KLĀŅI MIRE

Especially protected nature area

NATURE RESERVE
**Location** Pope and Tārgale Municipalities, Ventspils District  
**Established** 1977  
**Total area** 1,615 ha

**Status**
- Especially protected nature area in Latvia – nature reserve  
  *Nature reserve is natural or changed by human activities area of land that includes especially protected plants, animals and habitats. Klāņi Mire is one of 273 nature reserves of Latvia.*  
- Included in European network of protected territories Natura 2000  
  *Natura 2000 is the European Union network of especially protected territories, where every member state participates with its system of protected areas. There are 336 Natura 2000 sites in Latvia; they cover 11.9 % of the territory of Latvia.*

**Habitats**
- mires (31%)  
- forests (61 %)  
- lake (4 %)

**The mire has developed**
- 5,500 years ago

**Maximum depth of peat layer**
- 4 m

**Average depth of Klāņi Lake**
- 0.8 m

**The main nature values**
- different types of mires, mostly – raised bogs
- deciduous swamp forests
- bog woodland
- Klāņi Lake and lake side vegetation
- forest meadows, rich in species  
- 80 plant and animal species, especially protected in Latvia and Europe

**Negative influence**
- previous drainage of the raised bog and forest
- lowering of water-level in the lake by digging Klāņi – Būšnieki Canal
- destruction of the sandy lake side by cars
- overgrowing of forest meadows

**Management plan** – elaborated by Latvian Fund for Nature for the time period 2006-2016. The main management activity is the prevention of mire desiccation and further degradation of habitats in Klāņi and Pūņa Mires by building of dams on the drainage ditches, as well as other activities in order to conserve the various nature values of the territory. The activities are carried out within the framework of LIFE project “Implementation of Mire Habitat Management Plan for Latvia”.

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*Photo: V. Baroniņa*  
Pūņa Mire - one of the raised bogs of the nature reserve.

*Photo: V. Baroniņa*  
Klāņi Lake is located between the two raised bogs and is also a habitat for several rare plant species.
**Mire** is an area of land surface that is constantly or periodically waterlogged, has characteristic flora and fauna and where active peat formation takes place. Mires are accumulators of water and they have a very essential role in water circulation in the nature.

**Development of mires** may be of two kinds:
- land paludification
- terrestrialisation of waterbodies

**Klāņi Mire has developed** as result of lake terrestrialisation – studies were curried out in the mire and show sandy gyttia at the bottom of the mire in the depth of 4 m. It had started to accumulate about 8,500 years ago, consequently Klāņi Lake formed even earlier – as a result of Baltic Ice Lake water level changes more than 10,000 years ago. Investigations have shown that algae found in the sediments of gyttia are characteristic of freshwater habitats and they have no relation to salt water – this fact gives a new view about the origin of Klāņi Lake. Analysing peat samples from various layers of the mire we can get to know how was the vegetation of mire and its surrounding many thousand years ago. Palynological (pollen in the peat) studies confirm the presence of Stone Age people in the vicinity of Klāņi Lake.

**The course of development of Klāņi Mire:**
- during the Boreal period about 8,500 years ago gyttia started to accumulate
- at the end of the Atlantic period about 5,500 years ago fen peat started to develop
- in the beginning of Subatlantic period about 2,800 years ago raised bog peat started to accumulate. Since then, the raised bog vegetation dominates in Klāņi Mire.

Development of the raised bog peat and the “growth” of the peat layer continues also nowadays. It forms by decaying of the bottom part of *Sphagnum* species, besides a dome is formed in raised bogs as a result of the increase of the peat layer. Such domes have Klāņi and Pūņa Mires. They can be observed better in the three-dimensional model, and are comparatively higher than surrounding wet forests.

Studies of mire stratigraphy reveal that at the depth of 4 m there is a sandy gyttia that testifies about the mire origin from the lake.
Three-dimensional model of the raised bogs allows to understand the relief of the mire and its surrounding. In Pūņa Mire the dome is very well expressed.

Author: J. Matvejs
## DEVELOPMENT OF KLĀŅI MIRE

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| 2800 - nowadays    | Subatlantic (cool and moist) | 1.50 - 0.00 | Pine, spruce, birch. Increase of 
Ericaceae species and especially - Sphagnum species. Hare's-tail Cottongrass, Runnoch-rush.. | Moss (raised bog) peat |
| 4500 - 2800        | Subboreal (dry and warm with moist periods) | 2.00 - 1.50 | Decrease of broad-leaved forests. Again increase forests of pine. Birch, alder. Sedge, Sphagnum, Hare's-tail Cottongrass. | Sedge - moss (transition) peat |
| 7500 - 4500        | Atlantic (warm and moist) | 2.75 - 2.00 | Broad-leaved forests (oak, lime, elm, ash). Dominate sedges, Sphagnum species not common. Cultural plants - cereals appear. Bog - myrtle. Water-nut. | Fen (sedge) peat |
| 9000 - 7500        | Boreal (quite warm and dry) | 4.00 - 2.75 | Mainly coniferous trees, birch. Sedges, grasses. | Sandy or peaty gyttja with various algae species |

Analysing peat samples from various layers of the mire we can get to know how was the vegetation of mire and its surrounding many thousand years ago.

*Author: L. Kalniņa*
Klāņi Mire Nature Reserve has a special value due to the high number of especially protected habitats – there are 10 especially protected habitats of Latvia’s importance and 9 of European importance, in total at least 63% of nature reserve is taken up by specially protected habitats.

Mires occupies 1/3 of the territory and are represented by all three types: raised bog, transition mire and fen.

Most often raised bog vegetation has a hummock-hollow complex. Incessant carpet is made of typical raised bog moss – different Sphagnum species. Few small raised bog pools are found in Klāņi Mire.

Fens, where tall sedge, like Tufted-sedge Carex elata dominate, is the best habitat for Bog-myrtle Myrica gale – it makes spacious stands. Previously, and even in the second half of 20th century, such mires were used for hay making.

In Western Europe where intact raised bogs have almost ceased to exist, a special attention is given to degraded raised bogs where natural regeneration is possible or takes place. Raised bogs are degraded in Latvia as well – such degraded habitats occur near drainage ditches in Klāņi and Pūņa Mires - at least 60 ha of raised bogs are affected by drainage.

Transition mires mostly develop near Klāņi Lake as a result of lake terrestrialisation. However, this habitat has a tendency to increase due to the filling-in of the lake.

Three of mire habitats are of European importance, furthermore raised bog is a habitat of priority protection.

 Protected mire habitats of European importance:
- Intact raised bog (code 7110*)
- Transition mires and quaking bogs (code 7140)
- Degraded raised bogs where natural regeneration is possible or takes place (code 7120)

* priority protected habitat
Forests on peat dominate, both wet and drained types. Biologically more valuable are forests in undrained soils, in particular in this reserve often found deciduous swamp forests with Black alder *Alnus glutinosa* and Downy birch *Betula pubescens* where some rare wet and shadow-loving species can occur.

Several forest habitats of Klāņi Mire Nature Reserve are rare at the European level, besides they all are of priority protection:

**Protected forest habitats of European importance:**
- Fennoscandian deciduous swamp forests (code 9080* *)
- Bog woodland (code 91D0* *)
- Boreal forests (code 9010* *)

* priority protected habitat

Grassland habitats are not characteristic for this nature reserve, they appear in the form of small meadows in the forest openings. Earlier small forest glades were used for hay making. Although nowadays they are not managed anymore, some rare plant and invertebrate species still occur there.

**Protected grassland habitats of Latvia’s and European importance:**
- *Molinia caerulea* meadows (code 6410)
- *Sesleria caerulea* meadows

Dry forests occur only in the higher places of the relief.

Although forest glades have started to overgrow, rare and protected species occur there as well.

The birch-alder forest is a habitat for many species characteristic for such species.
The greatest part of Latvia’s rare and protected habitats are interconnected particularly with Klāņi Lake and its vicinity – for several habitats this is the only locality in Kurzeme (Western Latvia) or even in whole Latvia. Due to this Klāņi Lake is unique among other lakes.

Photo: V. Baronina

The stands of Bog-myrtle *Myrica gale* near Klāņi Lake is a specially protected habitat of Latvia and occur only in the Western Latvia coastal area.

Photo: V. Baronina

Bog-myrtle *Myrica gale* blooms in April during the spring flood time.

Protected freshwater habitats of Latvian and European importance:
- Lakes with *Myriophyllum alterniflorum* stands
- Lakes with *Nuphar pumila* stands (the only place in Western Latvia)
- Semi-dystrophic lakes (very rare in Latvia)
- Softwater lakes with *Isoetes, Lobelia dortmanna* and *Litorella uniflora* stands (only two places in Western Latvia)
- Coastal lakes with *Eleocharis multicaulis, Rhynchospora fusca* and *Myrica gale* stands (the only locality in Latvia)
- *Myrica gale* growths (habitat characteristic for Western Latvia coastal area and is found nowhere else in Latvia)
- Oligotrophic to mesotrophic standing waters with vegetation of *Litorelletea uniflorae* and/or *Isoto-nanojuncetea* (code 3130)
Over 500 vascular plant species are registered in Klāņi Mire Nature Reserve and comprise about 40% of local flora of Latvia. Also about 150 bryophyte species are known there. It is a high number for a comparatively small territory, and can be explained by the diversity of habitats in the reserve. In total, there are 53 rare and especially protected vascular and bryophyte species. The diversity of habitats and plant species was the reason for the establishment of protected nature area.

In the surrounding forests of Klāņi Mire very rare especially protected species occur:

- Lady’s-slipper Cypripedium calceolus
- Wavy Bitter-cress Cardamine flexuosa
- Corallroot Dentaria bulbifera

More often occur:

- Lesser Butterfly-orchid Platanthera bifolia
- Common Spotted-orchid Dactylorhiza fuchsii
- Viola uliginosa

Photo: M. Pakalne
Lesser Butterfly Orchid Platanthera bifolia occurs both in wet forests and forest glades.

Photo: U. Suško
Spotted – Orchids Dactylorhiza fuchsii and D. maculata are common in wet forests.

Photo: V. Baronia
Viola uliginosa is a characteristic plant for Western Latvia’s forests.

Photo: V. Baronia
Lady’s slipper Cypripedium calceolus is known more than 20 years, but probably it does not bloom every year in the shady forest.
In more open places an insectivorous plant Sundew – typical intact raised bog species grows. Round-leaved Sundew *Drosera rotundifolia* un Great Sundew *D. anglica* briefly can be differentiated by the leaves. Species characteristic for raised bogs occur in Klāņi and Pūna Mires – Hare’s-tail Cottongrass *Eriophorum vaginatum* and Heather *Calluna vulgaris*. They, together with colourful *Sphagnum* carpet, determine the main aspect of raised bog vegetation. In the transition mire near the lake a very rare especially protected orchid species in Western Latvia Fen Orchid *Liparis loeselii* was found. The other species, on the contrary, is characteristic for raised bogs particularly in Kurzeme coastal mires – Deer Grass *Trichophorum cespitosum*, it do not occur in Eastern Latvia.

*Photo: M. Pakalne*

On the raised bog hummocks together with Heather *Calluna vulgaris* and Hare’s-tail Cottongrass *Eriophorum vaginatum* also Cloudberry *Rubus chamaemorus* grows.

*Photo: U. Suško*

Fen Orchid *Liparis loeselii* mostly can be found in eastern part of Latvia, in Western Latvia it is rarity.

*Photo: M. Pakalne*
In the forest openings small, wet meadows appear, the vegetation here testifies about slightly calcareous soil. It seems rather unbelievable to find a sunny forest glade with Bird’s-eye Primrose *Primula farinosa*, Brown Bog-rush *Schoenus ferrugineus* and different orchid species – Fragrant Orchid *Gymnadenia conopsea*, Lesser Butterfly Orchid *Platanthera bifolia*, Marsh-orchids *Dactylorhiza* species and other rarities.
From the botanic perspective, the most interesting is Klāņi Lake with the marginal vegetation. The lake is shallow, its maximum depth is only 1.8 m. On its northern coast a sandy flooded area has developed, where at least 15 in Latvia rare and especially protected plant species occur. As a characteristic representative of Kurzeme (Western Latvia) flora, Bog-myrtle *Myrica gale* is abundant there. It has maintained in the flora of Latvia from the Atlantic period. Once it was widely used in treatment and beer brewery, however nowadays it is mostly recognized as odorous component of famous Rīga Black Balsam.

Several rare and especially protected species of Latvian flora have found a suitable habitat in the lake and its nearby area:

- Many-stalked Spike-rush *Eleocharis multicaulis*
- Brown Beak-sedge *Rhynchospora fusca*
- Shoreweed *Litorella uniflora*
- Water Lobelia *Lobelia dortmannana*
- Alternate Water-milfoil *Myriophyllum alterniflorum*
- Marsh Pennywort *Hydrocotyle vulgaris*

Several of those species are relict ones, in addition they testify about clean and not polluted water.

The analysis of pollen testify that in Atlantic period about 5000 years ago Floating Water-nut *Trapa natans* grew in Klāņi Lake, now very rare in Latvia.
In total 86 bird species are known in the nature reserve, from which 22 are especially protected, registered in different years. Almost every year in the lake:

- remain Whooper swan *Cygnus cygnus* and migrating species of ducks
- nest Common crane *Grus grus*, Honey-buzzard *Pernis apivorus*
  and Montagu’s harrier *Circus pygargus*

As a place of rest and hunting, the territory is used by White-tailed eagle *Haliaeetus albicilla*, Lesser spotted eagle *Aquila pomarina* and Osprey *Pandion haliaetus*. Hazel grouse *Bonasa bonasia* and European nightjar *Caprimulgus europaeus* are quite common in the forests.
The Nature Reserve is a habitat for rare woodpecker species:

- Three-toed woodpecker *Picoides tridactylus*
- Black woodpecker *Dryocopus martius*
- Grey-headed woodpecker *Picus canus*
- White-backed woodpecker *Dendrocopos leucotos*

Woodpeckers have left many traces in the wet deciduous and mixed forests – pecked trees and hollows. During different time periods Black stork *Ciconia nigra* has nested there, and now is still in the surrounding, it is observed regularly feeding in the territory.

In several places of the reserve the traces has left also Capercaillie *Tetrao urogallus* – may be one day leks will be established there as well. Black grouse *Tetrao tetrix* voice can be heard both in Klāņi and Pūņa Mires.

*Photo: A. Petriņš*

Three-toed woodpecker *Picoides tridactylus* is observed in several localities in coniferous and mixed forests.

*Photo: A. Petriņš*

The voice of Black grouse *Tetrao tetrix* can be heard both in Klāņi and Pūņa Mires.
Among invertebrates most interesting are dragonflies, butterflies and moluscs. Some of them are rare and especially protected species:

- Marsh fritillary *Euphydryas aurinia* - a rare butterfly species in Latvia and Europe, can be found in forest glades
- Eastern White-faced Darter *Leucorrhinia albifrons* and Large White-faced Darter *L. pectoralis* sometimes can be met in the surrounding of Klāņi Lake
- Fact File-Dragonfly *Libellula fulva* – a stable and rich population
- *Orthetum brunneum* - a new Dragonfly species in Latvia, in 2005 it was found near Klāņi Lake

The rarest species out of the 5 especially protected molusc species is *Clausilia cruciata*, which is mostly found in deciduous forests and has a very suitable habitat in the reserve. There are 27 molusc species known in the reserve.
Forests and wetlands is a habitat for various mammal species:

- roe deer *Capreolus capreolus*
- red deer *Cervus elaphus*
- elk *Alces alces*
- wild boar *Sus scrofa*

These animals particularly like the forest glades with good feeding conditions. Here such especially protected species as otter *Lutra lutra*, and protected species with restricted use – wolf *Canis lupus* and lynx *Lynx lynx* live. Beaver *Castor fiber*, which is rare in Europe indeed, feels at home here – many drainage ditches and Klāņi – Būšnieki Canal is a very good habitat for him. In a way beavers help to maintain once lowered water level of the lake.
In 20-ies and 30-ies of the 20th century Klāņi–Būšnieki Canal was dug, as a result the water level was considerably lowered in the lake, the overgrowing with the reed was hastened. Canal has drained a notable part of the surrounding forest. Klāņi Lake has no run-offs, thus the canal is its only outlet. Once the Nabele River flew out of the north-eastern part of the lake. However, due to the lowering of the water level, it has overgrown already a long time ago. Instead of it large ditch called Dižgrāvis gather the surrounding drainage waters and bring to the sea. Now beaver’s dams on the canal help to maintain the water level of the lake, thus the beavers and their dams are to be maintained.

In 50-ies and 60-ies of the 20th century the mire drainage was performed that considerably degraded the natural habitats of the raised bog. The third mire of the nature reserve - Dzīru Mire as the result of drainage has overgrown with the forest. In order to “save” Klāņi and Pūna Mires and to prevent the degrading effect of drainage, dams are to be built on the ditches to stabilise the hydrological conditions in the damaged raised bog area. In Klāņi Mire hydrological and vegetation monitoring is curried out.

Due to forest drainage, their biological value has decreased

The northern side of the lake is sandy, and it is the only area suitable for rest near the lake. In dry summers, when water level is low and the sandy lake side is without water, frequently it is damaged by cars, thus threatening the very rare lake side habitats. Both raised bog and rare lake side habitats are damaged also by fires.

Due to the termination of mowing of the forest glades, they have started to overgrow. Nevertheless, a large number of rare plant and invertebrate species concentrate in forest glades, therefore the openings are intended to be maintained open in the nature protection plan of the territory, thus the cutting of the trees and bushes is needed, in some places mowing as well.
In a territory of nature reserve, please take into consideration:

- Do not drive on the sandy lake side area nor damage it – that may extinguish very rare plant species habitats in Latvia and disturb the birds!
- Do not break bushes or pick flowers – many of them are in the Red Book of Latvia and in the list of especially protected plants!
- Make fires only in designated areas!
- The hunting of birds and beavers is prohibited in the nature reserve! The dams of beavers are to be preserved!
- Do not pollute the lake and its surrounding!

Take care about the site – a shelter for every tenant of the reserve and return back to enjoy your stay there once again!
CONTACT INFORMATION

Territory is managed by:
- Pope Municipality Council – “Pagastmāja” Pope, Pope Municipality, Ventspils District, LV-3614
- Tārgale Municipality Council – “Dzintarkalni” Tārgale, Tārgale Municipality, Ventspils District, LV-3621

The forest territories are managed by:
- Tārgale Municipality
- State Joint-Stock Company “Latvia’s Forests”
- 8 private owners and 1 legal entity

The protection is controlled by:
- Ventspils Regional Environmental Board – Dārzu Str. 2, Ventspils, LV-3601; www.vrvp.gov.lv

Information:
- Latvian Fund for Nature
  Raiņa Blvd. 31-6. Rīga, LV-1050, www.ldf.lv

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