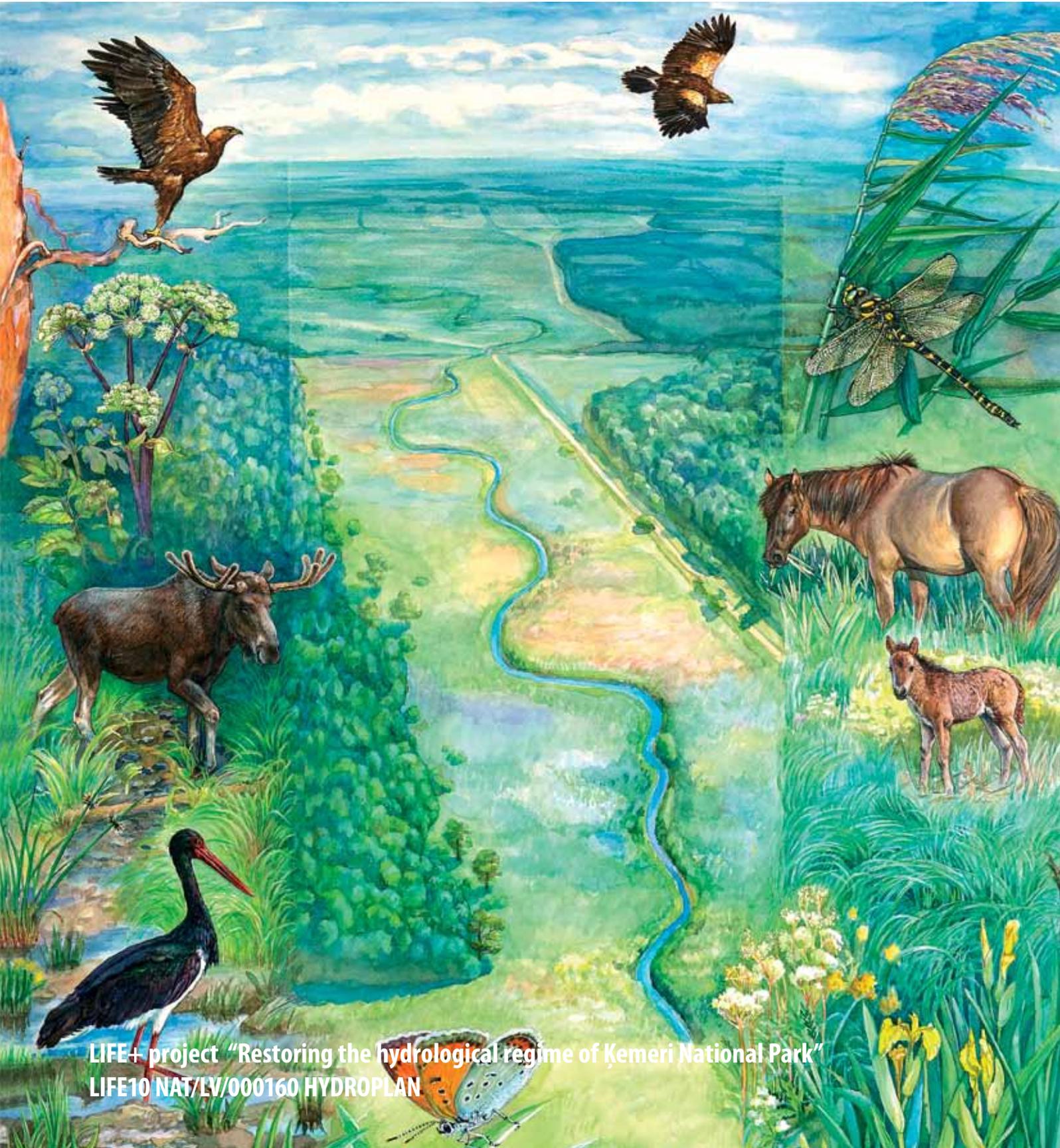




Wetlands for nature and people



LIFE+ project "Restoring the hydrological regime of Kemer National Park"
LIFE10 NAT/LV/000160 HYDROPLAN

What are wetlands?

The most common types of wetlands are raised bogs, rivers, lakes, swamp forests, floodplain forests and meadows, areas where land and water merge.

In such areas specific ecosystems are formed, being permanently or seasonally saturated with water.

Wetlands have a very special role both in nature cycles and lives of humans. For example, wetlands purify the water and accumulate the abundant nutrients, thus absorbing them and preventing their leakage into the sea.

Wetlands help to prevent flooding by temporary storing large water masses and later slowly releasing them. Wetlands are natural carbon storages helping to mitigate the climate change.

Wetlands host huge numbers of plant and animal species adapted to life in wet conditions. Many of these species are rare and threatened.

Wetlands for nature and people

Ķemeri National Park (ĶNP) is particular with large variety of wetlands – raised bogs, fens, swamp forests, coastal lakes and floodplains preserve nature treasures unique both on national and European Union scale. Under the bogs in the surroundings of Ķemeri mineral waters containing hydrogen sulphide are formed being the largest deposit in Latvia. Along with development of nature tourism the hiking trails in ĶNP have become increasingly popular offering a chance to visit swamp forests and raised bogs.

Persistence of wetlands depends on availability of water. Unfortunately, a significant proportion of wetlands in ĶNP is negatively affected by the drainage performed during the course of the last two centuries. As a result, the formerly open raised bogs overgrow with trees and the peat starts to decompose, while the swamp forests transform into drier woodlands along with extinction of numerous rare plant and animal species.

In order to preserve the nature values of European importance, in the period from 2011 to 2016 three deteriorated wetland areas will be restored by re-creating the natural hydrological regime.

LIFE+ project “Restoring the hydrological regime of Ķemeri National Park” will implement the following wetland restoration activities:

- restoration of raised bog in the surroundings of the former peat quarry in Zaļais Purvs (Engure municipality, Smārde parish),
- restoration of bog woodland and swamp forests along the Western margin of Ķemeri Raised Bog (Tukums municipality, Džūkste parish),
- re-meandering of the straightened Skudrupīte River, restoration of flood plain meadows (Tukums municipality, Džūkste parish).

Prior to restoration works the present hydrological situation will be investigated using innovative technologies. Hydrological models will be elaborated, thus finding a balance between the interests of nature and local people. The newly created floodplain meadows will be a new tourist attraction.

The wetland restoration project is carried out by Nature Conservation Agency in collaboration with Institute for Environmental Solutions, Latvian Fund for Nature and Elm Media. The project is supported by EU LIFE+ programme and Latvian Environmental Protection Fund.

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Kemeru National Park

Kemeru National Park (KNP) is located in the central part of Latvia. This specially protected nature area was established in 1997 in order to preserve natural, cultural, historical and balneological values as well as to promote sustainable economic activities, tourism and environmental education.

KNP is a wetland national park. Its symbol is White-backed Woodpecker, a rare woodpecker species living in moist deciduous forests.

The area of the national park is 38 165 hectares.

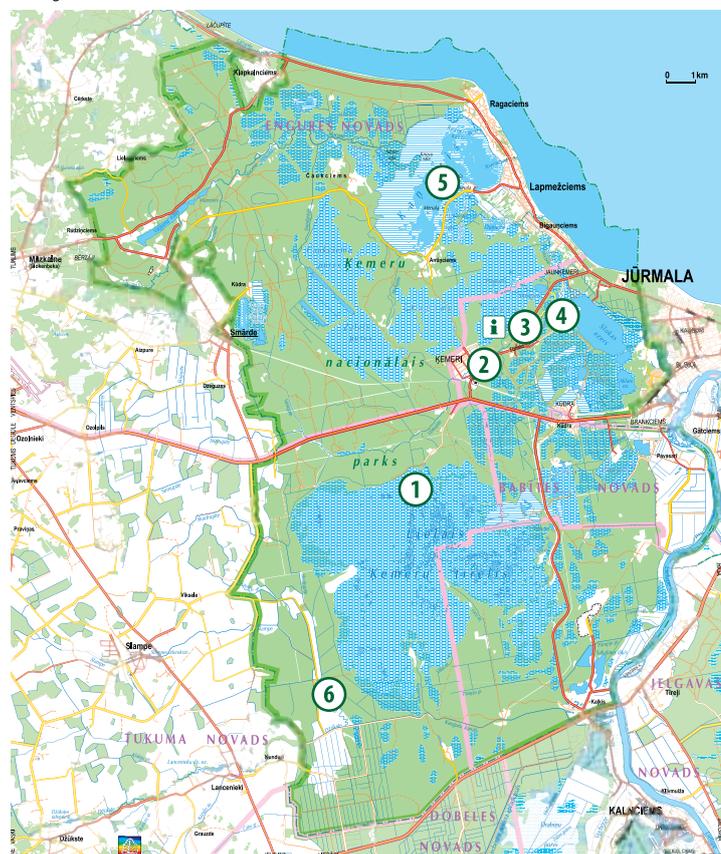
The main nature values of KNP are:

- raised bogs, particularly Kemeru Raised Bog, one of the largest raised bog massifs in Latvia (6192 hectares),
- sulphurous mineral waters forming underneath the bogs in the surroundings of Kemeru and discharging in more than 30 springs in the vicinity,
- coastal lakes – Lake Kanjieris and Lake Slokas with outstanding abundance of bird species,
- swamp forests and floodplain forests, home for eight different woodpecker species,
- old-growth coastal pine forests,
- floodplain grasslands, pastures for Heck cattle and Konik horses,
- calcareous fens rich in orchid species.

Several bird species threatened throughout Europe have permanently settled in KNP, e.g. White-tailed Eagle (4–5 breeding pairs), Lesser Spotted Eagle (3–5 pairs), Eagle Owl (4–5 pairs) and Black Stork (3–5 pairs). Lynxes and wolves dwell in the vast forests, while Pond Bat, a particularly rare bat species, can be found in old buildings.

Historical centre of Kemeru health resort dating back to 1838, coastal fishermen villages with local traditions, battle areas and memorial sites of the World War I and World War II are significant cultural heritage of KNP. Archaeological excavations in Siliņupe Stone Age settlement have proved a 5000 years long history of fishermen and hunter settlements in the territory of KNP.

In order to learn more and use the active recreation possibilities in KNP, specially marked nature trails and bicycle routes are created. The visitors can relax on the beach, visit museums, rent a boat or bicycle, use the fishing facilities etc.



Photos: Jānis Klūze

▲ White-tailed eagle.



Photos: Jānis Vītups

▲ Sight at the Kanjieris Lake with reed beds, the Slokene River with swamp forests, coastal pine forests and dunes, the sea and Lapmežciems village.



Photos: Kārlis Lapiņš

Worth seeing

1. Nature trail in Kemeru Raised Bog (open from 2013)
2. Historical centre of the Kemeru health resort
3. Trail in Black Alder Swamp and “Meža māja” (Forest House)
4. Bird watching tower and walking trail at the Sloka Lake
5. CEMEX bird watching tower at the Kanjieris Lake
6. Dunduri Meadows with horses and cattle and the restored Slupe River

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Rare and precious wetlands of ĶNP

Ķemeri National Park is wetland area of particular importance not only in Latvia, but also in the European context.

In the present area of the national park, wetlands began to form after withdrawal of the last ice cover. The Baltic Sea coast changed its configuration several times, the sea level dropped down and rose up, flooding the coastal lowland. The coastal lakes – Kanjieris, Lake Slokas and Dūņieris – are remains of the sea. The formation of bogs began after the withdrawal of the sea, when the peat started to accumulate in wet depressions. Over thousands of years, some wetland types have transformed into other ones, e.g. some lakes have overgrown and turned into bogs and fens. The overgrowing is a still ongoing process, though so slow that the changes usually cannot be observed within a single human life.

Currently ĶNP represents the second largest mire complex in Latvia including raised bogs, transitional mires and fens that cover about one fourth of the national park. Ķemeri Raised Bog, located in the central part of ĶNP, is recognized as a wetland of international importance.

The swamp forests along the Slocone, Vēršupīte and Lielupe Rivers and the Sloka Lake are rich in rare plant and animal species. ĶNP encompasses the largest, the least fragmented and thus very significant areas of black alder swamps in Latvia, the priority habitat of European Union.

Some of the wetlands in ĶNP – raised bogs, the Kanjieris Lake and moist forests, are of international importance for nesting and migratory birds.

Despite the establishment of the protected area the wetlands are being continuously damaged by the past impacts and the still functioning drainage systems. The swamp forests, floodplains and bogs are criss-crossed by drainage ditches. They drain the naturally wet areas, therefore the wetland ecosystems suffer and undergo human-caused changes, e.g. the peat layer accumulated in thousands of years gets decomposed, the deteriorated raised bogs overgrow with trees, the moist forests transform into drier, less diverse types.

The evidence of drainage systems established over the 20th century can be well seen in the raised bog Zaļais purvs with its peat extraction ponds and ditches and in the surroundings of Dunduri and Melnraģi Meadows, a good example of deteriorated area with straightened streams, ditches, drained forests and meadows.

Why should we save wetlands?

Natural filters

Natural wetlands such as seasonally flooded meadows along rivers serve as biofilters purifying the waters. The nutrients including organic pollution from agriculture accumulate in nutrient-rich floodplain soils and are uptaken in the lush vegetation. In a modified floodplain, the nutrient-rich waters run off quickly through the straight ditches and drain directly into larger rivers and further to the Baltic Sea, while in a natural system it gets gradually absorbed. The algal blooms and consequent oxygen depletion both in freshwaters and the Baltic Sea are largely caused by low capability of nutrient retention in modified wetlands.

Natural sponges

Wetland forests, raised bogs and floodplains capture large amounts of water during the floods, afterwards gradually releasing the water and thus serving as a huge sponge. Whereas, straightened streams and drainage ditches, similarly to pipelines, quickly release the waters causing high risk of vast floods downstream.

Contribution to climate change

Global warming has become one of the major challenges in the contemporary world. Scientists have discovered that wetlands are natural carbon storages. Wetland drainage causes decomposition of peat and other organic materials stored in the naturally wet ground. When the peat gets decomposed, it releases large amounts of greenhouse gases, CO₂ and methane, into the atmosphere.

Formation of sulphurous mineral waters

Wetlands of Ķemeri National Park are famous with sulphurous mineral waters, which form under the bogs in approximately 246 km² range. Sulphurous mineral waters are a very important resource of the Ķemeri health resort.

The sulphurous mineral water deposit in Ķemeri is the largest one in Latvia and one of the largest in Europe. The sulphurous mineral waters are formed in anaerobic biochemical process under the bogs with participation of sulphate reducing bacteria which use the sulphurous compounds and organic matter.

Besides mineral waters also the medical mud is being extracted providing a complex approach in healing with enhanced efficiency.

The healing resort in Ķemeri runs since the 18th century. In 1838 the first state bathhouse was built. The popularity of the resort was rapidly increasing, and in 1911 a direct train connection from Ķemeri to Moscow was opened. In the soviet time, Ķemeri was a resort of outstanding importance, where thousands of patients every year from all the Soviet Union came to recover. Currently the sulphurous mineral waters and healing mud are used in the resort rehabilitation centre "Jaunķemeri".



Photo from Jūrmala City Museum archive



Photo from RRC "Jaunķemeri" archive

◀ Sulphurous mineral water baths in Jaunķemeri health resort. Through skin and mucous membranes the hydrogen sulphide is being uptaken into blood, where it involves in biochemical reactions and promotes the processes in human body. Sulphurous mineral water bath procedures are applied for healing heart and blood-vessel diseases, disturbances in metabolism and inflammations. The mineral water is being used also internally to heal, for example, stomach and gallbladder diseases.

The wet forests of Ķemeri National Park are a paradise for woodpeckers. They need standing dead trees, where they search food and carve nesting holes. Every spring the woodpeckers drum at the tops of trees to mark their areas. Excellent "drumming" trees are sometimes used by several woodpecker species. In the photo: on the left – Middle Spotted Woodpecker, on the right – Great Spotted Woodpecker.



Photo: Sīnītiņa Kordule

◀ The bird watching tower at the Kapieris Lake in Riekstu peninsula allows overlooking the lake and its bird diversity.

Thanks to the phytoncides, active compounds derived from bog plants, the air in raised bogs has antibacterial properties. Visiting the trail of Ķemeri Raised Bog (rebuilt in 2013) helps to learn the unique bog environment and enjoy natural sun and air baths.



Photo: Jānis Kūze



Photo: Sīnītiņa Kordule



Photo: Andis Liepa

▲ In the Lielupe and Slampe floodplain meadows the pasturing Heck cattle and "Konik Polski" horses help to prevent the open grasslands from overgrowing.

In spring the ground of the swamp forest turns yellow when the bright Marsh Marigolds blossom out.

◀ In raised bogs and bog woodlands the boreal bog inhabitants – the cloudberry can be found. They require sunny places and acidic substrate. The amber-coloured fruits have a specific honey-like taste, the fruits are rich in vitamin C, ripe in the midsummer, and are used for making a delicious jam.



Photo: Māra Paikāle



Photo: Agnese Priede

Restoration of wetlands

Over the last decades scientists from many countries have concluded that wetlands have a crucial role in nature and human lives. Therefore it is worth to take care of them and restore these vulnerable ecosystems.

All over the world, more and more attention is paid to restoring the natural hydrological regime of wetlands. Also in Latvia with support of the EU LIFE programme hydrological regime has already been restored in more than 10 raised bogs including Teiči Bog, Cena Mire and Ķemeri Raised Bog (northeast part). Moreover, in 2013 the restoration works will be completed in Aizkraukle Mire, Aklais Mire and Rožu Mire in Zemgale as well as Melnais ezers Mire in the vicinity of Riga.

In 2006, the formerly straightened Slampe River was re-meandered into a 4.6 km long stretch. This was the first project of such scale in the Baltic countries. In Ilūkste municipality, there is an ongoing project on the re-meandering of the Dviete River (to be done until 2014) aimed at recovery of natural floodplain system and floodplain meadows.

LIFE+ project “Restoring the hydrological regime of Ķemeri National Park”

In the period from 2011 to 2016, in Ķemeri National Park a restoration of threatened wetland habitats of European Union importance – raised bogs, wetland forests and floodplain meadows – will be carried out.

The project “Restoring the hydrological regime of Ķemeri National Park” will include a detailed hydrological assessment and restoration of natural hydrological regime in three sites previously affected by drainage:

- in a raised bog Zaļais purvs – 550 hectares (Engure municipality, Smārde parish),
- in bog woodland and swamp forests on the Western margin of the Ķemeri Raised Bog – 1100 hectares (Tukums municipality, Džūkste parish),
- in floodplain meadows – by re-meandering the straightened Skudrupīte River, 85 hectares of floodplain meadows will be restored to conditions being suitable for threatened bird species such as Corncrake, Lesser Spotted Eagle and Black Stork (Tukums municipality, Džūkste parish).

The newly created floodplain meadows will be a new tourist attraction.

The project is carried out by Nature Conservation Agency in collaboration with Institute for Environmental Solutions, Latvian Fund for Nature and Elm Media. The project is co-financed by LIFE+ programme and Latvian Environmental Protection Fund.

Raised bog Zaļais purvs

Wet forests along the Western margin of Ķemeri Raised Bog

Skudrupīte floodplain



Crane



Planned activities within the project

Preparation phase

A.1 Investigation of the project area

In raised bog Zaļais purvs, in Melnragu Meadows along the Skudrupīte River and forests on the Western edge of the Ķemeri Raised Bog in about 2500 hectare large area hydrologists will carefully explore the drainage systems and the current water tables. Biologists will investigate the impacts of drainage on the protected habitats.

A.2 Elaboration of the programme for hydrological restoration

According to the results of pre-investigation and expert recommendations, taking into account the interests of local community and other factors, the programme for restoration of the hydrological regime in raised bog Zaļais purvs, Skudrupīte floodplain and forests to the West from Ķemeri Raised Bog will be elaborated.

Application of the newest available technologies will allow preparation of digital three-dimensional surface and relief models and hydrological water flow models. Data on land surface and relief will be acquired using remote sensing method – scanning the project areas by devices on a specially equipped aircraft. The models will help to calculate potential changes in ground water tables and flow directions of ground and surface waters. This will allow planning the restoration works so that they will not affect the surrounding residential areas or areas of economic activities.

During the elaboration of the programme, at least three public seminars will be organized.

A.3 Elaboration of technical projects and gaining the necessary permits

On the basis of the restoration programme technical projects for restoration actions in three wetland areas as well as technical projects for two supervision platforms in Skudrupīte floodplain will be prepared. All the responsible institutions will be addressed to gain the necessary permits.

Restoration of the natural hydrological regime

All activities will be supervised by nature conservation experts and hydrologists. If necessary all changes in water tables will be corrected using the elaborated hydrological models and three-dimensional surface and relief models.

C.1. Restoration of raised bog Zaļais purvs

The raised bog habitats will be restored in the surroundings of the abandoned peat excavation sites. As a result, continuous degradation in about 550 hectares of a raised bog habitat will be averted.

C.2.1 Restoration of bog woodland and swamp forests

On the Western margin of the Ķemeri Raised Bog in about 1100 hectares the water regime will be restored in the drained wetland forests. As a result, the natural hydrological regime will be re-created both in bog woodland and swamp forests, home for numerous rare plant and animal species.

C.2.2 Restoration of Skudrupīte and floodplain meadows

In Melnragi Meadows the Skudrupīte River will be re-meandered into approximately 7 km long stretch. In the floodplain along the river banks seasonally flooded meadows will be restored in about 85 hectares.

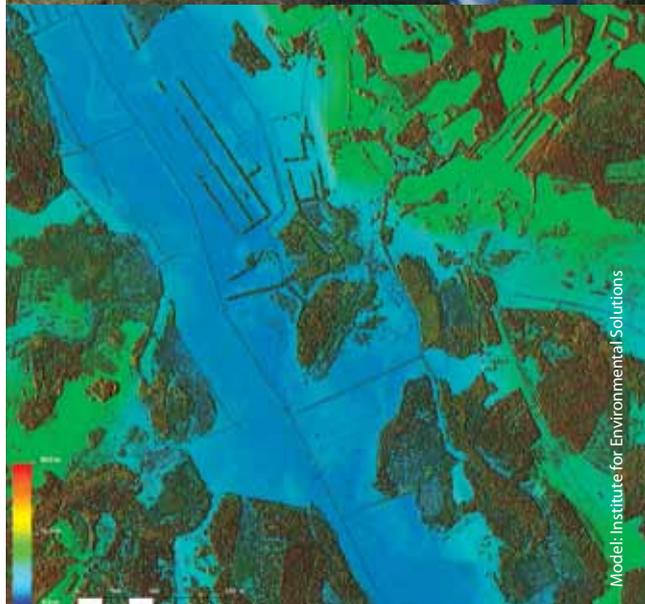
C.3 Establishment of pastures

In order to establish permanent grazing in the newly created floodplain meadow area, the Skudrupīte floodplain will be arranged as pasture connecting the fenced area to the neighbouring pasture of Slampe floodplain meadows.

Heck cattle and Konik horses will be used as grazing animals. Two sightseeing platforms available for the visitors and conservationists will allow observing the animal and plant life in the meadows.



Photo: Agnese Priede



Model: Institute for Environmental Solutions

Three-dimensional surface and relief models will help to calculate the changes in water flows and to predict the borders of the area influenced by the changes in hydrological regime.



Photo: Jānis Kūze



Photo: Jānis Štūke



Photo: Sintija Kordule



Photo: Sintija Kordule



Photo: Ieva Ūbele



Photo: Jānis Kuze

Information and public involvement

D.1. Project website

The actions and results within the project will be regularly published in the project website <http://hydroplan.daba.gov.lv>.

D.2 Information signs and boards

Five information boards and 30 information signs will be placed at the project sites in raised bog Zaļais purvs, Skudrupīte floodplain and at the bog woodland and swamp forests on the Western margin of Ķemeri Raised Bog. The information boards and signs will inform the visitors about the results of the restoration activities and the role of habitat restoration in conservation of nature values of European Union importance.

D.3 Seminars for local community and nature conservation practitioners

The project idea will be introduced in a kick-off seminar. The restoration programme developed in the next project stages will be discussed with the local community in at least three seminars. Two seminars about the wetland restoration issues will be dedicated to nature conservation experts.

D.4 Short films and interactive exposition in ĶNP information centre

Three 12-15 minutes long films about the restoration of wetlands will be produced. The films will tell about the unique nature values of ĶNP – raised bog, floodplain meadows, bog woodland and swamp forest and the necessity to restore these deteriorated habitats. The films will be distributed in the schools, libraries and other institutions in Latvia. The visitors of ĶNP information centre will be welcome to discover an interactive permanent exhibition about the project restoration activities.

D.5-D.6 Booklet, collection of papers and overview

A booklet introducing to the activities planned within the project will be published. At the end of the project a collection of papers targeted at nature conservation experts and practitioners will be prepared introducing to the experience gained in the restoration actions. At last a brochure introducing to the project results oriented at the local community, ĶNP visitors and others will be published.

Project management and supervision

E.1 Project management

The project is being carried out in collaboration between Pierīga Regional Administration of Nature Conservation Agency, scientific organization Institute for Environmental Solutions, nature protection non-governmental organization Latvian Fund for Nature and film studio Elm Media.

E.2 Steering Group

The project will be controlled and advised by representatives from Ministry of Environmental Protection and Regional Development, Ministry of Agriculture, Municipalities of Engure, Tukums and Jelgava, State Forest Service and local inhabitants including non-governmental organizations in ĶNP and hunters' associations. At least five meetings of the Steering Group are planned.

E.3 Experience exchange

The project experts, representatives of the local municipalities and local landowners will participate in three experience exchange trips in Latvia and abroad. The trips will be organized to visit areas with similar ongoing wetland restoration activities.

E.4 After-LIFE+ Plan

At the end of the project an After-LIFE Conservation Plan aimed at nature conservation activities in the project sites will be prepared.

E.5 Project audit

The final project report to the EU LIFE+ programme will be approved by an independent auditor.

E.6 Monitoring of wetland restoration

Throughout the project hydrology experts will regularly assess the changes in water tables including regular groundwater measurements. In order to assess the changes in ecosystem caused by restoration activities, biologists will systematically monitor the vegetation changes in permanent plots.

Wetland restoration sites

Raised bog Zaļais purvs

Raised bog Zaļais purvs is located in Engure municipality, Smārde parish. Its area reaches 1586 hectares, largely being covered with raised bog (1047 hectares).

In the mid 20th century, raised bog Zaļais purvs was a peat excavation site. As a result, the Western edge of the bog was drained and the Smirdgrāvis (Sēra grāvis) ditch, the major ditch carrying the bog waters to the Slocene River, was dug and hollowed.

Around the same time the scientists discovered that Zaļais purvs is one of the raised bogs in the surroundings of Ķemeri, where the sulphurous mineral waters are being formed. Therefore the bog was included in the sanitary protection zone of the health resort, and the peat excavation was ceased in 1960.

Along with the cessation of the peat extraction, the pumping of water from the ponds was stopped, therefore the peat quarries filled in with water. In spite of the cessation of peat extraction, the drainage systems continuously affect the raised bog ecosystem. The bog is deteriorated, particularly in the vicinity of the former peat quarries, and cannot recover itself. The bog overgrows with forest, while the typical bog species, e.g. sphagnum mosses, cranberries and sundews vanish.



Raised bog Zaļais purvs in 1911.

Map: Main headquarters geodesic – topographic division, published in 1928 according to the situation in 1911.



Raised bog Zaļais purvs today. Two peat excavation ponds and ditches cross the Western part of the bog.

Map: Latvian Geospatial Information Agency.



Photo from archive of Edgars Krūmiņš family

Peat extraction in the bogs in the vicinity of Smārde in the 1950's.

Raised bog Zaļais purvs today. The drainage ditches still promote the run-off of water, therefore the main peat formers – the sphagnum mosses – go extinct. The raised bog ceases formation and accumulation of peat, and overgrows with trees. The result is a degraded raised bog.



Photo: Agnese Priede

What is a raised bog?

Raised bogs are characteristic of high moisture, specific vegetation and accumulation of peat. Water in a raised bog is as much important as blood in a living organism. Without proper moisture content a raised bog cannot exist. In raised bogs, the keystone species are sphagnum mosses. Sphagnum has a unique ability to accumulate up to 20–25 times more water than its own mass, thus helping to preserve the moist environment of the bog. Also other raised bog plants, e.g. cranberries and cloudberry, require lots of moisture and specific conditions, therefore they can be found only in raised bogs.

In a raised bog, the peat accumulates when the sphagnum gradually dies. The raised bog environment is moist and acidic, the microorganisms lack oxygen and thus the decomposition of organic matter is very slow. The dead plant debris accumulates and forms peat.

The raised bog peat is used as fuel for burning (because of low mineral content), as litter in farming (because of high capability to accumulate moisture) and in gardening. Peat is a renewable resource, however, it should be used carefully as its formation is a very slow process. Averagely the peat layer accumulates about 1 mm per year. This means that one metre thick layer of peat can be accumulated in thousand years, while its extraction happens much faster – in few years.

Why should we save the raised bogs?

In Latvia, the raised bogs cover about 4.2 % of the country. Most of them are affected by drainage and peat extraction causing hydrological changes. Therefore the drainage-affected raised bogs overgrow with forest, and the peat layer decomposes.

In Latvia raised bogs are still a common element of landscape, while in many parts of Europe the raised bogs areas have decreased by up to 90 % over the last century.

Raised bogs are home for numerous species that cannot be found anywhere else, e.g. European Golden Plover and Wood Sandpiper.

Untouched active raised bogs and degraded raised bogs still capable of natural regeneration are included in the list of habitats protected under the European Union Habitats Directive. Latvia as a member state of the European Union has undertaken the responsibility on ensuring good conservation status of these wetland habitats.



Photo: Agnese Priede

▲ *Due to high moisture and acidity in a raised bog, many plant species have developed special adaptations to survive in the hostile environment. For example the carnivorous sundews uptake the nutrients by 'hunting' insects, which get trapped on their sticky leaves.*

▼ *Untouched raised bog. Such bogs are open, criss-crossed with wet hollows and bog ponds. In untouched bogs the plants have adapted to very wet conditions and cannot survive in other habitats, e.g. sphagnum mosses, sundews and cranberries.*



Photo: Agnese Priede

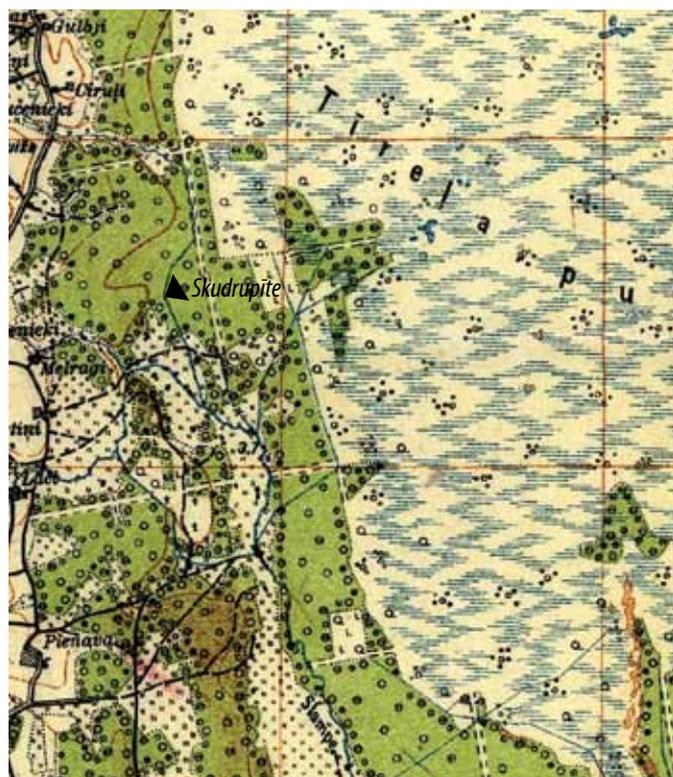
Wetland restoration sites

Skudrupīte floodplain and forests along the Western margin of Ķemeri Raised Bog

Melnragi Meadows, the floodplain of the straightened Skudrupīte River, and forest on the Western margin of Ķemeri Raised Bog are located in Tukums municipality, Džūkste parish. In the 19th century Skudrupīte River was a tributary of the Slampe River. The Slampe River discharged into the Bērze River, which flew into the Lielupe River. Later on, this area experienced large-scale drainage works and straightening of streams, thus adjusting the lands for agricultural purposes.

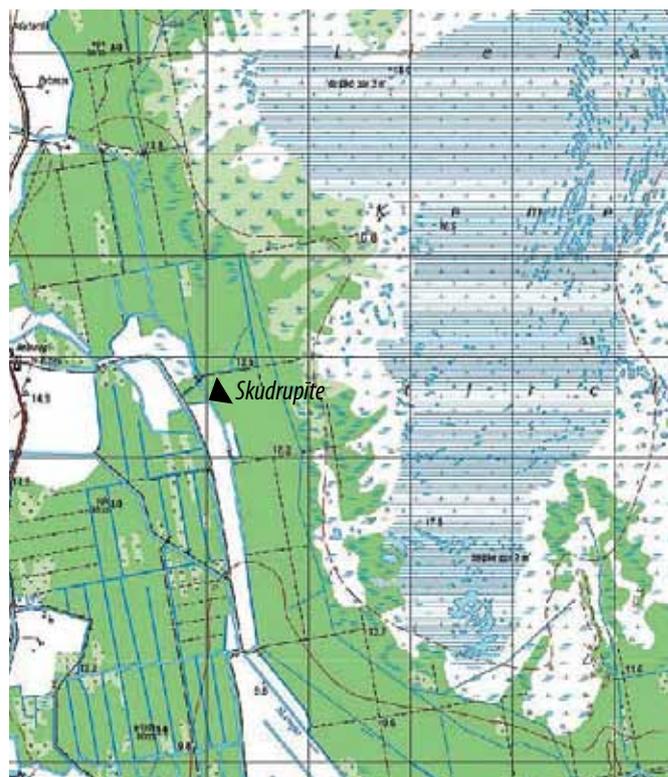
In the 1930ies, the Skudrupīte River was straightened, and by digging the 12 km long stretch of Kauguri Channel, the waters of Skudrupīte and Slampe were directly discharged into the Lielupe River. Later on, in 1964 the Slampe River was straightened. In all the surrounding floodplain meadows closed drainage pipe system was established causing cessation of seasonal flooding in this area.

Probably already at the end of the 19th century the first drainage was established in the forests on the Southwest margin of Ķemeri Raised Bog. The following vast drainage in 1964 and the reconstruction of drainage system in 1974 significantly altered the hydrological regime of these formerly wet forests.



Skudrupīte floodplain and forests along the Western margin of Ķemeri Raised Bog in 1911. The first forest drainage system was already established, while the open streams still had natural beds.

Map: Main headquarters geodesic – topographic division, published in 1928 according to the situation in 1911.



Skudrupīte floodplain and forests along the Western margin of Ķemeri Raised Bog in 2011. The Skudrupīte River is straightened, while the forests are criss-crossed by drainage ditches
Map: Latvian Geospatial Information Agency.



Photo: Jānis Kūze

The straightened Skudrupīte River.



Photo: Viesturs Lārmānis

Drainage ditch in forest.

What are floodplain meadows?

Floodplain meadows are seasonally flooded areas along rivers. Floods occur mostly in springtime, rarer – in other seasons with high precipitation. Floodplains temporarily store the excessive waters and gradually release them, thus mitigating the flooding risk downstream. Floodplains ‘catch’ the nutrients dissolved in waters and store them in the rich alluvial soils, thus playing a role of a filter. Nowadays few natural floodplains are left in Latvia. Over the last century vast floodplain areas were modified for agricultural purposes, the small streams were straightened and floodplain meadows were criss-crossed by drainage ditches.

Many plant and animal species have adapted to the seasonality of floodplain and its rich alluvial soils. In floodplain meadows numerous rare plant species can be found, while the shallow waters overrunning the meadows in spring are suitable environment for spawning pikes. Geese and wild ducks rest and feed in the flooded meadows during the long migration journeys. Floodplain meadows are the only nesting habitat of the rare, threatened Great Snipe. Also the threatened Corncrake is nesting in such grasslands, and it is excellent feeding habitat for the rare Lesser Spotted Eagle. Therefore the floodplain meadows are acknowledged as a protected habitat in the entire European Union.

In Latvia, large proportion of the floodplain meadows is included in the category of biologically valuable grasslands. The landowners can receive subsidiary payments for nature friendly management if regularly mowing the grass or grazing animals there.



Photo: Agnese Priede

▲ Natural floodplain – meandering river and seasonally flooded meadows on its banks.

◀ Purple-loosestrife.

Lesser Spotted Eagle. ▶

Large Cooper Butterfly.



Photo: Jānis Stomers



Photo: Agnese Priede



Photo: Jānis Jankovs



Photo: Uģis Pīterāns

▲ Corncrake.

Semi-natural floodplain meadow is multi-coloured. Dozens of brightly blooming plant species and their fertilizers dwell here. ▶



Photo: Agnese Priede



Photo: Agnese Priede



Photo: Jānis Kuze

▲
Black Woodpecker.

◀ *In a natural swamp forest with hillock-like root elevations and wet depressions diverse flora and fauna are found. Species adapted to drier conditions live on hillocks, species adjusted to wet conditions – in the depressions.*

Bog woodland and swamp forests

Wetland forests are diverse, rich in species, accumulate the waters and play the role of natural filters. Bog woodlands are mainly found in the marginal zone of raised bogs, mostly pines, rarely deciduous trees predominate. Swamp forests and wet alluvial forests are dominated by deciduous trees – mostly Black Alder and Downy Birch, in alluvial forests the broadleaves, e.g. Ash, Oak, Elm and other tree species can be found. The ground layer is usually rich in herbaceous species. Large diversity of mosses, lichens, fungi and small invertebrates can be found. Sometimes spring discharges form wet hollows, creating a nutrient-rich water supply to the forest environment and attracting species – wet forest specialists.

Drainage in such forests causes depression and decomposition of peat layer, destruction of the hillock-like roots of trees typical for swamp forests. The formerly lively wet hollows dry up, the moisture-loving species vanish.

Bog woodland and swamp forests are fragile habitats protected on a European scale under the European Union Habitats Directive.



Photo: Jānis Kuze

▲
Elk.

◀ *Drained swamp forest. The peat has dropped down opening naked roots of trees. Wet depressions have become dry, and the species adjusted to wetness have vanished.*



Photo: Agnese Priede

Nature Conservation Agency is a subordinated agency of Ministry of Environmental Protection and Regional Development, which ensures implementation of unified nature protection policy and promotes effective management and supervision of protected nature areas in Latvia.

Nature Conservation Agency has several departments and four regional administrations. They supervise all protected areas including Natura 2000 sites by implementing a unified nature conservation policy and supervising the implementation of legislative acts.



Ragged-Robin.

Photo: Agnese Priede

Brochure prepared by LIFE+ project "Restoring the hydrological regime of Ķemeri National Park" LIFE10 NAT/LV/000160 HYDROPLAN

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Wetlands for nature and people

The aim of the LIFE+ project "Restoring the hydrological regime of Ķemeri National Park" is elaboration of programme for restoration of hydrological regime and reconstruction of natural hydrological regime in raised bog Zaļais purvs, in wetland forests on the Western margin of Ķemeri Raised Bog, re-meandering the Skudrupīte River and restoring the floodplain regime in Melnragi Meadows. The project lasts from the 1st of September 2011 to the 31st of August 2016. The project location is Ķemeri National Park NATURA 2000 site.

<http://hydroplan.daba.gov.lv>



Come and learn more about wetlands!

In order to learn more about wetlands, their unique values and restoration of hydrology, you are welcome to join our guided excursions.

To apply please contact us:

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More information and excursion schedule can be found at:

<http://hydroplan.daba.gov.lv>



Foto: Gatis Pāvils

Working together in wetland restoration

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Natura 2000: Europe's nature for you. Ķemeri National Park is a part of the European Natura 2000 network. It has been designated because it hosts some of Europe's most threatened species and habitats. All 27 countries of EU are working together through the NATURA 2000 network to safeguard Europe's rich and diverse natural heritage for the benefit of all.
<http://ec.europa.eu/environment/nature/natura2000>



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