



Mitrāji
dabai un
cilvēkiem

“Restoring the Hydrological regime of the Kemerī National Park”

(LIFE Hydroplan)

LIFE10 NAT/LV/000160

After-LIFE Conservation Plan



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1. Project overview

1.1. Project overview

In September 2011 Nature Conservation Agency in close collaboration with three associated beneficiaries: Institute for Environmental Solutions, Latvian Fund for Nature and ELM MEDIA started the implementation of the project "Restoring the Hydrological regime of the Ķemeru National Park" (abbrev. Hydroplan).

The main objective of the project was to establish hydrological restoration programme and to carry out hydrology restoration measures within three different ecosystems to eliminate impact of altered hydrological regimes and restore natural or semi-natural hydrological conditions of:

- a) bog woodland and swamp forest habitats - peripheral forests at the western edge of the raised bog Ķemeru tīrelis;
- b) raised bog habitats - the raised bog Zaļais purvs;
- c) floodplain meadows - floodplain of the river Skudrupīte - Melnragu meadows.

During the project an inventory of protected bog, forest and grassland habitats was carried out. Also data were obtained by using remote sensing technologies, for assessing the condition of habitats, and existing drainage system.

Using the obtained data, three hydrology restoration programmes for three types of habitats were developed:

- a) Bog woodland (91D0*) and Fennoscandian deciduous swamp forests (9080*) - peripheral forests at the western edge of the raised bog Ķemeru tīrelis;
- b) Active raised bogs 7710* - the raised bog "Zaļais purvs";
- c) Floodplain meadows (habitat types 6450 and 6510) - floodplain of the River Skudrupīte & Melnragu meadows - breeding habitat for Corncrake (*Crex crex*).

Based on the research findings and developed management programs, at the end of 2017 practical works were started, restoring and managing protected bog, forest and grassland habitats in Ķemeru NP. During the Project, management of all three habitat types was carried out:

- 1) Restoration of hydrology of raised bog – Zaļais purvs:

Due to the drainage systems built in the 1930s and 1970s, water level of raised bogs and black alder swamps in the Ķemeru NP is severely modified. It has caused reduction of water table both in the bogs and swamps, thus changing the natural habitats.

For the hydrology regime restoration in bog “Zalais purvs” melioration ditches were completely filled up by peat in common length of 16,1 km. To avoid the water flow in filled up ditches, perpendicularly their location 124 dikes were made. Likewise water flow was stopped in 68 km length of ditches by building of 498 dams from the peat on them. Thereby drainage effect on bog’s ecosystem was stopped and hydrological regime was restored in total area of 550 ha.

2) Restoration of hydrology of forest habitats in peripheral forests at the western edge of the raised bog Ķemeru tīrelis

During the hydrological restoration work in forest habitats, melioration ditches were completely filled up by soil or peat in common length of 25,7 km. To avoid the water flow in filled up ditches, perpendicularly their location 371 dikes were made. Likewise water flow was stopped in 61 km length of ditches in wet forests by building of 296 dams from the soil or peat on them in the forest habitats, but in bog habitats – 96 dams. Thereby drainage effect on wet forests and bog ecosystems was stopped and hydrological regime was restored in total area of 1100 ha.

3) Restoration of hydrology of Skudrupīte meadows – breeding habitat for Corncrake (*Crex crex*)

By the restoration of hydrology of Skudrupīte meadows, riverbed was re-meandered. Before the re-meandering Skudrupīte was like a straight ditch in 5,5 km length. After the re-meandering of Skudrupīte, the new riverbed reached 7,5 km length (7 km were planned). The soil from the riverbed digging was levelled in both coasts of Skudrupīte. During the floods, the shallow coasts of river allow water to spread out in wide area thereby providing the natural hydrological regime for floodplains in 85 ha area (as originally planned). Some stones were putted in river for water purification purpose. In the same time stones in the river provide places where some water animals and fishes can hide. In that way stones putted into the river fulfil the same role as it is in natural rivers.

4) Stakeholder involvement

During the project implementation, the public awareness of the different methods of environmental protection was promoted through practical management work. In several meetings and seminars there were informed those local residents whose properties are located near the habitat management areas, as well as local authorities, field experts, and other interested parties. There were also issued various informative materials, including brochures, short films and a book of scientific articles, also information stands were installed and two supervisions platforms were created, which is now available publicly.

1.2. SWOT analysis

Strengths	Weaknesses (difficulties)
<ul style="list-style-type: none">• The results of project restoration activities are regularly monitored and assessed. This work will also continue in future, providing knowledge of preferable habitat restoration activities in similar situations.• Developed hydrological regime restoration programmes are useful tools not only for implementation of project activities but also fits for other similar situations.• “Report on hydrological restoration planning and implementation” with scientific articles and short films are a good source of information for all interested parties, also it is a good publicity instrument for Project and LIFE programme promotion.• Created short movies are also available on Youtube, which helps as a good educational material.• “Report on hydrological restoration planning and implementation” is especially important tool for further habitat management planning and the information included in it was not available anywhere until now.• The experience with development of long-term hydrology restoration programmes was a good tool and experience on how to work with local society and how to improve communication about habitat restoration issues.• The restored Bog habitats in “Zaļais purvs” fits very well to EU Environment Action Programme, since the bog ecosystem helps to store a lot of pollution and benefits local people with better air quality.• Applied full procedure of Environmental Impact Assessment provided a wide range of facts and evidences on project possible impact on surrounding territories.	<ul style="list-style-type: none">• Several weaknesses were met during the project. They can be categorized as difficulties due to inside factors and due to outside factors. <p><u>Difficulties due to inside factors</u></p> <ul style="list-style-type: none">- Project experienced a frequent change of project coordinators, so there were difficulties with a successful management of activities and lot of issues took more time to be sorted out. <p><u>Difficulties due to outside factors</u></p> <ul style="list-style-type: none">- Due to the complexity in relations with local land owners and other stakeholders, which resulted in extra studies and full EIA procedure, project has been prolonged two times and reached 8 years (96 months);- In case of any hydrological regime restoration works for them to be allowed, first a technical project has to be elaborated and agreed by all the responsible institutions. This process may take a lot more time than planned, taking into account that the application processing period is set by the law and many of local authorities tend to stretch the processing of applications for the maximum allowed time frame. Also a possible objections from local stakeholders should be reckon with. <ul style="list-style-type: none">• Any type of habitat restoration works that are closely connected to the habits of local community, must reckon with a negative response from locals, especially if it is a hydrological regime restoration with “possible” impact on surrounding territories. In case of this particular Project, the real problem was hidden in more historical issues related to the former habitats restoration activities and legal regulation in Ķemeri NP but the local community “found a way” to complain about those old issues through protests against project activities, therefore all habitat restoration actions have been delayed.• There is no allocated funds, which would provide a chance to continue further restoration and management of degraded habitats.

Opportunities	Threats
<ul style="list-style-type: none"> • A new Nature Conservation Plan for Ҷemerі National Park is currently in development so the acknowledgements and observations of the Project can be included in this upcoming document, which will set the future nature conservation policy in Ҷemerі NP area. • The upcoming new Nature Conservation Plan for Ҷemerі NP is also one of the key documents to raise funds for future habitat restoration and management activities. • The project has set the stage for creating further relationships between project beneficiaries and other interested parties. The topic of the importance of habitat restoration has been raised, so further cooperation and common research can be carried out. • One of the best ways to ensure the sustainability of nature protection is further nature education activities involving local residents and entrepreneurs. • In the project created information boards, grazing plots with animals, supervision platforms and restored habitats will attract visitors which will give a positive economic benefit for local entrepreneurs involved in nature tourism. 	<ul style="list-style-type: none"> • EU nature conservation policy foresees the elaboration of restoration and management plans, but those are not among national priorities, therefore neither effort nor funds are applied to long-term planning or practical nature management works. • There is still a lack of integration with other sectors, especially with forest management and rural development policies.

2. After-LIFE objectives and methodology

2.1. Habitat maintenance and restoration objectives and methodology

Raised bog “Zaļais purvs” habitat maintenance and restoration objectives and methodology

Bog ecosystems perform a number of vital functions that are lost as a result of drainage and peat gathering. It is estimated that drainage has reduced 90% of the areas covered by bogs in the EU. The typical hydrological regime is a precondition for the effective functioning of the bog ecosystem. Wetlands, peat accumulation and limited presence of nutrients are necessary for bog formation. Once bogs lose their ability to form peat effectively, they also lose the capacity to absorb carbon dioxide. Therefore during the Project there was a habitat natural hydrological regime restoration program for raised bog “Zaļais purvs” developed.

According to the hydrological restoration program, hydrological regime restored and further degradation of raised bog habitat averted in approximately 550 ha of habitat Active raised bogs 7710* by filling the ditches with the peat left on the sides of ditches and building dams both from peat and mineral soil. The restored hydrological regime will support the characteristic process of the habitat – slow tree growth and accelerate peat formation.

Hydrological restoration should foster the gradual return of active raised bog in locations that are now occupied by overgrown areas. Additionally, forest rarefaction is expected as some trees will struggle to adjust to the new habitat, thereby signalling of an effective functioning of the restored hydrological regime.

To contribute to restoration of raised bog, after the end of the project, cutting down the trees started, by use of “deforestation cut” in total area of 333 ha.

To ensure successful further process, a frequent check-up should be done on the condition of dams and closed ditches. In case of malfunction, there should be repairmen works carried out to ensure that dams function as planned and water stays in the bog. To ensure continuity of the restored area, a long-term planning should be carried out on possible restoration of all the degraded area. To do that, first the results of already applied methods should be assessed via frequent monitoring data collection and evaluation. If the impact on bog`s hydrology turns out to be positive, further attempts should be done to plan a wider scale of works and to search for possible ways to attract funding. Partial planning of the possible restoration works most probably will be carried out during the development of the Nature Conservation Plan for Kemer NP.

Forest habitats maintenance and restoration objectives and methodology

Reduction of the effects of drainage system is required to prevent further degradation and change of vegetation in habitat types of EU importance - Bog woodland 91D0* and Fennoscandian deciduous swamp forests 9080*.

According to hydrology restoration program, hydrologic regime restored in approximately 1'100 ha of forest areas, natural water regime restored or improved the conditions of Bog woodland (91D0*) and Fennoscandian deciduous swamp forests (9080* habitats).

Similar to previous – raised bog habitat - to ensure successful further process, a frequent check-up should be done on the condition of dams and closed ditches. In case of malfunction, there should be repairmen works carried out to ensure that dams function as planned and water stays in the territory of project activity.

Skudrupite meadows – breeding habitat for Corncrake – restoration objectives and methodology

Restoration of Skudrupite River flood plain meadows is necessary to restore breeding habitat for corncrake (*Crex crex*). Re-meandering of Skudrupite River provides periodical “floods” in meadows along the River which is precondition for appropriate hydrology regime in flood plain meadows.

According to hydrology restoration program, hydrologic regime restored in 85 ha of meadows along the River Skudrupite but Skudrupite River from 5 km straight ditch was re-naturalised in 7,5 km River stretch. To provide an adequate management of flood plain meadows (grazing by animals and mowing), grazing plot in total area of 85 ha was fenced by electric fence in total length of 3850 m and next to grazing plots two supervision platforms were build.

2.2. Monitoring objectives and methodology

Vegetation monitoring

The fastest and most observable changes after restoration will be seen in ground-floor vegetation, therefore vegetation monitoring was implemented in the areas where habitat restoration works were carried out. In each project activity site vegetation was monitored at least one year before (because of delaying of implementation of C actions, monitoring actually started even 4 years before) and continues a year after the management works to evaluate their impact on the habitat.

The vegetation monitoring in the Raised bog habitat in Zaļais purvs (Act. C.2.1) was carried out in 30 monitoring plots, for the forest habitats in peripheral forests at the western edge of the raised bog Ķēmeru tīrelis (Act. C.2.1.) 44 monitoring plots were established, but for grasslands habitats in Skudrupīte meadows (Act. C.2.2.) 29 sample plots were used – 12 new made during the project + 4 plots, installed previous.

According to the “Report on Vegetation monitoring” it was suggested henceforward continue monitoring as follow: once in six (optimally once in four) years. In grassland it is recommended to make vegetation monitoring more often - once in two years (optimally annually) because for grasslands it is characteristic that changes occur more faster than in forest on bog habitats.

Since the project restoration activities haven't yet got clearly obvious impacts on vegetation after the first year, all three areas will be continued to monitor for at least next 5-10 years to demonstrate effects on the vegetation after the habitat restoration activities.

Groundwater level monitoring

As foreseen in Hydrology Monitoring plan regular groundwater monitoring in 38 monitoring wells and monitoring points on 4 water courses were established in July 2012. Hydrology monitoring covers all three of project territories (C.1, C.2.1 and C.2.2). Hydrology monitoring data were collected with frequency two to four times per month. Additionally, data on electric conductivity of ground water and water courses were collected to establish origin of water supply – rain water or mineral springs (sulphide containing groundwater). The first measures were taken before restoration actions began to provide a base line and improve the restoration plan and first measurements after restoration already have showed positive changes in hydrology. Groundwater monitoring will be continued for at least 5 years after the project to ensure that territories outside the project area remain unaffected and water stays in the bog. It is expected that in coming years the measurements will demonstrate even more successful stabilisation of groundwater levels.

According to the “Report on groundwater monitoring” it was suggested henceforward continue monitoring as follow: in bog habitats in project territory C.1 (Zaļais purvs) it is recommended continue monitoring in 19 monitoring wells as well as observe water level in both queries. But in forest habitats (C.2.1.) and Skudrupīte River floodplains meadows (C.2.2.) - continue monitoring in 10 monitoring wells as well as observe existence and amount of spring time floods.

Water level in monitoring wells should be evaluated all year round at least twice in month by using hydro- acoustic method or data loggers.

2.3. Nature education and stakeholder involvement objectives and methodology

There is no doubts that nature education and general awareness of society is what forms the public opinion. During this Project there were many obstacles met regarding the negative and opposed public opinion and this led to conclusion that habitat restoration for the needs of nature and biological diversity is still a very sensitive and touchy subject in Latvia.

The reasons are several – they can be related to the former habitats restoration activities and legal regulation in Ķemeri NP, the general incomprehension between forests with economical and nature conservation purposes and general dislike of nature protection. Although it is very hard to change the attitude of people and it takes a long time, still it is the only way to ensure sustainable public opinion. The discussions that were started on this Project still lingers on the minds of people and further attempts should be done to not let it go. Almost every society has their local opinion leaders and one of the easiest ways how to get to the people would be through such locally respected individuals.

Since in upcoming years there is planned to carry out several nature conservation planning actions on national and regional level, it provides a very good basis for continuing the already started work.

Since 2016 the project “Preconditions for better biodiversity preservation and ecosystem protection in Latvia” or simply the “Nature Census” started. During the project habitats inventory at national level is going on as well as development of 25 management plans for protected territories and development of 5 species management plans. Such kind of project requires a significant involvement and information of society.

In the same way a new management plan for Ķemeri NP will be developed in next two years and, of course, it provides a very good basis for continuing the already started work in public involving, informing and education.

On everyday basis NCA is already carrying out different educational activities about all kinds of protected nature values, including key habitat types of Project and their nature values. All the materials produced within the Project are good tools for increasing the understanding and knowledge in a fun and attractive way. There is a Nature Education Centre in the territory of Ķemeri NP which is already doing a great educational work and will continue to raise people`s awareness on different nature conservation topics.

3. Financial outlook

Management activity	Activity implementer	Timeframe	Costs* Euro	Possible funding source	Performance indicators
Raised bog habitat restoration and maintenance (in “Zaļais purvs”)					
Check-ups on the infrastructure condition in restored habitat areas, reparation of damaged or loose quality	NCA	Annually	2640 Eur	NCA	Frequent quality check-ups done on the built dams and closed ditches, timely reparation done in cases of malfunction.

infrastructure (498 dams, 124 dikes in total area 550 ha)					
Continuation of tree cutting in the rest of Raised bog area, where hydrological regime was restored.	NCA	From the end of 2020	5000 -10000 Eur	NCA	In the all restored raised bog area (550 ha) tree cutting done by public activities, Junior Rangers, NCA workers etc. during 2020-2022.
Monitoring of groundwater level in restored Raised bog habitat area	NCA	Twice a month, until 2024. Data analysis once a year	2000 EUR / year	NCA	Frequent data on the groundwater level measurements in restored habitat areas collected
Vegetation monitoring in restored Raised bog habitat area	NCA	In 2023, 2027, 2031 etc.	700 Eur for each monitoring visit	NCA	Frequent data on the vegetation in restored habitat areas collected
Forest habitats restoration and maintenance (on west side of Lielais Kemeru tītēlis)					
Check-ups on the infrastructure condition in restored habitat areas, reparation of damaged or loose quality infrastructure (392 dams, 371 dikes in total area 1000 ha)	NCA	Annually	3300 Eur	NCA	Frequent quality check-ups done on the built dams and closed ditches, timely reparation done in cases of malfunction.
Monitoring of groundwater level in restored Raised bog habitat area	NCA	Twice a month, until 2024. Data analysis once a year	1000 EUR / year	NCA	Frequent data on the groundwater level measurements in restored habitat areas collected
Vegetation monitoring in restored forest	NCA	In 2023, 2027, 2031 etc.	700 Eur for each	NCA	Frequent data on the vegetation in

habitat area			monitoring visit		restored habitat areas collected
Skudrupite meadows – breeding habitat for Corncrake – restoration and maintenance					
Check-ups on the restored riverbed (demolishment of beaver dams and wood aggregations in 7,5 km length)	NCA	Annually	2640 Eur	NCA	Frequent check-ups done on the restored riverbed, timely demolishment of different kind aggregations
Check-ups on the infrastructure condition in restored habitat area, reparation of damaged or loose quality infrastructure (2 supervision platforms; pasture's fence in the total length of 3850 meters)	NCA	Annually	2688 Eur	NCA / land tenant	Frequent quality check-ups done on the built supervision platforms and fence, timely reparation done in cases of damages
Monitoring of groundwater level in restored Raised bog habitat area	NCA	Twice a month, until 2024. Data analysis once a year	1000 EUR / year	NCA	Frequent data on the groundwater level measurements in restored habitat areas collected
Vegetation monitoring in restored grassland habitat area	NCA	2021, 2023, 2025 etc	700 Eur for each monitoring visit	NCA	Frequent data on the vegetation in restored habitat areas collected
Data collection and general public awareness					
Updating of nature data system OZOLS with habitat management data	NCA	Annually	Administrative costs	NCA	Supplementing and constant updating of habitat data base with data about management works in nature

					data system OZOLS provided
Updating of nature data system OZOLS with monitoring data	NCA	Annually	Administrative costs	NCA	Supplementing and constant updating of monitoring data base in nature data system OZOLS provided
Consulting of land owners in implementation of habitat management activities	NCA/ habitat's experts	On request	Administrative costs, depend on request within the respective year	NCA	Consulting of land owners in implementation of habitat management activities provided
Organization of public discussions in the process of development of Nature Conservation Plan for Kemer NP	NCA	According to legislation (at least one public hearing is obligatory).	NCA / EU funds	NCA	Public discussions organized, regarding development of Nature Conservation Plan for Kemer NP, including foreseen habitat management issues and planned works for both responsible Institutions and landowners as well as local municipalities and field experts.
Organization of thematic educational activities regarding nature values of the Project key habitats	NCA	Annually	Administrative costs	NCA / ALEPF	Organization of thematic educational activities regarding nature values of the habitats provided