Norrfors village [63.7555,19.0168]. Many inner curves of meanders have sandy beaches. This is explained by the fact that the river lose power in the inner curve, so that the sand can settle. In the outer curve, on the other hand, the current is strong and undermines the river bank with great force. Some years several meters of the river banks are washed away in the outer curves.

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Agricultural land in Nordsjö village

The village of Nordsjö is one of the oldest villages along River Lögdeälven. Here are also active farms, which are rare along the river nowadays. The farmers cultivate soils in steep ravines and on flat river terraces.

Wild beaches can often be found at the inner curve of meanders.

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The pastures and meadows of Nordsjö village may have been used continuously as long as 700 years. Such a long period of hay-making and grazing, has led to the establishment of an unusually rich flora.

The Nordsjö Brook has environments were sea trout spawn in early fall. The aquatic environments of the brook have also been verified to be suitable as a spawning area for wild Baltic salmon.

Geranium sylvaticum (wood cranesbill) thrive in both the river's gully and in the traditional agricultural landscape.

⑥ rapids and waterfalls

Between the villages Fällfors and Norrfors are several steep rapids and falls, creating essential variation in the river landscape.

In winter, open water is almost only found in the rapids, where white-throated dippers and otters have water to dive in.
And only among the stones and gravel of the rapids the trout fry can grow up.

In Lögdeälven, the rapids are also active landscape builders: Both Fällforsen and Nordsjö Rapids play fundamental roles for the extensive meandering in nature areas 5 and 7.

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The rapids nearby Norrfors

Nearby Norrfors village are three detached rapids: Nedre Älgforsen, Övre Älgforsen and Svartforsen Rapids. All three are frequently visited by the locals.

A large pool is located at the foot of Svartforsen Rapids, just upstream Norrfors village. Here is a wild beach, with sauna and changing rooms for all who likes to take a bath. Large pools, such as this, are often seen just downstream of narrow river passages. The pool-forming process is explained by the fact that the turbulent and digging forces of the water are exaggerated just after narrow passages.

All three rapids also clearly show how the river's forces have smoothed the edges of rocks and boulders. So called potholes can also be found. Potholes are round holes in the rock - formed in the center of long

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lasting whirlpools in the water. At the foot of Svartforsen Rapids, on the western side, is one of the potholes, quite shallow and about 20 cm in diameter.

Nedre Älgforsen Rapids are surrounded by steep cliffs. Closest to the water rocks are polished by the river. The suspension bridge over the rapids is seen in the background.

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Fällforsen Rapids

Until the 1990s, neither salmon nor sea trout migrated upstream Fällforsen Rapids. The great power of the waterfall prevented even the strongest individuals to get past.

The people who lived in the neighborhood knew about this. Every year they caught some of the salmon below the fall.

But in order to increase the salmon population throughout the whole river, a fish tunnel has been built, so that the fish can access also the upper parts of River Lögdeälven. So, if the wild salmon fishing in the sea is limited to sustainable levels, more salmon will return to the river in the future.

The bedrock in Fällforsen Rapids is much more resistant to water erosion than the surrounding soils. Fällforsen Rapids may therefore have existed for many millions of

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years, during different geological periods.

The highest waterfall in River Lögdeälven is found in Fällforsen Rapids. The upper opening of the fish tunnel, in concrete, is seen in the background of the picture.

But it is also likely that the waterfall during long periods has been a “dead” fall, and that it will die in the future. That is because a deeper riverbed probably exist north of the rapids. Today, this old riverbed is buried in

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mighty soil layers. These layers will eventually be washed away, like many other soils layers in the valley. If this will happen in 500 or 1000 years, or after the next Ice Age, is however impossible to predict at the moment.

The dams that were shelved

The rapids between the villages of Fällfors and Norrfors together have almost 50 meters drop height. In the early 1980s, there were detailed plans on how these rapids, and most of the other rich rapids in the river, ought to be used for electricity generation.

At the neck of Fällforsen Rapids a dam and a power plant was planned, with a long underground tunnel leading to the foot of Mjösjöforsen Rapids. The river valley downstream Mjösjöforsen Rapids was planned to be filled by a dam at the neck of

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Övre Älgforsen Rapids (nearby Norrfors village). The opposition to the project was however strong and the plans were shelved. Nowadays all free flowing rapids in the river are protected by law.

In the 1980s, there were detailed plans to use River Lögdeälven for hydro power. Here at the bridge over Övre Älgforsen Rapids was one of the dams planned to be built. The dam would fill the valley up to Mjösjöforsen, thus taming the free power of three Rapids: Övre Älgforsen Rapids and Nedre Älgforsen Rapids downstream of the bridge, and The Svartforsen Rapids located upstream of the bridge.

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⑦ the upper meanders

During thousands of years Fällforsen Rapids have blocked the river upstream from digging deep gullies in the mighty soil layers.

Consequently, the river have had plenty of time to spread laterally, and create a meandering river landscape with flat riverbanks and many old riverbeds and oxbow lakes.

For those who want to build sandcastles are here countless of sandy beaches.

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The meander-curves - Lögdeånäsen

River Lögdeälvens largest area with meander-curves and water-filled oxbow lakes is located between the villages of Fällfors and Nedre Nyland.

One of the many meander-curves in the Upper Meanders.

The first meander-curve is located just one kilometer upstream Fällforsen Rapids. Here is also a large wild beach with a wind

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shelter. A nearby parking ground makes it possible to go by car to the beach [63.82906,18.93339].

The area gets much of its character due to the fact that the river is unable to dig down in the deep soils, and instead only can move back and forth laterally. This lateral movement has been going on for over eight thousand years, creating a conglomeration of oxbow lakes alongside the river.

The moist soils closest to the river is richer than the other adjacent soils. This was recognized early by the farmers in the area. The land therefore was cleared from trees already during the 1600s, and then used for hay-making until the 1940s. Today, the many hay barns and cabins are gone, and the rich meadows have been transformed into lush young forests.

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The Stor-Gravaberget hill, in the background, has an 80 meter high cliff that provides a nice view of the Upper Meanders.

The steep cliff and the pitfalls

The cliff on Hill Stor-Gravaberget is 80 meters high. The hill is made of granite and offers nice views of the upper meanders.

The Swedish name of the hill was documented in the early 1700s. “Grava” in the name means pit, and consequently the name probably stems from the many pitfalls

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lying on the pine heath between the steep cliff and the river [63.83500,18.93063]. The pitfalls originate from an ancient and very long-lived hunting culture in this area.

Fresh oxbow lake [63.85035,18.90931]

Near the village of Bjurvik the trail passes several oxbow lakes. "Gammån" is one of the most recently formed. Old maps shows that the river's mainstream went through Gammån at least until the beginning of the 1900s, and that the new channel took its present form around the 1950s. The municipal boundary between Nordmaling and Bjurholm was drawn along the river before the time Gammån became an oxbow lake. This has left an unusual bend on the otherwise very straight municipal boundary.

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⑧ river bluffs and terraces

Between the villages of Nedre Nyland and Övre Nyland the river is deeply eroded in the soil layers. The difference in height between the river and the river bank can be more than 60 meters. So, keep your footing, please!

The Dragons Back (Drakryggen) and the climbing walls of Blåberget Hill are two of the most visited nature objects in the area.

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The Giants Steps

On the side of Långforsen Rapids, upstream the village of Nedre Nyland, the river has created a 40-meter high "staircase" of eight terraces in the loose soil [start here: 63.89979,18.89029]. From a geological point of view, these "giants steps" are very fine examples of how land uplift and the digging force of the river, together have shaped the valley as it looks today.

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The Giant Steps consists of eight levels of terraces. The highest level marks the highest sea level after the Ice Age.

The formation of the “giant steps” started about 10,000 years ago, when the sea level was at the same height as the highest terrace. The valley below was at that time filled to the brim with sand, soil and icebergs. But the land uplift was more than 10 times faster than today, and the valley was lifted quickly above the sea level. The river thus acquired a great force to dig down

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into the loose soil. Terrace after terrace was formed as the land was lifted. The eight terraces were fully formed already after about 500 years, which is very fast in a geological point of view.

The Dragons Back [63.93244,18.86954]

The Dragons Back (Drakryggen) is an elongated, narrow and high residual of the soil layer that once filled the valley. The geological form is commonly called "nipudde" in Swedish. Such soil-formations are very unstable. Therefore, ridges as large as "Drakryggen" are very uncommon. The real dragon – River Lögdeälven - has already eaten up large parts of the formation, and every year it takes big bites. Within a few hundred years, at least the lower part of The Dragons Back will be completely gone.

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The Dragons Back is located in the center of a very interesting geological area along River Lögdeälven

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The lower part of The Dragons Back lacks vegetation, and will probably disappear within one or a few centuries, due to the strong erosion of the river.

Just 150 years ago, the river had a quite different running through the area. The river ran on both sides of The Dragons Back, and the steep rapids of Storforsen was located some hundred meters downstream. But during timber-floating in year 1873, a dam of timber was formed upstream the location of The Dragons Back. The river flooded over

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and found a new and deeper furrow in which long and relatively flat rapids were formed.

The clearest traces of Storforsen Rapids are currently located 500 meters downstream The Dragons Back. Among the trees on the eastern side of the suspension bridge, smoothed bedrock and boulders can be found [63.9271,18.87592]. There are also several cavities - potholes - formed by the whirlpools of the former rapids. The largest pothole is about one meter in diameter.

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⑨ thriving wetlands

If you want to find biologically rich environments you should seek areas where land and water meet.
There, life have access to both nutrients and the life-giving power of water.
A variety of life-forms thrives on low river banks and wetlands.
Wetlands are also often protected from modern forestry
and are difficult for people to be in.

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The wetlands of Övre Nyland

One of the biologically richest wetland areas is located just upstream the village of Övre Nyland. Numerous types of wetlands are found there, from meadows and marshes, to springs and bogs. The wetlands have formed in a wide depression in the landscape.

The wetlands of Övre Nyland receive water from springs and streams, and from the river. In some parts are also bogs, which receive water from rain and snow only. In the past, parts of the wetlands were used as meadows for hay-making.

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In the middle of the area the Esker of Lögdeälvsåsen form a narrow ridge with drier wooded land. Some smaller eskers also run through the south-eastern part of the area.

The wetlands of Övre Nyland receive water from springs and streams, and from the river. In some parts are also bogs, which receive water from rain and snow only. In the past, parts of the wetlands was used as meadows for hay-making. The meadows closest to the river yielded especially good harvest.

Mosquitoes

Mosquitoes can be quite abundant in the wetlands of Övre Nyland. Especially the biting mosquitoes will be noticed by those who passes here during summer. Also the mooses in the area can be troubled, and are

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happy to stay in water if they can.

Mosquitoes are found in several species. Common to many of them is that females need extra protein in the form of blood in order to lay eggs. The numerous small ponds in the wetlands of Övre Nyland provide plenty of space for female mosquitoes to lay eggs. And if the pond dries up, the eggs are quite resistant until the pond fills up again by rain or flooding of the river. Mosquitoes occur mainly between June and August.

Link to image source (GPL)

In Sweden, mosquito transmitted diseases are very rare. Nonetheless the bites can be very irritating to the skin, and even maddening for those who cannot protect themselves from bigger swarms.

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So, for those who want to avoid mosquito bites there are both mosquito nets and chemical agents. The effective chemicals should however be used carefully, and never on small children. Good mosquito nets in combination with clothes on the body is the healthiest and most efficient bite-protection. The clothes should not be too thin, because some mosquitoes then may bite through.

Holmsjöbäcken Brook [63.97558,18.79520]

After the fish tunnel in Fällforsen Rapids was built, both salmon and sea trout from the sea swims up to Holmsjöbäcken Brook. The brook also hosts the fish species perch, brook lamprey, pike, brown trout and bullhead. All these species have interesting behaviors and life strategies. The Bullhead, for example, is a fish that lack swim bladder

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and build nests to protect and defend their eggs.

In Holmsjöbäcken Brook the habitats for fish and other aquatic animals are partially damaged by the timber floating, which lasted until 1969. Among other things, canals were built in the rapids. This means that several species of fish eggs and larvae do not get the same protection as before. Also several dams were built. These dams hindered fish and other aquatic animals to swim upstream the water system.

In order to support the health of the aquatic ecosystem, work is now carried out to restore the Holmsjöbäcken Brook to its natural condition.

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Holmsjö brook, in the picture, flows into the wetlands of Övre Nyland. The brook is one of several biologically valuable tributaries to River Lögdeälven. Its water quality is very good, but many of the rapids were converted to canals during the timber-floating era (see picture). This means that several species of fish eggs and larvae do not survive as easily as before.

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⑩ where the river was reborn

River Lögdeälven's passage under road 92 marks the historic encounter between the inland ice and the ancient Ancylus Lake.

This was 10,000 years ago and the inland ice was melting rapidly. Colossal detached remnants of melting inland ice was stuck upstream the river mouth and in the shallow bay nearby (downstream road 92).

At the time the land was uplifted by up to 40 cm per year and the icy water of the river shimmered in green.

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The rebirth

River Lögdeälven was reborn after a one hundred thousand years long winter. The front wall of the ice sheet retreated to the west and a newborn land and the river emerged between wall and the Ancylus Lake a short distance downstream. This was 10,000 years ago and the sea was at its very highest level. The trace of the highest coastline today lies near the place where the road 92 passes River Lögdeälven.

In the river valley near road 92, there are still traces of icebergs that were detached from the huge wall of inland ice. The icebergs got stuck either in the sand some distance into the sea, or on the beaches. Some of the icebergs became buried under tens of meters of sand and gravel. The icebergs that lay buried, however soon melted so that large holes – so called kettle holes – appeared.

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One of many kettle holes nearby where road 92 passes River Lögdeälven. In this kettle-hole, and several others, the micro-climate is so harsh that no tree can take root.
[position: 63.98084,18.80430]

On top of the inland ice sheet were rivers and streams leading into huge holes. The holes was hundreds of meters deep and led down through the ice into a large main tunnel that ran under the ice at the bottom

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of the valley of River Lögdeälven. The esker that runs along the river is the main trace of this almost unimaginably powerful melt water tunnel. Particularly evident is the esker from the road 92 and up to Lake Lögdasundselet.

Immediately downstream of the current road 92 something unusual happened. Several eskers were formed next to each other - in the form of a network of eskers. Within esker-network are also conical mounds, called kames, which was formed when the cavities or holes in the ice were filled with stones and boulders.

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A rare landform is located close to River Lögdeälven nearby road 92: namely, a network of eskers (ridges) that was formed in the last years of the Ice Age. Today, the landscape is bright and gentle [the center of the esker-network: 63.98017,18.80068]

The delta at the highest coastline

River Lögdeäven's oldest delta is very large, and is often described as “the highest coastline delta”. The sediments from this delta are located between 50-60 km from the present coast (in the Valley of River

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Lögdeälven). Although large areas of the delta have been washed away, several large areas remain about 240 meters above the sea level in nature areas 8-9. Also, the pine forest heath of Angsjöheden (road 92 goes through it) belongs to the highest coastline delta of River Lögdeälven, although Angsjöheden is quite far from River Lögdeälven today [63.9318,18.9740].

Erratic boulders

Along the trail at the western shore of Lake Lögdasundselet are several very large boulders of granite [64.05399,18.71148]. The boulders come from the hills that slope down to the lake. The inland ice sheet moved them there, after it had run into cracks and weak zones in the hills above the lake.

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The forests of the Ecopark

From the wetlands of Övre Nyland and up to Lake Lögdasjön, the temple trail goes through the Ecopark Käringberget. Here the forestry company SveaSkog conduct an unusual form of forestry which aims to both preserve nature and develop more sustainable forestry practices. Older forests that will be used for nature conservation are marked with green color in the maps of area 10 (s 101) and area 11 (s 104).

A particular objective of the Ecopark Käringberget is to let more deciduous trees grow up and grow old. That will be very good for the natural balance of the forest, because most forest companies previously cleared out or even used poisons to get rid of as many deciduous trees as possible. Deciduous trees was considered to be less valuable than conifers.

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Ecopark Käringberget houses large areas of young deciduous forest. Deciduous trees have become scarce due to the large-scale forestry. The landowner SveaSkog is aware of this and actively take out conifers to favor deciduous trees. The picture also shows a glimpse of one of the erratic boulders in the area [at 64.05399,18.71148].

Just south of Lake Lögdasundselet, is a large area of forest that will be left for conservation only. In that forest are already many old trees and dead trees, and many deciduous trees. Such forests are particularly important for plant- and animal life. In the

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nearby area is also a 2 km long riverbed that is abandoned, but still forms wetlands in the forest. The total environmental value is very high, and many animal and plant species thrive here. More information about the ecopark is available at the homepage of the Ecopark.

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⑪ lakes and vast forests

The eleventh nature area of the trail lies farthest from the coast, and has not been washed by sea waves.
The fertile soil of glacial moraine thus remains as the inland ice sheet left it.
Especially on the hills, the difference is distinct: Hilltops close to the coast lacks soil cover, while the hilltops here can be so fertile that it is possible to grow crops on them. One example is the village of Stor-Lögda west of Lake Lögdasjön. This village was built on a fertile hilltop. Käringberget hill is another fertile hilltop, and the highest point in the area with far-reaching views.

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The view from Käringberget Hill

On Käringberget Hill there are several large areas of old forest, protected by the Ecopark's management plan. A specialty here is the presence of many old pines.

Käringberget gives a broad view of Lake Lögdasjön and an undulating landscape. In the foreground is one of the many old pines on Käringberget Hill.[64.08803,18.62903]

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Old pines are important for wildlife: The golden eagle needs old pines to build their nests in, and both woodpeckers and owls prefer large old trees for their nests.

Among the insects are also many species that need old pines. The bug *Nothorhina punctata* is one such example. The larvae of the bug can only develop in the thick bark of very old, still living, pines.

The view point on Käringberget Hill provides a sweeping view of Lake Lögdasundselet, lake Lögdasjön and forest landscapes beyond. The view point is located in the western slope, about 450 meters above the sea level [64.08803,18.62903].

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The protected forest on Käringberget Hill is visible from the part of the temple trail that runs on the west side of Lake Lögdasundselet.

Views over Lake Stora Lögdasjön

A beautiful view of Lake Stora Lögdasjön is located at a wild beach near the trail [at 64.07941, 18.59617]. A couple of hundred meters out into the lake the Esker Lögdeälvsåsen forms elongated islands.

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Viewpoint at Lake Lögdasjön, within Ecopark Käringberget. Neither mobile network or Internet can be reached here. Lake Lögdasjön is 14 kilometers long, and the largest lake in the river basin of Lögdeälven.

Forestry and clear-cuts

On the northeast shores of Lake Viskasjön, the temple trail passes vast young forests. These forests were large clear-cuts 20-30 years ago. Such clear-cuts and young forests have become increasingly common in

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Sweden over the last 100 years. Roe deer and moose are among the species that thrive thanks to clear-cutting. But many other animals and plants are at a disadvantage.

To increase the biodiversity, quite large areas of the Swedish forests are now managed according to the organization FSC's criteria. The FSC label means for example that biologically valuable trees or groups of trees are saved when the rest of the forest is harvested. But is it enough? This question is often debated in Sweden, since the renewable raw materials from the forest becomes increasingly important resources, at the same time as the importance of healthy ecosystems becomes more and more evident.

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Forestry has a huge economic impact in Sweden. The practice of clear-cut is nonetheless often debated because it is also possible to conduct forestry without clear-cutting.
The picture shows a modern clear-cut that goes from a moraine covered hillside, down into a small ravine in the valley of River Lögdeälven.

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No monsters in Lake Viskasjön

Lake Viskasjön is nearly 16 km long and consists of six large basins connected by narrow straits. The lake has nine forested islands and several smaller islets. The largest island is Gravholmen. In the past this island was a place for burial of the dead. The trees and the graves on the island are protected.

Lake Viskasjön is 16 km long and consists of six basins. The water in the lake exchanged very slowly, which means that Lake Viskasjön is extra sensitive for pollution.

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Trout, whitefish, pike and perch are fishes living in Lake Viskasjön. The chance to catch a glimpse of lake-monsters is however very small. Large aquatic creatures in fact demand more food than Lake Viskasjön can provide, at least according to the researchers who calculated how much food the monsters of Loch Ness would need. Terrestrial "beast" who take a dip or swim, and brown bears and moose, you can however spot in the lake if you are really, really lucky.

The Mother of soils – glacial till

Between Lake Stora Lögdasjön and the village of Fredrika, the forest grows on a soil type that is rare along the other parts of the Temple Trail. The soil is called glacial till and was formed when the vast inland ice sheet slowly slid on top of the landscape, and scraped the bedrock. Glacial till includes

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everything from fine grains to huge blocks. Almost all soil filling up the Valley of River Lögdeälven, downstream, originates from glacial till that has been sorted by waves and currents.

The Spring [64.07014,18.51229]

Near the hill Kallkällråkullen the trail passes a straight boundary line in the forest. This line marks the boundary between two properties.

Approximately 200 meters south along the boundary line, towards Lake Viskasjön, a small spring is located.

The water in the spring comes from rock fractures in the foot of the hill. The spring creates small mirrors of water, and a small runnel leads down to a ditch that goes along the boundary line.

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The drumlin of Lövnäs

A little south of the settlement Lövnäs, the trail climbs up on an elongated ridge made of glacial till [64.06356,18.53959]. The ridge leads towards a hilltop made of bedrock. Seen from above, it resembles a hill with a tail of soil.

There are several such hills with tails in the vicinity. They are called drumlins, and were formed when mighty glaciers moved across the northern Swedish province more than 10,000 years ago. The ice was moving from the Scandinavian mountains towards the Gulf of Bothnia. But behind bedrock hills the ice lost its scraping force so that tails of soil could be formed Therefore, all drumlins are pointing in the same direction as the ice sheet moved.

The vegetation on drumlins are most often stronger and denser than on the eskers that

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runs along River Lögdeälven. That is because the soil of the drumlins can store water and nutrients better than eskers.

The Erratic boulder

Nearby Fredrika Village on small mound lies large boulder [64.08407,18.41565]. The inland ice mostly moved smaller stones, but sometimes it also took large boulders, especially from hilltops with many cracks. This particular boulder likely originates from the Babelsberget hill about one kilometer away in a northwesterly direction.

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Erratic Boulders are often remnants of hilltops that were spread in the landscape by the inland ice sheet. Most erratic boulders along the trail are found in the area around Lake Viskasjön and Lake Lögdasundselet. This boulder is located on the trail near the Village of Fredrika [64.08407,18.41565].

The temple hill

The Temple Hill in Fredrika Village gives panoramic views over an undulating landscape. To the north are the three

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westernmost basins of Lake Viskasjön. The basin closest to the Temple Hill is called Djupsjön (“the deep lake”). The outlet of Lake Viskasjön goes from Djupsjön towards Lake Skinnmuddselet and The river of Gideälven.

The Temple Trail ends at the Temple Hill in the village of Fredrika [64.07962,18.35186]. The hill is made of an ancient gneiss rock that was formed deep down in the earths crust long before there was life on land. The outcrops seen today are in fact the foundation and roots of a bygone world.

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Lake Skinnmuddselet, that is glimpsed towards west, is one of the largest artificial lakes in Sweden. The lake is 30 km long and was built in 1989 to regulate the water flows in the hydro power plants of River Gideälven.

Farther to the northwest lies the hilly wilderness area of Stöttingfjället, with a rich fauna in its vast wetlands and spruce forests. At the uppermost part of the catchment of river Lögdeälven, the so called Stöttingfjället Nature Reserve (link to Swedish text) host patches of exceptionally pristine old growth forests.

Just south of Stöttingfjället, about 20-30 km, kilometers west of the Temple Hill are several other very valuable old growth forests, such as the Björnlandet National Park.

The Temple Hill consists of a gneiss rock

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that is about 1.9 billion years old. The base color of the gneiss is black with patches of white. The black color comes mainly from the iron-rich mineral biotite, or black mica. There are also hints of the black mineral hornblende. The white color comes primarily from the minerals feldspar and quartz. The red colors on the rock surfaces are corrosion formed when the black minerals come in contact with water and air.

The geological history of the Temple Hill is breathtakingly long. Yes, so long that the the hilltops that we see today, in fact, are the roots of much higher mountains that once stood here. These roots are here today, because the mountains above slowly have eroded away over millions and millions of years of rain, snow, cold and heat.

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Maps with nature objects

map legend on the next page →

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*reserves/the large landowners' own protection/old forest within the Ecopark's plan
Sources: Länsstyrelsen (2012)/skyddadskog.se (2012)/Käringbergets Ekoparksplan (2008)

For the map content:
Base map (roads, lakes, large-scale landforms): SACCESS DERIVATE WORKS
Other: sources above, and field data within the temple trail project
GODKÄND FRÅN SEKRETESSSYNPUNKT FÖR SPRIDNING, Lantmäteriet 20120816

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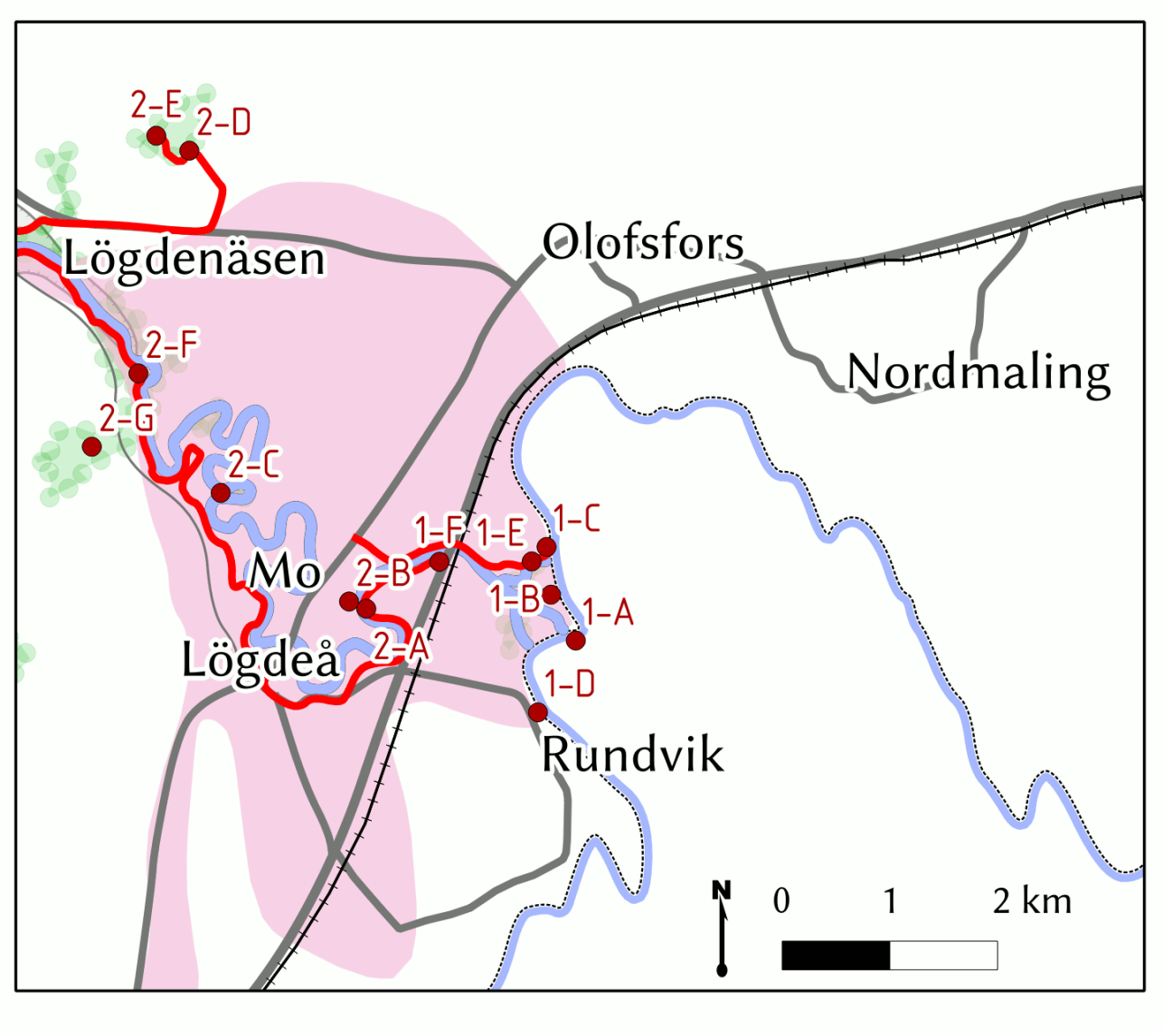
(area 1-2)



☞ LEGEND (p89)

1-A Outer delta @ 63.5507,19.44699

1-B Main river outlet @ 63.55461,19.44301

1-C Wild beach @ 63.55857,19.4428

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1-D Scenic view @ 63.54501,19.43909

1-E Delta-channel @ 63.55746,19.43988

1-F Lay-by E4 @ 63.55796,19.4228

2-A Meander curve with wild beach @ 63.55451,19.40872

2-B Old sand pit @ 63.5552,19.40564

2-C Oxbow lake to be formed here @ 63.56487,19.38332

2-D Tunnel Caves @ 63.59319,19.38029

2-E Scenic view @ 63.594,19.37909

2-F Nature reserve @ 63.57517,19.36963

2-G Nature reserve (old growth forest) @ 63.5694,19.36009

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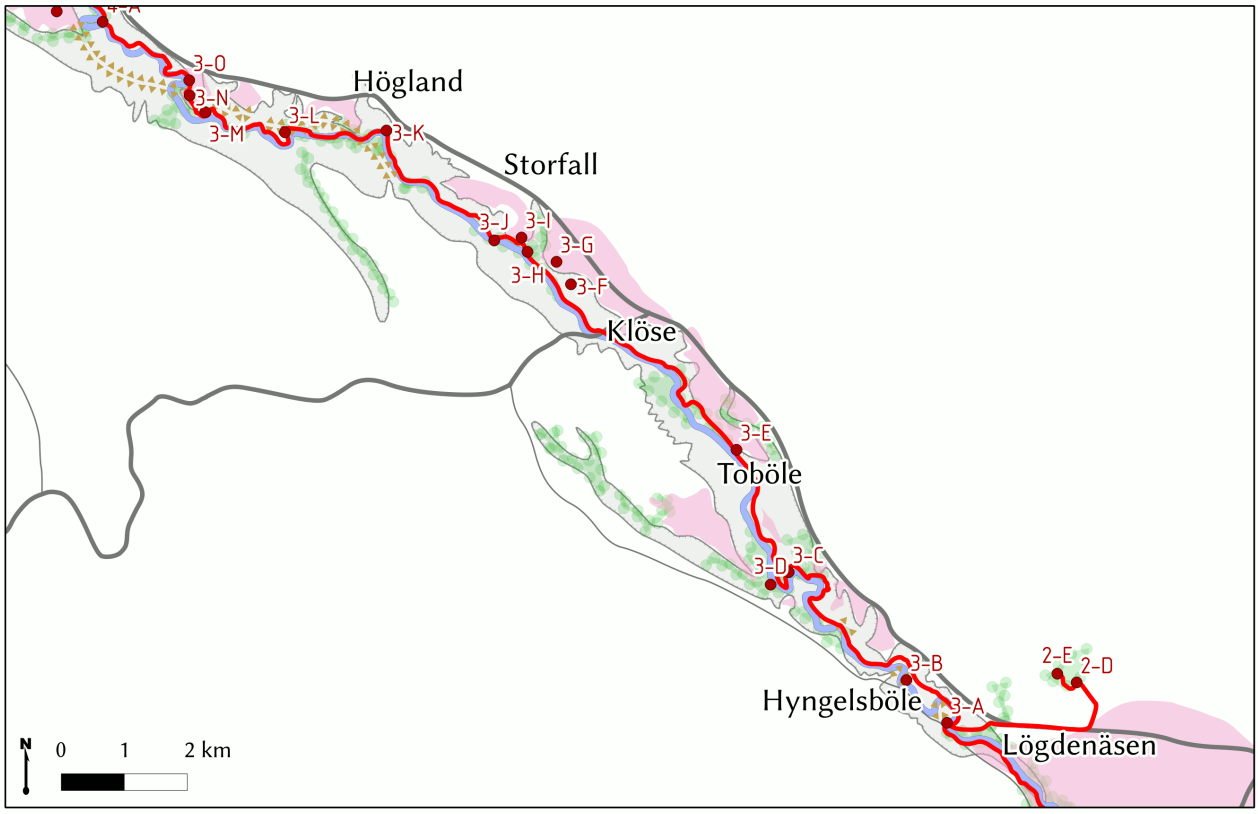
(area 3)



☞ LEGEND (p89)

3-A Lay-by and parking lots @ 63.58879,19.34005

3-B The main esker @ 63.59518,19.32813

3-C Mound of soil with fresh landslide @ 63.61147,19.29328

3-D Creek Sågbäcken Gully @ 63.60988,19.28728

3-E Erosion of former delta @ 63.62915,19.27936

3-F Old river channel @ 63.65397,19.23049

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3-G The former river-delta @ 63.65727,19.22637

3-H The gully of creek Stockbäcken @ 63.65894,19.21741

3-I Former river delta @ 63.661,19.21582

3-J Storfall rapids @ 63.66084,19.20711

3-K Rundbäcken brook @ 63.6773,19.17526

3-L Small lake @ 63.67798,19.14307

3-M Mound of soil @ 63.68153,19.11824

3-N Old delta @ 63.68403,19.11364

3-O Scenic meander @ 63.68616,19.11381

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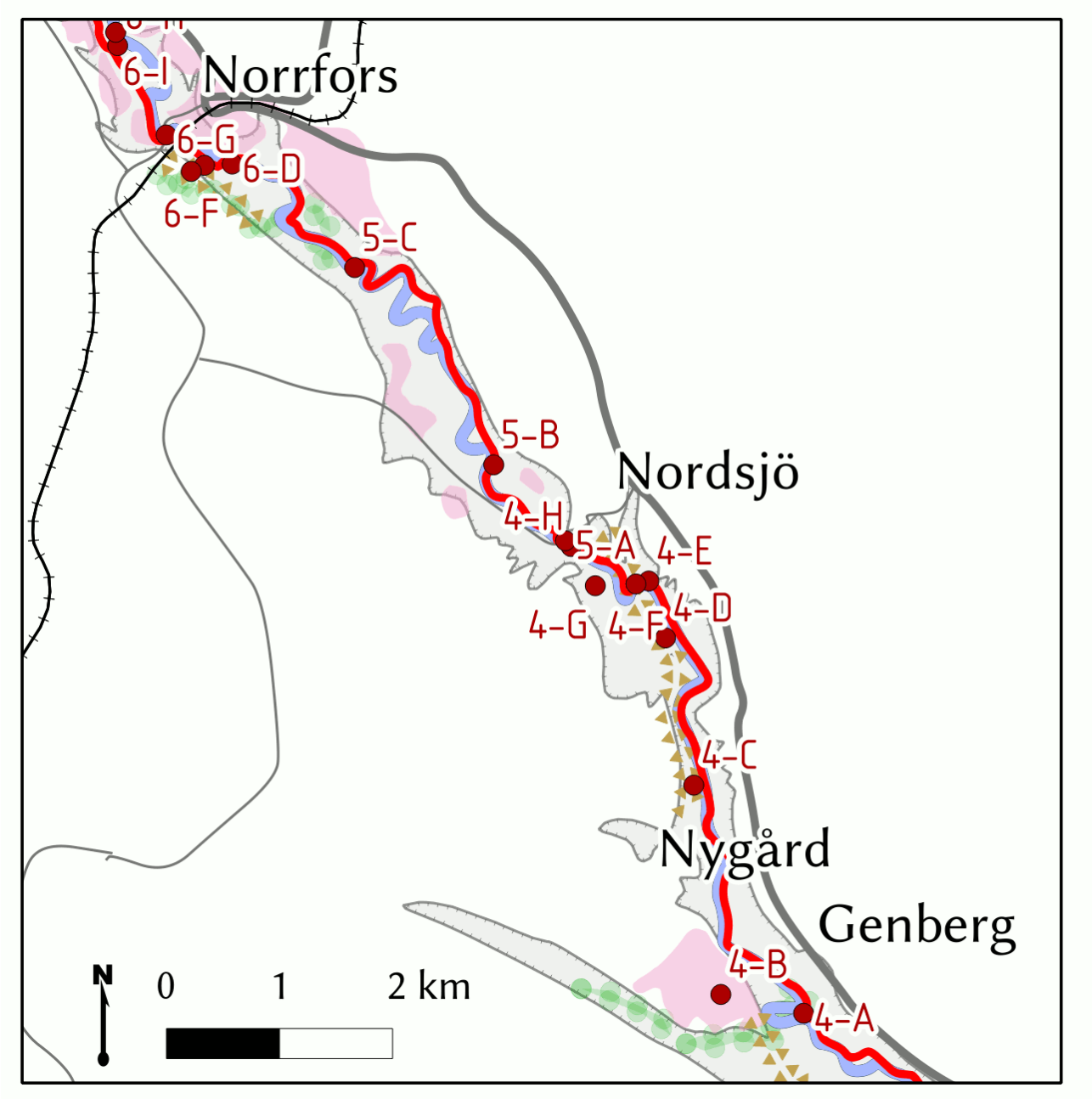
(area 4-5)



☞ LEGEND (p89)

4-A Ongoing erosion @ 63.69516,19.08757

4-B Old delta @ 63.69704,19.07322

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4-C The main esker @ 63.7135,19.0708

4-D The main esker @ 63.72513,19.06747

4-E Nordsjö brook @ 63.72965,19.06518

4-F The main esker @ 63.72948,19.06286

4-G Small spring @ 63.72955,19.05569

4-H Wild beach @ 63.73273,19.05185

4-I The highest shoreline @ 63.697,19.13854

5-A Nordsjö rapids @ 63.73321,19.05094

5-B Oxbow lakes @ 63.73949,19.03914

5-C Wild beach @ 63.75557,19.01682

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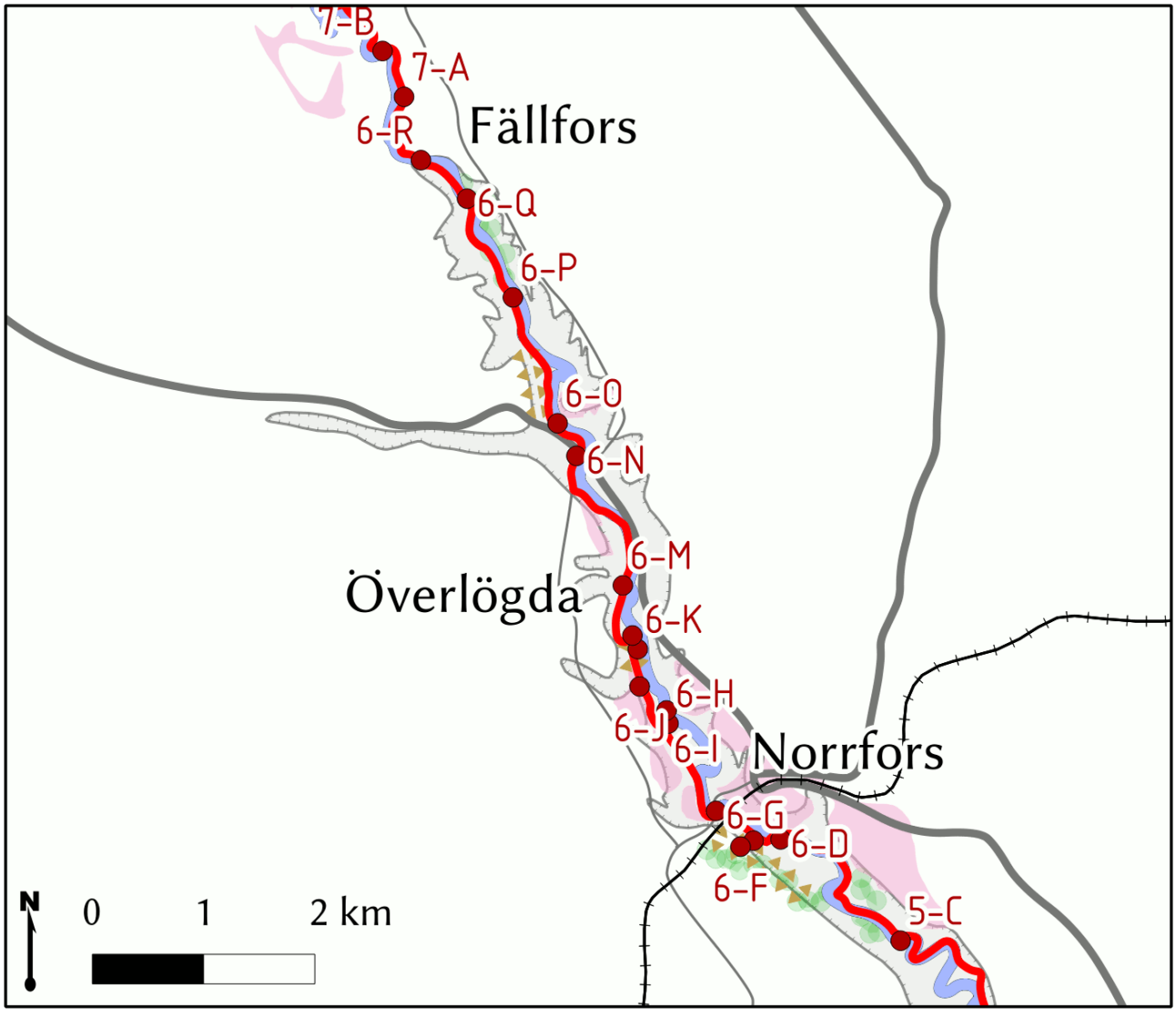
(area 6)



☞ LEGEND (p89)

6-D Rapids @ 63.76424,18.99635

6-E River Terraces @ 63.76428,18.99146

6-F The main esker @ 63.76387,18.98905

6-G Rapids @ 63.76684,18.98502

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6-H Beach with parking ground @ 63.77404,18.97745

6-I Rapids and potholes @ 63.77509,18.97725

6-J Old delta @ 63.77714,18.97266

6-K The main esker @ 63.78012,18.97274

6-L Gully @ 63.78124,18.97194

6-M Gully @ 63.78528,18.97078

6-N River Mjösjöån @ 63.79583,18.96385

6-O Mjösjö rapids @ 63.79852,18.96082

6-P Erratic boulder @ 63.80878,18.95416

6-Q Rapids @ 63.81687,18.947

6-R Fällforsen water fall @ 63.82017,18.9391

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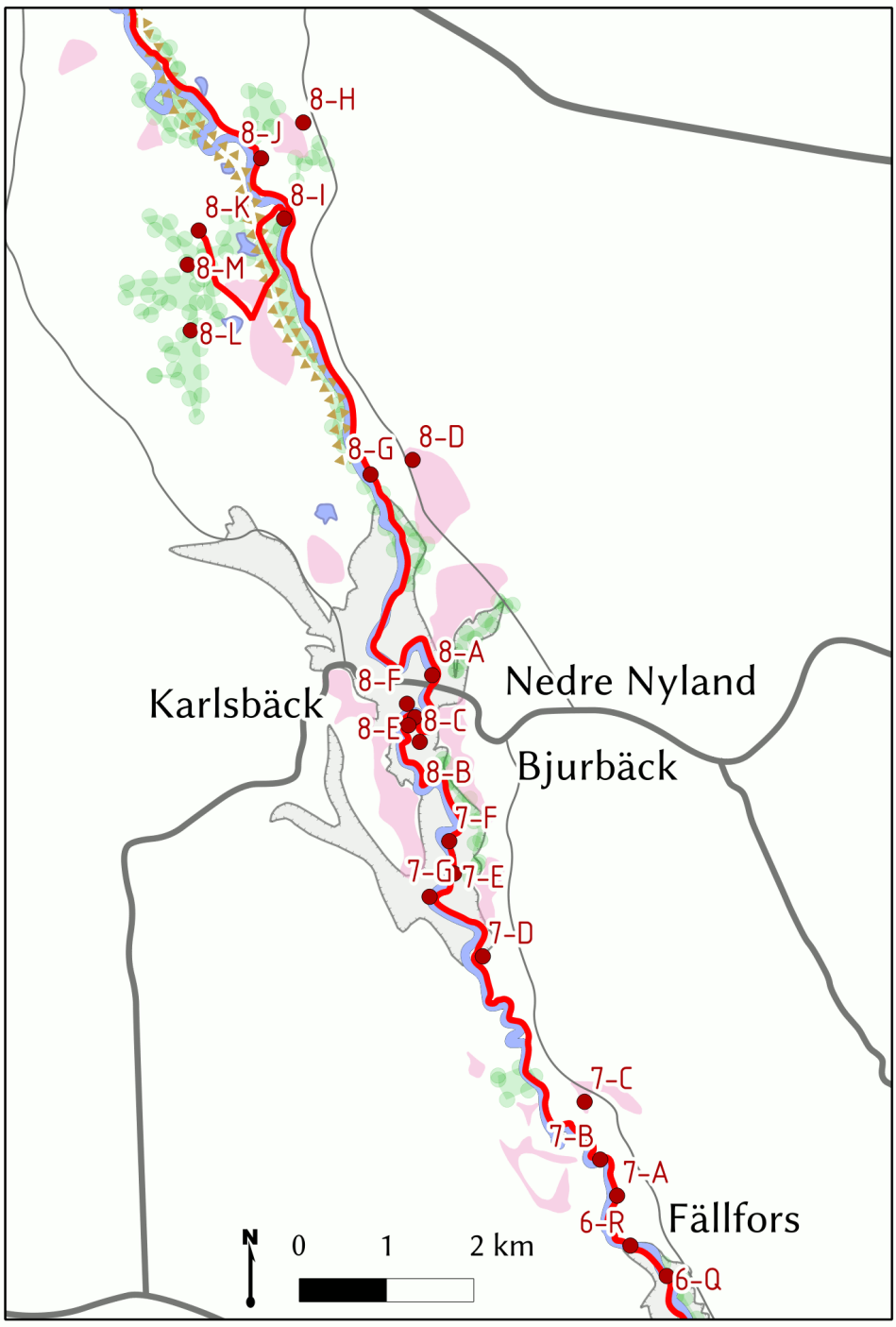
(area 7-8)



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☞ LEGEND (p89)

7-A Oxbow lake @ 63.82531,18.93675

7-B Wild beach @ 63.82906,18.93339

7-C Old river delta @ 63.83501,18.93064

7-D Oxbow lake @ 63.85035,18.90932

7-E Oxbow lake @ 63.8589,18.90387

7-F Soil mound @ 63.86221,18.90323

7-G Karls book @ 63.85671,18.89794

8-A Log-driving museum @ 63.87911,18.90164

8-B Old river channel @ 63.87244,18.89786

8-C Soil mound @ 63.87496,18.89713

8-D Early coastline @ 63.901,18.90017

8-E River terraces @ 63.87419,18.89549

8-F Soil mound and gravel pit @ 63.87637,18.89545

8-G The giants steps @ 63.89979,18.8903

8-H Ancient coastline and river channel @ 63.93581,18.87975

8-I Remains of the Storforsen rapids @ 63.9271,18.87592

8-J The Dragons back @ 63.93245,18.86954

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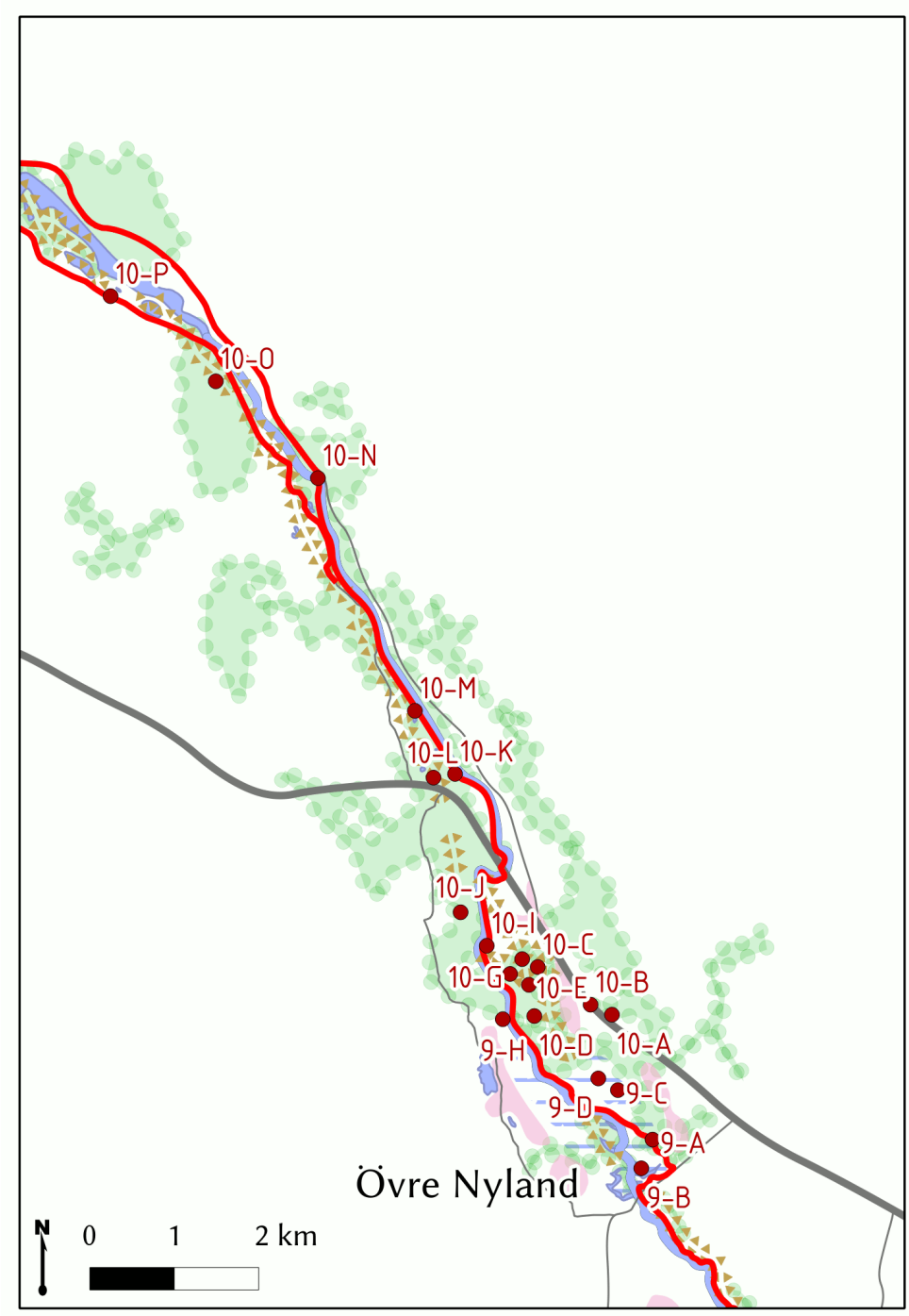
8-K Parking ground and trail to the walls @ 63.92553,18.85417

8-L The Small Wall @ 63.91547,18.85095

8-M The Great Wall @ 63.92214,18.85117

(area 9-10)



☞ contents (p3) maps with nature objects (p88)

☞ LEGEND (s89)

9-A Swamp @ 63.96199,18.82928

9-B Wetlands @ 63.95904,18.82618

9-C Kvarnmyran bog (fed by ground water) @ 63.96741,18.82172

9-D Kvarnmyran bog (fed by rain only) @ 63.96876,18.8172

9-H Brook @ 63.97558,18.7952

10-A Kettle hole @ 63.97537,18.82138

10-B Kettle hole @ 63.97655,18.8164

10-C Kettle hole @ 63.98084,18.8043

10-D The network of eskers ends @ 63.97572,18.80279

10-E Kettle hole @ 63.97903,18.80195

10-F Network of eskers @ 63.98177,18.80069

10-G Kettle hole @ 63.98029,18.7976

10-I Mound (kame) @ 63.9834,18.79242

10-J Kettle hole @ 63.98708,18.78664

10-K River bluff and sandur @ 64.00165,18.78728

10-L Kettle holes @ 64.0014,18.78206

10-M The main esker @ 64.00854,18.77857

☞ contents (p3) maps with nature objects (p88)

10-N Protected forest @ 64.0336,18.75864

10-O Protected forest @ 64.0444,18.73553

10-P Erratic boulders @ 64.05399,18.71148

10-Q Kettle hole @ 64.0677,18.68491

10-R Kettle hole @ 64.067,18.67808

10-S Ancient settlement @ 64.07039,18.66505

10-T Small bridge @ 64.07177,18.64475

10-B Network of eskers @ 64.07805,18.61102

10-G The esker goes into the lake @ 64.09242,18.54844

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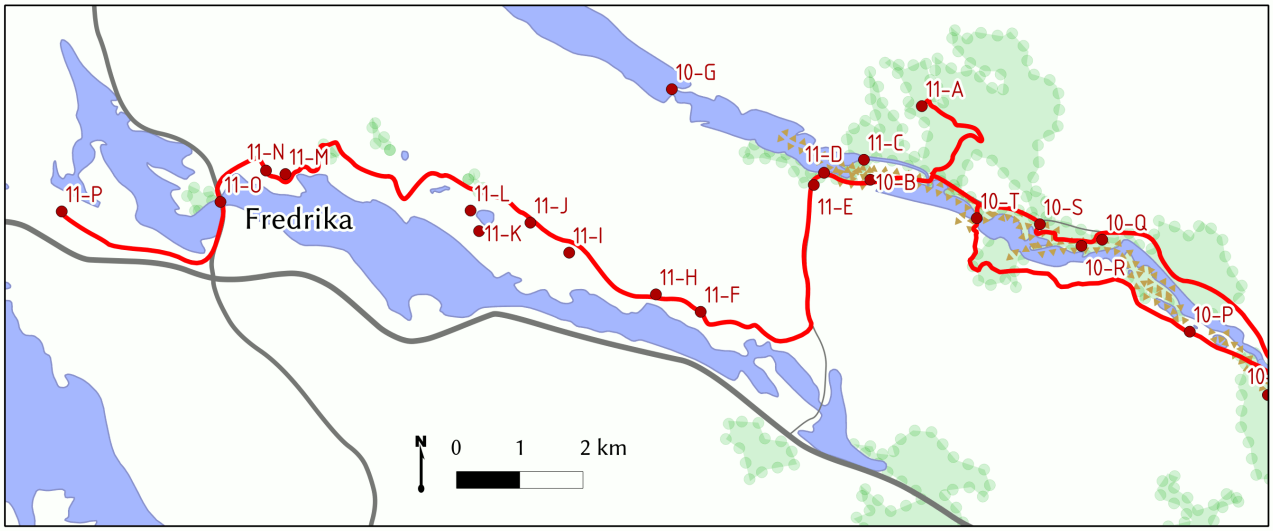
(area 11)



☞ LEGEND (p89)

11-A Hill with a fine view and old forest @ 64.08804,18.62903

11-C Old dam in the lake outlet @ 64.08093,18.60932

11-D Scenic wild beach @ 64.07941,18.59617

11-E Clear cut @ 64.07777,18.59263

11-F Young forest (former clear cut) @ 64.06075,18.55376

11-H Drumlin @ 64.06357,18.53959

11-I Small spring @ 64.07014,18.5123

11-J Drumlin @ 64.07468,18.50029

11-K Lake Segersjön @ 64.07389,18.48355

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11-L Old barn by a former reed-harvest lake @ 64.07686,18.48115

11-M Former reed-harvest lake @ 64.08344,18.42188

11-N Erratic boulder @ 64.08408,18.41566

11-O Lake Viskasjön @ 64.08,18.40038

11-P The temple hill @ 64.07962,18.35186

☞ contents (p3) maps with nature objects (p88)


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