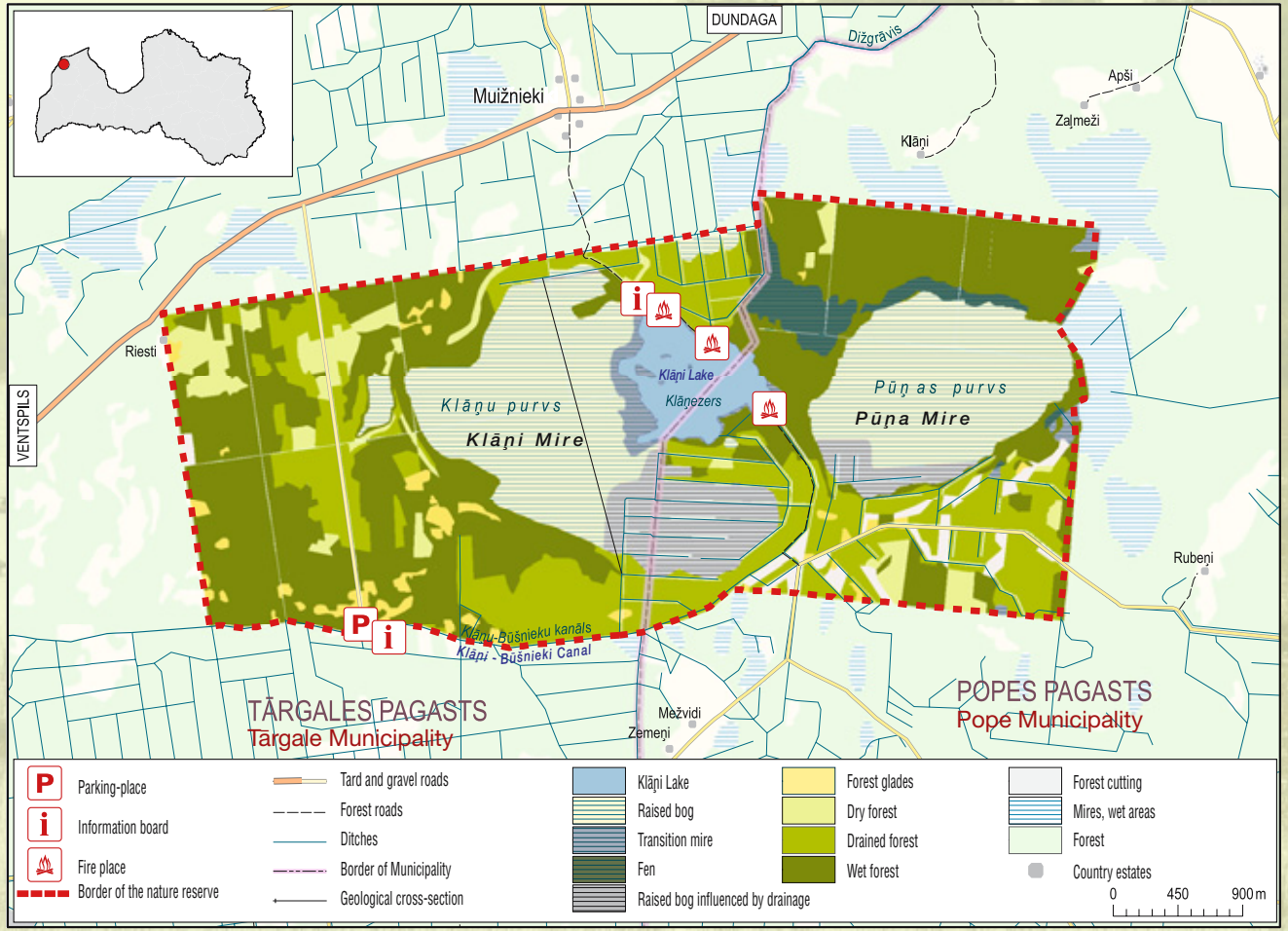
Especially protected nature area

KLĀŅI MIRE

NATURE RESERVE

NATURA 2000

KLĀŅI MIRE NATURE RESERVE



Author: B. Strazdiņa

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

Photo: V. Baroniņa
Klāņi Lake is located between the two raised bogs and is also a habitat for several rare plant species.

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

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

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".

***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.

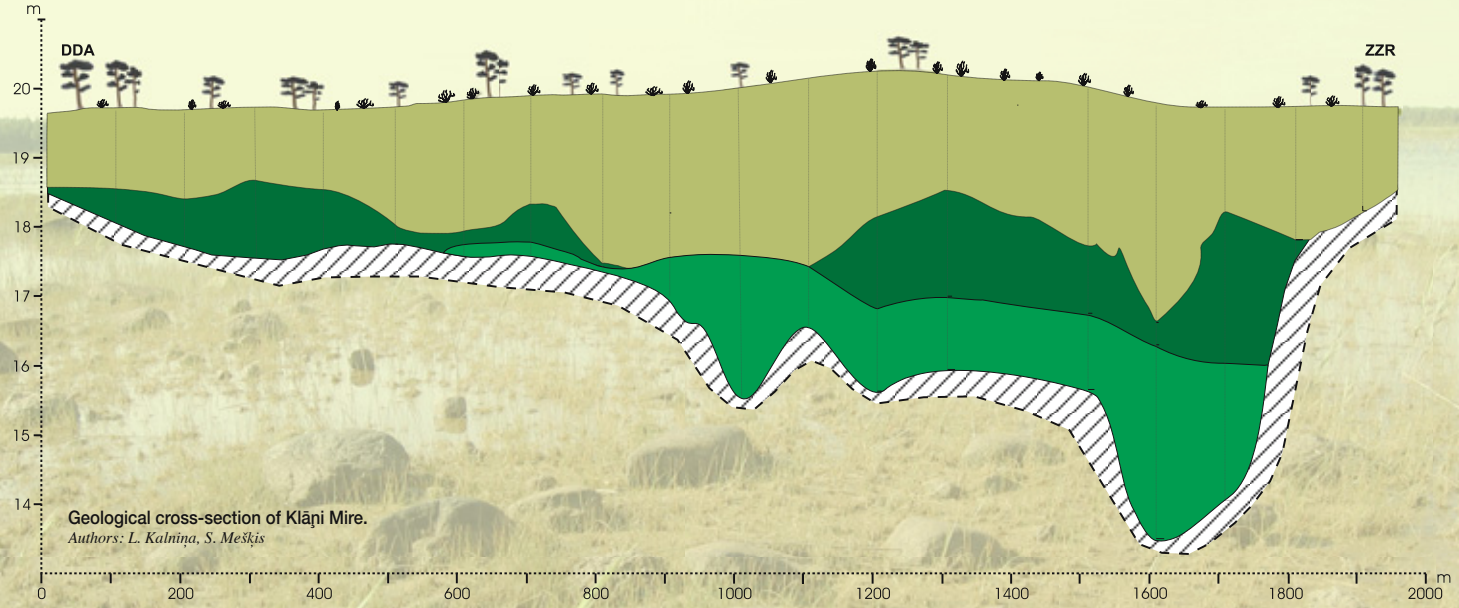
The course of development of Klāņi Mire:

- 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.

Photo: V. Baronina

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.

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.



Geological cross-section of Klāņi Mire.
Authors: L. Kalniņa, S. Mežķis

Raised bog peat

Fen peat

Gyttia

Mineralsoil

Three-dimentional 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

Hight intervals:
17.8 - 18.4
18.4 - 19.2
19.2 - 19.7
19.7 - 20.1
20.1 - 20.5
20.5 - 21.0
21.0 - 21.5
21.5 - 21.9
21.9 - 22.5
22.5 - 23.5

Km 0.5 0 0.5 1 1.5 2 2.5 3 3.5

Chronology (years)	Climatic period	Depth (m)	Dominating species	Botanical content	Deposit type
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 gyttia 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.

Photo: V. Baroniņa
The raised bog covers the largest areas of the nature reserve.

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.

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.

Photo: V. Baroniņa
Transition mire vegetation develops as a result of Klāņi Lake terrestrialisation.

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

Photo: V. Baroniņa
In the fen vegetation tall-sedge species occur where also Bog-myrtle *Myrica gale* and Early Marsh-orchid *Dactylorhiza incarnata* grows.

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*

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.

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*

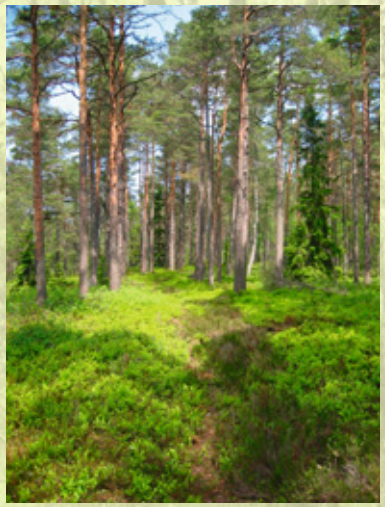


Photo: V. Baroniņa

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

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

Photo: V. Baroniņa

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

Photo: V. Baroniņa

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.

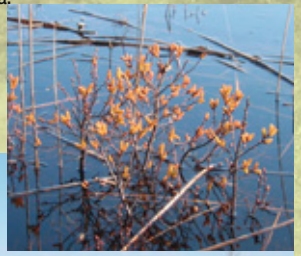


Photo: V. Baronina
Bog-myrtle *Myrica gale* blooms in April during the spring flood time.

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 *Iseto-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*

Photo: V. Baronina
Viola uliginosa is a characteristic plant for Western Latvia's forests.

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: V. Baronina
Lady's slipper *Cypripedium calceolus* is known more than 20 years, but probably it does not bloom every year in the shady forest.

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

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.

Photo: M. Pakalne

Species characteristic for raised bogs occur in Klāņi and Pūņa **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: U. Suško
Fen Orchid *Liparis loeselii* mostly can be found in eastern part of Latvia, in Western Latvia it is rarity.

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.

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.

Photo: V. Baroniņa
Forest glade.

Photo: M. Pakalne
Fragrant Orchid *Gymnadenia conopsea* testifies about the calcareous habitat.

Photo: U. Suško
Common Butterwort *Pinguicula vulgaris* and Bird's-eye Primrose *Primula farinosa* are common in forest meadows.

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 dortmanna*
- Alternate Water-milfoil *Myriophyllum alterniflorum*
- Marsh Pennywort *Hydrocotyle vulgaris*

Photo: V. Baroniņa
Bog-myrtle *Myrica gale* forms large stands both near the lake and in the wet forests.

Photo: M. Pakalne
Water Lobelia *Lobelia dortmanna* can be found in the lake floodplain area and assures the cleanliness of the water.

Photo: V. Baroniņa
Klāņi Lake is the only locality in Latvia for Many-stalked Spike-rush *Eleocharis multicaulis*.

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.

Photo: M. Pakalne
Brown-beak sedge *Rhynchospora fusca* is one of the rarities of Latvia's flora.

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 *Cyrcus pygarus*

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 haliaeetus*. Hazel grouse *Bonasa bonasia* and European nightjar *Caprimulgus europaeus* are quite common in the forests.

Photo: A. Petriņš
Hazel grouse *Bonasa bonasia* and European nightjar *Caprimulgus europaeus* are quite common species in this territory.

Photo: V. Baroniņa
Woodpeckers have left many traces in wet deciduous and mixed forests – pecked trees and hollows.

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.

Photo: V. Spuņģis
Marsh fritillary *Euphydryas aurinia* feeds in forest glades.

Photo: M. Kalniņš
The population of Fact File-Dragonfly *Libellula fulva* near Klāņi Lake is stable and rich.

Photo: M. Kalniņš
Wet deciduous forests are favoured by various *Clausilia* species that are the indicator species of natural forests.

Photo: M. Kalniņš
Scarlet Tiger *Callimorpha dominula* is very rare in the territory of the nature reserve.

Photo: V. Baroniņa

Beaver *Castor fiber* activities help to maintain the water level in the lake.

Photo: A. Klepers

Photo: V. Pilāts

Otter *Lutra lutra* is especially protected species both in Latvia and Europe.

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 Pūņa 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 boilogical 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.

Photo: V. Baroniņa
Klāņi-Būšnieki Canal has beaver dams and in places has flowing streams.

Photo: V. Baroniņa
Drainage ditches in the mire are not very deep, but still continue to drain the habitats.

Photo: V. Baroniņa
The vicinity of the lake is often damaged by cars, especially it is observed in low – water period.

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!

Photo: V. Baroniņa
The "Curved pine" already for many years withstands the winds coming over the lake and mires.

Photo: M. Pakalne
The rare plant species near the lake have not lost the attention by the researchers for more than 50 years.

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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Tārgales Municipality

Popes Municipality

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